REQUEST FOR PROPOSALS

FOR

NEW SIMON SANCHEZ HIGH SCHOOL: FINANCE, DEMOLITION, DESIGN, BUILD, LEASE/LEASEBACK & INSURE/CAPITAL MAINTENANCE (FDDBLM)

AS AUTHORIZED BY THE "MA KÅHAT ACT OF 2013" AND ALL SUBSEQUENT/RELATIVE PUBLIC LAWS AS APPROPRIATE

PROJECT No. 730-5-1059-L-YIG

LOURDES A. LEON GUERRERO
Governor of Guam

and

JOSHUA F. TENORIO
Lt. Governor of Guam

PREPARED BY:

public works
DIPATTAMENTON CHE'CHO' PUPBLEKO

DIVISION OF CAPITAL IMPROVEMENT PROJECTS
CONTRACTS ADMINISTRATION SECTION
DEPARTMENT OF PUBLIC WORKS
GOVERNMENT OF GUAM

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GOVERNMENT OF GUAM

2025

RECOMMEND APPROVAL:

JOHN F. CALANAYAN
Engineer Supervisor
Department of Public Works

Date: 3/21/25

APPROVED BY:

VINCENT P. ARRIOLA
Director
Department of Public Works

Date: 3-21-25

The Honorable
LOURDES A. LEON GUERRERO
Maga' Håga · Governor

The Honorable
JOSHUA F. TENORIO
Sigundo Maga' Låhi · Lieutenant Governor

public works
DIPATTAMENTON CHE'CHO' PUPBLEKO
VINCENT P. ARRIOLA
Director
LINDA J. IBANEZ
Deputy Director

REQUEST FOR PROPOSAL

The **Governor of Guam, Lourdes A. Leon Guerrero, and Lt. Governor Joshua F. Tenorio**, through the **Director of the Department of Public Works (DPW),** invite sealed proposals for the **New Simon Sanchez High School – Finance, Demolition, Design, Build, Lease/Leaseback, and Insure/Capital Maintenance (FDDBLM), Project No. 730-5-1059-L-YIG.**

RFP documents will be available starting **Friday, March 28, 2025**, at the **Contract Administration Technical Services Office, Ground Floor, TMC Building, DPW** for a **non-refundable fee of $25.00**. Payment must be made at the **Treasurer of Guam,** located at DPW, and a receipt must be presented to obtain the documents. Upon obtaining the RFP, Proposers must complete and return the **Acknowledgment of Receipt Form (Attachment 7)** to DPW. Failure to submit this form will result in the Proposer's disqualification as being non-responsive.

A **mandatory <u>in-person</u> pre-proposal conference** will be held on **Friday, April 4, 2025, at 9:00 a.m.** in the **Guam Economic Development Authority (GEDA) Conference Room, located on the 5th floor of the ITC Building.** A **mandatory site visit** will follow at 2 p.m. at the old Simon Sanchez High School to allow Proposers to familiarize themselves with the project site.

Sealed proposals must be submitted to the **Contracts Administration and Technical Services Section, Division of Capital Improvement Projects, Ground Floor, TMC Building, DPW** by **4:00 p.m., Friday, May 23, 2025**. Proposals will not be accepted without proof of payment.

DPW affirms that all minority business enterprises will have full opportunity to submit proposals and will not be discriminated against based on race, color, or national origin in consideration for an award. The Government of Guam reserves the right to reject any or all proposals and waive any irregularities in the best interest of the government.

VINCENT P. ARRIOLA
Director

Project Name: RFP FOR NEW SIMON SANCHEZ HIGH SCHOOL: FINANCE. DEMOLITION. DESIGN. BUILD. LEASIULEASE.BACK & INSURE/CAPITAL MAINTENANCE
Project No.: 730-5-1059-L-YIG

NEW SIMON SANCHEZ HIGH SCHOOL (FDDBLM)

RFP TIMELINES
Project No. 730-5-1059-L-YIG

Friday, March 28, 2025	**AVAILABILITY OF RFP DOCUMENTS**
Friday, April 4, 2025, 9 AM	**MANDATORY PRE-PROPOSAL CONFERENCE. MANDATORY SITE VISIT TO FOLLOW AT 2 PM**
Friday, April 18, 2025, 4 PM	**LAST DAY TO SUBMIT WRITTEN QUESTIONS AND/OR CLARIFICATIONS**
Wednesday, April 30, 2025, 4 PM	**ANTICIPATED RESPONSE/REPLIES TO QUESTIONS/CLARIFICATIONS**
Friday, May 23, 2025, 4 PM	**RFP SUBMITTAL DUE DATE (Submit to DPW, TMC Building, CIP Contract Section)**
Wed-Thursday, June 4-5, 2025	**ANTICIPATED PRESENTATION & INTERVIEW DATE**
Friday, June 20, 2025	**ANTICIPATED SELECTION NOTICE**

NEW SIMON SANCHEZ HIGH SCHOOL (FDDBLM)

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Attachments

ATTACHMENT A: FINANCING SCOPE OF WORK
ATTACHMENT B: DESIGN/CONSTRUCTION AND INSURANCE/CAPITAL MAINTENANCE SCOPE OF WORK

Required Forms

ATTACHMENT 1: AFFIDAVIT OF DISCLOSING OWNERSHIP AND COMMISSIONS
ATTACHMENT 2: AFFIDAVIT OF NON-COLLUSION
ATTACHMENT 3: AFFIDAVIT re NO GRATUITIES OR KICKBACKS
ATTACHMENT 4: AFFIDAVIT re CONTINGENT FEES
ATTACHMENT 5: AFFIDAVIT re ETHICAL STANDARDS
ATTACHMENT 6: DECLARATION re COMPLIANCE WITH U.S DOL WAGE DETERMINATION
ATTACHMENT 7: ACKNOWLEDGEMENT OF RECEIPT FORM
ATTACHMENT 8: DPW CHECKLIST OF RESPONSIVENESS
ATTACHMENT 9: PRICE PROPOSAL & ADDENDA ACKNOWLEDGEMENT OF RECEIPT FORM

I. PROJECT OVERVIEW

The Governor of Guam, through the Department of Public Works (DPW) and with the assistance of the Guam Economic Development Authority (GEDA), issues this Request for Proposal (RFP) for the financing, demolition, design, build, lease/leaseback, and insure/capital maintenance ("FDDBLM") of a new Simon Sanchez High School in Yigo.

The Government of Guam (the "Lessee"), acting through DPW, seeks to procure the new facility through a municipal lease/leaseback arrangement in compliance with the ***MA KÅHAT ACT OF 2013,*** Public Law 37-22*,* and all applicable public laws, including but not limited to Public Law 20-27, Chapter 8, Title 1 of the Guam Code Annotated, relating to Arts in Public Buildings and Facilities.

Under this RFP, the Government of Guam is authorized to lease school property to the successful Proposer to facilitate project financing, demolition, design, construction, FF&E services, and insurance and maintenance services. Upon completion, the Government of Guam will lease back the facility for a mutually agreed term necessary to amortize the associated costs. The leaseback period shall not exceed 30 years from the scheduled completion date. It may be an annually renewable lease with automatic renewal provisions contingent on available pledged or reserved revenue under §58D109 of Chapter 58 of Title 5 Guam Code Annotated. The leaseback shall not be considered "public indebtedness" under 48 U.S.C. § 1432a, §11 of the Organic Act of Guam, or Guam law. Any lease term extensions will be subject to and not exceed the statutory limit under Guam law.

Proposals must comply with all Government of Guam requirements outlined in this RFP and, where silent, Guam Procurement Law, Rules, and Regulations. The RFP details the required scope of services and proposal submission instructions.

Eligible Proposers include developers, contractors, and finance companies legally operating under U.S. state or territorial laws and subject to Guam licensing regulations. Information on licensing is available from the Director of Revenue and Taxation. Special-purpose company proposals may also be considered.

The successful Proposer will serve as the primary lessor of the new Simon Sanchez High School and must submit all required proposal documents within the timelines specified in this RFP.

II. TERM AND TIME OF PERFORMANCE

The term of this solicitation is comprised of two sections: 1) Financing and Construction not to exceed seven-hundred and thirty (730) days from the issuance of Notice to Proceed, and 2) The negotiated Lease/Leaseback Capital Maintenance period not to exceed thirty (30) years.

III. SCOPE OF SERVICES

The Proposer shall be responsible for the scope of work, services and responsibilities in this RFP and the requirements outlined in the Financing Scope of Work (Attachment A) and the Design/Construction and Insurance/Capital Maintenance Scope of Work (Attachment B).

IV. COMMUNICATION REGARDING THE RFP

Any correspondence or communication by a potential Proposer must be made in writing via email addressed to the sole point of contact John F. Calanayan, Engineer Supervisor at john.calanayan@dpw.guam.gov or by hand delivery at the Contract Administration Technical Services Office, Ground Floor, TMC Building. All written communications must reference: **NEW SIMON SANCHEZ HIGH SCHOOL: FDDBLM Project No. 730-5-1059-L-YIG** in the subject or reference line.

V. PROPOSAL PACKAGE REQUIREMENTS

Each Proposal Package will consist of the Proposer's Submittal with all the required forms/addenda, complete with original signatures and notarizations where necessary. The Proposal Package will also contain a **separate and sealed envelope** marked **"Term Sheet and Price Proposal"** for negotiations.

VI. PROPOSAL SUBMITTAL

The Proposal shall be submitted in a sealed envelope or box that is clearly marked **"NEW SIMON SANCHEZ HIGH SCHOOL FDDBLM Project No. 730-5-1059-L-YIG".** It must include one (1) original with all the required forms listed in Section XXXI- RFP ATTACHMENTS AND LEGAL REQUIREMENTS complete with original signatures and notarizations where necessary, six (6) copies, and two (2) electronic copies (CD or USB flash drive) containing the complete technical submittal and one (1) separate and sealed individual Term Sheet and an individual Price Proposal.

VII. INSTRUCTIONS FOR SUBMITTING A PROPOSAL

1. Format

Submission must be in 8.5 X 11-inch format with font no less than 12-point font size. Each submittal shall not contain more than forty (40) pages, excluding front and back covers, tabs, certificates of insurance, detailed schedule charts, and required forms. Attachments not part of the forty (40) pages should be tabbed and labeled accordingly.

Each RFP Packet shall include a description of the type, technical experience, background, qualifications, and expertise of the Proposer. The description shall show that the firm possesses the demonstrated skills and professional experience to perform the general functions of the Project and fulfill the government's goals and vision for the Project. Submittals shall describe in detail the Proposer's approach to the Project. Creative methodology, and/or technology that the Proposer uses or unique resources that the Proposer can offer to the Project is encouraged.

2. Contents

Respondents shall comply with the following requirements for its RFP Packet:

Section 1: Executive Summary (max. 1 page)-

This should be an overview of the entire RFP Packet with a description of the general approach and/or methodology they will use to meet the goals and fulfill the general functions set forth in the RFP.

Section 2: Table of Contents. Include clearly identifying the written material by section and page number.

Section 3: Cover Letter (max. 1 page)

Each proposal shall include a cover letter signed by a person within the firm authorized to make representations on behalf of the firm and to bind the firm. The cover letter shall include the following information:

a) The Proposer's contact person's name, phone number, and email address relative to the proposal.

b) The Proposer's principal place of business and the location of the office proposing/sponsoring the work relative to this proposal.

c) You must also indicate whether you are operating as an individual proprietorship, partnership, corporation, or joint venture.

d) A brief statement acknowledging the firm's understanding of the scope of work.

e) A positive commitment to perform the services described, with the personnel specified in the submission, **within the budgetary parameters of the "*MA KÅHAT ACT OF 2013" and any subsequent/relevant public laws*.**

f) An acknowledgement that all addenda were received (list each addendum number and date in the letter).

Section 4- Personnel Experience and Qualifications

a) A brief history of the Proposer. Please include any former names of the Proposer and the number of years the Proposer has participated in development or similar construction projects as a developer and/or general contractor under each name. List any reasons for change of name or corporate structure.

b) Identify the overall project coordinator or manager who will serve as the single point of contact and liaison between DPW's Construction Manager and the Proposer for all work under the contract. Explain why this person has been selected as the project coordinator/manager. The manager candidate may be subject to DPW approval.

c) Organizational Charts for Proposer. This shall include two (2) charts: 1. A chart of all corporate entities on the Proposers team, and 2. A chart of all key personnel, with their titles and specific task assignments for the Project.

d) Resumes of personnel involved with the Project shall be included, including their school construction experience. Include A&E personnel. The evaluation will consider the entire team. Therefore, no changes in the Proposer's composition will be allowed without written approval by DPW.

e) Provide a description of the Proposer's technical competence and ability to draw upon multi-disciplinary staff to address the services required under the RFP.

Section 5- Approach and Capacity of Proposer

Detailed description of the Proposer's plan, methods, and ability for carrying out the Project, including:

3. Construction and Insurance/Capital Maintenance

a) Provide a statement regarding the Proposer's availability and resources.

b) Location of nearest office and main office, if different.

c) The technical and managerial approach to the Proposer's partnership with the Government of Guam (DPW, GEDA, GDOE).

d) How the Proposer plans to ensure the project remains within the budgetary ceilings and parameters set by Guam law for Simon Sanchez High School, including strategies for cost control and efficient resource allocation.

e) How the Proposer plans to perform the required services with its resources and current workload; and how the Proposer plans to incorporate skilled and trained workforce into the Project. **Include a Critical Path Method (CPM) schedule and/or chart as an attachment to the proposal.**

f) How the Proposer plans to rapidly mobilize and execute an accelerated financing, demolition, design, and construction schedule to meet the project's expedited construction timeline. Describe any concurrent strategies to streamline mobilization, expedite demolition and accelerate project completion.

g) How the Proposer plans to incorporate design and construction innovations that enhance the expedited construction schedule and cost efficiency, ensuring the Government of Guam achieves the highest economic value throughout the design, construction, and insurance/capital maintenance period. Describe any innovative design approaches or technologies to help reduce operational costs for GDOE and the Government of Guam during the insurance and capital maintenance phase.

h) How the Proposer will incorporate **Attachment B** and the government's design references into the design and construction process **to ensure key stakeholder feedback is effectively integrated into the final build.**

i) How the Proposer intends to use resilient building materials and systems that will allow the Government of Guam to use the facility as an emergency shelter during a super-typhoon and quickly bring the facility back online after a storm.

j) How the Proposer plans to incorporate local subcontracting teams into the Project, if applicable.

k) How the Proposer plans to incorporate construction means, methods, and quality control into the Project.

l) Detailed discussion on costs related to fees, general conditions, insurance, supervision, and management of all portions of the scope of work.

m) Provide a statement of financial resources, bonding capacity and insurance coverage.

n) Certificates of Insurance identifying the firm's current insurance coverage.

o) Copy of the Contractor's License.

p) Provide name and license of Proposer's Architectural/Engineering Design Team.

q) Provide all required attachments in this RFP in an appendix not counted toward the forty (40) pages.

4. Financing

The Proposer shall work with the Guam Economic Development Authority (GEDA) to finance the new Simon Sanchez High School construction. Include the following information related to financing:

a) Proposer's proposed structure in detail, provisions for extension of maturity, roll-over, or any other similar occurrence.

b) Provide a sealed Term Sheet or similar format outlining the terms and conditions of the proposed lease/leaseback agreement.

c) Discuss the estimated timeline for the issuance of this lease/leaseback and describe your firm's ability to conduct this transaction in a timely. Please feel free to outline certain variables such as a credit committee, and their effects, if any, on the terms and conditions of the financing.

d) Please include your firm's latest audited financials for three (3) years.

e) Please describe any other terms and conditions your firm requires regarding this financing.

f) Indicate the principal personnel that would be available to GEDA and the government and describe their experience and responsibilities for this financing.

g) Ability of Proposer to offer suggestions on various arrangements for service and maintenance contracts in support of the upkeep and service of the leased facility. Please provide detail on suggested payment arrangements.

h) Ability of Proposer to allow the purchase of the leased school facility by Lessee at any time during the lease period. Please provide details on the pre-payment arrangement scenario.

Section 6- Experience on Similar Projects

Description of the Proposer's experience to the area of building public schools or similar construction in size, price, and scope. Please provide a list of completed or ongoing projects the Proposer has been involved with where the total project contracts are similar in size, price, and scope. Within that list:

a) Identify the method (e.g., leaseback, bid-build, etc.) by which each project was constructed. For leaseback projects, include the total cost of each project and the breakdown of the total cost by preconstruction services and construction services. Provide some examples of its experience in a municipal leaseback project.

b) Include a discussion of the Proposer's experience with projects performed adjacent to an occupied building and/or campus.

c) Discuss the Proposer's experience with projects performed in tropical environments.

d) Identify whether the project is completed or ongoing.

e) Identify if any of the projects had phased completion.

f) For the projects listed above, be sure to include the following information:
   i. Project name and Description.
   ii. Firm's role.
   iii. Award and completion dates.
   iv. Project initial contract price and final contract price.
   v. Construction cost.
   vi. Staffing, including Proposer's team members, subcontractors and consultants.
   vii. Relationships with Owner/Client during the project.
   viii. References- Provide the owner's contact name, telephone number, and email address.
   ix. Discussion of claims, demands, and/or litigation arising from the project and involving the Proposer, and the resolution.
   x. List projects that the Proposer has completed that had some or all of the following obstacles, including the creative solutions from the Proposer on how these obstacles were overcome: 1. A very aggressive schedule, 2. Significant budgetary Restrictions, 3. Be prepared to expand on what you did to accommodate the project's complexity; and the clients' needs, minimizing inconvenience; and maximizing safety.

Section 7- Performance Issues

Provide a claims statement for all resolved or ongoing claims. Submit a statement indicating any and all lawsuits or claims in which the Proposer or its personnel instigated a claim and/or litigation regarding construction projects within the past five (5) years and indicating any claims in which claims and/or litigation have been pursued against the Proposer or its personnel. For each listed claim and/or litigation

state the issues in the claim and/or litigation, the status of the claim/litigation, the names of the parties involved, and the outcome, if any.

The proposer's claims statements MUST include resolved and ongoing claims. Proposer's claims statement MUST include claims history of Proposer and its personnel, as well as Associated Firms. "Associated Firms" are businesses, corporations, companies, partnerships, or other entities associated with the Proposer and/or its personnel (e.g., firm name changes, association as previous owner, general partner, limited partner, or other officer).

The proposer must hold a Contractor's License, which is current, valid and in good standing with the Guam Contractor's Licensing Board. Include a copy of your contractor license and statement on whether the license has been revoked or suspended in the last five (5) years.

If any of the following have occurred, please describe in detail the circumstances of each occurrence.

a) Failure to enter into contract or professional services agreement once selected.

b) Withdrawal of a proposal or bid because of an error.

c) Termination or failure to complete a contract.

d) Debarment by any municipal, county, territory, state, federal state, federal, or local agency.

e) Involvement in litigation, arbitration, or mediation, whether concluded or ongoing.

f) Conviction of the Proposer or its principals in violating any territory, state, or federal antitrust laws by bid or proposal rigging, collusion, or restrictive competition between bidders or proposers, or conviction of any local, state or federal law related to bidding or performance of services.

g) Knowing concealment of a deficiency in the performance of a prior contract.

h) Falsifying information or submitting deceptive or fraudulent statements in connection with a contract.

i) Willful disregard for applicable rules, laws, or regulations.

j) Failure to disclose information regarding any of the above may indicate an unsatisfactory performance record. Information regarding any of the above may be considered in determining the suitability of Proposer to perform the services needed. Accordingly, the proposer may describe mitigating factors as a part of any of the above.

VIII. TERMS OF PAYMENT

1. The Government of Guam shall pay the Proposer on an annual basis for all lease payments due in accordance with the terms of the contract, consistent with the "MA KÅHAT ACT OF 2013" AND ANY SUBSEQUENT/RELEVANT PUBLIC LAWS.

2. All payments shall be made in accordance with, subject to, applicable provisions of §22505 of Chapter 22 of Title 5 of the Guam Code Annotated.
3. The Developer, Contractor or Finance Company shall submit one (1) annual invoice, in original form, for lease payments due. The Government of Guam shall have thirty (30) calendar days after receipt of the invoice to make payment.
4. Non-Appropriation Clause: In event that sufficient funds (a) are not appropriated by the I Liheslaturan Guahan prior to the beginning of any Renewal Term for the payment of the Base Rentals on the Base Rental Payment Dates and reasonably estimated Additional Rentals payable during such Renewal Term, or (b) are otherwise not legally available for such purpose, then an Event of Non-appropriation shall be deemed to have occurred. If an Event of Non-appropriation occurs, I Liheslaturan Guahan shall not be obligated to make payments of the Base Rentals and Additional Rentals provided for herein beyond the last day of the Renewal Term during which such Event of non-appropriation occurs, except for the Government of Guam's obligation to pay Rentals which are payable prior to the termination of the Lease.
5. If the Government fails to perform as lessee under the leaseback period or decides not to appropriate leaseback payments GDOE shall vacate the facility and the lessor may take possession of the Simon Sanchez High School, investors and/or the trustee will typically be permitted to operate the financed facility for a period of time specified in the ground lease. However, once the term of the ground lease expires, the Government of Guam is entitled to repossession of the site together with all improvements on the site, free and clear of any interest to the investors or a trustee on their behalf.
6. To expedite the construction schedule, the Government of Guam may issue 1) A separate Notice to Proceed for the Demolition and Clearing, covered by local funds, along with 2) the Notice of Award. The contractor must submit a separate invoice for Demolition and Clearing, which will be paid 30 days after receipt of invoice.

IX. AVAILABILITY

This Request for Proposals ("RFP") may be picked up at the Contract Administration Technical Services, Ground Floor, TMC Building, Department of Public Work, Monday through Friday, excluding holidays, between 8:00 a.m. and 5:00 p.m., beginning March 28, 2025. Upon obtaining this RFP, prospective Proposers must sign in in the Proposers Register in order toto receive any addenda or other notices related to this RFP. Failure by prospective Proposers to sign and register may result in the prospective Proposer not receiving notices or addenda from DPW regarding this RFP.

X. AMENDMENTS

DPW reserves all rights to revise or amend this RFP prior to the date set for opening proposals. Such revisions and amendments, if any, will be announced by an amendment or addenda to this RFP and shall be identified as such. Any amendment shall refer to the

portions of the RFP it amends. Amendments and addenda shall be sent to all prospective Proposers who have signed in the Proposers Register Form.

XI. PRE-PROPOSAL CONFERENCE

Pre-proposal conferences are *"Mandatory"* as stated on the RFP Timelines. The pre-proposal conference shall be attended by an in-person representative of the Proposer. It will be conducted only to explain the procurement requirements for this Request for Proposals. DPW will notify all Proposers in writing via an addendum to this RFP of any substantive clarification provided in response to any inquiry raised during the pre-proposal conference. A Proposer who does not attend the pre-proposal conference will not be considered and disqualified.

XII. PRE-PROPOSAL QUESTIONS

Proposers with questions or requiring clarification or interpretation of any section within this RFP must address their questions in writing or via e-mail to the sole point of contact John Calanayan john.calanayan@dpw.guam.gov on or before the deadline set forth in the RFP Timelines. Each question must provide clear reference to the section, page, and item of this RFP in question. Questions received after the deadline shall not be considered.

XIII. EXPLANATION TO PROPOSERS

No oral explanation in regard to the meaning of any part of this RFP will be made, and no oral instructions will be given, before the award of the contract. Discrepancies, omissions, or doubts as to the meaning of the specification shall be communicated in writing to the sole point of contact at DPW. Questions about any part of this RFP shall be communicated in writing to the sole point of contact at the Department of Public Works for interpretation before the deadline. Proposers should act promptly and allow sufficient time for a written reply to reach them before the submission of their proposal. Interpretation, if required, shall be made in the form of an amendment to the RFP which will be forwarded to all Proposers, and its receipt by the Proposer must be acknowledged.

XIV. DPW's ANSWERS

DPW's response will be by written addendum. Any other form of interpretation, correction, or change to this RFP will not be binding with the DPW. Any written addendum will be forwarded to all entities or individuals who have picked up an RFP and are included on the Register of Proposals Form. **All addenda shall form a part of the RFP documents and must be acknowledged upon receipt. Failure to acknowledge receipt of each addendum may be grounds for disqualification.**

XV. WITHDRAWAL OF PROPOSALS

Proposals may be withdrawn on written request received from the Proposer(s) prior to the time fixed for opening. Negligence on the part of the Proposer in preparing the proposal confers no right for the withdrawal of the proposal after it has been opened.

XVI. ALTERNATE OR MULTIPLE PROPOSALS NOT ACCEPTED

Alternate or multiple proposals will not be accepted. Any Proposer submitting alternate, multiple, or otherwise altered proposals will be deemed nonresponsive and disqualified from this solicitation.

XVII. NO LATE PROPOSALS

Proposals must be received at the DPW TMC Building, CIP Contract Section, by the Proposal Due Date set forth in the RFP Timelines. **Email or facsimile proposals will not be accepted**. Regardless of cause, late proposals will not be accepted and will automatically be disqualified from further consideration. It shall be the Proposer's sole risk to assure delivery at the DPW TMC Building, CIP Contract Section receptionist's desk by the designated time.

XVIII. PROHIBITION AGAINST EMPLOYMENT OF SEX OFFENDERS

Pursuant to 5 G.C.A. § 5253,

1. No person convicted of a sex offense under the provisions of Chapter 25 of Title 9 Guam Code Annotated, or an offense as defined in Article 2 of Chapter 28, Title 9 GCA in Guam, or an offense in any jurisdiction which includes, at a minimum, all of the elements of said offenses, or who is listed on the Sex Offender Registry, and who is employed by a business contracted to perform services for an agency or instrumentality of the government of Guam, shall work for his employer on the property of the government of Guam other than a public highway.

2. All contracts for services to agencies listed herein shall include the following provisions: (1) warranties that no person providing services on behalf of the contractor has been convicted of a sex offense under the provisions of Chapter 25 of Title 9 GCA or an offense as defined in Article 2 of Chapter 28, Title 9 GCA, or an offense in another jurisdiction with, at a minimum, the same elements as such offenses, or who is listed on the Sex Offender Registry; and (2) that if any person providing services on behalf of the contractor is convicted of a sex offense under the provisions of Chapter 25 of Title 9 GCA or an offense as defined in Article 2 of Chapter 28, Title 9 GCA or an offense in another jurisdiction with, at a minimum, the same elements as such offenses, or who is listed on the Sex Offender Registry, that such person will be immediately removed from working at said agency and that the administrator of said agency be informed of such within twenty-four (24) hours of such conviction.

XIX. EQUAL OPPORTUNITY

1. The DPW will not discriminate against any employee or applicant for employment because of race, religion, sex, color, age, economic status, or national origin. The Contractor will take affirmative action to ensure that qualified applicants are employed and that employees are treated during employment without regard to their race, religion, sex, color, age, economic status, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoffs or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship.

The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

2. The DPW will, in all solicitations or advertisements for employees placed by or on behalf of the Government of Guam, state that all qualified applicants will receive consideration for employment without regard to race, religion, sex, color, age, economic status, or national origin.

XX. RECEIPT/OPENING OF PROPOSALS

Proposals and modifications will be time-stamped upon receipt and held in a secure place until the established due date. After the date established for receipt of proposals, a Register of Proposals will be prepared. Proposals and modifications will be shown only to government personnel having a legitimate interest in them. The Register of Proposals will be opened to public inspection only after award.

XXI. CLASSIFICATION OF PROPOSALS AS RESPONSIVE OR NON-RESPONSIVE

All proposals will initially be classified as either "responsive" or "non-responsive" (*see RFP Attachment 8*). Proposals may be found non-responsive any time during the evaluation process or contract negotiation if any of the required information is not provided or the proposal is not within the plans and specifications described and required in the RFP. If a proposal is found to be non-responsive, it will not be considered further.

XXII. DETERMINATION OF RESPONSIBILITY

The procurement officer will determine whether a Proposer has met the standards of responsibility, per Guam procurement law. Such a determination may be made at any time during the evaluation process and through contract negotiation if information surfaces that would result in a determination of non-responsibility. If a Proposer is found non-responsible, the determination must be in writing, made a part of the procurement file and mailed to the affected Proposer.

XXIII. COMPLETENESS OF PROPOSALS

Selection and award will be based on the information contained in the Proposer's proposal. Proposals may not include references to information located elsewhere, such as Internet websites or libraries, unless specifically requested by DPW. Information or materials presented by Proposers outside the formal response or subsequent discussion/negotiation will not be considered, will have no bearing on any award, and may result in the Proposer being disqualified from further consideration.

XXIV. FAILURE TO COMPLY WITH INSTRUCTIONS

Proposers failing to comply with the instructions set forth in this RFP may be subject to point deductions. DPW may also choose to not evaluate, may deem non-responsive, and/or may disqualify from further consideration any proposals that do not follow this

RFP format, are difficult to understand, are difficult to read, or are missing any requested information.

XXV. DPW RIGHTS RESERVED

While DPW and the Government of Guam have every intention to issue an award as a result of this RFP, issuance of the RFP in no way constitutes a commitment by DPW or the Government of Guam to award and execute a contract. Upon a determination such actions would be in its best interest, DPW, in its sole discretion, reserves the right to:

1. Cancel or terminate this RFP as provided in the Guam Procurement Regulations;
2. Reject any or all proposals received in response to this RFP in the best interests of DPW or the Government of Guam as provided in the Guam Procurement Regulations;
3. Waive any undesirable, inconsequential, or inconsistent provisions of this RFP which would not have significant impact on any proposal;
4. Waive any minor informalities in proposals received, or have them corrected by the Proposer in accordance with applicable regulations;
5. Not award if it is in the best interest of DPW or the government of Guam not to proceed with contract execution; or
6. If awarded, terminate any contract if DPW determines adequate funds are not available.

XXVI. NON-DISCLOSURE OF DATA

In accordance with Guam Procurement Regulations § 3114(h) (2), Proposers may identify trade secrets and other proprietary data contained in their proposals. If the Proposer selected for award has requested in writing the nondisclosure of trade secrets and other proprietary data so identified, DPW shall examine the request to determine its validity prior to entering into negotiations. If the parties do not agree as to the disclosure of data, DPW shall inform the Proposer in writing what portion of the proposal will be disclosed and that, unless the Proposer withdraws the proposal or protests under 5 G.C.A. Chapter 5 Article 9, the proposal will be so disclosed.

XXVII. REJECTION OF PROPOSAL OFFER.

The Department of Public Works shall have the prerogative to reject any proposals in whole or in part if a determination is made that such rejection is in DPW's interest or in the best interest of the Territory of Guam as provided for in the regulations 2 GAR, Div. 4 §3115(e)(2).

XXVIII. CANCELLATION OF RFP SOLICITATION

Prior to the date deadline set for proposals, this solicitation may be canceled in whole or in part when the Director of Public Works or his designee determines in writing that there are cogent and compelling reasons to believe that the cancellation of the solicitation is in the Department of Public Works best interest, in accordance with the

Procurement Rules and Regulations; as provided for in the regulations 5 GCA §5225; 2 GAR, Div. 4 §3115(c).

XXIX. DEBARMENT

The Proposer certifies, by submitting its proposal, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any governmental department or agency. If a Proposer cannot certify this statement, attach a written explanation for review by the DPW.

XXX. PERFORMANCE AND PAYMENT BOND

The successful bidder must deliver to the Owner an executed performance and payment bond (forms enclosed) in an amount at least equal to one hundred percent (100%) of the accepted bid as security for the faithful performance of the contract and security for the payment of all persons performing labor and furnishing materials in connection with this contract. The sureties of all bonds shall be such surety company or companies as are approved by the Owner and as are authorized to transact business in Guam. The bonds must be approved by the Owner prior to execution of the formal contract.

XXXI. INDEMNIFICATION

The Proposer shall indemnify the Government of Guam, DPW, GDOE, GEDA and their Consultants from any liability arising from the implementation of the Proposer's proposal.

XXXII. RFP ATTACHMENTS & LEGAL REQUIREMENTS

The following are RFP Attachments and are made part of this RFP:

1. **Financing Scope of Work** (*reference RFP ATTACHMENT A*).
2. **Design/Construction & Insurance/Capital Maintenance Scope of Work** *(reference RFP ATTACHMENT B).*
3. **Affidavit Disclosing Ownership and Commissions** per 5 G.C.A. § 5233 *(reference: RFP ATTACHMENT 1).* As a condition of this RFP, any partnership, sole proprietorship, joint venture, association or corporation doing business with the government of Guam shall submit an affidavit executed under oath that lists the name and address of any persons, companies, partners, or joint ventures who have held more than ten percent (10%) of the outstanding interest or shares in said partnership, sole proprietorship joint venture, association or corporation at any time during the 365 days immediately preceding the submission date of a proposal. The affidavit shall contain the number of shares or the percentage of all assets of such partnership, sole proprietorship joint venture, association or corporation that have been held by each such person during the 365-day period. In addition, the affidavit shall contain the name and address of any person who has received or is entitled to receive a commission, gratuity or other compensation for procuring or assisting in obtaining business related to this RFP for the Proposer and shall also contain the amounts of any such commission, gratuity or other compensation. The affidavit shall be open and available

to the public for inspection and copying. *See RFP Legal Form: Affidavit re Disclosing Ownership (Major Shareholders) & Commissions; AG Procurement Form 002.*

4. **Affidavit of Non-Collusion** per 2 GAR Division 4 § 3126(b) *(reference RFP ATTACHMENT 2)*. By submitting an offer, the Proposer certifies that the price submitted was independently arrived at without collusion. *See RFP Legal Form: Affidavit re Non-Collusion; AG Procurement Form 003.*

5. **Affidavit Re No Gratuities or Kickbacks** per 2 GAR Division 4 § 11107(e) *(reference RFP ATTACHMENT 3)*. The bidder, Proposer, or contractor represents that it has not violated, is not violating, and promises that it will not violate the prohibition against gratuities and kickbacks set forth in §11206 (Gratuities and Kickbacks) of the Guam Procurement Regulations. **Gratuities**. It shall be a breach of ethical standards for any person to offer, give or agree to give any employee or former employee, or for any employee or former employee to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract; or to any solicitation or proposal therefor. **Kickbacks**. It shall be a breach of ethical standards for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order. *See RFP Legal Form: Affidavit Re No Gratuities or Kickbacks; AG Procurement Form 004.*

6. **Affidavit Re Contingent Fees** per 2 GAR § 11108 *(reference: RFP ATTACHMENT 4)*. It shall be a breach of ethical standards for a person to be retained, or to retain a person, to solicit or secure a government contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business. *See RFP Legal Form: Affidavit Re Contingent Fees; AG Procurement Form 007.*

7. **Affidavit Re Ethical Standards** per 2 GAR § 11103 *(reference: RFP ATTACHMENT 5)*. The bidder, Proposer, or contractor represents that it has not knowingly influenced and promises that it will not knowingly influence a government employee to breach any of the ethical standards set forth in 5 GCA Chapter 5 Article 11 (Ethics in Public Contracting) of the Guam Procurement Act and in Chapter 11 of the Guam Procurement Regulations. *See RFP Legal Form: Re Ethical Standards; AG Procurement Form 005.*

8. **DECLARATION RE COMPLIANCE WITH U.S. DOL WAGE DETERMINATION** *(reference: RFP ATTACHMENT 6)*.

9. **ACKNOWLEDGEMENT OF RECEIPT FORM** *(reference: RFP ATTACHMENT 7)*.

10. **DPW CHECKLIST OF RESPOSIVENESS** *(reference: RFP ATTACHMENT 8).*

11. **PRICE PROPOSAL FORM** *(reference: RFP ATTACHMENT 9).*

XXXIII. OPENING OF PROPOSALS

Proposals will not be opened publicly and will be opened in the presence of two or more DPW officials. Proposals will be checked for compliance with the mandatory requirements of the RFP. Failure to comply with any mandatory requirements may cause disqualification.

XXXIV. EVALUATION OF PROPOSALS AND AWARD OF CONTRACT

Proposals will be evaluated and ranked by the criteria provided in this RFP by a committee established by the ***"MA KÅHAT ACT of 2013"*** **and any subsequent/relevant Public Laws**. The Evaluation Committee includes:

1. GDOE Superintendent as the Chairperson
2. DPW Director or Deputy Director
3. DPW Building Permits Administrator
4. Director of Land Management or Guam Chief Planner
5. Administrator of Guam Economic Development Authority or Deputy Administrator
6. Principal of Simon Sanchez High School or his/her designee

Evaluation Process

1. Due to the complexity and diversity of the scope of services required in this RFP (finance, demolition, design, build, lease/leaseback, insurance and capital maintenance), DPW intends to convene the Evaluation Committee with subject matter experts (SMEs), to provide technical clarifications in specific areas. SMEs will not participate in scoring but may provide input to assist the committee in evaluating.

2. Each member of the Evaluation Committee will evaluate each proposal based on the qualifications outlined in Section XXXIV. Evaluation, Rating and Selection Table. The sealed Term Sheet and Price Proposal will not be used as the basis of the evaluation.

3. Each member of the Evaluation Committee will evaluate each proposal and rank each proposal based on the assigned points for each criterion (i.e., the Proposer with the greatest total points will be ranked the highest and the Proposer with the least number of points will be ranked the lowest).

4. Interviews will be conducted with the Proposers by the Evaluation Committee. After the interviews, each member of the Evaluation Committee will submit their Individual Evaluation Forms, which will be used as the basis of selection. The Evaluation Committee will conduct interviews with a minimum of the top three (3) qualified Proposers and will notify the Proposers with a date and time. The Proposer

must appear in person. Each Proposer will have thirty (30) minutes to make a presentation and thirty (30) minutes to answer questions. Proposers will be notified of the location of the interviews at a future date.

5. Tie Breaker Procedure: If two (2) or more Proposers' ranks are equal, the Chairperson will evaluate the proposals to break the tie.

6. The Evaluation Committee will prepare a report determining the best qualified Proposer with ranking order of preference, submit it to the DPW Director, and recommend the number one ranked Proposer for the first opportunity to negotiate a contract.

7. The DPW Director will review the report from the Evaluation Committee and will approve or disapprove the recommendation as deemed to be the best qualified to provide the required services and that is in the best interest of the Government. Failure to comply with any mandatory requirements may disqualify a proposal.

8. The Government will enter negotiations with the best qualified Proposer, at which time their sealed individual Term Sheet and individual Price Proposal will be opened for negotiation.

XXXV. EVALUATION CRITERIA

The evaluation will follow the criteria outlined in the Evaluation, Rating and Selection Table outlined in the section that follows. Proposers are requested to submit proposals, which are complete and unambiguous without the need for additional explanation or information. DPW may make a final determination as to whether a proposal is acceptable or unacceptable solely on the basis of the proposal as submitted and proceed with proposal evaluation without requesting further information from any Proposers.

XXXVI. EVALUATION, RATING AND SELECTION TABLE

In the evaluation, rating and selection of proposals, the evaluation factors and their relative importance follow. All proposals submitted will be evaluated by the Evaluation Committee and will be rated using the criteria provided in this RFP including the following:

EVALUATION CRITERIA	MAX SCORE	SCORE
Proposal Plan Overall proposal approach. A plan giving as much detail as practical on how the services will be performed. *(Refer to VII. INSTRUCTIONS FOR SUBMITTING A PROPOSAL, 2 Entire Contents section.)*	**15**	
Personnel Experience and Qualifications Specialized experience and qualifications of personnel to perform the required services. *(Refer to VII. INSTRUCTIONS FOR SUBMITTING A PROPOSAL, 2. Contents, Section 4, Personnel Experience and Qualifications)*	**20**	

EVALUATION CRITERIA	MAX SCORE	SCORE
Capacity of Proposer The Proposer's ability to perform the required services with its current resources and workload to meet the expected project outcome. *(Refer to VII. INSTRUCTIONS FOR SUBMITTING A PROPOSAL; 2. Contents, Section 5 Approach and Capacity of Proposer).*	**30**	
Proposer's Experience on Similar Projects The Proposer's specialized and extensive experience in projects similar in scope and nature in managing a project of this magnitude and is familiar with the tropical environment and unique logistical challenges. (Refer to VII. *INSTRUCTIONS FOR SUBMITTING A PROPOSAL, 2. Contents, Section 6 Experience on Similar Projects).*	**25**	
Performance Issues Proposer's performance issues related to past or present contracts and/or ongoing procurement. (Refer to VII. *INSTRUCTIONS FOR SUBMITTING A PROPOSAL, 2. Contents, Section 7 Performance Issues). *Note Proposers with the least amount of issues should score higher.*	**10**	
TOTAL POINTS	**100**	

XXXVII. INDIVIDUAL EVALUATION FORM

Evaluation Criteria	Evaluation Points	Remarks
Proposal Plan		
Capacity of Proposer		
Personnel Experience and Qualifications		
Proposer's Experience on Similar Projects		
Performance Issues		
Total		

XXXVIII. SUMMARY EVALUATION FORM

Criteria	Evaluators Points						Total Points	Remarks
Proposal Plan								
Capacity of Proposer								
Personnel Experience and Qualifications								
Proposer's Experience on Similar Projects								
Performance Issues								
Total								

XXXIX. TERM SHEET AND PRICE PROPOSAL SUBMITTAL

The Term Sheet and Price Proposal will be unsealed from the Highest Ranked Proposer prior to Negotiations and must be within the budgetary ceiling outlined within the "MA KÅHAT ACT OF 2013" AND ANY SUBSEQUENT Public Laws as relevant.

XL. NEGOTIATION AND AWARD OF CONTRACT

DPW, GEDA, and GDOE will negotiate a final contract with the best-qualified Proposer for the required services to ensure that the final contract meets the government's project objectives, financial interest and is consistent with the budgetary parameters outlined in Guam public law.

Contract negotiations will be directed towards:

1. Ensuring that the Proposer has a clear understanding of the scope of work, specifically, the essential requirements involved in providing the required services;
2. Agreeing upon final terms and compensation, which are fair and reasonable, taking into account the estimated cost of the project, the project schedule, funding parameters defined by law, the required services and the scope, complexity, and nature of such services.

XLI. SUCCESSFUL NEGOTIATION OF CONTRACT WITH QUALIFIED PROPOSER

If compensation, contract requirements, and contract documents can be agreed upon with the best-qualified Proposer, the contract will be awarded to the Proposer.

XLII. FAILURE TO NEGOTIATE CONTRACT WITH BEST QUALIFIED PROPOSER

If compensation, contract requirements, or contract documents cannot be agreed upon with the best qualified Proposer, a written record stating the reasons therefore shall be placed in the file and the Department of Public Works will advise such Proposer of the termination of negotiations which shall be confirmed by written notice. Upon failure to

negotiate a contract with the best-qualified Proposer, the Department of Public Works will enter negotiations with the next most qualified Proposer. If negotiations again fail, negotiations will be terminated as provided in this Section and commence with next most qualified Proposer.

XLIII. NOTICE OF AWARD

The Department of Public Works will notify all Proposers of the status of the RFP and intent to award. Written notice of award will be public information and made a part of the contract file.

XLIV. AWARDING OF CONTRACT

The Department of Public Works will negotiate a contract with the best qualified Proposer for the required services. If compensation, contract requirements, and contract documents can be agreed upon with the Proposer, a contract will be awarded to this Proposer.

XLV. COMMENCEMENT OF WORK

DPW will issue a Notice to Proceed (NTP) for services for the project upon approval of Contract Agreement. A separate NTP for demolition and clearing may be issued earlier to expedite the construction schedule.

XLVI. DEFINITIONS

- **Request for Proposals (RFP**) shall mean the invitation to invite proposals for the construction of the new Simon Sanchez High School. Proposal includes: Financing; Demolition of the existing facility; Design, Build, Lease/Leaseback, Insure the facility; operate and maintain the new facility for no more than 30 years.
- **Owner** shall mean the Guam Department of Education and the Governor of Guam, and/or his/her authorized representatives.
- **Contracting Officer** as used herein means the Director of Public Works of the Government of Guam and shall include his authorized representatives.
- **Critical Path Method (CPM**) shall mean the schedule that integrates the sequence of activities, task dependencies, durations, and critical milestones required for the financing, design, and construction of the New Simon Sanchez High School FDDBML Project. The CPM Schedule must be developed in accordance with contractual requirements, financial milestones, and performance obligations, ensuring completion within the 730-day period specified in the RFP. The 30-year leaseback period is excluded from the scheduling requirements.
- **Proposer** shall mean any developer, contractor, and finance companies legally operating under the US State or Territorial Laws and subject to Guam licensing regulations.
- ***MA KÅHAT ACT OF 2013*** shall mean Chapter 58D of Title 5, Guam Code Annotated.

- **FF&E** shall mean fixtures, furniture, and equipment for the new Simon Sanchez High School.
- **FF&E Services** shall mean the financing, procurement, storage, and installation of the FF&E.
- **Term Sheet** shall mean a formal document submitted by the Proposer that outlines the preliminary financial and contractual terms of the proposed financing arrangement for the project. This document provides a high-level summary of the financing structure, repayment mechanisms, risk allocation, and compliance with the requirements outlined in Attachment A—Financing Scope of Work of the RFP.
- **Price Proposal** shall mean the completed Price Proposal and Addenda Acknowledgment of Receipt Form
- **Notice** as used herein shall mean and include all written notice demands, instructions, claims, approvals and disapprovals required to obtain compliance with contract requirements. Any written notice by either party to the contract shall be sufficiently given if delivered to or at the last know business address of the person, firm, or corporation constituting the other party to the contract, or to his, their, or its duly authorized agent, representative, or officers, or when enclosed in a postage prepaid envelope addressed to such last known business address and deposited in a United States mail box. The Contractor must provide and maintain a post office address within the Territory of Guam and file the same with the Contracting Officer.
- **Responsiveness** as used herein shall mean all items listed on RFP Attachment A.
- **Responsibility** as used herein is defined by Section XXII. Determination of Responsibility and Guam Procurement law.
- **Debarment** as used herein is defined by Section XXIX Debarment and may be extended to subcontractors of the Proposer.
- **Critical Path Method (CPM)** is the construction schedule which networks techniques used for planning, scheduling, and controlling large complex projects.
- **Evaluation Committee** shall include the GDOE Superintendent as Chairperson, and the following five (5) members DPW Director or Deputy Director, DPW Building Permit Administrator, Director of Land Management or Guam Chief Planner, GEDA Administrator or Deputy Administrator, and Principal of Simon Sanchez High School.
- **Liquidated Damages** are contracted for damages before a contract breach that enforces an estimate of harm that would be hard to calculate with certainty. The Government reserves the right to negotiate the amount of Liquidated Damages provision with the Successful Proposer.

FINANCING SCOPE OF WORK

ATTACHMENT A

FINANCING SCOPE OF WORK

As the Guam Economic Development Authority ("GEDA") serves as the central financial manager and consultant for the Government of Guam ("Government") and those agencies or instrumentalities of the Government requiring financial guidance and assistance, GEDA is required to participate in any and all market related activities. The Proposer shall work with the Government and GEDA during the finance phase of this procurement to provide funds for the design (including architectural and engineering), demolition, construction of Simon Sanchez High School and to provide furniture and equipment. Any fees or expenses incurred by the Government or GEDA during this phase shall be covered by the financing.

The Proposer must also be able to provide capital maintenance and insurance for the school as a result of this RFP for the duration of the lease agreement. Funding shall be by annual legislative appropriation.

To minimize the cost to the Government of Guam, financing utilized by the successful proposer to fund the design, demolition, construction and FF&E services for the new Simon Sanchez High School shall be through tax-exempt obligations, or other financial instruments issued in conjunction with the Guam Economic Development Authority (GEDA). The successful Proposer and GEDA may use an alternative method of financing, including, but not limited to, a short-term debt, mortgage, loan, federally guaranteed loan, or loan by an instrumentality of the United States of America if such financing will better serve the needs of the people of Guam, subject to approval by I Liheslaturan Guåhan.

The purpose for this Section is to assure the Government of Guam pays the lowest possible interest rate so that the cost to the Government of Guam in financing the design, demolition, construction and FF&E services of the new Simon Sanchez High School, amortized through the lease/lease-back payments from the Government of Guam to the successful Proposer, will be lower than regular commercial rates.

Proposer must be able to provide capital maintenance for the new Simon Sanchez High School and must also provide typhoon, fire, earthquake and vandalism insurance as negotiated. Proposer must obtain all required property, liability and workmen's compensation insurance. The successful proposer shall provide a separate cost for the annual Insurance, Maintenance and Capital Maintenance of the new Simon Sanchez High School.

FINANCIAL DESCRIPTION

Leaseback agreement.

The Government of Guam, through the Guam Department of Education, as Lessor, shall enter into a leaseback agreement which the Government of Guam shall lease the Simon Sanchez High School property for a period of no more than thirty (30) years from the scheduled date of completion of the school at a cost of one dollar ($1) per year and Lessee shall lease back said property to the Government of Guam at the lease payment offered and accepted through this RFP for use as an educational facility.

The financing has been authorized by Chapter 58D of Title 5, Guam Code Annotated, known as the "*MA KÅHAT ACT OF 2013*" specifically for the financing, construction, demolition of the existing facility, provision of FF&E services and insurance and maintenance.

Pursuant to 5 GCA §58D103(b), at the expiration of the lease-back period, the government of Guam property and the education facility that is renovated or constructed on the government of Guam property will revert to the government of Guam with no further obligations to the Proposer.

Key Lease Terms.

The Government of Guam through the Guam Department of Education shall pay the Lessor, on an annual basis for all lease payments due in accordance with the terms of the contract, which may include any payments to GEDA or the Proposer due under the contract, and in accordance with applicable laws. Such portions of lease payments or forms of payments owed to the Proposer under the contract may be assigned by the Lessor.

All payments shall be made in accordance with Chapter 58D of Title 5 of the Guam Code Annotated. The Proposer (Lessor) shall submit one (1) annual invoice in **original** form, for lease payments due as well as for base rentals to cover the cost of annual insurance and maintenance costs.

Non-Appropriation Clause: In event that sufficient funds (a) are not appropriated by the Government prior to the beginning of any Renewal Term for the payment of the Base Rentals on the Base Rental Payment Dates and reasonably estimated Additional Rental Payment Dates and reasonably estimated Additional Rentals payable during such Renewal Term, or (b) are otherwise not legally available for such purpose, then an Event of Non-Appropriation shall be deemed to have occurred.

If an Event of Non-Appropriation has occurred, the Government shall not be obligated to make payment of the Base Rentals or Additional Rentals provided for in the lease beyond the last day of the Renewal Term during which such Event of Non-Appropriation occurs.

If the Government fails to perform as Lessee under the lease or fails to appropriate lease payments, the lease may provide that its term shall be extended for a period not to exceed the shorter of ten (10) years beyond the original term of the leaseback or such period of time as is necessary to repay in full any financing arranged pursuant to § 58D108. However, once the term of the ground lease expires, the Government is entitled to repossession of the site together with all improvements on the site free and clear of any interest.

If the Government loses the use of the leased facility under certain circumstances, lease payments will be made only during the times GDOE has full use of the leased facility. This could result in partial lease payments for the entire contract period.

FINANCE

Pursuant to 5 GCA §58D108, to minimize the cost to the government of Guam, financing utilized by the Proposer to fund the construction of and FF&E services for the new Simon Sanchez High School financing shall be through tax-exempt obligations, or other financial instruments; provided, that such financing is available at an interest rate of no more than eight-and-a-half percent (8.5%). The Proposer may use an alternative method of financing, including, but not limited to, a short-term debt, mortgage, loan, federally guaranteed loan, or loan by an instrumentality of the United States of America if such financing will better serve the needs of the people of Guam, subject to approval by *I Liheslaturan Guåhan*.

Supplemental Information

i.) The terms and conditions of the bonds shall be as determined by *I Maga'hagan Guahan* by the execution of a certificate or indenture authorizing the issuance of the bonds; provided, however, that the bonds are expected to mature not later than thirty (30) years after their date of issuance, shall bear interest at such rates and be sold for such price or prices as shall result in a yield to the bondholders that does not exceed eight and one-half percent (8.50%) per annum;

ii.) Any such pledge or reservation authorized under the indenture or similar instrument shall be valid and binding from the time the pledge or reservation is made; and

iii.) The bonds will not be "public indebtedness" as that term is defined in 48 USC §1423(a), §11 of the Organic Act of Guam.

iv.) Rental Payments from Lawfully Available Moneys. Rental payments under the lease and the lease-back, as well as funding required to support the activities set forth in Title 5 GCA Chapter 58D, may be reserved and payable from any lawfully available moneys of the government of Guam, and may be secured by a pledge or other reservation of such moneys on an annual basis.

TERMS OF PAYMENT

(see RFP section VIII. TERMS OF PAYMENT)

PLEDGED GENERAL FUND REVENUES

Rental payments under the lease and the lease-back may be secured by a pledge or other reservation of revenues payable from any lawfully available monies of the Government of Guam and may be secured by a pledge or other reservation of such monies on an annual basis.

(end)

DESIGN/CONSTRUCTION
AND
INSURANCE/CAPITAL MAINTENANCE
SCOPE OF WORK

ATTACHMENT B

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Attachment B-17: DPW Construction Management (CM) Requirements

A. Project Timeframe: 730 days for construction and full occupancy.

B. General Design Requirements

1. Provide the Final A/E Construction Documents for the project and all permits/clearances for construction and occupancy.

   The design documents prepared by TRMA and its consultants are not final construction documents. These serve solely as a preliminary basis for the developer, the developer's contractor, and A/E Designers of Record who are responsible for preparing the final construction documents for building regulations compliance, final programming requirements, financing, constructability, maintenance, and final price determination.

2. The Developer is responsible for procurement and installation of Furniture, Fixtures, and Equipment (FF&E).

3. Facilitate GDOE Review of the Developer's A/E Final Construction Documents at 60% Design Development and Final Design stages. These include GDOE Commissioning Design Review.

4. Disregard references to alternate bid items in the programming documents. The total cost must be for the financing, construction, and maintenance of the entire project scope and itemized as required in Part D.

5. Provide biological conservation measures prior to use of the site for clearing & grading or demolition. Refer to Part F1.

6. Provide geotechnical investigation work required for the Final Construction Documents.

7. Expedite demolition, clearing & grading, geotechnical, and building permit applications. Design work for the Final Construction Documents may be structured to allow for demolition, geotechnical work, clearing, and grading permit applications prior to Final Construction Document completion.

8. Expedite design work needed for construction procurement of long-lead materials, building systems, and FF&E.

C. General Construction Requirements

1. Ensure that all construction phase requirements are met.

2. Provide all required insurance.

3. Coordinate with GDOE, SSHS, and FBLG:

   a. Provide FBLG with all emergency contact information for the contractor and developer's project/construction manager.

   b. Provide 1-week notice prior to commencement of work activities within 100-ft of FBLG school grounds.

   c. Provide 3-weeks' notice prior to any utility work that will affect FBLG school.

4. Provide and Maintain Biological Conservation Measures. Refer to Part F1.
5. Obtain Demolition, Clearing & Grading, and Building Permits
6. Expedite procurement of long-lead materials, building systems, and FF&E.
7. Provide Temporary Utilities
8. Provide Engineering Special Inspections
9. Obtain Occupancy Permit
10. Comply with GDOE Commissioning Requirements
11. Provide and Install FF&E
12. Facilitate Sanitary Permit Application and Inspections with GDOE
13. Refer to Attachment B-18 DPW Construction Management (CM) Requirements

D. Project Scope

1. The project scope consists of:
    a. General Requirements for Design and Construction
    b. Financing
    c. Insurance, Capital Maintenance and Custodial Plan
    d. Site Development & Sports Facilities
    e. Administration Building, Main Entrance, Covered Walkways, and Courtyard
    f. A-wing Classroom Building
    g. Gymnasium Building
    h. B-wing Classroom Building
    i. Cafeteria
    j. JROTC Classroom Building and Multipurpose Space
    k. C-wing Classroom Building
    l. Auditorium including FF&E, Audio Visual, and Theater Specialty systems.
    m. Photovoltaic System
    n. Rainwater Catchment System
    o. Landscaping Plants, Irrigation, and Site Furnishing
    p. Credit Recovery Building

Price determination must be based on the entire project scope per the Programming Document Design and the required design development work for the Final Construction

Documents. Complete the Price Proposal Form (Attachment 9) and submit it with the sealed term sheet.

E. School Population

1. 2,000 students
2. Teachers and staff, 150 total
3. Buses, 22 total
4. Student & Guest Parking, 204 total
5. The programming document design is based on a 1,700-student population. The Final Construction Documents must comply with all requirements for a 2,000-student population except:
    a. No additional classroom spaces are required.
    b. No additional cafeteria seating is required.
    c. No additional gymnasium bleacher seating is required.
    d. No additional space is required for the library.
    e. No additional office space is required.
    f. No additional sports field spectator seating is required.
    g. No additional storage space is required.
    h. No additional courtyard seating is required.
    i. No additional employee and student parking is required.

F. Design Requirements:

1. Biological Conservation Measures
    a. Provide Biological conservation measures prior to any work onsite.
    b. Conduct an environmental survey to confirm the current site condition relative to the presence of any endangered species. Identify any changes to the information noted in Attachment B-2 Biological Assessment Report. Include a biological census to document the actual number of endangered species present on the site as required for a US Fish and Wildlife Services (USFWS) Incidental Take Permit Application.
    c. Execute a USFWS Incidental Take Permit Application for the translocation of endangered species found onsite to the new habitat designated in the programming document design.
    d. Obtain USFWS and Department of Agriculture approval prior to translocation of endangered species.
    e. Establish the new habitat prior to translocation of endangered species.

f. Complete the Incidental Take Permit Application and Translocation of the identified snail colony prior to construction of the shared multipurpose sports field.

g. Provide periodic biological monitoring during and after construction as required by the Guam Department of Agriculture and USFWS.

2. Demolition

a. Demolish the existing SSHS campus facilities excluding the Cafeteria and protect items required to be salvaged and relocated.

b. Comply with all requirements for Hazardous Material demolition work noted in the programming document.

c. Salvage the existing Simon Sanchez statue and relocate to the main entrance of the new campus. Coordinate salvage with time capsule opening by SSHS and GDOE.

d. Salvage items and relocate as identified in the programming document design.

3. Bus Stop

a. Protect the existing bus stop along Juan Jacinto Drive for uninterrupted use until the new bus stop is constructed and cleared for use by the government.

b. Provide the new bus stop adjacent to the primary car entrance and guard house prior to demolition of the existing bus stop.

4. Traffic Circulation and Parking

a. Locate the bus entrance/exit for the campus at the southeastern corner of the site along Juan Jacinto Drive.

b. Locate car entry/exits on the east side of the site along Juan Jacinto Drive to mitigate traffic issues along the north side of the site. Provide a guard house at the primary car entrance gate.

c. Provide a continuous emergency vehicle access road along the perimeter of the campus buildings.

d. Provide parking adjacent to the campus facilities and the sports facilities.

5. Community Walking Path

a. Provide a community walking path along the east side of the campus. The fence along the community walking path must incorporate local artist murals/artwork.

6. Credit Recovery Building

a. Provide the Credit Recovery building as a separate facility from the rest of the SSHS campus with separate parking and after-hours vehicular access.

7. Auditorium and Gymnasium

    a. Locate the Auditorium and Gymnasium adjacent to parking areas to accommodate after school hours use of these facilities.

8. Drill Pad

    a. Provide a concrete drill pad at the exterior grounds in general proximity to the JROTC program location.

9. Courtyard Space and Main Entrance

    a. Place campus buildings around a secured central courtyard excluding the credit recovery building. The primary entry for the campus buildings must be through the courtyard space.

    b. Provide a covered Main Entrance that functions as the primary controlled entry point together with the school office. Provide electronic access-controlled egress gates from the courtyard. Provide lockable decorative aluminum main entrance gates.

    c. Relocate the existing Simon Sanchez statue to the Main Entrance with a new 3-ft high concrete pedestal with a dedication plaque commemorating Simon Sanchez's historic significance.

    d. Provide four flag poles adjacent to the Main Entrance.

    e. Provide monument signage adjacent to the Main Entrance.

    f. Provide a covered walkway from the car rider drop-off area to the main office entrance.

    g. Provide a bus canopy (pedestrian covered walkway) from the bus drop-off area to the main courtyard. A secondary entrance into the courtyard may be used for the bus canopy.

    h. Provide covered walkways within the courtyard connecting the separate school building entrances and include covered student benches with adequate rain protection.

    i. Provide convenience walkways through the courtyard space and uncovered seating.

    j. Provide electronic access-controlled egress gates from the courtyard to the fire lanes/exit discharge areas.

    k. Secure the courtyard from other campus facilities that are used after school hours such as the Gymnasium and Auditorium.

    l. Provide access to 1st floor restrooms from the covered building entrances/walkways at the courtyard.

    m. Provide a stage for assembly events in the courtyard.

n. Do not place student lockers along the courtyard.

o. Provide student planting areas.

p. Provide trellis-covered outdoor learning areas.

q. Provide convenience outlets throughout the courtyard covered seating areas.

r. courtyard space.

s. Civil, Landscaping, Electrical, and Telecom requirements are identified in Attachments B-7, B-8, and B-15.

10. Sports Facilities

a. Provide a combined football/soccer field with a perimeter 8-lane running track, press box, restrooms, storage, and fixed spectator seating.

b. Provide an outdoor scoreboard that can be viewed from the press box and spectator seating.

c. Provide track and field provisions for long jump, triple jump, shot put, discus, and javelin throw.

d. Provide alternating lane colors for the running track.

e. Provide a 4-ft fence with access gates along the track perimeter to protect the track from excessive pedestrian traffic.

f. Provide a separate practice field near the football/soccer field.

g. Provide 4 tennis courts with spectator seating.

h. Provide a multipurpose baseball/softball/soccer field that will be shared by SSHS and FBLG schools.

i. Provide fixed spectator seating, backstops, and dugouts for the multipurpose baseball and softball fields.

j. Provide portable bleachers for the multipurpose soccer field.

k. Provide field lighting.

11. General Requirements for Building Design

a. Do not exceed a second-floor level.

b. Provide Access-controlled entry with egress override at exterior building doors.

c. Provide ADA door operator controls at primary building entrances.

d. Provide a minimum of two passenger elevators and one service elevator for 2nd floor access.

e. Provide Security Surveillance and Alarm systems.

f. Provide seismic separation as established in the programming document design.

g. Provide roof access and fall protection.

h. Provide gravel maintenance strips at perimeter of buildings.

i. Comply with Guam Zoning Code; International Building Code 2009; Guam Tropical Energy Code; ADA/ANSI A117.1-2003; Department of Public Health and Social Services requirements for school facilities; National Federation of High Schools standards for sports facilities.

j. Refer to Part I and J requirements.

12. Corridors

a. Minimize hiding spots in corridors.

b. Locate general student lockers in classroom building corridors.

c. Provide Access Control for exterior doors

13. Artwork

a. Provide Local Artist murals/artwork/embroidered banners/flags at building entrances; the fence structure along the east side of the campus adjacent to the community walking path; offices; conference rooms; cafeteria; auditorium lobby; and library. Refer to Attachment B-16 for CAHA requirements.

14. Room Requirements

a. Provide the rooms specified in the room requirements and adjust accordingly for the student population requirements. Refer to Part J.

15. Room Adjacencies

a. Maintain the general room adjacencies established in the programming document design; design development may modify adjacencies subject to GDOE approval.

16. Campus Wing Configurations

a. Maintain the desired A-wing, B-wing, and C-wing general grouping of spaces established in the programming document design; design development may modify campus wing configurations subject to GDOE approval.

17. Room Area and Dimensions

a. Maintain minimum room areas and dimensions established in the programming document design; design development may modify room area and dimensions subject to GDOE approval.

18. Building Systems Requirements

    a. Refer to Part I.

19. Access Control Requirements

    a. Refer to Part I.

20. Provide a concrete floor structure for Dance/Band/Choir Classrooms if these are located on the second-floor level.

G. Design Development Requirements for Final Construction Documents:

1. Modification of the Programming Document Design is acceptable for:

    a. Site Layout and Courtyard Configuration

    b. Room Configuration & Placement

    c. Building Shell Design

    d. Building Systems Design

    e. FF&E

2. Modifications must comply with the Programming Document Design intent and are subject to GDOE approval.

H. Site Development Requirements

1. Civil – Refer to Attachment B-15

2. Landscaping – Refer to Attachment B-15

3. Site Fire Protection – Refer to Attachment B-15

4. Site Electrical & Telecom – Refer to Attachment B-15

I. Building Shell & Systems Requirements

1. Architectural

    a. Exterior Sidewalks
        1) Provide sealer and broom finish concrete for Exterior Sidewalks with pattern as identified in the programming document design.

    b. Slab on Grade
        1) Provide termite treatment.
        2) Provide continuous vapor barrier at building perimeter foundations and slab on grade for interior spaces.
        3) Provide floor mats with drains at building entrances.
        4) Provide ADA-compliant floor transitions and maintain required tolerances for floor finishes.

c. Exterior Walls & Columns
    1) Provide plaster and paint finish for concrete walls and columns.
    2) Provide reveal and paint patterns per the programming document design.
    3) Provide beveled edges and corners.
    4) Flash and seal wall penetrations.
    5) Provide eyebrows/overhangs for exterior windows and doors.
    6) Provide aluminum or stainless steel seismic joint covering with weatherproofing.
    7) Provide aluminum or stainless-steel wall coping.
    8) Provide aluminum or stainless-steel roof drain cladding.

d. Suspended Slabs & Roofs
    1) Provide gutters and downspouts for balcony walkways and roofs.
    2) Provide roof drains with covers.
    3) Provide scuppers for drainage and overflow.
    4) Provide aluminum or stainless steel seismic joint covering with weatherproofing.
    5) Provide floor mats with drains at building entrances.
    6) Provide integrated rain drips at the bottom face of the exposed structure for balcony walkways and roofs.
    7) Provide sealer and broom finish for balcony walkways.
    8) Provide monolithic concrete connection of roof slab to parapet wall.
    9) Provide control joints at roofs to mitigate roof cracks.
    10) Provide continuous roof coating with flexible flashing at control joints, wall-roof transitions, penetrations, and elevation changes.
    11) Provide fireproofing for exposed steel structure where fire rating is required.
    12) Provide thermal insulation under the roofs of interior spaces.
    13) Provide acoustic insulation for the Dance, Choir, and Band rooms on the second floor above other rooms.

e. Exterior Doors & Windows
    1) Comply with wind loading requirements and standard testing requirements.
    2) Provide aluminum storefront and flush entrance doors to interior spaces; full lite doors for primary building entrances; flush doors with vision panels for other exterior doors; no vision panels at restroom doors.
    3) Provide aluminum storefront windows.
    4) Provide exterior doors with thresholds, and complete aluminum and rubber weatherstripping.
    5) Provide operable windows with screens at classrooms and offices
    6) Provide air curtains at designated doors.
    7) Provide ADA door operator systems at primary entrance doors.
    8) Provide access-control systems at exterior entrance doors excluding restrooms and utility rooms accessed from the main courtyard space.
    9) Provide aluminum accordion shutters for storefront doors and windows.

10) Provide clearstory windows for the library reading room, cafeteria dining area, and classroom building second floor corridors.
11) Provide tinted safety glass for doors and windows.
12) Comply with room requirements for exterior doors & windows.

f. Roof Access, Fall Protection, and Stairs
   1) Provide secure roof access stairs.
   2) Provide secure roof access ladders with fall protection.
   3) Provide parapet walls or guardrails for roofs.
   4) Provide fall protection system anchors without parapet walls or guardrails.
   5) Provide aluminum guardrails with handrails at stairways.
   6) Provide aluminum guardrails for balcony walkways and fall protection.

g. Interior Walls and Columns
   1) Provide plaster and paint finish for exposed concrete walls and columns.
   2) Provide gypsum board wall partitions and furring with light gauge metal framing; comply with fire resistance requirements.
   3) Provide cement backer board wall partitions with light gauge metal framing for walls receiving tile finish.
   4) Provide wood blocking and additional framing support where other work or equipment is attached to wall partitions.
   5) Provide acoustic insulation at wall partitions; use water and mold resistant insulation at plumbing walls and furring for exterior walls.
   6) Provide paint patterns per the programming document design.
   7) Provide rubber base for interior walls except for rooms with ceramic tile floor or wall finish.
   8) Comply with room requirements for interior walls and FF&E.

h. Interior Floor Finishes
   1) Provide VCT flooring for interior spaces except where otherwise required.
   2) Provide Rubber tile flooring for the Cafeteria dining area,
   3) Provide fluid-applied Athletic Flooring at the Gymnasium and Track.
   4) Provide Performance Flooring for the Dance, Band, and Choir Rooms.
   5) Provide porcelain ceramic wall and floor finish at restrooms.
   6) Provide quarry tile floor finish at Kitchen areas.
   7) Comply with room requirements for finishes.

i. Ceilings
   1) Provide 2’x2’ acoustical ceiling tile system. Gyp. Bd. Soffits may be utilized for concealing mechanical ductwork.
   2) Provide 2’x2’ smooth ceiling panels for the cafeteria and kitchen areas.
   3) Provide water-resistant gypsum board for soffits and roof furring.
   4) Provide ceiling access panels for maintenance requirements.
   5) Provide acoustic ceiling elements per room requirements.
   6) Provide seismic bracing for ceilings and soffits.
   7) Comply with room requirements for ceiling height.

j. Interior Doors & Windows
   1) Provide full lite doors at corridors.
   2) Provide flush wood doors with vision panels at classroom/prep room entrance and storage doors.
   3) Provide flush wood doors with no vision panels at corridor restroom entrances. Provide double-keyed deadbolts for multiple-occupant restrooms. Provide privacy function locksets for single-occupant and family restrooms.
   4) Provide clear safety glass for doors and windows.
   5) Provide exit devices per egress requirements.
   6) Provide window blinds except at clearstory windows
   7) Provide acoustic windows and doors per room requirements.

k. Toilet Partitions & Accessories
   1) Provide phenolic toilet partitions.
   2) Provide shower partitions and curtains to separate each individual shower.
   3) Provide toilet accessories for restrooms.
   4) Comply with DPHSS requirements.

l. Casework
   1) Provide ¾-inch plywood with hardwood edges, wood veneer, and plastic laminate finish casework with adjustable shelving.
   2) Provide epoxy resin countertops on ¾-inch plywood with backsplash at science and art classrooms.
   3) Provide solid surface countertop on ¾-inch plywood with backsplash at sink counters.
   4) Provide power, water, and LP gas connections and fixtures for science tables.
   5) Match casework base with wall base.
   6) Provide pipe insulation for exposed piping at accessible sinks and lavatories.

m. Signage
   1) Provide Exterior Building Signage designating each wing/building and visible from the emergency access road.
   2) Provide exterior signage for each wing/building that is visible from the courtyard.
   3) Provide Exterior Signage for each wing/building at each building entrance.
   4) Provide room signage indicating room number and name; include Braille.
   5) Provide directional signage for exits, restrooms, main office, cafeteria, gymnasium, band, choir, dance, and library.

2. Structural Requirements – Refer to Attachment B-15

3. Mechanical & Fire Protection Requirements – Refer to Attachment B-15

4. Electrical Power & Lighting – Refer to Attachment B-15

    a. Refer to access control requirements for the Courtyard, Main Entry, and building exterior doors.

5. Telecommunications – Refer to Attachment B-15

    a. Provide a combined Public Address, Intercom, and Bell system throughout the entire school for notifications to the classrooms, offices, corridors, covered walkways, library, multipurpose, cafeteria, auditorium, and gymnasium spaces. Provide intercom controls at each classroom, library, cafeteria office, gymnasium offices, and auditorium office/control room for 2-way communication to the PA control center at the Main Office.

J. Commissioning Requirements

1. Refer to Attachment B-8 Specifications Section 01910 General Commissioning Requirements.

K. Insurance and Capital Maintenance and Custodial Plan Requirements

Insurance

After the winning offeror takes occupancy of the Project, the offeror shall, in accordance with the Insurance and Maintenance Agreement, but solely from amounts available for such purpose in the Insurance and Maintenance Fund, at all times maintain or cause to be maintained with responsible insurers that are, at the time of obtaining each policy and on each policy renewal date, rated in an investment grade category (BBB- or equivalent and higher) by one or more nationally-recognized rating agencies, all such insurance on the Project (valued as defined below) which is required under the Trust Agreement or is customarily maintained with respect to properties of like character against accident to, loss of or damage to such properties. Notwithstanding the generality of the foregoing, the Offeror shall not be required to maintain or cause to be maintained any insurance which is not available from reputable insurers in the open market or more insurance than is specifically referred to below.

Subject to the preceding paragraph, the Proposer shall:

1. Keep or cause to be kept a policy or policies of insurance against loss or damage to the Project resulting from fire, lightning, vandalism, malicious mischief, riot and civil commotion and such perils ordinarily defined as “extended coverage” and other perils as the government may agree should be insured against in forms and in amounts which the offeror shall deem advisable or necessary to protect its interests. Such insurance may be carried in conjunction with any other fire and extended coverage insurance carried or required to be carried by the government. Such insurance shall be maintained in an amount not less than the full insurable value of the Project, subject to deductible conditions acceptable to the government. The term “full insurable value” as used in this subsection means an amount at least equal to the lesser of (i) the then-current replacement value of the Facility, or (ii) the aggregate principal amount represented by the then-outstanding Certificates plus one-half of the aggregate interest represented by the

then-outstanding Certificates and payable during the next Fiscal Year. Said "full insurable value" shall be determined from time to time but not less frequently than once in every twelve (12) months.

2. Maintain or cause to be maintained public liability insurance against claims for bodily injury or death, or damage to property occurring upon, in or about the Facility for the Site, such insurance to afford protection to a limit of not less than $1,000,000 for a single occurrence. Such insurance shall be maintained in sound insurance companies that comply with statutory insurance requirements. Such insurance may be carried in conjunction with any other liability insurance coverage carried or required to be carried by the Lessee.

3. Maintain or cause to be maintained earthquake and windstorm insurance for the Simon Sanchez High School Facility.

4. Maintain or cause to be maintained flood insurance for any portion of the Project located in a flood plain.

All Insurance herein provided for shall be affected under policies issued by insurers of recognized responsibility, licensed or permitted to do business in Guam, that arc, at the time of obtaining each policy and on each policy renewal date, rated in an investment grade category (BBB- or equivalent and higher) by one or more nationally recognized rating agencies, except as otherwise hereinafter provided. As an alternative to the requirement of subsections (i), (ii), (iii) and (iv), the offeror may insure such property to the same extent under a blanket insurance policy or policies which cover not only such property but other properties.

All policies or certificates issued by the respective insurers for insurance shall provide that such policies or certificates shall not be cancelled or materially changed without at least thirty (30) days prior written notice to the government. All policies or certificates issued by the respective insurers for insurance shall also require the insurer to give the government notice of the non-payment of the premium and shall give the government a reasonable opportunity to cure such non-payment. Certificates of insurance listing such policies shall be deposited with the Trustee together with appropriate evidence of payment of the premiums therefor, and, at least thirty (30) days prior to expiration dates of expiring policies or contracts held by the Trustee, copies of renewal or new policies or contracts or certificates shall be deposited with the government together with evidence of payment of premiums therefor.

All policies of insurance shall provide that the government is an additional insured, provided, that all policies of insurance (except the policy of public liability specified in Section 7.01(b)(ii)) shall also provide that the proceeds thereof shall be payable to the Lessor. The Net Proceeds of fire and extended coverage insurance shall be deposited into the Insurance and Maintenance Fund under the Trust Agreement to be applied to rebuild and repair the Facility or into the Redemption Fund under the Trust Agreement to be applied to prepay outstanding Certificates as provided in Article X, as determined by the offeror in consultation with the government.

Capital Maintenance and Custodial Plan

Post Construction Facilities Maintenance and Custodial Operations Plan - The design team shall prepare a complete operation manual for the school for the required post construction monitoring, maintenance, and custodial operations of the school facility. The plan shall address the operational and/or maintenance of the buildings, equipment, landscaping, the drainage system, all outdoor facilities, and for any facility appurtenances for the proper operation of the school.

The Maintenance Contractor will then prepare an annual budget to address the facilities annual custodial, grounds and maintenance & repair as a separate cost to the construction financing. Additionally, this budget will include a capital maintenance fund to fund all replacement equipment as highlighted in the attached "30 Year Maintenance Program" Work Scope.

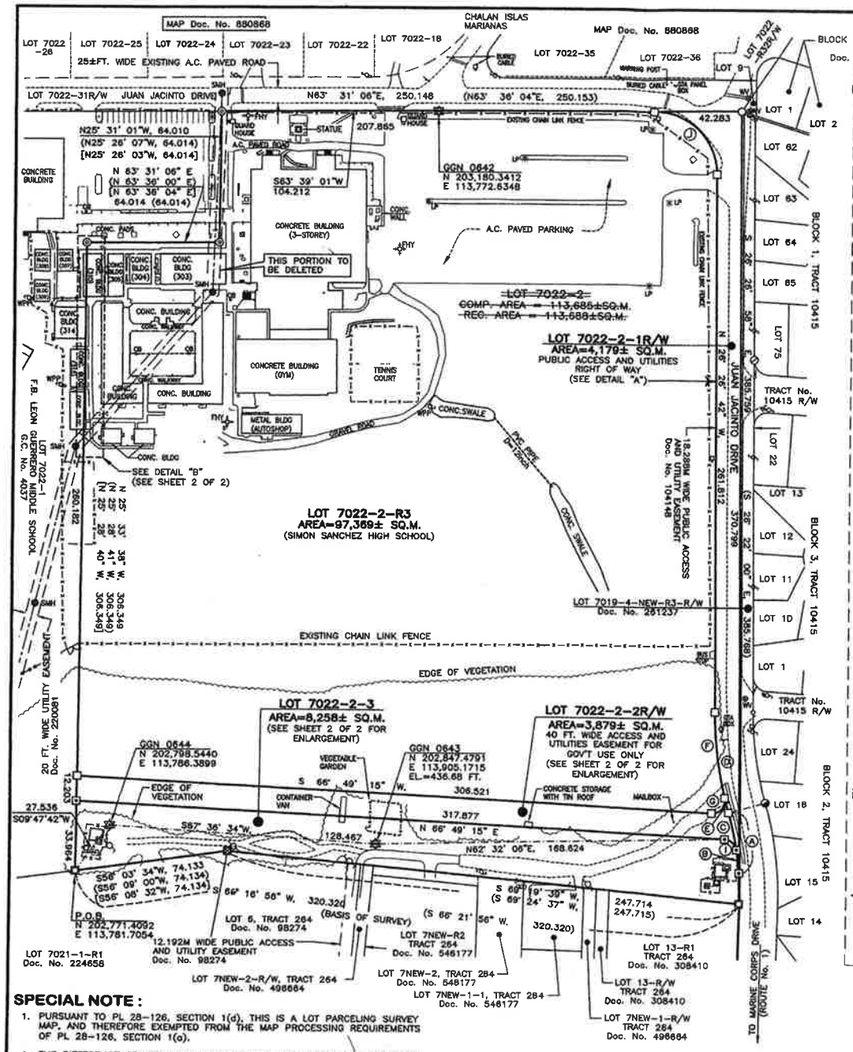
The building maintenance and custodial services phases shall commence upon acceptance of the school and shall continue for a period of thirty (30) years or until the leaseback contract is completed. Routine maintenance, repair and upkeep shall be the responsibility of the Contractor, as provided by the terms of the Insurance, Maintenance Agreement. Building maintenance includes the preventive maintenance of the whole facility, and the replacement of all fixed equipment. Custodial services include all janitorial services, ground maintenance, and trash disposal.

30 Year Maintenance Program			Type			
	Typical School Facility Components for Maintenance	Frequency	Janitorial	Preventive	Unscheduled	Capital
1	**Paving**					
1.1	Asphalt - repair/seal of cracks	As required			x	
1.2	Concrete Slabs on Grade and Elevated Slabs - repair cracks	As required			x	
2	**Structural**					
2.1	Structural Damage Assessments	As required			x	
2.2	Foundation Repairs	As required			x	
2.3	Repair of Structural Elements (incl. Crack Repairs)	As required			x	
2.4	Replacement of Structural Elements	As required			x	
2.5	Upgrading of Structural Elements	As required			x	
3	**Wall Systems**					
3.1	Doors including hardware	As required				x
3.2	Window Assemblies (including Aluminum Sash)	As required			x	x
3.3	Indoor Gym Bleachers that pull out from wall	As required		x		
3.4	Restroom Partitions (attached to wall)	As required			x	
4	**Floor Covering**					
4.1	Carpeting	Daily	x		x	x
4.2	Resilient Tile Flooring	Daily / Weekly	x		x	x
4.3	Sports Flooring	Daily / weekly	x		x	x
5	**Painting**					
5.1	Interior of classrooms, library, Offices, hallways, cafeteria, Restrooms, Gymnasium and Athletic Manager's Office, Covered Walkways, Laboratories and other Indoor and Outdoor Spaces.	As required / 5-years			x	x
5.2	Touch-up painting of walls	Monthly	x			
5.3	Exterior masonry, metal surfaces and trim	As required / 5-years			x	x
6	**Roofing**					
6.1	Large Sections or Whole Buildings of Roofing Systems including Water and Thermal Proofing	As required / 5-years			x	x
6.2	Flashings, Gutters, and Downspouts	As required		x	x	
6.3	Ceiling Tiles	As required			x	
7	**Electrical**					
7.1	Main Electrical Riser, Connections and Conduits within the Boundaries	As required		x	x	
7.2	Panels and Boards	As required		x	x	
7.3	Signal Systems, including Fire Alarm System and Public Address	Per Mfr		x		
7.4	Main Power Distribution System	As required			x	
7.5	Interior and Exterior Power Distribution Systems	As required			x	
7.6	Interior and Exterior Ligthing Systems including Interior and Exterior Incandescent and Flourecent Lighting and Fixtures	Monthly	x	x		
7.7	Equipment Connections	As required			x	
7.8	Condits, Consductors and Cables	As required			x	
7.9	Preventive Maintenance and Repair of Stand By Generator and Transfer Switch	Per Mfr		x	x	
8	**Plumbing**					
8.1	Main Water Supply Pipe Connections and Piping Within Boundaries	As required			x	
8.2	UndergroundWater Distribution Systems	As required			x	
8.3	Sewer piping, manholes within boundaries	As required			x	
8.4	Interior Water Supply	As required			x	
8.5	Interior and Exterior Plumbing, Connections, Piping and Fixtures, including heaters	As required / Per Mfr		x	x	x

30 Year Maintenance Program			Type			
	Typical School Facility Components for Maintenance	Frequency	Janitorial	Preventive	Unscheduled	Capital
9	**Air Conditioning/Ventilation/Heating**					
9.1	Air Conditioning Systems					
9.1.1	1.a Central Syatems	wk, mo, qrtr, 5-yr	x	x		x
9.1.2	1.b Individual Units	wk, mo, qrtr, 5-yr	x	x		x
9.2	2. Ventilation Systems					
9.2.1	2.a Toilet and Bath Fan Exhaust Systems	wk, mo, qrtr, 5-yr	x	x		x
9.2.2	2.b Cafeteria and Kitchen Fan Exhaust Systems	wk, mo, qrtr, 5-yr	x	x		x
9.1.3	2.c Construction and Automotive Workshops Fume Exhaust Systems	wk, mo, qrtr, 5-yr	x	x		x
10	**Fire Protection System**					
10.1	Testing and Certifying of Fire Protection System	Annualy		x		
10.2	Maintenance of Fire Protection Riser and System	As required			x	
10.3	Maintenance of Fire Alarm System	see Section 7				
10.4	Testing and Certifying of Kitchen Fire Protection System				x	
10.5	Certification and Replacement of Fire Extiguishers	Annualy/As Required		x	x	x
11	**Kitchen Equipment**					
11.1	Kitchen Equipment Maintenance	Weekly/As Required			x	x
12	**Telecom and Internet**					
12.1	Telecommunication Conduits / wiring	As Required			x	
12.2	Public Address	Per Mfr		x		
13	**Landscaping and Lawns**					
13.1	Grass cutting and maintain all grounds including Sports field	Bi-weekly	x			
13.2	Walkway edging	Bi-weekly	x			
13.3	Tree Trimming / Hedging	Monthly	x			
13.4	Provide and maintain Necessary Lawn Care Equipment (1- Riding Mower, 4-Bush cutters, 2-push Mowers)	As Required		x		x
14	**Custodial and Waste Collection**					
14.1	Garbage collection from classrooms, offices, restrooms and other building areas	Daily	x			
14.2	Site cleanup (hallways, walkways, parking lots, etc.)	Daily	x			
14.3	Waste removal by commercial hauler	Daily	x			
14.4	Classroom Floor polishing / waxing / sealing	Bi-Quarterly	x			
14.5	Restroom cleaning (Sweeping, mopping, wipedown of surfaces, Supply and replenishment of Paper Products, Soap)	Daily	x			
14.6	Restroom flushing and rinsing	Daily	x			
14.7	Classroom cleaning (Sweeping, mopping, wipedown of Student Desks, Cleaning of White boards	Daily	x			
14.8	Cleaning of Windows and doors interior and exterior	Daily	x			
14.9	Flushing exterior walkways / pressure washing	Bi-weekly / Quarterly	x			
15	**Pest Control**					
15.1	Spraying for control of pests(Ants, Cockroaches and Rats)	As Required	x			
15.2	Control of Termites	As Required	x			x
16	**Elevator Maintenance**					
16.1	Certification	annualy		x		x
17	**Campus Security**					
17.1	On Site Secrity	As Required	x			

(end)

ATTACHMENT B-1



1993 GRID

30 15 0 30 60 90

METRIC SCALE: 1:1250

CURVE DATA :

Ⓐ	Δ = 11° 18' 28"	Ⓑ	Δ = 04° 17' 13"
	R = 151.034		R = 151.034
	L = 29.807		L = 11.301
	Ch = 29.756		Ch = 11.296
	ChB = N36° 19' 32"W		ChB = S32° 48' 58"E
Ⓒ	Δ = 07° 01' 13"	Ⓓ	Δ = 15° 32' 04"
	R = 151.034		R = 183.569
	L = 18.508		L = 49.771
	Ch = 18.494		Ch = 49.616
	ChB = S36° 28' 09"E		ChB = S34° 12' 44"E
Ⓔ	Δ = 02° 18' 32"	Ⓕ	Δ = 13° 13' 53"
	R = 183.569		R = 183.569
	L = 7.390		L = 42.392
	Ch = 7.390		Ch = 42.298
	ChB = S40° 48' 51"E		ChB = S33° 03' 38"E
Ⓖ	Δ = 106° 29' 50"	Ⓗ	Δ = 15° 32' 04"
	R = 6.096		R = 185.281
	L = 11.331		L = 44.612
	Ch = 9.789		Ch = 44.475
	ChB = N13° 34' 20"E		ChB = N34° 12' 44"W (N34° 11' 19"W)
Ⓘ	Δ = 78° 13' 12"	Ⓙ	Δ = 90° 02' 12"
	R = 6.096		R = 30.480
	L = 6.322		L = 47.899
	Ch = 7.691		Ch = 43.114
	ChB = N74° 04' 09"W		ChB = S 71° 27' 49"E

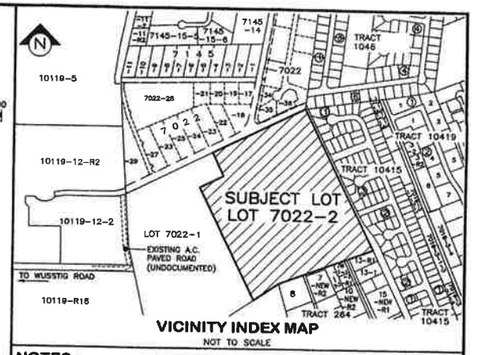
CHECKED BY :

FRANK P. TAITANO, PLANNER, D.L.M. — 5-18-20 DATE

MELVIN O. JAVIER, ENGINEERING TECHNICIAN, C.L.T.C. — 7-6-2020 DATE

PIERCE CASTRO, ENGINEERING TECHNICIAN, C.L.T.C. — 7-20-2020 DATE

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recorder
File for Record Instrument Number 952623
On this Year 20 20 Month 11 Day 25 Time 10:05
Recording Fee 80 Receipt # 21796
Deputy Recorder



VICINITY INDEX MAP
NOT TO SCALE

NOTES :

1. SURVEY WAS BASED ON FOUND CORNERS AS SHOWN.
2. ALL DISTANCES ARE IN METERS UNLESS OTHERWISE NOTED.
3. BEARINGS AND DISTANCES WITHIN THE PARENTHESES ARE RECORD DATA, WITHIN BRACKETS ARE BASED ON REF. No. 2, ALL OTHERS ARE 1993 GRID.
4. SUBJECT LOT IS WITHIN THE NORTHERN WATER RECHARGE AREA.
5. SUBJECT LOT IS ZONED "A" AGRICULTURAL PER 1967 OFFICIAL ZONING MAP F367541.
6. EXISTING AS-BUILTS SHOWN AS OF APPROVAL OF THIS MAP.
7. VERTICAL CONTROL SURVEY WAS BASED FROM GGN 0643 WITH AN ELEVATION OF 436.68 FEET MEAN SEA LEVEL (MSL) DATUM. CONTOURS WERE DEVELOPED FROM SPOT ELEVATIONS USING A COMBINATION OF GPS AND CONVENTIONAL TOPOGRAPHIC GROUND METHOD.

REFERENCES :

1. DWG No. 70-40-15, SURVEY FOR PROPOSED MATAGUAC JR. HIGH SCHOOL SITE OF LOT 7022-2, PREPARED BY RLS No. 18, L.M. No. 547-FY72, UNRECORDED
2. DWG No. ASA 72 020, PARCELING OF LOT 7022-1, PREPARED BY RLS No. 37, L.M. No. 473-FY72, UNRECORDED.
3. DWG No. CC-9812Y, RE-SUBDIVISION SURVEY MAP OF LOT 7NEW-1 AND LOT 7NEW-R1, TRACT 264, PREPARED BY RLS No. 48, L.M. No. 265-FY98, Doc. No. 546177.
4. DWG No. MS-93045, CONSOLIDATION SURVEY MAP OF LOT 7 AND LOT 12, TRACT 264 INTO LOT 7NEW, TRACT 264 THEN PARCELING OF LOT 7NEW, TRACT 264, PREPARED BY RLS No. 53, L.M. No. 568-FY93, Doc. No. 496684.
5. DWG No. RRVB6-20PIE, SUBDIVISION SURVEY MAP OF TRACT 10415 (CONSOLIDATION OF LOTS 7019-4NEW-3, 7019-4NEW-2 & 7019-4NEW-1), PREPARED BY RLS No. 54, L.M. No. 86-FY87, Doc. No. 392475.

CERTIFICATE OF GUAM CHIEF SURVEYOR

THIS MAP HAS BEEN EXAMINED FOR CONFORMANCE WITH TITLE 21, GUAM CODE ANNOTATED, CHAPTER 60, ARTICLE 5, UNIFORM TRIANGULATION SYSTEM AND REGULATIONS THEREUNDER ON THIS 3RD DAY OF August 2020

PAUL L. SANTOS, P.E.S. No. 68
GUAM CHIEF SURVEYOR/CHIEF OF CADASTRE

CERTIFICATE OF GUAM CHIEF PLANNER

APPROVAL PURSUANT TO TITLE 21, GUAM CODE ANNOTATED, CHAPTER 61, ZONING LAW AND CHAPTER 62, SUBDIVISION LAW

CELINE L. CRUZ
GUAM CHIEF PLANNER — 5/18/2020 DATE

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS; THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

NESTORIO C. IGNACIO, PLS No. 65 — 10/22/19 DATE

REGISTERED LAND SURVEYOR No. 65 EXP. 04-30-20 GUAM

DCA DUEÑAS · CAMACHO

* ENGINEERING * PLANNING * SURVEYING * ENVIRONMENTAL SERVICES
* GEOGRAPHIC INFORMATION SYSTEM * CONSTRUCTION MANAGEMENT GUAM
P.O. Box 8900, Tamuning, Guam 96931 / 238 S. Marine Corps Drive, Suite 201 Diamond Plaza, Hagatña, GU 96910-5194 / Tel: (671) 477-7991 / Fax: (671) 479-4313 SAIPAN Calle Ben PPP, Suite 104, Saipan, MP 96950 / Chalan Palo Arnold, Ada's Building South Garapan, Saipan 96950 / Tel: (670) 234-9017 / Fax: (670) 234-3842

SPECIAL NOTE :

1. PURSUANT TO PL 28-126, SECTION 1(d), THIS IS A LOT PARCELING SURVEY MAP, AND THEREFORE EXEMPTED FROM THE MAP PROCESSING REQUIREMENTS OF PL 28-126, SECTION 1(a).
2. THE DIFFERENCE OF AREA BETWEEN COMPUTED AND RECORD ARE BASED ON FOUND CORNERS AND FIELD CONDITION.

LEGEND :

- GGN STATION
- FND. No. 4 REBAR WITH A BROKEN CAP, SET BY UNKNOWN, REPLACED WITH 0.102m x 0.102m x 0.457 CONC. MON. CENTERED WITH 0.064M DIA. BRONZE DISK MARKED GWA BOUNDARY / P.L.S. No. 65
- FND. No. 4 REBAR WITH CAP MARKED DLM – ONE FOOT DEEP, PLACED A 0.102m x 0.102m x 0.457 CONC. MON. MARKED PLS 65 ON TOP OF REBAR (SAME LOCATION)
- SET 0.102m x 0.102m x 0.457 CONC. MON. CENTERED WITH 0.064M DIA. BRONZE DISK MARKED GWA BOUNDARY / P.L.S. No. 65
- SET 0.102 x 0.102 CONC. MONUMENT WITH PLASTIC CAP MARKED PLS 65
- FOUND NO. 4 REBAR WITH PLASTIC CAP MARKED RLS 48, UNRECORDED
- FOUND 3/4 DIA. G.I. PIPE WITH BRASS TAG MARKED RLS No. 24, REF #5
- FOUND NO. 4 REBAR WITH PLASTIC CAP MARKED PLS 77, UNRECORDED
- SET No. 4 REBAR WITH PASTIC CAP MARKED PLS No. 65
- CONCRETE POWER POLE
- GUY WIRE
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SIGN POST
- WV WATER VALVE
- LAMP POST

AUTHORITY (GDOE) :

REFERENCE: PROFESSIONAL LAND SURVEYING SERVICES FORMAT REQUEST FOR PROPOSAL; GDOE RFP 005-2019 PURCHASE ORDER No. 20191056

AUTHORITY (GWA) :

1. LAND SURVEY AGREEMENT BETWEEN GUAM WATERWORKS AUTHORITY AND DUENAS CAMACHO & ASSOCIATES Inc.; RFP GWA-2007-04, DATED NOVEMBER 19, 2007.
2. GRANT DEED Doc. No. 567559
   GRANTORS: GOVERNMENT OF GUAM AND / OR FORMER PUBLIC UTILITY AGENCY OF GUAM (PUAG)
   GRANTEE: GUAM WATERWORKS AUTHORITY (GWA)

GRANTORS HEREBY GRANT, TRANSFER, ASSIGN, AND CONVEY TO THE GRANTEE IN FEE SIMPLE ABSOLUTE, THE REAL PROPERTY INTERESTS FOR ONLY THOSE PORTIONS OF LANDS REQUIRED BY THE GRANTEE FOR PUBLIC UTILITIES PURPOSES.

SATISFACTORY TO AND APPROVED BY :

JON-JAY FERNANDEZ, SUPERINTENDENT OF EDUCATION, GOVERNMENT OF GUAM — 2-17-20 DATE

MIGUEL C. BORDALLO, P.E., GENERAL MANAGER, GUAM WATERWORKS AUTHORITY, GOVERNMENT OF GUAM, FOR GWA DEEP WELL SITES Y-05 AND Y-06 — 11-21-19 DATE

JOSEPH M. DAVIS, DIRECTOR, DEPARTMENT OF LAND MANAGEMENT, APPROVAL PURSUANT TO GRANT DEED Doc. No. 567559, PAGE 29, THEREOF, FOR GWA DEEP WELL SITES Y-05 AND Y-06 — 10/24/20 DATE

LOURDES A. LEON GUERRERO, GOVERNOR OF GUAM, APPROVAL PURSUANT TO GRANT DEED Doc. No. 567559, PAGE 29, THEREOF, FOR GWA DEEP WELL SITES Y-05 AND Y-06 — 11/07/2020 DATE

LOT PARCELING SURVEY MAP OF

LOT 7022-2

(GDOE: SIMON SANCHEZ HIGH SCHOOL)
(GWA: DEEP WELLS Y-05 and Y-06)
MUNICIPALITY OF YIGO

L.S. 10 SEC. 4

SURVEY DATA		DATE	LOT DATA	
FIELD	MPG/AUJ & CREW	5-9-2019	BASIC LOT	7022
BOOK	DCA1/GWA-2019		CERT. OF TITLE No.	C.C. 4037
COMPUTED	CNB	MAY 2019	REGISTERED DN:	AUGUST 30, 1939
DRAWN	CNB	MAY 2019	IN THE NAME OF:	
RESEARCHED	CNB	APRIL 2019	THE UNITED STATES OF AMERICA	
CHECKED	NCI	MAY 2019		

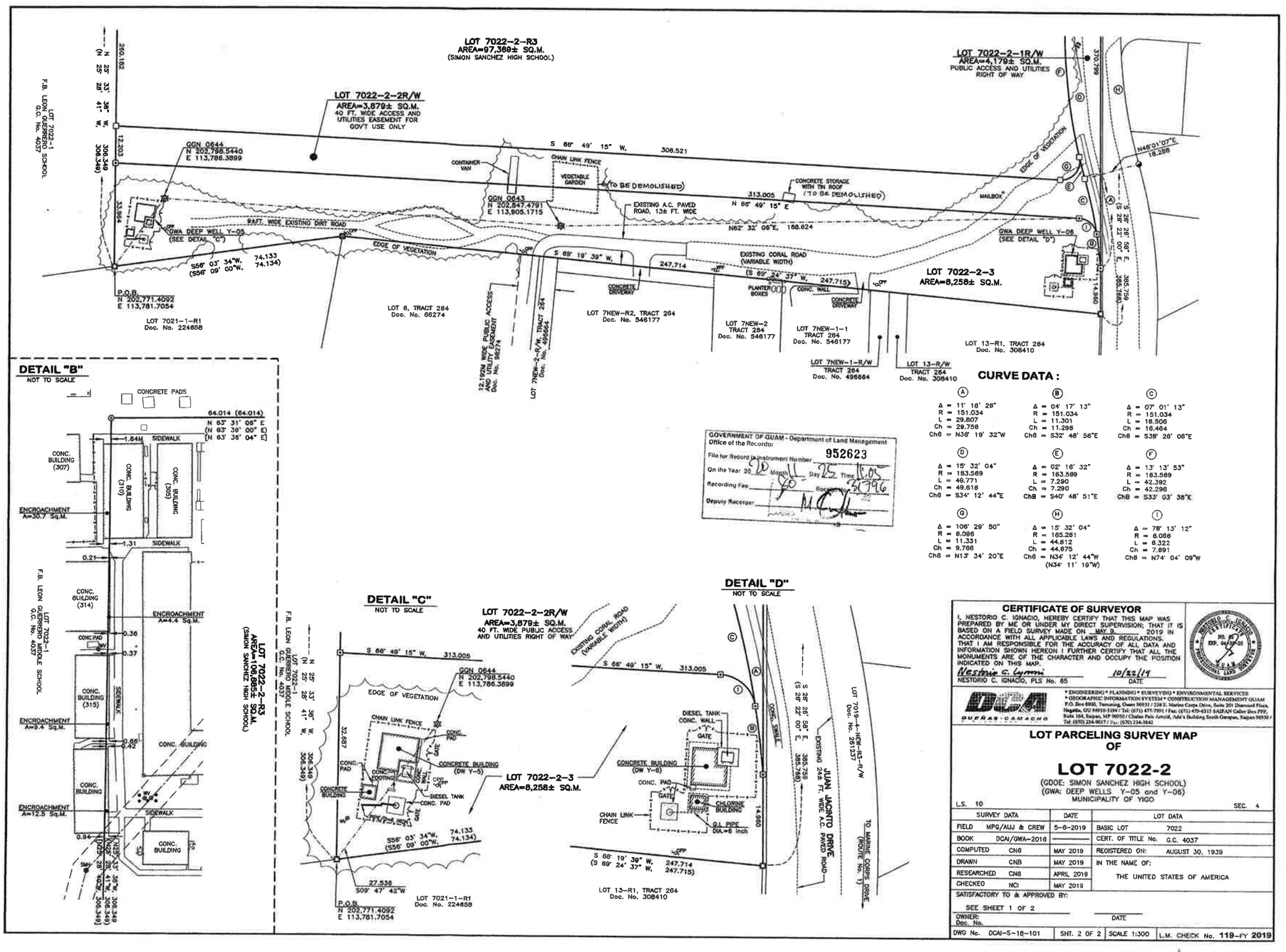
SATISFACTORY TO & APPROVED BY:

SEE PLAN — DATE

OWNER:
•Doc. No.

DWG No. DCA1-S-18-101 | SHT. 1 OF 2 | SCALE 1:1250 | L.M. CHECK No. 119-FY 2019

S-76030 Y2 DX



CURVE DATA :

(A)	(B)	(C)
Δ = 11° 16' 28"	Δ = 04° 17' 13"	Δ = 07° 01' 13"
R = 151.034	R = 151.034	R = 151.034
L = 29.807	L = 11.301	L = 18.506
Ch = 29.758	Ch = 11.298	Ch = 16.464
Ch6 = N36° 19' 32"W	Ch6 = S32° 48' 56"E	Ch6 = S38° 26' 06"E

(D)	(E)	(F)
Δ = 15° 32' 04"	Δ = 02° 16' 32"	Δ = 13° 13' 53"
R = 183.589	R = 183.589	R = 183.589
L = 49.771	L = 7.290	L = 42.392
Ch = 49.618	Ch = 7.290	Ch = 42.296
Ch6 = S34° 12' 44"E	ChB = S40° 48' 51"E	ChB = S33° 03' 38"E

(G)	(H)	(I)
Δ = 106° 29' 50"	Δ = 15° 32' 04"	Δ = 78° 13' 12"
R = 6.096	R = 165.281	R = 6.068
L = 11.331	L = 44.812	L = 8.322
Ch = 9.766	Ch = 44.675	Ch = 7.691
Ch6 = N13° 34' 20"E	Ch6 = N34° 12' 44"W (N34° 11' 19"W)	Ch6 = N74° 04' 09"W

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recordor
File for Record in Instrument Number 952623
On the Year 20 19 Month L Day 25 Time 10:05
Recording Fee 50 Receipt No. 5796
Deputy Recorder

DETAIL "B"
NOT TO SCALE

DETAIL "C"
NOT TO SCALE

DETAIL "D"
NOT TO SCALE

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

Nestorio C. Ignacio 10/22/19
NESTORIO C. IGNACIO, PLS No. 65 DATE

NESTORIO C. IGNACIO LICENSED PROFESSIONAL LAND SURVEYOR NO. 65 EXP. 04/30/20

DUEÑAS · CAMACHO

* ENGINEERING * PLANNING * SURVEYING * ENVIRONMENTAL SERVICES
* GEOGRAPHIC INFORMATION SYSTEM * CONSTRUCTION MANAGEMENT GUAM
P.O. Box 8900, Tamuning, Guam 96931 / 238 E. Marine Corps Drive, Suite 201 Diamond Plaza, Hagatña, GU 96910-5194 / Tel: (671) 477-7991 / Fax: (671) 479-6313 SAIPAN Cellini Box PPF, Suite 164, Saipan, MP 96950 / Chalan Pale Arnold, Ada's Building South Garapan, Saipan 96950 / Tel: (670) 234-9017 / Fax: (670) 234-3642

LOT PARCELING SURVEY MAP OF LOT 7022-2

(GDOE: SIMON SANCHEZ HIGH SCHOOL)
(GWA: DEEP WELLS Y-05 and Y-06)
MUNICIPALITY OF YIGO

L.S. 10 SEC. 4

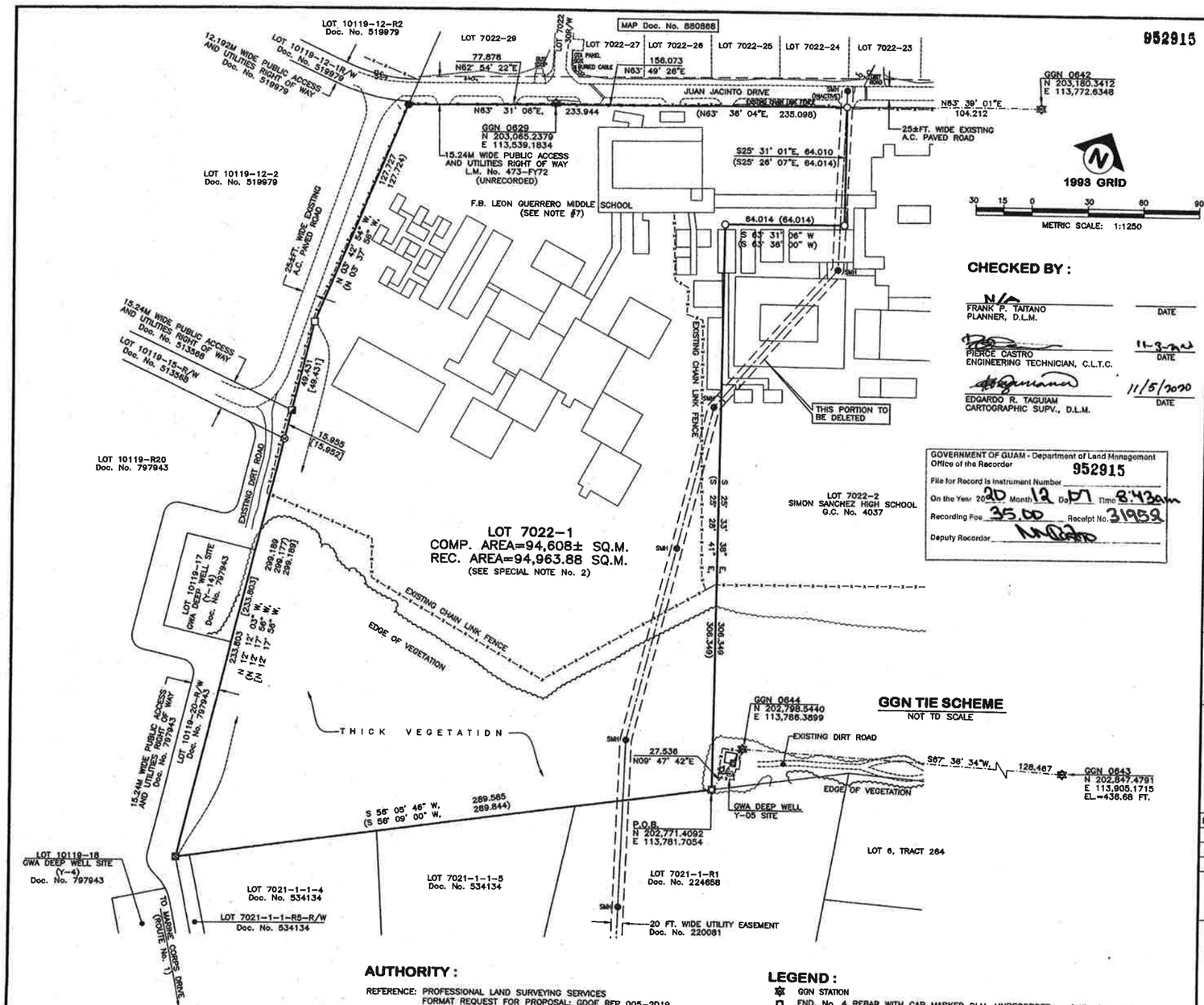
SURVEY DATA		DATE	LOT DATA	
FIELD	MPG/AUJ & CREW	5-8-2019	BASIC LOT	7022
BOOK	DCAI/GWA-2016		CERT. OF TITLE No.	G.C. 4037
COMPUTED	CNB	MAY 2019	REGISTERED ON:	AUGUST 30, 1939
DRAWN	CNB	MAY 2019	IN THE NAME OF:	
RESEARCHED	CNB	APRIL 2019	THE UNITED STATES OF AMERICA	
CHECKED	NCI	MAY 2019		

SATISFACTORY TO & APPROVED BY:
SEE SHEET 1 OF 2
OWNER: DATE
Doc. No.

DWG No. DCAI-S-18-101 | SHT. 2 OF 2 | SCALE 1:300 | L.M. CHECK No. 119-FY 2019

S-16030 2/2

952915



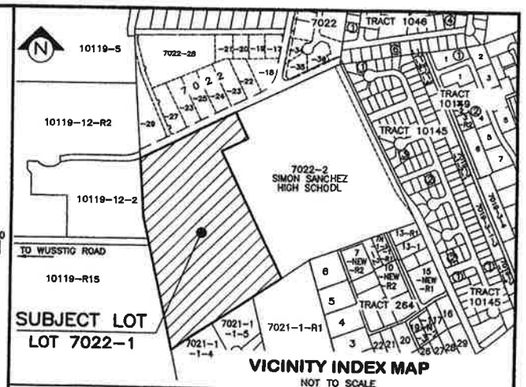
CHECKED BY :

N/A
FRANK P. TAITANO
PLANNER, D.L.M. — DATE

PIERCE CASTRO
ENGINEERING TECHNICIAN, C.L.T.C. — 11-3-20 DATE

EDGARDO R. TAGUIAM
CARTOGRAPHIC SUPV., D.L.M. — 11/5/2020 DATE

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recorder **952915**
File for Record is Instrument Number
On the Year 2020 Month 12 Day 07 Time 8:43am
Recording Fee 35.00 Receipt No. 31959
Deputy Recorder



VICINITY INDEX MAP
NOT TO SCALE

NOTES :

1. SURVEY WAS BASED ON FOUND CORNERS AS SHOWN.
2. ALL DISTANCES ARE IN METERS UNLESS OTHERWISE NOTED.
3. BEARINGS AND DISTANCES WITHIN THE PARENTHESES ARE RECORD DATA, ALL OTHERS ARE 1993 GRID.
4. SUBJECT LOT IS WITHIN THE NORTHERN WATER RECHARGE AREA.
5. SUBJECT LOT IS ZONED "A" AGRICULTURAL PER 1987 NORTH ISLAND OFFICIAL ZONING MAP F367541.
6. EXISTING AS-BUILTS SHOWN AS OF APPROVAL OF THIS MAP.
7. F.B. LEON GUERRERO MIDDLE SCHODL BUILDINGS AS SHOWN ON THIS MAP WAS DIGITIZED FROM AERIAL MAPS.

REFERENCES :

1. DWG No. 70-40-15, SURVEY FOR PROPOSED MATAGUAC JR. HIGH SCHOOL SITE OF LOT 7022-2, PREPARED BY RLS No. 18, L.M. No. 547-FY72, UNRECORDED
2. DWG No. ASA 72 02G, PARCELING OF LOT 7022-1, PREPARED BY RLS No. 37, L.M. No. 473-FY72, UNRECORDED.
3. L.M. DWG No. 14-93T456, RE-SUBDIVISION SURVEY MAP OF LDT 10119-R13 (HOUSING RENTAL UNIT SITE), PREPARED BY D.L.M., L.M. No. 303-FY93, Doc. No. 488804.

CERTIFICATE OF GUAM CHIEF SURVEYOR

THIS MAP HAS BEEN EXAMINED FOR CONFORMANCE WITH TITLE 21, GUAM CODE ANNOTATED, CHAPTER 9 ARTICLE 5, NAVIGATION TRIANGULATION AND REGULATIONS THEREUNDER ON THIS 6th DAY OF NOV. 2020

PAUL L. SANTOS, P.L.S. No. 68
GUAM CHIEF SURVEYOR/CHIEF OF CADASTRE

CERTIFICATE OF GUAM CHIEF PLANNER

APPROVAL PURSUANT TO TITLE 21, GUAM CODE ANNDTATED, CHAPTER 61, ZDNING LAW AND CHAPTER 62, SUBDIVISION LAW

N / A
CELINE L CRUZ
GUAM CHIEF PLANNER — DATE

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS; THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

Nestrio C. Ignacio — 2/19/20 DATE
NESTORIO C. IGNACIO, PLS No. 65

NESTORIO C. IGNACIO CERTIFICATE NO. 65 EXP. 06-30-21 GUAM PROFESSIONAL LAND SURVEYOR

REVISION	DESCRIPTION	BY	DATE	APPROVED BY	DATE

DCA DUEÑAS · CAMACHO

* ENGINEERING * PLANNING * SURVEYING * ENVIRONMENTAL SERVICES * GEOGRAPHIC INFORMATION SYSTEM * CONSTRUCTION MANAGEMENT GUAM
P.O. Box 8909, Tamuning, Guam 96931 / 238 E. Marine Corps Drive, Suite 201 Dimond Plaza, Hagatña, GU 96910-5194 / Tel: (671) 477-7991 / Fax: (671) 479-6315 SAIPAN Caller Box PPP, Suite 164, Saipan, MP 96950 / Chalan Pale Arnold, Ada's Building South Garapan, Saipan 96950 / Tel: (670) 234-9017 / Fax: (670) 234-5842

AUTHORITY :

REFERENCE: PROFESSIONAL LAND SURVEYING SERVICES
FORMAT REQUEST FOR PROPOSAL: GDOE RFP 005-2D19
PURCHASE ORDER No. 20191056

SPECIAL NOTE :

1. PURSUANT TO PL 28-126, SECTION 1(d), THIS IS A RETRACEMENT SURVEY MAP, AND THEREFORE EXEMPTED FROM THE MAP PROCESSING REQUIREMENTS OF PL 28-126, SECTION 1(a).
2. THE DIFFERENCE OF AREA BETWEEN COMPUTED AND RECORD ARE BASED DN FOUND CORNERS ACCEPTED AND FIELD CONDITION.

LEGEND :

- GGN STATION
- FND. No. 4 REBAR WITH CAP MARKED DLM, UNRECORDED — ONE FOOT DEEP, PLACED A 0.102m x 0.102m x 0.457 CONC. MONUMENT MARKED PLS 65 ON TOP OF REBAR (SAME LOCATION)
- SET 0.102 x 0.102 CONC. MONUMENT WITH PLASTIC CAP MARKED PLS 65
- FND. 0.102 x 0.102 CONC. MONUMENT WITH PLASTIC CAP MARKED D.L.M., REF #3
- FND. No. 4 REBAR WITH CAP MARKED DLM, REF #3, REPLACED WITH 0.102m x 0.102m x 0.457 CONC. MONUMENT MARKED PLS 65 (SAME POSITION)
- FND. No. 4 REBAR, SET BY D.L.M., REF #3
- SET No. 4 REBAR WITH PLASTIC CAP MARKED PLS No. 65
- SET No. 4 REBAR WITH PLASTIC CAP MARKED PLS No. 65 ON ROCK OUTCROP
- CONCRETE POWER POLE
- GUY WIRE
- TELEPHONE PEDESTAL
- SIGN POST

SATISFACTORY TO AND APPROVED BY :

JON J.P. FERNANDEZ
SUPERINTENDENT OF EDUCATION
GOVERNMENT OF GUAM — 9/7/20 DATE

JOSEPH M. BORJA
DIRECTOR
DEPARTMENT OF LAND MANAGEMENT
GOVERNMENT OF GUAM — 11/16/20 DATE

RETRACEMENT SURVEY MAP
OF
LOT 7022-1
(F.B. LEON GUERRERO MIDDLE SCHOOL)

L.S. 10 — MUNICIPALITY OF YIGO — SEC. 4

SURVEY DATA		DATE	LOT DATA	
FIELD	MPG/AUJ & CREW	5-9-2019	BASIC LOT	7022
BOOK	DCA1/GWA-2019		CERT. OF TITLE No.	G.C. 4037
COMPUTED	CNB	MAY 2019	REGISTERED DN:	AUGUST 30, 1939
DRAWN	CNB	MAY 2019	IN THE NAME OF:	THE UNITED STATES OF AMERICA
RESEARCHED	CNB	APRIL 2019		
CHECKED	NCI	MAY 2019		

SATISFACTORY TO & APPROVED BY:
SEE PLAN — DATE
OWNER:
Doc. No.

DWG No. DCA1-S-19-22 | SHT. 1 OF 1 | SCALE 1:1250 | L.M. CHECK No. 170-FY 2019

5-16034

BIOLOGICAL ASSESSMENT
FOR THE PROPOSED CONSTRUCTION OF SIMON SANCHEZ HIGH SCHOOL
LOT NOS. 7022-2-R3 AND 7022-1, YIGO, GUAM

Prepared for

Guam Department of Education
500 Mariner Ave
Barrigada, 96913, Guam

Prepared by

Dueñas, Camacho & Associates, Inc.
238 East Marine Corps Drive
Suite 201 Diamond Plaza
Hagatna, Guam 96910

JULY 2022

EXECUTIVE SUMMARY

Guam Department of Education (GDOE) is proposing to construct a new high school facility on the parcel containing the existing Simon Sanchez High School (SSHS) campus, with supporting facilities proposed on the adjacent F.B. Leon Guerrero (FBLG) Middle School parcel. Duenas, Camacho & Associates, Inc. (DCA) is part of an architectural and engineering design team led by Taniguchi Ruth Makio Architects that is tasked by GDOE with the initial surveying, design, and engineering work. The new school facility will be constructed, financed, and built by a single contractor in two phases.

The project site is located in Yigo on Lot Nos. 7022-2-R3 and 7022-1. Lot 7022-2-R3 is a 97,369 sq. m (24-acre) parcel that encompasses the existing SSHS campus. Lot 7022-1 is an approximately 94,607 sq. m (23-acre) parcel adjacent and west of Lot 7022-2-R3. The northern portion of Lot 7022-1 contains the FBLG campus; however, only the southern portion (approximately 10 acres) is included in the action area. The western boundary of Lot 7022-1 abuts Lot 10119-20-R/W (a 50-foot-wide public access and utility right-of-way) and Lot 10119-17, which contains Well Y-14, a Guam Waterworks Authority (GWA) production well. The southern boundary of Lot 7022-2-R3 abuts a 40-foot-wide access and utilities easement (Lot 7022-2-2R/W). Adjacent and south of this easement is Lot 7022-2-3, which contains two GWA water production wells (Wells Y-5 and Y-6).

This Biological Assessment (BA), prepared by DCA, a non-federal consultant, assesses the effects of the proposed construction of the new high school on federally-protected species or their designated critical habitat in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. Visual pedestrian surveys for locally and federally-listed threatened or endangered species within the SSHS action area were conducted by DCA biologists in October 2020, March 2021, and March 2022. The surveys documented a colony of the ESA-listed endangered Guam tree snail (*Partula radiolata*) that spans the southern sectors of Lot Nos. 7022-2-R3 and 7022-1.

We have determined that with the implementation of conservation measures described in this BA, the proposed action may affect, but is not likely to adversely affect the locally-listed and ESA-listed Guam tree snail (*Partula radiolata*), and the humped tree snail (*Partula gibba*) and fragile tree snail (*Samoana fragilis*) if present. We have also determined that this project will have "no effect" on the following ESA-listed threatened plant species because these species do not occur in the action area based on the 2021 and 2022 pedestrian surveys: wild onion (*Bulbophyllum guamense*), *Dendrobium guamense,* and *Tuberolabium guamense*. Given the absence of sightings during 2021 and 2022 surveys, and the implementation of conservation measures described in this BA, we have determined that the proposed action may affect, but is not likely to adversely affect the locally-listed and ESA-listed Mariana fruit bat (*Pteropus mariannus mariannus*). Additionally, because of approximately seven miles of spatial separation,

we have determined that the SSHS project will have no effect on designated critical habitat for the Mariana fruit bat.

Much of Lot 7022-2-R3 has been cleared and developed for the existing high school facilities. A narrow strip of scrub forest (about 4.01 acres) south of this cleared land remains along the length of the southern parcel boundary. Additionally, of the 10 acres of Lot 7022-1 included in the project area, 0.18 acres are scrub/shrub, and 8.62 acres are scrub forest. The plant community contains native limestone forest components, such as seeded breadfruit or dokdok (*Artocarpus mariannensis*) trees and beyuko halomtano' or false rattan (*Flagellaria indica)* vines. Native pago or sea hibiscus (*Taliparitі tiliaceum*) and introduced tangantangan (*Leucaena leucocephala*) are common scrub forest trees, along with the occasional kafu' or screwpine (Pandanus tectorius) trees. Common birds such as the Philippine collared dove (*Streptopelia dusumieri*) and the Migratory Bird Treaty Act (MBTA) listed yellow bittern (*Ixobrychus sinensis*) were observed flying overhead and resting on tangantangan. Black drongos (*Dicurus macrocercus*) were frequently spotted flying low throughout the open field within the fenced confines of FBLG and SSHS or resting on ironwood trees. Other bird sightings included the MBTA-listed white tern (*Gygis alba*) and Pacific golden plover (*Pluvialis fulva*). The white tern (*G. alba*) was observed flying throughout the southern sector of the project site and resting on an ironwood (*Casuarina equisetifolia)* tree. In contrast, Pacific golden plovers (*P. fulva*) were observed throughout the open, grassy fields south of both campuses. The following non-listed fauna were either observed directly, or signs of their presence were detected throughout the project site: feral pig (*Sus scrofa*), skinks (*Emoia caeruleocauda* and *Carlia ailanpalai*), snails (*Drymaeus multilineatus* and *Satsuma succincta*), dogs (*Canis lupus familiaris*), chickens (*Gallus gallus domesticus*), spiders (*Heteropoda venatoria*) and monitor lizards (*Varanus tsukamotoi*).

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1 INTRODUCTION

The purpose of this Biological Assessment (BA) is to assess the effects of the proposed construction of a new Simon Sanchez High School facility in Lot Nos. 7022-2-R3 and 7022-1, Yigo, Guam, on federally-protected species or their designated critical habitat. This BA, prepared by Duenas, Camacho, and Associates, Inc. (DCA), a non-federal consultant, addresses the proposed action in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. Section 7 of the ESA assures that, through consultation (or conferencing for proposed species) with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS), federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat.

1.1 Summary of Proposed Action

GDOE is planning to construct a new school facility south of the existing Simon Sanchez High School in Lot 7022-2-R3, as well as on the southern portion of Lot 7022-1 in Yigo, Guam.

All activities will occur on non-federal, Government of Guam-owned property. The project will be funded and built by a single contractor, who would need to seek coverage under the U.S. Environmental Protection Agency (USEPA) National Pollutant Discharge Elimination System (NPDES) 2022 Construction General Permit (CGP). The 2022 CGP took effect on February 17th, 2022, replacing the 2017 CGP. Coordination between USEPA and USFWS is part of the interagency consultation process for this permit.

1.2 Coordination History

DCA initiated informal coordination via email on October 30, 2020, with Ms. Jacqueline Flores of the USFWS Guam Office by requesting a list of any federally-listed species or proposed critical habitat that may be present within the project area. Ms. Lauren Taylor, Fish and Wildlife Biologist, assigned the project Reference No. 01EPIFOO-2021-SL-0043, and issued a species list on December 2, 2020 (Appendix D).

2 BACKGROUND AND PROJECT DESCRIPTION

2.1 Project Description

Guam Department of Education (GDOE) is proposing to construct a new high school facility on the campus of the existing Simon Sanchez High School (SSHS). Duenas, Camacho & Associates, Inc. (DCA) is part of an architectural and engineering design team led by Taniguchi Ruth Makio Architects (TRMA) that is tasked by GDOE with the initial surveying, design, and engineering work. The new school facility will be constructed, financed, and built by a single contractor in two phases. Phase 1 would construct the main campus buildings, parking spaces and a 60,000 square foot stormwater ponding basin. Phase 2 would construct a multipurpose field and other amenities.

The project site is located on Lot Nos. 7022-2-R3 and 7022-1 Yigo, Guam. The property survey map is enclosed in Appendix E. Lot 7022-2-R3 is a 97,369 sq. m (24-acre) parcel, which encompasses the existing SSHS campus. All of the new campus classrooms, parking spaces and supporting facilities will be constructed in this parcel. Lot 7022-1 is an approximately 94,607 sq. m (23-acre) parcel situated adjacent and west of Lot 7022-2-R3. Since the northern portion of Lot 7022-1 contains the F.B. Leon Guerrero (FBLG) Middle School campus, the project will utilize much of the southern portion (approximately 10 acres) of the lot. These uses include new stormwater infrastructure (Phase 1) and a new multipurpose sports field (Phase 2).

The eastern project boundary abuts Lot 7022-2-1R/W, a public access and utilities right-of-way that encompasses a portion of Juan Jacinto Street; this street is the nearest paved vehicle access to the project site. The southern project boundary abuts Lot 7022-2-2R/W, a 40-foot-wide access and utilities easement. Adjacent and to the south of this easement is Lot 7022-2-3, which contains two Guam Waterworks Authority (GWA) water production wells (Wells Y-5 and Y-6). The western property boundary of Lot 7022-1 abuts Lot 10119-20-R/W, a 50-foot-wide public access and utility right-of-way, and Lot 10119-17 containing GWA production Well Y-14 (Appendix A). Located east of the property is GHURA 506 housing, to the west are Ypaopao Estates and GHURA 505, and to the north of the property is the University of Guam's Triton Farm.

Construction of the new high school campus is anticipated to involve an excavator equipped with a bucket for clearing and grading activities such as the removal of debris and excavated material from vegetated areas; dump trucks to haul equipment to and from the site as well as for the removal of green waste; and equipment (cement trucks, hoses and chutes, motor grader) to pave and surface the parking spaces and roadways. Designated areas for staging/stockpiling materials and/or equipment maintenance/storage have not yet been identified by the Contractor but would be located within the project site. If additional staging areas beyond the project site are

necessary, these areas would be subject to site selection restrictions, and the conservation/impact mitigation measures described below and summarized in Table 3 of Section 5 Effects Analysis.

2.2 Physical Conditions

2.2.1 Topography

The SSHS project site is generally on relatively flat terrain with an elevation range between 432 and 446 feet around the perimeter of the Lot 7022-R3 boundary (Appendix A, Figure 3). However, Lot 7022-1 contains low berms along its western and southwestern boundaries that consist of mostly anthropogenic metallic and household waste. Earthen berms are also located within the southwestern sector of Lot 7022-1 where existing stormwater runoff water flows. Additional earthen berms as well as a pile of large rocks were found centered in the southwestern sector of this parcel. No sinkholes were encountered during the recent survey, nor are there any depicted on the ground survey map (Appendix A, Figure 3) or U.S. Geological Survey Map (Figure 1) (USGS, 2000).

2.2.2 Soils

One soil type has been mapped in the SSHS site by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (2014). Guam cobbly clay loam, 3 to 7 percent slopes, dominates the entire project site. The soil is shallow, with a depth to limestone ranging from 5 to 41 cm. It is a well-drained soil on limestone plateaus characterized by a dark reddish brown surface layer of cobbly clay loam. The permeability of Guam cobbly clay loam is moderately rapid and the available water capacity is very low. The soil has slow runoff characteristics and a slight hazard of water erosion (Young, 1988).

2.3 Project Timeline

Construction of the new SSHS facility would commence upon receipt of all required permits and clearances, including coverage under the NPDES Construction General Permit. Phase 1 Construction is anticipated to take 2 years. Phase 2 Construction is anticipated to take 1 year.

2.4 Conservation Measures

The following conservation measures and best management practices (BMPs) have been developed that will be implemented by GDOE and its contractor to reduce or eliminate potential impacts on MBTA-listed and ESA-listed species and their habitats. For the purpose of this BA, a qualified biologist is an individual who possesses a degree in Biology or related Environmental Science; who has at least two years of experience in conducting natural resource surveys and identifying ESA-listed species and habitats specific to Guam; and who is familiar with the laws and regulations that govern these species. The GDOE biological monitor is defined by the same qualifications as the qualified biologist. The GDOE biological monitor is hired by a contract and is bound by the requirements specified in the contract.

1) TREE SNAIL CONSERVATION MEASURES. One colony of the locally and federally-protected Guam tree snail (*Partula radiolata*) was observed in the central sector of the southern forested sector of the project area. The following measures specific to Guam tree snail, humped tree snail (*Partula gibba*), and fragile tree snail (*Samoana fragilis*) protection would be implemented by GDOE and their contractor during construction of the new SSHS campus project:

   a. PRE-CONSTRUCTION SURVEYS. Potential habitat for ESA-listed tree snails generally includes broad-leaved epiphytic and terrestrial plant species. Since tree snails are mobile and cryptic, one week prior to the commencement of vegetation removal or construction activities in the vicinity of all potential tree snail habitat, a qualified biologist or GDOE biological monitor would conduct a survey to reconfirm the colony boundary of ESA-listed tree snails (Partulidae). If a protected snail species is detected outside of the original established colony boundary, a Designated Responsible Person (DRP) will notify the GDOE Construction Manager, who will contact the USFWS and Guam Department of Agriculture for further technical assistance and guidance.

   b. PERMANENT DUST BARRIER/ SECURITY FENCE INSTALLATION. Prior to the commencement of construction activities within a 23 m (75-foot) distance of known occupied tree snail habitat, the Contractor would install a permanent security fence around the snail colony buffer prior to construction. The fence would be designed to deter unauthorized persons from accessing and disturbing the protected snail habitat. The fence would incorporate a permanent dust barrier. This dust barrier may be similar to the existing barrier at the Mangilao Solar Farm (Photo 1), and would effectively prevent dust and wind exposure from affecting the colony. The dust barrier would be of sufficient height to shield the occupied snail habitat from fugitive dust, based on the height of the habitat and potential for dust generation by the construction activity. The barriers would be installed such that they would not damage the nearby buffer vegetation. The dust barrier would be maintained by the Contractor throughout the duration of construction activities that occur within a 23 m (75-foot) radius of the occupied tree snail habitat. A biological monitor would be present during the installation of the barrier before construction commences. Once the barrier is installed, regular inspections of the barrier would be performed by the Contractor's DRP to ensure it is intact and functioning as intended. Prior to commencing work within 23 m (75 feet) of ESA-listed tree snail



Photo 1. Dust barrier and security fence along occupied tree snail habitat in Mangilao, Guam. Source: C. Camacho, DCA.

occupied areas, the Contractor shall coordinate with the USFWS and Guam Division of Aquatic and Wildlife Resources (DAWR) staff. USFWS and DAWR staff will be provided 48-hour notice prior to work and be afforded an opportunity to inspect the installed tree snail protection measures.

c. ESTABLISHMENT OF BUFFER VEGETATION. The USFWS recommended buffer zone for ESA-listed tree snails is 200 feet (61 meters) (Personal communication, Toni Mizerek, USFWS, December 29, 2017). A buffer of up to 75 feet (23 meters) is proposed around the Guam tree snail colony at the locations indicated in Figure 1. The reduction in the size of the buffer will be offset by enhancing the peripheral vegetation, and by installing a permanent artificial dust barrier to supplement the natural buffer vegetation.

   The contractor will first install a permanent dust barrier and security fence approximately 5-10 feet from the buffer zone perimeter depicted in Figure 1. This dust barrier would be tall enough to reduce wind and dust exposure of the colony. Following the installation of the dust barrier, the contractor would plant native trees and shrubs along the perimeter of the buffer to provide a more natural barrier for the colony. This enhancement vegetation would be planted between the dust barrier and scrub forest. With plants of varying heights and thickness, the vegetation will provide a tall, dense natural barrier to enhance the buffer. The dense buffer vegetation may also help to deter unauthorized individuals from accessing the scrub forest, which is a dumping ground for household and other miscellaneous waste.

   The understory of this natural barrier will be planted with plants native to Guam, such as latherleaf or gasoso (*Colubrina asiatica*), lada (*Morinda citrifolia*), and half-flower or nanåso (*Scaevola taccada*). Within the SSHS action area, latherleaf and lada were among the most commonly observed host plants for the Guam tree snail, making these plants ideal candidates for the natural barrier. Nanåso, a large shrub, has been used for landscaping as hedges by hotels and private businesses on the island, and may be ideal for forming the exterior of the natural barrier. Among the suitable mid-story and overstory plants are påhong (*Pandanus dubius*), fago' (*Ochrosia oppositifolia*) and puting (*Barringtonia asiatica*). Påhong is a medium-sized tree whose compact shape would contribute towards blocking wind and dust. Fago', a medium-sized, broad-leaved tree, would be highly suitable habitat for the Guam tree snail (*P. radiolata*) while adding to the height of the forest canopy. Puting, a large tree with a full canopy, would provide the shade and help maintain the humidity needed for tree snail survival.

d. REMOVAL OF TRASH AND DEBRIS. Illegal dumping is rampant in the snail habitat area. Trash and debris also provide refugia for the New Guinea flatworm (*Platydemus*

manokwari). The rubbish would be carefully removed under the supervision of a qualified biologist and properly disposed without disturbing the snail colony habitat.

e. SUPERVISOR AWARENESS TRAINING. Prior to construction activities, the Contractor's DRP shall receive awareness training for ESA-listed tree snails. The Contractor shall schedule this training with the GDOE Construction Manager. Awareness training would be provided to the GDOE Construction Manager and Contractor's DRP by a qualified biologist. When feasible, the qualified biologist will also provide this training to as many of the supervisory staff and site workers as possible. The DRP will be responsible for training the remaining supervisory staff and site workers as they come onto the project. The DRP will also be responsible for performing daily checks for listed species and overseeing the regular maintenance of protection measures at the start of the day, in the areas that will have construction activity that day. The GDOE Construction Manager is tasked to perform periodic checks throughout the duration of the project. Educational materials provided by the qualified biologist will include photographs of target species, contact information, and instructions if ESA-listed species are encountered. These will be posted at the job site for reference for the duration of construction activities.

f. INSTALLATION OF SIGNAGE. Signs labeled "DO NOT ENTER - Endangered Tree Snails Present" will be posted on the exterior of the permanent dust barrier/security fence surrounding the buffer vegetation at the Guam tree snail colony. The signs will be maintained by the Contractor for the duration of construction.

g. MINIMIZATION OF VEGETATION REMOVAL DURING CONSTRUCTION. The contractor will avoid cutting or removing vegetation within the established buffer zone surrounding the known tree snail occurrence to minimize impacts to the snails and their habitat. The Contractor shall not remove any existing vegetation within the buffer zone without the approval of DAWR, and if approved, this would be supervised by the GDOE biological monitor. Workers will remain alert and observant for damage to vegetation within the 23 m (75-foot) wide buffer surrounding the occupied tree snail area, or to the dust barrier. If vegetation is damaged, or the dust barrier is damaged or not functioning as intended, the worker will inform the DRP. The DRP will immediately suspend construction activities in the area until the situation is corrected. If vegetation is damaged, the DRP will inform the GDOE Construction Manager, who will contact USFWS/DAWR. Additionally, the contractor will confine movement of heavy equipment to existing roadways and minimize the generation of dust to the extent practicable. The contractor will also employ sufficient dust suppression measures (such as wetting the soil) as necessary during construction.

h. PROTECTION OF TREE SNAIL HABITAT AFTER CONSTRUCTION. After construction of the SSHS project is completed, the following measures will be implemented by GDOE.

1) **Maintain Permanent Dust Barrier/Security Fence and Signage**. The permanent security fence and barrier installed prior to construction around the buffer zone will be maintained by GDOE so long as the habitat is occupied by the tree snail colony. GDOE will periodically inspect the fence/dust barrier and repair it as needed.

2) **Provide Awareness Training.** All supervisors and site workers at the SSHS campus grounds will be educated on how to identify the Guam tree snail and how to protect occupied snail habitat from potential construction impacts. GDOE will provide a Guam Tree Snail Awareness Presentation to educate all GDOE personnel and subcontractors working at the SSHS campus. New workers will undergo this awareness orientation as they come onto the SSHS campus site.

3) **Maintain Buffer Zone Vegetation and Signage.** The natural barrier installed prior to construction as a buffer zone around the colony will be maintained by GDOE. Maintenance measures include periodically inspecting the barrier, and replanting vegetation as needed to replace dead vegetation and fill in gaps. SSHS students and teachers may also assist with the planting of replacement vegetation within the buffer zone.

4) **Periodically Remove Flatworms and Flatworm Refugia.** GDOE will provide a Guam Tree Snail Awareness Presentation to educate SSHS Science teachers, Science Club student members and club advisors on how to identify the Guam tree snail, protect occupied snail habitat, and how to identify and reduce threats to the Guam tree snail. These trained students and their teachers would periodically inspect the buffer zone and manually remove any New Guinea flatworms (*Platydemus manokwari*) and any artificial debris (such as trash) and natural debris (such as coconuts), which are potential refugia for flatworms. This would provide some basic control measures for the flatworm.

2) MARIANA FRUIT BAT PROTECTION MEASURES. The federally-listed threatened Mariana fruit bat was not detected in the project's construction footprint or adjacent buffer zone; however, there is available scrub forest containing tree species that may potentially support foraging habitat for this species (Appendix A, Figure 4; Appendix C). The following best management practices would be implemented by GDOE and the Contractor to minimize project impacts to the Mariana fruit bat.

a. GDOE and the contractor would minimize alteration or loss of Mariana fruit bat habitat (i.e., scrub forest) at the project site to protect potential roosting, foraging, and breeding sites.

b. GDOE and the contractor would limit exposing bat locations to the public and other contractors to reduce potential poaching of this species. Information on any fruit bat locations would not be shared outside of those persons directly involved in the project, and government regulatory agencies, such as USFWS and Guam Department of Agriculture.

c. Workers will be educated on how to identify the Mariana fruit bat and how to protect occupied fruit bat habitat from potential construction impacts. Prior to the start of work, all workers involved in the project shall participate in the Mariana Fruit Bat Awareness Presentation. The Contractor shall schedule this presentation with the GDOE biological monitor. This special presentation shall be held to educate all the workers. New workers will undergo this awareness orientation as they come onto the job site.

d. The contractor would be required to regularly brief the construction crew to be vigilant for the potential presence of the Mariana fruit bat, and to follow protocols if any bats are detected during construction. These protocols include halting construction immediately, informing a supervisor, and reporting the observation to Guam Department of Agriculture.

e. If a fruit bat is present within 150 m (492 feet) of the project site, the work in that area will be postponed until the bat has left the area voluntarily as confirmed and documented by a biologist. If no bats are detected, construction may commence. Once construction begins, if a fruit bat moves into the project footprint while work is ongoing, the work in that area will be immediately halted and postponed until the bat has voluntarily left the area.

f. If an onsite protected species does not depart the area on its own for three (3) days or more, the contractor will notify GDOE, who will contact the USFWS and Department of Agriculture for further technical assistance and guidance.

g. GDOE would use hooded lighting within 492 feet (150 m) of all potential fruit bat roost habitat.

h. No construction activity would be performed during evening or early morning (pre-dawn) hours. This would minimize the potential for interaction with solitary Mariana

fruit bats, which tend to be more mobile during early morning hours (Wheeler and Aguon, 1978).

3) MIGRATORY BIRD PROTECTION MEASURES. Resident avian species (such as the white tern or yellow bittern) and nonresident avian species (Pacific golden plover) listed as protected under the Migratory Bird Treaty Act (MBTA) (50 CFR Part 10.13) were observed during the biological surveys of the action area. Based on information from the USFWS Office of Migratory Birds, the following conservation measures and beneficial practices would minimize and avoid incidental take of migratory birds.

a) TEMPORAL CONTROLS. Vegetation clearing associated with the construction would be timed to avoid peak nesting of birds, to the extent practicable, to avoid incidentally killing or disturbing nesting birds. White terns (*Gygis alba*) may potentially nest or roost in ironwood (*Casuarina equisetifolia*) trees that exist on the developed open field north of the chain link fence. If timing of construction cannot be altered, then any potential nesting trees, shrubs, or other bird nesting habitat in the footprint of the project would be removed at a time when the birds are not nesting, e.g., well in advance of construction. In order to plan the vegetation removal or other habitat disturbance, consideration will be given to the amount of time that a species of bird needs to complete their nesting effort, from egg laying to fledging, and the activity would be planned far in advance.

b) REMOVAL OF EGGS OR YOUNG. If take cannot be avoided, e.g., birds are actively nesting in trees that are slated for removal and site clearing cannot wait until the young fledge, then DAWR or a permitted rehabilitation facility may be contacted to take the orphaned eggs or young.

c) HAZING. It might also be possible to discourage birds from nesting in trees by hazing, or bothering them in some way to the point that they abandon the site prior to settling in and laying an egg. A similar approach may be taken for ground-nesting and burrow-nesting species, including seabirds. Ground nesting by white terns is uncommon (Birds of the World, 2020b). If a ground-disturbing activity must take place, it would be planned outside the nesting season when possible.

4) SPILL AND DUST CONTROLS. The construction and demolition work would follow the Environmental Protection Plan (EPP) developed for the project and tailored to the specific construction and demolition methods. The EPP measures would control discharges and manage spills from heavy equipment operating at the site. Containment booms and absorbent pads would be readily available on-site for cleaning up lubricant or petroleum spills. The Contractor would implement dust suppression measures during construction, such as wetting down exposed soils as needed to prevent the generation of fugitive dust.

Fill materials, pre-cast structures, and other project-related materials would be staged and stockpiled in upland areas either in the Government property or another upland location arranged by the contractor. No project-related materials would be stockpiled within or in close proximity to habitat occupied by listed species.

5) SEDIMENT CONTROLS. As part of the EPP, the contractor would implement an erosion control and restoration plan to control short-term and long-term erosion and sedimentation effects. Environmental protection measures will be installed and maintained prior to construction or demolition activities. Stormwater protection measures (e.g., sandbags or silt fences) would be installed strategically around the work area and maintained to contain sediments and direct runoff away from occupied habitat during construction. The DRP will be responsible for overseeing the regular maintenance, inspection and determination of BMP effectiveness during construction.

6) SALVAGING OF NATIVE PLANT SPECIES. The proposed action will disturb or remove much of the vegetation (approximately 9.45 acres) within the southern scrub forest of the action area containing native limestone forest components. Within this southern forested area are native vegetation components such as dokdok (*Artocarpus mariannensis*), ifit (*Intsia bijuga*), and vining morinda (*Morinda umbellata*) (Appendix B, Photo 17). Although they are not ESA-listed species, they but are significant due to their role in the ecosystem or Guam's culture. The ifit tree, the Territorial tree of the island, is culturally significant because of its sturdiness and termite resistance, making it an ideal wood to craft furniture. Skilled woodcarvers utilize dokdok trees for crafting items such as canoes. The uncommon vining morinda is listed among the species propagated by the Guam Plant Extinction Prevention Program (GPEPP), a program looking to prevent the extinction of Guam's rarest plant species. Before removing vegetation from the southern scrub forest, the contractor would allow different agencies or interested groups the opportunity to salvage some of these species, so long as these salvage activities occur beyond the buffer zone around the existing Guam tree snail colony.

3 ACTION AREA

The "action area" defines all areas that may be directly or indirectly affected by the proposed action. The limits of construction for the proposed action encompass parcel Lot 7022-2-R3 (24 acres) and much of the southern portion of Lot 7022-1 (approx. 10 acres) (Appendix A, Figures 1 to 3). The action area is approximately 35 acres for this project and encompasses the limits of construction and any areas slightly beyond this limit needed for construction. The action area includes staging areas for materials and equipment within the limits of construction, and the area immediately adjacent to the active worksite where ESA-listed species may be directly or indirectly affected by the noise, dust, and disturbance from construction activities.

4 SPECIES & CRITICAL HABITAT CONSIDERED

4.1 ESA-Listed Species and Critical Habitat

Guam-Listed Threatened and Endangered Species. Thirty-one species, i.e., 11 birds, three mammals, ten reptiles, four mollusks, and three plants, are listed as endangered by the Guam Department of Agriculture under the Endangered Species Act (ESA) of Guam (5 GCA, Section 63205(c)). The Guam tree snail (*Partula radiolata*) or akaleha' and Mariana fruit bat are among the 28 animals listed as endangered under the Guam ESA. No orchid species are currently listed under the Guam ESA; however, the three U.S. ESA-listed orchids found on Guam are Species of Greatest Conservation Need (SOGN) in the latest Guam Wildlife Action Plan (GWAP) (Department of Agriculture, 2019).

Federally-Listed Threatened and Endangered Species. The U.S. Endangered Species Act (ESA) (16 U.S.C. 1531-1544) of 1973, as amended, prohibits the taking of any listed species without prior approval of the Secretary of the Interior.

- **Take** is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."
- **Harm** is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."

Prior to 2015, the USFWS previously listed 11 species under the Act as either threatened or endangered for Guam, i.e., two mammals (little Mariana fruit bat and Mariana fruit bat); six birds (Mariana swiftlet, Mariana crow, Guam Micronesian kingfisher, Mariana common moorhen, Guam rail and Guam bridled white-eye); two reptiles (green sea turtle and hawksbill sea turtle); and one plant (hayun lagu). The USFWS rule in October 2015 (80 FR 59424) listed an additional 16 animal species from the Mariana Islands as endangered, and seven plants as threatened under the ESA. Among the newly listed animal species are native tree snails (Partulidae) protected under the Guam ESA. The USFWS species list issued in December 2020 identified 9 plants and 5 animal species that may occur within or pass through the project site (see Appendix D). Based upon this correspondence, the 2015 USFWS ruling, the habitats associated with each listed species, and the habitats identified in the action area, including the absence of native limestone forest, the following Guam and federal ESA-listed species were considered in this BA:

a) threatened epiphytic orchids (Orchidaceae);
b) endangered endemic and indigenous tree snails (Partulidae); and
c) threatened Mariana fruit bat (*Pteropus mariannus mariannus*).

- The orchids ***Bulbophyllum guamense, Dendrobium guamense*** and ***Tuberolabium guamense*** were listed as threatened by the USFWS in 2015 (Federal Register Vol. 80 No. 190 Part IV). All three species are endemic to Guam and certain islands in the Northern Marianas, and are epiphytic on trees in limestone and ravine forest communities. They are threatened by habitat loss and urban development, typhoons, wildland fires, invasive plants and animals, and herbivory by non-native slugs (USFWS, 2009; DAWR, 2018). One *T. guamense*, and fewer than 250 *B. guamense* orchids and 250 *D. guamense* and were known to occur on Guam at the time of the 2015 federal listing (USFWS, 2015). Recent surveys in Northwest Field in northern Guam found nine (9) *D. guamense* and 674 *T. guamense* plants (Demeulanaere et al., 2018).

- The **Guam tree snail (*Partula radiolata*), humped tree snail (*Partula gibba*)** and **fragile tree snail (*Samoana fragilis*)** (Family Partulidae) were listed as endangered by the USFWS in 2015 (Federal Register Vol. 80 No. 190 Part IV), and by the Government of Guam per Guam Endangered Species Regulation No. 6 (5GCA §63205). The Guam tree snail is endemic to and found only on Guam. At the time of their federal listing, the USFWS assumed that there were approximately 26 colonies remaining on Guam (2015). Since the 2015 listing, field surveys have shown there are an estimated 60 sites supporting Guam tree snails on the island, although the species is still considered at risk, according to Dr. Curt Fielder of the University of Guam (Wiese, 2018). The humped tree snail is endemic to Guam and the Northern Mariana Islands. This once abundant species is now limited to a population of about 100 snails in northern Guam (DAWR, 2018). The fragile tree snail is found on just two islands, Rota and Guam; only four small populations have been identified on Guam (DAWR, 2018).

  All three listed tree snail species thrive in cool, shaded and humid forest habitats in which reduced air movement prevents their desiccation (Crampton, 1925). These diminutive snails are threatened by habitat loss, habitat modification by non-native animals, pesticides and by invasive introduced species such as the predatory New Guinea flatworm (*Platydemus manokwari*), and little fire ant (*Wasmannia auropunctata*) (USFWS, 2015; DAWR, 2018). There is no critical habitat designation or recovery plan for any of these tree snail species.

- The **Mariana fruit bat (*Pteropus mariannus mariannus*)**, or fanihi, was listed as endangered on Guam in August 1984 (49 FR 33881 33885). In January 2005, the Mariana fruit bat was reclassified from endangered to threatened on Guam, and listed as threatened throughout its range in the Northern Marianas (70 FR 1190 1210). The biology, habitat, and conservation status of this species is described in the species recovery plans (USFWS, 1990; USFWS, 2009). Several forest types, including scrub forest, are used for foraging, roosting, and breeding. While there is no longer a colony roosting on Guam, according to DAWR, the island still supports between 50 and 100 individuals (Wiese 2018).

Mariana fruit bats are strong, highly mobile fliers that have been observed traveling long distances, even between islands in the Marianas (USFWS, 2009). Most bat sightings in Ritidian are strays from colonies in nearby Rota (Wiese, 2018). The fruit bats in southern Guam are solitary individuals that forage in the ravine areas between Leo Palace Resort and Windward Hills, and are known to use the forests in Chalan Pago as a corridor to foraging grounds (Pers. communication, Jeff Quitugua, DAWR). Mariana fruit bats became more common and widespread on Guam since Typhoons Mangkhut and Yutu in September and October 2018, respectively, and these solitary bats may have come to the island to forage after the storms (Personal communication, Toni Mizerek, USFWS, April 19, 2019).

Bats primarily roost during the day and typically have high fidelity to certain roosting sites (e^2M, 2008). These mammals are largely frugivorous and leave their roost for several hours after sunset to forage (USFWS, 1990), although solitary bats may be more mobile in the early morning hours (Wheeler and Aguon, 1978). Illegal hunting, loss of forest habitat, and brown tree snake predation are the primary threats to Mariana fruit bats (USFWS, 2009; Wiles and Brooke, 2009). The bats may also be stressed by noise and light pollution, which can cause the animals to flush and alter their behavior (Personal communication, Toni Mizerek, USFWS, April 19, 2019). Human activity, even detection of human scent, has resulted in the abandonment of colony roost sites in Andersen Air Force Base in northern Guam; this sensitivity by fruit bats to human activity is considered to be a response to former heavy hunting pressure at colony roost sites (e^2M, 2008).

Migratory Birds. The Migratory Bird Treaty Act of 1918 (16 USC 703-711) protects migratory birds and their nests and eggs. Over 40 species of non-resident migratory shorebirds are known to winter in Guam (DAWR, 2019). The main southward migration of shorebirds to the region typically begins in August and continues through October (Williams and Williams 1988). Most shorebirds leave by the following April and May (Personal communication, Jeff Quitugua, DAWR). The Pacific golden plover (*Pluvialis fulva*), a non-resident avian species protected under the MBTA (50 CFR Part 10.13), was observed during the March 2022 surveys with the fenced, developed, open fields south of the FBLG and SSHS campuses.

Resident avian species (such as the white tern or yellow bittern) listed as protected under the Migratory Bird Treaty Act (MBTA) (50 CFR Part 10.13) were observed during surveys of the action area. Yellow bitterns or kakkak (*Ixobrychus sinensis*) are most commonly found in savanna grasslands and freshwater wetlands but may forage in screwpine (*Pandanus* spp.) or coconut (*Cocos nucifera*) trees (Jenkins, 1983). This species is carnivorous, with a diet ranging from tiny insects to snails, fish, and reptiles (e.g., skinks and geckoes) (Jenkins, 1983). The birds prefer to nest near marshes and freshwater wetlands but are occasionally known to nest in upland habitats, such as dry fields and grassy thickets (Jenkins, 1983). Peak nesting appears to occur during dry season months (January through June). No nesting has been reported on Guam in May, July, August, and September, presumably because heavy rains may flood the nests

(Jenkins, 1983). Data from other Pacific Islands indicates egg incubation ranges from 17 to 20 days, and the young will leave their nest around 20 days later (Birds of the World, 2020a).

Unlike many of the seabirds known from Guam protected under the MBTA, white terns or Chunge' (*Gygis alba*) breed on Guam. A white tern will lay a single egg directly on an existing shallow surface, such as a tree branch, instead of building a nest; sometimes, urban structures are used (Birds of the World, 2020b). On Guam, white terns seem to favor nesting in ironwood (*Casuarina equisetifolia*) trees. Based on data from other islands in the Pacific, white terns incubate their egg for around 36 days, and upon hatching, the chick will depart the nest between 31 and 67 days later (Birds of the World, 2020b). Egg-laying appears to occur year-round on many Pacific Islands, although peak nesting periods vary among the regions (Birds of the World, 2020b).

Critical Habitat. Based on December 2, 2020, correspondence with USFWS, the action area is not located within a wildlife preserve, National Wildlife Refuge, or proposed or designated critical habitat under USFWS jurisdiction. The USFWS designated the Ritidian Unit of the Guam National Wildlife Refuge as critical habitat for the Mariana fruit bat, the Guam Micronesian kingfisher, and the Mariana crow in October 2004. The Ritidian Unit is located approximately seven (7) miles north of the Yigo project site, and encompasses approximately 1,217 acres, i.e., 385 terrestrial acres and 832 acres of submerged land offshore.

4.2 Current Survey and Methodology

Three DCA biologists were assigned to conduct the biological surveys on Lot 7022-2-R3 and Lot 7022-1 with each survey being performed by a pair of biologists at a time. On October 29, 2020, two of these biologists surveyed the SSHS campus site and portions of the forested southern sector. The team also surveyed portions of the adjacent Lot 7022-2-3 on the mornings of March 9 and 11, 2021 (Appendix A). In March 2022 additional surveys of the forested southern sector of the action area were performed. This was to include an additional portion of land (approx. 10 acres) south of the FBLG school campus in Lot 7022-1. During most survey days, the weather was clear and cool. However, on March 22, 2022 there was a slight drizzle for about 10 minutes while on March 24, 2022, it continuously rained for about an hour. The types of vegetation that make up this 34-acre project area are classified as 1.28 acres (5,176.98 sq. meters) bare land, 6.44 acres (26,061.76 sq. meters) impervious, 0.18 acres (732 sq. meters) scrub/shrub, 11.95 acres (48,368 sq. meters) scrub forest, and 14.1 acres (57,060.68 sq. meters) developed, open space (Appendix A, Figure 4). The 0.18 acres of scrub/shrub and the 11.95 acres of scrub forest were extensively investigated using meandering pedestrian surveys following the perimeter of the scrub forest, and creating transects within the scrub forest to document existing vegetation. The area adjacent and south of Lot 7022-2-R3 was also surveyed by the biologists; this sector comprised approximately 0.665 acres of scrub forest and 0.685 acres of developed, open space)

(Appendix A). The pedestrian surveys were performed by a team of three DCA biologists equipped with 7 x 50, 10 x 42, and 12 x 25 power binoculars.

The survey for listed orchids focused on potential orchid host plants. Orchid host plants encompass a wide range of native and non-native species, including molave (*Vitex parviflora*), fig (*Ficus* spp., nunu) and limeberry (*Triphasia trifolia*, lemonchina) (Personal communication, Catherine Brunson, USFWS, 19 January 2018). *T. guamense* has been observed on more than 19 different species (native and non-native) as well as on dead branches and trees (USFWS, 2017); however, this species is most commonly found on molave (*Vitex parviflora*) and screwpine (*P. tectorius*) (Joint Region Marianas (JRM), 2016; Department of the Navy (DON), 2017). Wild onion (*B. guamense*) has been observed in native and non-native host tree species including: hernandia (*Hernandia labyrinthica*), blue marble tree (*Elaeocarpus joga,* yoga), headache tree (*Premna serratifolia,* ahgao), looking-glass tree (*Heritiera longipetiolata,* ufa-halomtåno), bird catcher tree (*Pisonia umbellifera,* umumu), avocado *(Persea americana*), molave (*Vitex parviflora*), betel nut palm (*Areca catechu*, pugua), *Eugenia* spp., *Ficus* spp., *Dypsis* spp. or screwpine (*P. tectorius*), as well as in dead trees (Zarones et al. 2015; JRM, 2016; DON, 2017). In northern Guam, *Dendrobium guamense* has been found mostly on fig (*Ficus* spp.); in southern Guam (Naval Magazine) it has been found on numerous tree species (JRM, 2016). DCA biologists conducted searches of host plant branches and trunks for 5-10 minutes, depending on the size of the host plant and canopy, using binoculars as needed to view the overstory.

The search for mollusks focused on the presence of indigenous tree snails (Partulidae) listed as endangered by the USFWS in 2015. The biologists searched potential tree snail habitat where snail host plants were present, including coconut (*Cocos nucifera*) and seeded breadfruit (*Artocarpus mariannensis*) trees. Most of these trees were laden with epiphytic ferns, such as lanceleaf tongue ferns (*Pyrrosia lanceolata*). The searches were conducted over a period of about 10-20 minutes per tree or stand of plants by experienced biologists familiar with the listed tree snails. The ventral and dorsal surfaces of the host plants were searched either manually or with binoculars. The survey methods included searching the ground within the site for any bleached or recent shell remains.

The presence of the indigenous, locally and federally-protected Guam tree snails (*Partula radiolata*) was observed in the central portion of the southern scrub forest within the project site. Upon discovery of the Guam tree snail, the approximate extent of the colony was determined by surveying outwards in all directions until the presence of Guam tree snails was no longer detected. Trees and shrubs that were occupied by Guam tree snails were conspicuously marked with bright yellow colored flagging tape labeled “ENDANGERED SNAILS – KEEP OUT”. A conservative colony size of 274 species was observed throughout this sector of the action area. However, as a comprehensive survey was not conducted and only the extents of the colony were established, it is suspected that far more live snails may be present within the heart of the colony.

On the morning of Tuesday, March 22, 2022, two DCA biologists proceeded to the southern scrub forest for a biological survey. At which point, they noticed mass clearing of vegetation within the northeastern sector of the scrub forest. Biological surveys were conducted on Monday, March 21, 2022, the morning prior to this discovery, until about 12:45 pm. During the biological survey, all construction appeared and was assumed to be within the open field south of the SSHS campus (Appendix B, Photo 27). However, after the biologists had left for the day, the geotechnical contractor appeared to have initiated the clearing of vegetation for soil investigations at multiple boring sites within the southern scrub forest. As a result of this decision, the 75-foot (23-meter) buffer zone recommended for snail protection was not met. Upon discovering the vegetation clearing, the biologists began pedestrian surveys at the boring site (B-23) thought to be closest to the snail habitat. Vegetation for this boring appeared to stop at the border of the Guam tree snail (*P. radiolata*) colony, exposing any snails occupying trees or shrubs along the border (Appendix B, Photo 28). Although the snails seemed to be exposed, no recently empty, unbleached snail shells were found on the ground. Occupied trees or shrubs were flagged with bright yellow tape, and the geotechnical contractor and TRMA were immediately notified. The remainder of the vegetation clearing and construction within the southern scrub forest was halted to allow for the extent of the Guam tree snail (*P. radiolata*) colony to be determined by DCA. Upon completing the B-23 investigation, two biologists surveyed the other boring sites. Guam tree snails (*P. radiolata*) were not observed immediately within the vicinity of the other clearings for soil boring sites. Areas not yet cleared but marked for soil investigations were also surveyed for snails. Any occupied Guam tree snail (*P. radiolata*) habitat was flagged with bright yellow flagging tape.

4.3 Terrestrial Flora

The U.S. Forest Service (2014) analyzed satellite imagery and performed surveys to produce a vegetation map of Guam using a classification scheme based on land cover. Based on this scheme, the following classes were mapped within the Simon Sanchez High School action area: Impervious, Developed, Open Space, Bare Land, Scrub Forest, and Scrub/Shrub (Appendix A, Figure 4). Pedestrian surveys were conducted to characterize the existing plant communities and identify any species of concern that may require special consideration. All plants recorded during the survey are listed in Appendix C.

Impervious, Developed, Open Space and Bare Land. The north sector of the action area encompasses the existing SSHS facility, including a basketball court, a soccer field, a gym, parking space, and the school itself. A chain-link fence extends along the entire southern boundary of the campus grounds, but does not delineate the property boundary (see Appendix E). This fence generally separates the Developed, Open Space of the SSHS and FBLG campus to the north from the Scrub Forest area to the south. A stand of ironwood (*Casuarina equisetiflia)* trees and wild cane (*Saccharum spontaneum)* grasses occupy the area north of the fence; however, the majority of the non-paved area is an open field. Immediately south of the fenced perimeter, a dirt

road runs parallel to the fence and continues west beyond the project area. The area south of the fenced perimeter but north of the scrub forest contains pioneering vegetation, including flowering stands of yellow alder (*Turnera ulmifolia*) with scattered patches of low-stature rustweed (*Polypremum procumbens*), turkey tanglefoot (*Phyla nodiflora*), and St. John's sedge (*Fimbristylis cymosa*), and an occasional *Buchnera floridana* (Appendix B, Photos 3 and 4).

Scrub Forest and Scrub/Shrub. Fosberg (1960) describes scrub forest as a secondary vegetation type that may have once been limestone forest but has since had a long history of human disturbance leading to its present condition. Scrub forest is mapped as the main vegetation type within Lot Nos. 7022-2-R3 and 7022-1. According to the most recent forest assessment, scrub forest comprises the largest vegetation class on Guam, covering 29,745 acres (U.S. Forest Service 2014).

At the SSHS project site, the most prevalent species in the overstory were tangantangan (*Leucaena leucocephala*), coconut (*Cocos nucifera*), pago or beach hibiscus (*Talipariti tiliaceum*), and molave (*Vitex parviflora*) trees laden with golden pothos vines (*Epipremnum aureum)*. The majority of the overstory trees throughout the property are covered with epiphytic ferns such as lanceleaf tongue ferns (*Pyrrosia lanceolata)* and *Microsorum punctatum* as well as epiphytic vines such as golden pothos (*E. aureum*), creeping philodendron (*Rhaphidophora decursiva*), and arrowhead vine (*Syngonium angustatum*). Trees that had epiphytes were extensively searched for listed endangered snails and threatened orchids. Binoculars were used to inspect the overstory for federally-listed threatened orchids on potential host trees. These included seeded breadfruit (*A. mariannensis*) and screwpine (*P. tectorius)*. Other native flora, such as the sumac (*Aidia cochinchinensis*) and luluhut (*Gymnosporia thompsonii,* syn. *Maytenus thompsonii*), were observed and are listed in Appendix C.

The southeastern sector of the parcel contains tall coconut (*C. nucifera*) and tangantangan (*L. leucocephala*) trees. This area is accessed by walking through a dirt road and tramping through wild cane grass (*Saccharum spontaneum*), beggar's tick (*Bidens alba*), elephant grass (*Pennisetum purpureum)*, swordferns (*Nephrolepis biserrata)*, and one large molave (*V. parviflora)* tree laden with golden pothos (*E. aureum*) vines interspersed amongst the other vegetation. On the southern boundary of the action area is a row of coconut (*C. nucifera*) trees of varying heights, which may have been planted by the adjacent bordering residences. Around the border of this southwestern sector are pago (*T. tiliaceum*) trees and tangantangan (*L. leucocephala*) trees.

The perimeter of the southeastern sector has one large, seeded breadfruit (*A. mariannensis)* tree along the dirt access road, as well as screwpine (*Pandanus tectorius)* and flametree (*Delonix regia*), none of which had ESA-listed epiphytes growing on them. Pago (*T. tiliaceum*) trees within this sector were laden with bird's nest fern (*Asplenium nidus*) or densely packed creeping

philodendron (*Rhaphidophora decursiva*) vines (Appendix B, Photo 9). Additionally, there were lemonchina (*Triphasia trifolia)*, indigo berry (*Passiflora suberosa)*, drumstick (*Moringa oleifera*) tree, and latherleaf or gaso'so (*Colubrina asiatica*) (Appendix B, Photo 22). In the understory were bilimbi or pickle tree (*Averrhoa bilimbi)* saplings, soursop (*Annona muricata*) saplings, and a lada (*Morinda citrifolia*) sapling with false rattan (*Flagellaria indica)* growing adjacent to it. Near the southeastern border was a former shipping container among a cluster of Moses-in-a-cradle (*Tradescantia spathacea*) plants (Appendix B, Photo 10). About 15 feet to the north was a pile of garbage, which was previously observed during the October 2020 survey, along with a betelnut (*Areca catechu*) tree.

The central-southeastern sector contained an understory of swordferns (*N. biserrata*) up to five feet tall. Woody species included introduced fruiting trees such as, pickle tree (*A. bilimbi*) and soursop (*A. muricata*), and native species such as pago (*T. tiliaceum*), abas duendes (*Glochidion marianum*), and lada (*Morinda citrifolia*), which occurred beneath an overstory of molave (*V. parviflora)* and pink tecoma (*Tabebuia heterophylla*) trees. Among these trees, the native ifit (*Intsia bijuga*) tree was found along the southern sector of the forested sector abutting Lot 7022-2-2R/W. The uncommon vine *Morinda umbellata* (vining morinda) was seen sprawling over the molave (*V. parviflora)*. Several molave (*V. parviflora*) trees were windthrown, especially in the southern sector (Appendix B, Photo 11). Additionally, although not ESA-listed, flowering moth orchids (*Phalaenopsis amabilis*) can be found close to the southern border of the southeastern sector of the forested area (Appendix B, Photo 16). A ground orchid (*Zeuxine fritzii*) and the native worm orchid or kamuke-nanofe (*Taeniophyllum mariannense*) can also be seen within this same area, but along the northern end of the forested sector (Appendix B, Photos 12 and 13).

The central-southwestern sector's understory was comprised of swordferns (*N. biserrata*), lada (*Morinda citrifolia*), screwpine (*Pandanus tectorius*), knob-fruited screwpine or Påhong (*Pandanus dubius*), and fagot (*Ochrosia oppositifolia)*. Common epiphytes were lanceleaf tongue ferns (*Pyrrosia lanceolata*) and *Microsorum punctatum*. False rattan (*Flagellaria indica*), a semi-woody climbing plant, permeates this sector, climbing to the top of trees such as the seeded breadfruit (*A.* mariannensis) and blue marble tree (*E. joga*). These trees, along with pago (*T. tiliaceum*), fagot (*Ochrosia oppositifolia*), and molave (*V. parviflora*), were observed in the overstory of this sector. Another uncommon plant sighted within this portion of the project area was zebrawood or panao (*Guettarda speciosa*).

The southwestern section of the project area contained swordferns (*N. biserrata*), false giant taro (*Alocasia macrorrhizos*), screwpine (*P. tectorius*), young, seeded breadfruit (*A. mariannensis*), starburst clerodendrum (Cl*erodendrum quadriloculare*), betelnut (*A. catechu*), and lada (*M. citrifolia*) all within the understory. Furthermore, the overstory consisted of pago (*T. tiliaceum*), screwpine (*P. tectorius*), and tangantangan (*L. leucocephala*). Among these trees, epiphytic ferns such as the lineleaf (*Antrophyum plantagineum*), lanceleaf tongue fern (*P. lanceolata*), and *M. punctatum* were observed. Other epiphytic vegetation within this portion of the project site

were aggressive and invasive vines such as golden pothos (*E. aureum*), *Derris trifoliata*, tonkin creeper (*Telosma cordata*), and wild bitter melon (*Momordica charantia*). False rattan (*F. indica*), a prevalent climbing plant, was found interwoven among the overstory trees with vines reaching down to the ground floor throughout the project area. The entirety of the southwestern sector was laden with trash (metallic and household waste) (Appendix B, Photo 24).

4.4 Terrestrial and Avian Fauna

All fauna observed during the March 9 and 11, 2021 as well as the March 2022 surveys are documented in Table 1.

Table 1. Terrestrial and Avian Fauna Observed in March 2021 and March 2022 within or adjacent to the Simon Sanchez High School Project Site, Lot Nos. 7022-2-R3 and 7022-1, Yigo, Guam

	Common Name	**Status**	**Abundance**
MOLLUSKS			
Drymaeus multilineatus	Lined tree snail	I	R
Partula radiolata	Guam tree snail	E	C
Satsuma succincta	Cinnamon bun snail	I	C
REPTILES			
Carlia ailanpalai	Four-toed skink	I	R to U
Emoia caeruleocauda	Pacific bluetail skink	N	R
Varanus tsukamotoi	Monitor lizard	N	R
BIRDS			
Dicrurus macrocercus	Black drongo	I	R to U
Gallus gallus domesticus	chicken	I	R
Gygis alba	white tern	N/M	R to U
Ixobrychus sinensis	yellow bittern	N/M	R
Passer montanus	Eurasian tree sparrow	I	R
Pluvialis fulva	Pacific golden plover	M/V	R to C
Streptopelia dusumieri	Philippine collared-dove	I	R
MAMMALS			
Canis lupus familiaris	Stray dog	I	R
Sus scrofa	Feral pig	I	R*
Key to Status (Guam Department of Agriculture, 1998): I=introduced resident; N= native; E=endemic; M= migratory; V= visitor. Abundance Ratings: Birds (sightings/vocalizations per 8-minute period or incidental: R = rare (1 to 2); U= uncommon (3 to 6 per observation); C= common (7 to 10); A= abundant (more than 10). Other fauna (sightings or signs per 1-hr period): R= rare (1 to 4); U= uncommon (5 to 9); C= common (10 to 19); A= abundant (20 or more); * = not directly observed, only signs detected (scat, rooting, rubbings, etc.)			

4.4.1 Mollusks

The native Guam tree snail (*Partula radiolata*) as well as the introduced cinnamon bun snail (*Satsuma succincta*) and lined tree snail (*Drymaeus multilineatus*) were the only live snails observed during the pedestrian field surveys. The Guam tree snail and cinnamon bun snail were frequently observed on lada (*M. citrifolia*) and latherleaf (*C. asiatica*) throughout the forested southern section of the action area, while the lined tree snail was only observed on creeping philodendron (*R. decursiva*) and arrowhead vine (*Syngonium angustatum*) to the southeast and on betelnut (*A. catechu*) to the southwest of the project site.

The presence of the indigenous, locally and federally-protected Guam tree snail (*P. radiolata*) was first detected within the central portion of the southern scrub forest on March 18, 2022. Many *P. radiolata*, of all life stages were observed on low-lying vegetation within the central portion of the southern forested area. Their prevalence within the understory allowed for an accurate identification of the species. Table 2 presents the vegetation occupied by the Guam tree snail (*P. radiolata*) during the March 2022 surveys and the number of individual snails sighted on each plant species. Lada (*Morinda citrifolia*), fagot (*Ochrosia oppositifolia*), and latherleaf (*Colubrina asiatica*) were the most common plants within the action area to host Guam tree snails. A conservative colony size of 274 species was observed throughout the action area. However, given that a comprehensive survey was not conducted and only the extent of the colony was established, it is suspected that far more live snails may be present within the heart of the colony.

Bleached shells of the cinnamon bun snail (*S. succincta*), the giant African snail (*Lassachatina fulica*), and the common Pythia (*Pythia scarabaeus*) were observed throughout the forested southern section of the action area. Bleached cinnamon bun snail (*S. succincta*) shells were also observed around the large, seeded breadfruit (*A. mariannensis)* tree at the southeastern section of the action area.

Table 2. Vegetation occupied by the Guam Tree Snail (*P. radiolata*) in March 2022 within the Simon Sanchez High School Project Site, Lot Nos. 702202-R3 and 7022-1, Yigo, Guam

Vegetation Type	Common Name/ Chamorro Name	Number of Snails
Trees, Shrubs, Herbs		
Artocarpus altilis	Seedless breadfruit/Lemmai	9
Cocos nucifera	Coconut Tree/ Niyok	5
Colubrina asiatica **2**	Latherleaf/ Gaso'so	45
Flagellaria indica	False Rattan/ Beyuko halomtano'	18
Ficus tinctoria	Fig/ Hoda	1
Geniostoma rupestre var. glaberrimum	N/A	4
Glochidion marianum	Åbas duendes	3

Vegetation Type	Common Name/ Chamorro Name	Number of Snails
Gymnosporia thompsonii	Luluhut	2
Intsia bijuga	Ifit	1
Ixora chinensis	Chinese ixora	1
Morinda citrifolia **1**	Indian Mulberry, Noni /Lada	93
Ochrosia oppositifolia **3**	Fagot	33
Pandanus dubius	Knob-fruited screwpine/Påhong	1
Pandanus tectorius	Screwpine/ Kafu'	13
Premna serratifolia	Headache tree/ Ahgao	11
Swietenia mahagoni	Cuban Mahogany	2
Talipariti tiliaceum	Sea Hibiscus / Pago	23
Vitex parviflora	Molave/ Ahgao Manila	3
Ferns		
Microsorum punctatum	N/A	6
Total snails observed:		**274**
Key: "**1**" = Ranked snail sightings on plant species, 1 being the most sightings		

4.4.2 Reptiles

The only reptiles observed during the pedestrian surveys were the introduced four-toed skink (*Carlia ailanpalai*), the native Pacific bluetail skink (*Emoia caeruleocauda*), and the native monitor lizard or hilitai (*Varanus tsukamotoi*). The arboreal and nocturnal brown tree snake (*Boiga irregularis*) was not observed during the daytime pedestrian surveys. This introduced fruit bat and bird predator (Wiles and Brooke, 2009) is expected to forage in the action area, especially since domestic chickens (*Gallus gallus domesticus*) have been observed in the vicinity.

4.4.3 Birds

The native yellow bittern or kakkak (*Ixobrychus sinensis*) was observed during daytime pedestrian surveys; however, no nests by this resident migratory bird were detected. Philippine collared doves (*Streptopelia dusumieri*) were observed during early morning bird surveys conducted on March 9, 2021, and March 18, 2022. The bitterns were seen on the tangantangan (*L. leucocephala*) trees within the action area, while the collared doves were seen on separate occasions flying low and fast or foraging within the action area. During pedestrian surveys, biologists observed stray chickens (*Gallus gallus domesticus*) in the southern sector, presumably from the neighboring residences. On March 9, 2021 four white terns (*Gygis alba*) were seen flying over the open fields of the southern sector of the SSHS parcel, while on March 22, 2022, five white terns (*G. alba*) were spotted flying over the bare land sector south of the SSHS campus. It is possible that these birds may be using the ironwood (*C. equisetifolia*) trees that exist on the developed, open space north of the chain link fence to either roost or nest. During the

bird survey conducted on March 11, 2022, two Eurasian tree sparrows (*Passer montanus*) were observed heading from the campus towards the forested southern section of the action area. Additionally, Pacific golden plovers (*Pluvialis fulva*) and black drongos (*Dicrurus macrocercus*) were often observed dispersed throughout the open fields, within the fenced areas south of the SSHS and FBLG campuses. On any given biological survey day, no more than eight plovers (*P. fulva*) and three black drongos (*D. macrocercus*) were observed at one time.

4.4.4 Mammals

The Mariana fruit bat was not detected during the fruit bat surveys on March 9 and 11, 2021, by two DCA biologists. The action area and vicinity contain thirteen potential food plants and eight potential roost plants for the Mariana fruit bat (e^2M, 2008) (Appendix C). Of the potential food species, the only species that were fruiting during the biological survey periods was papaya (*Carica papaya*) and blue marble (*Elaeocarpus joga*) tree in March 2022. Heavy human activity was detected in the project area, with occupied residential and storage structures, such as shipping containers and non-functioning school buses, observed in the southern sector. Household waste and dumped animal carcasses were observed in March 2022 along the unpaved road parallel to the fenceline delineating the southern campus boundary in Lot Nos. 7022-2-R3 and 7022-1. Additional rubbish was observed along the western boundary of Lot 7022-1. Considering the regular presence and activity of humans in the project area, the likelihood of Mariana fruit bats to be present is considered low.

The large, seeded breadfruit tree (*Artocarpus mariannensis*) in the action area was not actively fruiting in March 2021 and 2022, and there were no fallen breadfruit in the area beneath the canopy. When the breadfruit is in its fruiting season, it might attract feral pigs (*Sus scrofa*). During the biological surveys conducted in March 2021 and 2022 no feral pigs were sighted. However, in March 2022, the presence of feral pigs was apparent through the observations of animal scat and damaged tree trunks (Appendix B, Photo 26). In addition to feral pigs, stray and potentially non-stray dogs (*Canis lupus familiaris*) have been observed frequenting the project area during the pedestrian surveys.

5 EFFECTS ANALYSIS

5.1 ESA-Listed Orchids

The current surveys of the Simon Sanchez High School (SSHS) action area did not find any ESA-listed plants, including the following orchids: *Bulbophyllum guamense, Dendrobium guamense* and *Tuberolabium guamense*. The area may be considered marginal habitat for these epiphytic orchids based on the dominance of pago (*T. tiliaceum*) in the scrub forest, and the extensive areal coverage of golden pothos vines on most potential host trees in the action area. Therefore, we have determined that the proposed action will have **no effect** on these listed plant species.

5.2 ESA-Listed Tree Snails

The March 2022 pedestrian surveys detected a colony of approximately 274 Guam tree snails (*Partula radiolata*) within the central portion of the southern forested sector of the action area. Although no observations occurred of the humped tree snail (*Partula gibba*) and fragile tree snail (*Samoana fragilis*), habitat for these species is present in the action area. All life stages of the Guam tree snail would be exposed to the following project elements. Minimization and avoidance measures for these project elements (Section 2.3) are discussed below and summarized in Table 3.

Vegetation removal. The removal of vegetation has the potential to result in a direct take of the listed species if the vegetation is occupied at the time of removal. The loss of buffer vegetation has the potential to disrupt the microclimate that supports ESA-listed tree snails, exposing them to dry conditions and potentially leading to desiccation and death. Biological monitoring of potential tree snail habitat would be performed in advance of vegetation removal to confirm no ESA-listed tree snails are present. Construction activities in the vicinity of the Guam tree snail colony site would avoid the removal of vegetation that may serve as habitat for snails. A permanent dust barrier and security fence would be installed for the duration of construction work to minimize desiccation effects. The dust barrier and fence would be maintained after construction so long as the habitat continues to be occupied by the snail colony.

Dust Generation. Construction activities would involve excavation and demolition activities to install and construct the new campus, which would generate dust. Vehicle traffic associated with these activities would also generate dust. The generation of dust in proximity to occupied snail habitat has the potential to smother live snails, potentially leading to desiccation and death. In accordance with conservation measures described earlier, dust barriers would be erected between occupied habitat and the construction activities for the duration of the work, and beyond construction while the habitat is occupied by tree snails. The barriers would be inspected prior to commencement of construction activities, and periodically checked to ensure they are functioning as intended. Dust suppression would be performed as needed to reduce dust levels in the construction zone and minimize the migration of fugitive dust. A dust barrier/security fence would be erected adjacent to occupied tree snail habitat and under the supervision of biologists to protect adjacent occupied snail habitat. The dust barrier/fence would remain in place while the habitat is occupied by listed tree snails.

Noise and vibration disturbance during construction. There is currently no known information on harmful effects to Guam tree snails (*P. radiolata*) through noise and vibration (Personal communications, Dr. Curt Fiedler and Barry Smith). Guam tree snails have no auditory organs; however, it is possible that tree snails could be harassed or annoyed through the generation of vibrations, and react to this by altering their behavior, however, this has yet to be documented. The Pacific Islands USFWS Office has provided environmental reviews of

renewable energy projects and listed their primary concerns associated with this type of development for Hawaii's threatened and endangered species, including tree snails (USFWS, 2014). Although Hawaii's tree snails are not in the same family as the Guam tree snail, it should be noted that "noise and vibration disturbance during construction" of onshore wind farms, for instance, was not listed as a concern for Oahu tree snails (*Achatinella* spp.), Newcomb's tree snails (*Newcombia cumingi*) or Lanai tree snails (*Partulina semicarinata*) (USFWS, 2014). Instead, only habitat impacts, such as direct impacts caused by vegetation clearing, or indirect impacts caused by spreading of invasive species and increased fire risk, were listed for these Hawaii tree snail species (USFWS, 2014). Ambient noise levels in the vicinity of the new SSHS action area are mostly attributed to the existing high school and middle school campuses, vehicle traffic and residential uses. The proposed construction activities are expected to temporarily increase the noise levels during daylight hours, particularly during removal of vegetation and construction of the new facilities.

Stormwater runoff. Unmanaged **s**tormwater runoff could have the potential to flood occupied tree snail habitat and flush tree snails away from their habitat. Although the Guam tree snail (*P. radiolata*) primarily inhabits trees within the SSHS action area, they were also found on understory species (e.g. bird's nest fern). Dr. Curt Fiedler of UOG has also stated that during rainfall events, he has observed tree snails moving on the ground (Personal communication, January 23, 2018).

These best management practices and conservation measures described above, in Section 2.4 and summarized in Table 3 would be implemented by GDOE and their construction contractor in order to avoid or minimize potential effects on the ESA-listed and endemic Guam tree snail, and native humped tree snail and fragile tree snail if present. Therefore, we have determined that the proposed action **may affect, but is not likely to adversely affect** these listed snail species.

5.3 Mariana Fruit Bat

The current Mariana fruit bat population is estimated to have between 50 and 100 individual bats remaining on Guam (Wiese, 2018). No fruit bats were detected during the March 2021 and 2022 morning surveys. If present, all life stages of this species would be affected by the following project elements: vegetation removal, dust and spill generation, noise, light and vibration, and human activity. To minimize any potential direct or indirect effects on this ESA-listed species during construction, GDOE and the Contractor would implement conservation measures and best management practices for the Mariana fruit bat described in Section 2.4 of this BA and summarized in Table 3.

The proposed action would disturb or remove vegetation within the SSHS action area such as the large breadfruit tree (*A. mariannensis*) and the surrounding scrub forest (Appendix A, Figures 4 and 5), which may serve as potential foraging habitat for fruit bats (Appendix A, Figures 4 and

5). However, biological monitoring would be performed in advance of this activity to confirm no fruit bats are present and using the area. The proposed construction of a new SSHS campus would remove approximately 0.18 acres of scrub/shrub and 9.45 acres of scrub forest. Considering the availability of similar forest habitat beyond the action area in other parts of Yigo and throughout the island (29,745 acres), the potential effect of lost foraging habitat (9.45 acres) is determined to be insignificant (USFS, 2014). Since no construction is proposed to take place at night and in the early morning hours when bats are most active, there is a low potential for encountering this species. Given the absence of bats detected in the recent survey, the availability of scrub forest as foraging habitat elsewhere on the island, and the implementation of conservation measures to minimize or avoid the potential for encountering this species, the effects of the proposed action on the Mariana fruit bat would be minimized. Therefore, we have determined that the proposed action **may affect but would not adversely affect** the Mariana fruit bat.

Table 3. Summary of Minimization and Avoidance Measures for ESA-Listed Species

Impact Type (Direct or Indirect)	Minimization and Avoidance Measures
Vegetation removal (direct and indirect impacts)	• Vegetation removal would be minimized to only the amount necessary to complete the work. The contractor will avoid cutting or removing vegetation within the established buffer zone surrounding the known tree snail occurrence to minimize impacts to the snails and their habitat. The Contractor shall not remove any existing vegetation within the buffer zone without the approval of DAWR, and if approved, this would be supervised by the GDOE biological monitor. Workers will remain alert and observant for damage to vegetation within the 23 m (75-foot) wide buffer surrounding the occupied tree snail area, or to the dust barrier. If vegetation is damaged, or the dust barrier is damaged or not functioning as intended, the worker will inform the DRP. The DRP will immediately suspend construction activities in the area until the situation is corrected. If vegetation is damaged, the DRP will inform the GDOE Construction Manager, who will contact USFWS/DAWR. The Contractor shall not remove any existing vegetation within 23 m (75 feet) of ESA-listed tree snail occupied areas without the approval of DAWR, including staging areas for equipment and materials. If approved, this vegetation removal would be supervised by the GDOE biological monitor. • Prior to the commencement of construction activities within a 23

Impact Type (Direct or Indirect)	Minimization and Avoidance Measures
	m (75-foot) distance of known occupied tree snail habitat, the Contractor would install a permanent security fence around the snail colony buffer prior to construction. The fence would be designed to deter unauthorized persons from accessing and disturbing the protected snail habitat. The fence would incorporate a permanent dust barrier. The permanent dust barrier and security fence would be installed and maintained for the duration of the work to minimize desiccation effects on tree snails. The dust barriers would remain in place and continue to be maintained by GDOE after construction as long as the Guam tree snail colony is occupied. • Following the installation of the dust barrier, the contractor would plant native trees and shrubs along the perimeter of the buffer to provide a more natural barrier for the colony. This enhancement vegetation would be planted between the dust barrier and scrub forest. • A qualified biologist or GDOE biological monitor would be present during installation of the dust barrier and security fence to prevent the accidental take of any tree snails. The DRP would regularly inspect the barriers and perform daily checks for listed species. • A qualified biologist or GDOE biological monitor will perform pre-construction surveys for listed tree snails and Mariana fruit bat when work occurs in the vicinity of potential habitat prior to the start of construction and vegetation clearing. One week prior to the commencement of vegetation removal or construction activities in the vicinity of all potential tree snail habitat, a qualified biologist or GDOE biological monitor would conduct a survey to reconfirm the colony boundary of ESA-listed tree snails (Partulidae). If a protected snail species is detected outside of the original established colony boundary, a Designated Responsible Person (DRP) will notify the GDOE Construction Manager, who will contact the USFWS and Guam Department of Agriculture for further technical assistance and guidance. • If a fruit bat is present within 150 m (492 feet) of the project site, the work in that area will be postponed until the bat has left the area voluntarily as confirmed and documented by a biologist. If no bats are detected, construction may commence. Once

Impact Type (Direct or Indirect)	Minimization and Avoidance Measures
	construction begins, if a fruit bat moves into the project footprint while work is ongoing, the work in that area will be immediately halted and postponed until the bat has voluntarily left the area.
Dust generation and spills (direct and indirect impact)	• Fill materials, pre-cast structures, and other project-related materials would be staged and stockpiled in upland areas either in the Government property or another upland location arranged by the contractor. No project-related materials would be stockpiled within or in close proximity to habitat occupied by listed species. • Dust suppression by watering down of road and installation of a dust barrier/security fence would be performed protect occupied tree snail habitat. The barriers shall be installed so that they will not damage adjacent tree snail habitat. • Containment booms and absorbent pads would be kept on-site during construction and readily available on-site for cleaning up lubricant or petroleum spills.
Noise, light and vibration disturbance (direct)	• Temporary noise during construction would be mitigated by BMPs and engineering controls. No construction would occur during evening or early morning hours. • If work must occur near Mariana fruit bat habitat, a GDOE biological monitor would check for the presence of these species prior to the start of work. If fruit bats are observed, no work would proceed until the animal has left voluntarily. If an onsite protected species does not depart the area on its own for three (3) days or more, the contractor will notify GDOE, who will contact the USFWS and Department of Agriculture for further technical assistance and guidance. • GDOE would use hooded lighting within 492 feet (150 m) of all potential fruit bat roost habitat. The lighting will be directed to shine away from potential fruit bat habitat. • Where feasible, the movement of heavy equipment and personnel would be confined to the existing roadways.
Stormwater (direct and indirect impact)	• Stormwater protection measures (e.g., sandbags or silt fences) would be installed strategically around the work area and maintained to contain sediments and direct runoff away from occupied habitat during construction. The DRP will be responsible for overseeing the regular maintenance, inspection and determination of BMP effectiveness during construction.

Impact Type (Direct or Indirect)	Minimization and Avoidance Measures
Human activity (direct and/or indirect)	• Trees and other plants occupied by ESA-listed tree snails are to be clearly marked and flagged only in their vicinity to avoid inadvertent dislodging and trampling of tree snails. The actual occupied plants will not be marked/flagged or damaged. • Signs labeled "DO NOT ENTER - Endangered Tree Snails Present" will be posted on the exterior of the permanent dust barrier/security fence surrounding the buffer vegetation at the Guam tree snail colony. The signs will be maintained by the Contractor for the duration of construction. • The Contractor's DRP will participate in awareness training for ESA-listed Tree Snails and Mariana fruit bat. The DRP will be responsible for training the supervisory staff, and for performing daily checks for listed species and overseeing the regular maintenance of protection measures at the start of the day, in the areas that will have construction activity that day. • GDOE and the Contractor would limit exposing fruit bat locations to the public and other contractors to reduce potential poaching of this species

5.4 Migratory Birds

The implementation of conservation measures (Section 2.4) would serve to reduce the proposed action's impacts on MBTA-listed species, and minimize the potential for incidental take. These measures include planning work outside of nesting periods to the extent practicable; hazing to discourage birds from nesting; and removing eggs or young if removal of occupied vegetation is not avoidable. Therefore, it is likely through these beneficial practices that construction activities as described would not violate the MBTA and would avoid incidental take of listed birds during the course of the new SSHS campus project.

6 CONCLUSION AND DETERMINATION OF EFFECTS

Based on the information presented in this BA, we have determined that the proposed action to construct a new high school in Lot Nos. 7022-2-R3 and 7022-1 will have no effect on the following ESA-listed species: wild onion *(Bulbophyllum guamense*), *Dendrobium guamense*, *Tuberolabium guamense*), humped tree snail (*Partula gibba*), fragile tree snail (*Samoana fragilis*).

With GDOE and the Contractor's implementation of the recommended Conservation Measures described in Section 2.4, we have determined that the proposed action **may affect but would not adversely affect** the locally and federally-listed and Mariana fruit bat (*Pteropus mariannus mariannus*) and Guam tree snail (*Partula radiolata*). Additionally, because of spatial separation, we have determined that the new SSHS campus project would have no effect on designated critical habitat for the Mariana fruit bat.

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8 LIST OF CONTACTS MADE AND PREPARERS

8.1 List of Contacts

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APPENDIX A
Figures

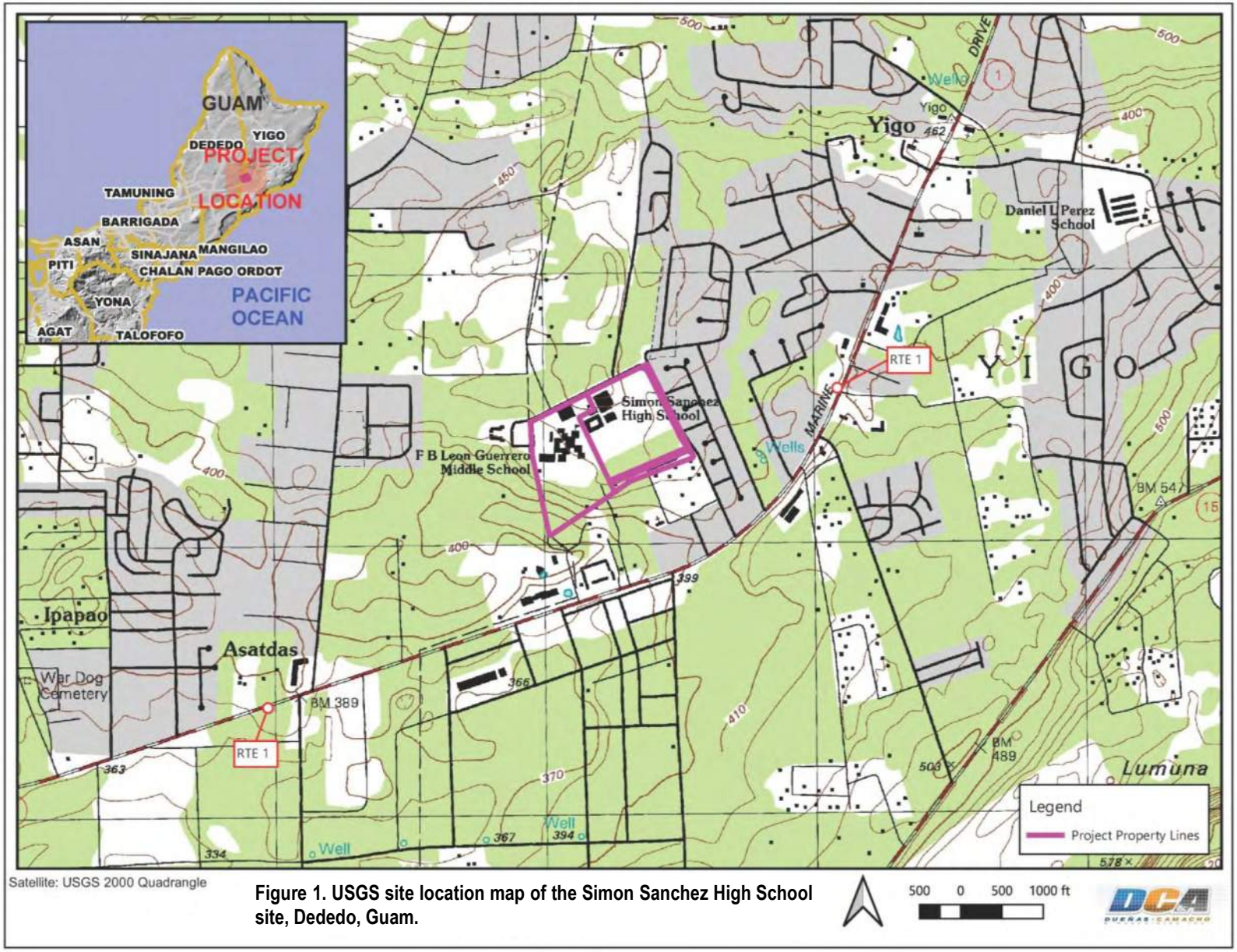


Figure 1. USGS site location map of the Simon Sanchez High School site, Dededo, Guam.

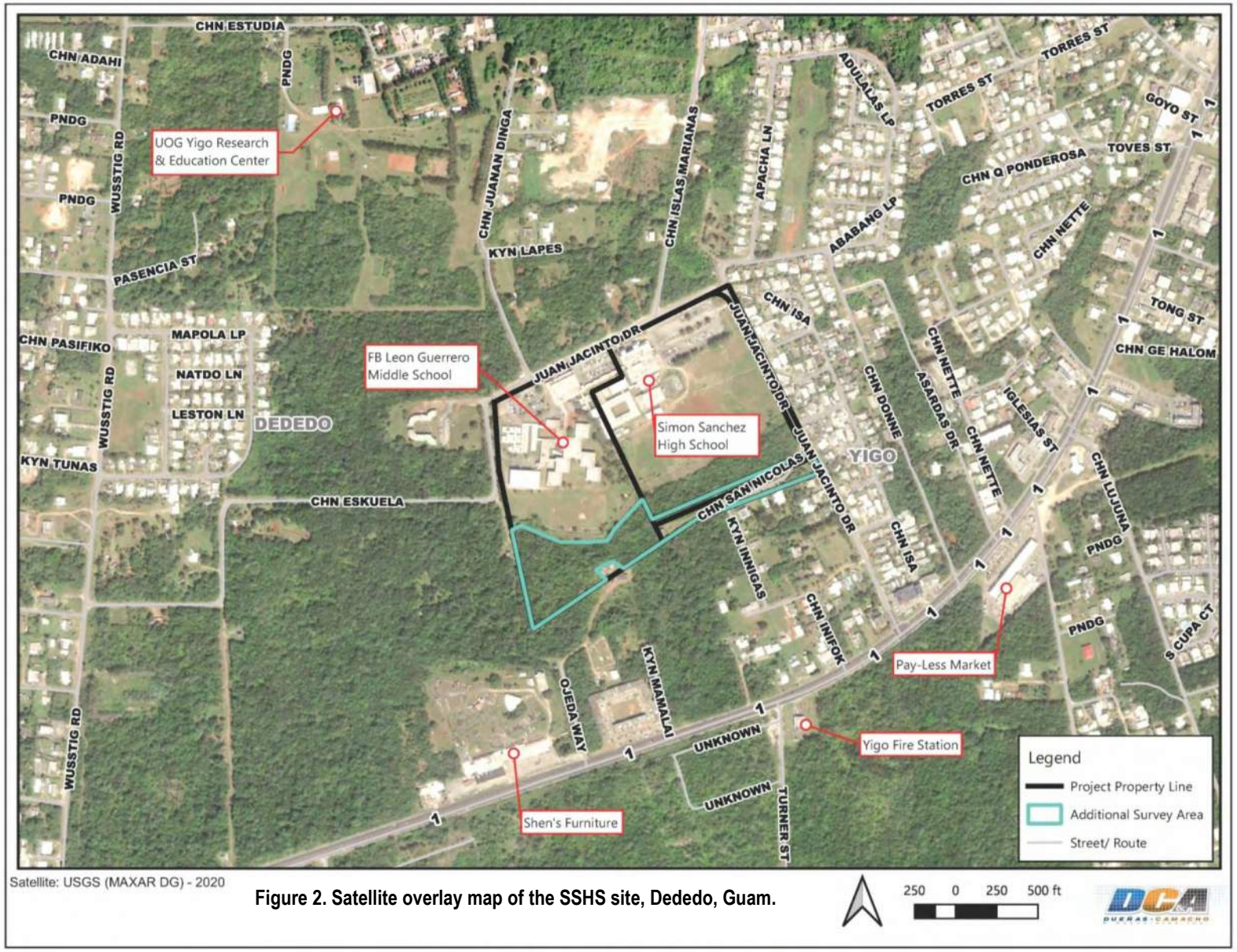


Figure 2. Satellite overlay map of the SSHS site, Dededo, Guam.

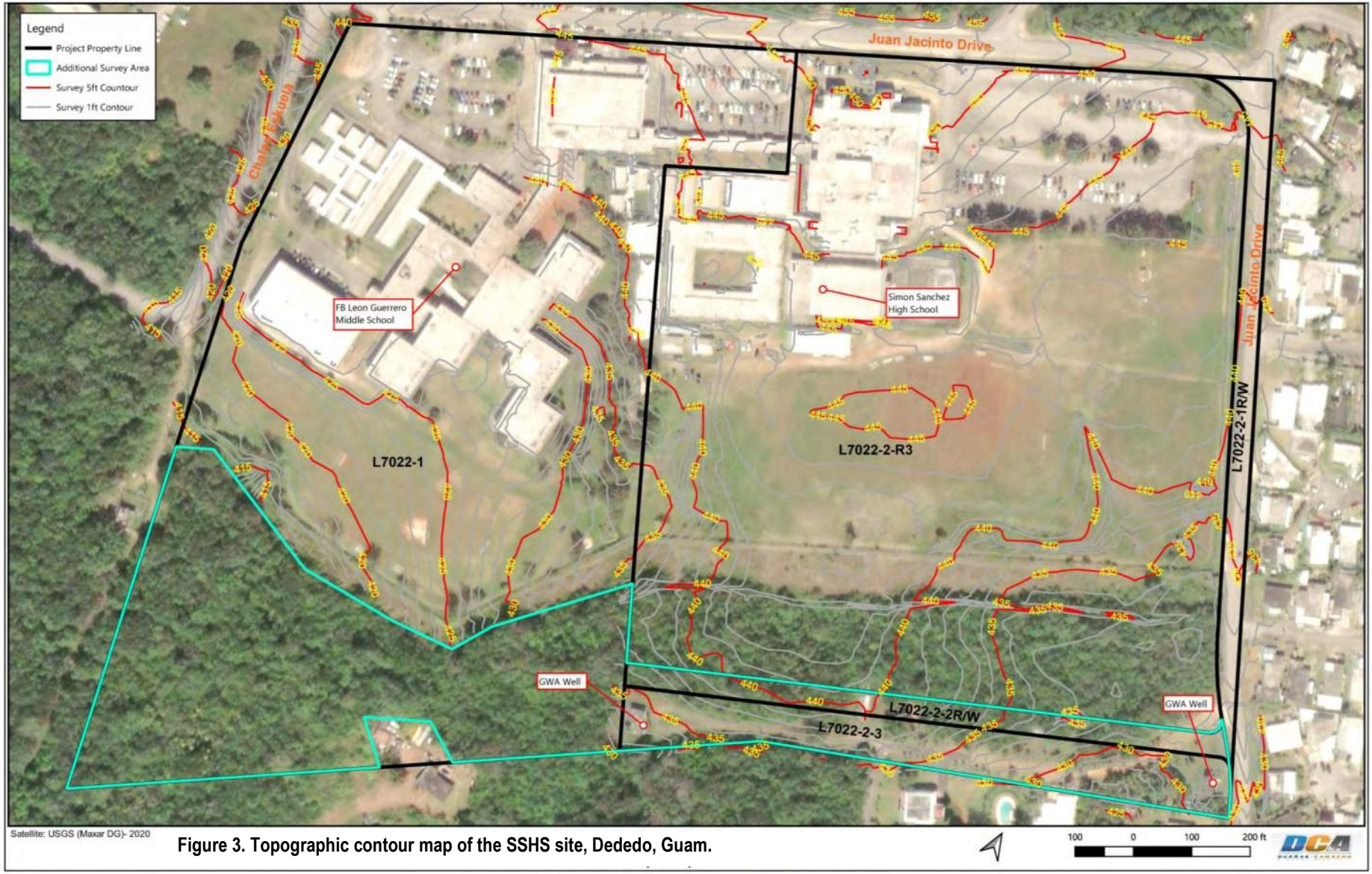


Figure 3. Topographic contour map of the SSHS site, Dededo, Guam.

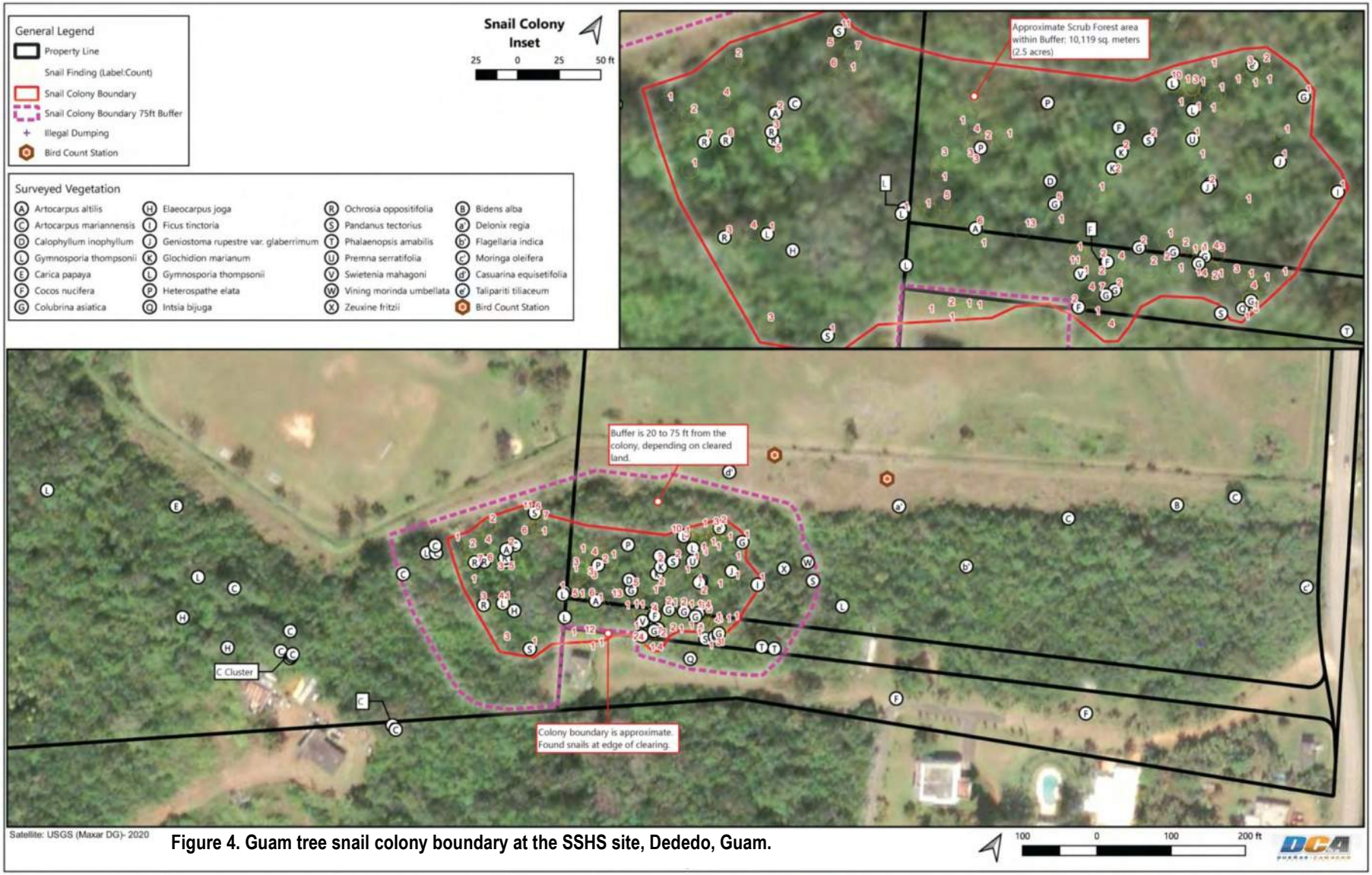


Figure 4. Guam tree snail colony boundary at the SSHS site, Dededo, Guam.

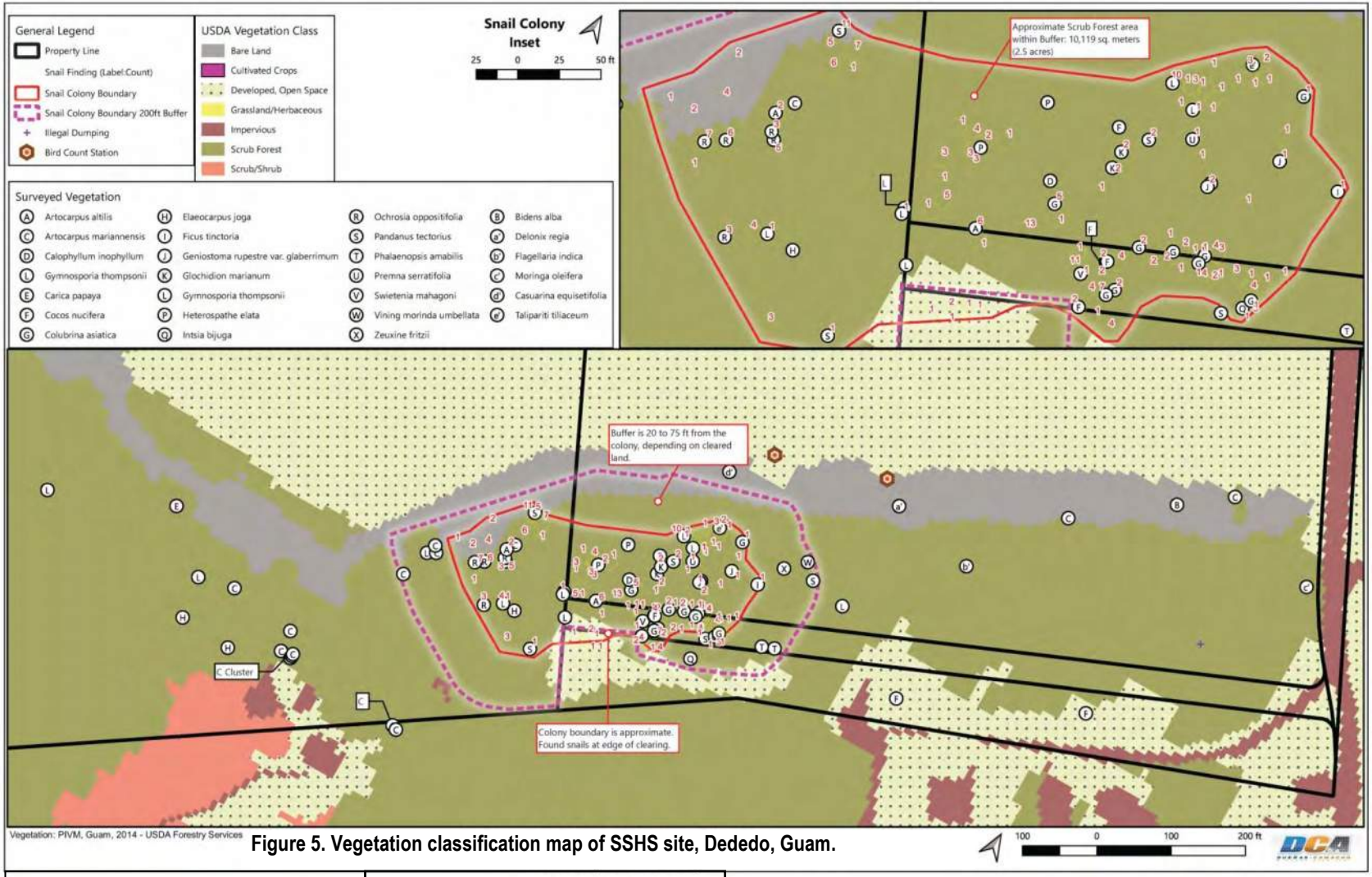


Figure 5. Vegetation classification map of SSHS site, Dededo, Guam.

Vegetation acreage	**Acreage of Scrub Forest**
Bare Land: **1.28 acres** Developed, Open Space: **14.1 acres** Impervious: **6.44 acres** Scrub/Shrub: **0.18 acres**	Inside Buffer: **2.5 acres** Outside Buffer: **9.45 acres** Total: **11.95 acres**

APPENDIX B

**Photographs of the Simon Sanchez High School Project Site,
Lot 7022-2-R3, Lot 7022-1, and Vicinity**

March 2021 and March 2022



Photo 1. View facing northwest along Juan Jacinto Street showing fenced eastern boundary of SSHS campus in Lot 7022-2-R3.



Photo 2. View facing west across Juan Jacinto Street showing fenced southeastern corner of SSHS campus. Behind the bus stop, a dirt road leads west from Juan Jacinto Street along the fence line. However, this fence line does not delineate the southern boundary of Lot 7022-2-R3.



Photo 3. View facing east along a dirt road abutting the fenced southern boundary of the SSHS campus in Lot 7022-2-R3. This fence line delineates the campus, but does not delineate the southern parcel boundary of Lot 7022-2-R3.



Photo 4. View facing southeast towards a narrow strip of scrub forest in the southern sector of Lot 7022-2-R3, south of the SSHS campus.



Photo 5. View facing west toward GWA Well Y-5 in Lot 7022-2-3, located south of a 40-foot wide access and utilities easement (Lot 7022-2-2R/W) and the SSHS campus property (Lot 7022-2-R3).



Photo 6. View facing south toward GWA Well Y-6 in Lot 7022-2-3, located south of Lot 7022-2-2R/W and the SSHS campus (Lot 7022-2-R3). The paved Juan Jacinto Street is to the left (east). A dirt-paved road leads west from Well Y-6 to Well Y-5.



Photo 7. View of the overstory within the eastern portion of the scrub forest running along the southern border of the parcel showing *Leucaena leucocephala* and *Taliparitiliaceum* trees.



Photo 8. View of the open canopy and fern understory within the central portion of the southern forested sector of Lot 7022-2-R3.



Photo 9. Dense stands of creeping philodendron (*Rhaphidophora decursiva*) within the east-southeastern sector of the southern forested potion of the forested area.



Photo 10. Cluster of Moses-in-a-Cradle by the storage container near the southeastern border.



Photo 11. One of many large windthrown trees throughout the southern scrub forest of the project site.



Photo 12. Uncommon orchid *Zeuxine fritzii* in the central-northeastern sector of the southern scrub forest.



Photo 13. View of the native worm orchid (*Taeniophyllum mariannense*) flowering in the project site.



Photo 14. View of golden pothos (*Epipremnum aureum*) vine, lineleaf fern (*Antrophyum plantagineum*), and *Microsorum punctatum* within the southwestern portion of the scrub forest.



Photo 15. Large boulders occupied the southwestern sector of the scrub forest.



Photo 16. View of one of two moth orchids (*Phalaenopsis amabilis*) present within the project area.



Photo 17. Uncommon vining morinda (*Morinda umbellata*) sprawling over other vegetation located in the central-southwestern sector of the scrub forest.



Photo 18. View of open earthen swale in the southwestern sector of the scrub forest in Lot 7022-1 leading to a bermed area dominated by pago or sea hibiscus (*Talipariti tiliaceum*) trees.



Photo 19. View of an earthen berms located in the southwestern sector of the scrub forest of Lot 7022-1. Since existing runoff flows towards this area, this sector is proposed for a stormwater basin.



Photo 20. Panoramic view within the southwestern potion of the scrub forest showing several golden pothos (*E. aureum*) "vine towers" that are potential tree snail habitat.



Photo 21. View within the central-southwestern potion of the scrub forest in Lot 7022-1 facing south. The orange arrow is pointing to a dilapidated shipping container and the red arrow is pointing to a broken-down school bus. These are likely utilized by squatters occupying a nearby structure.



Photo 22. View facing south at the southern border of Lot 7022-2-R3 showing drumstick tree (*Moringa oleifera*) and sprawling gaso'so (*Colubrina asiatica*) adjacent to a molave (*Vitex parviflora*) tree.



Photo 23. Photo of illegal trash dumping activities near the southeastern boundary of Lot 7022-2-R3.



Photo 24. Photo of illegal trash dumping activities near the southwestern boundary of Lot 7022-1.



Photo 25. Photo of animal scat observed on the bare land sector of the project site abutting the fenced southern boundary of the SSHS campus in Lot 7022-2-R3.



Photo 26. Photos of damaged tree trunks likely caused by feral pig (*Sus scrofa*) activity in the central southeastern portion of the project site. A pink cell phone is shown in the lower left of the photo for scale.



Photo 27. A drill rig was observed performing soil borings within the fenced open field south of the SSHS on the morning of Monday, March 21, 2022, at 10:27 am.



Photo 28. Photo of boring B-23 closest to snail colony on March 22,2022. The orange arrow in the center of the photo is pointing to the wooden stake placed to mark the ground of the boring location. A white arrow points to the yellow flagging of the closest vegetation occupied by the Guam tree snail (red circle).



Photo 29. An occupied lada (*M.* citrifolia) located along the northwestern extent of the colony conspicuously flagged with yellow flagging tape. A white arrow points to a Guam tree snail (red circle).



Photo 30. View facing scrub forest from the bare land to the north of the scrub forest. The red arrow in the center of the photo is pointing to the same flagged tree in Photo 29 occupied by the Guam tree snail.



Photo 31. Photos of the introduced four-toed skink (*Carlia ailanpalai*), which were uncommon within the southern scrub forest of the project site. The skink in the right photo is beginning to shed its skin.



Photo 32. A native Pacific bluetail skink (*Emoia caeruleocauda*) seen on screwpine of kafu' (*Pandanus tectorius*).



Photo 33. The lined tree snail (*Drymaeus multilineatus*) on creeping philodendron (*Rhaphidophora decursiva*) in the southeastern sector of the southern forested sector of the action area.



Photo 34. A cinnamon bun snail (*Satsuma succincta*) traversing along false rattan (*Flagellaria indica*).



Photo 35. Photos of Guam tree snails (*P. radiolata*) on latherleaf (*Colubrina asiatica*) in the project site. The left photo shows three snails (1 juvenile and 2 adults) occupying a single leaf. The right photo shows these same snails from afar occupying the same latherleaf plant within close proximity of other snails.



Photo 36. Photos of the Guam tree snail (*P. radiolata*) on March 21, 2022, actively roaming on latherleaf (left) and *Ochrosia oppositifolia* (right) plants after a period of rainfall the previous day in the project site.



Photo 37. DCA biologist collecting GPS coordinates (right photo) of adult Guam tree snail (*P. radiolata*) on lada (*M. citrifolia*) along the southern extent of the colony (left photo). GWA Production Well Y-05 can be seen in both photos.



Photo 38. Photo of five white terns (*Gygis alba*) flying over the southern scrub forest of the project site on the morning of March 22, 2022.



Photo 39. A black drongo (*Dicrurus macrocercus*) resting on an ironwood tree (*Casuarina equisetifolia*) within the fenced open field south of the FBLG campus.



Photo 40. A Pacific golden plover (*Pluvialis fulva*) within the fenced open field south of the SSHS campus.

APPENDIX C
Checklist of Vascular Plants Observed within or adjacent to the Simon Sanchez High School Project Site, Lot Nos. 7022-2-R3 and 7022-1 in Yigo, Guam

	Common Name	Chamorro Name	Status
Trees, Shrubs, Herbs			
Aidia cochinchinensis	N/A	Sumak	N
Allamanda cathartica	Golden trumpet	N/A	I
Alocasia macrorrhizos	False Giant Taro	Papao apaka	I
Annona muricata	Soursop	Laguanå	I
Areca catechu	Betelnut tree	Pugua	I
Artocarpus mariannensis **F, R**	Seeded breadfruit tree	Dokdok	**E
Artocarpus altilis **F, R**	Seedless breadfruit	Lemmai	I
Averrhoa bilimbi	Pickle tree	Bilimbi	I
Bidens alba	Beggar's tick	N/A	I
Buchnera floridana	N/A	N/A	I
Caesalpinia major	Yellow nicker-bean	N/A	N
Calophyllum inophyllum **F**	Mastwood, Palomaria	Da'ok	N
Carica papaya **F**	Papaya	N/A	I
Casuarina equisetifolia **F, R**	Ironwood tree	Gagu	N
Clerodendrum quadriloculare	Starburst Clerodendrum	N/A	I
Cocos nucifera **F, R**	Coconut tree	Niyok	N
Colubrina asiatica	Latherleaf	Gaso'so	N
Cordyline fruticosa	Ti plant	N/A	I
Delonix regia	Flametree	Atbut	I
Dracaena fragrans	Corn plant	N/A	I
Elaeocarpus joga **F, R**	Blue Marble Tree	Yoga	**E
Flagellaria indica	False Rattan	Beyuko halomtano'	N
Ficus tinctoria **F**	Fig	Hoda	N
Geniostoma rupestre var. glaberrimum	N/A	N/A	N
Glochidion marianum	N/A	Åbas duendes	**E
Guettarda speciosa **F, R**	Zebrawood	Panao	N
Gymnosporia thompsonii	N/A	Luluhut	**E
Hippobroma longiflora	Star-of-Bethlehem	N/A	I
Intsia bijuga	N/A	Ifit	N
Ixora chinensis	Chinese Ixora	N/A	I
Leucaena leucocephala	Hedge Acacia	Tangantangan	I
Morinda citrifolia	Indian Mulberry, Noni	Lada	N
Morinda umbellata	N/A	N/A	N

	Common Name	Chamorro Name	Status
Moringa oleifera	Drumstick Tree	Katdes	I
Ochrosia oppositifolia **F, R**	N/A	Fagot	N
Pandanus dubius	Knob-fruited screwpine	Påhong	N
Pandanus tectorius **F**	Screwpine	Kafu'	N
Peltophorum pterocarpum	Yellow Flame Tree	N/A	I
Persea americana **F**	Avocado	Alageta	N
Phalaenopsis amabilis	Moth Orchid	N/A	I
Phyla nodiflora	Turkey Tanglefoot	N/A	I
Planchonella obovata	North. Yellow Boxwood	Lalahag	N
Polypremum procumbens	Rustweed		I
Polyscias scutellaria	Platito, Saucer-leaf	N/A	I
Premna serratifolia **F, R**	Headache tree	Ahgao	N
Psychotria mariana	N/A	Aploghating	**E
Swietenia mahagoni	Cuban Mahogany	N/A	I
Tabebuia heterophylla	Pink Tecoma	N/A	I
Taliparitiliaceum	Sea Hibiscus	Pago	N
Taeniophyllum mariannense	Worm orchid	Kamuke-nanofe	***E
Tradescantia spathacea	Moses-in-a-Cradle	N/A	I
Triphasia trifolia	Limeberry	Lemonchina	I
Turnera ulmifolia	Yellow Alder	N/A	I
Vitex parviflora **R**	Molave	Ahgao Manila	I
Zeuxine fritzii	N/A	N/A	N
Ferns			
Antrophyum plantagineum	Lineleaf Fern	N/A	N
Asplenium nidus	Bird's Nest Fern	N/A	I
Microsorum punctatum	N/A	N/A	N
Nephrolepis biserrata	Swordfern	N/A	N
Phymatosorus scolopendria	Monarch Fern	N/A	I
Pyrrosia lanceolata	Lanceleaf Tongue Fern	N/A	I
Vittaria incurvata	Shoestring fern	N/A	N
Vines			
Derris trifoliata	N/A	N/A	N
Epipremnum aureum	Golden Pothos	N/A	I
Momordica charantia	Bitter Melon	N/A	I
Monstera sp.	N/A	N/A	I
Passiflora suberosa	Indigo Berry	N/A	I
Rhaphidophora decursiva	Creeping Philodendron	N/A	I
Stictocardia tiliifolia	Spotted heart	N/A	I
Syngonium angustatum	Arrowhead vine	N/A	I

	Common Name	**Chamorro Name**	**Status**
Telosma cordata	Tonkin Creeper	N/A	I
Grasses			
Eustachys petraea	Pinewoods Finger Grass	N/A	I
Fimbristylis cymosa	St. John's sedge	N/A	N
Pennisetum purpureum	Elephant Grass	N/A	I
Saccharum spontaneum	Wild cane	N/A	I
Tripsacum latifolium	N/A	N/A	I
Key to Status: I = introduced; N= native; E= endemic (* to Guam, **Mariana Islands, ***Micronesia) (Sources: Stone, 1970; Raulerson, 2006; and Raulerson and Rinehart, 2018.) **F**= Mariana fruit bat food species; **R** = Mariana fruit bat roost species (Source: e2M engineering-environmental Management, Inc. 2008)			

APPENDIX D

Letter from U.S. Fish and Wildlife (December 2020)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2021-SL-0043

December 02, 2020

Claudine Camacho
Duenas, Camacho & Associates, Inc.
238 E. Marine Corps Drive
Suite 201, Diamond Plaza
Hagatna, Guam 96910

Subject: Species List for Construction of New School Facility at Simon Sanchez High School Campus in Yigo, Guam

Dear Claudine Camacho:

The U.S. Fish and Wildlife Service (Service) received your correspondence on October 30, 2020 requesting a list of endangered, threatened, and candidate species and the presence of critical habitat in the vicinity of a proposed new school facility on the Simon Sanchez High School campus in Yigo, Guam.

Project Description
The new school facility will be located on a 29-acre parcel of land of which much has been previously cleared and developed for the existing high school facilities. A narrow strip of scrub forest remains along the length of the southern parcel boundary.

We reviewed the proposed project pursuant to the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Based on the information you provided and the pertinent information in our files, we determined that no designated critical habitat exists within or near the project site. The following species may occur within or pass through the project site.

Listed Species	Common/ Chamorro Name	Listing Status
MAMMALS		
Pteropus mariannus mariannus	Mariana fruit bat/ fanihi	Threatened
INVERTEBRATES		

Hypolimnas octocula marianensis	Mariana eight-spot butterfly/ abbabang	Endangered
Partula gibba	Humped tree snail/ akaleha	Endangered
Partula radiolata	Guam tree snail/ akaleha	Endangered
Samoana fragilis	Fragile tree snail/ akaleha dogas	Endangered
PLANTS		
Bulbophyllum guamense	Siboyas halumtano	Threatened
Cycas micronesica	Fadang	Threatened
Dendrobium guamense	No common name	Threatened
Nervilia jacksoniae	No common name	Threatened
Psychotria malaspinae	Aplokating palaoan	Endangered
Solanum guamense	Biringenas halumtanu	Endangered
Tabernaemontanta rotensis	No common name	Threatened
Tinospora homosepala	No common name	Endangered
Tuberolabium guamense	No common name	Threatened

Migratory birds
For questions regarding bird species federally protected under the Migratory Bird Species Act, please see the attached enclosure.

If it is determined that the proposed project may affect federally listed species, we recommend that you contact our office early in the planning process so that we may assist you with ESA compliance. We appreciate your efforts to conserve listed species and native ecosystems pursuant to the ESA. If you have additional questions, please contact Lauren Taylor at lauren_taylor@fws.gov or by telephone at (808) 792-9528. In future communications with us regarding this project, please refer to reference number: 01EPIF00-2021-SL-0043. To expedite the Service's response to any future official correspondence, please address it to pifwo_admin@fws.gov.

Sincerely,

JACQUELINE FLORES

Digitally signed by JACQUELINE FLORES
Date: 2020.12.02 07:10:33 +10'00'

Jacqueline Flores
Islands Team Manager
Mariana Islands

Enclosures: Migratory Bird Species Act information.

Dear Project Proponent:

Thank you for your inquiry and for your interest in protecting migratory birds. There are several resources available to you in order to generate a Migratory Bird Species List for your project and to understand how to reduce impacts on migratory birds.

1) Migratory Bird Species List:
A list of the migratory bird species covered by the Migratory Bird Treaty Act, is available at this link.

2) IPaC:
The Information for Planning and Conservation (IPaC) tool is an online tool through which users may use to generate a list of Threatened and Endangered Species (https://ecos.fws.gov/ipac/). Information in IPaC is incomplete for migratory birds, particularly for birds on Pacific islands.

3) Site-Specific Bird Species Lists:
The best way to create a site-specific bird species list is for a biologist to visit the site and record bird occurrence throughout the year. If this is not possible, project proponents can generate a bird occurrence list in eBird which can inform your creation of a site-specific list of migratory birds.

Once you arrive at the eBird website, click "Explore," and enter your state, county, province or country into the "Explore Regions" search bar. From there you can zoom into your specific project area, or select a hot spot that is closer to your project area.

3) Conservation Measures to Reduce Project Effects on Birds:

The M-Opinion developed by the Department of Justice solicitors in December 2017 states that incidental take is no longer a violation of the Migratory Bird Treaty Act. While take of nesting birds might occur during your project, if that take occurs incidentally to the purpose of your otherwise legal activity, then that take is not prohibited. If birds are purposefully killed, that is, the take is intentional, then it is prohibited unless you have a permit authorizing that take. It is likely that your construction activities as described would not violate MBTA if birds were harmed incidentally during the course of your development. Regardless, we encourage developers to minimize and avoid incidental take of migratory birds if possible.

Conservation measures geared toward specific activities may reduce your project's impacts on birds. Several fact sheets are available through the U.S. Fish and Wildlife Service (USFWS) Office of Migratory Birds Website.

Vegetation management is one of the most common construction-related activities that affects migratory birds. In particular, vegetation clearing associated with the construction may be timed to avoid peak nesting of birds; this is the easiest way to avoid incidentally killing or disturbing nesting birds. If timing of construction cannot be altered, consider removing any potential nesting trees, shrubs, or other bird nesting habitat in the footprint of the project at a time when the birds are not nesting, e.g., well in advance of construction. In order to plan the

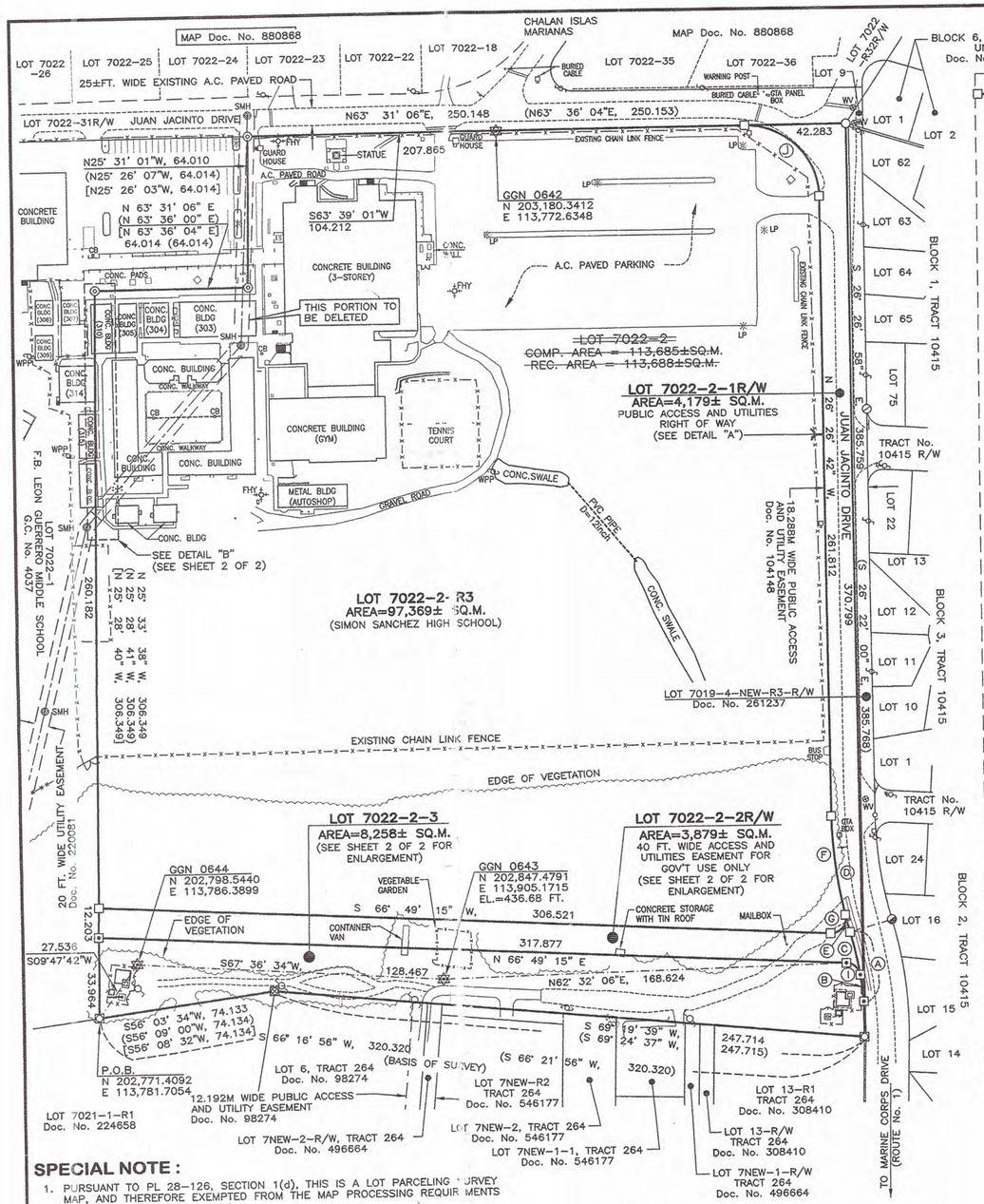
vegetation removal or other habitat disturbance, take account of the amount of time that a species of bird needs to complete their nesting effort, from egg laying to fledging, and plan your activity far in advance. Additional guidelines for vegetation control are available through the USFWS Office of Migratory Birds.

If take cannot be avoided, e.g., birds are actively nesting in trees that are slated for removal and site clearing cannot wait until the young fledge, then consider contacting a permitted rehabilitation facility to take the orphaned eggs or young. It might also be possible to discourage birds from nesting in trees by hazing or bothering them in some way to the point that they abandon the site prior to settling in and laying an egg.

A similar approach can be taken for ground-nesting and burrow-nesting species, including seabirds. If a ground-disturbing activity must take place, plan it outside the nesting season.

Information on birds and their nesting seasons can be found by searching for species name at Wikipedia, and Cornell's All About Birds website.

APPENDIX E
Lot Parceling Survey Map of Lot 7022-2 (2 sheets)



CURVE DATA :

(A)		(B)	
Δ	= 11° 18' 26"	Δ	= 04° 17' 13"
R	= 151.034	R	= 151.034
L	= 29.807	L	= 11.301
Ch	= 29.758	Ch	= 11.298
ChB	= N36° 19' 32"W	ChB	= S32° 48' 56"E
(C)		(D)	
Δ	= 07° 01' 13"	Δ	= 15° 32' 04"
R	= 151.034	R	= 183.569
L	= 18.506	L	= 49.771
Ch	= 18.494	Ch	= 49.618
ChB	= S38° 28' 09"E	ChB	= S34° 12' 44"E
(E)		(F)	
Δ	= 02° 16' 32"	Δ	= 13° 13' 53"
R	= 183.569	R	= 183.569
L	= 7.290	L	= 42.392
Ch	= 7.290	Ch	= 42.298
ChB	= S40° 48' 51"E	ChB	= S33° 03' 38"E
(G)		(H)	
Δ	= 106° 29' 50"	Δ	= 15° 32' 04"
R	= 6.096	R	= 165.281
L	= 11.331	L	= 44.812
Ch	= 9.769	Ch	= 44.675
ChB	= N13° 34' 20"E	ChB	= N34° 12' 44"W (N34° 11' 19"W)
(I)		(J)	
Δ	= 78° 13' 12"	Δ	= 90° 02' 12"
R	= 6.096	R	= 30.480
L	= 8.322	L	= 47.898
Ch	= 7.691	Ch	= 43.119
ChB	= N74° 04' 09"W	ChB	= S 71° 27' 48"E

CHECKED BY :

Frank P. Taitano — 5-18-20
FRANK P. TAITANO
PLANNER, D.L.M. — DATE

7-6-2020
MELVIN O. JAVIER
ENGINEERING TECHNICIAN, C.L.T.C. — DATE

7-30-2020
PIERCE CASTRO
ENGINEERING TECHNICIAN, C.L.T.C. — DATE

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recorder
File for Record is Instrument Number 952623
On the Year 2020 Month 11 Day 25 Time 1:05
Recording Fee 80 Receipt No. 31796
Deputy Recorder

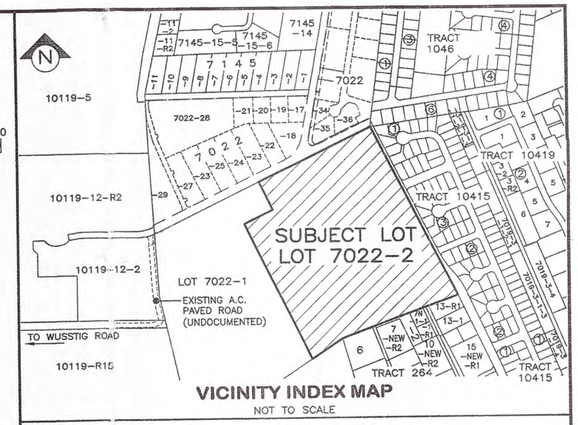
SATISFACTORY TO AND APPROVED BY :

2.17.20
JON M. FERNANDEZ
SUPERINTENDENT OF EDUCATION
GOVERNMENT OF GUAM — DATE

11.21.19
MIGUEL C. BORDALLO, P.E.
GENERAL MANAGER, GUAM WATERWORKS AUTHORITY
GOVERNMENT OF GUAM
FOR GWA DEEP WELL SITES Y-05 AND Y-06 — DATE

10/24/20
JOSEPH M. BOÑA
DIRECTOR, DEPARTMENT OF LAND MANAGEMENT
APPROVAL PURSUANT TO GRANT DEED
Doc. No. 567559, PAGE 29, THEREOF
FOR GWA DEEP WELL SITES Y-05 AND Y-06 — DATE

11/07/2020
LOURDES A. LEON GUERRERO
GOVERNOR OF GUAM
APPROVAL PURSUANT TO GRANT DEED
Doc. No. 567559, PAGE 29, THEREOF
FOR GWA DEEP WELL SITES Y-05 AND Y-06 — DATE



VICINITY INDEX MAP

NOT TO SCALE

NOTES :

1. SURVEY WAS BASED ON FOUND CORNERS AS SHOWN.
2. ALL DISTANCES ARE IN METERS UNLESS OTHERWISE NOTED.
3. BEARINGS AND DISTANCES WITHIN THE PARENTHESES ARE RECORD DATA, WITHIN BRACKETS ARE BASED ON REF. No. 2, ALL OTHERS ARE 1993 GRID.
4. SUBJECT LOT IS WITHIN THE NORTHERN WATER RECHARGE AREA.
5. SUBJECT LOT IS ZONED "A" AGRICULTURAL PER 1967 OFFICIAL ZONING MAP F367S41.
6. EXISTING AS-BUILTS SHOWN AS OF APPROVAL OF THIS MAP.
7. VERTICAL CONTROL SURVEY WAS BASED FROM GGN 0643 WITH AN ELEVATION OF 436.68 FEET MEAN SEA LEVEL (MSL) DATUM. CONTOURS WERE DEVELOPED FROM SPOT ELEVATIONS USING A COMBINATION OF GPS AND CONVENTIONAL TOPOGRAPHIC GROUND METHOD.

REFERENCES :

1. DWG No. 70-40-15, SURVEY FOR PROPOSED MATAGUAC JR. HIGH SCHOOL SITE OF LOT 7022-2, PREPARED BY RLS No. 18, L.M. No. 547-FY72, UNRECORDED
2. DWG No. ASA 72 02G, PARCELING OF LOT 7022-1, PREPARED BY RLS No. 37, L.M. No. 173-FY72, UNRECORDED.
3. DWG No. CC-9612Y, RE-SUBDIVISION SURVEY MAP OF LOT 7NEW-1 AND LOT 7NEW-R1, TRACT 264, PREPARED BY RLS No. 48, L.M. No. 265-FY96, Doc. No. 546177.
4. DWG No. MS-93045, CONSOLIDATION SURVEY MAP OF LOT 7 AND LOT 12, TRACT 264 INTO LOT 7NEW, TRACT 264 THEN PARCELING OF LOT 7NEW, TRACT 264, PREPARED BY RLS No. 53, L.M. No. 568-FY93, Doc. No. 496664.
5. DWG No. RV866-20PIE, SUBDIVISION SURVEY MAP OF TRACT 10415 CONSOLIDATION OF LOTS 7019-4NEW-3, 7019-4NEW-2 & 7019-4NEW-1), PREPARED BY RLS No. 54, L.M. No. 86-FY87, Doc. No. 392475.

CERTIFICATE OF GUAM CHIEF SURVEYOR

THIS MAP HAS BEEN EXAMINED FOR CONFORMANCE WITH TITLE 21, GUAM CODE ANNOTATED, CHAPTER 60 ARTICLE 5, UNIFORM TRIANGULATION SYSTEM AND REGULATIONS THEREUNDER ON THIS 3rd DAY OF August, 2020

PAUL L. SANTOS, P.E.S. No. 68
GUAM CHIEF SURVEYOR/CHIEF OF CADASTRE

CERTIFICATE OF GUAM CHIEF PLANNER

APPROVAL PURSUANT TO TITLE 21, GUAM CODE ANNOTATED, CHAPTER 61, ZONING LAW AND CHAPTER 62, SUBDIVISION LAW

CELINE L. CRUZ
GUAM CHIEF PLANNER — 5/18/2020 DATE

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

NESTORIO C. IGNACIO, PLS No. 65 — 10/22/19 DATE

NESTORIO C. IGNACIO CERTIFICATE No. 65 EXP. 04-30-20 GUAM PROFESSIONAL LAND SURVEYOR

DUEÑAS · CAMACHO
* ENGINEERING * PLANNING * SURVEYING * ENVIRONMENTAL SERVICES
* GEOGRAPHIC INFORMATION SYSTEM * CONSTRUCTION MANAGEMENT GUAM
P.O. Box 8900, Tamuning, Guam 96931 / 238 E. Marine Corps Drive, Suite 201 Diamond Plaza, Hagatña, GU 96910-5194 / Tel: (671) 477-7991 / Fax: (671) 479-6315 SAIPAN Caller Box PPP, Suite 164, Saipan, MP 96950 / Chalan Pale Arnold, Ada's Building South Garapan, Saipan 96950 / Tel: (670) 234-9017 / Fax: (670) 234-3842

LOT PARCELING SURVEY MAP OF LOT 7022-2

(GDOE: SIMON SANCHEZ HIGH SCHOOL)
(GWA: DEEP WELLS Y-05 and Y-06)
MUNICIPALITY OF YIGO

L.S. 10 — SEC. 4

SURVEY DATA		DATE	LOT DATA	
FIELD	MPG/AMU & CREW	5-9-2019	BASIC LOT	7022
BOOK	DCA/GWA-2019	———	CERT. OF TITLE No.	G.C. 4037
COMPUTED	CNB	MAY 2019	REGISTERED ON:	AUGUST 30, 1939
DRAWN	CNB	MAY 2019	IN THE NAME OF:	
RESEARCHED	CNB	APRIL 2019		THE UNITED STATES OF AMERICA
CHECKED	NCI	MAY 2019		
SATISFACTORY TO & APPROVED BY:				
SEE PLAN		DATE		
OWNER:				
Doc. No.				
DWG No.	DCA-S-18-101	SHT. 1 OF 2	SCALE 1:1250	L.M. CHECK No. 119-FY 2019

SPECIAL NOTE :

1. PURSUANT TO PL 28-126, SECTION 1(d), THIS IS A LOT PARCELING SURVEY MAP, AND THEREFORE EXEMPTED FROM THE MAP PROCESSING REQUIREMENTS OF PL 28-126, SECTION 1(a).
2. THE DIFFERENCE OF AREA BETWEEN COMPUTED AND RECORD ARE BASED ON FOUND CORNERS AND FIELD CONDITION.

LEGEND :

- GGN STATION
- FND. No. 4 REBAR WITH A BROKEN CAP, SET BY UNKNOWN, REPLACED WITH 0.102m x 0.102m x 0.457 CONC. MON. CENTERED WITH 0.064M DIA. BRONZE DISK MARKED GWA BOUNDARY / P.L.S. No. 65
- FND. No. 4 REBAR WITH CAP MARKED DLM - ONE FOOT DEEP, PLACED A 0.102m x 0.102m x 0.457 CONC. MON. MARKED PLS 65 ON TOP OF REBAR (SAME LOCATION)
- SET 0.102m x 0.102m x 0.457 CONC. MON. CENTERED WITH 0.064M DIA. BRONZE DISK MARKED GWA BOUNDARY / P.L.S. No. 65
- SET 0.102 x 0.102 CONC. MONUMENT WITH PLASTIC CAP MARKED PLS 65
- FOUND NO. 4 REBAR WITH PLASTIC CAP MARKED RLS 48, UNRECORDED
- FOUND 3/4 DIA. G.I. PIPE WITH BRASS TAG MARKED RLS No. 24, REF #5
- FOUND NO. 4 REBAR WITH PLASTIC CAP MARKED PLS 77, UNRECORDED
- SET No. 4 REBAR WITH PASTIC CAP MARKED PLS No. 65
- CONCRETE POWER POLE
- GUY WIRE
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SIGN POST
- WV WATER VALVE
- LAMP POST

AUTHORITY (GDOE) :

REFERENCE: PROFESSIONAL LAND SURVEYING SERVICES
FORMAT REQUEST FOR PROPOSAL: GDOE RFP 005-2019
PURCHASE ORDER No. 20191056

AUTHORITY (GWA) :

1. LAND SURVEY AGREEMENT BETWEEN GUAM WATERWORKS AUTHORITY AND DUENAS CAMACHO & ASSOCIATES Inc.; RFP GWA-2007-04, DATED NOVEMBER 19, 2007.
2. GRANT DEED Doc. No. 567559
   GRANTORS: GOVERNMENT OF GUAM AND / OR FORMER PUBLIC UTILITY AGENCY OF GUAM (PUAG)
   GRANTEE: GUAM WATERWORKS AUTHORITY (GWA)

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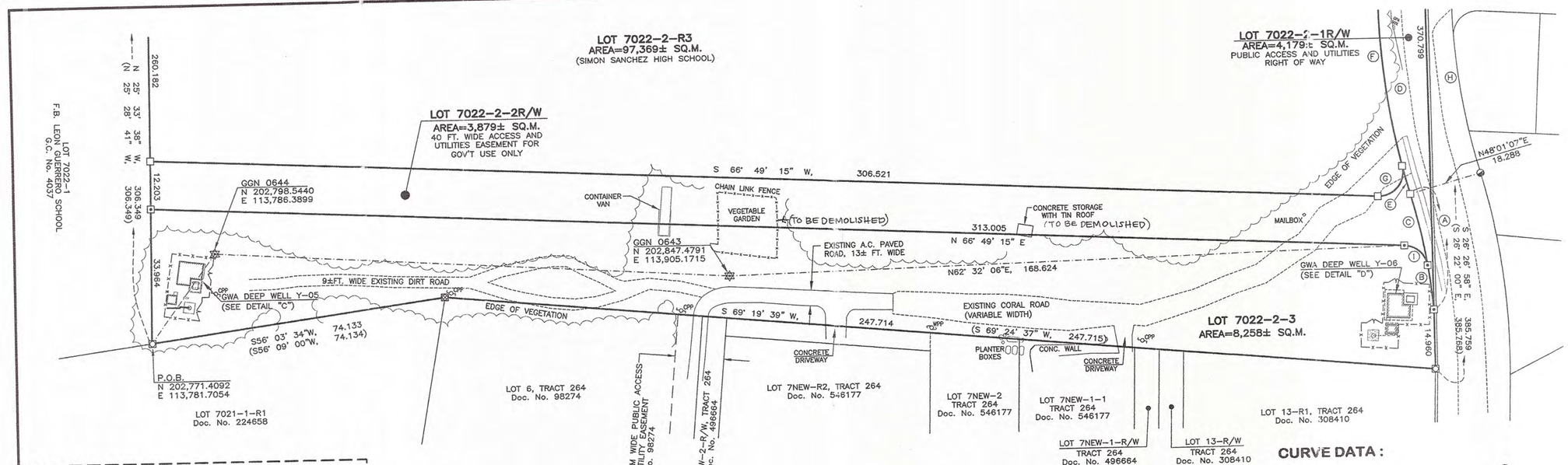

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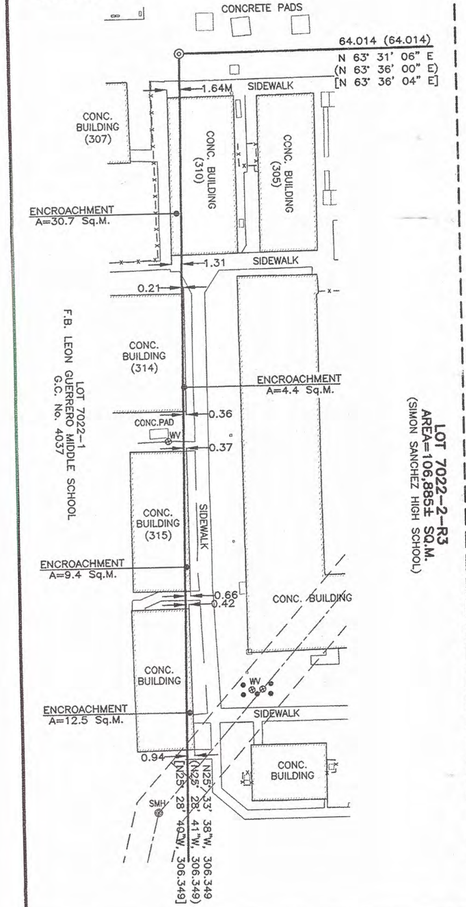

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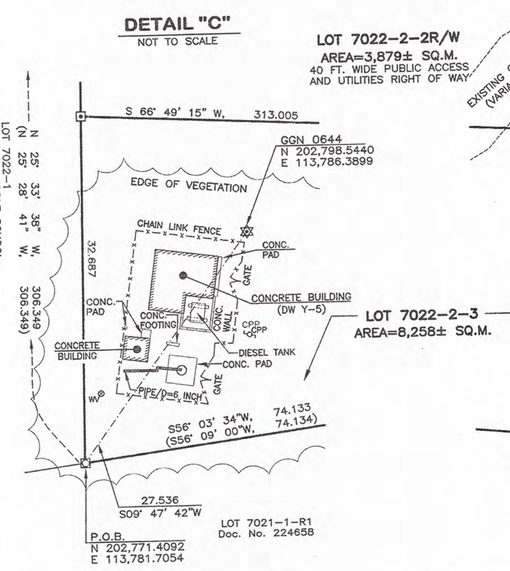

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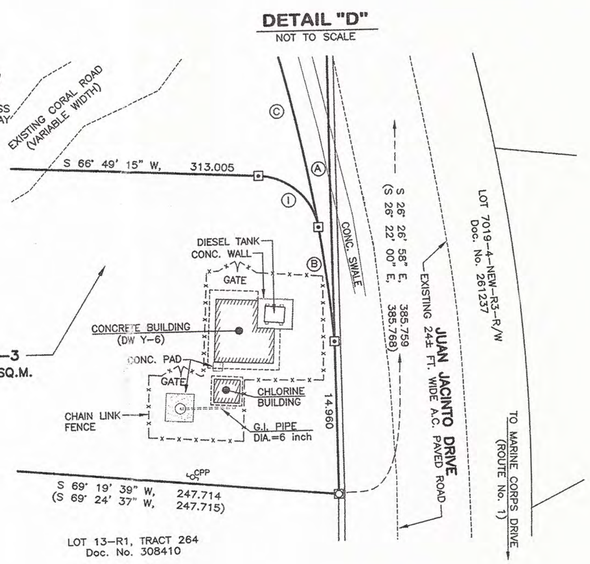

CURVE DATA :

Ⓐ	Ⓑ	Ⓒ
Δ = 11° 18' 26"	Δ = 04° 17' 13"	Δ = 07° 01' 13"
R = 151.034	R = 151.034	R = 151.034
L = 29.807	L = 11.301	L = 18.506
Ch = 29.758	Ch = 11.298	Ch = 18.494
ChB = N36° 19' 32"W	ChB = S32° 48' 56"E	ChB = S38° 28' 09"E

Ⓓ	Ⓔ	Ⓕ
Δ = 15° 32' 04"	Δ = 02° 16' 32"	Δ = 13° 13' 53"
R = 183.569	R = 183.569	R = 183.569
L = 49.771	L = 7.290	L = 42.392
Ch = 49.618	Ch = 7.290	Ch = 42.298
ChB = S34° 12' 44"E	ChB = S40° 48' 51"E	ChB = S33° 03' 38"E

Ⓖ	Ⓗ	Ⓘ
Δ = 106° 29' 50"	Δ = 15° 32' 04"	Δ = 78° 13' 12"
R = 6.096	R = 165.281	R = 6.096
L = 11.331	L = 44.812	L = 8.322
Ch = 9.769	Ch = 44.675	Ch = 7.691
ChB = N13° 34' 20"E	ChB = N34° 12' 44"W (N34° 11' 19"W)	ChB = N74° 04' 09"W

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recorder
File for Record is Instrument Number 952623
On the Year 2019 Month 11 Day 25 Time 1105
Recording Fee 90 Receipt No. 237996
Deputy Recorder
LISA M. CAMACHO

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

Nestorio C. Ignacio — 10/22/19
NESTORIO C. IGNACIO, PLS No. 65 — DATE

NESTORIO C. IGNACIO CERTIFICATE No. 65 EXP. 04-30-20 GUAM PROFESSIONAL LAND SURVEYOR

DUEÑAS · CAMACHO
* ENGINEERING * PLANNING * SURVEYING * ENVIRONMENTAL SERVICES
* GEOGRAPHIC INFORMATION SYSTEM * CONSTRUCTION MANAGEMENT GUAM
P.O. Box 8900, Tamuning, Guam 96931 / 238 E. Marine Corps Drive, Suite 201 Diamond Plaza, Hagatña, GU 96910-5194 / Tel: (671) 477-7991 / Fax: (671) 479-6315 SAIPAN Caller Box PPP, Suite 164, Saipan, MP 96950 / Chalan Palo Arnold, Ada's Building South Garapan, Saipan 96950 / Tel: (670) 234-9017 / Fax: (670) 234-3842

LOT PARCELING SURVEY MAP OF LOT 7022-2

(GDOE: SIMON SANCHEZ HIGH SCHOOL)
(GWA: DEEP WELLS Y-05 and Y-06)
MUNICIPALITY OF YIGO

L.S. 10 — SEC. 4

SURVEY DATA		DATE	LOT DATA
FIELD	MPG/AMJ & CREW	5-9-2019	BASIC LOT 7022
BOOK	DCA/GWA-2019		CERT. OF TITLE No. G.C. 4037
COMPUTED	CNB	MAY 2019	REGISTERED ON: AUGUST 30, 1939
DRAWN	CNB	MAY 2019	IN THE NAME OF:
RESEARCHED	CNB	APRIL 2019	THE UNITED STATES OF AMERICA
CHECKED	NCI	MAY 2019	

SATISFACTORY TO & APPROVED BY:
SEE SHEET 1 OF 2 — DATE
OWNER:
Doc. No.

DWG No. DCA-S-18-101 | SHT. 2 OF 2 | SCALE 1:300 | L.M. CHECK No. 119-FY 2019

686

ATTACHMENT B-3

— Final —

Archaeological Survey and Subsurface Testing in Support of Simon Sanchez High School Expansion, Yigo, Guam

GHRD RC 2016-0961

Prepared by:
Scott M. Fitzpatrick

Prepared for:
Taniguchi Ruth Makio Architects +
P.O. Box EA
Hagåtña, Guam 96932

INTERNATIONAL ARCHAEOLOGY, LLC
MARCH 2024

— FINAL —

ARCHAEOLOGICAL SURVEY AND SUBSURFACE TESTING IN SUPPORT OF SIMON SANCHEZ HIGH SCHOOL EXPANSION, YIGO, GUAM

GHRD RC 2016-0961

Prepared by:

Scott M. Fitzpatrick, Ph.D.

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International Archaeology, LLC

Guam Office
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Honolulu Office
2081 Young Street
Honolulu, Hawai‘i 96826

March 2024

ABSTRACT

At the request of Taniguchi Ruth Makio Architects +, Guam, International Archaeology, conducted archaeological survey and subsurface testing in support of the proposed expansion of Simon Sanchez High School, Yigo, Guam. The work described herein was required per Certificate of Approval No. 0504 from the Guam Historic Resources Division (GHRD). The work complies with Guam Executive Orders 89-9 and 89-24; Public Laws Title 21, GCA, Chapter 76; and the Department of Parks and Recreation, General Guidelines for Archaeological Burials, Section IV, Reburial Guidelines, as amended March 2010. The GHRD Review and Compliance (RC) number for this project is RC 2016-0961.

No archaeological deposits and no cultural resources were encountered during survey and subsurface testing. Results of the pedestrian survey and subsurface testing involving 46 shovel test pits revealed extensive post-World War II-era landscape modification and construction fill as evidenced by shallow, mixed, and/or fill deposits. These primarily date to the original construction of the school property as observed in the open grassy fields in the northeastern portion of the project area, and the generally shallow deposits and extensive debris/refuse push piles in the south/southwest portions of the area.

It is unlikely that subsurface archaeological deposits are still present in the project area. Additional archaeological testing and monitoring, therefore, is not recommended for the proposed project area or its immediate vicinity.

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I. INTRODUCTION

At the request of Taniguchi Ruth Makio Architects +, Guam, International Archaeology, LLC (IA) conducted archaeological survey and subsurface testing in support of the proposed expansion of Simon Sanchez High School, Yigo, Guam (Figure 1 to Figure 3). This work was required per Certificate of Approval No. 0504 from the Guam Historic Resources Division (GHRD). All work complied with Guam Executive Orders 89-9 and 89-24; Public Laws Title 21, GCA, Chapter 76; and the Department of Parks and Recreation, General Guidelines for Archaeological Burials, Section IV, Reburial Guidelines, as amended March 2010. The GHRD Review and Compliance (RC) number for this project is RC 2016-0961.

The proposed Simon Sanchez High School expansion project encompasses constructing several new buildings, renovating several existing buildings, and upgrading the associated parking lots and utilities. Archaeological pedestrian survey and subsurface testing covered an area of approximately 27.75 ac., including the undeveloped portions of the Simon Sanchez High school property, as well as part of the adjoining F.B. Leon Guerrero Middle School property.

J. Stephen Athens, Ph.D., was the Project Manager (PM) and Principal Investigator (PI) for the project. As PM, Dr. Athens was responsible for overall management, ensuring that appropriate research standards were maintained, ensuring appropriate personnel were selected to conduct the project, and providing research direction and oversight to ensure the client's needs were fully addressed. As PI, he provided overall project-specific guidance for the project, including assistance in the establishment of research goals and procedures as appropriate to the project scope of work, and oversight of project development, field investigations, and report

preparation. Scott M. Fitzpatrick, Ph.D. and Michael C. Mlyniec, M.Sc. were the Project Co-Directors (PD). Dr. Fitzpatrick and Mr. Mlyniec were responsible for conducting field investigations, and Dr. Fitzpatrick wrote the technical report. Barbara VanBenthuysen, B.A., Darrel Hardy, B.A., Zeth Lujan, B.A., and Emily van Zanten, B.A., served as field technicians for the project. Fieldwork was conducted over the course of seven days from February 22–25, 2022, and March 7–8, 2023. Dr. Athens, Dr. Fitzpatrick, and Mr. Mlyniec meet the institutional and professional qualifications in *The U.S. Secretary of the Interior's Standards and Guidelines on Archeology and Historic Preservation* (48 FR [Federal Register], 44716 ff, 29 September 1983).

This document is organized into five sections. Section I introduces the project. Section II summarizes the physical environmental characteristics and important cultural and historical background information for the project area. Section III discusses the research questions and expectations that guided the project and the field methods that were employed. Section IV presents the results of the fieldwork. Section V discusses the results in the context of the research questions, and also provides a conclusion and management recommendations. All references cited in the report are presented after Section V. Appendix A is the Guam Historic Resources Division Archaeological Report Summary Form.

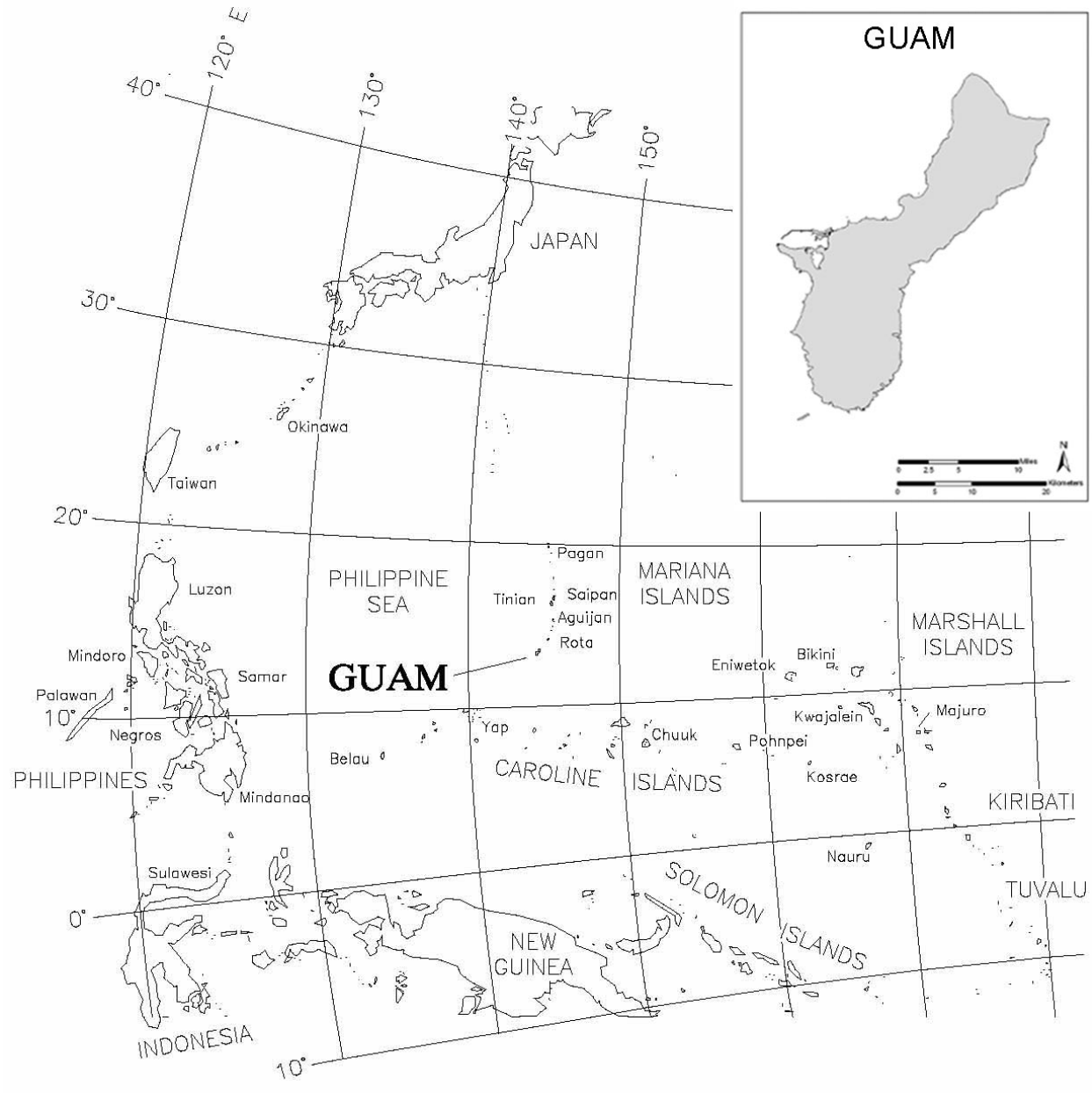

Figure 1. Guam in the Pacific.

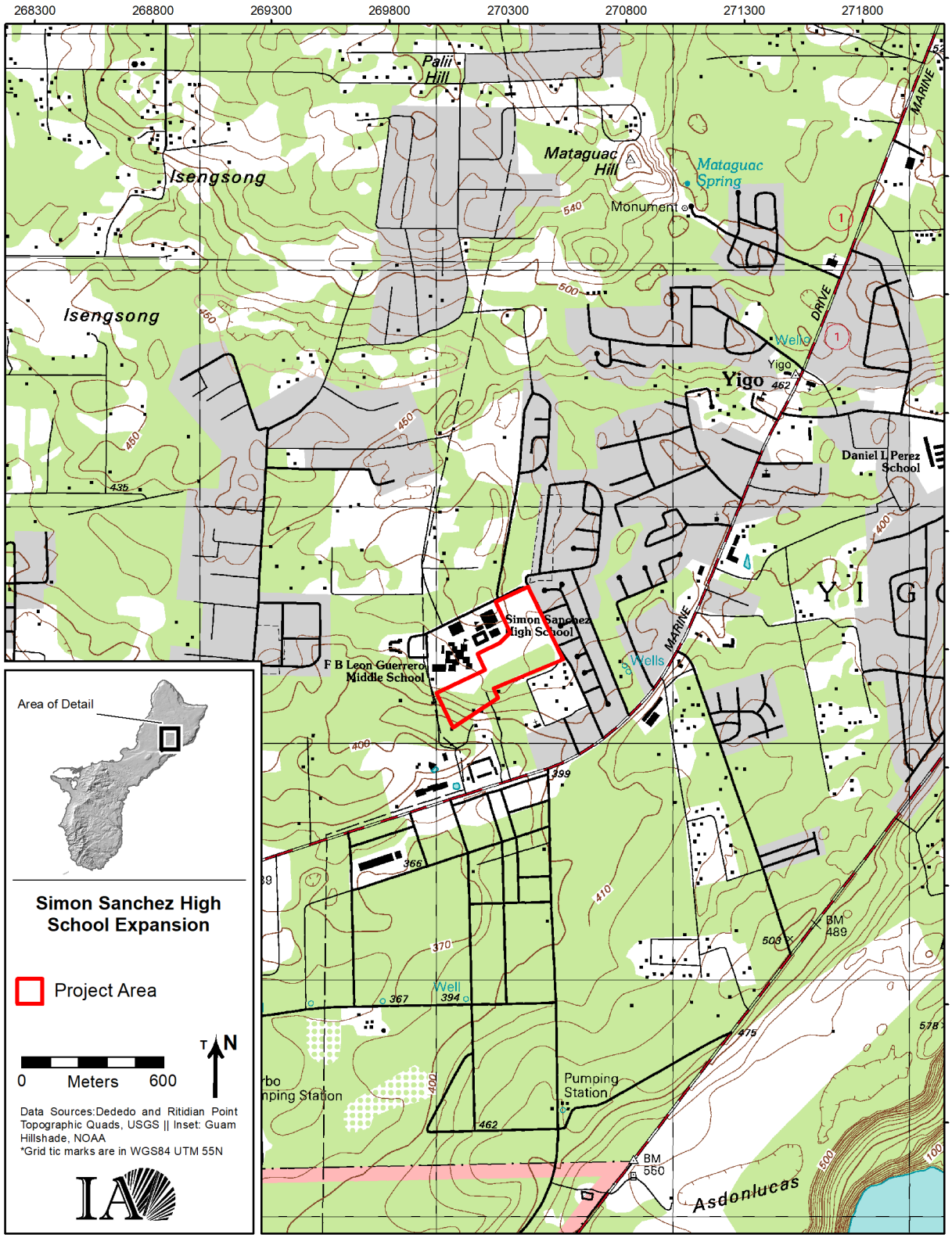

Figure 2. Project area on 2000 series USGS Dededo topographic quadrangle map (U.S. Geological Survey 2000).

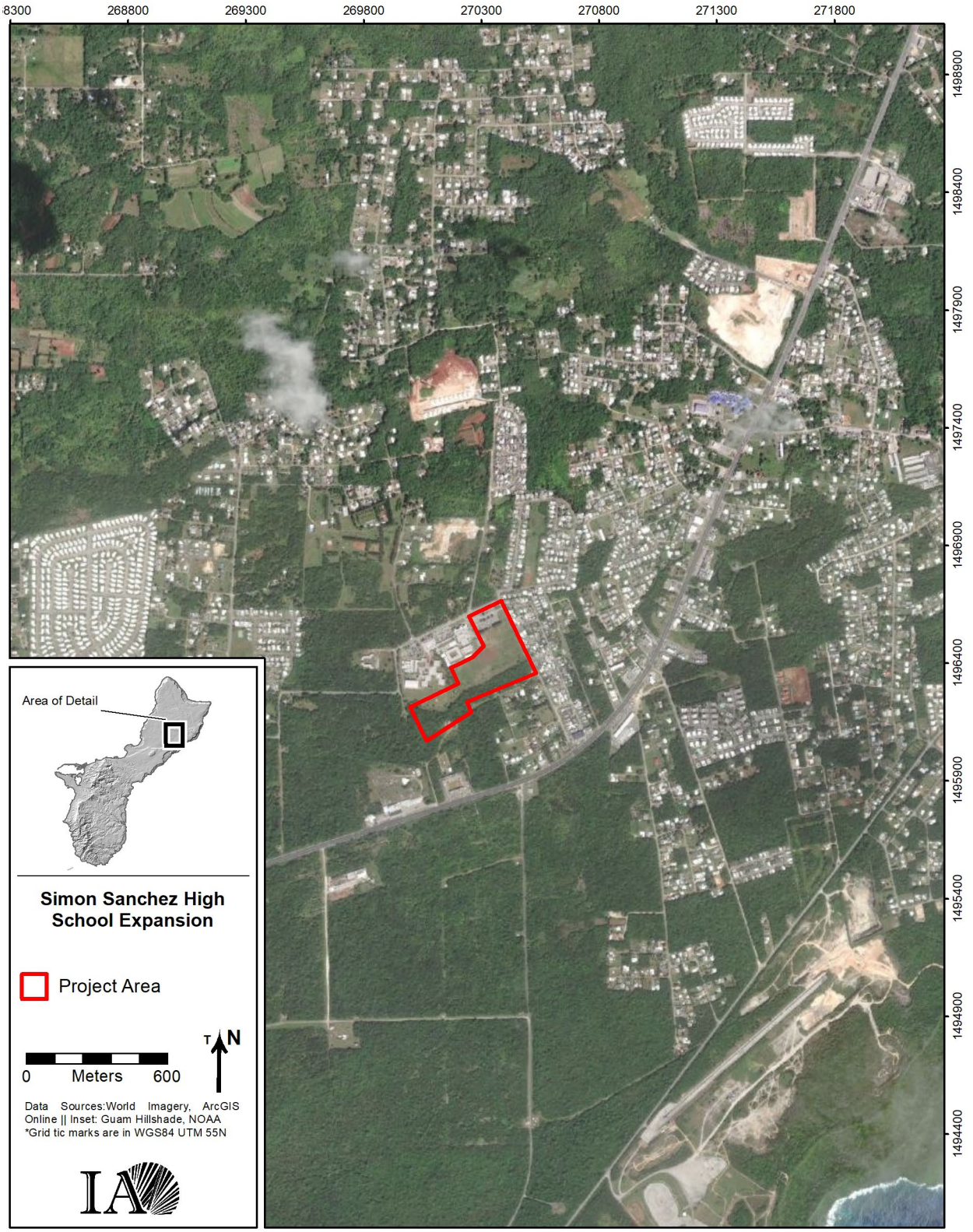

Figure 3. Project area on February 2020 orthomosaic image (World Imagery, ArcGIS Online).

II. BACKGROUND

This section presents relevant background information to contextualize the current project. This includes summaries of the physical environment of Guam and the project area, the cultural and historical context of Guam, land use history of the project area, and previous archaeological research in the vicinity of the project area.

PHYSICAL ENVIRONMENT

The project area is on the island of Guam, the southernmost of the Mariana Islands in Micronesia (see Figure 1). The Mariana archipelago is about 2,300 kilometers (km) southeast of Japan, 6,100 km west of Hawai'i, and 2,600 km east of the Philippines. Guam, at the southern end of the approximately 644 km long archipelago, is the largest island in both the archipelago and Micronesia as a whole. With a land area of 539 sq. km, Guam is roughly 50 km long and 6.4 to 12.9 km wide on a roughly northeast axis. It is near latitude 13°2' N and longitude 144°4' E. Guam's nearest neighbor island in the Mariana chain is Rota, which is 71 km to the north-northeast.

CLIMATE

The Mariana Islands are characterized by a tropical rainforest climate with a monsoonal weather pattern—a dry season from January through June and a wet season from July through December. Average annual rainfall is 258.67 centimeters (cm) with a standard deviation of 56.39 cm. The dry season receives an average of 79.20 cm and the wet season 178.33 cm. A south-to-north decreasing rainfall gradient in the Mariana Islands exacerbates dry conditions during the dry season in the northern islands. The winter dry season is associated with the easterly

trade winds, whereas calm and light winds prevail during the summer rainy season. Additionally, every three to four years, El Niño/Southern Oscillation (ENSO) events are likely (Lander 1994), potentially causing especially dry conditions during the dry season. From time to time, west to northwest moving storm systems and typhoons bring unstable weather to the Mariana Islands, particularly during the latter half of the year. On average about 18 cyclonic storms pass through the archipelago each year (Lander 1994:7). For Guam, each year typically has a 73.5 percent chance of a typhoon passing within 60 nautical miles, and a 38.2 percent chance of one passing within 10 nautical miles (Lander 1994:7).

VEGETATION

The United States Department of Agriculture (USDA) Forest Service defines 21 vegetation and non-vegetation classes for Guam, including limestone forest, ravine forest, scrub forest, *Leucaena* stand, *casuarina* thicket, *acacia* plantation, savanna complex, strand vegetation, other shrubs and grass, coconut plantation, agriculture field, urban built up, urban cultivated, mangrove swamp, marsh land, wet land, bad land, sand beaches and bare rocks, barren, and water (Liu and Fischer 2006).

The majority of the project area is classified as urban cultivated, a class that primarily includes maintained grassy areas around developed areas. A small pocket on the northern edge of the area is classified as urban built-up, a class that includes built-up areas such as buildings, roads, and parking lots. A strip along the southern edge of the project area is classified as scrub forest, a highly variable class resulting from long-term human disturbance to the native vegetation, which often includes breadfruit trees, coconut groves, bamboo clumps, patches of scrub forest, small cultivated areas, and patches of tangantangan (*Leucaena leucocephala*) (Liu and Fischer 2006).

GEOLOGY AND PEDOLOGY

The following discussion is summarized from Tracey et al. (1964) and Young (1988), which provide more detailed discussions of the geology and pedology of Guam. Geologically, there are two distinct physiographic provinces on Guam—a dry, generally flat limestone plateau in the north and a volcanic province of higher, gently rolling uplands and moderate to steep slopes descending into alluvial valleys in the south.

The northern half of Guam is composed of uplifted Neogene coralline limestone, overlying deeper igneous formations deriving from ongoing subduction processes in the Mariana Arc. This coralline limestone is not uniform in age or type. Most of the island's northern interior is composed at the surface of Mariana Limestone, a friable limestone that formed in an epipelagic environment during the Pliocene-Pleistocene (Tracey et al. 1964). Together with the Barrigada Limestone (a Miocene-Pliocene sedimentary unit with a benthic geogenesis), this forms the karstic plateau that comprises the northern half of Guam and represents a "nearly flat constructional platform of reef-associated limestone that has been lifted above sea level and tilted gently southwestward" (Tracey et al. 1964:A62). The plateau rises from an elevation near 60 m in the south along the Adelup-Pago Bay fault line, to greater than 180 m in the north at Mount Machanao and Pati Point.

The geology of southern Guam consists of rugged volcanic highland with some limestone outliers. The oldest exposed rocks are of Eocene and Oligocene age and comprise the Facpi and Alutom Formations, in the highlands from central to southern Guam. These formations contain a series of pillow basalts and pyroclastic rocks ranging from tuffaceous shale to coarse boulder conglomerate and breccia. The Umatac Formation dates to the Oligocene and late Miocene, located on top of the Alutom Formation. It consists primarily of reef and forereef limestone, tuff breccia and volcanic conglomerate, and basalt flows (Tracey et al. 1964:A62–A71).

Soil in the project area is classified as Guam cobbly clay loam (Figure 4), a very shallow, well-drained soil found on limestone plateaus. Young (1988:33), described the typical soil profile of this soil class as follows:

> … the surface layer is dark reddish brown cobbly clay loam about 5 centimeters thick. The subsoil is dusky red gravelly clay loam about 15 centimeters thick. Limestone is at a depth of 20 centimeters. Depth to limestone ranges from 5 to 41 centimeters. In some places, a thin layer of soft, fractured limestone is below the subsoil. The deeper areas commonly are nongravelly, and the shallower areas commonly are very gravelly.

HISTORICAL AND CULTURAL CONTEXT

The history of the Mariana Islands is divided into two broad eras. The pre-Contact era encompasses the initial settlement of the islands and the development of traditional CHamoru culture prior to European contact in AD 1521. The post-Contact era is defined by interactions between the CHamoru and a succession of colonizing powers up to the present day. Each era is subdivided into several periods. The GHRD defines 14 chronological periods for the history of Guam. Table 1 outlines the chronology of these periods, including date ranges and defining characteristics. The general history of the Marianas with a focus on Guam is summarized following the table, organized by era and period, to provide a context for understanding the place of the project area in these broader developments.

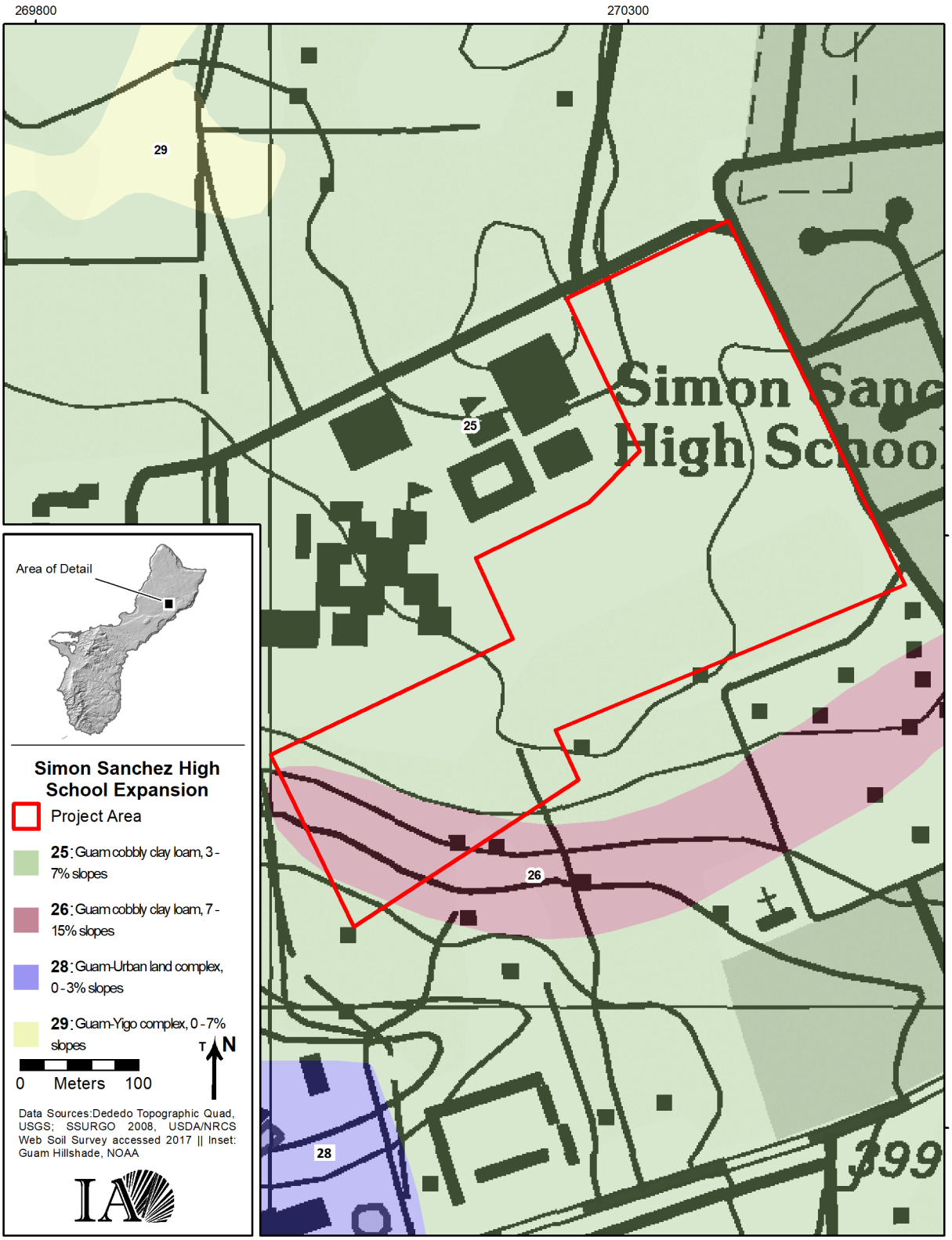

Figure 4. USDA soil classes in the vicinity of the project area (Soil Survey Staff 2021; U.S. Geological Survey 2000).

Table 1. Outline of GHRD-defined Chronological Periods.

Historic Period	Dates	Summary of Defining Characteristics
Early Pre-Latte Period	1500–1000 BC[1]	Thin-walled, typically calcareous sand tempered vessels (rounded jars, carinated jars and bowls, open bowls) with thinned or parallel rims (Type A); red-slipped (Marianas Red or Redware) or black-burnished; incised designs (Achugao and San Roque Incised); shell tools and ornaments common; chert tools; coastal settlement with a marine subsistence focus.
Middle Pre-Latte Period	1000–500 BC	Ceramic vessels on average slightly thicker-walled than preceding period, with calcareous sand and mixed calcareous-terrestrial sand temper; Marianas Redware still common but Achugao and San Roque Incised absent; bolder, impressed, lime-filled designs present; carinated vessels common; coastal settlement focus but archaeological and paleoenvironmental evidence for inland activities.
Late Pre-Latte Period	500 BC–AD 500	Thick-walled, large shallow bowls and pans with Type A rims; mixed sand temper most common; mat impressions and uncommonly Ipao Stamped decoration; deposits dating to this period found on all major islands; coastal settlement focus but expansion along river valleys occurred.
Transitional	AD 500–800	Ceramic attributes transition from unthickened (Type A) to thickened rims (Type B); flat bottomed pans disappear with rounded vessels more common; variety of tempers; typically, undecorated surfaces; open and rockshelter sites along coasts and interiors on all islands; agricultural soils dated to this period; terminal end of the period is marked by appearance of *latte* stone structures.
Early Latte Period	AD 800–1100	Defining characteristics are *latte* structures and thicker, larger vessels (particularly globular pots) with thickened rims; *lusong* and slingstones appear; *Tridacna* adzes become more common; settlement across all islands.
Middle Latte Period	AD 1100–1350	*Latte* structures, ceramics similar to the Early Latte Period; *lusong*, slingstones, and *Tridacna* adzes common; marine subsistence focus; major expansion into inland areas.
Late Latte Period	AD 1350–1521	Similar material culture and site patterning as Middle Latte Period, though with a higher proportion of very thick Type B rims; dense *latte* villages along coasts and suitable interior areas; highly developed agriculture and arboriculture; marine subsistence focus, including pelagic fishing (similar to earlier periods).
Pre-Colonial European Trade Period	AD 1521–1668	Period following Magellan's landing in AD 1521; indigenous material culture remains largely unchanged, but foreign materials such as iron and glass became available in limited quantities as did foreign animals; village settlement and subsistence patterns similar to the preceding period.

Table 1. Outline of GHRD-defined Chronological Periods.

Historic Period	Dates	Summary of Defining Characteristics
Spanish Missionization Period/CHamoru-Spanish Wars	AD 1668–1700	Arrival of Jesuit missionaries and soldiers and a concerted attempt to convert the CHamoru population to Christianity and change local customs; uprisings against Spanish aggression led to years of conflict; following subjugation, the Spanish implemented the policy of *reducción*, which involved removing CHamoru from other Mariana islands and forced settlement in villages in Guam; CHamoru population reduced in numbers through Spanish conflict and introduced diseases.
Spanish Colonial Period	AD 1700–1898	Spanish gubernatorial rule with rigid hierarchical system; settlement restricted to a few major villages; subsistence economy transformed to provide provisioning to galleons and other ships; maize introduced and became a staple crop; Catholicism and the church became fundamental structures for social life and organization.
First American Territorial Period	AD 1898–1941	U.S. Naval administration following the Spanish-American War; Guam served as a remote, but important, transportation and communication node: as a fueling station, site for the trans-Pacific cable, base for a naval radio station, and landing for the Pan-American trans-Pacific air clippers; minimal military defensive development.
World War II—Japanese Military Occupation	AD 1941–1944	Japanese military rule began December 10, 1941, with Japanese forces landing on the island and the U.S. naval commander surrendering; attempts to acculturate the local population to Japanese norms and culture.
Post-World War II/ Second American Territorial Period	AD 1944–1950	The recapture of Guam by U.S. forces resulted in a substantial military build-up of the island's defenses and offensive capabilities; post-WWII the island was administered by the U.S. Navy, but in 1949 a limited civilian government was established and in 1950 Guam was made an unincorporated U.S. territory.
Organic Act/Home Rule/ Economic Development Period	AD 1950–present	Establishment of a local, territorial government including an executive branch, legislature, and judiciary; U.S. citizenship for residents; economic development as a tourist destination after lifting of security clearance restrictions in 1962, as well as a result of a continued U.S. military presence.

[1] Bayesian calibration modeling by Rieth and Athens (2019) and Petchey et al. (2017) suggest that the earliest date for this period should be revised to approximately 1300 BC.

A Brief History of Archaeological Research in the Mariana Islands[1]

The earliest archaeological observations in the Mariana Islands were made by Commodore George Anson in 1742 when his six-ship squadron stopped at Tinian. Anson described the House of Taga ruins and a drawing was made of it by a junior officer. In 1819 a French expedition under the command of Louis de Freycinet stopped in Guam. Freycinet "collected a significant body of data relating to contemporary and ancient Chamorro culture, which he later compiled and published …" (Russell 1998:20). His draftsman, Jacques Arago, also visited the House of Taga on Tinian. Then in 1870, a report by Governor Felipe de la Corte provided observations concerning *latte* sites on Guam, Rota, and Tinian, the latter including the House of Taga. In the 1880s, Antoine-Alfred Marche, another Frenchman, visited the Mariana Islands to collect biological specimens, though he also had an interest in archaeology and the study of ancient societies. As Anson, Freycinet, and Corte had done earlier, Marche visited Tinian and the House of Taga, and he also went to Rota to see the large Mochong *latte* site. Marche then visited the remote Northern Islands, including Agrigan, Pagan, and Alamagan, where he documented *latte* sites and collected artifacts. His collective findings were presented in an 1889 report (Marche 1982). Olive y Garcia, Governor of Guam, produced a report in 1884 at the end of his administration that also included his observations concerning *latte* sites. He brought attention to the odd fact that the earliest Western visitors to the Mariana Island, the Spanish, had failed to note in detail "such notable and visible monuments" (Olive y Garcia in Russell 1998:25). With Germany's acquisition of Micronesia, Georg Fritz was appointed government administrator in

1. This section draws heavily on Russell (1998) and the website Guampedia.com.

Saipan in 1899. He had an avid interest in archaeology and ethnology, publishing his observations in 1904 (Fritz 1989).

The earliest systematic archaeological investigations in the Mariana Islands began with the work of Hans G. Hornbostel between 1920 and 1922 (Hornbostel 1924–1925). Though he was not academically trained, Hornbostel recorded and collected archaeological material over a four-year period in the 1920s under the auspices of the Bernice P. Bishop Museum in Honolulu. His collections amounted to more than 9,000 specimens, including *latte* stones, potsherds, stone implements, and skeletal remains. Hornbostel's wife, Gertrude, who was fluent in the CHamoru language, assisted with the compilation of texts with translations, lists of CHamoru family and place names, field notes on excavations, maps, and photographs. Though Hornbostel left extensive notes concerning his work, he did not formally compile and present his findings in reports and publications. Rather, it was Laura Maud Thompson, an American anthropologist employed by the Bishop Museum in Honolulu, who compiled his notes and collections in the volume *Archaeology of the Mariana Islands*, which was published in 1932 and was the first definitive volume on Guam and Marianas archeology.

Russell (1998:37) considers the work of Alexander Spoehr (1957) as marking the beginning of modern archaeological research in the Mariana Islands. His investigations were confined to surveys and stratigraphic excavations in Saipan and Tinian in 1949 and 1950. The study of pottery by stratigraphic layer was of particular interest to him as he recognized its value for understanding cultural and temporal changes. As a result of this work, Spoehr proposed that the prehistory of the Mariana Islands could be divided into two main phases or periods: a Pre-Latte Period and a Latte Period. The later Latte Period, with its distinctive thick-walled pottery, was associated with the stone *latte* monuments. The earlier Pre-Latte Period had a distinctive thin-

walled Redware pottery, some of which was intricately decorated with various incised designs. Thanks to Willard Libby's work on the radioactive decay of the carbon 14 isotope at that time, Spoehr was able to obtain an absolute time frame for his two periods. The earlier Pre-Latte Period, according to a radiocarbon determination on an oyster shell from a deep archaeological deposit, dated to 3,500 years ago. Another sample, from carbonized wood collected in deposits below a *latte* structure on Tinian dated to roughly 1,000 years ago, establishing the beginning date for the Latte Period. While archaeological research during the past 70 or so years has refined, adjusted, and/or expanded upon Spoehr's findings, his basic work still remains the underpinning of modern archaeological research in the Mariana Islands.

During the 1950s, Erik Reed documented *latte* villages and Spanish Period sites for the U.S. National Park Service (Reed 1952); Douglas Osborne, who was on Guam from 1945–1947, also had conducted a survey (Osborne 1946, 1947), but his work in the region focused mainly on Palau. Later, in the early 1970s, Fred Reinman's careful survey work on Guam documented dozens of *latte* villages and sites in what was, up to that time, the most systematic and thorough island-wide archaeological survey of Guam (Reinman 1977).

As explained by Russell (1998:47), historic preservation programs in the Territory of Guam and the Commonwealth of the Northern Mariana Islands were established in the late 1970s, along with both federal and local preservation legislation and funding. Coinciding with a construction boom largely fueled by Japanese development capital and tourism, the need for archaeological surveys, archaeological data recovery, and related investigations mushroomed to satisfy preservation laws and permit obligations. As the field of archaeology matured, this work brought with it new methodologies, techniques, and research orientations (e.g., paleoenvironmental research). Many of these later investigations are cited in the discussion below.

PRE-CONTACT ERA

The commonly cited date for the initial settlement of the Marianas is 1500 BC, and some researchers argue for earlier settlement in the 17th century BC (Carson 2010, 2012; Carson and Hung 2017; Carson and Kurashina 2012; Guam State Historic Preservation Office 2016; Hung et al. 2011; Russell 1998; Spoehr 1957). However, Bayesian modeling of data from sites with the most robust suites of high-quality (i.e. identified short-lived taxa from secure contexts) radiocarbon determinations suggests initial settlement more likely took place in the period 1280–1135 BC (3230–3085 cal. BP, 95.4% highest probability density) (Petchey et al. 2017; Rieth and Athens 2019). Initial settlement of the Marianas took place in the context of a broader dispersal of people out of Island Southeast Asia (ISEA) into the Pacific; however, the precise ISEA origin of the first settlers of the Marianas remains uncertain. Recent genetic studies using modern and ancient DNA (deoxyribonucleic acid) have produced varied results that may not be contradictory but rather are indicative of a complex migration process and genetically diverse migrants. Vilar et al. (2013:120–121) analyzed modern mitochondrial DNA (mtDNA) from individuals in the Marianas and their findings suggest Sulawesi and the Maluku Islands of Indonesia as the most likely origin of the founding population, which subsequently developed unique mutations in isolation after settlement. Liu et al. (2022), in their analysis of genome-wide data from ancient and modern individuals from the Marianas and other islands of Micronesia, find a homogenous East Asian ancestry for the earliest Mariana Islanders with no Papuan admixture. Later admixture with an initial Palauan lineage is estimated to have occurred between ~2400–1700 BP. Pugach et al.'s (2021) analysis of mtDNA and genome-wide single nucleotide polymorphism (SNP) data from two skeletal samples dating ~2000 cal. BP finds a closest similarity to modern Taiwanese and Philippine samples. Later admixture with an initial Palauan lineage is estimated to have

occurred between ~2400–1700 BP.[2] Pugach et al.'s (2021) analysis of mitochondrial DNA and genome-wide single nucleotide polymorphism (SNP) data from two skeletal samples dating ~2000 cal BP[3] finds a closest similarity to modern Taiwan and Philippine samples. An origin in the northern Philippines has also been argued based primarily on similarities in ceramic decorative motifs (Carson et al. 2013; Hung et al. 2011, 2012), but neither a detailed consideration of the ceramic evidence (Clark and Winter 2019; Winter et al. 2012) nor seafaring simulation models (Fitzpatrick and Callaghan 2013; Montenegro et al. 2016) support this. It has also been argued there was not a single founding population, but a series of groups, possibly from different origins, that visited intermittently and settled at various times during this early dispersal, eventually forming the population that developed traditional CHamoru culture (Hunter-Anderson and Eakin 2016). Evidence related to the initial settlement of the Mariana Islands, and its interpretation, remains in flux.

The original settlers brought with them from ISEA voyaging knowledge, technology, and canoes; a language that shares cognates with other Austronesian languages (e.g., Russell 1998:Table 3); and economic plants believed to have included aroids (taro and its relatives), banana, and yams, which supplemented the scant edible native plant inventory—primarily coconut, cycads, and one breadfruit species (Russell 1998:94). The settlers also brought artifact traditions from ISEA. These included red-slipped and lime-filled incised ceramic wares that resemble, in decorative techniques and sometimes in actual motifs, contemporaneous and earlier

[2] Liu et al. (2022:77) state that the sampled Latte Period individuals post-date 700 BP, and that admixture with the Palauan lineage occurred 45–50 generations prior to that time. Using a 28-year generation time span, the date of this admixture would have occurred about 2400 to 1700 BP (it is unclear if the Liu et al. dates refer to calibrated years before the radiocarbon present [AD 1950]). This problem aside, a five-generation variance in the estimated time for the admixture equates to 140 years and not 700 years as Liu et al. indicate.

[3] Pugach et al. (2021) and Carson (2017), which originally presents the radiocarbon date, also offer problematic date calculations. Without isotopic values to estimate the presumed marine component to the dated individual's diet and without a reliable deltaR value for Ritidian, accurate calibration parameters are uncertain.

ceramics from Indonesia and the Philippines (Hung et al. 2011, 2012; Winter et al. 2012). Other material traits shared by the Marianas and ISEA include ceramic bowl and jar forms and calcareous sand temper, polished stone tools including certain adzes with cross sections found in the Philippines, and shell artifacts (e.g., Thiel 1987).

Developments subsequent to initial settlement are divided archaeologically into three periods based on changes in ceramics and other aspects of material culture over time—the Pre-Latte Period (1500 BC–AD 500), the Transitional Period (AD 500–800), and the Latte Period (AD 800–1521). Defining aspects of the material cultural assemblages, settlement patterns, subsistence, and other aspects of CHamoru culture in these periods are summarized below.

Pre-Latte Period (1500 BC–AD 500)

The best studied feature defining Pre-Latte Period assemblages is pottery. Based on changes in ceramics, the period is subdivided into Early (ca. 1500–1000 BC), Middle (1000–500 BC), and Late (500 BC–AD 500) phases (Leidemann 1980; Moore 1983, 2002). The defining pottery of the Early and Middle phases is the ware type known as Marianas Red. This pottery is a generally thin-walled earthenware tempered primarily with calcareous sand, often made red through the application of a slip, paint, or film, and typically with thinned, vertical or everted (Type A) rims. The most common early vessel forms were small bowls and jars with a carinated shoulder. Although the term Redware has often been preferred since it was coined by Spoehr (1957:117), the term Early Calcareous Ware has also been suggested due to some early authors applying the term Redware inconsistently to different pottery types and the fact that not all of the earliest sherds with the same characteristics are red. Red was the most common color, but gray- or black-slipped sherds and, more rarely, unslipped or buff-slipped sherds are also found. The

black-slipped sherds—as well as the gray, which are likely faded black-slipped sherds—have sometimes been termed separately as "black ware" or "black-burnished" (Butler 1995:171; Carson and Hung 2017:43; Hunter-Anderson and Butler 1995:49–50; Moore 2002:7–9; Pellett and Spoehr 1961:323).

The most distinctive Redware sherds are those bearing decorations, which occur in small numbers at most early sites. The earliest decorative styles are known as Achugao and San Roque incised decoration. The Achugao style consists of pairs of fine, parallel, incised lines, typically in rectilinear designs, but also in curvilinear patterns, with rows of stamped circles between or around the lines and negative space filled with a series of fine dentate punctuations. The San Roque style consists of stamped circles connected by fine, incised lines in curvilinear patterns. Both styles are on the neck of vessels, between the rim and carinated shoulder, and both were often filled with slaked lime to highlight the designs in white. The Achugao style is found in equal frequency on red- and black-slipped sherds, while the San Roque style occurs almost exclusively on red-slipped sherds. Although they are roughly contemporaneous, it appears the San Roque style may have been introduced later or remained in use longer than the Achugao style (Butler 1995:191–202; Moore 2002:7–9).

From the early pottery described above, a number of changes occurred over the course of the Pre-Latte Period. In general, vessels became larger with thicker walls over time, and carinated shoulders gradually disappeared. In the Late Pre-Latte, thick-walled, flat-bottomed shallow bowls or pans were prominent. The function of these vessels is uncertain, and they have been tentatively presented as griddles, earth oven pans, salt drying pans, communal serving dishes, or boat stoves. The frequency of black-slipped pottery decreased early in the period and slipping of all colors eventually disappeared. Temper also changed, as primarily calcareous sand tempers were replaced

by or mixed with volcanic sands in increasing frequency. The Achugao and San Roque incised decorations were replaced first by a style known as Ipao Stamped, which consists of bold lines, circles, half circles, and chevrons in simple patterns, appearing on the shoulder and often lime-filled. This style also disappeared over time, and by the end of the period the only decorations were simple incised or stamped designs along the rim of vessels. The simplification in ceramic vessel forms and decoration over this period may be related to an increase in population, allowing for more vessels to be produced with less effort, but the cause of these changes has not been well studied (Carson 2016:189; Hunter-Anderson and Butler 1995:49–54; Moore 2002:7–12; Moore and Hunter-Anderson 1999).

The early settlement pattern in the Marianas appears to be one of small groups living along sandy shorelines with easy access to marine resources, fresh water sources, and suitable cultivable land. These settlements were established during the mid-Holocene highstand, when sea level was ca. 1.8 m higher than at present (Dickinson 2000, 2001). At that time, many of the current low-lying coastal areas were not available for settlement. The shorelines at the time consisted of fewer sandy beaches and more embayments and estuaries with marshy environments. There is evidence that the earliest settlements consisted of houses built on poles or stilts around these shoreline features and that, while the inhabitants primarily made use of protected fishing and shellfish gathering grounds, they also made forays into the interior to hunt and forage. It has also been suggested that the earliest sites represent only short-term encampments for small groups who visited the islands intermittently—surviving on marine resources during their short stays—but did not found permanent settlements for 500–1000 years after the discovery of the islands (Carson 2016:140–142, 157; Graves and Moore 1985:159–162; Hunter-Anderson and Eakin 2016; Russell 1998:91–100).

Over the following centuries, environmental changes related to the sea level drawdown precipitated changes in settlement patterns, subsistence strategies, and material culture. Settlements shifted inland onto stable backbeach areas, becoming denser and more spatially distinctive. There is evidence of increased use of inland areas and temporary habitation of the interior. A successful, established population is suggested by the increased number of sites and the diversity of settings ranging from open-air locales along or near the coast, coastal and near-coastal caves and rock shelters, and a few inland caves. As the shorelines slowly began to form their present stance, settlements shifted to make use of more stable land along the coast (Amesbury et al. 1996; Carson 2016:183, 187–193, 211, 213).

Pre-Latte Period sites are known on the north, west, south, and east coasts (Moore 1983:45). These include sites at Ritidian (Carson 2017), Tarague (Moore 1983), Ypao (Leidemann 1980), Merizo (Kurashina et al. 1983), Mangilao (Dilli et al. 1998), and the Talofofo River valley (Reinman 1977). Most Pre-Latte sites throughout the Marianas occur along former shorelines, at the bases of cliffs near beaches (e.g., Bath 1986:Fig. 71), or in rockshelters—all located at least 2 m above sea level. The pattern reflects coastal settlement in relation to higher sea levels before ca. 500 BC (Allen 1990; Allen et al. 2002:13; Amesbury et al. 1996; Athens and Ward 1993, 1995, 1998; Dickinson 2000; Easton et al. 1978). An uncalibrated radiocarbon date processed by Reinman (1977:30) for Talofofo provides possible evidence of a move into a major river valley in the south ca. 250 BC, during the Late Pre-Latte phase. Although few inland sites have been documented for the Pre-Latte Period, several rockshelters and caves in the Naval Ordnance Annex along the upper tributaries of the Talofofo River have produced evidence of Pre-Latte occupation (Allen et al. 2002). More recent Bayesian modeling of radiocarbon dates for the Talofofo River

valley indicate initial settlement of the area occurred sometime in the period 310 BC to AD 70 (Tomonari-Tuggle et al. 2018a:70).

Although archaeologists have not recovered any stone habitation remains or other permanent architecture at well-researched Pre-Latte Period sites (Athens 1986; Kurashina et al. 1983; Kurashina and Clayshulte 1983; Liston 1996; Moore 1983), post molds at Tumon (Matapang, Tumon Ball Park) (Bath 1986:50, 116), Ritidian (Carson 2017), Unai Bapot[4] (Carson and Hung 2017), and House of Taga (Carson 2018) suggest former structures were made of wood and thatch.

Compared to pottery, the understanding of the nature and variability of other aspects of the Pre-Latte Period assemblage is less developed, but some trends have been suggested. Throughout the period, and extending into the Latte Period, marine shell, most often *Tridacna*, was the most common material for adzes and other cutting and chopping tools. Alongside this, chert was a common material early in the period, which later declined and fell out of use. Volcanic stone was used at a lower frequency than either shell or chert throughout the period but rose in frequency as chert declined. Beads made of thin ground *Cypraea* shells are found at the earliest sites, but not later. Beads of *Conus* shell were made throughout the period and into the Latte Period, but they became coarser and less polished over time. In general, as with pottery, other types of shell ornaments appear to have become less refined and less labor intensive over time (Carson 2016:111–112, 151–153, 176, 189; Mangold 1998:224).

[4] The commonly used name of this site on Saipan, Unai Bapot, is used here and elsewhere in this document. The grammatically correct term in CHamoru would be Unain Bapot.

The shift in ceramic forms from the early to the later part of the Pre-Latte Period may represent a shift in the preferred cooking method, as the shallow, flat-bottomed pans that became common toward the end of the period would be better suited to baking food in an earth oven rather than cooking on an above ground hearth. A potential shift toward more communal eating among larger groups, and a shift toward greater reliance on terrestrial rather than marine food sources, is also suggested (Moore and Hunter-Anderson 1999). Although Pre-Latte Period foodways have not been well studied, it is likely that plant food sources, both introduced and indigenous, such as breadfruit (*Artocarpus mariannensis*), coconut (*Cocos nucifera*), taro (*Colocasia* sp.), yam (*Discorea* sp.), and others were likely an integral part of the diet during this time (Moore 2015; Russell 1998:165).

Fishing appears to have been important from the earliest part of the Pre-Latte Period. Fishing gear, including J-shaped rotating hooks made of shell and net weights made of ceramic or limestone have been found from the earliest layers through the entire Pre-Latte Period. Possible but unconfirmed trolling lures have been found from the middle of the period. Analysis of faunal remains shows that reef fishes—most commonly parrotfish—made up the largest percentage of individual fish caught. However, pelagic species, which averaged 16 percent of individuals among 10 assemblages studied in detail, undoubtedly accounted for the majority of the weight of fish consumed. Unique among the Pacific Islands, a number of pelagic species are represented among Marianas faunal assemblages, including mahi-mahi, marlin, and tuna (Amesbury 2013; Carson 2016:112, 153–154). Regarding shellfish exploitation, bivalve collection was clearly emphasized during the Pre-Latte Period, in contrast to gastropods that overwhelmingly predominate in Latte Period middens (Amesbury 1999). As discussed by Amesbury, the reason for this change may be

the result of loss of mangrove habitat that gradually occurred with the late Holocene ocean highstand drawdown.

Mortuary practices in the Pre-Latte period are poorly studied compared to those of the Latte Period, as few Pre-Latte period burials—and none from the earliest part of the period—have been excavated. This may be due in part to the same factors that make intact Pre-Latte sites difficult to find and excavate in general. It is also possible that the earliest mortuary practices did not involve internments that would be preserved to the present day, or that burials took place away from residential areas in locations that have not yet been discovered and excavated. It has also been suggested that the lack of discovered burials from the earliest part of the period may indicate that no permanent settlements had yet been established. Nevertheless, some generalizations may be made based on the few burial assemblages that have been excavated. The oldest and largest excavated assemblage of burials from this time is the 155 burials at the Naton Beach site on Guam, which date between 860–410 BC. Most notably, compared to the Latte Period burials from the same site, the Pre-Latte burials had a much higher occurrence of grave goods. This was most commonly *Conus* shell beads and bracelets, but a variety of other items including shark teeth, ceramic vessels, bone tools, fishing gear, and shell adzes were also found. Grave goods were found with burials of both sexes, but beads were more commonly found with female burials. Most burials were in an extended supine position with the feet toward the shoreline. They were clustered in groups of mixed sex in a way that suggested they may have been interred around residences and grouped by kinship, a practice that was later documented by early European visitors to the islands (Carson 2016:193; Hunter-Anderson and Eakin 2016; Walth 2015:283, 320–321, 349–351, 358). A group of Pre-Latte Period burials at the Tumon Ball Park on Guam were similarly arranged around post-molds in a way that suggested they had been buried around residences (Bath

1986:116). On Saipan, 12 burials were excavated in a layer associated with Pre-Latte Period pottery within a rockshelter on Laulau Bay. All were in extended supine position in pits lined on the bottom with beach sand (Spoehr 1957:52–58). It is possible that burial within rockshelters and caves was practiced more widely during the Pre-Latte Period. Late-19th and early-20th century visitors noted the common finding of human remains within caves in the Marianas. However, due to bone collecting by those early visitors, the use of caves by civilians and military personnel as shelters during World War II (WWII), and more recent Japanese war dead recovery missions, most such sites have been heavily disturbed, and it has not been possible to study them (Hunter-Anderson and Butler 1995:58).

Transitional Period (AD 500–800)

The Transitional Period is defined by gradual changes in ceramic attributes from those of the Late Pre-Latte Period to those of the Early Latte Period, with no sharp division between the two (Sant and Lebetski 1988:252). Archaeological evidence suggests continued, though limited, expansion into the Guam interior (Dye and Cleghorn 1990). The typical Late Pre-Latte pottery vessel forms drop out early in this period (Butler 1995:225–226). Lime-filled impressed and incised decorations no longer occur on ceramic vessels (Moore 1983). Wall thickness declines over time and vessels with more rounded bottoms replace the flat-bottomed bowls (Moore 1983; Sant and Lebetski 1988). Hemispherical bowls of widely varying sizes are typical of this period. Volcanic sand temper and mixed volcanic and calcareous sand temper become more common, although apparently not in a simple, temporally continuous pattern. Ceramics associated with the Transitional Period generally have thicker rims. This period does not have a sharp distinction from the Latte Period. However, by AD 1000 ceramics in the archaeological record are more consistent

with those of the Latte Period, and the hallmarks of the Pre-Latte ceramic tradition are no longer seen (Sant and Lebetski 1988:252).

Latte Period (AD 800–1521)

The Latte Period dates from ca. AD 800 until the first contact between the CHamoru and Europeans in AD 1521. The appearance of *latte* structures and changes to the ceramic assemblage are the primary markers of the beginning of the Latte Period, although several other changes to the overall assemblage are also noted. *Latte* are two-part columns consisting of a pillar (*haligi*) topped with a hemispherical capital (*tasa*). *Latte* elements are made of limestone or volcanic stone, and coral heads were sometimes used as *tasa.* *Latte* were arranged in parallel rows to make sets of 6–14 columns that served to support wood and thatch residential structures. The ceramics of the assemblages associated with *latte* are generally thicker and less refined than earlier ceramics, with limited decorations, thickened rims, and a preponderance of large globular vessels. An increase in the number of volcanic stone tools and large volcanic stone mortars (*lusong*) are also characteristic of this period (Hunter-Anderson and Butler 1995:28, 40, 50; Russell 1998:103–108).

The start of the Latte Period is difficult to define chronologically. Although the features described above combine to define the period as an archaeological complex, it appears they developed at different times, and possibly from different sources. The Latte Period ceramic complex was the result of gradual changes from the earlier ceramic types, which had developed into the ceramics typical of the Latte Period by around AD 1000 (Hunter-Anderson and Butler 1995:50). The marked increase in the use of volcanic stone appears to have occurred around AD 950–1150, although the reason for this change is not fully understood (Mangold 1998:224). The appearance of *latte* architecture is often dated to AD 1000, however, most dates reported in

association with *latte* sets are not from contexts directly associated with the construction of the *latte*, and the actual date for the earliest appearance of *latte* is not known beyond the generalized start date for the Latte Period (Tomonari-Tuggle et al. 2018a:73–74).

The Latte Period was a time of expanding settlement patterns, intensifying the use of optimal coastal sites and expanding to interior and more marginal areas, as well as expanding into the islands north of Saipan (Russell 1998:100). *Latte* sets are sometimes found individually but are more often in hamlet or village groups ranging from as small as two to three sets to as many as 50. The majority of *latte* sets have eight columns, and 10-column sets are the second most common. Typically, one 10-stone *latte* set is associated with a cluster of several eight-stone sets. Larger village groups typically consist of *latte* sets arranged in multiple linear rows or of several non-linear clusters (Craib 1986:168–169). *Latte* villages were primarily at or near the coast (Reinman 1977; Thompson 1932), but there were also large inland locations, especially in the southern highland region (Henry et al. 1998a, 1998b; Welch 2010a). Well-known coastal sites include those in Tumon and at Nomna and Tarague; inland *latte* include, among others, those in Manenggon and the Guam Naval Ordnance Annex (Allen et al. 2002; Hunter-Anderson 1994a, 1994b, 1994c; Hunter-Anderson and Moore 2002; Reinman 1977; Thompson 1932). It has been suggested based on data from sites in the Manenggon Hills area of Guam and from the Alaguan and Gampapa areas on Rota that the permanent settlement of interior and marginal coastal sites occurred in pulses, beginning in the 1200s, peaking in the 1400s, and showing a smaller peak in the 1600s, with declines in the 1300s and 1500s (Butler 1997:326; Hunter-Anderson 2012). Hunter-Anderson (2012) suggests the pattern of expansion into inland and marginal areas may be associated with climactic changes due to the Medieval Warm Period, a time of reliable rainfall and

overall good agricultural conditions from AD 800–1350, and the Little Ice Age, a time of frequent drought and less stable conditions from AD 1350–1900.

Latte Period villages supported populations of 100 to 1,000 individuals. The social organization of the residents of these settlements has been described in various ways. European visitors, such as Freycinet in 1819, described three classes of social stratification, with paramount chiefs above all, such as Taga on Tinian (Russell 1998:20). However, it has also been described as being organized around lineages, with important men as their heads or elders (Cordy and Allen 1986:21–22). The largest *latte* stones ever erected are the 16-foot tall stones at the House of Taga on Tinian. Even larger are the partially excavated stones in the quarry at As Nieves on Rota, which would have stood 18 feet tall if erected (Morgan 1988:133, 136). In general, it appears the size of *latte* stones increased over time, and it is thought that these exceptionally large stones were the result of competition between villages. The date these large stones were quarried is unclear, and it has been speculated they were not constructed until the 16th or 17th centuries, perhaps with the aid of iron tools (Butler 1997:323; Craib 1986:174; Hunter-Anderson 2012:164).

Some small, short *latte* uprights found in inland locations, either associated with larger sets or alone (e.g., Allen et al. 2002:85–87, Site 66-02-1661) are interpreted tentatively as supports for field or work structures. Study of two adjacent *latte* structures at the Ritidian site in northern Guam has suggested that single households sometimes utilized multiple *latte* structures for distinct purposes. Artifacts related to subsistence activities were concentrated at one structure, while artifacts related to tool production and other crafts were concentrated at the other. The nature of the artifacts between the two structures may further indicate a gendered divide, with typically male activities taking place at one structure and typically female activities at the other (Bayman et al. 2012).

Changes to the ceramic assemblage are also a signature of the Latte Period. Marianas Plainware, a pottery type characterized by thick walls, rims with thickened lips, no slipping, and minimal decoration, replaced the earlier Marianas Redware. Decoration is limited to incising on vessel shoulders and notches and finger impressions on vessel lips (Moore 2002:12–14; Spoehr 1957:109–116). Clay paste is typically coarse, with a high frequency of volcanic sand temper and less calcareous sand temper. Relatively tall, thick-walled, globular, or conoidal vessels with restricted orifices were common. Butler (1990) suggests that this development of new vessel forms reflects an increased reliance on boiling of starchy foods. The forms and larger sizes of these vessels relative to Pre-Latte ceramics also suggest increased storage capacity for water and food. The Latte Period ceramic complex was the result of gradual changes from the earlier ceramic types, which had developed into the ceramics typical of the Latte Period by around AD 1000 (Hunter-Anderson and Butler 1995:50).

Around the start of the Latte Period, volcanic stone such as basalt and andesite became the predominant material used for stone tools such as adzes, pestles, and scrapers, and large volcanic stone mortars (*lusong*) became common. Sources of volcanic stone are limited in the southern islands of Saipan, Tinian, Rota, and Guam, and it has been speculated that much of the volcanic stone used in the Latte Period was imported from the volcanic islands north of Saipan (Mangold 1998:224; Spoehr 1957:131). However, little research into the sourcing of volcanic stone artifacts from this period has been published, and the reason for the increase in the use of volcanic stone remains unclear. In a study of nine volcanic stone artifacts from Guam, Rota, and Tinian, Mangold (Mangold 1998:228) found that the Umatac Formation in southern Guam was the most likely source for seven of the nine, while the remaining two were sourced from either the Umatac Formation or from the northern islands of Agrigan or Anatahan.

Latte Period subsistence maintained a focus on fishing for both reef and ocean species, and the species represented among faunal remains from this period are similar overall to those from the Pre-Latte, with no confirmable changes over time. Rotating hooks and limestone net weights remain common through the Latte Period, but a number of new items also appear, including V-shaped gorges, trolling lures, and octopus lures (Amesbury 2013; Carson 2016:111–112). Also important were the collecting of other marine resources, agriculture, foraging, and hunting of birds, bats, and lizards. Unlike most other islands settled in Remote Oceania, colonists did not bring pigs, dogs, or chickens (these animals and others were introduced after Spanish contact). Breadfruit (*Artocarpus mariannensis*), yams (*Dioscorea* spp.), and aroids (*Colocasia* sp. and others) were the staple crops during this period. Bananas (*Musa* spp.) and sugarcane (*Saccharum* spp.) were also important. Significantly, rice (*Oryza sativa*) was introduced at this time. Basalt or limestone *lusong* are commonly found at latte sites and may indicate an increased reliance on pounded food processing, possibly including rice and the nut of the cycad (*Cycas micronesica*) (Hunter-Anderson et al. 1995; Moore 2015; Russell 1998:165–196). Shellfish consumption in the Latte Period is notably different than the Pre-Latte Period at most sites, with Latte Period midden deposits comprised primarily of gastropods such as *Gibberulus gibbosus* rather than the bivalves that were favored earlier. This shift is thought to reflect a change in the shoreline environment from the mangrove habitats that supported the previously preferred species such as *Anadara antiquata* to sand flats preferred by *Gibberulus gibbosus.* A notable exception to this is southern Guam, where mangroves persisted and *Anadara antiquata* remained a common species in Latte Period midden deposits (Amesbury 2007).

Mortuary practices in the Latte Period have been well studied, as a large number of burials from this time have been excavated. Burials of this time are most commonly in an extended supine

position interred around or within extant *latte* stones or arranged in a way that suggests they were interred around *latte* stones that have since been removed or around wooden structures. These are often in mixed sex groups, suggesting burial in kinship groups; however, some clusters dominated by male or female burials have been found, suggesting they were possibly buried around a gender-specific dwelling. Grave goods in the Latte Period are less common compared to the Pre-Latte Period and vary in frequency between assemblages (Hunter-Anderson and Butler 1995:57, 60; Walth 2015:347–349, 359). For example, at the Naton Beach site, almost half of the 212 Latte Period burials included at least one item of possible grave goods. These were most commonly shell adzes, but also included fishing gear, ceramic vessels, bone tools, slingstones, and beads (Walth 2015:344–346). At the site of the Imperial Pacific International Casino (Site SP-0762) on Saipan, on the other hand, although some burials contained fishing gear, shell adzes, shell pendants, and *Spondylus* shell beads, the majority of the 418 burials contained no identifiable grave goods. Notable exceptions to this pattern included one burial that was covered in a cache of 150 slingstones, and another with a cache of 29 slingstones (Dega et al. 2017:125, 175). Earlier, unpublished work at the same site recorded two additional burials with large slingstone caches, including one with 460 stones and another with more than 200 (Randy Harper, personal communication 2020). Aside from the most common extended supine inhumations, other less common practices include flexed burials, bundle burials, and cremation. Burial in caves was also practiced, although, for reasons discussed in the previous section, it has not been possible to study this practice in depth. Unique burials have included a woman apparently buried in a canoe and a child buried inside a large ceramic vessel (Dega et al. 2017:176; Hunter-Anderson and Butler 1995:57–61).

Several other common mortuary practices relate to the removal and reuse or reburial of individual skeletal elements. The use of human bone for tool and weapon production is well documented ethnographically and archaeologically, and numerous burials have been documented missing long bones, in particular leg bones (McNeill 2005). Crania were also removed for ritual use by the CHamoru according to ethnographic sources, and numerous burials with missing crania have been found. Occasionally, individual elements were reburied, as isolated crania and groups of long bones have sometimes been found. In one unique case, five additional crania were buried around a single individual (Dega et al. 2017:154; Hunter-Anderson and Butler 1995:60; McNeill 2005; Russell 1998:153).

It has long been suggested that the changes associated with the Latte Period were the result of an influx of new people that brought these new cultural traits with them to the Marianas (Russell 1998:112). Recently, evidence from a study of modern CHamoru genetics has been used to suggest a second migration of people from ISEA during the Latte Period, though a genetic origin of the characteristic B4 lineage inclusive of the C16114T mutation from neighboring Yap and the Caroline Islands cannot be discounted at this time (Vilar et al. 2013). On the other hand, a breadfruit hybrid present in the Marianas (Zarega 2003; Zarega et al. 2004, 2006) has been suggested as evidence of a later migration from the Caroline Islands (Peterson 2012). Conclusive evidence of a second migration has yet to be found, however, and the question remains unanswered at this time.

Traditional CHamoru culture as it had developed up to the end of the Latte Period persisted after European contact, with only minor changes due to interactions with Europeans until the beginning of Spanish colonization efforts at the end of the 17th century, as described in the next section. While written accounts by European visitors of the 16th and 17th centuries provide some

details about CHamoru culture as it existed at that time, it cannot be assumed that those descriptions apply equally to the Latte Period as a whole or to the Pre-Latte Period. Many aspects of the culture described by Europeans may only represent developments from late in the Latte Period, or developments that took places in the century and a half between contact and colonization.

POST-CONTACT ERA

The post-Contact era on Guam is divided into seven periods based on the succession of colonizing nations that have held sway over the island. The Spanish first encountered the Marianas in 1521, and there was a period of intermittent contact and trade between the CHamoru and Europeans until 1668. Spanish colonization began in 1668, followed by conflict with the CHamoru until around 1700. The period of Spanish colonial rule continued until 1898. At that time, Guam was captured by the United States, while the other islands of the Marianas were purchased by Germany. The Japanese military captured Guam in 1941 and controlled the island until it was recaptured by the U.S. in 1944. Guam then remained under U.S. Naval administration until it became an unincorporated U.S. territory in 1950, the status it remains under today. The historical context of each of these periods is summarized below.

Pre-Colonial European Trade Period (AD 1521–1668)

Initial contact between the CHamoru and Europeans took place in 1521 when Ferdinand Magellan's fleet made landfall at Guam during their voyage of circumnavigation. This encounter quickly turned deadly, as the Spanish killed several CHamoru onboard a ship and sacked a coastal village before continuing toward the Moluccas. After Magellan's death in the Philippines, the fleet under command of Gonzalo Gomez de Espinosa stopped twice in the Marianas in their

attempts to return to Spain. Three crew members deserted on Maug at the north end of the archipelago, and one, Gonzalo de Vigo, lived several years on Rota before he was picked up on Guam by the Loaísa expedition in 1526 (Russell 1998:263–268).

De Vigo reported that the CHamoru valued iron highly. His rescuers remained off Guam for six days, trading various iron implements for fresh water and food, setting the precedent for the next 150 years of CHamoru-Spanish interactions. In 1565, Miguel López de Legazpi stopped on Guam for two weeks during his voyage that established the later Manila Galleon trade route. Amid episodes of vigorous trade with and violence against the CHamoru, Legazpi also claimed the islands officially for Spain. Despite this claim, the Spanish did not attempt to colonize the islands for more than a century. Instead, a pattern of short but regular contact with European vessels developed. This included irregular visits by English and Dutch ships but centered on the annual voyages of the Manila Galleons or *La Nao de China* (The China Ship), which were well established by 1600 (Schurz 1939). These vessels, traveling from Acapulco in Mexico to Manila in the Philippines, would typically stop in the Marianas, the only stop on the yearlong voyage. The galleons would stop at Umatac Harbor in southern Guam or drift slowly with the currents through the channel between Guam and Rota and trade with the 150–300 canoes that would come out to meet them from both islands. As in the early encounters, the Spanish would trade iron objects such as nails, knives, hatchets, scissors, and hoop iron for fresh water and food to replenish their supplies after the long Pacific crossing (Driver 1983:198–199; Quimby 2011; Russell 1998:271–289; Schurz 1939; Spoehr 1954:5–8).

A first-hand account of the nature of CHamoru society on Rota early during this period of regular contact with the Spanish is provided by Fray Juan Pobre de Zamora, who spent seven months on Rota in 1602. Although there may have been some differences between the islands, it

is thought this description applies in large part to CHamoru society on Guam at the time as well. Relevant details of his account, translated by Driver (1983, 1988), are summarized in the following paragraphs.

During a voyage from Mexico to the Philippines, Pobre jumped into a CHamoru canoe in defiance of orders from the Spanish authorities that he was not allowed to do mission work in the Marianas. He was taken to the coastal village of *Tazga* on Rota and kept at the home of Sunama, a *mag'låhi*, a word that is often translated as chief, but which Pobre says was applied to several leading citizens in each village. According to Pobre, there were as many as 50 villages on Rota at the time, and a population of 12,000. Life in the coastal villages centered on fishing, with many traditions about how fish were shared among the community and ceremonies involving ancestral skulls to ensure safety at sea and a good catch. He notes that the CHamoru made very fast canoes and had many ingenious techniques for catching ocean fish, such as mahi-mahi, blue marlin, and flying fish. While the men of the villages focused on fishing, the primary activities for women were cooking and weaving leaves to make sails, sleeping mats, mats to eat on, and containers. Although the CHamoru had traditionally made fishhooks out of wood and shell, by 1602 most had replaced these with hooks made out of nails either traded for or recovered from the *Santa Margarita*, a galleon that wrecked on the coast of Rota in 1601. Similarly, they had replaced the stone tools traditionally used to prepare fish with iron knives.

The inhabitants of the coastal villages maintained small farm plots further inland, but it was the inhabitants of the inland villages who focused on agriculture, according to Pobre. In particular, he mentions that they cultivated two types of taro, two types of yams, sweet potatoes, rice, coconut, and breadfruit. Taro, yams, and breadfruit were cooked into a kind of pie, but breadfruit was also eaten roasted or boiled. Sweet potatoes would be mixed with grated coconut

and rice to form small balls, which were sometimes eaten and other times mixed with water to make a drink. Pobre claimed to have taught them how to plant corn alongside their taro. Both men and women took part in tending to their gardens. Unlike fishing, the CHamoru had not adapted iron to their agricultural pursuits and continued to use sharpened sticks for most tasks in the garden. Pobre notes that the inhabitants of the coastal villages were considered of a higher status than those of the inland villages, and that the coastal villages would trade fish for the produce of the inland villages.

Each village had several *mag'låhi,* whose families were accorded special honors and served as village leaders. Also important were the *macanas*, who maintained collections of ancestral skulls and were responsible for healing and rituals to bring good weather. The communities were tightly knit and generous to each other, coming together to erect *latte* and build houses, sharing food with those who were ill and unable to fish for themselves, and generally making sure everyone's needs were provided for. Inter-village relations were generally peaceful. Several thousand people from multiple villages would come together for feasts multiple times a year, where they would also host debates, which sometimes devolved into physical contests or fighting, typically ending once someone was injured. Although typically peaceful and friendly, Pobre noted the CHamoru were highly skilled with spears and slings. He also described how the canoes of different coastal villages raced each other to reach a Spanish ship first to trade with it.

Pobre was not the only outsider living in the Marianas at the time, and he provides an idea of how CHamoru attitudes towards the Spanish had developed. When *Santa Margarita* wrecked, many of the 40 Spaniards who survived the wreck were killed after they threatened the CHamoru, and only 20–25 were left alive. Some of them were rescued a month after the wreck, and more were recovered early in 1602, but at least three remained, spread among Guam, Saipan, and Tinian

during Pobre's stay. In addition to these, at least 18 African slaves from *Santa Margarita* had chosen to stay in the Marianas and hid in the jungle whenever Spanish ships arrived. Pobre was told that the CHamoru considered it a great honor to house Spaniards because they would receive a large amount of iron when they brought them back to a Spanish ship. This was indeed the case for Sunama, who was given iron hoops, knives, scissors, and a monkey when he brought Pobre to a Spanish ship.

As described by Pobre, traditional CHamoru society did not change fundamentally during this first century of regular European contact. Trade with the Europeans was mediated through the inhabitants of the coastal villages, who had long served a similar function in the pre-Contact network of inter-island exchange. Similarly, iron implements were integrated into existing systems—nails were fashioned into fishhooks, drill tips, and awls; knives were used to prepare fish and other food; machetes and cutlasses were used to clear land for agriculture; and hoop iron was fashioned into adzes and other wood working tools (Quimby 2011:12–15). Excavations at *latte* structures at Ritidian (*Litekyan*) have shown those structures were inhabited into the late 17th century. Despite the presence of some European artifacts at the sites, such as glass beads and forged iron fragments, traditional CHamoru lifeways and social organization appear to have persisted at the site through this period (Bayman et al. 2012).

Spanish Missionization Period/CHamoru-Spanish Wars (AD 1668–1700)

The nature of the interactions between the CHamoru and the Spanish changed in 1668 with the establishment of the first mission on Guam by Father Diego Luis de San Vitores. Reactions among the various CHamoru villages to the establishment of the mission and the subsequent work of the Jesuits led by San Vitores were mixed. Some, like Kephuha, a *mag'låhi* who provided land

for the mission in Hagåtña, welcomed the missionaries. Others resisted attempts at missionization, eventually burning churches and killing some of the missionaries. The situation escalated after San Vitores himself was killed on Guam in 1672. The Spanish reinforced the mission with soldiers and a military governor, and violent reprisals against the CHamoru spurred further resistance. What followed was a period of sometimes fierce but intermittent fighting, with some CHamoru supporting the Spanish and others resisting. This culminated in a large uprising on Guam in 1684 while the military governor and many soldiers were away on Saipan. After that uprising was put down, the situation on Guam remained largely peaceful, but it was not until 1695 that fighting ceased throughout the Marianas (Hezel 2015; Quimby 2011:23–26; Russell 1998:291–300).

Between the start of the Spanish mission and the end of the Spanish conquest, the CHamoru population of the Marianas appears to have dropped by more than 90 percent. The population in 1668 is estimated around 40,000, with at least half residing on Guam. By 1710, the total population was recorded as 3,500. The majority of these deaths are attributed to diseases introduced by the Spanish, to which the CHamoru population had no immunity. Two epidemics in 1688 and 1700 were noted as particularly bad. CHamoru deaths during the conflict with the Spanish, on the other hand, are estimated at 110–120 (Hezel 2015, 2021:13–16; Russell and Fleming 1990).

Beginning in 1680, the Spanish instituted a policy of *reducción*—the relocation of the entire CHamoru population to centralized villages on Guam, Rota, and Saipan in order to facilitate the mission efforts. In this, Governor Antonio de Saravia appointed a prominent CHamoru man, Antonio Ayhi, as lieutenant governor to work with other CHamoru leaders around the island to convince the residents of their villages to relocate. Particular villages were chosen based on their size and their previous relationship to the mission efforts, with larger villages that had been receptive to missionization being chosen. In the north, Inapsan was initially chosen because the

other large villages at Ritidian (*Litekyan*), Tarague (*Talågi*), and Hanum (*Hånom*) had shown too much resistance to the Spanish. However, the church at Inapsan was soon burned down and the Spanish removed it from the list of resettlement villages, leaving no official village in the north. On the east coast, the inland village of Mapupan was initially chosen, but the church closed within two years and Pago (*Pågu*) was selected as a replacement, as the other villages on the east coast had shown too much resistance. Hagåtña, already a prominent village prior to *reducción*, became more prominent during this time, and no villages on the northwest coast north of Hagåtña were selected for resettlement. Agat (*Hågat*) was selected in the southwest, as the other villages of that part of the coast had shown too much resistance to the Spanish. Fina, inland of Agat (*Hågat*), was also selected, but its residents slowly moved away to coastal villages in the following years. Umatac (*Humåtak*), prominent as the landing place for the yearly galleon, was selected as the resettlement village for the south. Although not named as resettlement villages initially, Merizo (*Malesso'*) and Inarajan (*Inalåhan*) in the south were added as they grew in size to house CHamoru relocated from the northern islands. By the end of the process in 1700, there were six major villages on Guam: Hagåtña, Pago (*Pågu*), Umatac (*Humåtak*), Agat (*Hågat*), Merizo (*Malesso'*), and Inarajan (*Inalåhan*). This policy of *reducción* extended across the Mariana islands, resulting in the relocation of CHamoru from northern islands to Guam, with the exception of those on Rota and Saipan, although Saipan too was abandoned by 1731 (Hezel 2021:12–16, 21; Tomonari-Tuggle et al. 2018b:79–81).

The society that developed after the *reducción* has been described as "neither indigenous nor imported, but a blend of old and new," (Spoehr 1954:24). Society was reorganized around the Catholic church and the Spanish governmental system, but these came to reflect CHamoru influences. Those who held authority and influence in the traditional structures were recognized

with official Spanish titles and retained influence in the villages. CHamoru relocating to new villages worked in the traditional matrilineal system to arrange for new land to live on. The CHamoru were also allowed to retain rights to their family land at their previous villages. The pattern that developed in this time of living in the centralized villages but farming at ranches or *låncho* on land outside the villages—the village-*låncho* system—remained the basic structure of CHamoru society into the 20th century. *Latte* structures also remained in use for a time, in some cases serving as residences and in others as storehouses for family valuables. Although new crops and tools were introduced, many continued farming their traditional lands at *låncho* or ranches outside the villages, and reef and lagoon fishing remained important. Catholicism in the Marianas took on a special character, with traditional feasting practices becoming associated with Church feast days and particular rituals practiced to celebrate the dead and placate harmful spirits (Atienza 2014; Hezel 2021:22–27, 39–42).

Traditional material culture was augmented and eventually replaced by newly available Spanish items, but the changes during this time are not well studied archaeologically. New crops and domesticated animals were certainly introduced in this time, as were new farming and fishing tools, as well as the tools for other crafts such as weaving, blacksmithing, masonry, or carpentry. Items of Spanish origin such as kiln-fired potsherds, nails, beads, porcelain, metal tools, *metates* (grinding stones), beehive ovens, and metal pots have been found. However, due to a general lack of excavation at sites dating to this time, little can be said about when particular items were adopted for use by the CHamoru, when more traditional items were abandoned, and what the typical material cultural assemblage from this time would consist of. Beginning in this period, traditional CHamoru seafaring knowledge and technology was lost as the Spanish reorganized the society

and, in some cases, physically destroyed canoes to stop CHamoru from Guam from fleeing to the northern islands (Spoehr 1954:31–37; Tomonari-Tuggle et al. 2018a:86–90, 2018b:93).

Spanish Colonial Period (AD 1700–1898)

Over the next 100 years, the Spanish government on Guam was primarily concerned with protecting its military and commercial interests by facilitating the Manila galleon trade and preventing other colonial powers from making use of the islands. The government forced the CHamoru population to grow cash crops, such as tobacco, and tend livestock on Jesuit Farms (*Estancias Jesuiticas*) and royal-owned land,[5] as well as requiring a labor tax (*apluy*) of 40 days per years for other projects. Development was focused on structures important to the government, such as churches, forts and other military buildings, government offices, and the development of Apra Harbor. The road along the west coast connecting Hagåtña to other villages was also improved with gravel paving and bridges, coming to be called the *Camino Real* or royal road (Hezel 2021:32; Tomonari-Tuggle et al. 2018b:93, 98).

The CHamoru population reached a low of 1,700 in 1722, but steadily grew over the century, reaching 4,000 by 1800. At that time, although the majority of the population resided in Hagåtña, the villages of Agat (*Hågat*), Inarajan (*Inalåhan*), Merizo (*Malesso'*), Pago (*Pågu*), and Umatac (*Humåtak*) remained inhabited. The northern part of the island had no permanent villages at this time. Apart from their work on the Jesuit and royal farms, most CHamoru retained private *låncho* outside the villages, where they farmed to provide for their families and produce small surpluses to barter for items they could not produce themselves. Fishing also remained important during this time. Despite other changes later in the period described below, this essential pattern

[5] The Jesuit Farms themselves became royal farms after the expulsion of the Jesuits in 1769.

of residing in villages but working government lands and private *låncho* outside the villages remained in place through the rest of the Spanish Colonial Period (Liston 1996; Tomonari-Tuggle et al. 2018b:93, 96, 98).

The situation for the Spanish government changed in the early 19th century, with revolutions in colonies in Central and South America. As a result, the Manila galleon trade ended in 1815, and the administration of the Marianas shifted from Guam to the Philippines in 1817. A further turning point came in the middle of the century, with a massive earthquake and crop failures in 1849 and a smallpox epidemic that killed more than 40 percent of the population in 1856. Despite this, the population grew through the century, and demographics and settlement patterns shifted. At the time of the 1818 census, the total population of Guam was recorded as 5,229, with 1,960 CHamoru. Sixty percent of the population at the time resided in Hagåtña, which had a population that was 55 percent Filipino, 30 percent Spanish, and only 11 percent CHamoru. The other villages, by contrast, were almost entirely CHamoru. At the time, there were five villages near Hagåtña—Tepungan (*Tipungan*), Asan (*Assan*), Anigua (*Aniguak*), Sinahagna (*Sinahånña*), and Mongmong—as well as five others around the south end of the island—Pago (*Pågu*), Inarajan (*Inalåhan*), Merizo (*Malesso'*), Umatac (*Humåtak*), and Agat (*Hågat*). Each had a number of associated royal farms and *låncho*, with much more privately cultivated land (approx. 30,705 ha.) than government land (approx. 5,606 ha.). By the end of the century, Hagåtña had grown to a population of 5,979, now encompassing the five former nearby villages. Pago (*Pågu*) had also been abandoned after a typhoon in 1857. The demographics of the island also changed, first with an increase in Filipino immigration, and later with the arrival of Carolinians (*Refaluwasch*). The first Carolinians came to the Marianas from islands in the present-day Federated States of Micronesia, such as Lamotrek and Satawal, after their islands were devastated by Typhoons around

1815. The first groups settled on Saipan, but later groups also settled at the *barrio* of Maria Christina on Guam and, for a short time, on Tinian. The Carolinians resettling Saipan were followed later in the 19th century by some CHamoru as well. With the growing population on the other islands, the Carolinians became the primary source of interisland communication during this time (Spoehr 1954:39–43; Tomonari-Tuggle et al. 2018b:105, 134–138, 160, 171).

First American Territorial Period (AD 1898–1941)

In 1898, during the Spanish-American War, the U.S. cruiser *Charleston* entered undefended Apra Harbor, and the U.S. quickly took control of the island. As part of American annexation, the U.S. Navy controlled the island until 1941, improving sanitation, roads, health care, and education, but with a focus on the military usefulness of the island. A 1901 census documented 9,576 inhabitants of the island with the large majority in "Agaña and its dependent villages" (Safford 1905:137). For most CHamoru, settlement followed the village-*låncho* pattern (Safford 1905:123–124; Wheeler 1900:8). Tomonari-Tuggle et al. (2018b:206) write that by 1940–1941, "Economic development had brought some material success to CHamoru, including access to automobiles, and the population of CHamoru had significantly increased since 1901." The 1940 census (Beales 1941) lists a total population of 22,290 of which 20,177 were CHamoru. By this time, the island had been divided into 15 municipalities, an increase from the six districts that had previously structured government administration (Tomonari-Tuggle et al. 2018b:207).

During this period, one of the worst epidemics to hit Guam occurred when influenza, which had been occurring worldwide, was bought to the island aboard the U.S. Army Transport (USAT) *Logan*. The epidemic of 1918–1919 killed 858 people, estimated as 6 percent of the population

(Rogers 1995). Older CHamoru were particularly affected and it was estimated that "80 percent of CHamorus who spoke Spanish died in the influenza epidemic" (Rogers 1995:143).

Alongside economic development, U.S. interests in this period were focused on the usefulness of Guam, and Apra Harbor in particular, to the U.S. Navy. Under U.S. naval rule, CHamoru life was heavily regulated in an attempt to Americanize the population. This particularly took the form of attempts to change the traditional subsistence-based agricultural system to produce surpluses to support Navy personnel and to educate the CHamoru population to serve in low-level positions in the naval administration. Changes during the period were evolutionary rather than revolutionary, however, as the CHamoru accepted or adapted some new practices but rejected or resisted others, and society took on a somewhat Americanized, but distinctly CHamoru, nature (Hattori 2014).

Given its importance to the U.S. Navy, the area of Apra Harbor was improved in many ways during this time. The Piti Channel was cleared, the wharf at Piti was extended, and a small Navy yard was built inland of the wharf. A causeway was built connecting Cabras Island to the mainland, and a coal storage facility and quarantine station were built on Cabras Island by 1914. Major improvements were made in 1941, including new breakwaters, sea plane facilities, and fuel storage tanks and an oil dock on Cabras Island. The harbor was defended for a time by guns on Cabras Island and Orote Point, but these were removed in 1931 (Moore and Hunter-Anderson 2005:16–18).

World War II–Japanese Military Occupation (AD 1941–1944)

During WWII, on December 8, 1941, shortly after the assault on Pearl Harbor (December 7 in Hawai‘i), Japanese planes attacked Guam. On December 10, Japanese forces landed on Guam,

and within hours the American naval commander surrendered. Most CHamoru fled to *låncho* in rural areas at the start of the Japanese attack, and Hagåtña was practically abandoned. Around one-quarter of the residents eventually returned, but most remained in the rural areas. The Imperial Japanese Army left in 1942, and the Imperial Japanese Navy administered the island through a civilian administration department. The Japanese naval administration attempted to assimilate the CHamoru population with Japanese language and cultural education, but this was largely unsuccessful. Those living in the rural areas were required to provide food to the Japanese administration in addition providing for their own subsistence. The Japanese also organized communal farms to supply food for the administration, requiring around 8,000 CHamoru to work these farms (Tomonari-Tuggle et al. 2018b:229–232).

In 1944, under the increasing threat of U.S. invasion, the Japanese Army resumed control of the island. Many CHamoru were forced to work on government run farms or on defensive construction projects, however, 5,000 to 10,000 CHamoru were placed in concentration camps (Sanchez 1979; Tomonari-Tuggle et al. 2018b:237).

On July 8, 1944, as a step in the Marianas campaign, U.S. ships and planes commenced intensive bombardment of Guam, which continued for 13 days. On July 21, American Marines landed at Asan Beach, beginning the ground campaign to recapture the island. The last defensive positions of the Japanese at the north end of the island were attacked between August 8 and 10. By August 10, all organized resistance ended (Lodge 1954). However, the caves in the Tarague cliff line as well as other locations throughout Guam, especially at what is now the Navy Ordnance Annex, provided shelter to Japanese stragglers, both military and civilian, who continued resistance for months, even years, thereafter (Denfeld 1997:206–206; Dixon et al. 2013). Most resistance was unorganized, but there were two small organized groups of infantry soldiers, the

latter surrendering on September 4, 1945, after the emperor of Japan broadcast his order to surrender. By that time over 1,200 Japanese troops had surrendered (Denfeld 1997:205–206; Dixon et al. 2013:112). But even afterward, stragglers continued to be captured or killed. The last three holdout stragglers were found as late as 1960 and 1972.

World War II/Post-World War II/Second American Territorial Period (AD 1944–1950)

The recapture of Guam was followed on the one hand by a massive U.S. military buildup and, on the other, by the civilian population attempting to rebuild their lives shattered by the war. As Lodge (1954:164) writes, by the end of WWII in 1945:

> … the entire face of Guam had been changed. A busy naval operating base occupied Apra Harbor, and Navy planes crowded the fields at Agana and on Orote Peninsula. On the northern plateau, B-29's of the Twentieth Air Force rested on fields bulldozed from the jungle … on the heights above Agana was the advance headquarters of the Pacific Fleet.… Scattered throughout the island were vast naval and military supply installations.

The situation for the CHamoru population returning from the Japanese concentration camps varied across the island. For those in the south, where the villages were little damaged by the war, life returned quickly to normal; those in the north more often found a landscape of flattened buildings, stripped of trees and soil, and littered with grenades, bombs, and other military debris. Alongside the vast areas set aside for the military, U.S. military planners allocated a number of areas for civilian resettlement and farming, and constructed a number of resettlement villages, including at Agaña Heights, Agat, Barrigada, Dededo, Santa Rita, Sinajaña, Talofofo, and Yona. Many of the several thousand houses built by the military government and by the

CHamoru themselves during this time remained in use until they were destroyed by a typhoon in 1962. Hagåtña, where most former residences had been destroyed, was developed largely as a military colony, with some civilian settlements, but primarily military structures. Alongside new residences, the military administration also worked to build new churches, hospitals, schools, and transportation facilities, and to rehabilitate agricultural areas (Tomonari-Tuggle et al. 2018b:246–254).

Organic Act/Home Rule/Economic Development Period (AD 1950–Present)

After the end of WWII, Guam was under U.S. naval administration until 1949, when a civilian government was established. The Guam Organic Act went into effect in July 1950, establishing Guam as a U.S. territory and allowing limited self-government. Although many U.S. military installations had been deactivated in the years following the end of WWII, land totaling almost 36 percent of the island was retained for U.S. military use prior to the implementation of the Organic Act. The onset of the Korean War in 1950, Cold War competition with the Soviet Union, and the Vietnam War from 1964 to 1975 spurred ever-increasing military development on Guam, which has continued through the present day (Aaron 2011:3–16–18, 3–23–25, 3–32–33, 3–37–45; Rogers 1995:222, 230).

Alongside the military development of the island during this time, civilian development also increased due to economic growth. New economic growth through tourism was made possible primarily through the lifting of strict military clearance requirements to enter the territory in 1962. New concrete houses were built in many parts of the island in subdivisions of single-family homes spreading out from the traditional village centers. Hotels also became more common along the

coast to serve the growing tourist market, particularly from Japan (Rogers 1995:247–249). This pattern of development has continued to the present.

HISTORICAL LAND USE

Little detail is available about the precise use of the project area prior to the construction of Simon Sanchez High School; however, the general pattern of land use in the surrounding area provides an idea of how the project area may have been used in the past.

Prior to the arrival of the Spanish, it appears one or more traditional CHamoru villages were located in the vicinity of the project area. The Lopez map of 1676 shows several village names inland of Pagat Point, including Hinani, Ypahon, Tapis, and Machauti (Figure 5). A church was built at Pagat in 1672, with its parish including the villages near the project area, but it was destroyed during a CHamoru uprising later that decade. It is not clear if the church at Pagat was ever rebuilt, and it was certainly no longer in existence by 1690, when the entire northern plateau had been depopulated through the *reducción.* Initial attempts at *reducción* in the north were complicated by the fierce resistance to the Spanish from many of the northern villages. Inapsan was first selected as the primary *reducción* village, as Spanish misisonaries had been killed at the other large villages of the north at Taragüe (*Talågi*) and Ritidian (*Litekyan*), but the church there was burned and most of the CHamoru of that village fled to Rota. Hanum (*Hånom*), northwest of the project area, was then selected but abandoned after one of the bloodiest battles between the Spanish and CHamoru took place there in 1679. This left the north without an official resettlement village, and the inhabitants of the area would eventually be moved to villages in the south (Tomonari-Tuggle et al. 2018b:42–54, 80–81; Hezel 2021:13–14). Due to the imprecision of the Lopez map, it is not clear if the project area was within any of the traditional villages shown on

the map or how exactly the area was used during this time. Any villages that did exist in the area would have been abandoned during the *reducción*.

No major developments are documented historically near the project area through the 18th and 19th centuries. Maps from this time (Figure 6 to Figure 8) indicate the area was heavily wooded but show several roads and/or trails through the area. Several place names, including Mataguac, Yigo, and Asatdas, are shown in the vicinity, possibly indicating locations used for ranching or agriculture, but it is not clear what activity, if any, took place within the project area itself during this time.

The same pattern of land use continued through the middle of the 20th century. Maps from this time (Figure 9 and Figure 10) show numerous roads and trails around the project area, and several place names, including Mataguac, Asatdas, Asdonlucas, Yigo, and Sabanan Palie. A trail passing through the northern part of the project area is shown on the 1914 map, but not later. A road is shown in the southwest corner of the project area on the 1914 and 1944 maps, but not later. The overall increase in trails and named places in the 20th-century maps as compared to earlier maps appears to correspond to increased farming and ranching activity in the area. This is supported by records from the late 19th century, such as the 1887 description by Governor Olive y Garcia, which states that many ranches and farms were located on the northern plateau by that time. More permanent settlement in the area also increased during this time; by 1940, records show 324 people resided in the Yigo area (Tomonari-Tuggle et al. 2018b:172–173, 192, 208–209). Apart from the trail and road, it remains unclear what activity took place within the project area itself during this time, although it may have included farming and/or ranching.

Most CHamoru fled from the villages in the south when the Japanese began bombing the island in 1941, with many taking refuge in *låncho* in the Yigo area, possibly including the project area. Many remained in the area for several years, farming and foraging to survive. In 1944, shortly before the U.S. invasion, the Japanese forced CHamoru in the area to march south to the Manenggon concentration camp, with many dying along the way (Workman and Haun 1995:36; Tomonari-Tuggle et al. 2018b:230, 237). During the battle for Guam, the U.S. Marines 77th Division advanced near the project area on August 5–6, 1944 during their drive north toward Mt. Santa Rosa (Figure 11). Although they faced Japanese resistance numerous times during the advance through this area, no significant battles are noted within the project area itself (Lodge 1954:145–147).

Following the Liberation of Guam, the U.S. military developed facilities to the north (Andersen Air Force Base) and south (Mariana-Bonin Islands [MARBO] Base Command) of the project area, but the immediate vicinity of the project area was reserved for CHamoru farms according to a 1944 U.S. Navy development plan (Tomonari-Tuggle et al. 2018b:248). A 1953 aerial photograph (Figure 12) and 1954 map (Figure 13) show the project area remained wooded and undeveloped at this time, despite the nearby military developments.

Simon Sanchez High School opened on the property as a middle school in 1974, and was converted into a high school in 1981. Most of the property is cleared and leveled at this time apart from a small strip on the south edge of the property, which remains covered in vegetation (see Figure 3). Alongside this, numerous housing developments have been constructed in the vicinity of the project area in the past 40 years.



Figure 5. A 1676 map of guam with inset showing the vicinity of the project area. Note location of Pagat at cross on coatline and locations of (north to south) Hinani, Ypahon, Tapis, and Machauti inland in the vicinity of the project area (Lopez 1676).

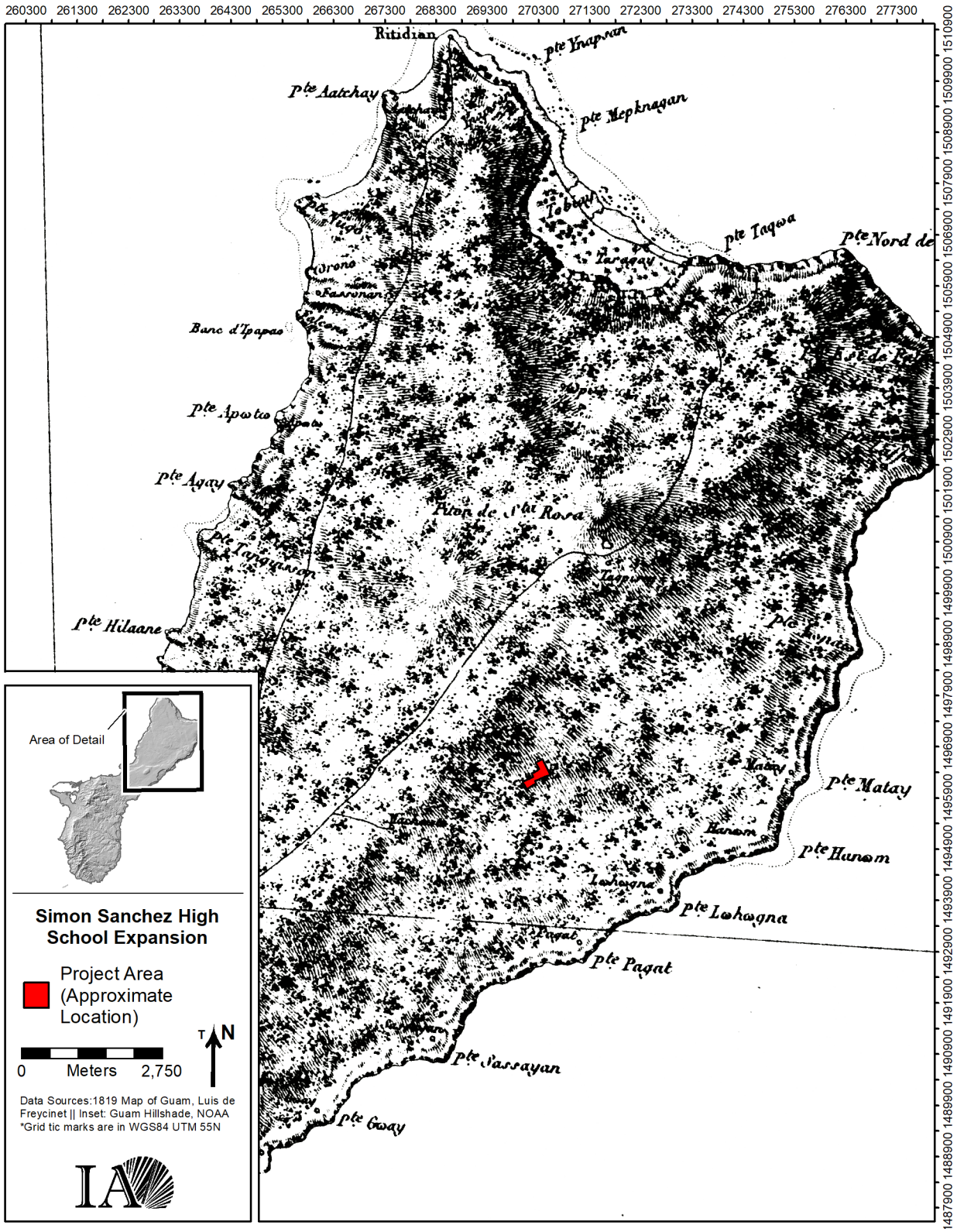

Figure 6. Approximate project area location on detail of an 1819 map of Guam (Freycinet 1819).

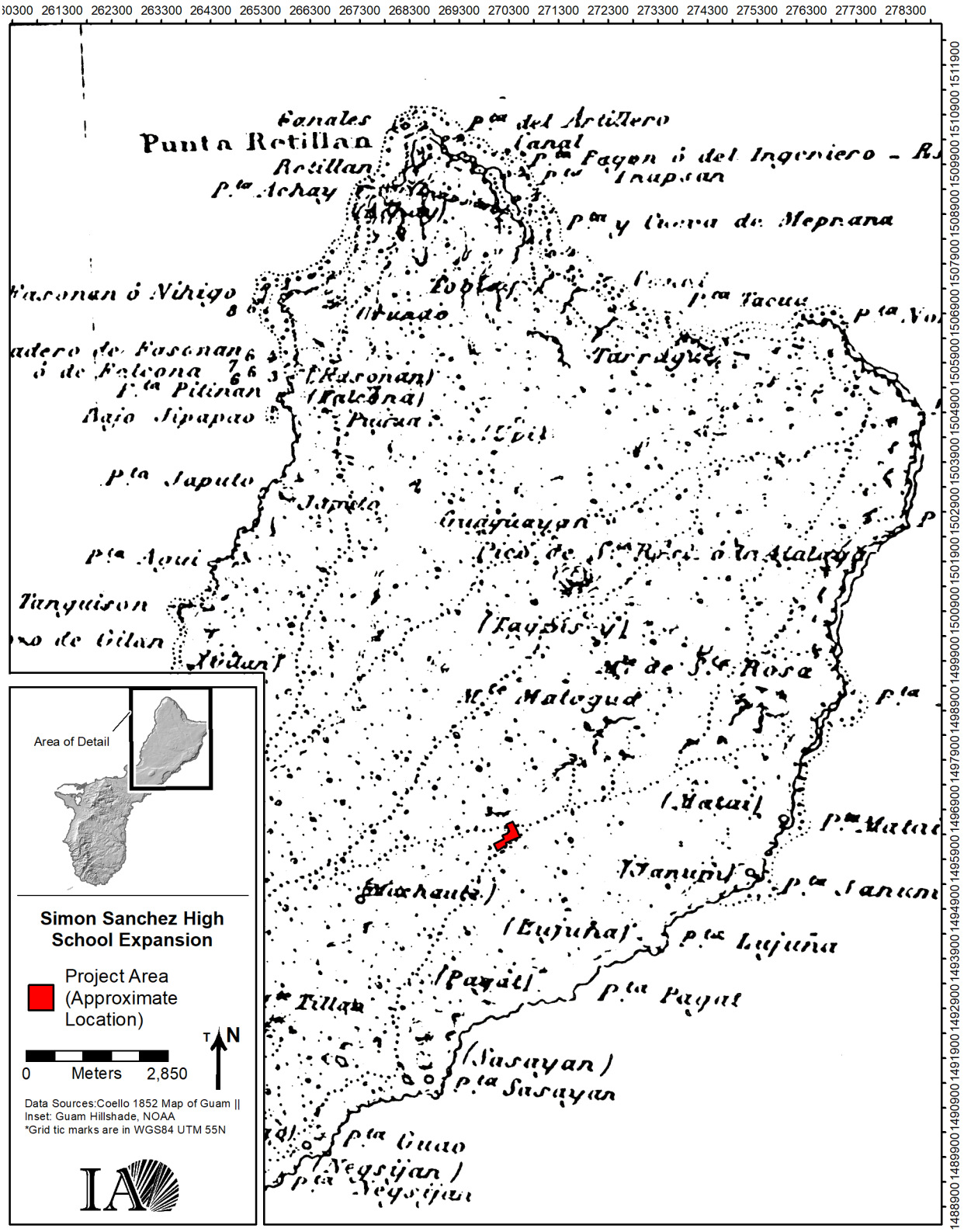

Figure 7. Approximate project area location on detail of an 1852 map of Guam (Coello 1852).

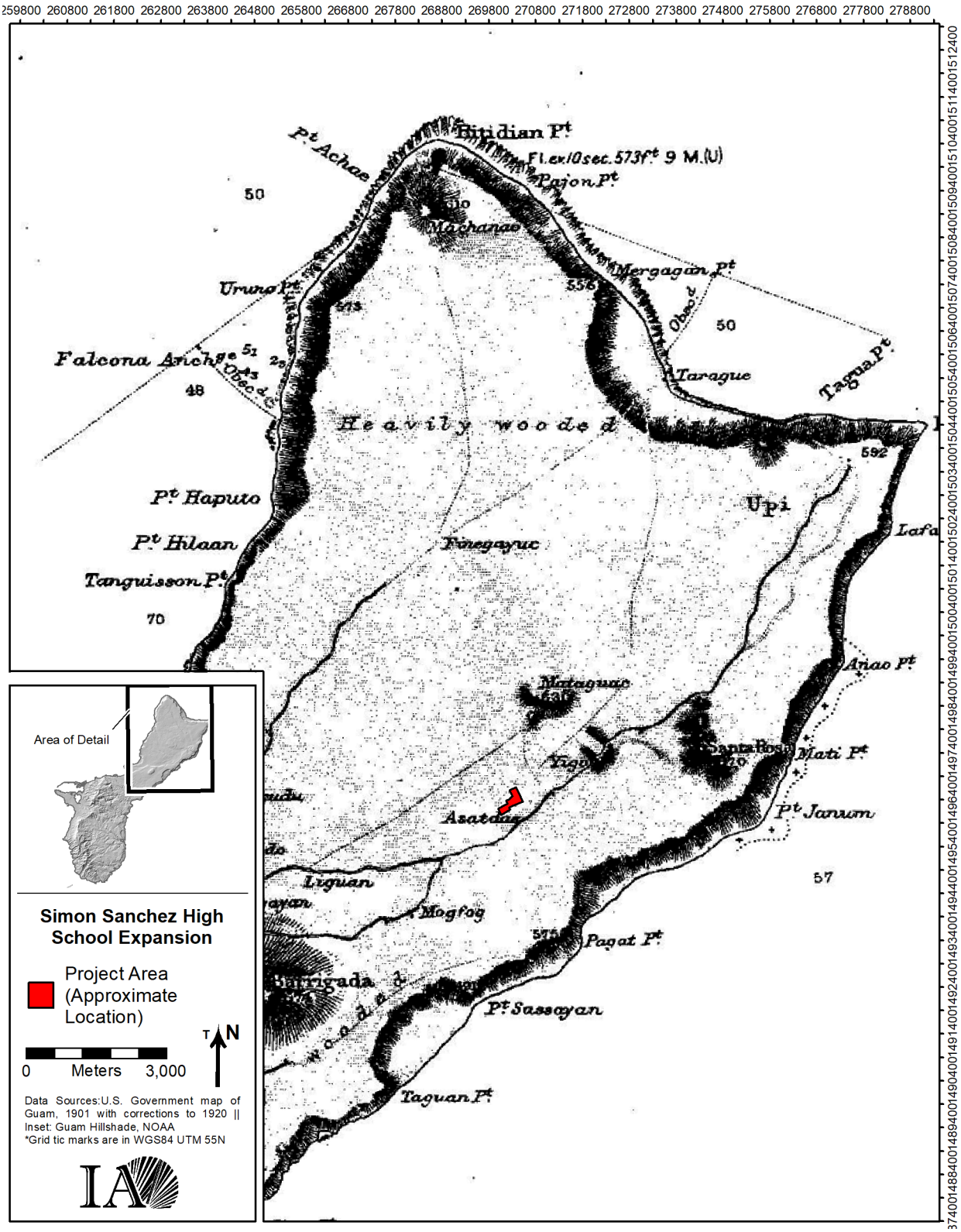

Figure 8. Approximate project area location on detail of a 1901 map of Guam with corrections through 1920 (Cox 1926).

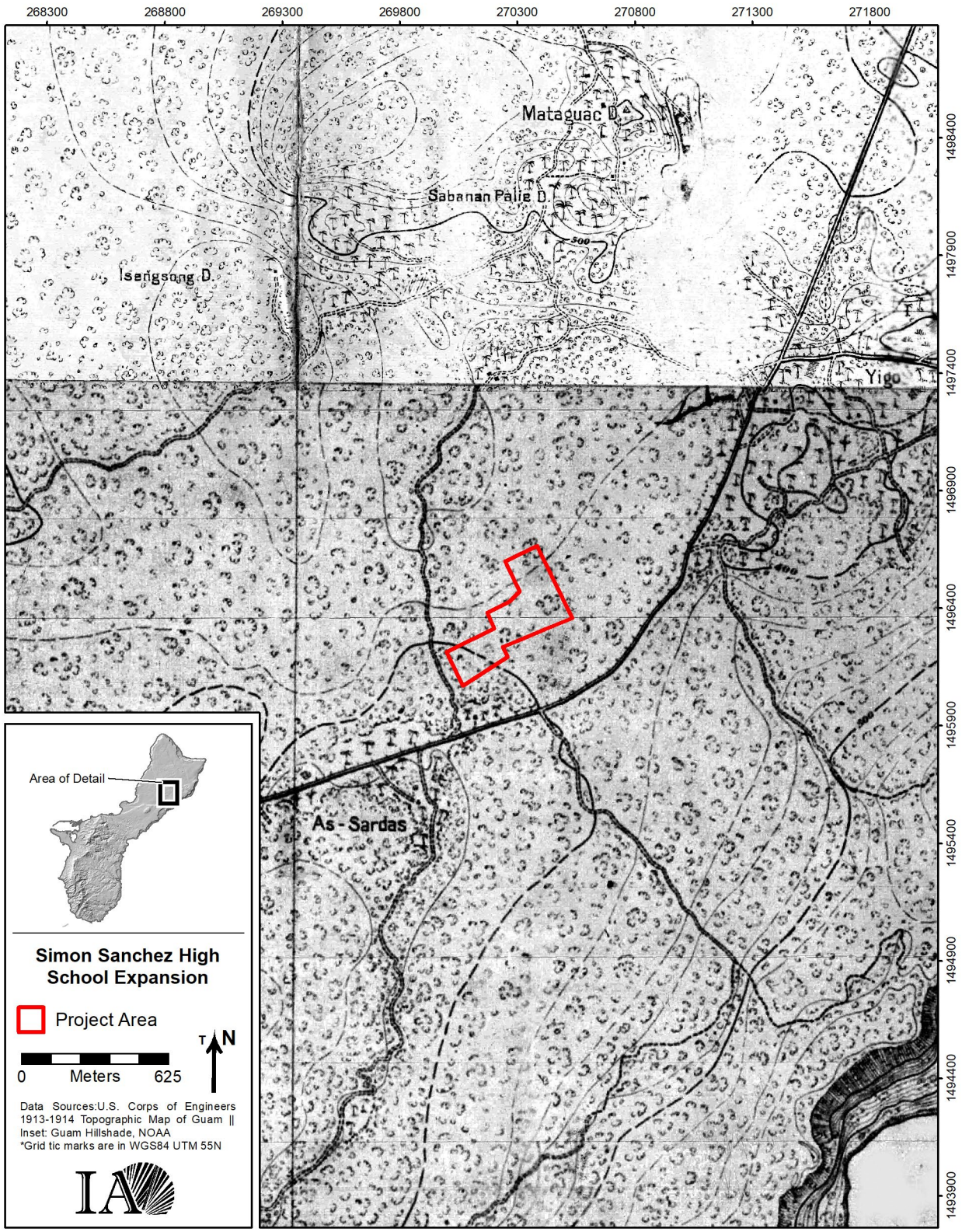

Figure 9. Project area on detail of a 1914 map of Guam (Sturdevant 1914).

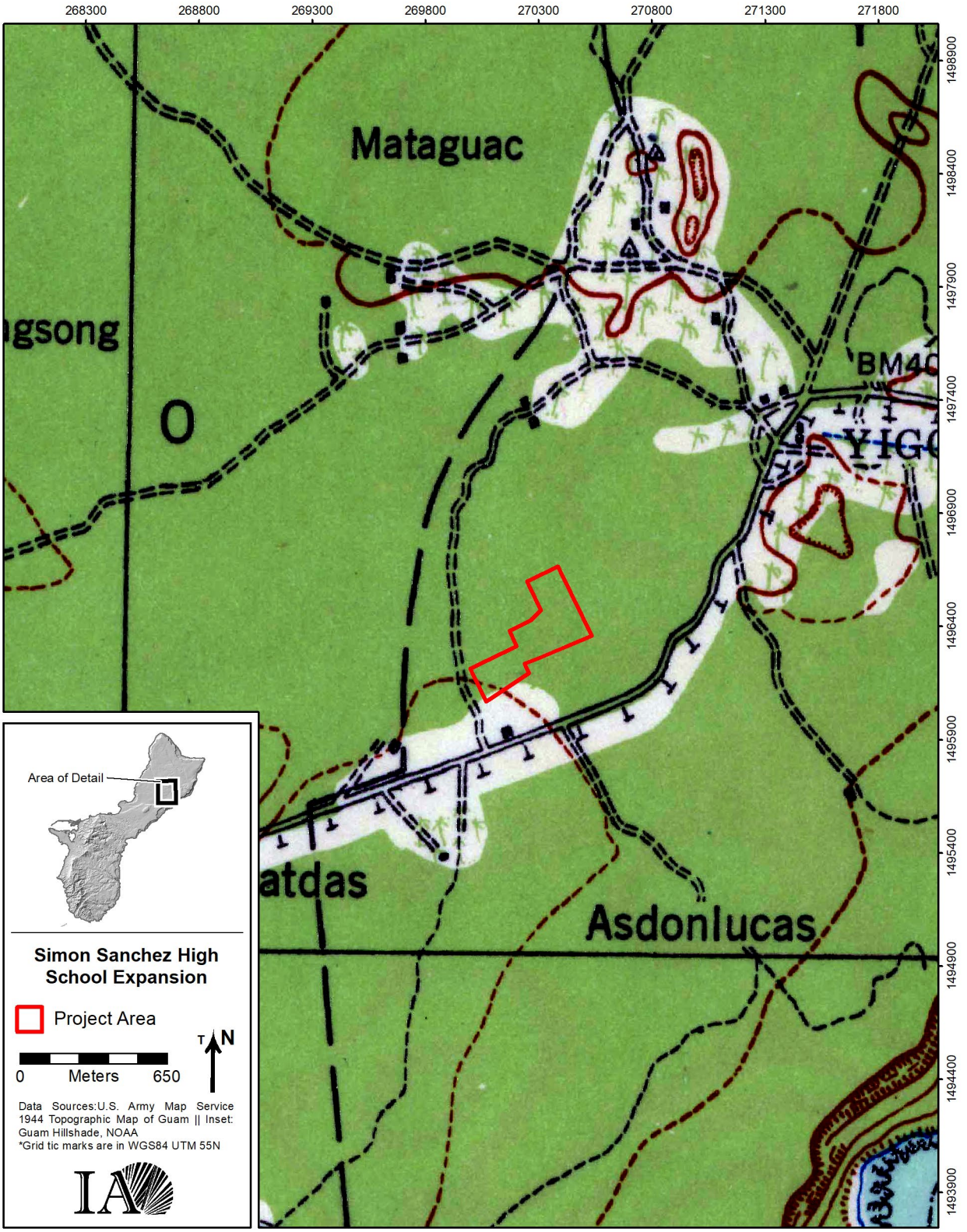

Figure 10.Project area on detail of a 1944 map of Guam (Army Map Service 1944).

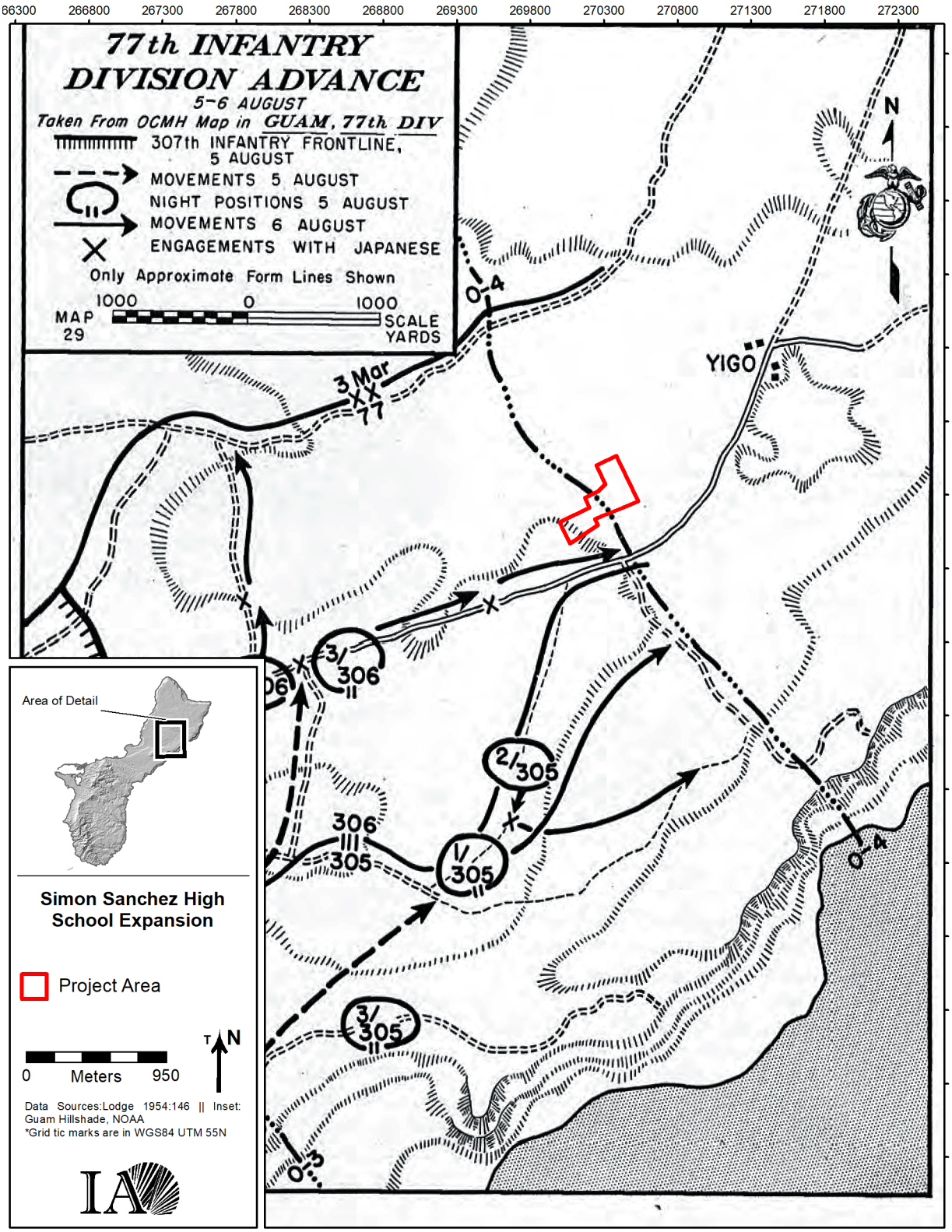

Figure 11. Project area on detail of a map of the 77th Infatnry Division advance 5–6 August, 1944 (adapted from Lodge 1954:Map 29).

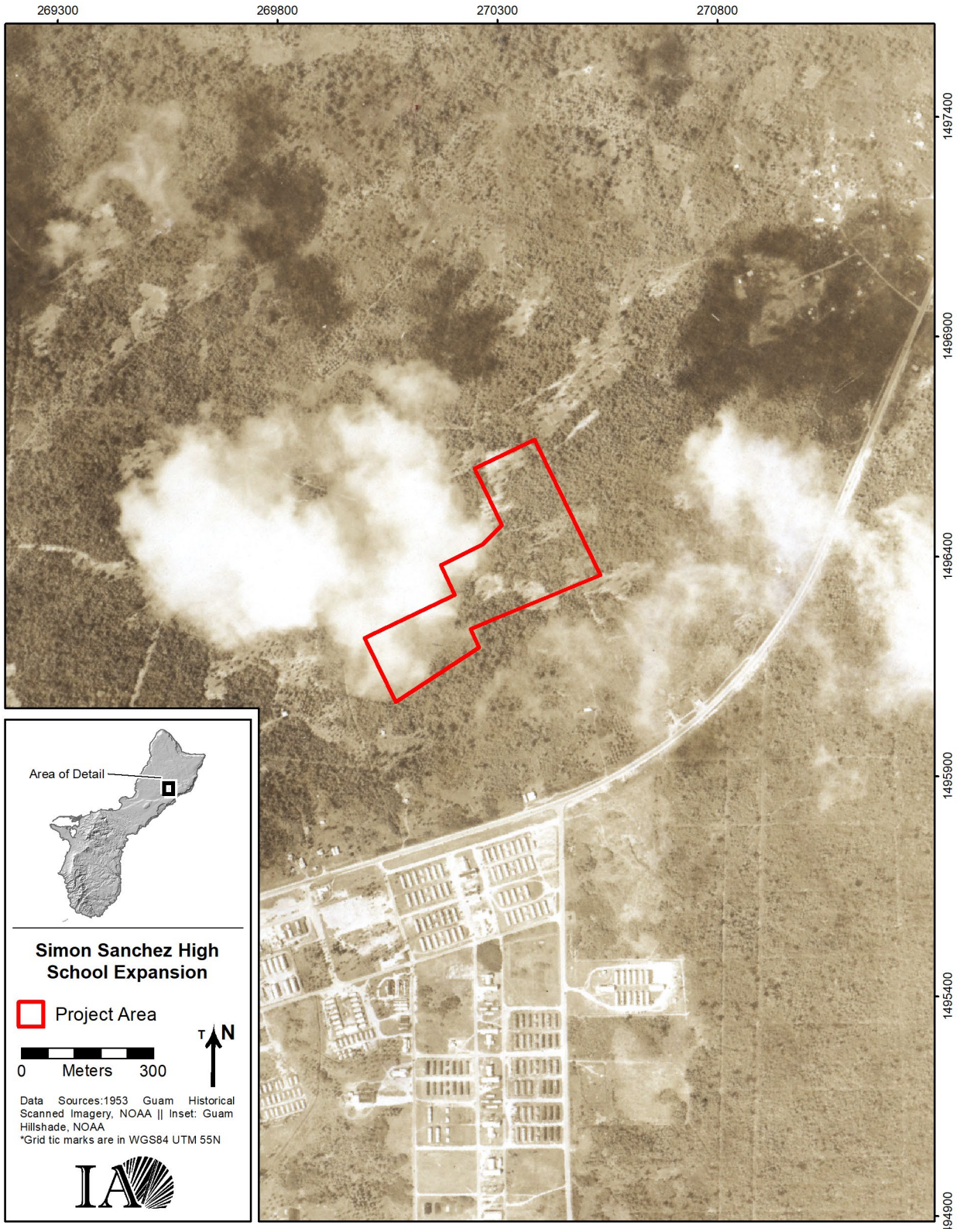

Figure 12.Project area on detail of a 1953 aerial photograph (National Oceanic and Atmospheric Administration 2021)

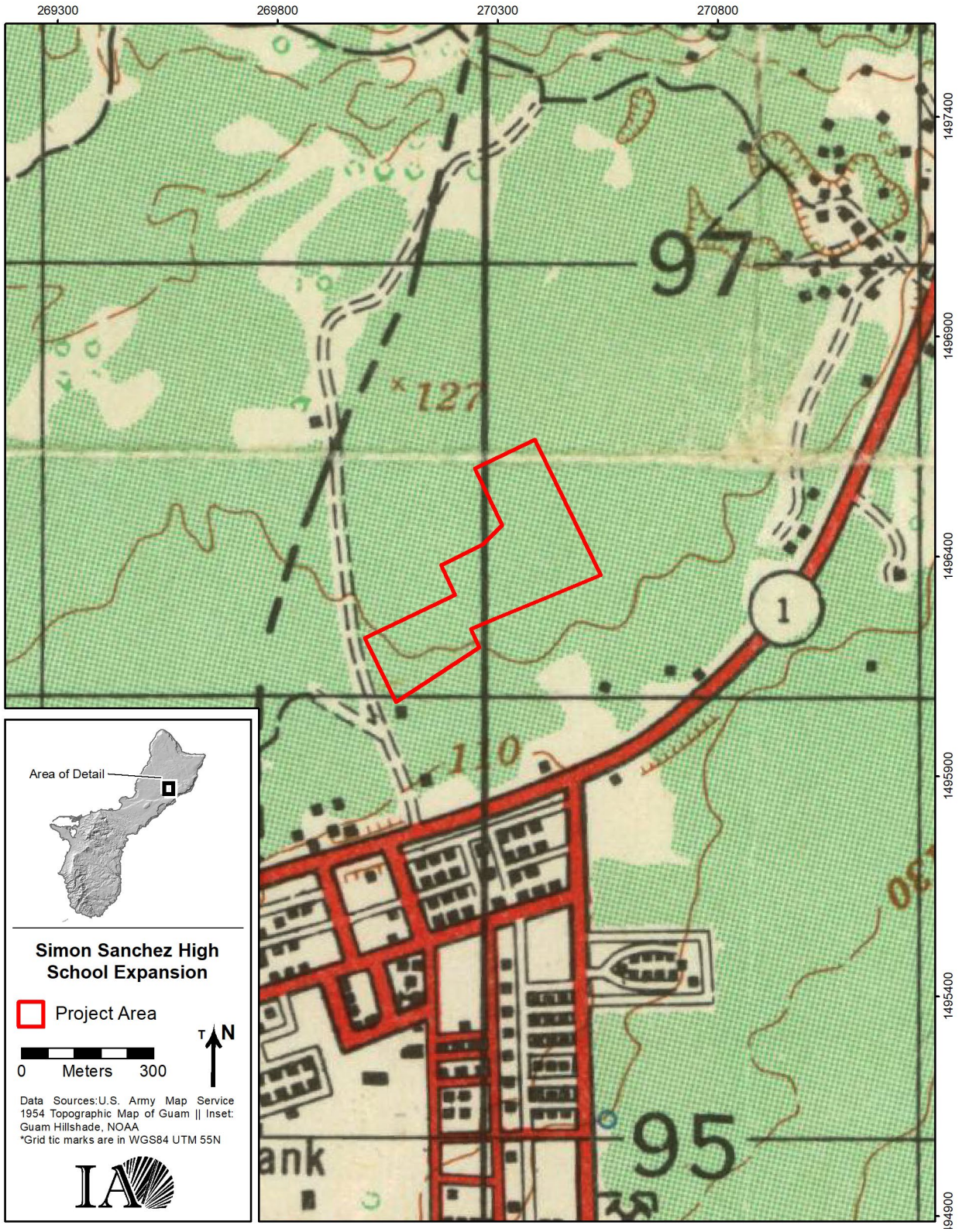

Figure 13.Project area on detail of a 1954 map of Guam (Army Map Service 1954).

PREVIOUS ARCHAEOLOGICAL RESEARCH

Ten previous archaeological investigations have been completed in the vicinity of the project area; however, none overlapped with the project area (Figure 14; Table 3). Two known sites are located within 400 m of the project area (Figure 15; Table 3). The findings of previous projects in the vicinity and the known sites are described below. Previous evaluations of National Register of Historic Places (NRHP) eligibility are noted where applicable.

In 1986, Moore conducted an archaeological inventory survey of a 19 ac. area adjacent to the project area (Moore 1986). The area was subject to pedestrian survey. The survey identified many bulldozer push piles and modern refuse, such as glass, plastic, tin roofing, tires, and automobile parts, indicating significant modern disturbance to the area. Two large cement slabs were documented in the southern part of the project area. The slabs were determined to be historically insignificant, although they may have been related to the MARBO Base Command area to the south. A scatter of four Latte Period ceramic sherds in a 2 by 0.5 m area was identified, along with five other Latte Period sherds scattered more widely nearby. The Latte Period ceramic scatter was designated as GHPI Site 66-08-0221; however, it was evaluated as ineligible for the NRHP due to its small size and the disturbed nature of the area (Moore 1986:1, 8–12). The site area has since become a residential development.

In 1987, Kurashina, Williams, and Loft-Williams conducted an archaeological inventory survey of a 14 ac. area at the site of the Yigo Garden Subdivision, 75 m northeast of the project area (Kurashina et al. 1987). The area was subject to pedestrian survey at an average spacing of 23 m. The survey identified surface scatters of Latte Period ceramics in nine locations. Most locations had fewer than five Latte Period sherds, often mixed with sherds of historic ceramics; however, one location contained a denser concentration of 46 Latte Period sherds in a thin layer

of clay, which was present along the western edge of the project area. The survey also identified a modern concrete house foundation. Based on the lack of surface features, this survey determined the area was not the site of permanent pre-Contact settlement but was used in some limited way during the Latte Period. The survey report recommended subsurface testing at the locations of the surface scatters. The lack of additional reports for this area at the time of writing indicates that recommended testing did not occur. Therefore, the nature of the Latte Period use of the area remains unclear. None of the surface scatters were designated as sites, and their NRHP eligibility was not evaluated (Kurashina et al. 1987:7–12).

In 1993, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey of a 34 ac. area at the site of a proposed multifamily housing unit project 390 m northwest of the project area (Workman and Haun 1993). The area was subject to pedestrian survey. The survey identified two trash dumps, an animal water trough, and a house foundation, all dating to the post-WWII period (GHPI Sites 66-04-1328–66-04-1331). All were evaluated as NRHP-eligible under Criterion D for their potential to provide information about the post-WWII; however, no additional work on the sites was recommended as the data collected during the survey was deemed sufficient to mitigate any adverse effects (Workman and Haun 1993:27, 32).

In 1994, PHRI conducted archaeological monitoring of mechanical clearing of a 4.5 ac. area at a site 570 m east of the project area (Workman and Haun 1995). The depth of earthmoving associated with the project is not noted in the report, but was likely shallow due to the nature of the project as mechanical clearing rather than excavation. The project found several features associated with a ranch used from the 1960s to the 1970s, but no other cultural resources (Workman and Haun 1995:36).

In 2007, International Archaeological Research Institute, Inc. conducted archaeological survey of a number of U.S. military areas, including 1,700 ac. of the Andersen South area 585 m southwest of the project area (Welch 2010a and 2010b). Survey included ground-truthing of WWII and post-WWII military features associated with the former MARBO Base Command area (Site AS-2007-T-1/Map No 1066) and pedestrian survey of the entire Anderson South area. The survey identified and documented numerous WWII and Post-WWII features in the area. The survey also identified several Latte Period artifact scatters, all more than 1 km away from the project area. MARBO Base Command area is the only site documented during this survey that is within 400 m of the current project area. Although little original construction remains at this site, and it has generally lost integrity of design, more research was recommended before making a final determination of NRHP eligibility (Welch 2010a:48, 311–322).

In 2008, TEC, Inc. conducted surveys of an area 400 m south of the project area in Andersen South (Dixon, Walker, and Carson 2011). This included ground-truthing survey of approximately 60 ac. in the northeast corner of the MARBO Base Command area (Site AS-2007-T-1) and intensive pedestrian survey and limited subsurface testing of approximately 165 ac. on the eastern edge of the area. Subsurface testing was conducted via shovel testing at identified surface features. The strategy for determining the number and placement of shovel test pits is not discussed in the report. Shovel test pits were excavated to bedrock, typically at a depth of less than 50 cm. The ground-truthing survey confirmed the location and condition of concrete pads, roadbeds, and other known features of the MARBO Base Command area. The survey and subsurface testing found pre-Contact material—including *latte* stones; *lusong;* and surface scatters of Latte Period Ceramics, stone, and shell artifacts—in eight locations, all at the south end of the survey area, approximately 2 km south of the project area. All were in secondary context, with

little to no subsurface material in shovel testing and probing. They found little potential for subsurface deposits due to the shallow depth to bedrock (Dixon, Walker, and Carson 2011:15).

In 2010, TEC, Inc. conducted an archaeological inventory survey of utilities and road-widening areas along highways in northern Guam, including a corridor parallel to Route 1 475 m south of the project area (Dixon, Walker, and Schaefer 2011). The corridor was subject to pedestrian survey. The survey did not identify any cultural resources in this corridor (Dixon, Walker, and Schaefer 2011:2-44).

In 2013–2014, Naval Facilities Engineering Command (NAVFAC) Pacific conducted archaeological inventory survey on a number of areas to fill in gaps in previous surveys related to the proposed Guam and Commonwealth of the Northern Mariana Islands (CNMI) military relocation (NAVFAC Pacific 2015). This included an approximately 0.2 ac. area 390 m south of the project area that was subject to pedestrian survey. The survey did not identify any cultural resources in this area (NAVFAC Pacific 2015:2-3, 15-16–15-17).

In 2015, Southeastern Archaeological Research, Inc., conducted a historic inventory survey of approximately 13 ac. in the MARBO Base Command area (Mohlman 2015:288–308), documenting 11 facilities dating from 1945 to 1961, all of which were ineligible for the NRHP.

In 2020, IA conducted archaeological monitoring of construction activities in a 470 ac. section of Andersen South, including a spur 360 m south of the project area (Hlatky and Maxwell 2019). Work on this project is ongoing, and the depth of excavation associated with monitoring is not yet reported. This project has identified a number of new areas with Latte Period material, all of which were located 2.5–4 km from the project area, but no cultural resources were found in the sections closest to the project area (Hlatky 2020:2–5).

Table 2. Previous Projects within 400 m of the Project Area.

Reference	Project Type	Subsurface Testing	Findings	Historical Context of Findings
Moore (1986)	Pedestrian Survey	No	Latte Period ceramic scatters; concrete slabs (possible WWII)	Latte Period; WWII
Kurashina et al. (1987)	Pedestrian Survey	No	Scattered Latte Period ceramics; historic ceramics; post-WWII house foundation	Latte Period; post-Contact; post-WWII
Workman and Haun (1993)	Pedestrian Survey	No	Post-WWII house foundation, animal trough, and dumps	Post-WWII
Workman and Haun (1995)	Archaeological Monitoring	No	Post-WWII ranch features	Post-WWII
Welch (2010b)	Pedestrian Survey	No	WWII military foundations and roads; Latte Period artifact scatters	Latte Period; WWII
Dixon, Walker, and Carson (2011)	Pedestrian Survey; Shovel Testing	Yes	WWII military foundations and roads; *latte* stones, *lusong* mortars, and Latte Period artifact scatters in secondary context	Latte Period; WWII
Dixon, Walker, and Schaefer (2011)	Pedestrian Survey	No	No findings	N/A
NAVFAC (2015)	Pedestrian Survey	No	No findings	N/A
Mohlman (2015)	Historical Architectural Survey	No	WWII and post-WWII structures	WWII; post-WWII
Hlatky (2020)	Archaeological Monitoring	No	Latte Period artifact scatters and combustion features	Latte Period

Table 3. Known Historical and Archaeological sites within 400 m of the Project Area.

Site No.	Other No(s).	Description/Name	NRHP Status	Reference(s)
66-08-0221		Yigo Subdivision Lot #7019-4	Ineligible	Moore (1986)
No data available	AS-2007-T-1; MapNo1066	MARBO Base Command Area	Unevaluated	Welch (2010a)

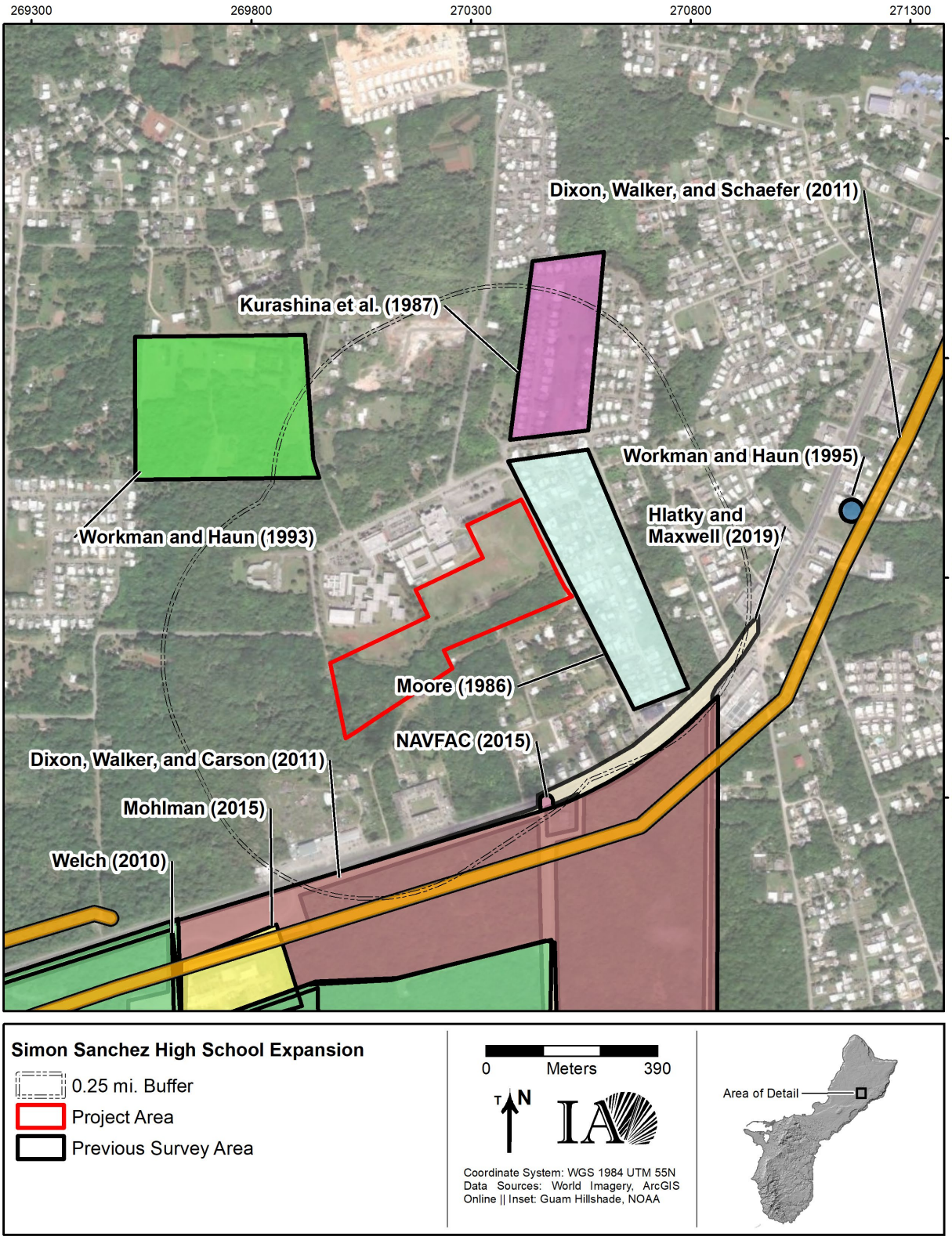

Figure 14.Previous archaeological research within 0.25 miles of the project area.

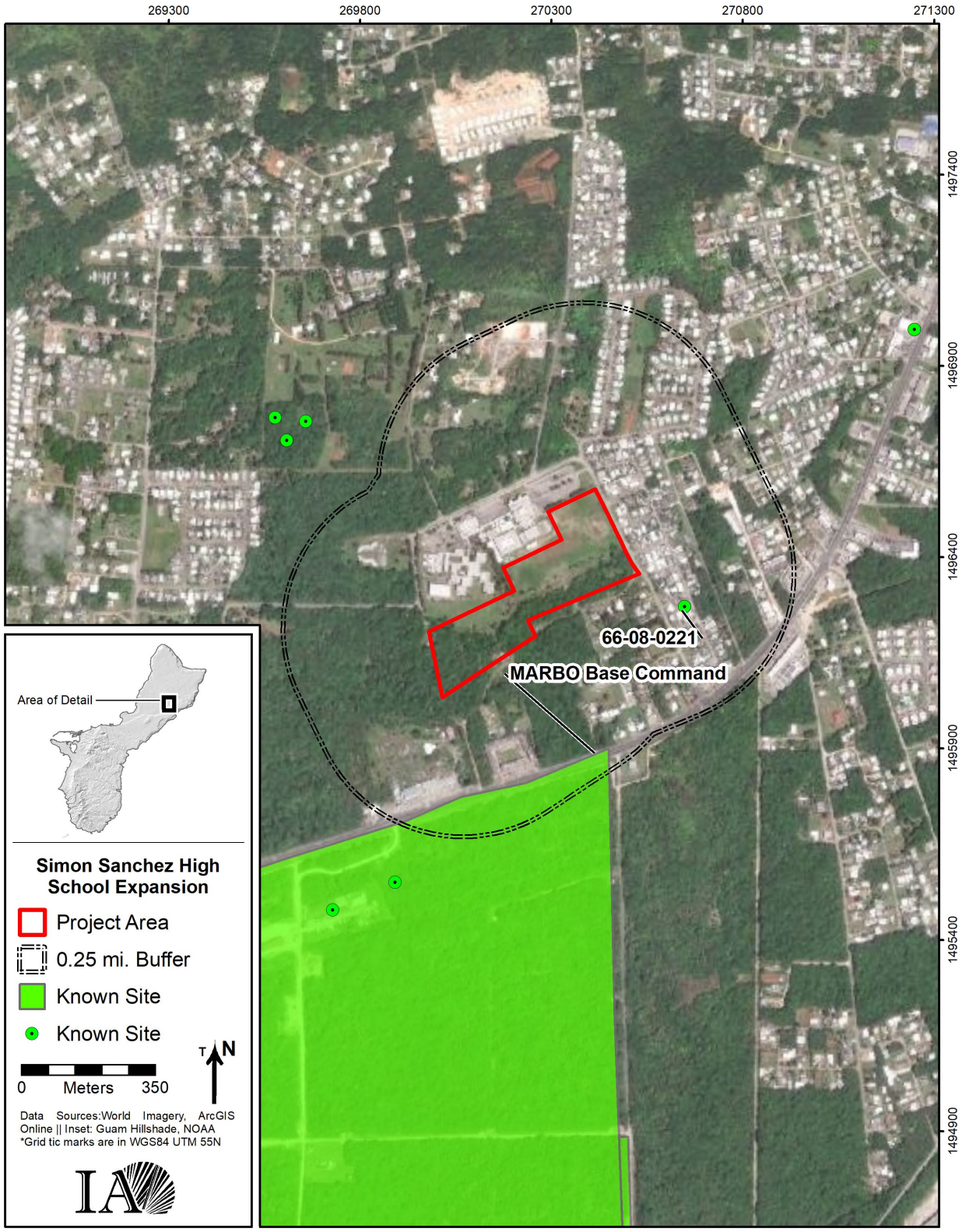

Figure 15.Known historical and archaeological sites within 0.25 miles of the project area.

III. METHODS

This section presents the research questions and expectations that guided the project and describes the field and laboratory methods that were employed.

RESEARCH QUESTIONS

The primary purpose of the survey was to determine the presence or absence of cultural resources in the project area, in particular late pre-Contact and early post-Contact resources as resources from other time periods were not expected. All encountered cultural deposits or historical sites would be assessed in terms of chronology of occupation, extent, significance, and NRHP eligibility. The following research questions were posed in the research design:

1. **What was the nature of the late pre-Contact and early post-Contact use of the project area, if any?**

   Previous research on Guam's northern plateau has typically found only sparse traces of settlement and other land use during the end of the pre-Contact and beginning of the post-Contact eras. This may accurately reflect very limited use of the interior of the plateau during this period, or may be a result of later disturbance to the area destroying evidence from this time. Nearby projects have found sparse Latte Period material, and historical records indicated traditional villages were located in the vicinity of the project area at the end of the 17th century, so material from this time may be expected in the project area. Given the overall scarcity of material from this time in this area, any sites dating to this time would be of great importance in interpreting the use of the area.

2. **What was the nature of the 20th-century use of the project area, if any?**

   Previous projects in the vicinity of the project area have identified features related to Post-WWII ranching. Such features may also be present in the project area and could aid in interpreting how this area was used during the 20-century, both before and after WWII.

EXPECTATIONS

It was expected that Latte Period cultural material may be present in limited quantities in the project area. Although material from this period is generally sparse in this area, such material has been found previously at several locations within 0.25 miles (400 m) of the project area. Historical records indicate several traditional villages were located in this general area at the end of the 17th century. Material at other sites consisted of small surface scatters of Latte Period ceramics, sometimes mixed with later historic ceramics (Moore et al. 1986; Kurashina et al. 1987). It was expected that any surface material in the project area would be similar. Subsurface deposits, although unlikely to be extensive due to the shallow depth of the soil, could be associated with any surface scatters. The review of the historical land use of the project area did not suggest any significant cultural material from later periods should be expected, as the area appears to have remained vacant until the construction of Simon Sanchez High School. However, given the findings of post-WWII ranching features nearby (Workman and Haun 1993, 1995), such features could be present in the project area as well. Due to the clearing and leveling of most of the area associated with the construction of the high school, the highest probability for cultural resources was in the vegetated area at the southern edge of the project area, which was presumed to be less disturbed.

SURVEY AND SUBSURFACE TESTING METHODS

The entirety of the 27.75 ac. area designated for archaeological survey was subject to pedestrian survey and subsurface testing, with a focus on the vegetated area at the southern end of the project area.

A team of two archaeologists conducted pedestrian survey of the project area. Vegetation clearance was be kept to the minimum required to fully document any sites. The following pedestrian survey methods were used:

1. Survey transects were spaced 5–10 m apart; tighter spacing was be employed in areas of dense vegetation.

2. The archaeologists kept an updated daily log that recorded work completed (including the number of transects), notes on any finds, and summaries of other relevant information (e.g., the density of vegetation, evidence for modern disturbance). The daily log was completed using a standardized form on Samsung Galaxy tablet computers.

3. Photographs were taken of all archaeological finds and overviews of the survey area. Photographs were taken using a Samsung Galaxy Tab S3 (SM-T820) tablet with a 13.0-megapixel camera and included a scale and north arrow (with the exception of landscape overview photographs) and were recorded in a photography log. The log includes the photograph file number, the date that the photograph was taken, the direction the photographer was facing, a general description of the photograph, and the initials of the photographer.

4. The locations of archaeological sites and features were recorded with a professional-grade Trimble GeoXH Global Positioning System (GPS) unit using World Geodetic System (WGS) 84 Universal Transverse Mercator (UTM) Zone 55 North. GPS data was differentially corrected for submeter accuracy and was exported as a geographic information system (GIS) geodatabase. The location of isolated surface artifacts or low-density clusters of artifacts (e.g., sherds), had they been found, would be recorded similarly. In the case of a low-density cluster of pottery or lithics, the remains would be defined by only a center GPS point in some cases, or with a polygon that shows the dispersal area in other cases. GPS data was differentially corrected for submeter accuracy and exported as geographical information system (GIS) shapefiles. These data were plotted on a U.S. Geological Survey (USGS) topographic quadrangle map using ArcMap. In regard to shovel testing at the location of an isolated find (or low-density cluster), a decision about testing was made following completion of the surface survey of the project area; this involved a consideration of such factors as the degree of past disturbance of soil at the location, the overall goals of the project, and time constraints versus other project requirements. In most cases, a shovel test would not be conducted at the location of an isolated surface find.

5. In terms of isolated surface finds, if the item was chronologically or functionally diagnostic or unique (e.g., a stone adze), it would be collected (following GPS recording) for laboratory analyses and documentation. This would include all isolated portable artifacts (lithic, bone, and shell artifacts, and decorated pottery or

rim sherds). Plain body sherds would have been described in the field and left in place.

6. Archaeological sites and features would be documented through text descriptions, plan view maps, and photography (with a north arrow and scale), along with GPS recording. Text descriptions would be completed on the tablet computers using a standardized form, which includes fields to record site/feature form and construction details, metric dimensions, age and function assessments, integrity and condition evaluations, associated surface artifacts, and environmental characteristics (slope, substrate/soil, vegetation).

Following the pedestrian survey, a team of two archaeologists conducted subsurface testing of the area. Shovel test pits (STPs) were focused primarily in the vegetated area as this is the most likely area to contain intact subsurface deposits. A total of 46 STPs were excavated, 8 of which were placed across the northern grassy area while 38 were distributed across the southern vegetated area. Thirteen of the STPs (03, 05, 06 [both 2022 and 2023], 07, 09, 10, 11, 14, 35, 36, 41, and 42) originally plotted prior to fieldwork could not be excavated as they were placed within the grid in areas that had either shallow turf with pavement/compact gravel underneath (open grassy areas to the north) or on an immovable push pile of debris (vegetated areas to the south). The STPs are numbered 1–46 (see Figure 16). Note, however, that 13 of these are duplicate numbers (STPs 01-13) which were excavated in March 2023. These are highlighted in Figure 16 and Table 4 (STP summary) for easy reference. The following subsurface testing methods were used:

1. STPs were 50 by 50 cm squares excavated to culturally sterile sediment or bedrock. STPs were excavated by natural strata in approximately 10–20 cm levels.

Excavated soil was not screened but was visually inspected and combed through for cultural material. If artifacts or midden had been observed, a measured bulk sample of the deposit (approximately 1 to 5 liters) would have been collected and passed through a 1/4-inch screen. Cultural material retained in the screen would have been collected for quantification and characterization at IA's Guam laboratory.

2. All STPs were photographed at the completion of excavation with a north arrow and scale visible in the image. Stratigraphic profiles were drawn for representative STPs, as well as for STPs that revealed an archaeological deposit or feature. The profiles are accompanied by detailed soil descriptions following the U.S. Department of Agriculture (USDA) Soil Survey Manual and Munsell color. The profiles were drawn in metric units, the cardinal direction of the profiled sidewall face was noted, and the location was recorded with a professional-grade Trimble Geo XH GPS unit using WGS 84 UTM Zone 55 North. GPS data was differentially corrected for submeter accuracy and exported as geographical information system (GIS) shapefiles.

3. If subsurface archaeological features were exposed, they would be drawn to scale and photographed in profile or plan view, whichever was appropriate. The stratum from which the feature originated would be recorded as would metric and non-metric characteristics. Feature matrix would be excavated separately from the surrounding stratum. A bulk soil sample would be collected from all cultural deposits and subsurface features. Bulk samples would be screened with 1/8 in. mesh and cultural contents will be collected for laboratory analyses. For

combustion features, charcoal samples would be collected for possible wood charcoal identification and radiocarbon dating.

4. Artifacts, midden, and charcoal recovered from the STPs would be collected in sealable bags that have a unique catalog number and which record the contents, provenience (STP/probe number, layer and level, and depth below surface), collection date, and recorder.

5. If significant archaeological deposits were discovered, GHRD would be consulted to determine the appropriate level of analysis, including radiocarbon dating or other specialized studies.

6. If human skeletal remains were encountered, work would cease at the find location, the remains would be secured in place, and GHRD would be notified of the find. Skeletal remains would be handled with respect and dignity. The rules and regulations enumerated in the following documents would be followed: Guam Public Law 20-151; Guam Code Title 21, Division 2, Chapter 76; Guam Executive Order 89-24; and the Department of Recreation General Guidelines for Archaeological Burials as amended March 2010. IA would ensure that the remains were secure and await direction from the government.

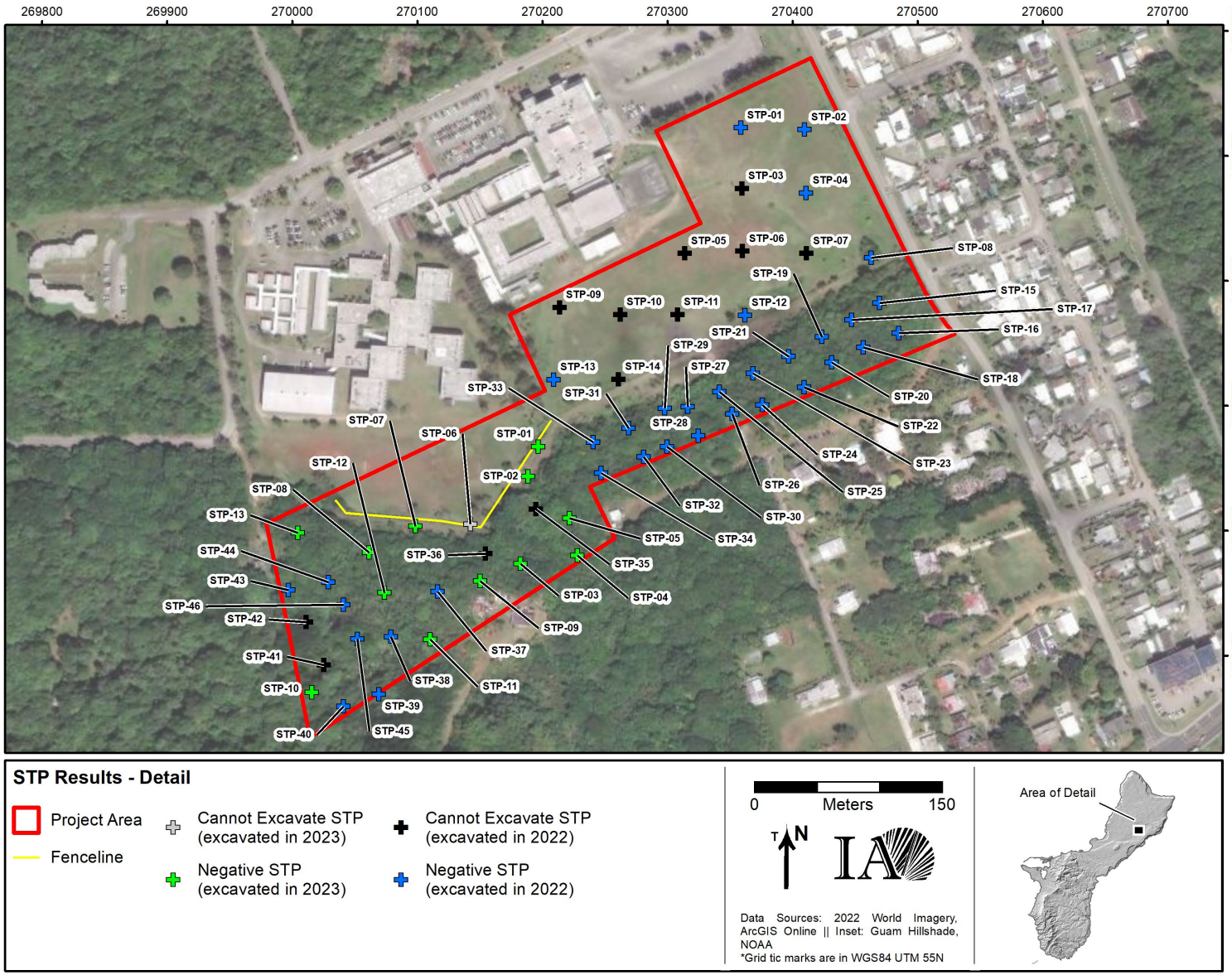

Figure 16. STP locations.

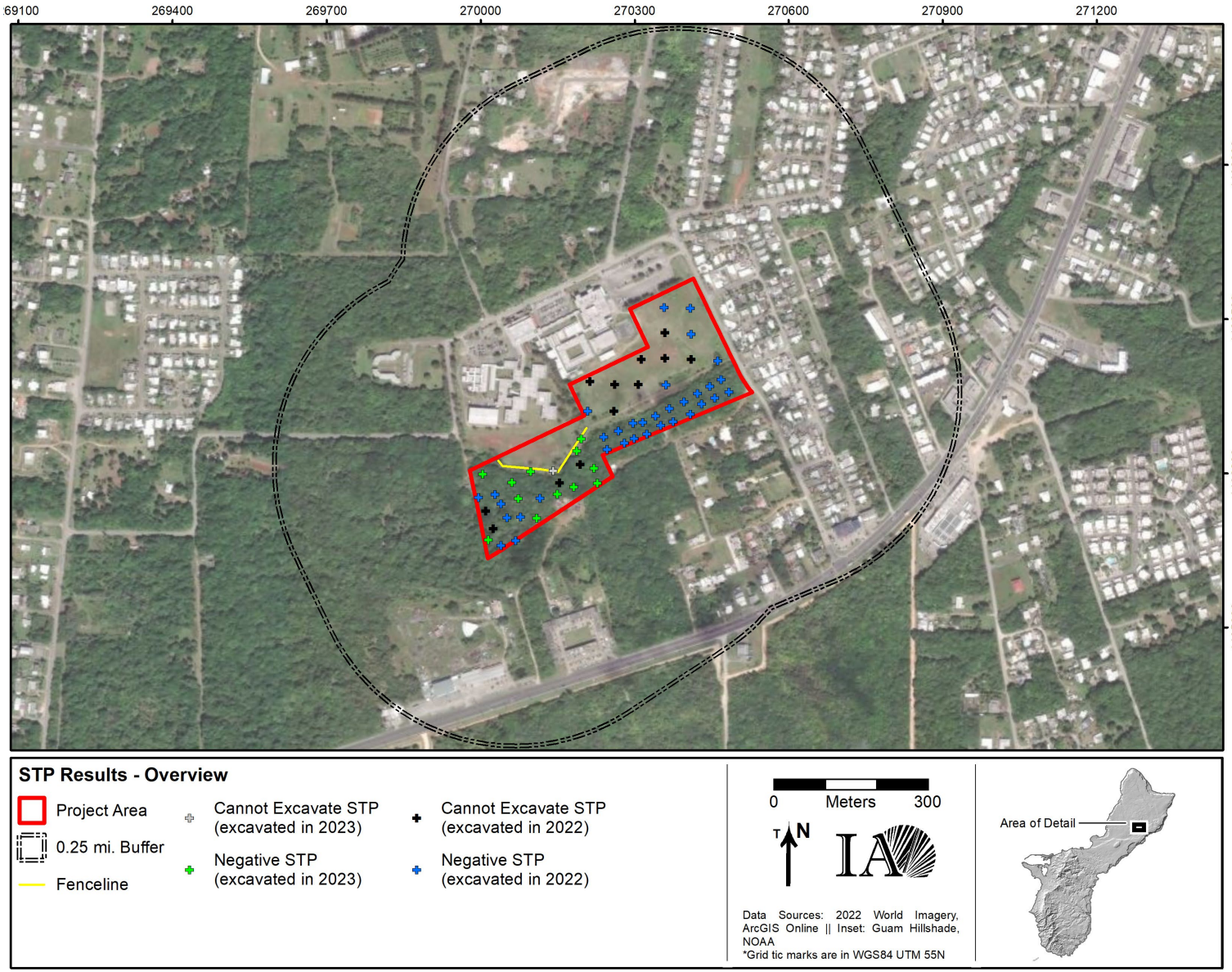

Figure 17. STP locations showing 0.25 mile buffer zone.

POST-FIELDWORK ANALYSES

Field collections, if any were found, would be cleaned and sorted at IA's Guam laboratory. Artifacts would be sorted by material and type. Metric and non-metric attributes would be recorded for all diagnostic pottery sherds, as well as lithic, shell, and bone artifacts. Vertebrate and invertebrate faunal remains would be sorted to the lowest taxonomic category possible with identifications aided by IA's reference collections and published reference guides. Laboratory results would be presented in prose, tabular, and chart formats in the report.

If significant archaeological deposits with appropriate materials were discovered, specialized analyses agreed to in consultation with GHRD could include, but not be limited to taxonomic identification of charcoal samples, radiocarbon dating, residue or plant microfossil analysis of ceramic and lithics, and petrographic or geochemical analysis of ceramics and lithics.

All materials other than human skeletal remains would be processed and stored in the IA's archaeology laboratory for transfer to the Guam Repository on completion of the project. Standard archival boxes are used for storage, and each box would be accessioned and labeled. Field notes and forms would also electronically stored at the International Archaeology Research Institute Inc. office for transfer to the Guam Repository. Human skeletal remains also, if discovered, would be transferred to Guam Repository upon completion of the project. Laboratory data would be recorded on standard laboratory forms and input into a database. All analytic results would be presented in coherent tabular format in the report and discussed in the text.

IV. RESULTS AND DISCUSSION

This section presents the results of the survey and subsurface testing. No archaeological resources were identified. All STPs were negative for archaeological deposits and material (Figure 16) and all observed sediment was either imported fill or archaeologically sterile natural soil.

The project area included both open areas on the school grounds to the north and a heavily vegetated area to the south. The open areas were flat and covered in short grass with no observable cultural material on the surface during pedestrian survey. The heavily vegetated areas were within an urban residential area with modern refuse ubiquitous throughout, including abandoned structures and vehicles, large appliances, tires, metal debris, and trash. Previous clearing efforts have resulted in large push piles that generally run from east to west.

Forty-four STPs were required as part of the work plan, though 46 were excavated. As noted previously, 59 total STP locations were plotted across the project area, but excavation was not possible in 13 of these because of underlying pavement/fill or proximal refuse push piles. In addition, 13 of the STPs had duplicate numbers resulting from the first phase of the project taking place in February 2022 and the second phase taking place more than a year later, the latter starting the numbering sequence over again (see Figure 16 and Table 4). Subsurface testing was complicated by the highly disturbed nature of the area and the difficulty of manually excavating through compact fill or gravel which was pervasive across much of the open northeast portion of the project area, and various parts of the more heavily vegetated southwest portion of the project area due to debris push piles and/or concentrated refuse (see Photo 1–Photo 56 and Figure 17–Figure 25 for representations of STP excavations and recorded stratigraphy).

SOILS AND STRATIGRAPHY

Two soil strata (Layers I and II) were identified across the project area. Layer I was a mixed humic (A horizon) developing on top of a weakly developed B horizon and/or fill depending on the location. Layer II was a mix of A and B horizons mixed with fill and/or refuse.

Layer I was a silty clay loam that extended between 0–42 cm bs, though this layer was mostly relegated to the top 20 cm bs in most areas. Layer II was only found intermittently in four of the STPS. Thirteen of the planned STPS could not be excavated due to either pavement or hard compact fill found underneath the turf in the open grassy areas or the presence of push piles and heavy root concentration in the vegetated areas in the southern part of the project area.

Table 4. Results of the STP Survey.

STP	Depth (cm bs)	Stratigraphy	Archaeological Material	Comments
01	22	I	Negative	
01	12	I	Negative	
02	21	I, II	Negative	
02	40	I	Negative	
03	-	-	-	Could not excavate
03	10	I	Negative	
04	10	I	Negative	
04	20	I	Negative	
05	-	-	-	Could not excavate
05	30	I	Negative	
06	-	-	-	Could not excavate
06	-	-	-	Could not excavate
07	-	-	-	Could not excavate
07	30	I	Negative	
08	19	I	Negative	

Table 4. Results of the STP Survey.

STP	Depth (cm bs)	Stratigraphy	Archaeological Material	Comments
08	9	I	Negative	
09	-	-	-	Could not excavate
09	10	I	Negative	
10	-	-	-	Could not excavate
10	23	I	Negative	
11	-	-	-	Could not excavate
11	15	I	Negative	
12	10	I	Negative	
12	10	I	Negative	
13	7	I	Negative	
13	18	I	Negative	
14	-	-	-	Could not excavate
15	40	I, II	Negative	
16	8	I	Negative	
17	16	I	Negative	
18	17	I	Negative	
19	12	I	Negative	
20	27	I	Negative	
21	19	I	Negative	
22	13	I	Negative	
23	22	I	Negative	
24	20	I	Negative	
25	10	I	Negative	
26	14	I	Negative	
27	13	I	Negative	
28	14	I	Negative	
29	7	I	Negative	
30	20	I	Negative	
31	19	I	Negative	

Table 4. Results of the STP Survey.

STP	Depth (cm bs)	Stratigraphy	Archaeological Material	Comments
32	17	I	Negative	
33	24	I	Negative	
34	10	I	Negative	
35	-	-	-	Could not excavate
36	-	-	-	Could not excavate
37	22	I	Negative	
38	10	I	Negative	
39	50	I, II	Negative	
40	27	I	Negative	
41	-	-	-	Could not excavate
42	-	-	-	Could not excavate
43	13	I	Negative	
44	41	I	Negative	
45	22	I, II	Negative	
46	42	I	Negative	

* Bold numbers indicate duplicated STPs excavated in 2023; all others were excavated in 2022.

Table 5. Soil Descriptions.

Layer	Typical Depth Range (cm bs)	Descriptions	Interpretation
I	0–42 cm bs	Dark reddish brown (2.5YR 3/4) silty clay loam; moist; structureless, weakly cemented to hard compact (indurated); non-plastic; few to many roots; up to 40% angular pebbles and cobbles; course or cemented lower boundary; modern refuse common	Humic soil developing on top of fill
II	16–50 cm bs	Dark reddish brown (2.5YR 3/6) silty clay with some sand; moist, structureless, very hard compact (indurated); non-plastic; fewer roots; up to 40-50% angular pebbles; cemented lower boundary; modern refuse common	Mix of A and B horizons mixed with fill



Photo 1. Project area overview showing example of heavy vegetation in the area; looking north.



Photo 2. Overview of project area in open grassy field on school grounds; looking south.



Photo 3. Overview of project area in open grassy field on school grounds; looking north.



Photo 4. Overview of project area in open grassy field on school grounds; looking south.



Photo 5. STP 01 (2022) basal level of excavation; looking north (0–22 cm bs).



Photo 6. STP 01 (2023) basal level of excavation; looking north (0–12 cm bs).



Photo 7. STP 02 (2022) basal level of excavation; looking south (0–21 cm bs).

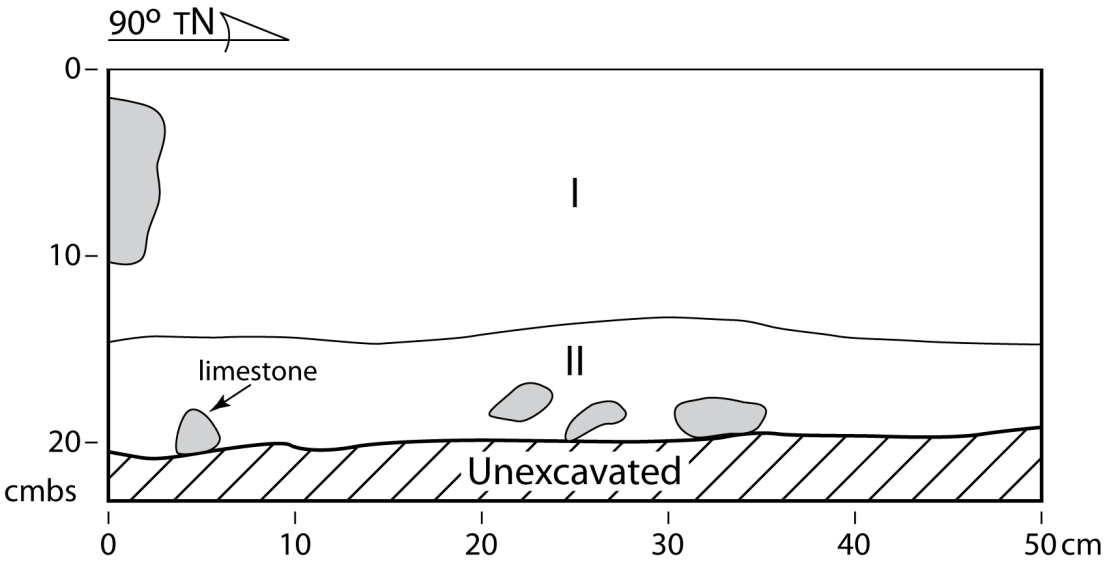

Figure 18.STP 02 soil profile.



Photo 8. STP 02 (2023) basal level of excavation; looking east (0–40 cm bs).



Photo 9. STP 03 (2023) basal level of excavation; looking south (0–10 cm bs).



Photo 10. STP 04 (2022) basal level of excavation; looking north (0–10 cm bs).



Photo 11. STP 04 (2023) basal level of excavation; looking south (0–20 cm bs).



Photo 12. STP 05 (2022) looking south; could not excavate due to paving underneath.



Photo 13. STP 05 (2023) basal level of excavation; looking north (0–30 cm bs).



Photo 14. STP 06 (2022) surface looking north; could not excavate due to paving underneath.



Photo 15. STP 07 (2022) looking north; could not excavate due to paving underneath.



Photo 16. STP 07 (2023) basal level of excavation; looking west-northwest (0–30 cm bs).



Photo 17. STP 08 (2022) basal level of excavation; looking north (0–17 cm bs).



Photo 18. STP 08 (2023) basal level of excavation; looking north (0–9 cm bs).



Photo 19. STP 09 (2023) basal level of excavation; looking north (0–10 cm bs).



Photo 20. STP 10 (2022) looking south; could not excavate due to paving underneath.



Photo 21. STP 10 (2023) basal level of excavation; looking north (0–23 cm bs).



Photo 22. STP 11 (2022) looking south; could not excavate due to paving underneath.



Photo 23. STP 11 (2023) basal level of excavation; looking north/northeast (0–15 cm bs).



Photo 24. STP 12 (2022) basal level of excavation; looking north (0–10 cm bs).



Photo 25. STP 12 (2023) basal level of excavation; looking north (0–10 cm bs).



Photo 26. STP 13 (2022) basal level of excavation; looking south (0–7 cm bs).



Photo 27. STP 13 (2023) basal level of excavation; looking north (0–18 cm bs).



Photo 28. STP 14 (2022) looking south; could not excavate due to paving underneath.



Photo 29. STP 15 (2022) basal level of excavation; looking north (0–40 cm bs).

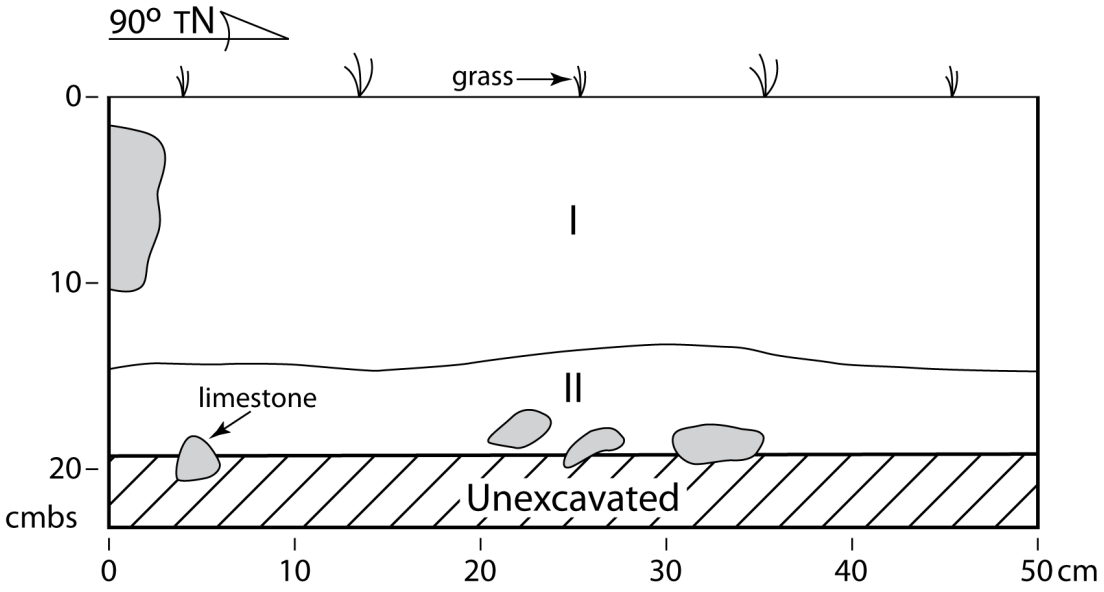

Figure 19.STP 15 soil profile.



Photo 30. STP 16 basal level of excavation; looking north (0–8 cm bs).



Photo 31. STP 17 basal level of excavation; looking north (0–16 cm bs).



Photo 32. STP 18 basal level of excavation; looking north (0–17 cm bs).



Photo 33. STP 19 basal level of excavation; looking north (0–12 cm bs).



Photo 34. STP 20 basal level of excavation; looking north (0–27 cm bs).



Photo 35. STP 21 basal level of excavation; looking north (0–19 cm bs).



Photo 36. STP 22 basal level of excavation; looking north (0–13 cm bs).



Photo 37. STP 23 basal level of excavation; looking north (0–22 cm bs).



Photo 38. STP 24 basal level of excavation; looking north (0–20 cm bs).



Photo 39. STP 25 basal level of excavation; looking north (0–10 cm bs).



Photo 40. STP 26 basal level of excavation; looking north (0–14 cm bs).



Photo 41. STP 27 basal level of excavation; looking north (0–13 cm bs).



Photo 42. STP 28 basal level of excavation; looking north (0–14 cm bs).



Photo 43. STP 29 basal level of excavation; looking north (0–7 cm bs).



Photo 44. STP 30 basal level of excavation; looking north (0–20 cm bs).



Photo 45. STP 31 basal level of excavation; looking north (0–19 cm bs).



Photo 46. STP 32 basal level of excavation; looking north (0–17 cm bs).

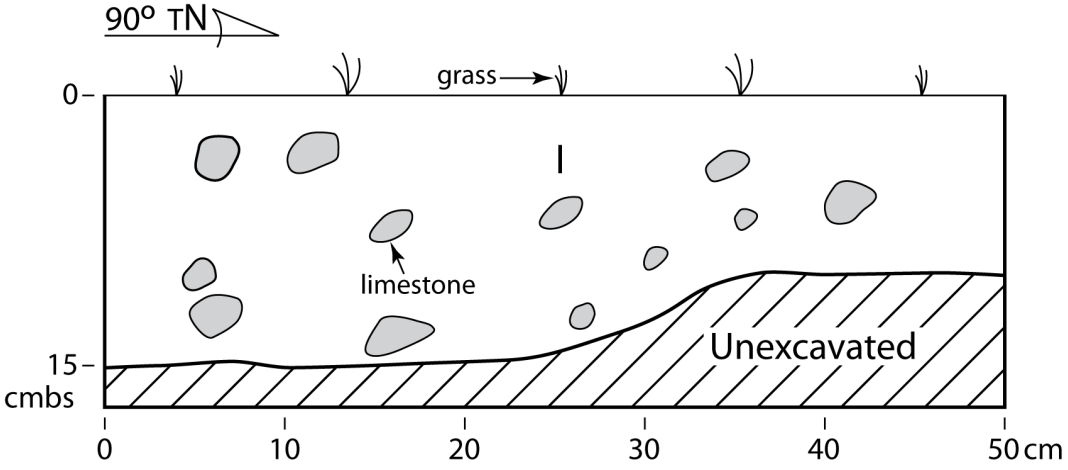

Figure 20.STP 32 soil profile.



Photo 47. STP 33 basal level of excavation; looking north (0–24 cm bs).

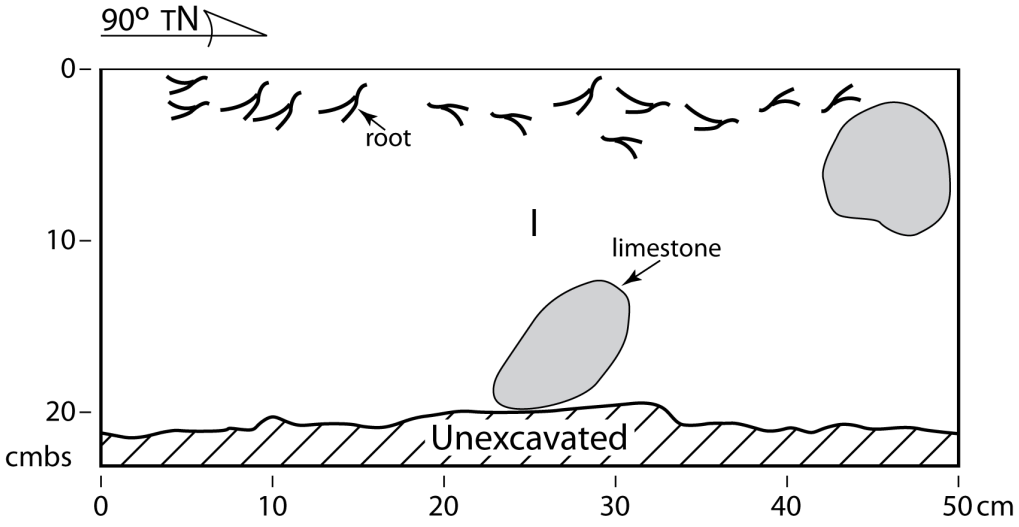

Figure 21.STP 33 soil profile.



Photo 48. STP 34 opening of excavation looking north.



Photo 49. STP 37 basal level of excavation; looking north (0–22 cm bs).



Photo 50. STP 38 basal level of excavation; looking north (0–10 cm bs).



Photo 51. STP 39 basal level of excavation; looking north (0–50 cm bs).

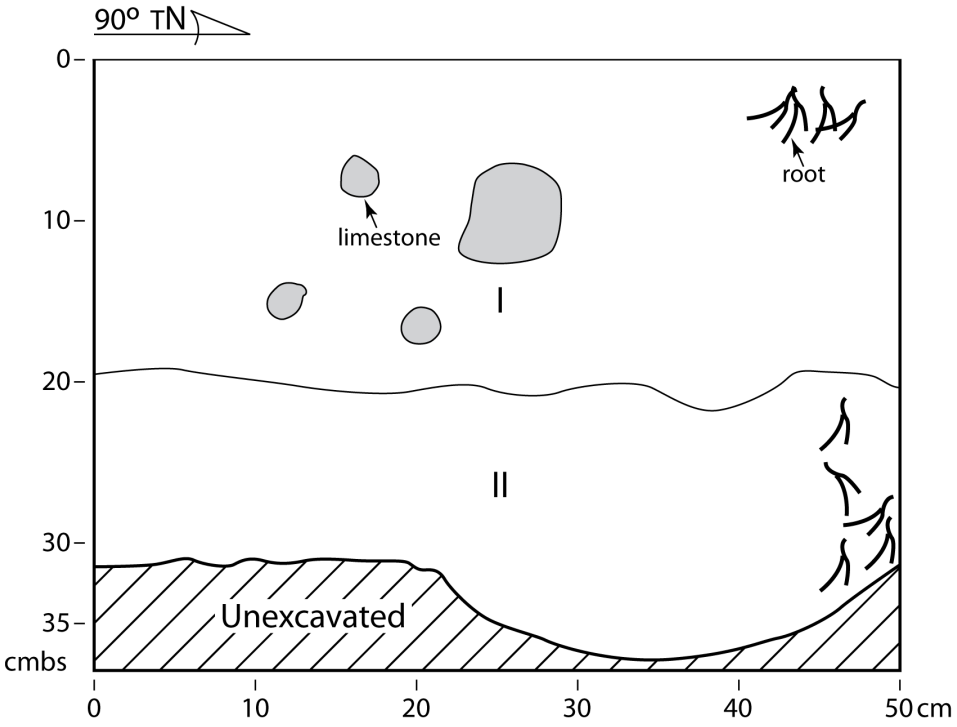

Figure 22.STP 39 soil profile.



Photo 52. STP 42 looking north (unexcavated).



Photo 53. STP 43 basal level of excavation; looking north (0–13 cm bs).



Photo 54. STP 44 basal level of excavation; looking north (0–41 cm bs).

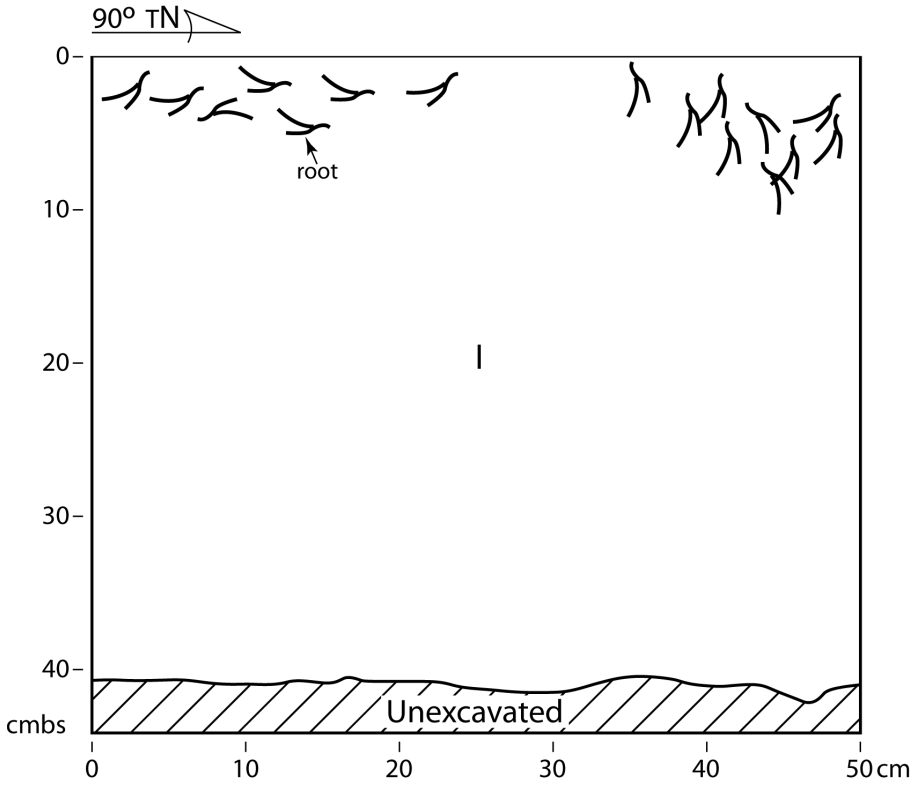

Figure 23.STP 44 soil profile.



Photo 55. STP 45 basal level of excavation; looking north (0–22 cm bs).

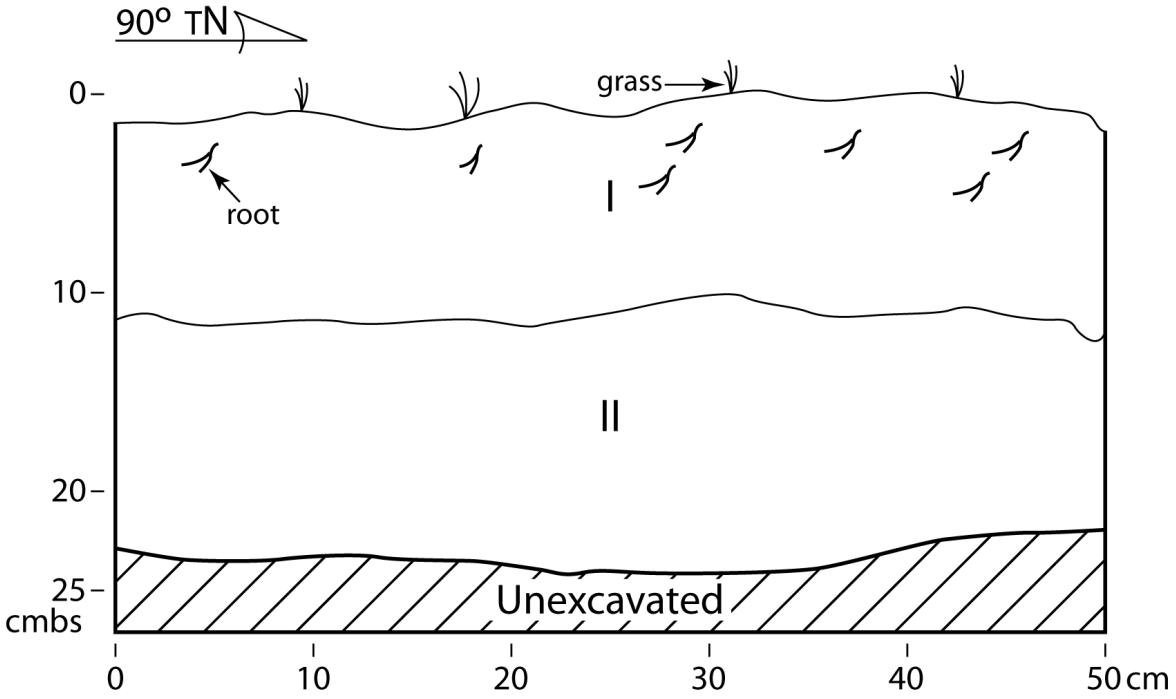

Figure 24.STP 45 soil profile.



Photo 56. STP 46 basal level of excavation; looking south (0–42 cm bs).

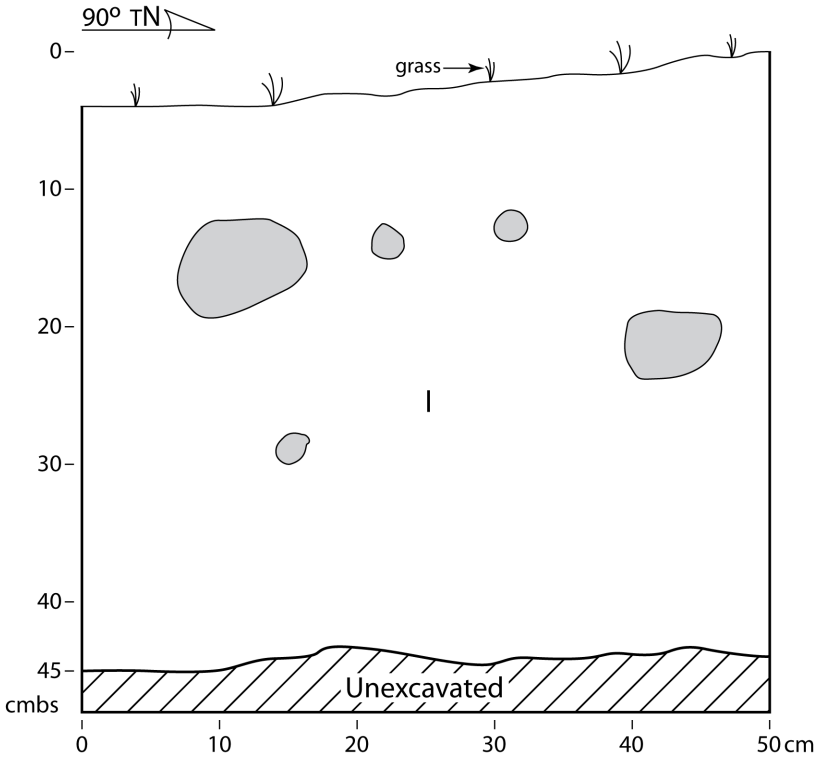

Figure 25.STP 46 soil profile.

The primary purpose of the survey was to determine the presence or absence of cultural resources in the project area, in particular whether there was evidence of late pre-Contact or early post-Contact resources, as remains from other time periods were not expected. The following research questions were posed in the research design:

What was the nature of the late pre-Contact and early post-Contact use of the project area, if any?

No archaeological deposits were encountered during subsurface testing. No cultural material was recovered. The potential for previously undocumented archaeological deposits in this area is unlikely as excavation revealed a shallow, mixed A horizon in all STPs that in some cases overlaid pavement or filling with modern construction fill overlaying a poorly developed B horizon intermixed with fill and/or refuse.

What was the nature of the 20th-century use of the project area, if any?

As noted above, previous projects in the vicinity of the project area identified features related to Post-WWII ranching. Such features could have also been present in the project area and could aid in interpreting how this area was used during the 20th-century, both before and after WWII. However, there was no cultural material related to any WWII or post-WWII activities.

V. CONCLUSION AND RECOMMENDATIONS

At the request of Taniguchi Ruth Makio Architects +, Guam, International Archaeology, LLC conducted archaeological survey and subsurface testing in support of the proposed expansion of Simon Sanchez High School, Yigo, Guam (Figure 2 and Figure 3). The proposed project encompasses the construction of several new buildings, renovating several existing buildings, and upgrading the associated parking lots and utilities. Archaeological pedestrian survey and subsurface testing covered an area of approximately 27.75 ac., including the undeveloped portions of the Simon Sanchez High school property, as well as part of the adjoining F.B. Leon Guerrero Middle School property.

Because the area had a known history of late pre-Contact or early post-Contact resources, it was expected that there could be evidence for these, while evidence would be lacking for earlier periods. However, no archaeological deposits and no cultural resources were encountered during survey and subsurface testing of the project area, which included 46 STPs. Given the area's long history of disturbance during and after WWII, particularly during construction of the Simon Sanchez High School and related buildings that included grading and filling of the fields, and also the use of the highly vegetated area in the southern portion of the project area as an illicit dumping area in more recent years, it is unlikely that archaeological deposits, if present, are still intact. Given these findings, additional archaeological testing is not recommended for the project area. Also, archaeological monitoring during construction would seem to be of little value and is not recommended.

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APPENDIX A: ARCHAEOLOGICAL REPORT SUMMARY FORM

DEPARTMENT OF PARKS AND RECREATION

Guam Historic Resource Division
(State Historic Preservation Office)

Archaeological Report Summary Form (ARSF)

FOR DPR-GHRD OFFICE USE ONLY		
RC No.		Draft:
Date:		
Reviewer:		
GIS: Ent. - Date:		Final
By – Staff:		
GHPI Site No.:		

Please print clearly when completing this form. Include completed (ARSF) forms in all reports being submitted to the Department, such as Draft and Final reports. This form may be downloaded or expanded as needed, but do not eliminate any fields.

1. Report Title: Archaeological Survey and Subsurface Testing in Support of Simon Sanchez High School Expansion, Yigo, Guam
2. Principal Investigator: J. Stephen Athens ☐ M.A. ☑ Ph.D./Firm or Institution International Archaeology, LLC
3. Report Date: (01-06-2002) 03-27-24 Number of Pages 162 Draft Report ☑ Final Report ☐
   Letter of Acceptance of Final Report ☐ Final Report: Two (2) spiraled-bound copies, 1 CD, Shapefiles: Y/N
   Research Design: Yes ☑ No ☐ Scope of Work: Yes ☑ No ☐ RC # 2016-0961
4. Type of Report: Terrestrial ☑ Marine ☐ Architecture: ☐ Historic ☐ Prehistoric ☐
   Type of Work: Identification ☑ Evaluation ☑ Data Recovery ☐ Monitoring ☐ Shapefiles Provided: Y / N
   Further work recommended Yes ☐ No ☑ What? _____ Preservation Y / N
5. Agency/Lessees Name: Guam Department of Education Federal ☐ Guam ☑ Private ☐
   Company / Land Owner: Guam Department of Education Lot No. (s): L7022-1 and L7022-2
6. Project Area: Quad, Municipality, Village, Place Name/s: Simon Sanchez H.S.

Quad	Municipality	Village	Place Name
Dededo	Yigo		Simon Sanchez H.S.

7. Nearest Project Area Drainage (s): Santa Rosa Distance from site: Adjacent
8. Basic Field Information: Series of Soil: Guam cobbly clay loam
   a. Area of Potential Effect (APE) / Project Area in Hectares: 11.23 Acres: 27.75
   b. Type of Proposed Project/ Impacts: Construction Date/s of Field Investigation/s: 2/22-25/22; 3/7-8/23
   c. Closest Recorded Historic Property/(ies) to APE (GHPI Site No. and Name.): 66-08-0221; MARBO Base Command
   d. Description of Field Conditions and Disturbance (wooded, previously cleared, bulldozed, untouched, etc.): Previously cleared and bulldozed areas for school construction as well as wooded areas.
9. GHPI Site Numbers, if any: N/A GHPI Data Form/s submitted: Yes ☐ No ☑
10. Number of sites "Meeting" National Register Criteria: 0 Guam Register Criteria _____
11. Number of sites "Not Meeting" National Register Criteria: 0 Guam Register Criteria: _____
12. Number of Sites with No Effect Determination 0 No Adverse Effect 0 Adverse Effect 0
13. Other documents issued / submitted / required: Certificate of Approval # _____ Notice of Violation # _____
    Memorandum of Agreement _____ Programmatic Agreement _____ Artifact Catalog # _____
14. Disposition of Artifacts / Stored With / Date: N/A

Lourdes A. Leon Guerrero
Governor
Joshua F. Tenorio
Lt. Governor

Department of Parks and Recreation
Dipattamenton Plaset yan Dibuetsion
Government of Guam
Director's Office, Parks and Recreation Divisions:
#1 Paseo de Susana, Hagåtña, Guam 96910
P.O. Box 2950, Hagåtña, Guam 96932
(671) 475-6288; Facsimile (671) 477-0997
Guam Historic Resources Division:
490 Chalan Palasyo, Agana Heights, Guam 96910
(671) 475-6294/6355; Facsimile (671) 477-2822

Angel R. Sablan
Acting Director
Warren Pelletier
Deputy Director

July 31, 2024

In reply refer to:
RC 2016-0961

Elmer Prudente Jr.
Taniguchi Ruth Makia Architects
100 Cliff Business Center
P.O. Box EA
Hagatna, Guam 96932

Subject: FINAL Archaeological Survey and Subsurface Testing in Support of Simon Sanchez High School Expansion, by Scott M. Fitzpatrick, RC 2016-0961 [IA202028]

Hafa Adai Mr.Prudente,

Thank you for submitting the FINAL volume and digital files for *Archaeological Survey and Subsurface Testing in Support of Simon Sanchez High School Expansion, Yigo Guam.*

Should you have any questions, please contact Mr. Logan Myers, Archaeologist at (671) 475-6340 or by email: logan.myers@dpr.guam.gov.

Sincerely,

Angel R. Sablan
Acting State Historic Preservation Officer

Cc: Stephen Athens, IA LLC

ATTACHMENT B-4

REPORT

SUBSURFACE SOIL INVESTIGATION
NEW SIMON SANCHEZ HIGH SCHOOL
YIGO, GUAM

Prepared for

Taniguchi-Ruth-Makio Architects
Cliff Business Center
Hagatna, Guam 96910

Prepared by

Geo-Engineering and Testing, Inc.
P. O. Box 8170
Tamuning, Guam 96931

31 August 2022

327.110

INTRODUCTION

This report presents the results of the subsurface soil investigation we conducted for the New Simon Sanchez High School, planned for construction in Yigo, Guam.

We understand that the existing school buildings will be demolished and to be replaced with new school facility. The planned development will consist of an administration building, credit recovery building, classrooms (A-, B-, and C-wings), gymnasium, auditorium, an open field, and a multi-purpose field. Site improvements will include parking lots and storm water surface run-off disposal.

The purpose of our investigation was to perform limited explorations of the subsurface soil conditions at the project site, perform limited laboratory testing and engineering analyses and evaluation to provide discussion and recommendations concerning the site grading earthwork and foundation supports of the new structures generally as follows:

1. General subsurface conditions of the project site (based on the test boring information obtained at the site).

2. Site grading earthwork, soil material requirements, placement and compaction procedure, and subgrade improvements, as appropriate.

3. Foundation support methods for the new buildings, and settlement estimate.

4. Subgrade preparations for the on-grade concrete ground floor slabs, pavements.

5. New flexible asphalt pavement section design thicknesses.

6. Percolation rate for storm water runoff disposal design.

We conducted the test borings on March 16 to 22, 2022 and again on June 20 to 30, 2022. We provided the General Assessment and Preliminary Geotechnical Recommendations Report to TRM+A on June 15, 2022.

SUBSURFACE EXPLORATIONS

Test Borings

A total of 40 test borings were drilled at the project site. We initially drilled a total of 20 test borings; however, there were modifications on some structures as well as boring locations. After the modifications and new boring locations were completed, we resumed and drilled the additional 20 test borings. The test borings were drilled utilizing a truck-mounted, 8-inch diameter hollow-stem auger drill rig to approximately 17 to 30 feet below the existing ground surface or in hard coralline limestone below. The locations of the test borings are shown on Plate 1.

During the subsurface explorations, our technical staff was at the site full-time logging the subsurface materials that were encountered in the test bored holes and obtaining disturbed and undisturbed subsurface soil and rock samples for visual examination, soil and rock classifications, and laboratory testing. The logs of the test borings are presented on Plates 2 through 41. The Soil Classification System that has been used for describing and classifying soils is presented on Plate 42.

While obtaining the subsurface soil and rock samples, we also obtained the standard penetration test (SPT) values or N-values. The N-value is defined as the number of blows per each foot of penetration into the underlying, undisturbed soil or weak to moderately hard rock, utilizing a 2.0-inch outside diameter, split spoon soil sampler, driven by a 140-pound drop weight free falling 30 inches per each blow.

However, in order to obtain better undisturbed soil samples for laboratory testing, a larger, 3.0-inch outside diameter split spoon soil sampler was used and the field blow counts were converted to the standard penetration test or N-values using a correction factor of 0.68 times the field blow counts of the 3.0-inch diameter sampler.

The N-values obtained from the test bored holes are shown on the logs of the test borings where they were taken.

Percolation Tests

In addition to conducting the test borings, we also performed four percolation tests at the locations also shown on Plate 1. The percolation test holes were excavated to approximately 13 to 24 inches in diameter and 3 feet deep below the existing ground surface.

Percolation Tests 1, 2, and 3 exposed few inches of reddish brown-white gravelly sandy silt, overlying light brown-white coralline limestone formation. Percolation Test 4 encountered approximately 7 inches thick of reddish brown-white gravelly sandy silt, followed by reddish brown clayey silt to the bottom of the test hole.

The percolation test holes were saturated first prior to conducting the tests. The following percolation test results were obtained together with our recommended rates:

Percolation Test No	Average rate, inches/minute	Last rate, inches/minute	Recommended rate, inches/minute
1	0.108	0.041	0.041
2	0.057	0.048	0.028
3	0.284	0.109	0.109
4	0.149	0.084	0.074

Note: 1. Percolation rates may vary from point to point.
2. The recommended rate is either the last rate or the average rate, Whichever is lower.

LABORATORY TESTING

In our laboratory, the subsurface soil and rock samples obtained from the project site were re-examined and selected soil/rock samples were tested to determine their in-situ moisture content, unit weight (dry density), particle size distribution, liquid limit and plasticity index, and minus no.200 sieve (silt and clay particles). The results of the tests are shown on the boring logs where the tested samples were taken, and are also shown graphically on Plates 43 through 55. A Key to Test Data shown on Plate 42 explains the abbreviations of the test designations shown on the logs of the test borings.

The laboratory tests performed for this project were in accordance with the American Society of Testing and Materials (ASTM) standard test procedures.

SUBSURFACE CONDITIONS

In general, the project site is underlain with variable thickness of overburden soil consisting of few inches to approximately 5 feet thick of loose to very dense silty sandy limestone gravel and gravelly silty sand, and soft to very stiff clayey silt, sandy silt, gravelly silt, and gravelly clayey silt, overlying native coralline limestone formation; the limestone should extend to much deeper, likely more than a few hundred deep below surface. The coralline limestone is mostly hard with weak and moderately hard zones.

No ground water was found in the test borings. Permanent ground water at the project site should be deeper than a few hundred feet below surface or close to the sea level. Therefore, ground water has no significance to this project.

Seismic Site Class – The shallow depth native coralline limestone formation should extend to much deeper than 100 feet below the existing surface, which is the depth of defining seismic site class; therefore, the seismic site class of the project site is Class C in accordance with the 2012 International Building Code, which is defined as very dense soil and/or soft rock.

DISCUSSION AND CONCLUSIONS

Based on the results of our investigation, the project site is underlain with shallow overburden soil overlying mostly hard coralline limestone. The new buildings can be supported on conventional, shallow spread footings and/or

continuous footings, resting on moderately hard to hard coralline limestone or on densely compacted, silty limestone sand/gravel soil having at least 95 percent of its maximum dry density (MDD, as determined from ASTM D1557 laboratory compaction test).

Details of our recommendations are presented in the remainder of this report.

RECOMMENDATIONS

Site Clearing and Stripping – Initially, the areas to be graded should be cleared of vegetation, debris and unsuitable matters. Topsoil containing roots should be stripped and disposed elsewhere or stockpiled at appropriate locations for later reuse in landscaping, if it is desired.

Additional Excavation – After the above and any site cuts are completed, within the new structural footprints, including sidewalks, walkways, and parking areas, and at least 3 feet wider all around their edges, any exposed silty soil, which is potentially expansive that can shrink or swell with its moisture change, should be excavated entirely or 3 feet deep maximum, subject to the approval of the geotechnical engineer during construction, for replacement with densely compacted, non-expansive, limestone silty sand/gravel soil fill.

Recompaction – After the required excavations are completed, the final exposed surfaces of the excavated areas and the areas to be filled should be lightly scarified to approximately 6 inches deep, moisture conditioned (wetted or

air dried) as necessary, and recompacted to achieve at least 95 percent of its MDD, with uniform, dense and unyielding surfaces.

Fill and Backfill Soils and Placement – All fill and backfill soils should be free of organic matter, debris, and rock fragments or lumps larger than 4 inches or one-half of the compacted layer thickness, whichever is less, in greatest dimension. In addition, the fill and backfill soils within the building footprint and exterior concrete slabs and sidewalks, driveways and parking lots, including at least 3 more feet wider all around their edges, should be non-expansive with plasticity index 12 percent maximum, liquid limit no more than 35 percent, and contain no more than 30 percent finer than no. 200 mesh sieve (silt and clay sizes), but should have adequate medium to coarse sand for dense compaction.

Approved fill and backfill soils should be placed in 10-inch maximum loose layers, moisture conditioned as necessary and compacted to at least 95 percent MDD of the soil being compacted.

The on-site excavated, silty limestone sand/gravel soils meeting the above requirements may be re-used as fill and backfill soils.

The on-site excavated silty soil should only be used in non-load-bearing areas, and utility backfill outside of the load-bearing areas. The compacted density of such backfill can be 90 percent of its MDD, or 85 percent MDD in landscape areas.

Potential Hard Rock Excavation - In general, the on-site coralline limestone rock is mostly hard and will be difficult to excavate, and will require an excavator with vibratory rock breaker. The contractor should be responsible for

the excavations and the safety of men and equipment working with and around the excavations.

Foundation Supports

The new buildings can be supported on shallow spread footings and/or continuous footings resting directly in the underlying, moderately hard to hard coralline limestone formation or densely compacted, silty limestone sand/gravel soil fill or subbase fill compacted to at least 95 percent of its maximum dry density (MDD).

The foundations should be designed with the following criteria:

1. Allowable bearing pressures:
   Dead plus live loads
   (psf = pounds per square foot) — 4000 psf

   Total design loads, including
   wind or seismic forces — 5300 psf

2. Resistance to lateral loads.

   Friction across foundation bottoms
   (percent of dead load at foundation
   bottoms) — 35

   Passive soil resistance against one face
   of the footings (triangular with depth) for
   densely compacted sand/gravel soils
   around the footings. Ignore top one foot
   if it is not directly covered with concrete
   slab or asphalt pavement), — 400 pcf
   (pcf = psf/ft. of depth or pounds per cubic foot)

3. Minimum footing width, columns — 3 feet
   walls — 2 feet

4. Minimum footing embedment below lowest
   adjacent final grade, columns — 3 feet
   walls — 2 feet

During construction, if silt or loose sand/gravel are found at the footing bottom (footing subgrade), they should be removed entirely and replaced with densely compacted, silty limestone sand/gravel soil fill in 8-inch maximum loose loose layers, moisture conditioned as necessary and compacted to at least 95 percent of its MDD, including edges and corners.

The footings strictly constructed as recommended herein should be designed to tolerate 1-inch total settlement and 1-inch differential settlement across the building width.

Subgrade Preparation for Concrete On-Grade Slabs

The finished subgrades for the on-grade concrete slabs should have been compacted to a uniform, dense and unyielding surface with at least 95 percent of its MDD, or relatively clean, exposed moderately hard to hard limestone. The concrete slabs should be directly underlain with 6 inches thick of crushed aggregate base course meeting standard road paving base course requirements, uniformly spread without segregation, moisture conditioned as necessary and compact to dense and unyielding with 100 percent of its MDD.

Where penetration of moisture vapor through the concrete on-grade slabs is objectionable, an impervious membrane should be placed between the compacted aggregate base course and the concrete slabs.

Flexible Pavements

The following flexible asphalt pavement sections should be used for the new access roads, driveways, and parking areas for passenger vehicles, light and heavy trucks:

	Asphalt Surface	Aggregate Base
Main access road and heavy truck trafficking and parking areas	3 inches	8 inches
Passenger vehicles and light pick-up truck traffic and parking areas	2 inches	6 inches

The pavement subgrades should be either moderately hard to hard coralline limestone or densely compacted, non-expansive silty limestone sand/gravel soil with at least 95 percent of its MDD, as recommended earlier in this report. The final subgrade surfaces should be inspected and verified by the special inspector or the geotechnical engineer of the project

The base course aggregate should conform to the following requirements:

Sieve Size	Cumulative Percent Finer by Weight
2 inches	100
1.5 inches	90 - 100
0.75 inch	50 - 80
No. 4	30 - 60
No. 40	15 - 30
No. 200	5 - 13

Fraction passing No. 200 sieve should not be more than 1/2 of fraction passing No. 40 sieve.

California Bearing Ratio	100 minimum
Abrasion wear	40 maximum
Liquid limit	25 maximum
Plasticity index	6 maximum

The base course aggregate should be uniformly spread without segregation, uniformly moisture conditioned as necessary and compacted with a vibratory roller compactor at least 10 tons in weight to provide a uniform, dense and unyielding surface with 100 percent of its MDD. Care should be taken during the spreading of the base aggregate to avoid segregation of the aggregate.

Construction Inspection and Testing

During construction, the earthwork and foundation construction, including the flexible asphalt pavement, should be performed under geotechnical engineering inspection and testing to verify that the works and the materials used conform to the project plans and specifications and the intent of the geotechnical recommendations, and to modify the recommendations if unanticipated subsurface conditions are found. Inspection and testing would satisfy the requirements of the 2012 International Building Code.

INVESTIGATION LIMITATIONS

Our findings, discussion and recommendations presented herein are based on the information obtained from the test borings of this investigation. Unanticipated subsurface conditions may be encountered during construction and cannot be fully determined by test borings. Therefore, some contingency fund is thus recommended for the project to accommodate these possible costs.

This report has been prepared for the exclusive use of the government and the project architects and engineers, and the project contractor. It shall not be used by or transferred to any other party or to another project without the prior written, expressed consent and/or thorough review by this facility.

The following plates are included to complete this subsurface soil investigation report for the New Simon Sanchez High School, planned for construction in Yigo, Guam.

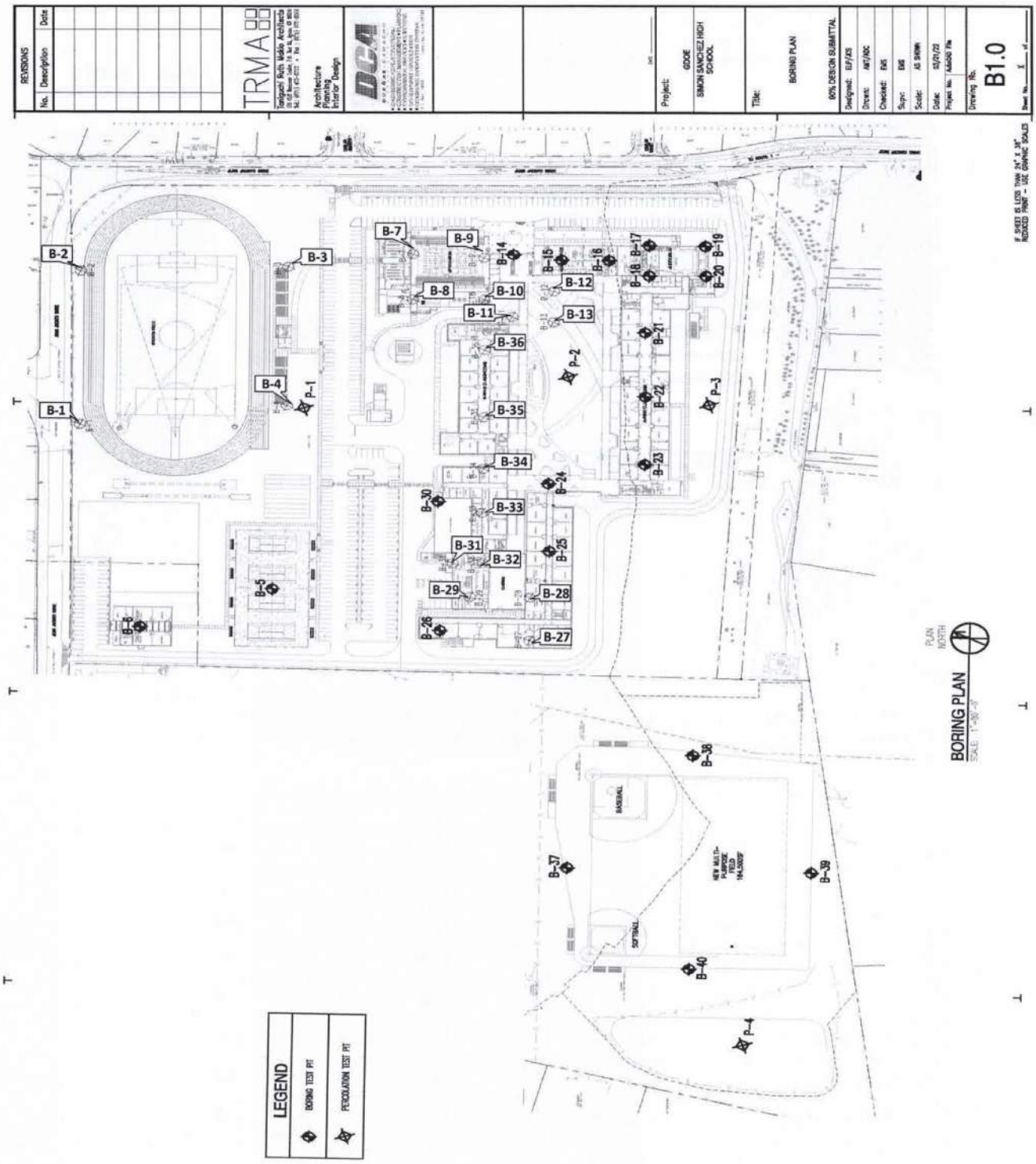
Plate 1	-	Test Boring and Percolation Test Location Plan
Plates 2 through 41	-	Logs of Test Borings 1 through 40
Plate 42	-	Soil Classification Chart and Key to Test Data
Plates 43 through 52	-	Particle Size Distribution Report
Plates 53, 54, and 56	-	Liquid and Plastic Limits Test Report

Respectfully submitted,

GEO-ENGINEERING & TESTING, INC

Michael C. Rayo
Project Manager

Ukrit Siriprusanan
Civil Engineer - 360



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TEST BORING AND PERCOLATION TEST LOCATION PLAN

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO GUAM

PLATE 1

Job No. 327.110 **Appr.** US/ **Date** 5/30/22

LOG OF TEST BORING 1

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 19, 2022

EQUIPMENT 8" Dia Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - very dense, moist				41/5"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				60/5"			
5	1								
	2					26/0"			
10	3								
	4					25/0"			
15	5								
						70/5"			
20	6	(no free water encountered)							

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 1

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 2

LOG OF TEST BORING 2

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 19, 2022

EQUIPMENT 8" Dia Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	2" Thick Asphalt Pavement				14			
		BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist				61	11.5	103	SA
	1	REDDISH BROWN CLAYEY SILT (MH) - stiff, moist				58/6"			
5		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard				10/1"			
	2	hard from 3'				12/1"			
10	3								
	4					54/5"			
15									
	5	(no free water encountered)				10/ 0.5"			

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 2

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 3

LOG OF TEST BORING 3

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 17, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	DARK BROWN-WHITE GRAVELLY SILT (ML) - soft to medium stiff, moist				14	8.4	96	SA
		BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist				14			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
5						65			
	2					54			
						75			
10	3								
	4					61			
15									
	5	weak from 17'							
						34			
20	6								
	7					31			
		(no free water encountered)							

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 3

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 4

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 4

DATE March 17, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				76	10.2	118	SA
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard				41			
	1	weak at 1.5'-3'							
5						65			
						86			
	2	hard from 6'				24/1"			
10	3								
	4					65/7"			
15									
	5					71/11"			
		(no free water encountered)							

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 4

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 5

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 5

DATE June 22, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE GRAVELLY SILTY SAND (SM) - dense, moist				43	13.9	100	SA
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - weak				42			
	1								
5						31			
	2					44			
						39			
10	3								
		moderately hard from 12'				85			
	4								
15									
	5								
						67			
20	6								
		hard from 22'-27'				22/2"			
	7								
25									
	8								
						79			
30	9								
		(no free water encountered)							

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LOG OF TEST BORING 5

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

Job No. 327.11 Date 7/5/22

PLATE 6

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 6

DATE June 23, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	2" thick AC pavement							
		BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				52/ 6.75"			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				74 54/6"			
5						61/ 5.5"			
	2					31/3"			
10	3								
		no recovery at 12'				30/2"			
	4								
15									
	5					35/2"			
20	6	(no free water encountered)							

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Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 6

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 7

LOG OF TEST BORING 7

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 17, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist very dense from 1.5'				43 41/5"	10.9	112	SA
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				60/5"			
5	2					20/0"			
10	3								
	4					60/5"			
15	5					60/4"			
20	6								
	7					35/0"			
25	8					60/2"			
30	9	(no free water encountered)							

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 7

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 8

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 8

DATE March 17, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				60/2"			
						20/0"			
	1	moderately hard at 3'-4.5'				58			
5						106			
	2					60/4"			
10	3								
						60/4"			
	4								
15									
	5					60/5"			
20	6								
						70/6"			
	7								
25									
	8					120/ 10"			
30	9								
		(no free water encountered)							

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 8

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 9

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 9

DATE March 17, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - very dense, moist				44/4"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				60/2"			
5	1								
	2					30/0"			
10	3								
						30/0"			
15	4								
	5					127/ 11"			
20	6								
	7					60/5"			
25	8					35/1"			
30	9	(no free water encountered)							

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Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 9

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 10

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 10

DATE March 18, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				83/8"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				25/0"			
5	1								
	2					60/5"			
10	3								
		moderately hard from 12'				69			
15	4								
	5					71			
20	6								
	7					69			
25	8					94			
30	9	(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 10

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 11

LOG OF TEST BORING 11

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 18, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILTY SAND (SP-SM) - loose, moist				5	4.1	86	SA
		medium dense from 1.5'				24			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard				73			
5						66			
	2	hard from 6'				20/0"			
10	3								
						70/6"			
	4								
15									
	5					20/0"			
20	6								
						20/0"			
	7								
25									
	8					126			
30	9								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 11

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 12

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 12

DATE March 18, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				32			
						59/11			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				100/ 11"			
5									
	2					20/0"			
10	3								
						31/0"			
	4								
15									
	5					30/0"			
20	6								
		(no free water encountered)				20/0"			

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/19/22

LOG OF TEST BORING 12

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 13

LOG OF TEST BORING 13

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 21, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist				17 13			
	1	REDDISH BROWN GRAVELLY SANDY CLAYEY SILT (MH) - stiff, moist				14		86	SA
5		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				74/11"			
	2					43/5"			
						41/5"			
10	3								
						11/0"			
	4								
15									
	5	moderately hard at 17'-18.5'				88			
	6								
20									
	7					85/6"			
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

LOG OF TEST BORING 13

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 14

Job No. 327.110 Date 5/19/22

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 14

DATE June 20, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE GRAVELLY SILTY SAND (ML) - soft, moist, with roots				59			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard				68/5"			
	1	hard from 1.5'				39/ 3.5"			
5		no recovery at 4.5"				22/ 2.5"			
	2	no recovery at 6'				20/2"			
10	3								
						42/3"			
15	4								
	5					20/2"			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 14

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 15

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 15

DATE June 20, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION .

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN CLAY (CL) - very stiff, moist				24	33.2	88	-#200=99.9% LL=46; PI=24
		LIGHT BROWN-WHITE CORALLINE LIMESTONE -				71			
	1	moderately hard							
		hard fom 3'				61/7"			
5		no recovery at 4.5'				13/1"			
	2					58/6"			
10	3								
		no recovery at 12'				16/1"			
	4								
15									
	5					23/1"			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 15

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 16

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 16

DATE June 27, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				67/7"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				14/1"			
	1					10/1"			
5						20/ 1.5"			
	2					20/2"			
10	3								
		no recovery at 12'				35/ 2.5"			
	4								
15									
	5								
		no recovery at 17'				57/ 5.5"			
20	6								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 16

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 17

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 17

DATE June 28, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				62/ 10.5"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				12/1"			
	1	no recovery at 3'				32/3"			
5						59/6"			
	2					15/ 1.5"			
10	3								
						52/5"			
	4								
15									
	5					33/3"			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 17

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 18

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 18

DATE June 27, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - stiff, moist				31/ 5.5"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				26/ 1.5"			
	1	no recovery at 1.5'				14/1"			
		no recovery at 3'							
5						10/1"			
	2					50/ 3.5"			
10	3								
		no recovery at 12'				46/2"			
	4								
15									
	5					60/5"			
20	6								
		(no free water encoutered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 18

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 19

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 19

DATE June 28, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				34/3"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				21/1"			
	1	no recovery at 1.5'				14/1"			
5		no recovery at 4.5'				15/1"			
	2					61/ 5.5"			
10	3								
						48/3"			
	4								
15									
	5					50/ 3.5"			
20	6								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 19

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 20

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 20

DATE June 27, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SANDY SILT WITH GRAVEL (ML) - soft, moist				21/2"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE				20/2"			
		no recovery at 1.5'							
	1	no recovery at 3'				29/3"			
5		no recovery at 4.5'				35/2"			
	2					60/ 5.5"			
10	3								
		no recovery at 12'				36/3"			
	4								
15									
	5					34/2"			
20	6								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

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LOG OF TEST BORING 20

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 21

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 21

DATE June 28, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN SANDY SILT (ML) - soft, moist				22	12.0	92	SA
		BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist							
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard				58 10/1"			
5		hard from 3' no recovery at 4.5'				41/ 3.5"			
	2	no recovery at 6'				36/3"			
10	3								
		no recovery at 12'				67/ 5.5"			
	4								
15									
	5					47/3"			
20	6								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

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LOG OF TEST BORING 21

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 22

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 22

DATE June 29, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				41/3"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				27/ 2.5"			
	1	no recovery at 1.5'				42/ 3.5"			
5						65/ 7.5"			
	2	no recovery at 6'				42/3"			
10	3								
		no recovery at 12'				30/2"			
	4								
15									
	5					50/3"			
20	6								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 22

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 23

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 23

DATE June 29, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				20/ 2.5"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				71/8"	7.9	106	
	1	no recovery at 3'				33/3"			
5		no recovery at 4.5'				29/3"			
	2	no recovery at 6'				22/2"			
10	3								
						70/6"			
	4								
15									
	5					41/4"			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

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LOG OF TEST BORING 23

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 24

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 24

DATE June 21, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				40/ 3.5" 14/1"	8.8	92	SA
	1					24/2"			
5						12/1"			
	2	moderately hard from 6'				56			
10	3								
	4					76			
15									
	5	hard fom 17'				30/ 2.5"			
20	6	(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 24

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 25

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 25

DATE June 21, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE / DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SANDY SILT WITH GRAVEL (ML) very soft, moist			29/ 2.5"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard			37/ 4.5"			
	1	moderately hard from 3'			61			
5		weak from 4.5'			41			
	2				37			
		hard from 8'						
10	3							
					27/2"			
	4							
15								
	5				41/ 3.5"			
20	6							
		(no free water encountered)						

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 25

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 26

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 26

DATE June 22, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				73			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				31/3"			
	1	no recovery at 1.5'				20/2"			
		no recovery at 3'							
5		no recovery at 4.5'				22/ 1.5"			
	2	no recovery at 6'				22/2"			
10	3								
		no recovery at 12'				21/ 1.5"			
	4								
15									
	5	moderately hard from 17'				53			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 26

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 27

LOG OF TEST BORING 27

Notes:

- Relatively Undisturbed Sample
- Disturbed/Bulk Sample
- SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 22, 2022
EQUIPMENT 8" Dia. Hollow-Stem Auger
ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist medium dense from 1.5'				31 28	10.4	96	SA
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				11/1"			
5						12/ 0.5"			
	2					11/1"			
10	3								
	4					41/ 5.75"			
15									
	5	(no free water encountered)				15/0"			

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LOG OF TEST BORING 27

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 28

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 28

DATE March 22, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - very dense, moist				53			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				31/ 1.75"			
	1					13/ 0.25"			
5		moderately hard at 4.5'-6'				86			
	2					54/6"			
10	3								
						11/ 0.1"			
	4								
15									
	5					10/ 0.25"			
20	6								
						23/2"			
	7								
25									
	8					30/4"			
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

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LOG OF TEST BORING 28

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 29

LOG OF TEST BORING 29

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 22, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN CLAYEY SILT (MH) - very stiff, moist				17	28.1	79	SA
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				73/11"			
	1					41/4"			
5									
	2					41/5"			
10	3								
						14/0"			
	4								
15									
	5					15/0"			
20	6								
						60/5"			
	7	(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 29

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 30

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 30

DATE June 22, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILT (ML) - very stiff, moist				16	27.0	94	SA LL=47; PI=14
		BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - very dense, moist				51			
1		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				24/2"			
5		no recovery at 4.5'				34/ 2.5"			
	2	no recovery at 6'				30/2"			
10	3								
	4					39/3"			
15	5								
		no recovery at 17'				40/ 2.5"			
20	6								
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 30

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 31

LOG OF TEST BORING 31

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 21, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				38	8.6	108	
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - weak				48			
	1	moderately hard from 3'							
5						68	14.1	93	
						80			
	2								
						51			
		weak at 7.5'-9'							
						44			
		hard from 9'							
10	3					58/7"			
		moderately hard at 12'-13.5'							
	4					64			
15									
	5								
						41/5"			
20	6								
						118/ 11"			
	7								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 31

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 32

LOG OF TEST BORING 32

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 21, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN SANDY SILT (ML) - medium stiff, moist				42			
		REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				35	10.5	88	SA
5	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - weak hard from 3'				55/7"			
	2					12/ 0.75"			
10	3					10/1"			
	4					13/1"			
15	5					23/ 1.75"			
20	6								
	7					15/0"			
25	8								
		(no free water encountered)				11/ 0.5"			

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 32

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 33

LOG OF TEST BORING 33

Notes:

- Relatively Undisturbed Sample
- Disturbed/Bulk Sample
- SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 21, 2022
EQUIPMENT 8" Dia. Hollow-Stem Auger
ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - very dense, moist				54	5.9	106	SA
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				108			
	1	moderately hard at 3'-4.5'				80			
5						47/6"			
	2					10/ 0.75"			
10	3								
						10/ 0.25"			
	4								
15									
	5					44/5"			
20	6								
						10/1"			
	7								
25									
	8					12/ 0.25"			
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 33

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 34

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 34

DATE March 18, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN SILT (ML) - very stiff, moist				28	25	97	SA LL=41; PI=10
						16			
1						15	34	90	-#200=99.9% LL=49; PI=13
5		LIGHT BROWN-WHITE CORALLINE LIMESTONE - very weak hard from 6'				23			
	2					12/1"			
10	3								
						11/1"			
	4								
15									
	5					12/ 0.5"			
20	6								
						13/ 0.75"			
25	7								
	8					48/6"			
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 34

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 35

LOG OF TEST BORING 35

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE March 18, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN SILT (ML) - very stiff, moist	23	27.4	97	-#200=98.1% LL=45; PI=14
		REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist	31			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - weak	122/11" 10/1"	9.5	102	
5		hard from 3'				
	2		107			
10	3					
		moderately hard at 12'-13.5'				
	4		99			
15						
	5		87/6"			
20	6					
		moderately hard from 22'	51			
	7					
25						
	8		70			
		(no free water encountered)				

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 35

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 36

Notes:

▮ Relatively Undisturbed Sample

⊠ Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 36

DATE March 21, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist				16	8.8	100	SA
						21			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - weak				48			
5		moderately hard from 4.5'				71			
	2					51			
		weak from 7.5'				36			
10	3					46			
		moderately hard from 11'				60			
	4								
15									
	5								
		hard from 17'				48/6"			
20	6								
						54/6"			
25	7								
	8					7/0"			
30	9								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.110 Date 5/20/22

LOG OF TEST BORING 36

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 37

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 37

DATE June 24, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SANDY SILT WITH GRAVEL (ML) - medium stiff, moist, with roots				51			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard				45/5"			
	1	hard from 1.5'				44/3"			
		no recovery at 3'							
5		no recovery at 4.5'				24/2"			
	2	no recovery at 6'				25/ 1.5"			
10	3								
						25/			
	4					1.5"			
15									
	5								
		no recovery at 17'				31/2"			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 37

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 38

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 38

DATE June 24, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	BROWN-WHITE SANDY SILT WITH GRAVEL (ML) soft, moist				75/8"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				34/3"			
	1	no recovery at 3'				33/3"			
5		no recovery at 4.5'				27/ 2.5"			
	2	no recovery at 6'				30/2"			
10	3								
		no recovery at 12'				31/ 1.5"			
	4								
15									
	5					30/2"			
20	6	(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 38

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 39

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 39

DATE June 29, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				99	21.5	63	SA
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				31/3"			
	1	no recovery at 3'				28/3"			
5		weak from 4.5'				34			
	2	very weak at 6'-8'				21	8.4	86	
10	3								
		no recovery at 12'				45/4"			
	4								
15									
	5			X		60/6"			
20	6								
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 39

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 40

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

LOG OF TEST BORING 40

DATE June 30, 2022

EQUIPMENT 8" Dia. Hollow-Stem Auger

ELEVATION

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (min/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, lbs./cu.ft.	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE GRAVELLY SILT (ML) - soft, moist				61/ 5.75"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				20/2"			
	1	weak from 3'-6'							
5						47	6.8	91	
						41			
	2	no recovery at 6'				54/5"			
10	3								
						109			
	4								
15									
	5					64/5"			
20	6								

(no free water encountered)

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 327.11 Date 7/5/22

LOG OF TEST BORING 40

NEW SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

PLATE 41

MAJOR DIVISIONS			SYMBOL		TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAT # 200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS, GRAVEL - SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH OVER 12 % FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL - SAND - SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL - SAND - CLAY MIXTURES
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12 % FINES	SM		SILTY SANDS, POORLY GRADED SAND - SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN HALF IS SMALLER THAN # 200 SIEVE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILT WITH SLIGHTLY PLASTICITY
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

SOIL CLASSIFICATION SYSTEM AND KEY TO TEST DATA

SA	=	Sieve Analysis
LL	=	Liquid Limit
PI	=	Plasticity Index

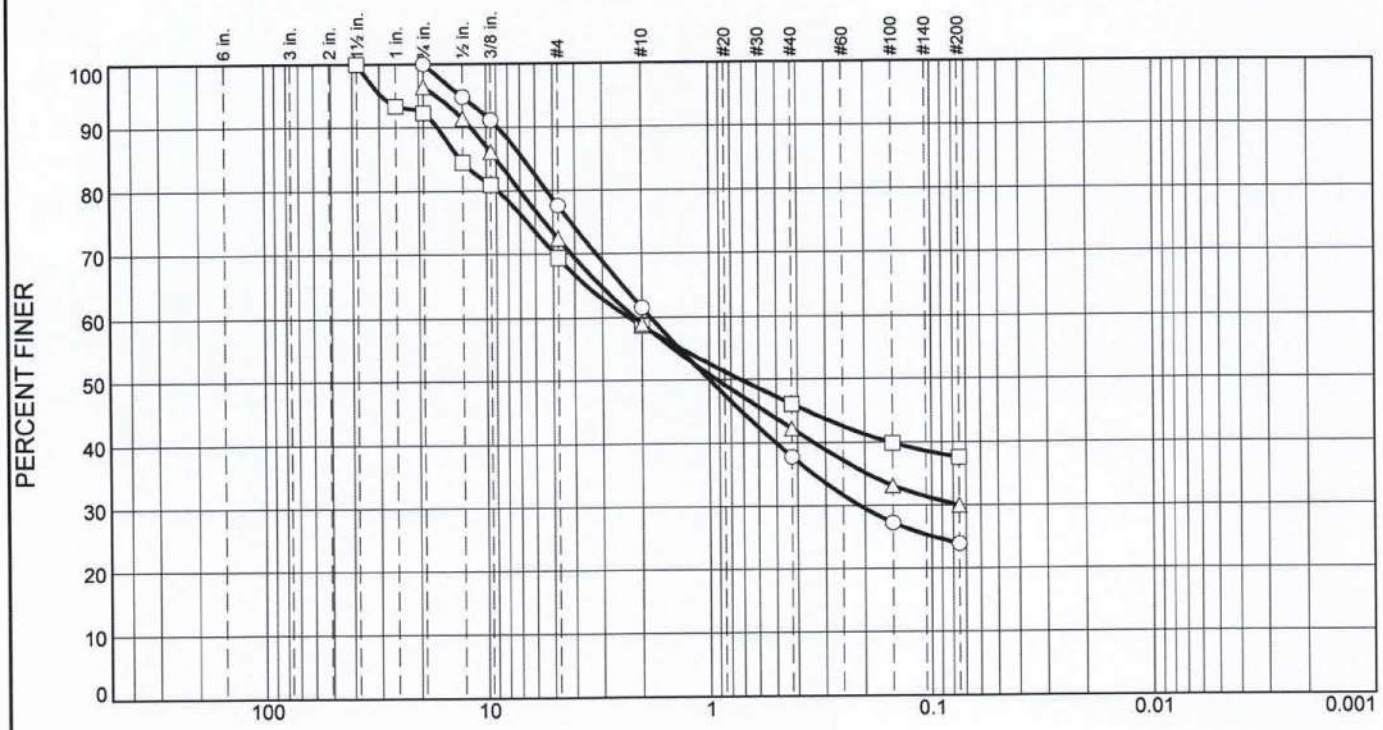
☒	=	"Disturbed" Sample
■	=	"Undisturbed" Sample

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers
Job No. 327.110 Appr. US/ Date:5/30/22

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA
NEW SIMON SANCHEZ HIGH SCHOOL
YIGO GUAM

PLATE
42

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	22	16	24	14	24	
□	0	8	23	10	13	8	38	
△			24	13	17	12	30	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			6.7633	1.8294	0.9947	0.2123				
□			13.0700	2.2913	0.7206					
△			8.9981	2.1606	0.9203	0.0759				

Material Description	USCS	AASHTO
○ LIGHT BROWN-WHITE CORALLINE LIMESTONE	ROCK	
□ BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	
△ LIGHT BROWN-WHITE CORALLINE LIMESTONE	ROCK	

Project No. 327.110 **Client:** TANIGUCHI-RUTH-MAKIO

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 2 **Depth:** 2.25

□ **Source of Sample:** 3 **Depth:** 0.75

△ **Source of Sample:** 4 **Depth:** 0.75

Remarks:

GEO-ENGINEERING & TESTING, INC.

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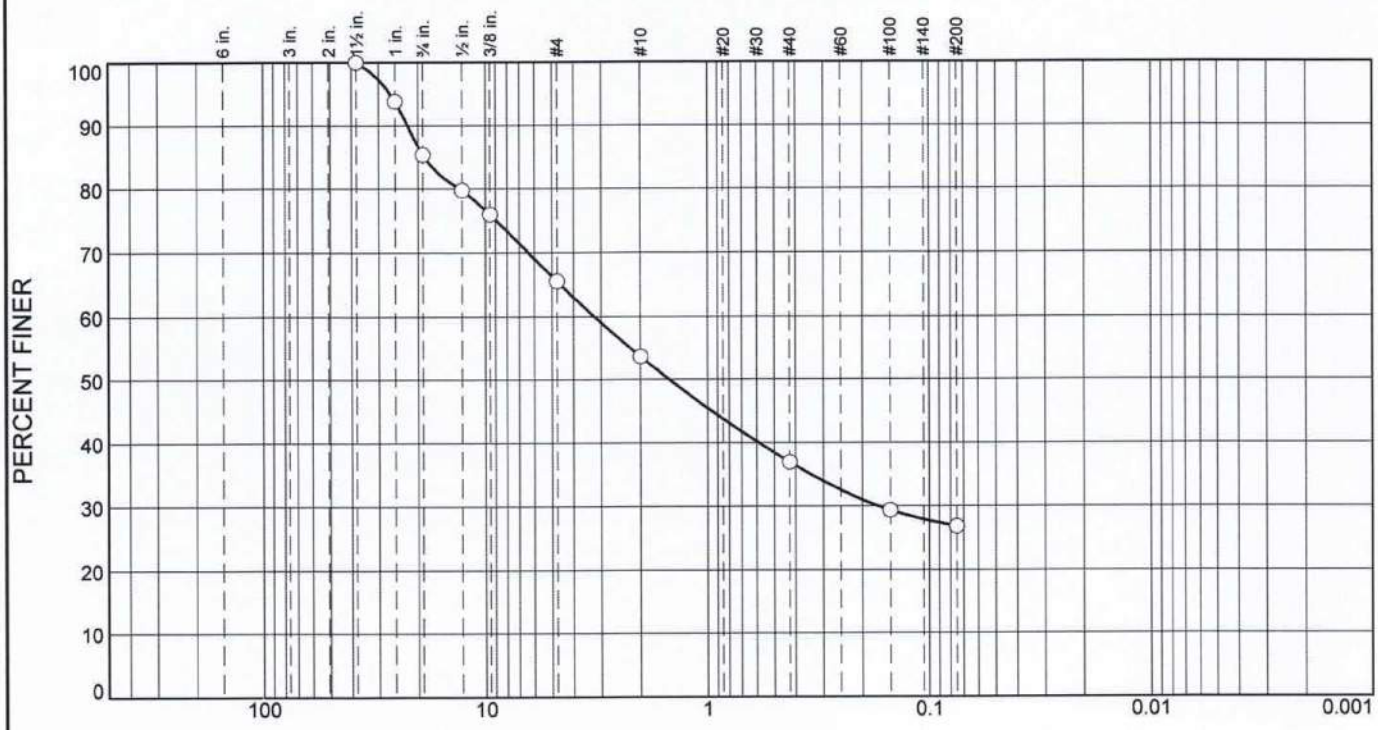
Figure 43

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	14.6	19.9	11.8	16.8	10.1	26.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	18.7658	3.2318	1.4824	0.1713				

Material Description	USCS	AASHTO
○ BROWN-WHITE GRAVELLY SILTY SAND	SM	

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 5 **Depth:** 0.75

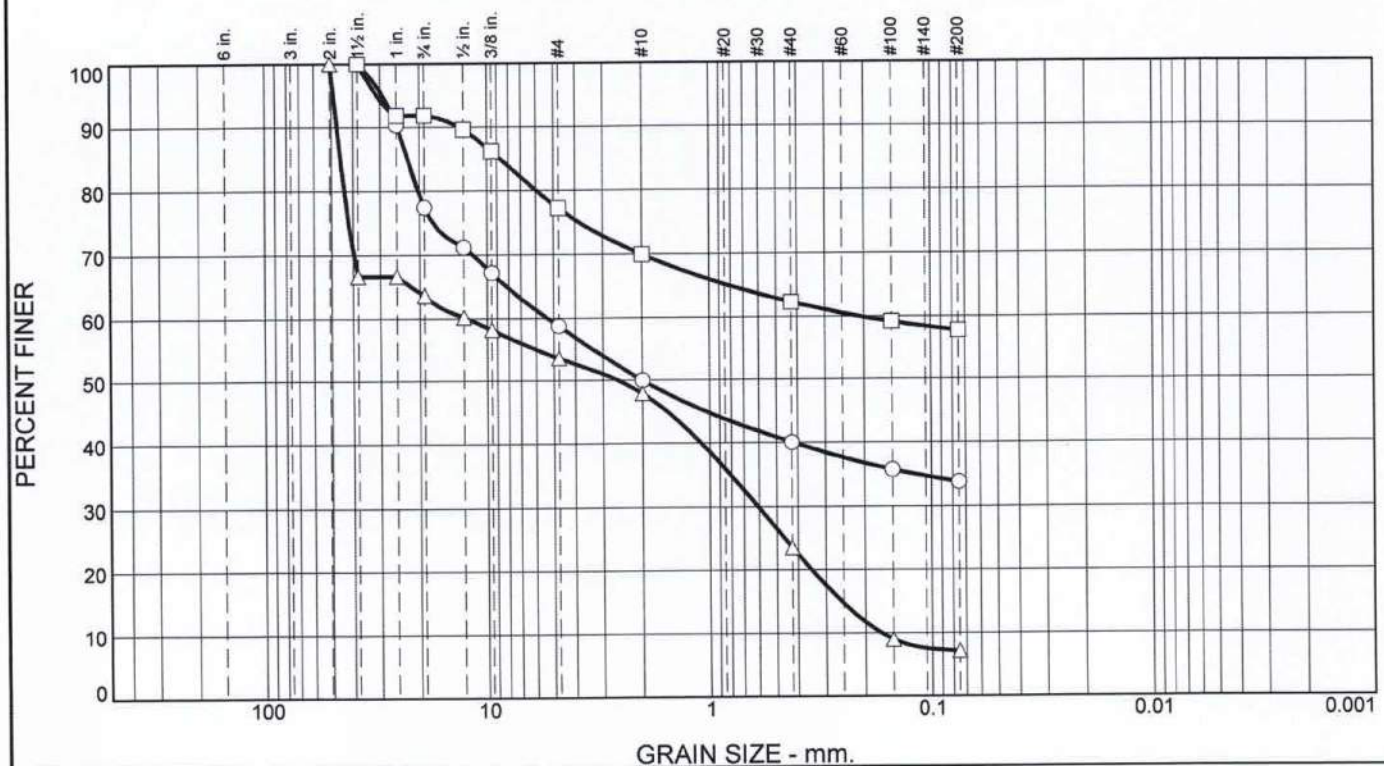
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 44

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	23	18	9	10	6	34	
□	0	8	15	7	8	4	58	
△	0	36	10	6	24	17	7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			22.6159	5.3464	2.0048					
□			8.6590	0.2106						
△			45.6163	12.3409	2.5842	0.6080	0.2552	0.1695	0.18	72.82

	Material Description	USCS	AASHTO
○	BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	
□	REDDISH BROWN GRAVELLY SANDY CLAYEY SILT	MH	
△	REDDISH BROWN-WHITE GRAVELLY SILTY SAND	SP-SM	

Project No. 327.110 **Client:** TANIGUCHI-RUTH-MAKIO

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 7 **Depth:** 0.5

□ **Source of Sample:** 13 **Depth:** 4

△ **Source of Sample:** 11 **Depth:** 0.5

Remarks:

GEO-ENGINEERING & TESTING, INC.

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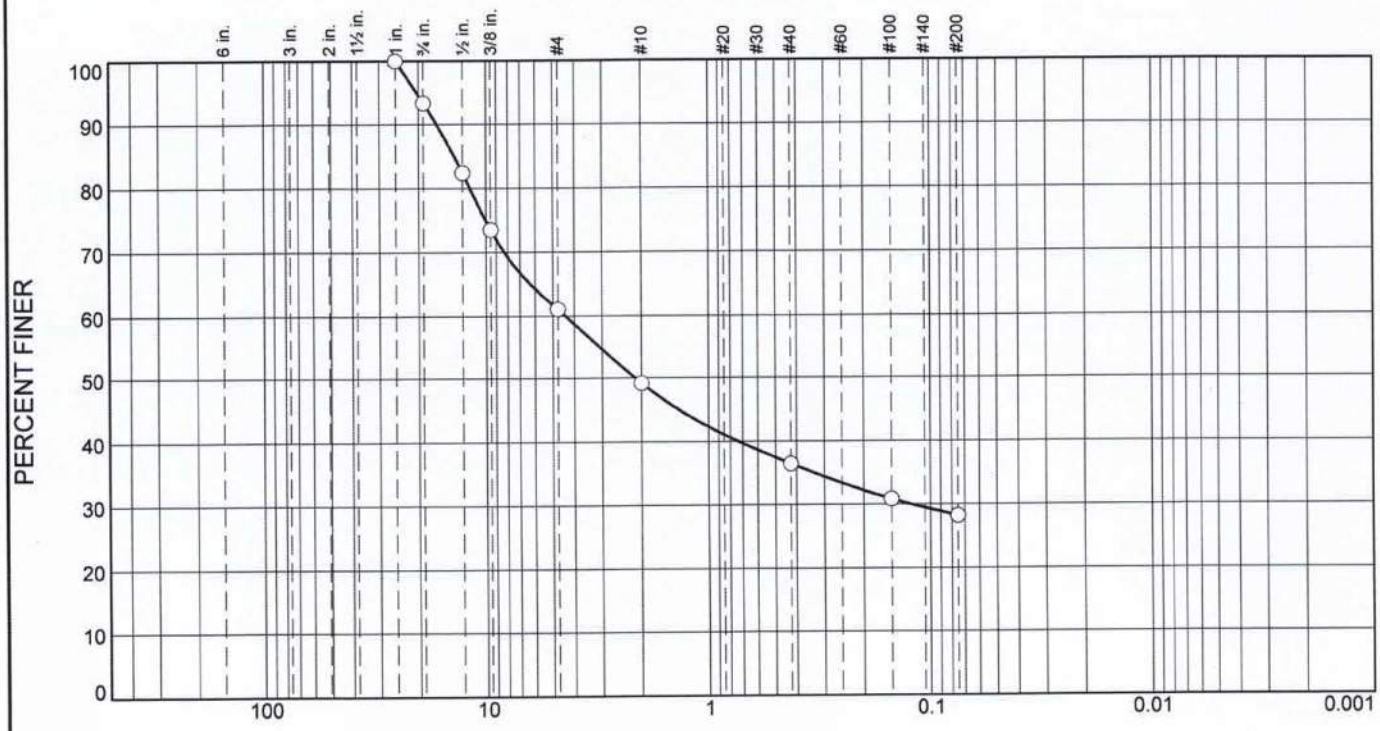
Figure 45

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	6.6	32.4	11.8	12.7	8.3	28.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			13.8421	4.4066	2.1326	0.1235				

Material Description	USCS	AASHTO
○ BROWN-WHITE SILT SANDY LIMESTONE GRAVEL	GM	

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 21 **Depth:** .5

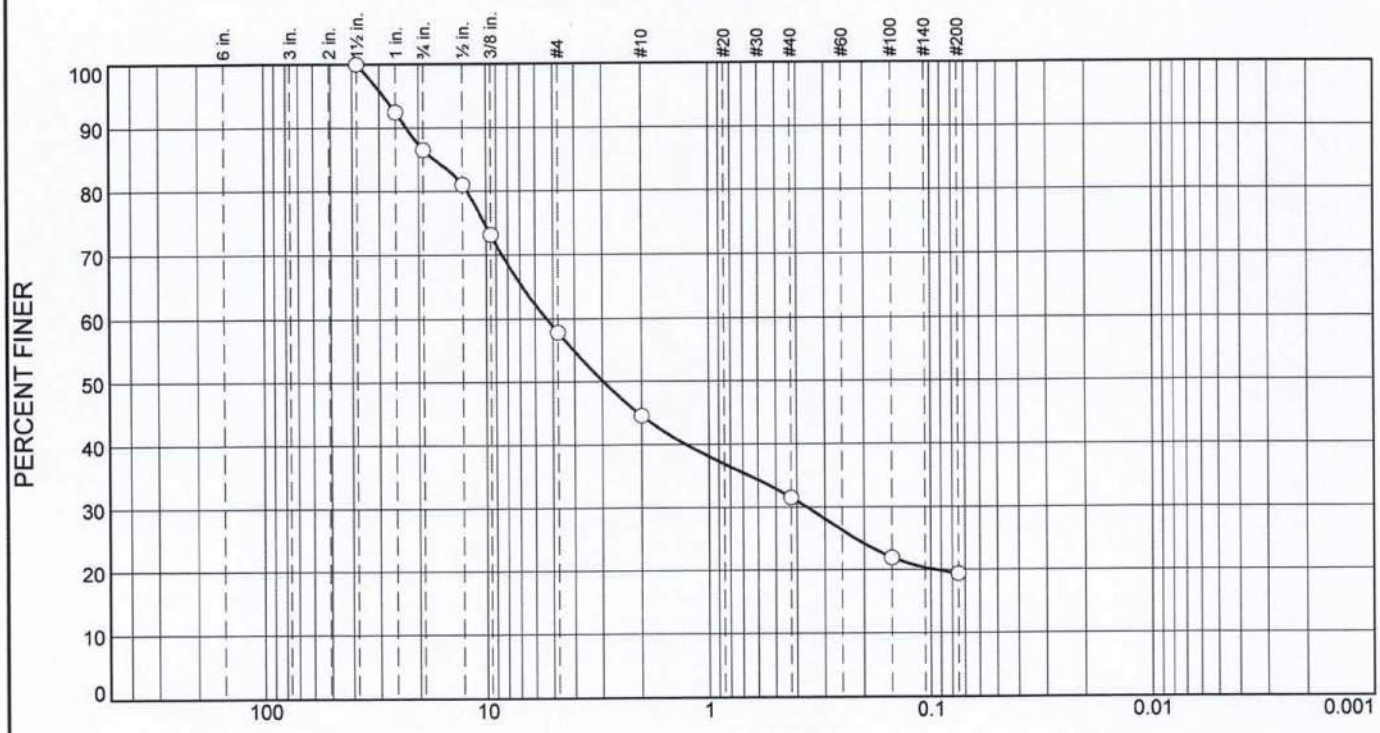
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 46

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	13.5	28.6	13.3	13.1	12.2	19.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			17.0415	5.3436	2.9708	0.3624				

Material Description	USCS	AASHTO
○ LIGHT BROWN-WHITE CORALLINE LIMESTONE	ROCK	

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 24 **Depth:** 1.5

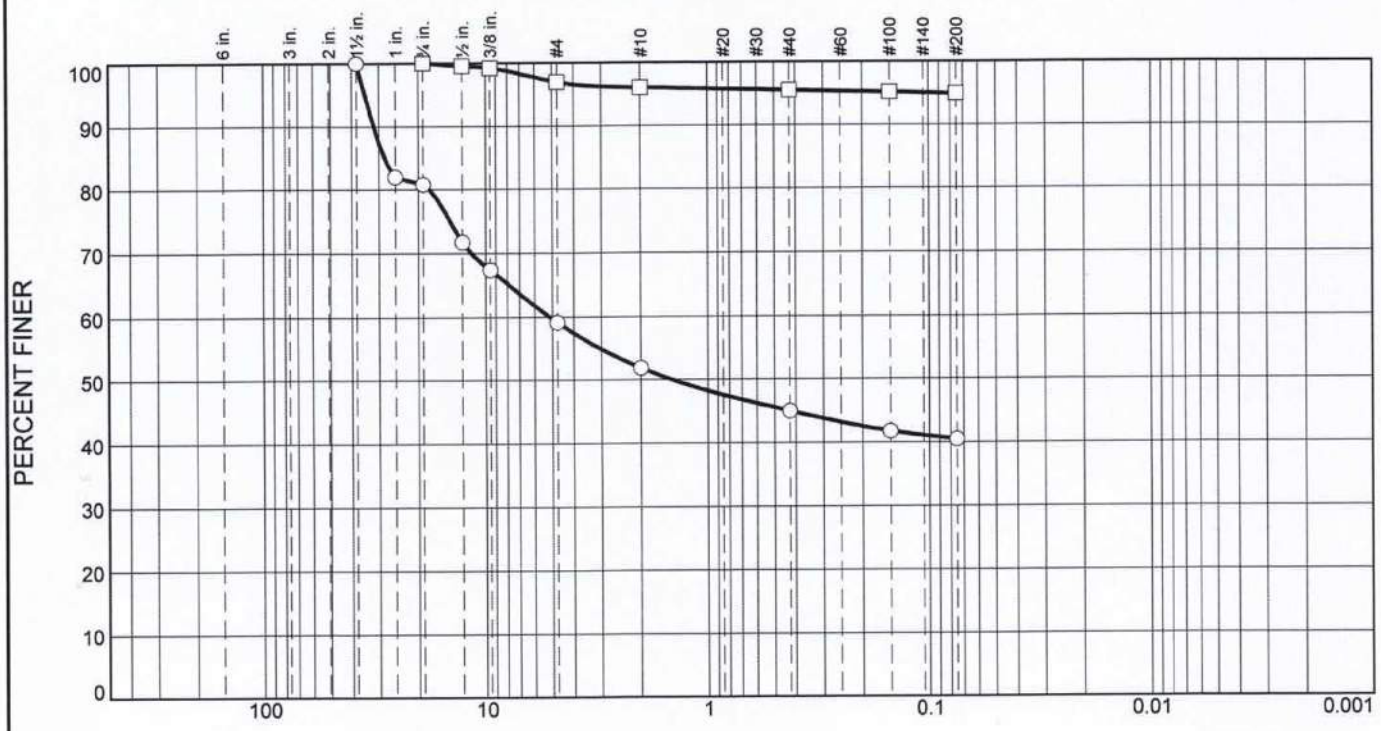
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 47

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	19	22	7	7	5	40	
□	0	0	3	1	1	0	95	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			28.3826	5.1409	1.4473					
□										

	Material Description	USCS	AASHTO
○	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	
□	REDDISH BROWN ELASTIC SILT	MH	

Project No. 327.110 **Client:** TANIGUCHI-RUTH-MAKIO

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 27 **Depth:** 0.75

□ **Source of Sample:** 29 **Depth:** 0.5

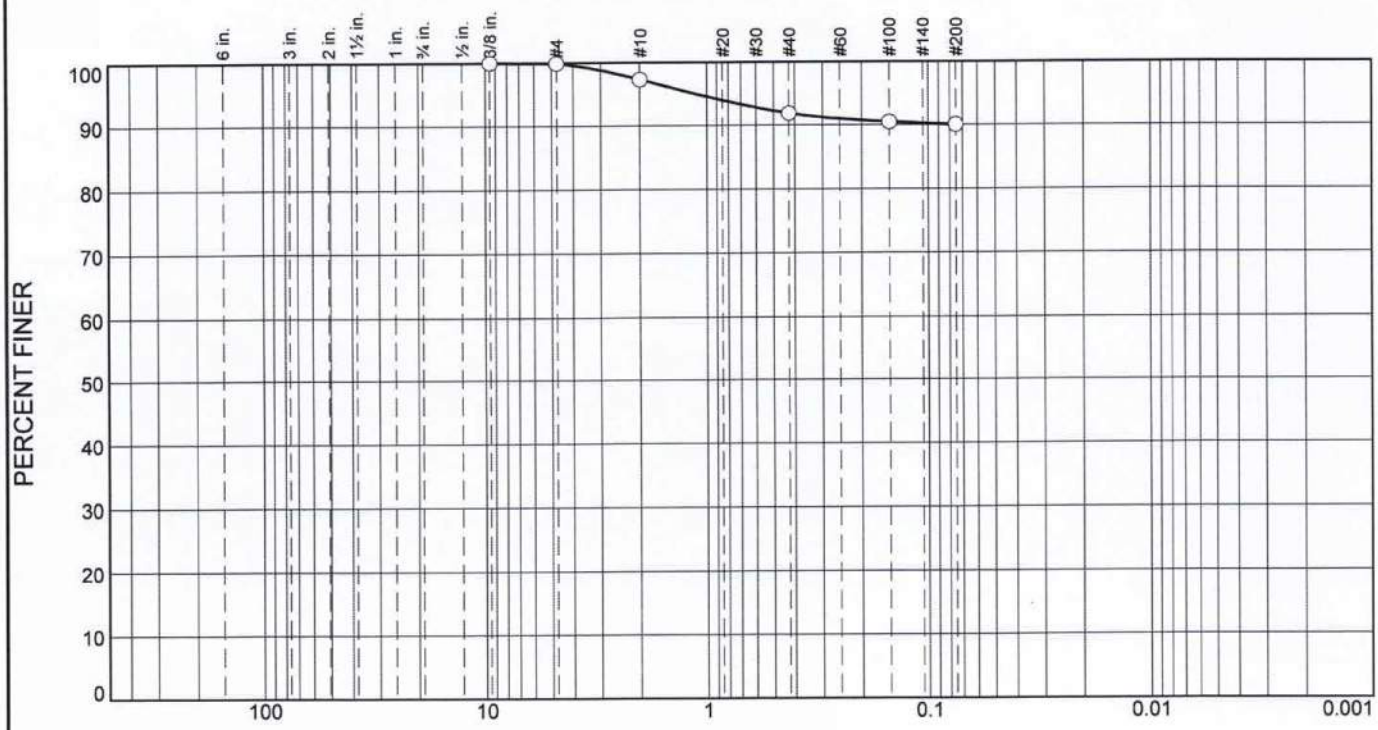
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 48

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	2.6	5.4	1.9	90.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	47	33								

	Material Description	USCS	AASHTO
○	REDDISH BROWN-WHITE SILT	ML	

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 30 **Depth:** .75

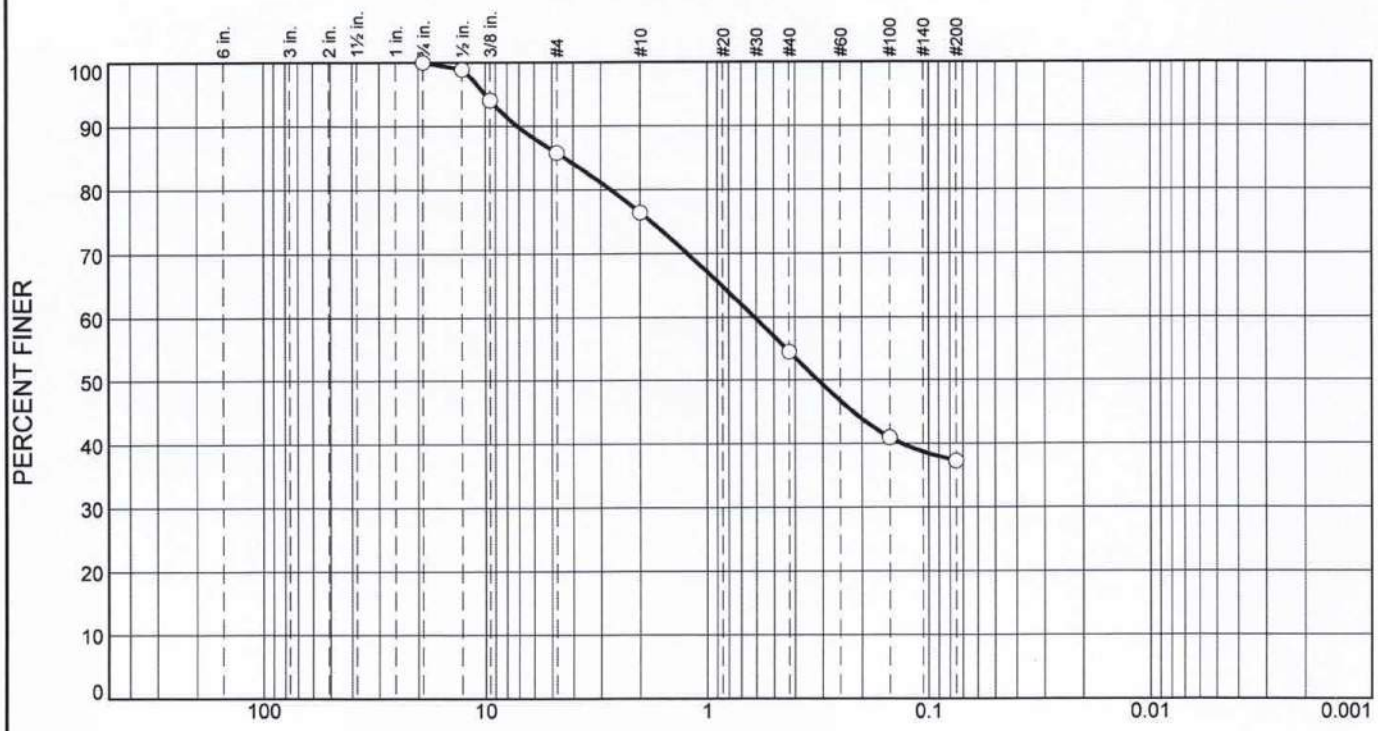
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 49

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	14	10	22	17	37	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			4.3591	0.6114	0.3154					

Material Description	USCS	AASHTO
○ LIGHT BROWN-WHITE CORALLINE LIMESTONE	ROCK	

Project No. 327.110 **Client:** TANIGUCHI-RUTH-MAKIO

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 32 **Depth:** 2.25

Remarks:

GEO-ENGINEERING & TESTING, INC.

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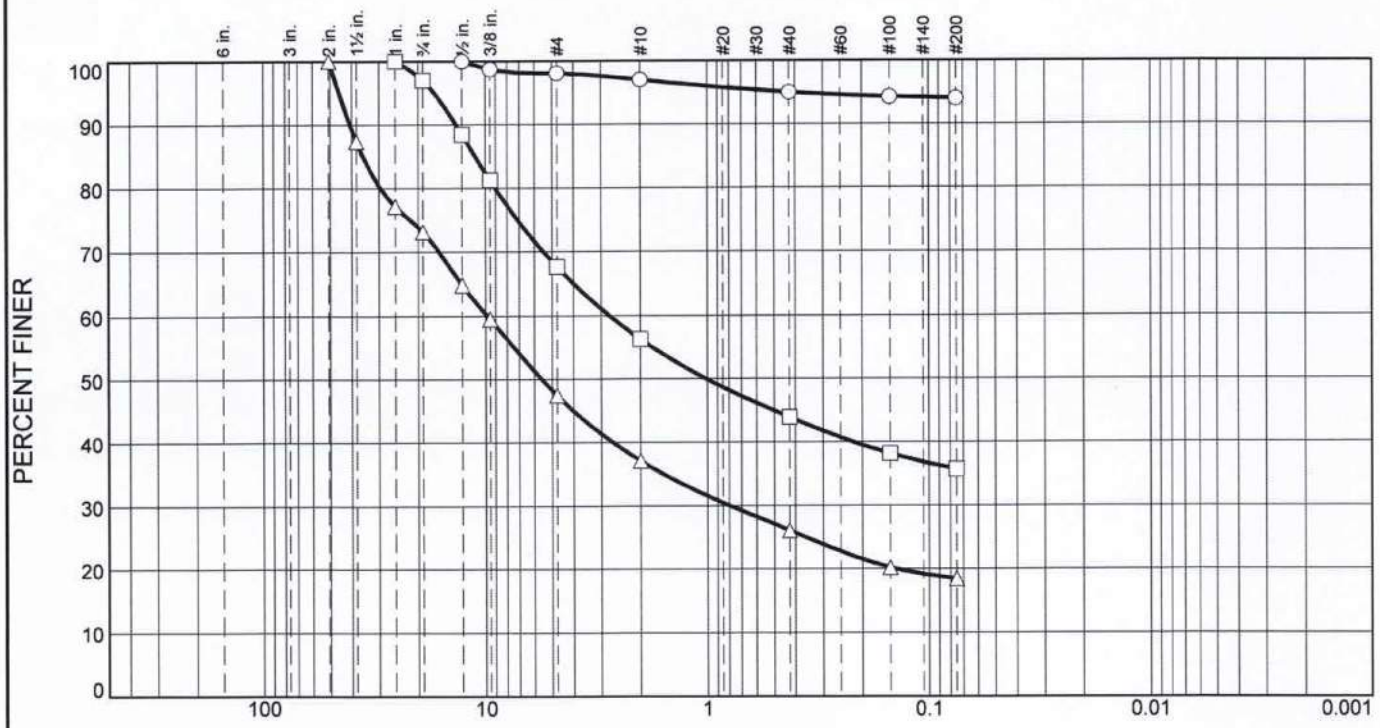
Figure 50

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	2	1	2	1	94	
□	0	3	29	12	12	8	36	
△	0	27	26	10	11	8	18	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	41	31								
□			11.0717	2.7682	1.0103					
△			35.5695	9.8018	5.5532	0.7944				

Material Description	USCS	AASHTO
○ REDDISH BROWN SILT	ML	A-5(12)
□ REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	
△ REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	

Project No. 327.110 **Client:** TANIGUCHI-RUTH-MAKIO

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 34 **Depth:** 0.75

□ **Source of Sample:** 36 **Depth:** 1

△ **Source of Sample:** 33 **Depth:** 0.75

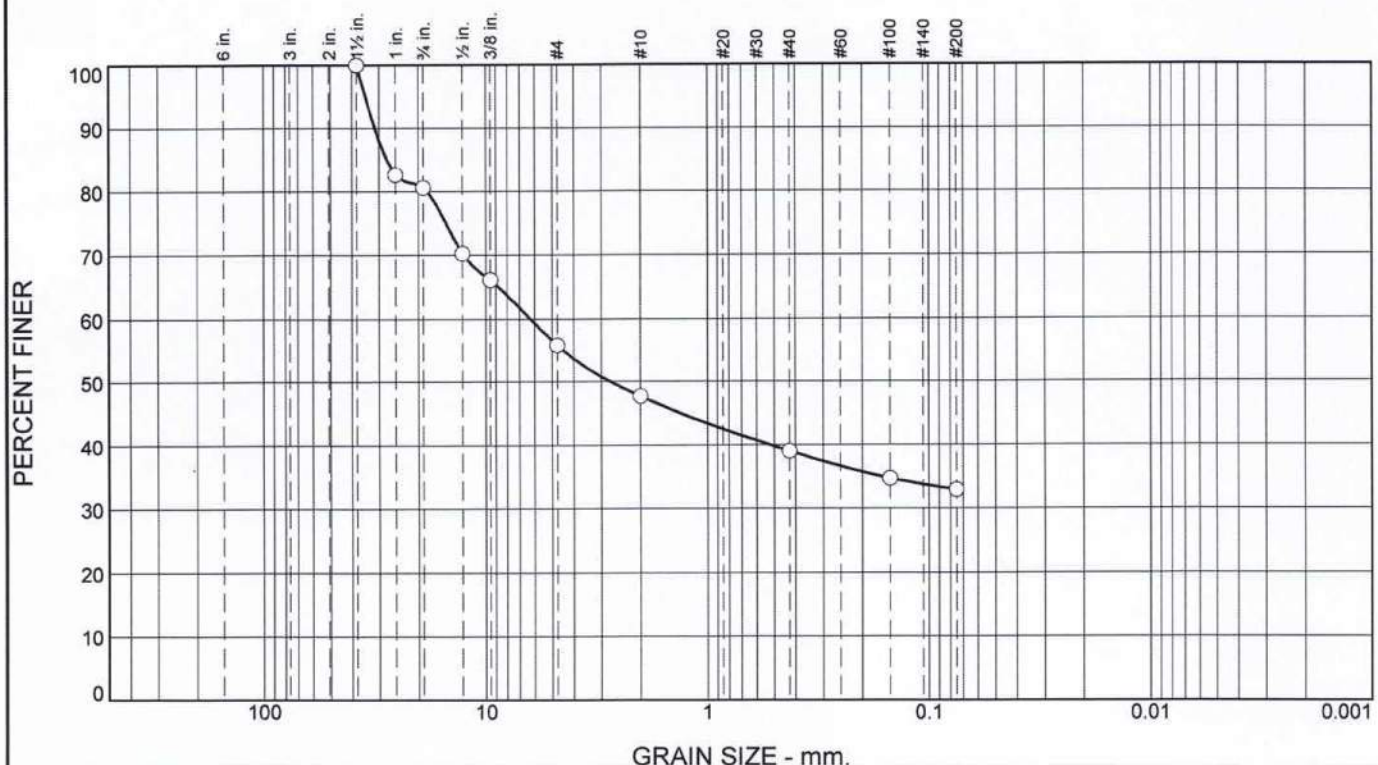
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 51

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	19.4	24.8	8.1	8.7	6.1	32.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			27.8408	6.2653	2.7398					

Material Description	USCS	AASHTO
○ LIGHT BROWN-WHITE CORALLINE LIMESTONE	ROCK	

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

○ **Source of Sample:** 39 **Depth:** .75

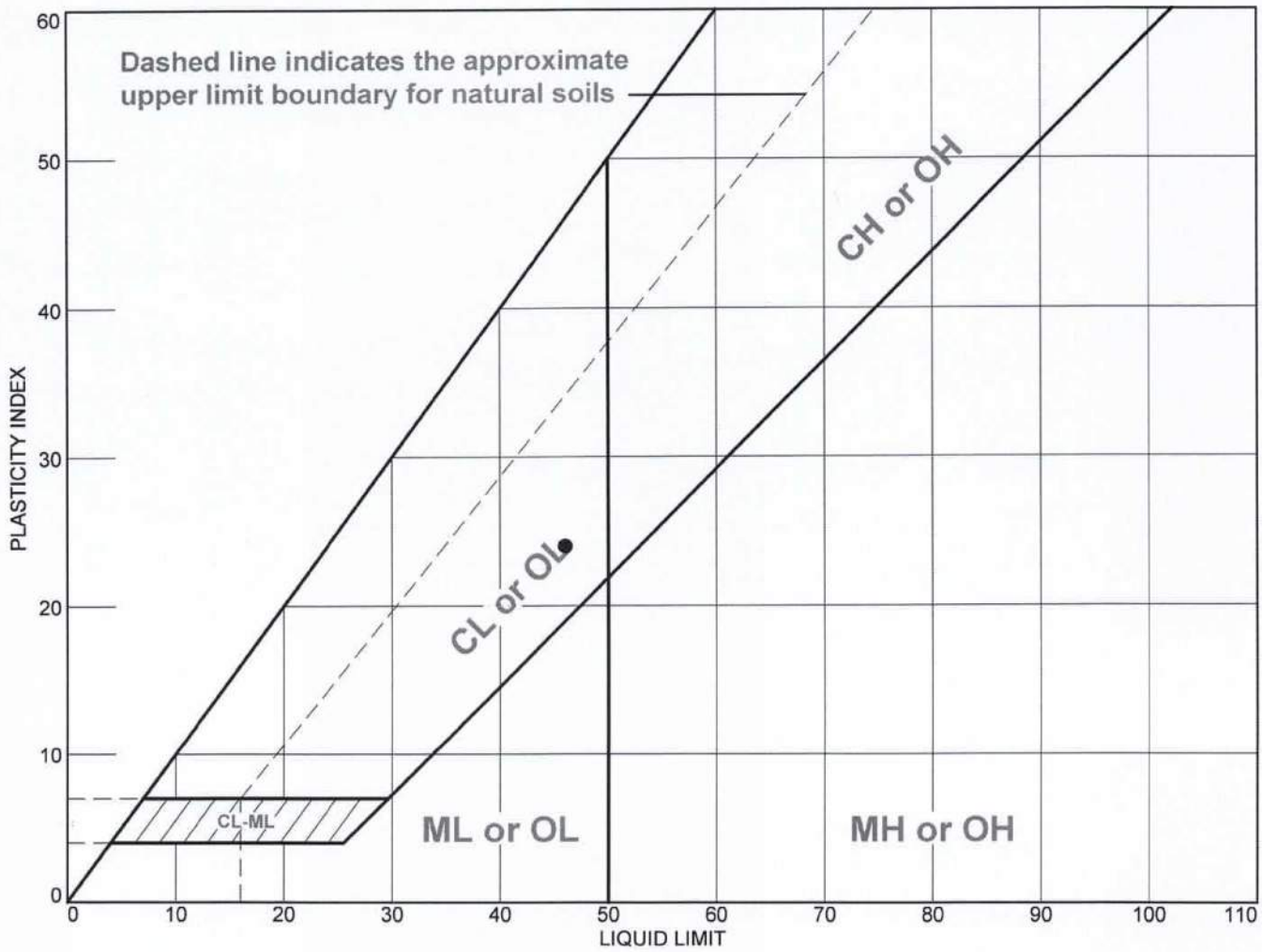
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Figure 52

ATTERBERG LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN CLAY	46	22	24			CL

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

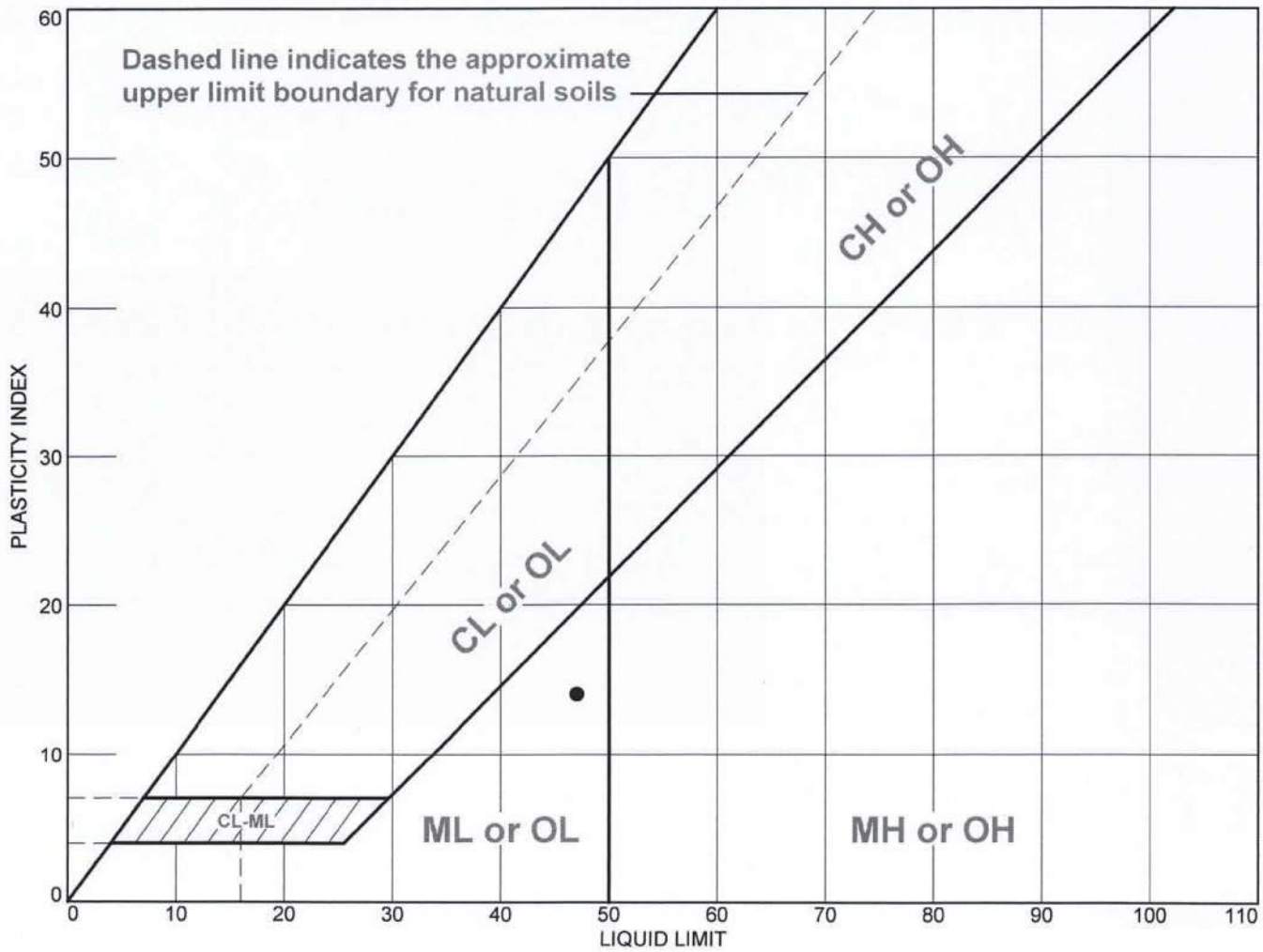
● **Source of Sample:** 15 **Depth:** .5

Remarks:

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Figure 53

ATTERBERG LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN-WHITE SILT	47	33	14	91.9	90.0	ML

Project No. 327.11 **Client:**

Project: NEW SIMON SANCHEZ HIGH SCHOOL

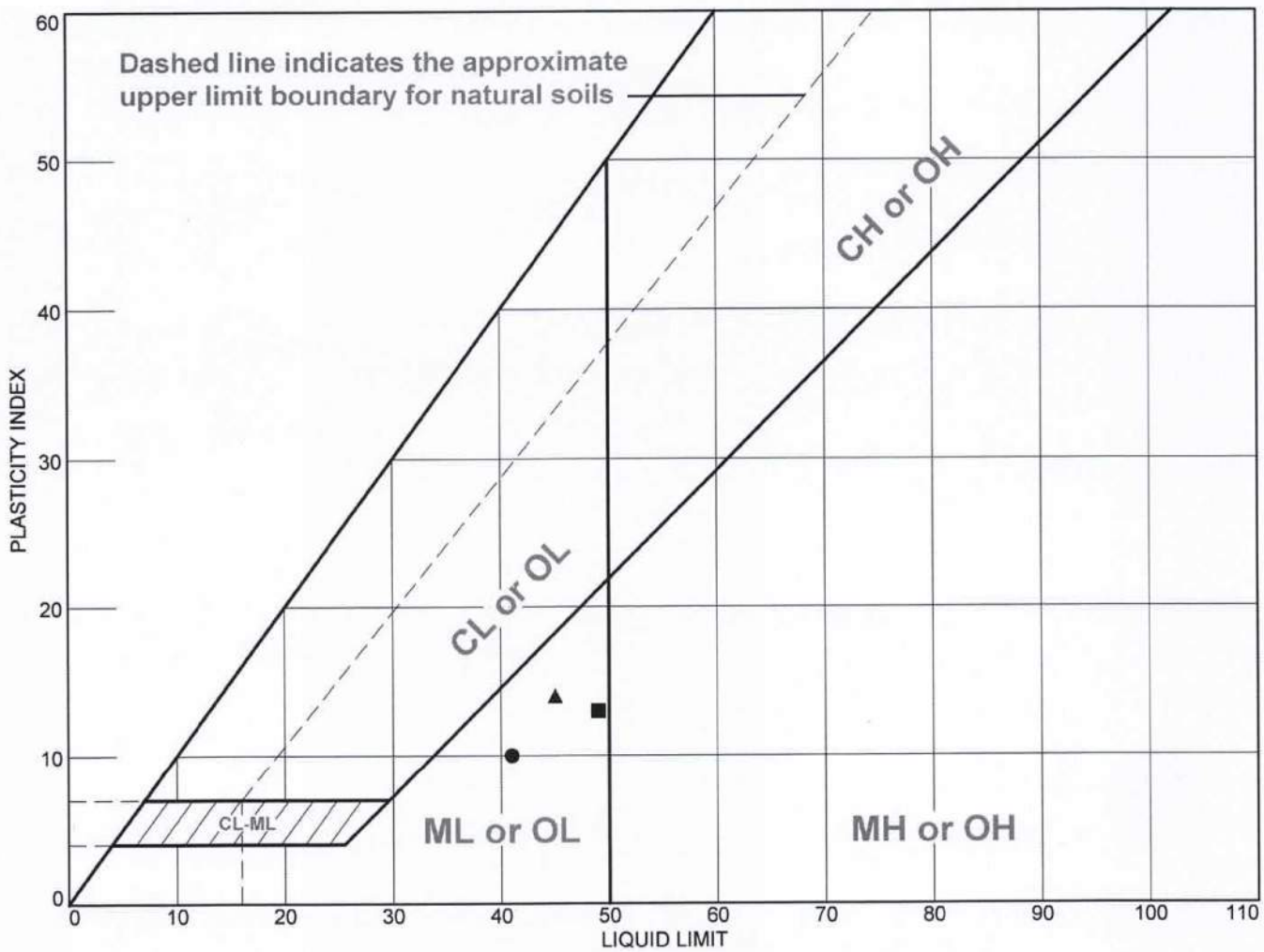
● **Source of Sample:** 30 **Depth:** .75

Remarks:

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Figure 54

ATTERBERG LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN SILT	41	31	10	95	94	ML
■	REDDISH BROWN SILT	49	36	13		99.9	ML
▲	REDDISH BROWN SANDY CLAYEY SILT	45	31	14		98.1	ML

Project No. 327.110 **Client:** TANIGUCHI-RUTH-MAKIO

Project: NEW SIMON SANCHEZ HIGH SCHOOL

● **Source of Sample:** 34 **Depth:** 0.75

■ **Source of Sample:** 34 **Depth:** 3.75

▲ **Source of Sample:** 35 **Depth:** 0.75

Remarks:

GEO-ENGINEERING & TESTING, INC.

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Figure 55

GDOE Simon Sanchez High School		
TRMA		
PROGRAMMING DOCUMENT - FEBRUARY 14, 2025		
SHEET COUNT	DWG NUMBER	SHEET TITLE
ARCHITECTURAL		
1	T-1	TITLE SHEET, LOCATION PLAN, VICINITY PLAN
2	T-4	TOPOGRAPHIC SURVEY
3	T-5	TOPOGRAPHIC SURVEY
4	D1.0	EXISTING SITE PLAN
5	A1.2	OVERALL SITE PLAN
6	A1.3	OVERALL A-WING & B-WING LEVEL 1 PLAN
7	A1.4	OVERALL A-WING & C-WING LEVEL 1 PLAN
8	A1.5	OVERALL A-WING & B-WING LEVEL 2 PLAN
9	A1.6	OVERALL NORTH FIELD PLAN (EAST)
10	A1.7	OVERALL NORTH FIELD PLAN (WEST)
11	A1.8	OVERALL WEST FIELD PLAN
12	A2.1	ENLARGED PLAN - B-WING GYMNASIUM LEVEL 1
13	A2.2	ENLARGED PLAN - A-WING LEVEL 1 (EAST)
14	A2.3	ENLARGED PLAN - A-WING LEVEL 1 (WEST)
15	A2.4	ENLARGED PLAN - C-WING LEVEL 1
16	A2.5	ENLARGED PLAN - B-WING LEVEL 1
17	A2.6	ENLARGED PLAN - A-WING LEVEL 2 (EAST)
18	A2.7	ENLARGED PLANS - B-WING & A-WING (WEST) LEVEL 2
19	A2.8	ENLARGED PLANS - CREDIT RECOVERY
20	A2.9	ENLARGED PLAN - MAIN ENTRANCE LEVEL 1
21	A2.10	GYMNASIUM PLAN
22	A2.11	GYMNASIUM LOCKER ROOMS PLAN
23	A2.12	ADMIN. OFFICES PLAN
24	A2.13	AUDITORIUM LEVEL 1 PLAN
25	A2.14	CLASSROOM PLANS A101 - A102
26	A2.15	CLASSROOM PLANS A103 - A105
27	A2.16	CLASSROOM PLANS A107 - A112
28	A2.17	CLASSROOM PLANS C101 - C106
29	A2.18	CLASSROOM PLANS C107 - C111
30	A2.19	CAFETERIA PLAN
31	A2.20	CLASSROOM PLANS C124 - C126 (JROTC)
32	A2.21	CLASSROOM PLANS B104 - B109
33	A2.22	CLASSROOM PLANS B101 - B103
34	A2.23	LIBRARY PLAN
35	A2.24	CLASSROOM PLANS DANCE
36	A2.25	AUDITORIUM LEVEL 2 PLAN
37	A2.26	CLASSROOM PLANS A201 - A203
38	A2.27	CLASSROOM PLANS A204 - A207
39	A2.28	CLASSROOM PLANS A208 - A215
40	A2.29	CLASSROOM PLANS B201 - B203
41	A2.30	CLASSROOM PLANS B204 - B211

42	A2.31	CREDIT RECOVERY
43	A2.32	GUARD HOUSE
44	A3.1	ENLARGED RCP - B-WING GYMNASIUM LEVEL 1
45	A3.2	ENLARGED RCP - A-WING LEVEL 1 (EAST)
46	A3.3	ENLARGED RCP - A-WING LEVEL 1 (WEST)
46	A3.4	ENLARGED RCP - C-WING LEVEL 1
48	A3.5	ENLARGED RCP - B-WING LEVEL 1
49	A3.6	ENLARGED RCP- A-WING LEVEL 2 (EAST)
50	A3.7	ENLARGED RCPS - B-WING & A-WING (WEST) LEVEL 2
51	A3.8	ENLARGED RCP - MAIN ENTRANCE LEVEL 1
52	A3.9	GYMNASIUM RCP
53	A3.10	GYMNASIUM LOCKER ROOMS RCP
54	A3.11	ADMIN. OFFICES RCP
55	A3.12	AUDITORIUM LEVEL 1 RCP
56	A3.13	CLASSROOM RCPS A101 - A102
56	A3.14	CLASSROOM RCPS A103 - A105
58	A3.15	CLASSROOM RCPS A107 - A112
59	A3.16	CLASSROOM RCPS C101 - C106
60	A3.17	CLASSROOM RCPS C107 - C111
61	A3.18	CAFETERIA RCP
62	A3.19	CLASSROOM RCPS C124 - C126 (JROTC)
63	A3.20	CLASSROOM RCPS B104 - B109
64	A3.21	CLASSROOM RCPS B101 - B103
65	A3.22	LIBRARY RCP
66	A3.23	CLASSROOM RCPS DANCE
67	A3.24	AUDITORIUM LEVEL 2 PLAN
68	A3.25	CLASSROOM RCPS A201 - A203
69	A3.26	CLASSROOM RCPS A204 - A207
70	A3.27	CLASSROOM RCPS A208 - A215
71	A3.28	CLASSROOM RCPS B201 - B203
72	A3.29	CLASSROOM RCPS B204 - B211
73	A3.30	CREDIT RECOVERY
74	A4.1	OVERALL ROOF PLAN
75	A4.2	ENLARGED ROOF PLAN - GYMNASIUM
76	A4.3	ENLARGED ROOF PLAN - B-WING CLASSROOMS
77	A4.4	ENLARGED ROOF PLANS - A-WING (ADMIN. OFFICES & AUDITORIUM)
78	A4.5	ENLARGED ROOF PLAN - A-WING CLASSROOMS
79	A4.6	ENLARGED ROOF PLAN - C-WING
80	A4.7	ENLARGED ROOF PLANS - CREDIT RECOVERY
81	A5.1-1	BUILDING ELEVATIONS
82	A5.1-2	COURTYARD ELEVATIONS
83	A5.2	BUILDING ELEVATIONS - GYMNASIUM
84	A5.3	BUILDING ELEVATIONS - GYMNASIUM
85	A5.4	BUILDING ELEVATIONS - B-WING
86	A5.5	BUILDING ELEVATIONS - B-WING
87	A5.6	BUILDING ELEVATIONS - C-WING
88	A5.7	BUILDING ELEVATIONS - C-WING
89	A5.8	BUILDING ELEVATIONS - C-WING
90	A5.9	BUILDING ELEVATIONS - A-WING

91	A5.10	ENLARGED ELEVATIONS - A-WING
92	A5.11	ENLARGED ELEVATIONS - A-WING
93	A5.12	ENLARGED ELEVATIONS - A-WING
94	A5.13	SITE SECTIONS
95	A5.14	MAIN ENTRANCE/ ADMINISTRATION BUILDING SECTIONS
96	A5.15	ADMINISTRATION BUILDING & AUDITORIUM SECTIONS
97	A5.16	AUDITORIUM & A-WING SECTIONS
98	A5.17	A-WING SECTIONS
99	A5.18	JROTC SECTIONS
100	A5.19	CAFETERIA SECTIONS
101	A5.20	GCC & CREDIT RECOVERY BUILDING SECTIONS
102	A5.21	GCC
103	A5.22	GYMNASIUM SECTIONS
104	A5.23	WALL SECTIONS
105	A5.24	WALL SECTIONS
106	A5.25	WALL SECTIONS
107	A5.26	WALL SECTIONS
108	A5.27	WALL SECTIONS
109	A5.28	WALL SECTIONS
110	A5.29	WALL SECTIONS
111	A5.30	WALL SECTIONS
112	A5.31	WALL SECTIONS
113	A5.32	TYPICAL WALL PATTERN
114	A6.0	ADMIN - RECEPTION
115	A6.1	ADMIN - OFFICES
116	A6.2	A-WING DETAIL PLANS AND INT. ELEVATIONS
117	A6.3	SCIENCE PREP ROOMS
118	A6.4	A-WING DETAIL PLANS AND INT. ELEVATIONS
119	A6.5	A-WING DETAIL PLANS AND INT. ELEVATIONS
120	A6.6	AUDITORIUM DETAIL PLANS
121	A6.7	B-WING DETAIL PLANS AND INT. ELEVATIONS
122	A6.8	GCC DETAIL PLANS AND INT. ELEVATIONS
123	A6.9	GCC DETAIL PLANS AND INT. ELEVATIONS
124	A6.10	GCC DETAIL PLANS AND INT. ELEVATIONS
125	A6.11	GCC DETAIL PLANS AND INT. ELEVATIONS
126	A6.12	GCC DETAIL PLANS AND INT. ELEVATIONS
127	A6.13	GCC DETAIL PLANS AND INT. ELEVATIONS
128	A6.14	GCC DETAIL PLANS AND INT. ELEVATIONS
129	A6.15	GCC DETAIL PLANS AND INT. ELEVATIONS
130	A6.16	GCC INTERIOR ELEVATIONS
131	A6.17	CAFETERIA DETAIL PLANS AND INT. ELEVATIONS
132	A6.18	CAFETERIA DETAIL PLANS AND INT. ELEVATIONS
133	A6.19	ART CLASSROOM DETAIL PLANS AND INT. ELEVATIONS
134	A6.20	GYM LOCKER ROOM DETAIL PLANS AND INT. ELEVATIONS
135	A6.21	GYM LOCKER ROOM DETAIL PLANS AND INT. ELEVATIONS
136	A6.22	GYMNASIUM LOCKER ROOM INTERIOR ELEVATIONS
137	A6.23	JROTC DETAIL PLANS AND INTERIOR ELEVATIONS
138	A6.24	JROTC DETAIL PLANS
139	A6.25	JROTC INTERIOR ELEVATIONS

140	A6.26	GCC DETAIL PLANS AND INT. ELEVATIONS
141	A6.27	LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS
142	A6.28	LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS
143	A6.29	LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS
144	A6.30	LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS
145	A6.31	LIBRARY INTERIOR ELEVATIONS
146	A6.32	AUDITORIUM RESTROOM DETAIL PLAN
147	A6.33	ADMIN RESTROOM DETAIL PLANS
148	A6.34	A-WING RESTROOM DETAIL PLANS AND INT. ELEVATIONS
149	A6.35	A-WING INTERIOR ELEVATIONS
150	A6.36	A-WING INTERIOR ELEVATIONS
151	A6.37	A-WING INTERIOR ELEVATIONS
152	A6.38	A-WING INTERIOR ELEVATIONS
153	A6.39	B-WING INTERIOR ELEVATIONS
154	A6.40	B-WING INTERIOR ELEVATIONS
155	A6.41	B-WING INTERIOR ELEVATIONS
156	A6.42	INTERIOR ELEVATIONS
157	A6.43	INTERIOR ELEVATIONS
158	A7.4	ELEVATOR PLANS AND SECTIONS
159	A7.5	ELEVATOR PLANS AND SECTIONS
160	A8.18	FF&E SCHEDULE
161	A8.19	FF&E SCHEDULE
162	A9.2	ROOF DETAILS
163	A10.3	CEILING DETAILS
164	A12.4	CASEWORK DETAILS
165	A12.5	CASEWORK DETAILS
166	A13.1	SIGNAGE DETAILS
167	A13.2	SIGNAGE DETAILS
168	A14.1	FLOOR DETAILS
169	A15.1	EXPANSION DETAILS
170	A16.1	MISCELLANEOUS DETAILS

CIVIL SHEET NO	DRAWING NO	SHEET TITLE
1	C0.1	GENERAL NOTES, LEGENDS, SYMBOLS, & ABBREVIATIONS
2	C1.0	OVERALL EXISTING CONDITIONS & DEMOLITION PLAN
3	C1.1	EXISTING CONDITIONS & DEMOLITION PLAN - 1
4	C1.2	EXISTING CONDITIONS & DEMOLITION PLAN - 2
5	C1.3	EXISTING CONDITIONS & DEMOLITION PLAN - 3
6	C1.4	EXISTING CONDITIONS & DEMOLITION PLAN - 4
7	C1.5	EXISTING CONDITIONS & DEMOLITION PLAN - 5
8	C2.0	EROSION CONTROL PLAN - PHASE 1
9	C2.1	EROSION CONTROL PLAN - PHASE 2
10	C2.2	EROSION CONTROL DETAILS
11	C3.0	OVERALL SITE IMPROVEMENT PLAN
12	C3.1	SITE IMPROVEMENT PLAN - 1
13	C3.2	SITE IMPROVEMENT PLAN - 2
14	C3.3	SITE IMPROVEMENT PLAN - 3
15	C3.4	SITE IMPROVEMENT PLAN - 4
16	C3.5	SITE IMPROVEMENT PLAN - 5
17	C4.0	OVERALL GRADING AND DRAINAGE PLAN
18	C4.1	GRADING AND DRAINAGE PLAN - 1
19	C4.2	GRADING AND DRAINAGE PLAN - 2
20	C4.3	GRADING AND DRAINAGE PLAN - 3
21	C4.4	GRADING AND DRAINAGE PLAN - 4
22	C4.5	GRADING AND DRAINAGE PLAN - 5
23	C5.0	OVERALL WATER PLAN
24	C5.1	WATER PLAN - 1
25	C5.2	WATER PLAN - 2
26	C5.3	WATER PLAN - 3
27	C5.4	WATER PLAN - 4
28	C5.5	FIRE WATER PLAN - 1
29	C5.6	FIRE WATER PLAN - 2
30	C5.7	FIRE WATER PLAN - 3
31	C5.8	BLDG LATERAL ENLARGED PLAN
32	C6.0	OVERALL SEWER PLAN
33	C6.1	SEWER PLAN - 1
34	C6.2	SEWER PLAN - 2
35	C6.3	SEWER PLAN - 3
36	C6.4	SEWER PLAN - 4
37	C6.5	SEWER PLAN - 5
38	C7.1	SITE SECTIONS - 1
39	C7.2	SITE SECTIONS - 2
40	C7.3	ROAD A CENTERLINE PROFILE - 1
41	C7.4	ROAD A CENTERLINE PROFILE - 2
42	C7.5	RETAINING WALL PROFILE - 1
43	C7.6	RETAINING WALL PROFILE - 2
44	C8.1	DRAINAGE PROFILE - 1
45	C8.2	DRAINAGE PROFILE - 2
46	C8.3	DRAINAGE PROFILE - 3
47	C8.4	DRAINAGE PROFILE - 4
48	C8.5	DRAINAGE PROFILE - 5
49	C8.6	WATERLINE PROFILE - 1
50	C8.7	WATERLINE PROFILE - 2
51	C8.8	WATERLINE PROFILE - 3
52	C8.9	FIRE LINES PROFILE PROFILE - 1
53	C8.10	FIRE LINES PROFILE PROFILE - 2
54	C8.11	FIRE LINES PROFILE PROFILE - 3
55	C8.12	SEWERLINE PROFILE - 1
56	C8.13	SEWERLINE PROFILE - 2
57	C8.14	SEWERLINE PROFILE - 3

CIVIL SHEET NO	DRAWING NO	SHEET TITLE
58	C9.1	WATER DETAILS - 1
59	C9.2	WATER DETAILS - 2
60	C9.3	WATER AND SEWER DETAILS - 1
61	C9.4	SEWER DETAILS - 1
62	C9.5	DRAINAGE DETAILS - 1
63	C9.6	DRAINAGE DETAILS - 2
64	C9.7	DRAINAGE DETAILS - 3
65	C9.8	SITE DETAILS - 1
66	C9.9	SITE DETAILS - 2
67	C9.10	SITE DETAILS - 3
68	C9.11	SITE DETAILS - 4
69	C9.12	SITE DETAILS - 5
70	C9.13	CONCRETE STEPS AND RAMP DETAIL
71	C9.14	BASEBALL AND SOFTBALL BACKSTOP DETAIL
72	C9.15	TRACK AND FIELD AND TENNIS COURT DETAIL
73	C9.16	CONCRETE BLEACHER DETAIL
74	C9.17	ENLARGED PLAN VIEWS - 1
75	C9.18	ENLARGED PLAN VIEWS - 2
76	C9.19	ENLARGED PLAN VIEWS - 3
77	C9.20	ENLARGED PLAN VIEWS - 4
78	C9.21	ENLARGED PLAN VIEWS - 5

GDOE Simon Sanchez High School		
TRMA		
PROGRAMMING DOCUMENT - FEBRUARY 14, 2025		
SHEET COUNT	DWG NUMBER	SHEET TITLE
LANDSCAPE		
1	L1.0	HARDSCAPE SCHEDULE
2	L1.1	OVERALL HARDSCAPE SITE PLAN
3	L1.2	COURTYARD HARDSCAPE PLAN
4	L1.3	COURTYARD HARDSCAPE ENLARGEMENT PLAN - 1
5	L1.4	COURTYARD HARDSCAPE ENLARGEMENT PLAN - 2
6	L1.5	HARDSCAPE DETAILS
7	L2.0	IRRIGATION SCHEDULE AND NOTES
8	L2.1	PARTIAL SITE IRRIGATION PLAN - 1
9	L2.2	PARTIAL SITE IRRIGATION PLAN - 2
10	L2.3	COURTYARD IRRIGATION PLAN
11	L2.4	IRRIGATION DETAILS - 1
12	L2.5	IRRIGATION DETAILS - 2
13	L2.6	IRRIGATION DETAILS - 3
14	L2.7	IRRIGATION DETAILS - 4
15	L3.0	PLANTING SCHEDULE AND NOTES
16	L3.1	OVERALL PLANTING PLAN
17	L3.2	PARTIAL PLANTING PLAN - 1
18	L3.3	PARTIAL PLANTING PLAN - 2
19	L3.4	PARTIAL PLANTING PLAN - 3
20	L3.5	PARTIAL PLANTING PLAN - 4
21	L3.6	PARTIAL PLANTING PLAN - 5
22	L3.7	PARTIAL PLANTING PLAN - 6
23	L3.8	PARTIAL PLANTING PLAN - 7
24	L3.9	PARTIAL PLANTING PLAN - 8
25	L3.10	PARTIAL PLANTING PLAN - 9
26	L3.11	COURTYARD PLANTING ENLARGEMENT PLAN - 1
27	L3.12	COURTYARD PLANTING ENLARGEMENT PLAN - 2

GDOE Simon Sanchez High School		
TRMA		
PROGRAMMING DOCUMENT - FEBRUARY 14, 2025		
SHEET COUNT	DWG NUMBER	SHEET TITLE
STRUCTURAL		
	S0	
1	S0.0.1	STRUCTURAL KEY PLAN
2	S0.1.1	STRUCTURAL DESIGN CRITERIA AND NOTES
3	S0.1.2	DESIGN WIND PRESSURE
4	S0.1.3	SPECIAL INSPECTION NOTES AND SCHEDULE
5	S0.1.4	REINFORCING SCHEDULE, LEGENDS AND ABBREVIATIONS
6	S0.2.1	TYPICAL DETAILS
7	S0.2.2	WALL FOOTING SCHEDULE AND DETAILS
8	S0.2.3	COLUMN FOOTING SCHEDULE & DETAIL AND TYPICAL COLUMN SECTION
9	S0.3.1	CAST-IN-PLACE WALL SCHEDULE AND TYP. DETAILS
10	S0.3.1A	TYPICAL CAST-IN-PLACE SECTIONS
11	S0.3.2	TYPICAL OPENING AND CONNECTION DETAILS
12	S0.3.4	TYPICAL BEAM ELEVATIONS AND TYPICAL DETAILS
13	S0.4.1	TYPICAL PRECAST WALL FOOTING SCHEDULE AND DETAILS
14	S0.4.2	PRECAST WALL PANEL SCHEDULE AND TYPICAL WALL PANEL SECTIONS
15	S0.4.3	TYPICAL WALL PANEL CONNECTION DETAILS
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15	M3.11	A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (EAST)
16	M3.12	A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)
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18	M3.14	A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (EAST)
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22	M3.18	GYMNASIUM LOCKER ROOM MECHANICAL CEILING PLAN
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24	M3.20	B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (EAST)
25	M3.21	B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)
26	M3.22	B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (EAST)
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30	M3.26	GCC PARTIAL MECHANICAL PLAN
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36	M4.4	MECHANICAL ROOF PLAN - AUDITORIUM
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47	M7.5	MECHANICAL EQUIPMENT SCHEDULE - 5
48	M7.6	MECHANICAL EQUIPMENT SCHEDULE - 6
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3	P1.2	OVERALL PLUMBING SITE PLAN - LEVEL 2
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11	P2.16	PLUMBING PLAN - GCC-NORTH CLASSROOM LEVEL 1
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13	P2.18	PLUMBING PLAN - GCC-SOUTH CLASSROOM LEVEL 1
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18	P2.23	PLUMBING PLAN - ADMINISTRATION BUILDING LEVEL 1
19	P2.24	PLUMBING PLAN - MAIN ENTRY LEVEL 1
20	P2.25	PLUMBING PLAN - CREDIT RECOVERY BUILDING
21	P2.26	PLUMBING PLAN - GENERATOR AND FIRE PUMP BUILDING
22	P2.30	PLUMBING PLAN - CLASSROOM LEVEL 2 (B-WING EAST)
23	P2.31	PLUMBING PLAN - CLASSROOM LEVEL 2 (B-WING WEST)
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29	P4.11	PLUMBING ROOF PLAN - GYMNASIUM
30	P4.12	PLUMBING ROOF PLAN - CLASSROOM (B-WING EAST)
31	P4.13	PLUMBING ROOF PLAN - CLASSROOM (B-WING WEST)
32	P4.14	PLUMBING ROOF PLAN - JROTC
33	P4.15	PLUMBING ROOF PLAN - CAFETERIA
34	P4.16	PLUMBING ROOF PLAN - GCC BUILDING
35	P4.17	PLUMBING ROOF PLAN - GCC BUILDING (LOWER ROOF)
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37	P4.20	PLUMBING ROOF PLAN - CLASSROOM (A-WING)
38	P4.21	PLUMBING ROOF PLAN - CLASSROOM (A-WING EAST)
39	P4.22	PLUMBING ROOF PLAN - AUDITORIUM
40	P4.23	PLUMBING ROOF PLAN - ADMIN / LIBRARY
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50	P7.16	EQUIPMENT SCHEDULE - RAINWATER HARVESTING SYSTEM
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5	FS3.12	FIRE SPRINKLER PLAN - GYMNASIUM (ASSEMBLY/COURT)
6	FS3.13	FIRE SPRINKLER PLAN - GYM WEIGHT ROOM/CLASSROOM
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12	FS3.19	FIRE SPRINKLER PLAN - GCC-NORTH SHOPS
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24	FS3.54	FIRE SPRINKLER PLAN - A-WING LEVEL 2 CENTER
25	FS3.55	FIRE SPRINKLER PLAN - A-WING LEVEL 2 EAST
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5	FA3.13	FIRE ALARM PLAN - GYM WEIGHT ROOM/CLASSROOM
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7	FA3.15	FIRE ALARM PLAN - B-WING LEVEL 1 EAST
8	FA3.16	FIRE ALARM PLAN - JROTC
9	FA3.17	FIRE ALARM PLAN - CAFETERIA
10	FA3.18	FIRE ALARM PLAN - GCC-NORTH CLASSROOMS

11	FA3.19	FIRE ALARM PLAN - GCC-NORTH SHOPS
12	FA3.20	FIRE ALARM PLAN - GCC-SOUTH CLASSROOMS
13	FA3.21	FIRE ALARM PLAN - A-WING LEVEL 1 WEST
14	FA3.22	FIRE ALARM PLAN - A-WING LEVEL 1 CENTER
15	FA3.23	FIRE ALARM PLAN - A-WING LEVEL 1 EAST
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17	FA3.25	FIRE ALARM PLAN - AUDITORIUM (HIGH CEILINGS)
18	FA3.26	FIRE ALARM PLAN - ADMINISTRATION LEVEL 1
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22	FA3.51	FIRE ALARM PLAN - B-WING LEVEL 2 WEST
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1	E1.0	ELECTRICAL SYMBOL LIST & GENERAL NOTES
2	E1.1	ELECTRICAL SITE PLAN
3	E1.2	OVERALL KEY PLAN LEVEL 1 - EAST (1 OF 3)
4	E1.3	OVERALL KEY PLAN LEVEL 1 - EAST (2 OF 3)
5	E1.4	OVERALL KEY PLAN LEVEL 2 - EAST (3 OF 3)
6	E2.0	ONE LINE DIAGRAM (MAIN BUILDING)
7	E2.1	ONE LINE DIAGRAM (LIFE SAFETY, GEN SYSTEM)
8	E2.2	PARTIAL ONE LINE DIAGRAM, A-WING & B-WING
9	E2.3	ONE LINE DIAGRAM (CAFETERIA, GCC, ROTC)
10	E2.4	EXTERIOR LIGHTING, HOA SWITCH & PV SYSTEM CONDUIT DIAGRAM
11	E2.5	TENNIS AND EXTERIOR LIGHTING DIAGRAM
12	E2.6	SOLAR PV SCHEMATIC DIAGRAM
13	E2.7	CAFETERIA (SOLAR PV) SCHEMATIC DIAGRAM
14	E3.0	ELECTRICAL DISTRIBUTION PLAN LEVEL 1 (EAST)
15	E3.1	ELECTRICAL DISTRIBUTION PLAN LEVEL 1 (WEST)
16	E3.2	ELECTRICAL DISTRIBUTION PLAN LEVEL 2
17	E4.0	GYMNASIUM LIGHTING PLAN - LEVEL 1
18	E4.1	LOCKER ROOM LIGHTING PLAN - LEVEL 1
19	E4.2	MAIN ENTRANCE LIGHTING PLAN - LEVEL 1
20	E4.3	ADMIN LIGHTING PLAN - LEVEL 1
21	E4.4	AUDITORIUM LIGHTING PLAN - LEVEL 1
22	E4.5	A WING CLASSROOM LIGHTING PLAN - LEVEL 1 (EAST)
23	E4.6	A WING CLASSROOM LIGHTING PLAN - LEVEL 1 (MIDDLE)
24	E4.7	A WING CLASSROOM LIGHTING PLAN - LEVEL 1 (WEST)
25	E4.8	B WING CLASSROOM LIGHTING PLAN - LEVEL 1 (EAST)
26	E4.9	B WING CLASSROOM LIGHTING PLAN - LEVEL 1 (WEST)
27	E4.10	CAFETERIA LIGHTING PLAN
28	E4.11	GCC CLASSROOM LIGHTING PLAN - (1 OF 2)
29	E4.12	GCC CLASSROOM LIGHTING PLAN - (2 OF 2)
30	E4.13	ROTC LIGHTING PLAN
31	E4.14	MAIN ENTRY & LIBRARY LIGHTING PLAN - LEVEL 2
32	E4.15	CHOIR & BAND LIGHTING PLAN - LEVEL 2
33	E4.16	AUDITORIUM LIGHTING PLAN - LEVEL 2
34	E4.17	A WING CLASSROOM LIGHTING PLAN - LEVEL 2 (EAST)
35	E4.18	A WING CLASSROOM LIGHTING PLAN - LEVEL 2 (MIDDLE)
36	E4.19	A WING CLASSROOM LIGHTING PLAN - LEVEL 2 (WEST)
37	E4.20	B WING CLASSROOM LIGHTING PLAN - LEVEL 2 (EAST)
38	E4.21	B WING CLASSROOM LIGHTING PLAN - LEVEL 2 (WEST)
39	E4.22	CREDIT RECOVERY LIGHTING PLAN - LEVEL 1
40	E5.0	GYMNASIUM POWER PLAN - LEVEL 1
41	E5.1	LOCKER ROOM POWER PLAN - LEVEL 1
42	E5.2	MAIN ENTRANCE POWER PLAN - LEVEL 1
43	E5.3	ADMIN POWER PLAN - LEVEL 1
44	E5.4	AUDITORIUM POWER PLAN - LEVEL 1
45	E5.5	A WING CLASSROOM POWER PLAN - LEVEL 1 (EAST)
46	E5.6	A WING CLASSROOM POWER PLAN - LEVEL 1 (MIDDLE)
47	E5.7	A WING CLASSROOM POWER PLAN - LEVEL 1 (WEST)
48	E5.8	B WING CLASSROOM POWER PLAN - LEVEL 1 (EAST)
49	E5.9	B WING CLASSROOM POWER PLAN - LEVEL 1 (WEST)
50	E5.10	CAFETERIA POWER PLAN
51	E5.11	CC CLASSROOM POWER PLAN - (1 OF 2)
52	E5.12	CC CLASSROOM POWER PLAN - (2 OF 2)
53	E5.13	ROTC POWER PLAN
54	E5.14	MAIN ENTRY& LIBRARY POWER PLAN - LEVEL 2
55	E5.15	CHOIR & BAND POWER PLAN - LEVEL 2
56	E5.16	AUDITORIUM POWER PLAN - LEVEL 2
57	E5.17	A WING CLASSROOM POWER PLAN - LEVEL 2 (EAST)
58	E5.18	A WING CLASSROOM POWER PLAN - LEVEL 2 (MIDDLE)
59	E5.19	A WING CLASSROOM POWER PLAN - LEVEL 2 (WEST)
60	E5.20	B WING CLASSROOM POWER PLAN - LEVEL 2 (EAST)
61	E5.21	B WING CLASSROOM POWER PLAN - LEVEL 2 (WEST)

62	E5.22	CREDIT RECOVERY POWER PLAN - LEVEL 1			
63	E6.0	ENLARGED ELECTRICAL ROOM PLAN			
64	E6.1	ENLARGED ELECTRICAL ROOM PLAN			
65	E6.2	ENLARGED ELECTRICAL ROOM PLAN			
66	E6.3	PUMP ROOM #1 (SE) LIGHTING & POWER PLAN			
67	E6.4	PUMP ROOM #2 (SE) LIGHTING & POWER PLAN			
68	E6.5	PUMP ROOM #3 (SE) LIGHTING & POWER PLAN			
69	E6.6	PUMP ROOM #4 (SE) LIGHTING & POWER PLAN			
70	E6.7	ENLARGED ELECTRICAL GENERATOR ROOM PLAN			
71	E6.8	COURTYARD COVERED WALKWAY ELECTRICAL PLAN (1 OF 2)			
72	E6.9	COURTYARD COVERED WALKWAY ELECTRICAL PLAN (2 OF 2)			
73	E6.10	FOOTBALL TRACK & FIELD ELECTRICAL PLAN			
74	E6.10A	PRESS BOX LIGHTING & POWER PLAN - LEVEL 1 & 2			
75	E6.10B	ONE LINE DIAGRAM - FOOTBALL FIELD			
76	E6.10C	SCHEDULE			
77	E6.11	SOFTBALL BASEBALL ELECTRICAL PLAN			
78	E6.11A	ONE LINE DIAGRAM - SOFTBALL,BASEBALL FIELD			
79	E6.11B	DETAILS			
80	E6.11C	SCHEDULE			
81	E6.12	TENNIS COURT ELECTRICAL PLAN			
82	E6.12A	SCHEDULE			
83	E7.0	GYMNASIUM ROOF ELECTRICAL PLAN			
84	E7.1	ADMINISTRATION ROOF ELECTRICAL PLAN			
85	E7.2	AUDITORIUM ROOF ELECTRICAL PLAN			
86	E7.3	A-WING ROOF ELECTRICAL PLAN			
87	E7.4	B-WING ROOF ELECTRICAL PLAN			
88	E7.5	CAFETERIA & ROTC ROOF ELECTRICAL PLAN			
89	E7.6	GCC BUILDING ROOF ELECTRICAL PLAN			
90	E7.7	CREDIT RECOVERY ROOF ELECTRICAL PLAN			
91	E8.0	DETAILS			
92	E9.10	LIGHT FIXTURE SCHEDULE-SHEET 1			
93	E9.11	LIGHT FIXTURE SCHEDULE-SHEET 2			
94	E9.12	AUDITORIUM LIGHT FIXTURE SCHEDULE			

GDOE Simon Sanchez High School

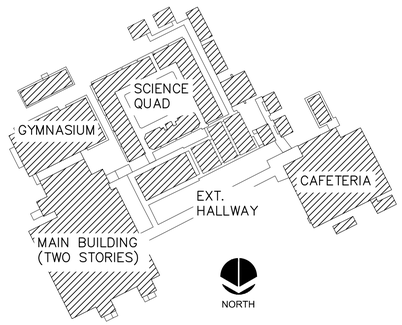
TRMA

PROGRAMMING DOCUMENT - FEBRUARY 13, 2025

SHEET COUNT	DWG NUMBER	SHEET TITLE
		TELECOM
1	T0.1	INTERIOR AND SITE TELECOMMUNICATIONS GENERAL NOTES
2	T0.2	TELECOMMUNICATIONS GENERAL NOTES
3	T.03	TELECOMMUNICATIONS SYMBOLS LIST
4	T1.1	OVERALL TELECOMMUNICATIONS SITE PLAN
5	T1.2	OVERALL LEVEL 1 TELECOMMUNICATIONS PLAN
6	T1.3	OVERALL LEVEL 2 TELECOMMUNICATIONS PLAN
8	T2.1	MAIN ENTRANCE LEVEL 1 TELECOMMUNICATIONS PLAN
9	T2.2	GYMNASIUM TELECOMMUNICATIONS PLAN
10	T2.3	GYMNASIUM LOCKER ROOMS TELECOMMUNICATIONS PLAN
11	T2.4	ADMINISTRATION OFFICES TELECOMMUNICATIONS PLAN
12	T2.5	AUDITORIUM LEVEL 1 TELECOMMUNICATIONS PLAN
13	T2.6	A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - EAST
14	T2.7	A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - CENTER
15	T2.8	A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - WEST
16	T2.9	C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - EAST
17	T2.10	C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - CENTER
18	T2.11	C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - WEST
19	T2.12	CAFTERIA TELECOMMUNICATIONS PLAN
20	T2.13	C-WING TELECOMMUNICATIONS PLAN (JROTC)
21	T2.14	B-WING LEVEL 1 TELECOMMUNICATIONS PLAN - WEST
22	T2.15	B-WING LEVEL 1 TELECOMMUNICATIONS PLAN - EAST
23	T2.16	MAIN ENTRANCE LEVEL 2 TELECOMMUNICATIONS PLAN
24	T2.17	A-WING, CHOIR & BAND LEVEL 2 TELECOMMUNICATIONS PLAN
25	T2.18	AUDITORIUM LEVEL 2 TELECOMMUNICATIONS PLAN
26	T2.19	A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - EAST
27	T2.20	A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - CENTER
28	T2.21	A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - WEST
29	T2.22	B-WING LEVEL 2 TELECOMMUNICATIONS PLAN - EAST
30	T2.23	B-WING LEVEL 2 TELECOMMUNICATIONS PLAN - WEST
31	T2.24	CREDIT RECOVERY AND PRESS BOX TELECOMMUNICATIONS PLANS
32	T2.31	MAIN ENTRANCE LEVEL 1 SECURITY PLAN
33	T2.32	GYMNASIUM SECURITY PLAN
34	T2.33	GYMNASIUM LOCKER ROOMS SECURITY PLAN
35	T2.34	ADMINISTRATION OFFICES SECURITY PLAN
36	T2.35	AUDITORIUM LEVEL 1 SECURITY PLAN
37	T2.36	A-WING LEVEL 1 SECURITY PLAN - EAST
38	T2.37	A-WING LEVEL 1 SECURITY PLAN - CENTER
39	T2.38	A-WING LEVEL 1 SECURITY PLAN - WEST
40	T2.39	C-WING CLASSROOMS SECURITY PLAN - EAST
41	T2.40	C-WING CLASSROOMS SECURITY PLAN - CENTER
42	T2.41	C-WING CLASSROOMS SECURITY PLAN - WEST
43	T2.42	CAFTERIA SECURITY PLAN
44	T2.43	C-WING SECURITY PLAN (JROTC)
45	T2.44	B-WING LEVEL 1 SECURITY PLAN - WEST

46	T2.45	B-WING LEVEL 1 SECURITY PLAN - EAST
47	T2.46	MAIN ENTRANCE LEVEL 2 SECURITY PLAN
48	T2.47	A-WING, CHOIR & BAND LEVEL 2 SECURITY PLAN
49	T2.48	AUDITORIUM LEVEL 2 SECURITY PLAN
50	T2.49	A-WING LEVEL 2 SECURITY PLAN - EAST
51	T2.50	A-WING LEVEL 2 SECURITY PLAN - CENTER
52	T2.51	A-WING LEVEL 2 SECURITY PLAN - WEST
53	T2.52	B-WING LEVEL 2 SECURITY PLAN - EAST
54	T2.53	B-WING LEVEL 2 SECURITY PLAN - WEST
55	T2.54	CREDIT RECOVERY AND PRESS BOX SECURITY PLANS
56	T4.1	ENLARGED MAIN DISTRIBUTION FACILITY (MDF) ROOM
57	T4.2	ENLARGED INTERMEDIATE DISTRIBUTION FACILITY (IDF) ROOMS
58	T4.3	ENLARGED INTERMEDIATE DISTRIBUTION FACILITY (IDF) ROOMS
59	T4.4	ENLARGED INTERMEDIATE DISTRIBUTION FACILITY (IDF) ROOMS
60	T5.1	CABINET ELEVATIONS
61	T5.2	CABINET ELEVATIONS
62	T5.3	CABINET ELEVATIONS
63	T5.4	CABINET ELEVATIONS
64	T5.5	CABINET ELEVATIONS
65	T5.6	CABINET ELEVATIONS
66	T5.7	CABINET ELEVATIONS
67	T6.1	TELECOMMUNICATIONS SITE DISTRIBUTION DIAGRAM
68	T6.2	TELECOMMUNICATIONS RISER DIAGRAMS - ADMIN, A-WING AND B-WING
69	T6.3	TELECOMMUNICATIONS RISER DIAGRAMS
70	T6.4	CATV SYSTEM RISER DIAGRAMS - ADMIN, A-WING AND B-WING
71	T6.5	CATV SYSTEM RISER DIAGRAMS
72	T6.6	GROUNDING SYSTEM DIAGRAMS
73	T6.7	GROUNDING SYSTEM DIAGRAMS
74	T6.8	INTERCOM SYSTEM DIAGRAMS
75	T6.9	CCTV SYSTEM DIAGRAM

ATTACHMENT B-6



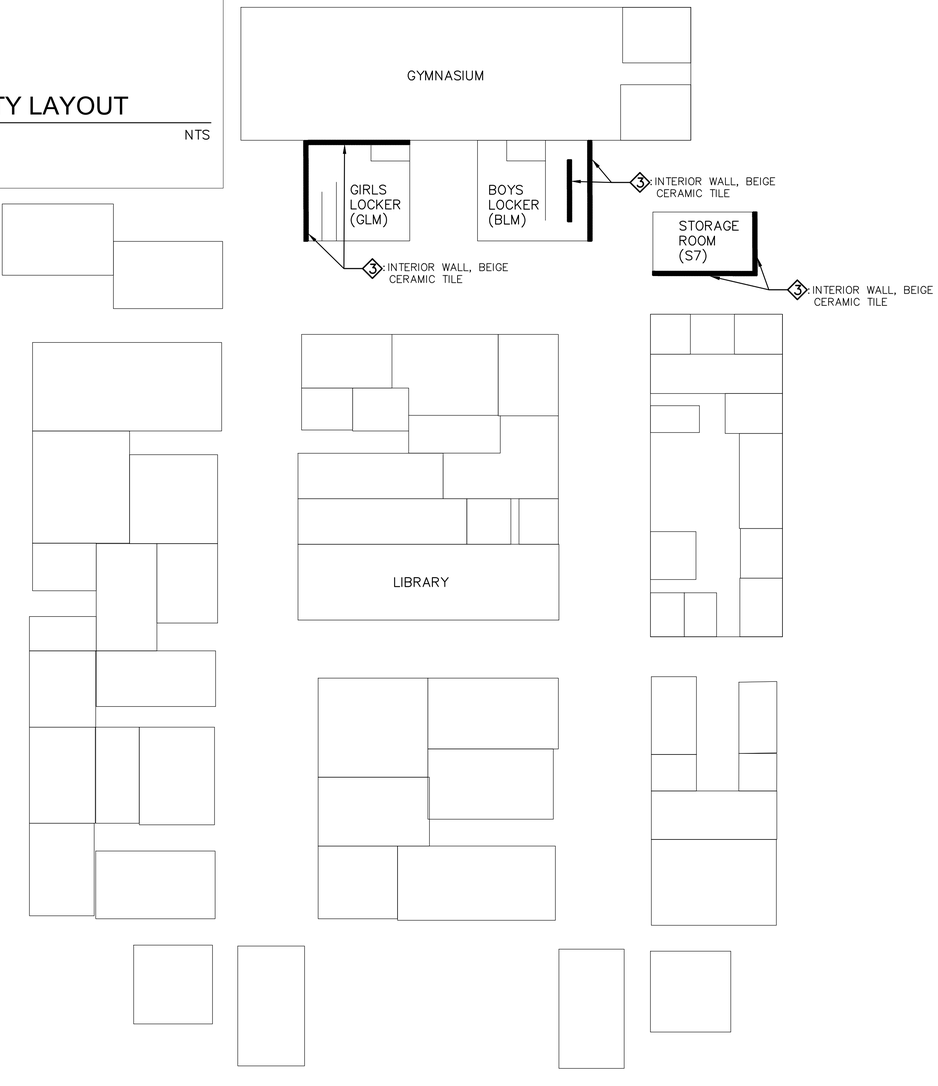
1 EXISTING FACILITY LAYOUT
SCALE: NTS

ASBESTOS-CONTAINING MATERIALS

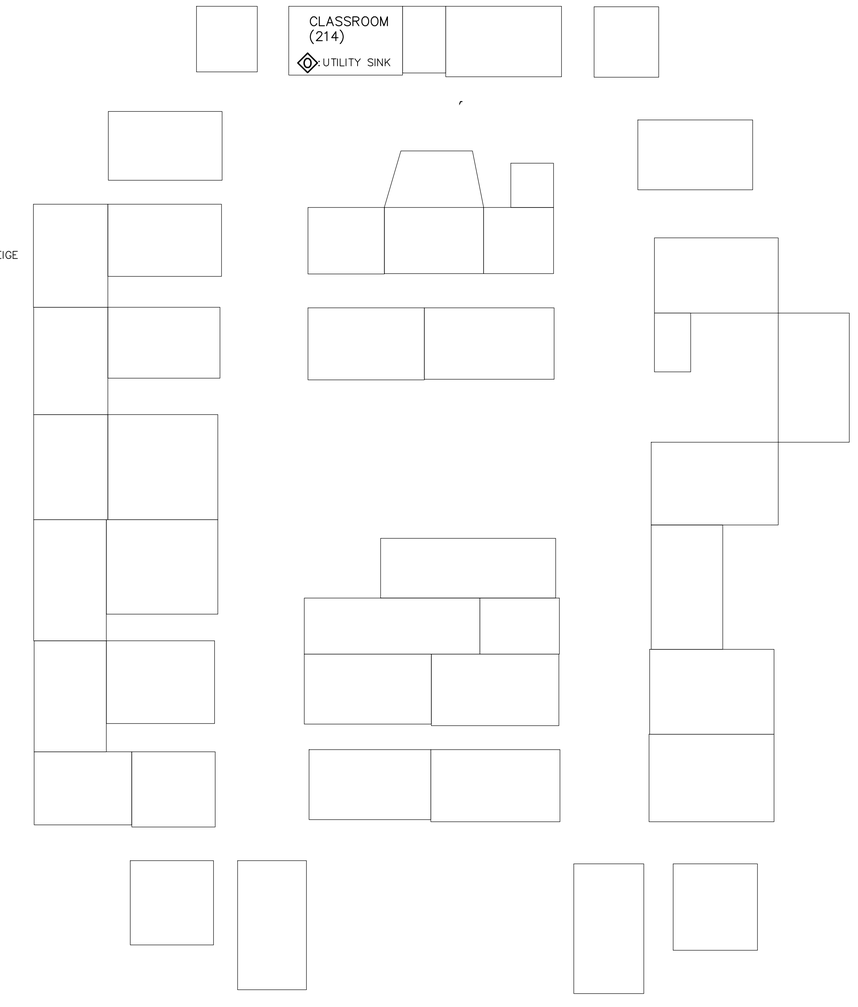
MARK	DESCRIPTION	APRX. QUANTITY
①	FLOOR TILE/ MASTIC	4,200 SF

MATERIALS WITH LEAD BASED PAINT

MARK	DESCRIPTION	APRX. QUANTITY
②	DOOR/ DOOR FRAME	15 EA
③	WALL	22,000 SF
R	FIRE PIPE RISER	3 EA
◇: NOTE	OTHER MATERIAL	(SEE NOTES)



2 MAIN BUILDING FIRST STORY - ABATEMENT PLAN
SCALE: NTS



3 MAIN BUILDING SECOND STORY - ABATEMENT PLAN
SCALE: NTS

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax : (671) 472-3381
Architecture
Planning
Interior Design

DCA DUEÑAS · CAMACHO
■ ENGINEERING (CIVIL/STRUCTURAL)
■ CONSTRUCTION MANAGEMENT ■ PLANNING
■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

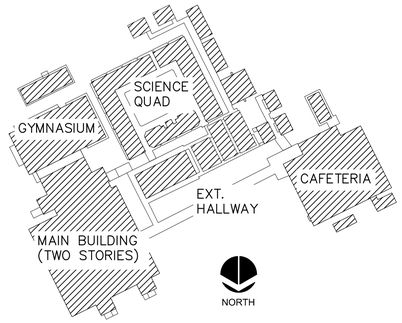
Title:
ABATEMENT FLOOR PLANS 1

60% DESIGN SUBMITTAL

Designed:	N/A
Drawn:	JMM
Checked:	KMR
Supv:	KMR
Scale:	AS SHOWN
Date:	11/01/21
Project No.	AutoCAD File

Drawing No.
SR-1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 EXISTING FACILITY LAYOUT

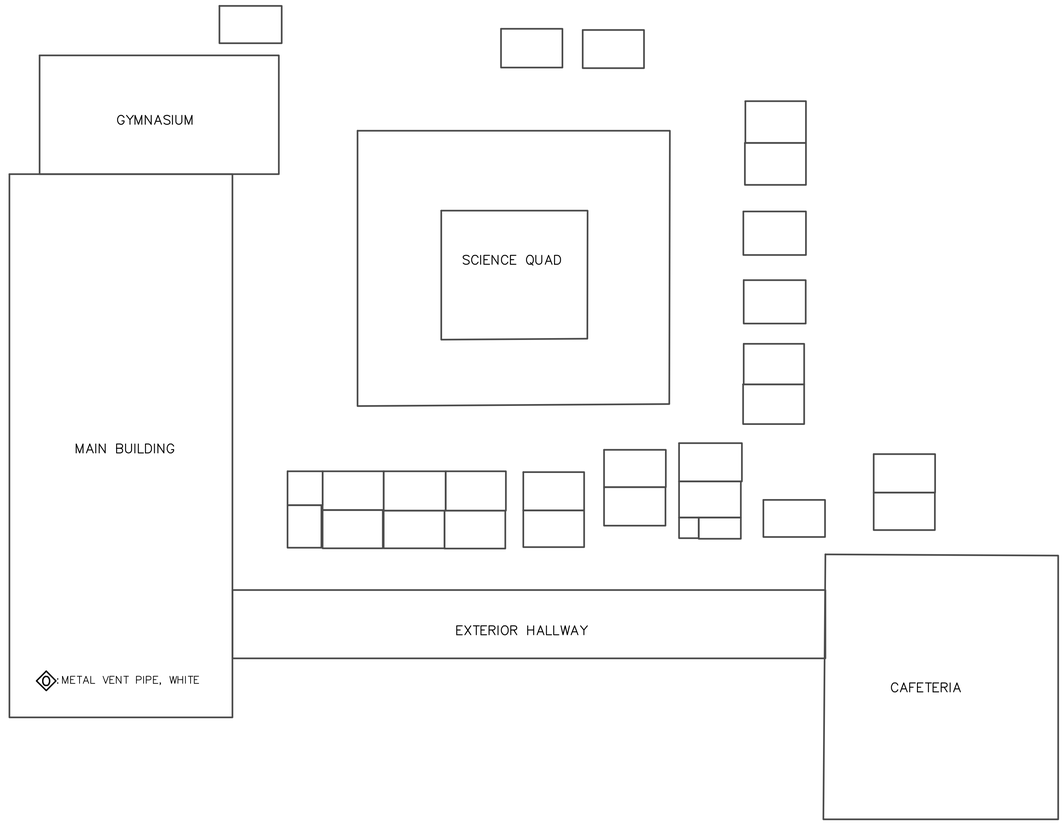
SCALE: NTS

ASBESTOS-CONTAINING MATERIALS

MARK	DESCRIPTION	APRX. QUANTITY
①	FLOOR TILE/ MASTIC	

MATERIALS WITH LEAD BASED PAINT

MARK	DESCRIPTION	APRX. QUANTITY
②	DOOR/ DOOR FRAME	
③	WALL	
R	FIRE PIPE RISER	
⓪: NOTE	OTHER MATERIAL	(SEE NOTES)



2 ROOF - ABATEMENT PLAN

SCALE: NTS

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REVISIONS

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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ABATEMENT FLOOR PLANS 2

60% DESIGN SUBMITTAL

Designed:	N/A
Drawn:	JMM
Checked:	KMR
Supv:	KMR
Scale:	AS SHOWN
Date:	11/01/21
Project No.	AutoCAD File

Drawing No.
SR-2

Sheet No. _____ of _____

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ATTACHMENT B-7

SIMON SANCHEZ HIGH SCHOOL

YIGO, GUAM

VOLUME 1

PROGRAMMING DOCUMENT

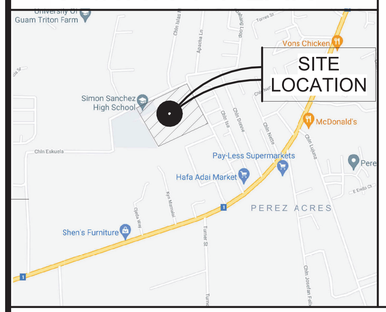
ARCHITECT

Taniguchi Ruth Makio Architects

LOCATION MAP



VICINITY PLAN







LANDSCAPE	ARCHITECTURAL
BCH A Bowers + Kubota Company	TRMA Taniguchi Ruth Makio Architects 100 Cliff Business Center, P.O. Box EA, Agana, GU 96910 Tel.: (671) 475-8772 • Fax.: (671) 472-3381 Architecture Planning Interior Design

CIVIL/STRUCTURAL	MECHANICAL/ FIRE PROTECTION	ELECTRICAL	TELECOMMUNICATIONS
DCA DUEÑAS · CAMACHO & Associates, Inc. Dueñas Camacho & Associates, Inc. 238 E. Marine Corps Drive, Ste. 201, Diamond Plaza, Hagatna, Guam 96910 Tel: (671) 477-7991 Fax: (671) 479-6315	WM ENGINEERING SERVICES, LLC MECHANICAL & FIRE PROTECTION CONSULTING ENGINEERS & CONSTRUCTION MANAGEMENT SVCS. WM ENGINEERING SERVICES, LLC P.O. Box 392, Hagåtña, Guam 96932 Tel ..... 646-8127 Fax ..... 646-0704 E-Mail ..... main@wmesguam.com	EMCE · Consulting Engineers 133 ANTONIA COURT TAMUNING, GUAM 96913 P.O. BOX 9940 Tel: (671) 649-0166/7 Fax:(671) 646-EMCE (3623)	INSYNERGY ENGINEERING MECHANICAL • ELECTRICAL • FIRE PROTECTION

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REVISIONS		
No.	Description	Date

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Taniguchi Ruth Makio Architects
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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

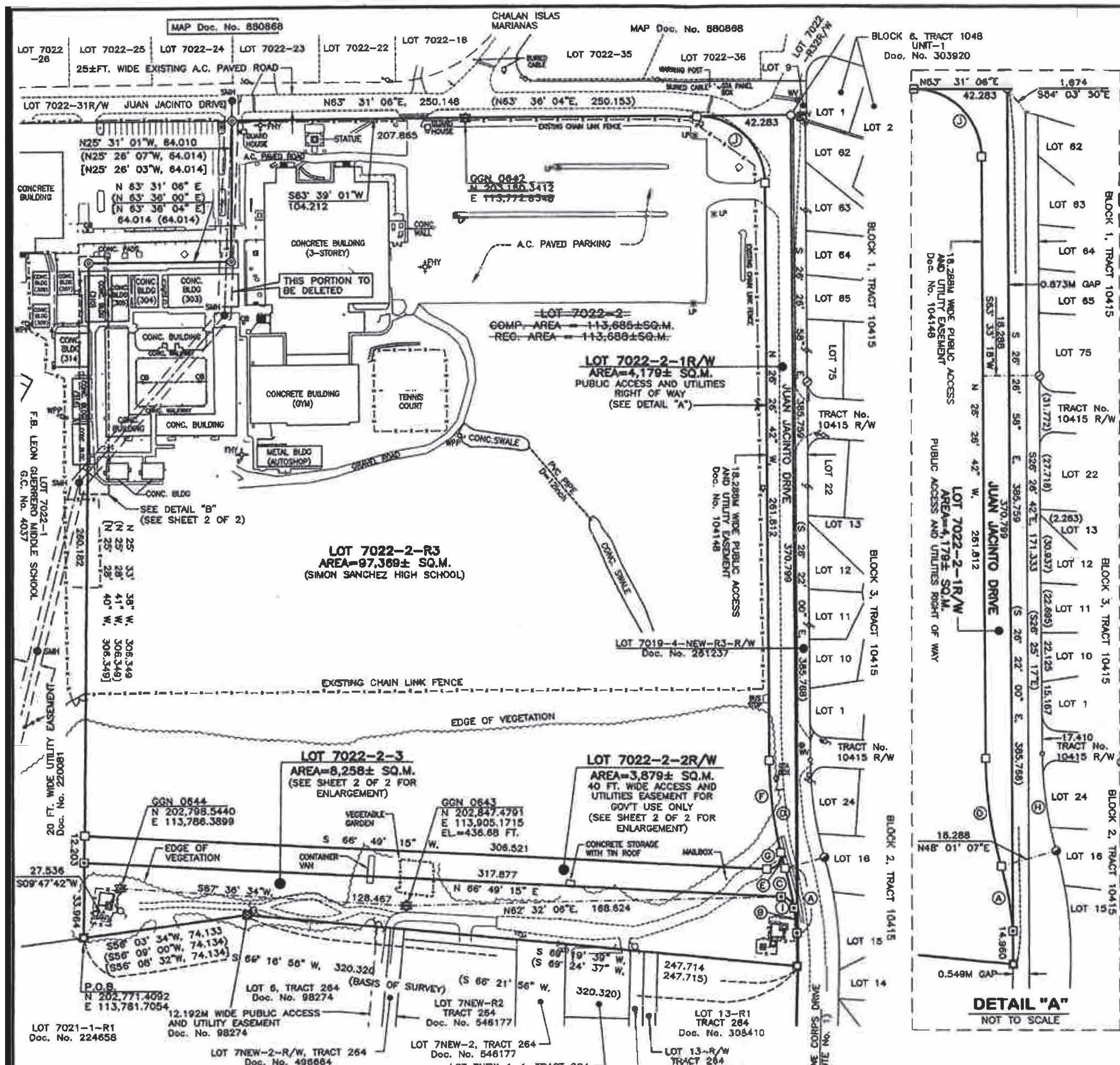
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: TITLE SHEET, LOCATION PLAN, CODE, VICINITY PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No. T-1

Sheet No. _____ of _____

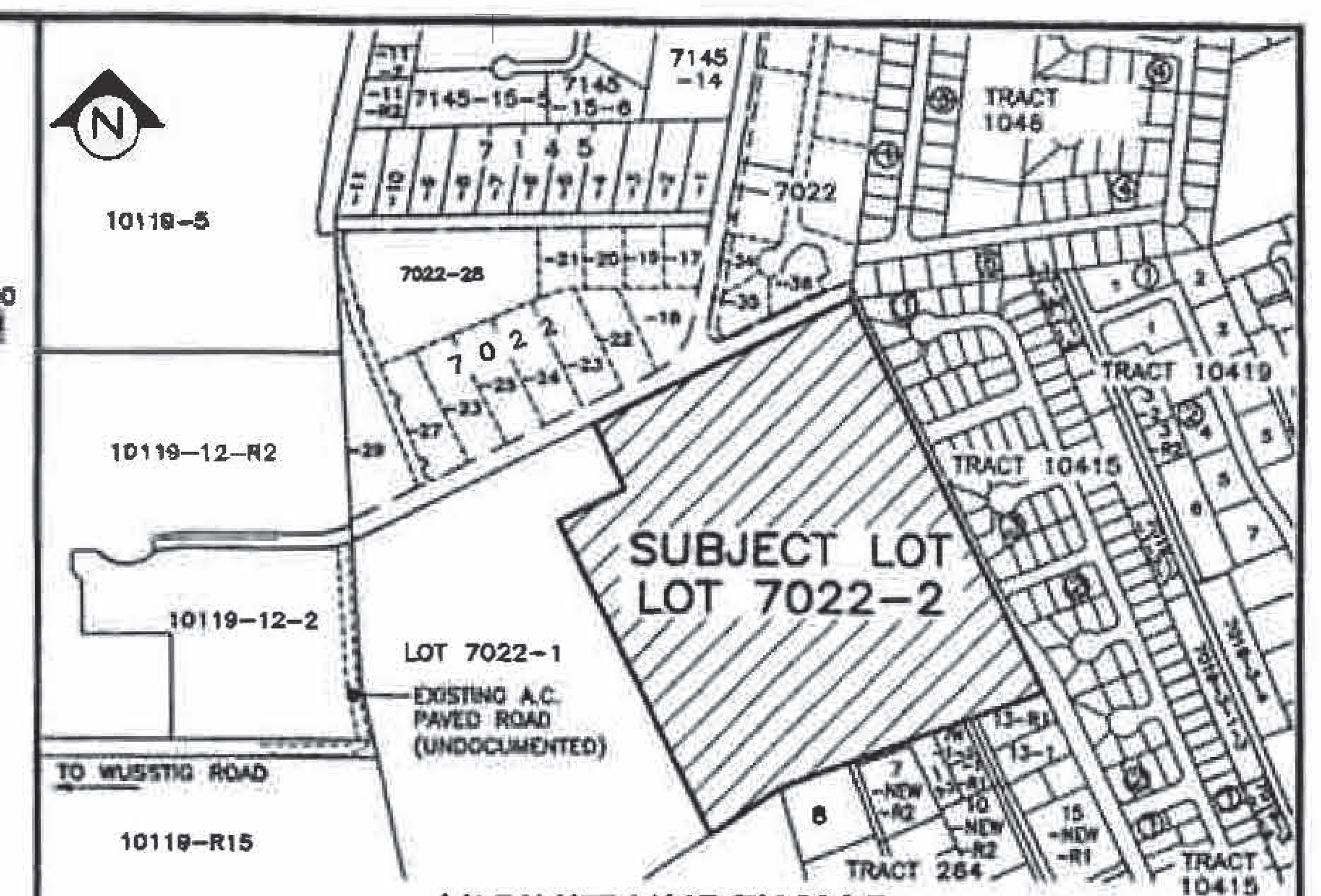


1993 GRID

METRIC SCALE: 1:1250

CURVE DATA :

	Δ	R	L	Ch	ChB
A	11° 18' 26"	151.034	29.807	29.758	N36° 19' 32"W
B	04° 17' 13"	151.034	11.301	11.298	S32° 46' 56"E
C	07° 01' 13"	151.034	18.506	18.494	S36° 28' 09"E
D	15° 32' 04"	183.569	49.771	49.618	S34° 12' 44"E
E	02° 16' 32"	183.569	7.290	7.290	S40° 48' 51"E
F	13° 13' 53"	183.569	42.392	42.298	S33° 03' 38"E
G	106° 29' 50"	6.096	11.331	9.769	N13° 34' 20"E
H	15° 32' 04"	165.261	44.612	44.675	N34° 12' 44"W (N34° 11' 19"W)
I	78° 13' 12"	6.096	8.322	7.691	N74° 04' 09"W
J	90° 02' 12"	30.480	47.898	43.119	S71°27'48"E



VICINITY INDEX MAP
NOT TO SCALE

NOTES :

1. SURVEY WAS BASED ON FOUND CORNERS AS SHOWN.
2. ALL DISTANCES ARE IN METERS UNLESS OTHERWISE NOTED.
3. BEARINGS AND DISTANCES WITHIN THE PARENTHESES ARE RECORD DATA, WITHIN BRACKETS ARE BASED ON REF. No. 2. ALL OTHERS ARE 1993 GRID.
4. SUBJECT LOT IS WITHIN THE NORTHERN WATER RECHARGE AREA.
5. SUBJECT LOT IS ZONED "A" AGRICULTURAL PER 1967 OFFICIAL ZONING MAP F387S41.
6. EXISTING AS-BUILTS SHOWN AS OF APPROVAL OF THIS MAP.
7. VERTICAL CONTROL SURVEY WAS BASED FROM GGN 0643 WITH AN ELEVATION OF 436.68 FEET MEAN SEA LEVEL (MSL) DATUM. CONTOURS WERE DEVELOPED FROM SPOT ELEVATIONS USING A COMBINATION OF GPS AND CONVENTIONAL TOPOGRAPHIC GROUND METHOD.

REFERENCES :

1. DWG No. 70-40-15, SURVEY FOR PROPOSED MATAGUAC JR. HIGH SCHOOL SITE OF LOT 7022-2, PREPARED BY RLS No. 18, L.M. No. 547-FY72, UNRECORDED
2. DWG No. ASA 72 020, PARCELING OF LOT 7022-1, PREPARED BY RLS No. 37, L.M. No. 473-FY72, UNRECORDED.
3. DWG No. CC-9612Y, RE-SUBDIVISION SURVEY MAP OF LOT 7NEW-1 AND LOT 7NEW-R1, TRACT 264, PREPARED BY RLS No. 48, L.M. No. 265-FY98, Doc. No. 546177.
4. DWG No. MS-93045, CONSOLIDATION SURVEY MAP OF LOT 7 AND LOT 12, TRACT 264 INTO LOT 7NEW, TRACT 264 THEN PARCELING OF LOT 7NEW, TRACT 264, PREPARED BY RLS No. 53, L.M. No. 568-FY93, Doc. No. 496664.
5. DWG No. RRV86-20PIE, SUBDIVISION SURVEY MAP OF TRACT 10415 (CONSOLIDATION OF LOTS 7019-4NEW-3, 7019-4NEW-2 & 7019-4NEW-1). PREPARED BY RLS No. 54, L.M. No. 86-FY87, Doc. No. 392475.

SPECIAL NOTE :

1. PURSUANT TO PL 28-126, SECTION 1(d), THIS IS A LOT PARCELING SURVEY MAP, AND THEREFORE EXEMPTED FROM THE MAP PROCESSING REQUIREMENTS OF PL 28-126, SECTION 1(a).
2. THE DIFFERENCE OF AREA BETWEEN COMPUTED AND RECORD ARE BASED ON FOUND CORNERS AND FIELD CONDITION.

LEGEND :

- GGN STATION
- FND. No. 4 REBAR WITH A BROKEN CAP, SET BY UNKNOWN, REPLACED WITH 0.102m x 0.102m x 0.457 CONC. MON. CENTERED WITH 0.064M DIA. BRONZE DISK MARKED GWA BOUNDARY / P.L.S. No. 65
- FND. No. 4 REBAR WITH CAP MARKED DLM – ONE FOOT DEEP, PLACED A 0.102m x 0.102m x 0.457 CONC. MON. MARKED PLS 65 ON TOP OF REBAR (SAME LOCATION)
- SET 0.102m x 0.102m x 0.457 CONC. MON. CENTERED WITH 0.064M DIA. BRONZE DISK MARKED GWA BOUNDARY / P.L.S. No. 65
- SET 0.102 x 0.102 CONC. MONUMENT WITH PLASTIC CAP MARKED PLS 65
- FOUND NO. 4 REBAR WITH PLASTIC CAP MARKED RLS 48, UNRECORDED
- FOUND 3/4 DIA. G.I. PIPE WITH BRASS TAG MARKED RLS No. 24, REF #5
- FOUND NO. 4 REBAR WITH PLASTIC CAP MARKED PLS 77, UNRECORDED
- SET No. 4 REBAR WITH PASTIC CAP MARKED PLS No. 65
- CONCRETE POWER POLE
- GUY WIRE
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SIGN POST
- WATER VALVE
- LAMP POST

AUTHORITY (GDOE) :

REFERENCE: PROFESSIONAL LAND SURVEYING SERVICES
FORMAT REQUEST FOR PROPOSAL: GDOE RFP 005-2019
PURCHASE ORDER No. 20191056

AUTHORITY (GWA) :

1. LAND SURVEY AGREEMENT BETWEEN GUAM WATERWORKS AUTHORITY AND DUENAS CAMACHO & ASSOCIATES Inc.; RFP GWA-2007-04, DATED NOVEMBER 19, 2007.
2. GRANT DEED Doc. No. 567559
GRANTORS: GOVERNMENT OF GUAM AND / OR FORMER PUBLIC UTILITY AGENCY OF GUAM (PUAG)
GRANTEE: GUAM WATERWORKS AUTHORITY (GWA)

GRANTORS HEREBY GRANT, TRANSFER, ASSIGN, AND CONVEY TO THE GRANTEE IN FEE SIMPLE ABSOLUTE, THE REAL PROPERTY INTERESTS FOR ONLY THOSE PORTIONS OF LANDS REQUIRED BY THE GRANTEE FOR PUBLIC UTILITIES PURPOSES.

CHECKED BY :

FRANK P. TAITANO, PLANNER, D.L.M. — 5-18-20 DATE

MELVIN O. JAVIER, ENGINEERING TECHNICIAN, C.L.T.C. — 7-6-2020 DATE

PIERCE CASTRO, ENGINEERING TECHNICIAN, C.L.T.C. — 7-30-2020 DATE

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recorder
File for Record is Instrument Number 952623
On the Year 20 20 Month 11 Day 25 Time 15:05
Recording Fee 1.80 Receipt 31796
Deputy Recorder

SATISFACTORY TO AND APPROVED BY :

JON J.P. FERNANDEZ, SUPERINTENDENT OF EDUCATION, GOVERNMENT OF GUAM — 2-17-20 DATE

MIGUEL C. BORDALLO, P.E., GENERAL MANAGER, GUAM WATERWORKS AUTHORITY, GOVERNMENT OF GUAM, FOR GWA DEEP WELL SITES Y-05 AND Y-06 — 11-21-19 DATE

JOSEPH M. BORJA, DIRECTOR, DEPARTMENT OF LAND MANAGEMENT, APPROVAL PURSUANT TO GRANT DEED Doc. No. 567559, PAGE 29, THEREOF FOR GWA DEEP WELL SITES Y-05 AND Y-06 — 10/26/20 DATE

LOURDES A. LEON GUERRERO, GOVERNOR OF GUAM, APPROVAL PURSUANT TO GRANT DEED Doc. No. 567559, PAGE 29, THEREOF FOR GWA DEEP WELL SITES Y-05 AND Y-06 — 11/07/2020 DATE

CERTIFICATE OF GUAM CHIEF SURVEYOR

THIS MAP HAS BEEN EXAMINED FOR CONFORMANCE WITH TITLE 21, GUAM CODE ANNOTATED, CHAPTER ... ARTICLE ... AND REGULATIONS THEREUNDER ON THIS 3rd DAY OF August 2020

PAUL L. SANTOS, P.L.S. No. 68
GUAM CHIEF SURVEYOR/CHIEF OF CADASTRE

CERTIFICATE OF GUAM CHIEF PLANNER

APPROVAL PURSUANT TO TITLE 21, GUAM CODE ANNOTATED, CHAPTER 61, ZONING LAW AND CHAPTER 62, SUBDIVISION LAW.

CELINE L. CRUZ, GUAM CHIEF PLANNER — 5/18/2020 DATE

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

NESTORIO C. IGNACIO, PLS No. 65 — 10/22/19 DATE

DCA DUENAS · CAMACHO

LOT PARCELING SURVEY MAP OF

LOT 7022-2

(GDOE: SIMON SANCHEZ HIGH SCHOOL)
(GWA: DEEP WELLS Y-05 and Y-06)
MUNICIPALITY OF YIGO

L.S. 10 SEC. 4

SURVEY DATA		DATE	LOT DATA	
FIELD	MPG/AUJ & CREW	5-9-2019	BASIC LOT	7022
BOOK	DCAI/GWA-2019		CERT. OF TITLE No.	G.C. 4037
COMPUTED	CNB	MAY 2019	REGISTERED ON:	AUGUST 30, 1939
DRAWN	CNB	MAY 2019	IN THE NAME OF:	
RESEARCHED	CNB	APRIL 2019	THE UNITED STATES OF AMERICA	
CHECKED	NCI	MAY 2019		

SATISFACTORY TO & APPROVED BY:
SEE PLAN DATE
OWNER:
Doc. No.

DWG No. DCAI-S-18-101 | SHT. 1 OF 2 | SCALE 1:1250 | L.M. CHECK No. 119-FY 2019

S-16030

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REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

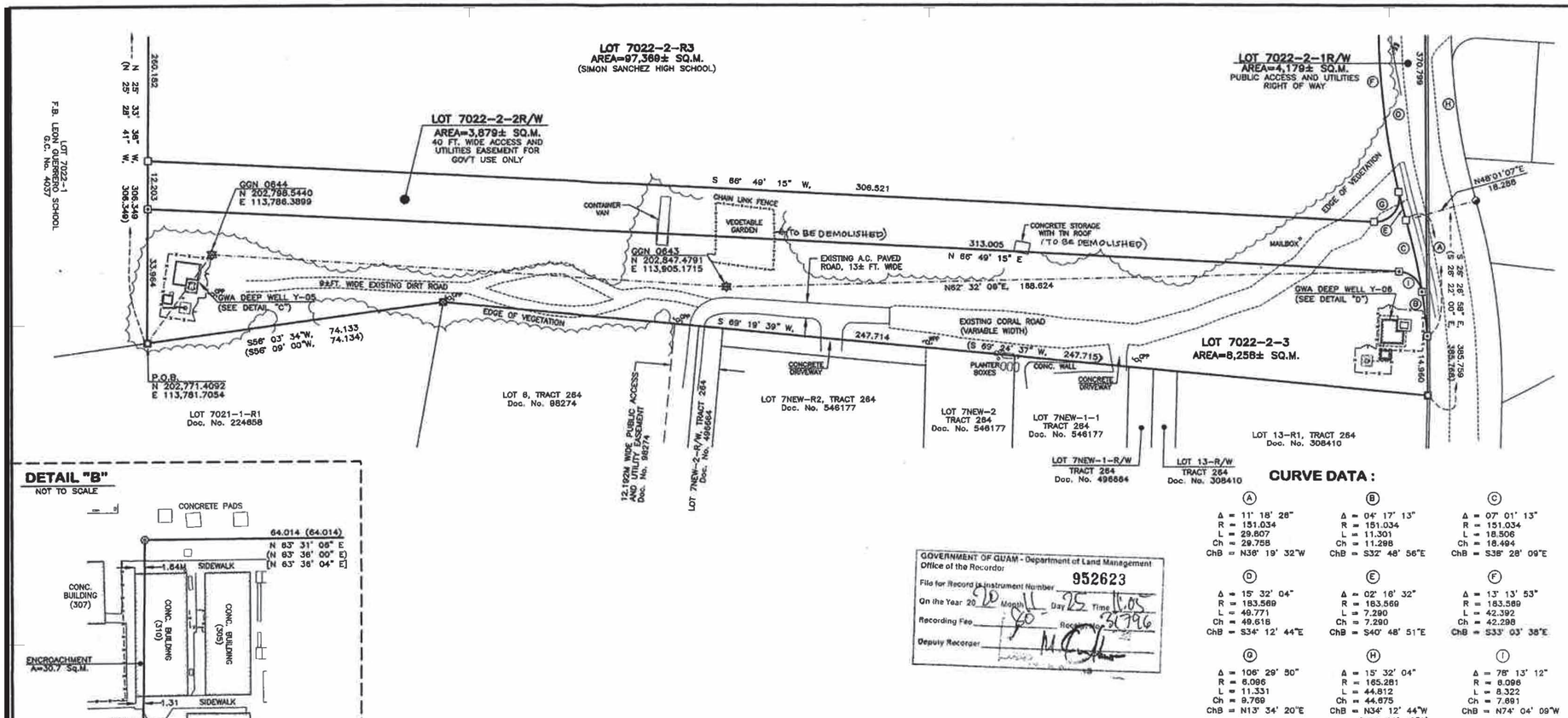
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: TOPOGRAPHIC SURVEY

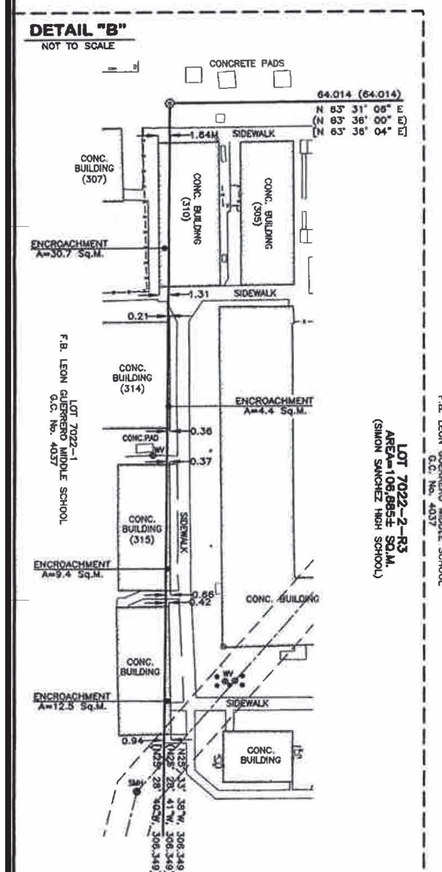
PROGRAMMING DOCUMENT

Designed:
Drawn:
Checked:
Supv:
Scale:
Date: 3/31/25
Project No. No.
File
Drawing No. T-4
Sheet No. of

NOT FOR CONSTRUCTION



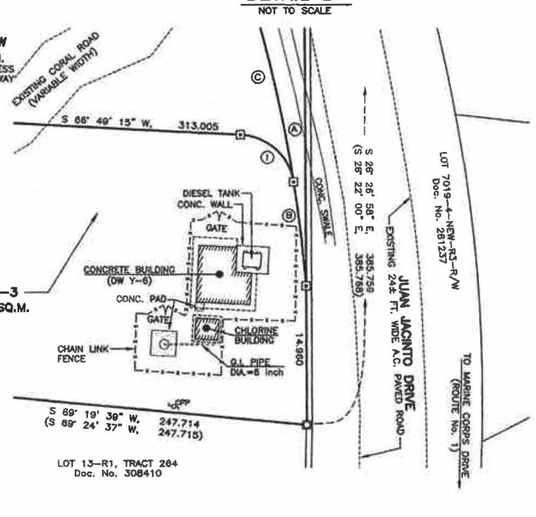
DETAIL "B"
NOT TO SCALE



DETAIL "C"
NOT TO SCALE



DETAIL "D"
NOT TO SCALE



CURVE DATA :

Ⓐ	Ⓑ	Ⓒ
Δ = 11° 18' 28"	Δ = 04° 17' 13"	Δ = 07° 01' 13"
R = 151.034	R = 151.034	R = 151.034
L = 29.807	L = 11.301	L = 18.506
Ch = 29.758	Ch = 11.298	Ch = 18.494
ChB = N36° 19' 32"W	ChB = S32° 48' 56"E	ChB = S38° 28' 09"E

Ⓓ	Ⓔ	Ⓕ
Δ = 15° 32' 04"	Δ = 02° 18' 32"	Δ = 13° 13' 53"
R = 183.569	R = 183.569	R = 183.569
L = 49.771	L = 7.290	L = 42.392
Ch = 49.618	Ch = 7.290	Ch = 42.298
ChB = S34° 12' 44"E	ChB = S40° 48' 51"E	ChB = S33° 03' 38"E

Ⓖ	Ⓗ	Ⓘ
Δ = 106° 29' 50"	Δ = 15° 32' 04"	Δ = 76° 13' 12"
R = 6.096	R = 165.281	R = 6.096
L = 11.331	L = 44.812	L = 8.322
Ch = 9.769	Ch = 44.675	Ch = 7.691
ChB = N13° 34' 20"E	ChB = N34° 12' 44"W (N34° 11' 19"W)	ChB = N74° 04' 09"W

GOVERNMENT OF GUAM - Department of Land Management
Office of the Recordor
File for Record in Instrument Number 952623
On the Year 20 19 Month 11 Day 25 Time 11:05
Recording Fee 50 Receipt No. 53796
Deputy Recorder M C

CERTIFICATE OF SURVEYOR

I, NESTORIO C. IGNACIO, HEREBY CERTIFY THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION; THAT IT IS BASED ON A FIELD SURVEY MADE ON MAY 9, 2019 IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. THAT I AM RESPONSIBLE FOR THE ACCURACY OF ALL DATA AND INFORMATION SHOWN HEREON I FURTHER CERTIFY THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITION INDICATED ON THIS MAP.

Nestorio C. Ignacio 10/22/19
NESTORIO C. IGNACIO, PLS No. 65 DATE

NESTORIO C. IGNACIO CERTIFIED No. 65 EXP. 04/30/20 GUAM PROFESSIONAL LAND SURVEYOR

DCA DUEÑAS · CAMACHO
* ENGINEERING * PLANNING * SURVEYING * ENVIRONMENTAL SERVICES
* GEOGRAPHIC INFORMATION SYSTEM * CONSTRUCTION MANAGEMENT GUAM
P.O. Box 8900, Tamuning, Guam 96931 / 238 S. Marine Corps Drive, Suite 201 Diamond Plaza, Hagatña, GU 96910-5164 / Tel: (671) 477-7991 / Fax: (671) 479-4310 SAIPAN Cutler Bay PPP, Suite 164, Saipan, MP 96950 / Chalan Palo Arnold, Ada's Building South Garapan, Saipan 96950 / Tel: (670) 234-9017 / Fax: (670) 234-3842

LOT PARCELING SURVEY MAP OF
LOT 7022-2
(GDOE: SIMON SANCHEZ HIGH SCHOOL)
(GWA: DEEP WELLS Y-05 and Y-06)
MUNICIPALITY OF YIGO

L.S. 10 SEC. 4

SURVEY DATA		DATE	LOT DATA	
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RESEARCHED	CNB	APRIL 2019	THE UNITED STATES OF AMERICA	
CHECKED	NCI	MAY 2019		

SATISFACTORY TO & APPROVED BY:
SEE SHEET 1 OF 2
OWNER: DATE
Doc. No.

DWG No. DCAI-S-18-101 | SHT. 2 OF 2 | SCALE 1:300 | L.M. CHECK No. 119-FY 2019

5-16030 2/2

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REVISIONS

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

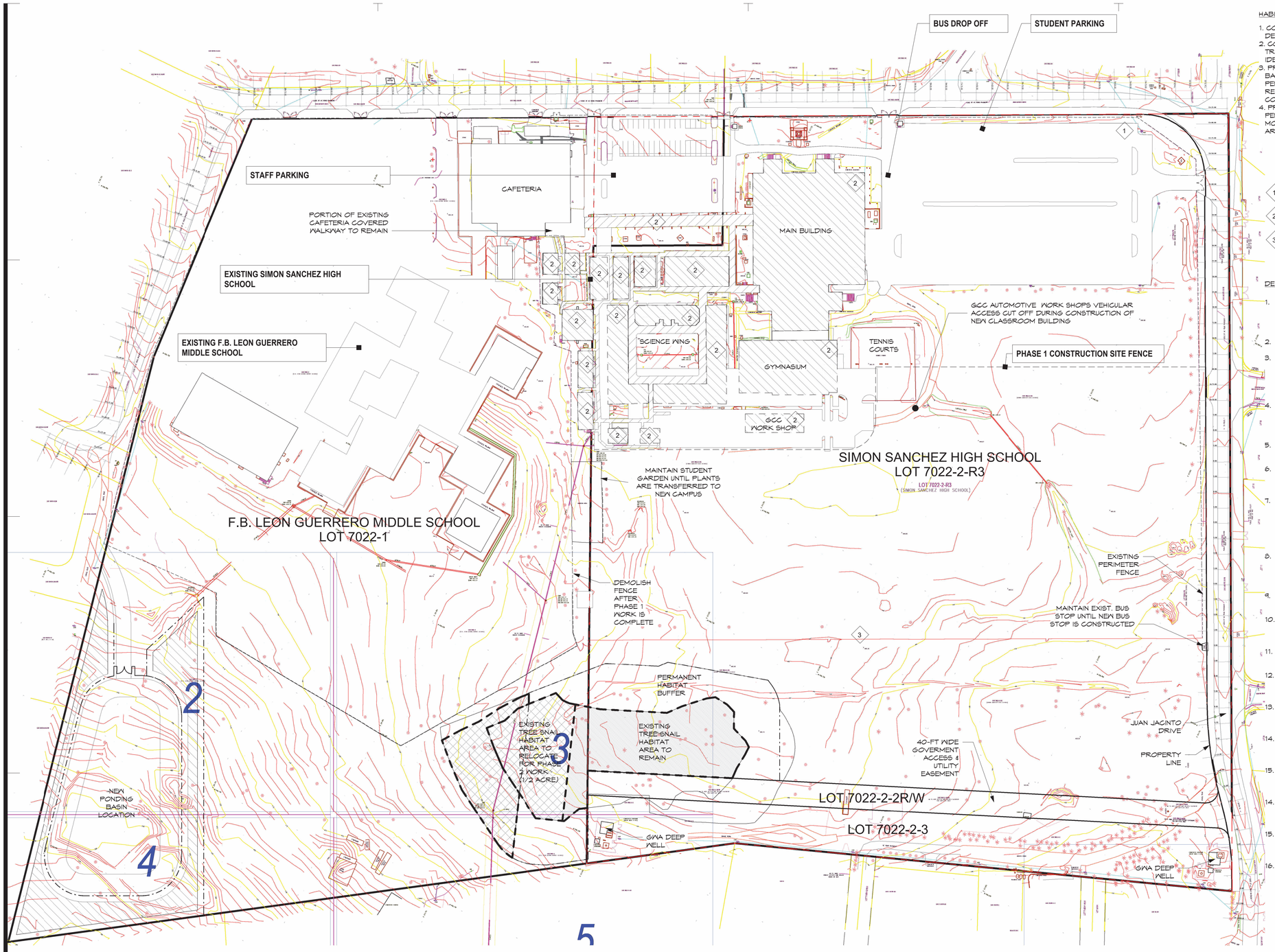
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: TOPOGRAPHIC SURVEY
PROGRAMMING DOCUMENT

Designed:
Drawn:
Checked:
Supv:
Scale:
Date: 3/31/25
Project No. No. File

Drawing No. T-5

Sheet No. of



1 DEMOLITION PLAN
SCALE: 1" = 80'-0"

NORTH
SCALE 1:80 0' 40' 80' 160'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

HABITAT CONSERVATION MEASURES:

1. CONSERVATION MEASURES MUST BE DONE PRIOR TO ALL DEMOLITION AND CONSTRUCTION WORK.
2. CONDUCT A BIOLISIGCAL SURVEY TO IDENTIFY ANY GUAM TREE SNAILS BEYOND THE EXISTING HABITAT BOUNDARY IDENTIFIED IN THE DRAWINGS.
3. PROVIDE A CONTINUOUS PROTECTIVE CONSTRUCTION MESH BARRICADE ALONG THE EXISTING SNAIL HABITAT BUFFER PERIMETER. ADJUST THE PERIMETER AFTER SNAILS ARE RECOLATED FROM THE SPECIFIED AREA OF THE EXISTING COLONY TO THE NEW HABITAT AREA.
4. PROVIDE A PERMANENT CHAIN LINK SECURITY FENCE WITH PERSONNEL ACCESS GATES AT THE PERIMETER OF THE MODIFIED EXISTING SNAIL HABITAT AND THE NEW HABITAT AREA.

DEMOLITION KEYNOTES:

1 EXISTING PARKING LOT TO BE DEMOLISHED.
2 EXISTING BUILDINGS TO BE DEMOLISHED.
3 EXISTING FENCE TO BE DEMOLISHED.

DEMOLITION NOTES:

1. EXISTING SCHOOL FACILITIES TO REMAIN IN USE DURING PHASE 1 WORK EXCEPT WHERE OTHERWISE NOTED. MAJOR DEMOLITION WORK COMMENCES WITH PHASE 2 WORK.
2. VERIFY EXISTING CONDITIONS & DIMENSIONS.
3. ALL WORK SHALL BE IN COMPLIANCE WITH APPLICABLE FEDERAL AND LOCAL CODES AND REGULATIONS PERTAINING TO LIFE SAFETY, PROPERTY PROTECTION, AND ENVIRONMENTAL PROTECTION.
4. PROVIDE AND MAINTAIN HOARDING/BARRICADES, LIGHTING, AND GUARDRAILS AS REQUIRED BY APPICABLE CODES AND REGULATIONS TO PROTECT OCCUPANTS OF BUILDINGS AND WORKERS.
5. KEEP EXITS, EXIT ACCESSES, EXIT DISCHARGES, AND PUBLIC WAYS CLEAR AT ALL TIMES.
6. VERIFY LOCATION AND EXTENT OF DEMOLITION WORK FOR ALL TRADES NECESSARY FOR THE WORK WHETHER INDICATED OR NOT.
7. PROVIDE AND MAINTAIN PARTITIONS/BARRIERS AS REQUIRED TO PREVENT SPREAD OF DUST, FUMES, SMOKE, ETC. TO OTHER PARTS OF THE BUILDING. ON COMPLETION, REMOVE PARTITIONS AND REPAIR DAMAGED SURFACES TO MATCH ADJACENT SURFACES
8. PROTECT ADJACENT AREAS AND EXISTING BUILDING ELEMENTS / COMPONENTS TO REMAIN FROM POTENTIAL DAMAGES RESULTING FROM DEMOLITION WORK.
9. REPAIR DAMAGES TO ADJACENT SURFACES, ETC. WHERE AFFECTED BY DEMOLITION WORK.
10. IF DEMOLITION IS PERFORMED BEYOND THAT IS REQUIRED, RESTORE AFFECTED AREAS AT NO COST TO THE OWNER.
11. NOTIFY OWNER BEFORE DEMOLITION BEGINS IN OCCUPIED AREAS.
12. KEEP AREAS CLEAN AND HAZARD-FREE THROUGHOUT DURATION OF DEMOLITION WORK. LEAVE AREAS BROOM CLEAN READY FOR NEW WORK.
13. REMOVE [FROM SITE DAILY] AND LEGALLY DISPOSE OF DEBRIS, RUBBISH, AND OTHER MATERIALS RESULTING FROM DEMOLITION WORK.
14. NO EXISTING WORK BY OWNER SHALL BE REMOVED UNLESS SUCH REMOVAL IS APPROVED IN WRITING BY OWNER.
15. NOTIFY OWNER OF UTILITIES, PIPES, CONDUIT, AND OTHER ELEMENTS FOUND WITHIN DEMOLITION AREA THAT ARE NOT SHOWN ON DRAWINGS.
14. CONTRACTOR TO OBTAIN AND PAY FOR PERMIT FEES.
15. REFER TO CIVIL DRAWING FOR SCARIFYING & GRADING OF SITE.
16. EXTENT OF CONSTRUCTION SHALL BE COORDINATED WITH CIVIL & LANDSCAPEING WORKS.

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
EXISTING SITE PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

Drawing No.
D1.0
Sheet No. ____ of ____

ALTERNATE BID ITEMS:

1. AUDITORIUM
2. MULTIPURPOSE FIELD & 2 TENNIS COURTS
3. PHOTOVOLTAIC SYSTEM
4. RAINWATER CATCHMENT SYSTEM
5. LANDSCAPING PLANTS
6. LANDSCAPING IRRIGATION
7. LANDSCAPING SITE FURNISHING
8. CREDIT RECOVERY FACILITY

SITE PLAN NOTES:

1. VERIFY EXISTING CONDITIONS & DIMENSIONS.
2. REFER TO DEMOLITION PLANS FOR PHASE 1 & 2 WORK REQUIREMENTS.
3. COMPLY WITH SNAIL HABITAT REQUIREMENTS PER SPECIFICATIONS.

GATE 3
GATE 4
GATE 5
GATE 2
GATE 1

ALTERNATE BID ITEM #8 CREDIT RECOVERY BUILDING (1 A2.8)

ALTERNATE BID ITEM #2 TENNIS COURTS (1 A1.7)

PRACTICE FIELD

SPORTS FIELD (1 A1.6)

TENNIS COURTS

DRILL PAD

75 CARS

76 CARS

LPG TANK LOCATION

EDGE OF BUFFER

(SIMON SANCHEZ HIGH SCHOOL)

C WING

B WING

A WING

1.4 ACRE NEW TREE SNAIL HABITAT WITH PERMANENT BUFFER

SOFTBALL

BASEBALL

PONDING BASIN 60,000SF

NEW MULTI-PURPOSE FIELD 164,500SF

MODIFIED EXISTINGTREE SNAIL HABITAT WITH PERMANENT BUFFER

ALTERNATE BID ITEM #2 MULTIPURPOSE BASEBALL/ SOFTBALL FIELD (1 A1.8)

1 SITE PLAN
SCALE: 1" = 80'-0"

NORTH

0' 40' 80' 160'

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

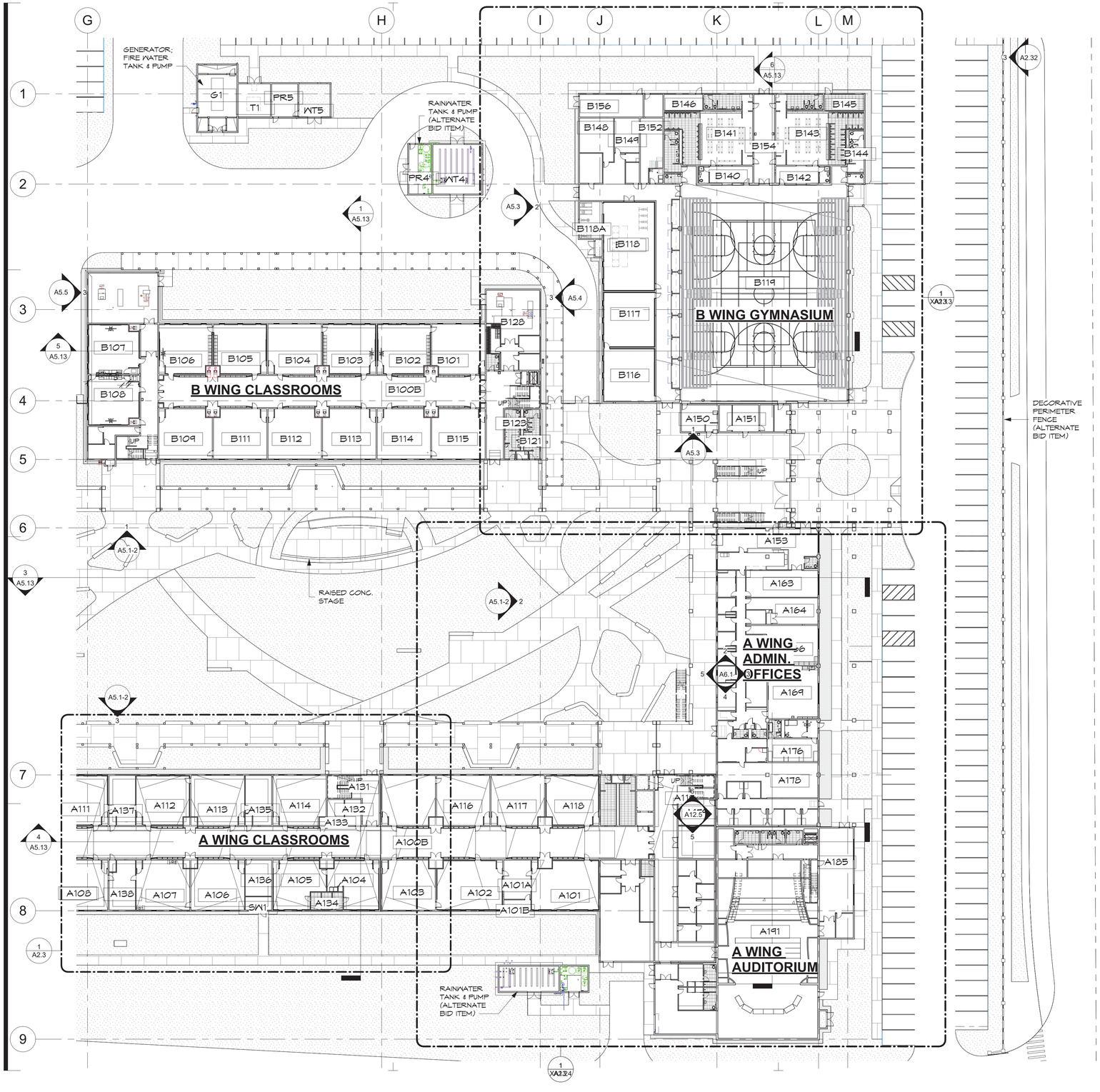
Title: OVERALL SITE PLAN

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No. A1.2

Sheet No. ____ of ____



ADMIN BUILDING

A153	LOBBY
A153A	RESTROOM
A154	HALLWAY
A155	PRINCIPAL
A156	AP
A157	AP
A158	AP
A159	AP
A160	SPED
A161	BUSINESS
A162	STO.
A163	CONFERENCE ROOM
A164	TELECOM
A165	OFFICE
A166	WORKROOM AND RESOURCE CENTER
A167	STO.
A168	ELEC
A169	FACULTY & STAFF LOUNGE
A170	MEN'S
A171	JAN.
A172	WOMEN'S
A173	VESTIBULE
A174	WAITING
A175	NURSE
A176	SICK BAY
A176A	RR
A177	ANTE
A177A	ISOLATION
A178	CUMULATIVE FOLDER STORAGE
A180	COUNSELORS
A180A	COUNSELOR'S OFFICE
A180B	COUNSELOR'S OFFICE
A180C	COUNSELOR'S OFFICE
A180D	COUNSELOR'S OFFICE
A180E	COUNSELOR'S OFFICE
A180F	COUNSELOR'S OFFICE
A180G	COUNSELOR'S OFFICE
A180H	COUNSELOR'S OFFICE

GYMNASIUM

A150	STO.
A150A	ELEC
A151	SRO
A151A	HOLDING ROOM
A151B	HOLDING ROOM
A152	TICKET BOOTH
B116	CLASSROOM
B117	TABLE TENNIS
B118	WEIGHT ROOM
B118A	AEROBICS ROOM
B119	GYMNASIUM
B119A	TICKET BOOTH
B137	HALLWAY
B138	FAMILY RR
B139	MEN'S
B140	M. PE'S OFFICE
B140A	STAFF RR
B141	M. LOCKER ROOM
B142	W. PE'S OFFICE
B142A	STAFF RR
B143	W. LOCKER ROOM
B143	FAMILY RR
B144	WOMEN'S
B145	SOLAR WATER HEATER
B146	SOLAR WATER HEATER
B147	TELECOM
B148	MAT ROOM
B149	STO.
B150	JAN.
B151	AD OFFICE
B152	STO.
B153	LAUNDRY ROOM
B154	HALLWAY
B155	ELEC
B156	MAIN ELEC

AUDITORIUM

A185	LOBBY
A185A	FAMILY RR
A185B	WOMEN'S
A185C	MEN'S
A185D	JAN
A186	ELEV.
A186	VESTIBULE
A186A	ELEC.
A186B	TELECOM
A187	STO.
A188	STAIRS
A189	OFFICE
A190	VESTIBULE
A191	AUDITORIUM
A192	STAGE
A193	BACKSTAGE
A194	DRESSING ROOM
A194A	DRESSING ROOM
A195	DRESSING ROOM
A195A	DRESSING ROOM
A196	VESTIBULE

A-WING LEVEL 1 (EAST)

A100A	VESTIBULE
A101	ART
A101A	ART STO.
A101B	ART STO.
A102	ART
A116	SCIENCE (ESL)
A117	HEALTH
A118	HEALTH
A120	VESTIBULE
A120A	ELEV.
A121	VESTIBULE
A121A	ELEV.
A122	WOMEN'S
A123	JAN.
A124	MEN'S
A125	INT. CORRIDOR
A126	STAFF RR
A127	STO.
A128	MECH
A129	ELEC
A130	TELECOM
A144	INT. CORRIDOR
A145	STAFF RR
A146	STO.
A179	WAITING
A181	CONF. RM
A182	CRT
A182A	CRT OFFICE
A182B	CRT OFFICE
A182C	STO.
A182D	CRT OFFICE
A182E	CRT OFFICE
A183	ESL
A183A	TESTING ROOM
A184	VESTIBULE
A328A	HALLWAY

A-WING LEVEL 1 (CENTER)

A100B	HALLWAY
A103	SPED (MATH)
A104	SPED
A104A	SPED TOILET
A105	SPED
A105A	SPED TOILET
A106	BIOLOGY
A113	BIOLOGY
A114	BIOLOGY
A115	BIOLOGY
A132	TELECOM
A133	ELEC
A135	SCIENCE PREP 1
A136	STO.
SW1	SOLAR WATER HEATER

B-WING LEVEL 1

B100A	VESTIBULE
B100B	HALLWAY
B100C	VESTIBULE

B-WING LEVEL 1 (EAST)

B101	ENGLISH
B102	ENGLISH
B103	ENGLISH
B113	ENGLISH
B114	ENGLISH
B115	ENGLISH (ESL)
B120	STAIRS #7
B121	WOMEN'S
B122	JAN.
B123	MEN'S
B124	VESTIBULE
B124A	ELEV.
B125	VESTIBULE
B126	TELECOM
B127	ELEC
B128	MECH
B129	STO.
B130	STAFF RR

B-WING LEVEL 1 (WEST)

B104	ENGLISH
B105	ENGLISH
B106	ENGLISH
B107	ENGLISH
B108	ENGLISH
B109	ENGLISH
B111	ENGLISH
B112	ENGLISH
B131	STAIRS #6
B132	VESTIBULE
B133	MECH
B134	VESTIBULE
B135	ELEC
B136	TELECOM

2 A-WING & B-WING LEVEL 1

SCALE: 1" = 30'-0"

NORTH 0' 15' 30' 60'

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Interior Design

NOT FOR CONSTRUCTION

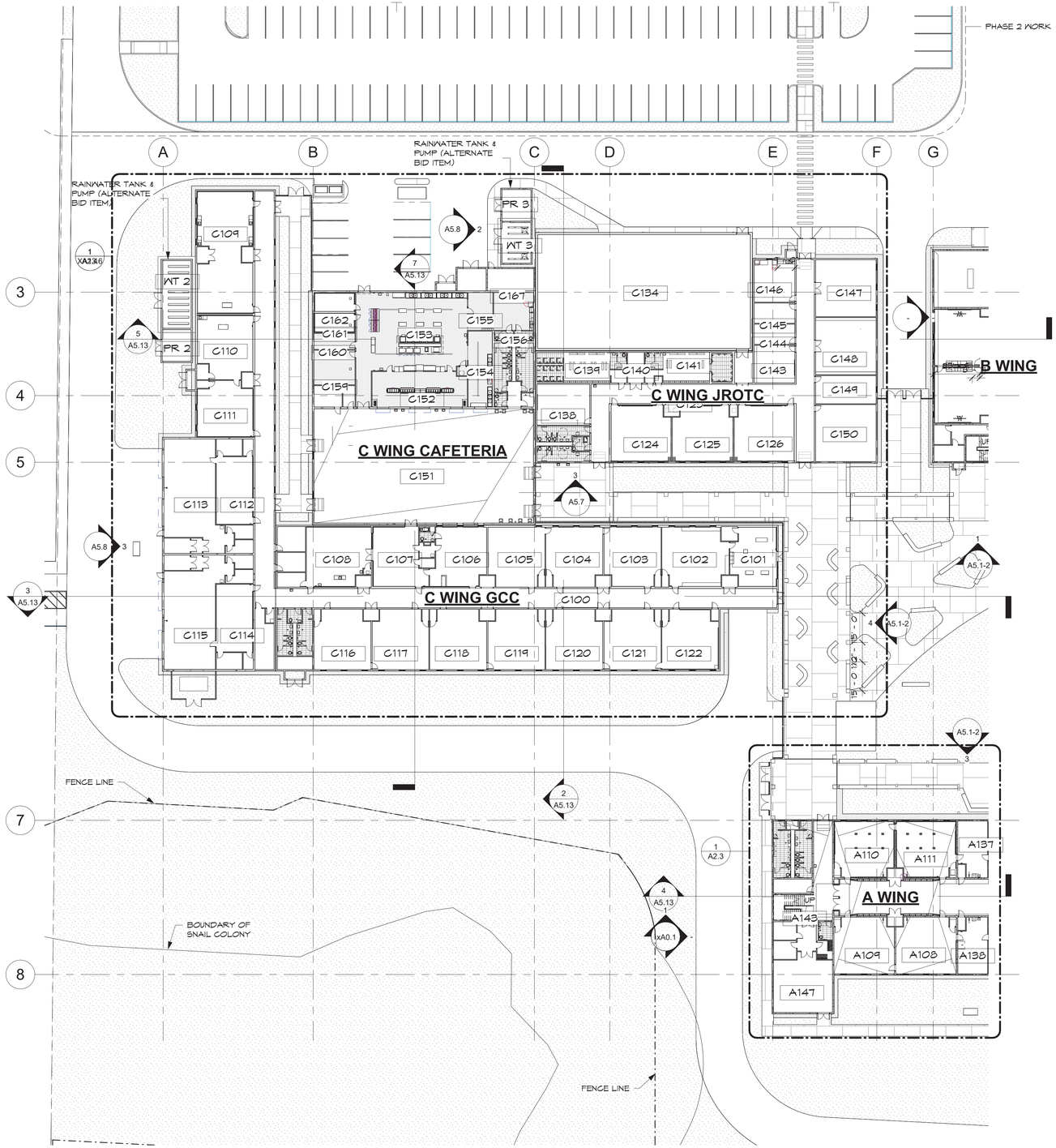
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: OVERALL A-WING & B-WING LEVEL 1 PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No. A1.3

Sheet No. ____ of ____



1 LEVEL 1 PLAN (WEST)

SCALE: 1" = 30'-0"

A-WING LEVEL 1 (WEST)	
A100C	HALLWAY
A107	CHEMISTRY
A108	PHYSICS
A109	PERMACULTURE
A110	MARINE BIOLOGY
A111	MARINE BIO
A112	ANATOMY
A134	SPED SHO.
A137	SCIENCE PREP 2
A138	SCIENCE PREP 3
A139	WOMEN'S
A140	JAN.
A141	MEN'S
A142	SCIENCE STO.
A147	MECH
A148	ELEC
A149	TELECOM
A-WING LEVEL 1 WEST)	
A127	JAN.

GCC BUILDING	
C100	GCC HALLWAY
C107	GCC (HCS)
GCC BUILDING (EAST)	
C101	MARKETING STORE
C101A	STO.
C102	MARKETING
C103	CLASSROOM
C104	CLASSROOM
C105	CLASSROOM
C106	HOSPITALITY & TOURISM
C106A	MOCK RESTROOM
C106B	LAUNDRY AREA
C106C	WATER HEATER 1
C107A	STO.
C118	CLASSROOM
C119	CLASSROOM
C120	CLASSROOM
C121	CLASSROOM
C122	HEALTH
GCC BUILDING (WEST)	
C100A	ELEC.
C100B	STO.
C100C	MEN'S
C100D	STAFF
C100E	WOMEN'S
C100F	JAN.
C100G	TELECOM
C107	PROSTART
C108	PROSTART KITCHEN
C108A	PANTRY
C108B	JAN.
C109	HEALTH CAREER SERVICES
C109A	STO.
C110	ELECTRONICS WORKSHOP
C110A	STO.
C111	ELECTRONICS COMPUTER LAB
C111A	MOCK IDF
C112	AUTOMOTIVE
C112A	STO.
C113	AUTOMOTIVE WORKSHOP
C114	CARPENTRY
C114A	STO.
C115	CARPENTRY WORK SHOP
C116	CLASSROOM
C116A	STO.
C117	CLASSROOM
C127	AUTO MOTIVE OFFICE
C128	WOMEN'S
C129	MEN'S
C130	VESTIBULE
C130A	AIR COMPRESSOR
C131	CARPENTRY OFFICE
C132	WOMEN'S
C133	MEN'S
C134	VESTIBULE
C134A	AIR COMPRESSOR

CAFETERIA	
C151	CAFETERIA
C152	SERVING AREA
C153	KITCHEN
C153A	WATER HEATER
C154	SCULLERY
C155	OFFICE
C156	KITCHEN STAFF LOUNGE
C156A	WOMEN'S
C156B	MEN'S
C157	TELECOM
C158	ELEC
C159	PANTRY
C160	STOR
C161	REFRIGERATOR
C162	FREEZER
C163	STAFF
C164	WOMEN'S
C165	MEN'S
C166	JAN.
C167	ELEC
C168	TRANSFORMER ENCLOSURE
JROTC BUILDING	
C123	JROTC HALLWAY
C123A	JAN
C124	JROTC CLASSROOM
C125	JROTC CLASSROOM
C126	JROTC CLASSROOM
C134	MULTI-PURPOSE TRAINING FACILITY
C135	MEN'S
C136	STAFF
C137	WOMEN'S
C138	CONFERENCE ROOM/COMPUTER LAB
C139	WOMEN'S LOCKER ROOM
C140	STO
C141	MEN'S LOCKER ROOM
C142	VESTIBULE
C143	BATALLION HQ
C144	TELECOM
C145	ELEC
C146	STAFF COLLABORATION
C147	FIELD AND DRILL EQUIP. STO.
C148	JROTC SUPPLY ROOM
C149	INSTRUCTOR'S OFFICES
C150	ARMS ROOM

NORTH

0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

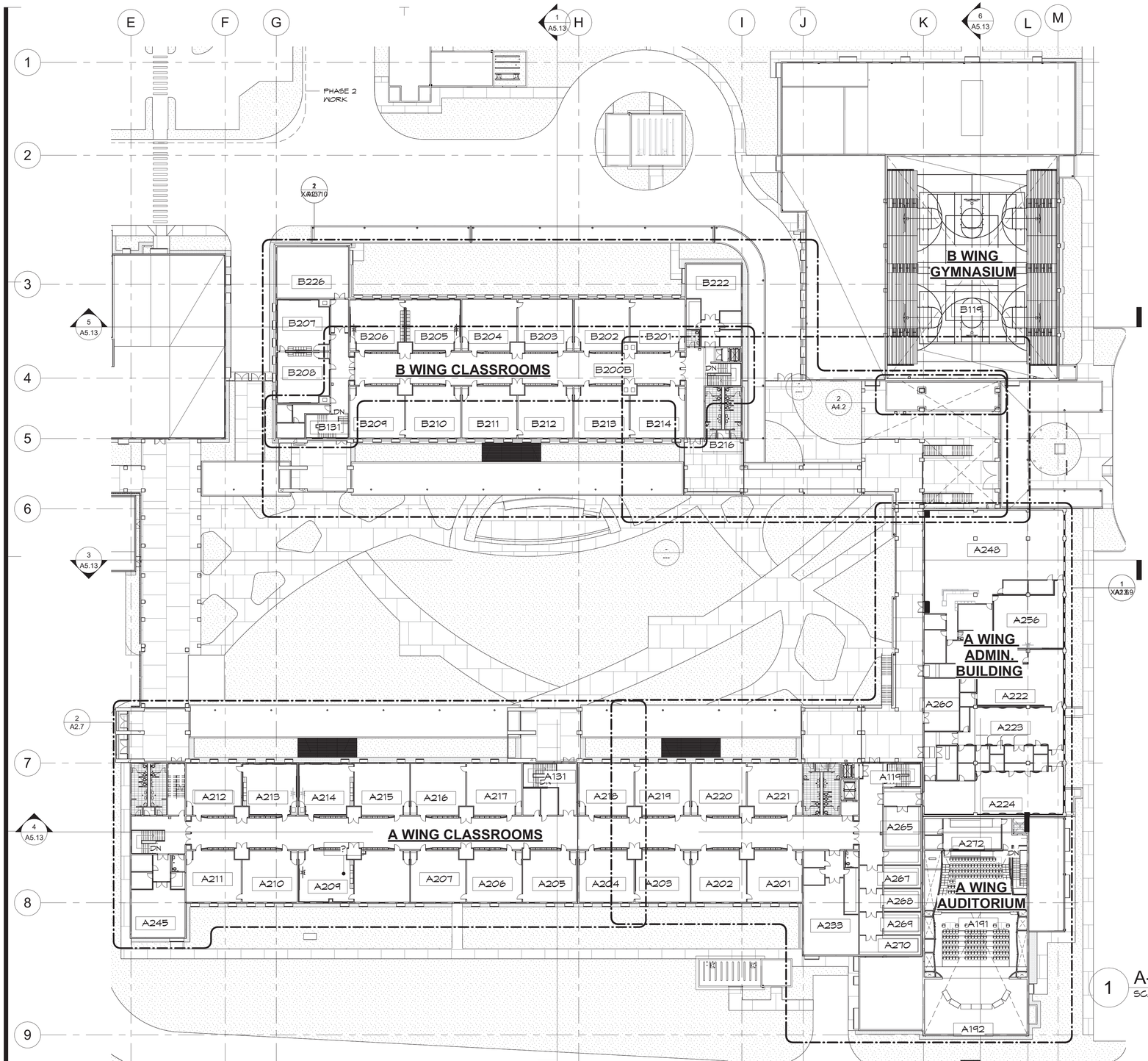
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL A-WING & C-WING LEVEL 1 PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.: No.	File:

Drawing No.
A1.4
Sheet No. ____ of ____



1 A-WING & B-WING LEVEL 2
SCALE: 1" = 30'-0"

NORTH

0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

ADMIN BUILDING LEVEL 2

A222	DANCE
A222A	VESTIBULE
A223	CHOIR
A223A	OFFICE
A223C	STOR.
A223D	STOR.
A223E	STOR.
A224	BAND
A224A	OFFICE
A224B	PRACTICE ROOM
A224B	STOR.
A224C	PRACTICE ROOM
A224D	STOR.
A224E	PRACTICE ROOM
A248	LIBRARY
A249	LIBRARIAN
A250	TECH.
A251	BOOK ROOM
A252	STAFF RR
A253	MEDIA CENTER
A254	ELEC.
A255	TELECOM
A256	COMPUTER LAB
A257	STOR.
A258	ELEC
A259	STOR.
A259	VESTIBULE
A260	MECH.
A261	STOR.
A262	RECORDING ROOM
A263	VESTIBULE

B-WING LEVEL 2

B200A	HALLWAY
B200B	HALLWAY
B200C	HALLWAY

B-WING LEVEL 2 (EAST)

B201	MATH
B202	MATH
B203	MATH
B212	MATH
B213	MATH
B214	MATH (ESL)
B215	WOMEN'S
B216	JAN.
B217	MEN'S
B218	VESTIBULE
B219	VESTIBULE
B220	TELECOM
B221	ELEC
B222	MECH
B223	CHAIR STORAGE 2
B224	STAFF RR
FCU9	FCU 9
FCU10	FCU 10
FCU11	FCU 11
FCU12	FCU 12

B-WING LEVEL 2 (WEST)

B204	MATH
B205	MATH
B206	MATH
B207	MATH
B208	MATH
B209	MATH
B210	MATH
B211	MATH
B225	VESTIBULE
B226	MECH
B227	VESTIBULE
B228	ELEC
B229	TELECOM
FCU13	FCU 13
FCU14	FCU 14
FCU15	FCU 15
FCU16	FCU 16

A-WING LEVEL 2 (EAST)

A201	CHAMORU
A202	CHAMORU
A203	CHAMORU
A219	SOCIAL STUDIES (ESL)
A220	CHAMORU
A221	ENGLISH (ESL)
A225	VESTIBULE
A226	VESTIBULE
A227	WOMEN'S
A228	JAN.
A229	MEN'S
A229	CHAIR STORAGE 1
A230	VESTIBULE
A231	STAFF RR
A233	MECH
A234	ELEC
A235	TELECOM
A264	VESTIBULE
A265	BAND STORAGE
A266	STORAGE
A267	BOOK STORAGE
A268	BOOK STORAGE
A269	BOOK STORAGE
A270	BOOK STORAGE

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

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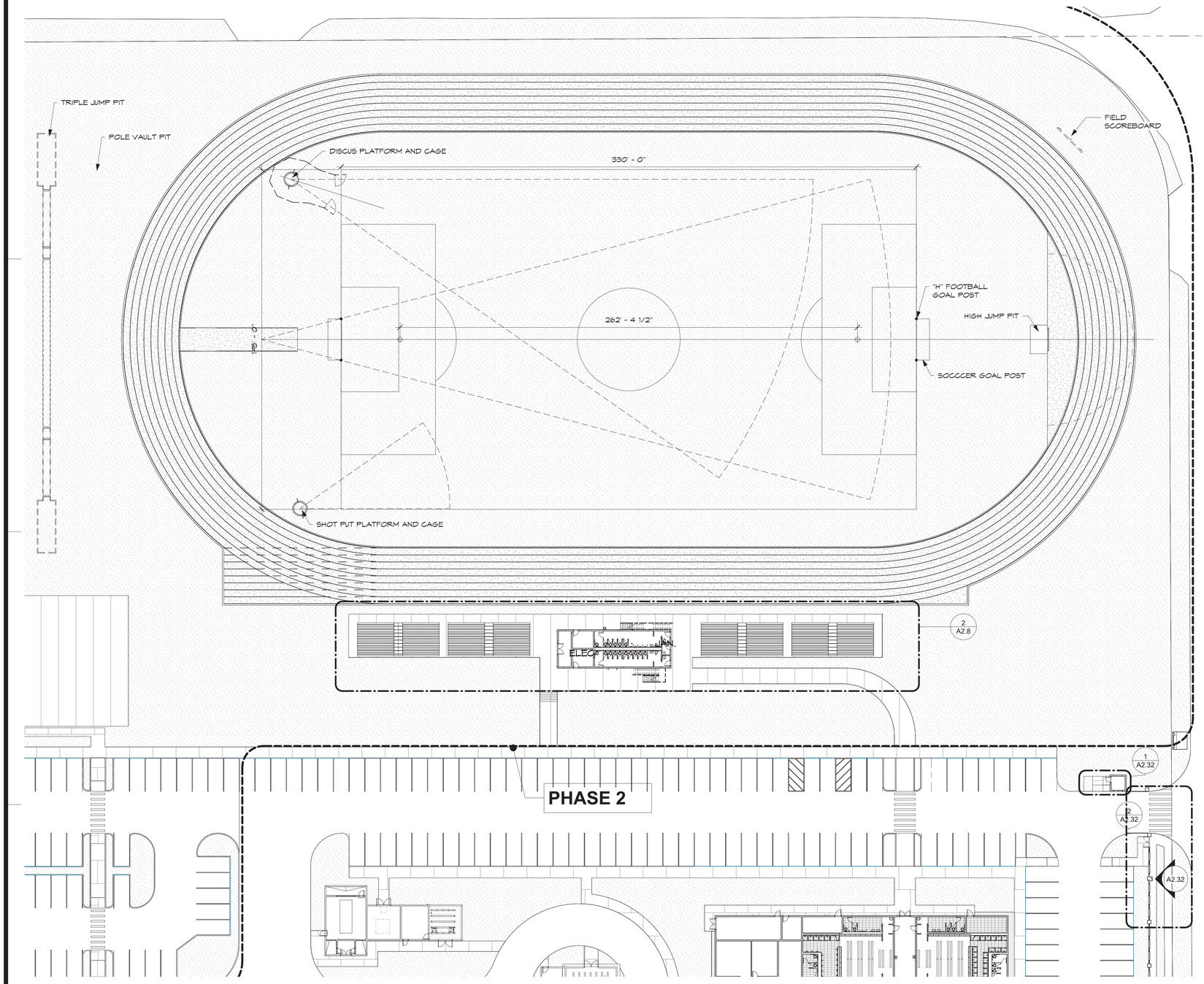
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL A-WING & B-WING LEVEL 2 PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A1.5
Sheet No. ____ of ____



1 NORTH FIELD PLAN (EAST)
SCALE: 1" = 30'-0"

NORTH

0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS		
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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

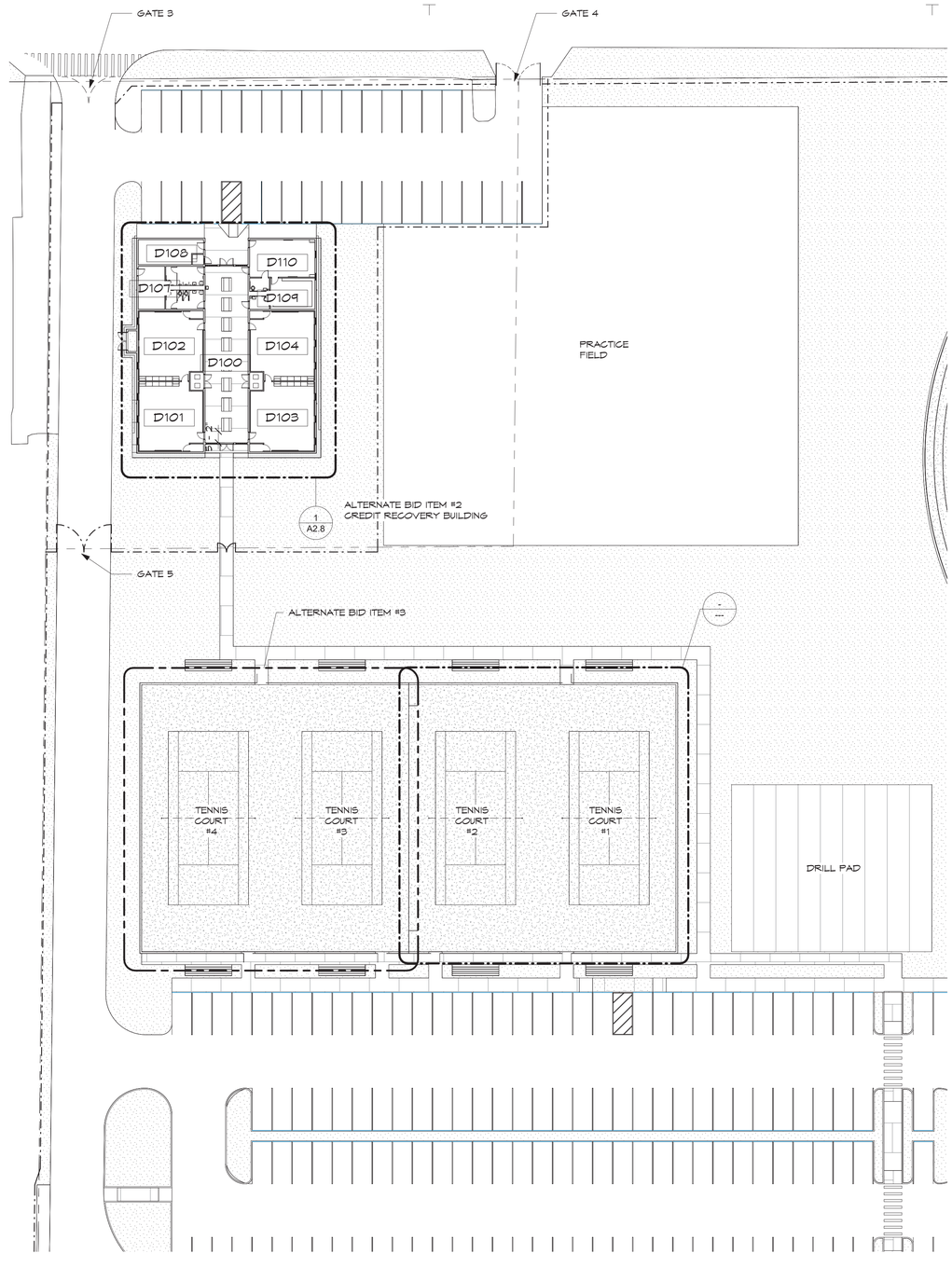
Title:
OVERALL NORTH FIELD PLAN (EAST)

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A1.6

Sheet No. ____ of ____



1 NORTH FIELD PLAN (WEST)
SCALE: 1" = 30'-0"

CREDIT RECOVERY BUILDING	
D100	COMMON AREA
D101	CLASSROOM
D102	CLASSROOM
D103	CLASSROOM
D104	CLASSROOM
D105	WOMEN'S
D106	MEN'S
D107	ELEC.
D108	TELECOM
D109	STOR
D110	OFFICE
D113	JAN.

NORTH

0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

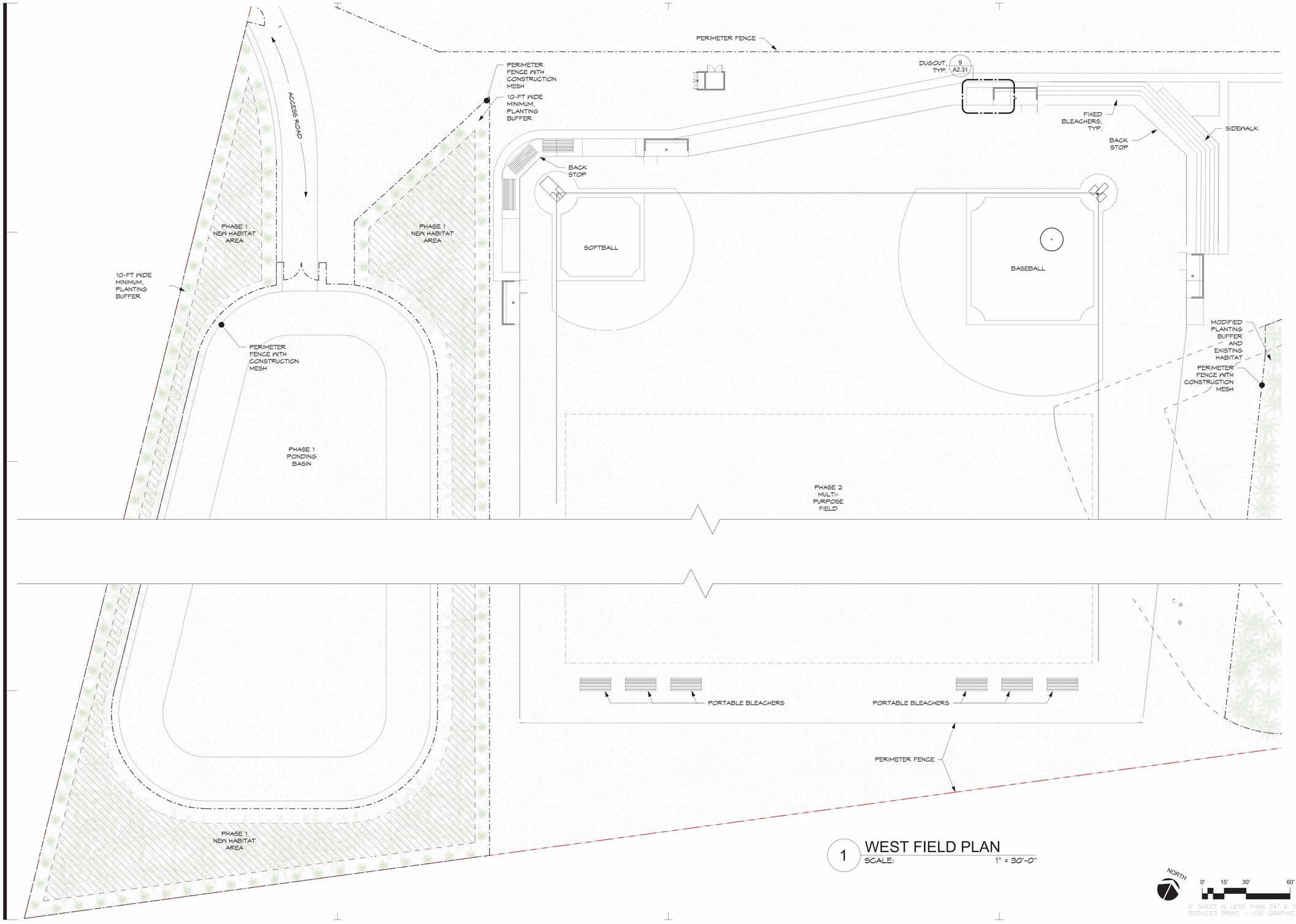
Title:
OVERALL NORTH FIELD PLAN (WEST)

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A1.7

Sheet No. ____ of ____



1 WEST FIELD PLAN
SCALE: 1" = 30'-0"

NORTH
0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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REVISIONS		
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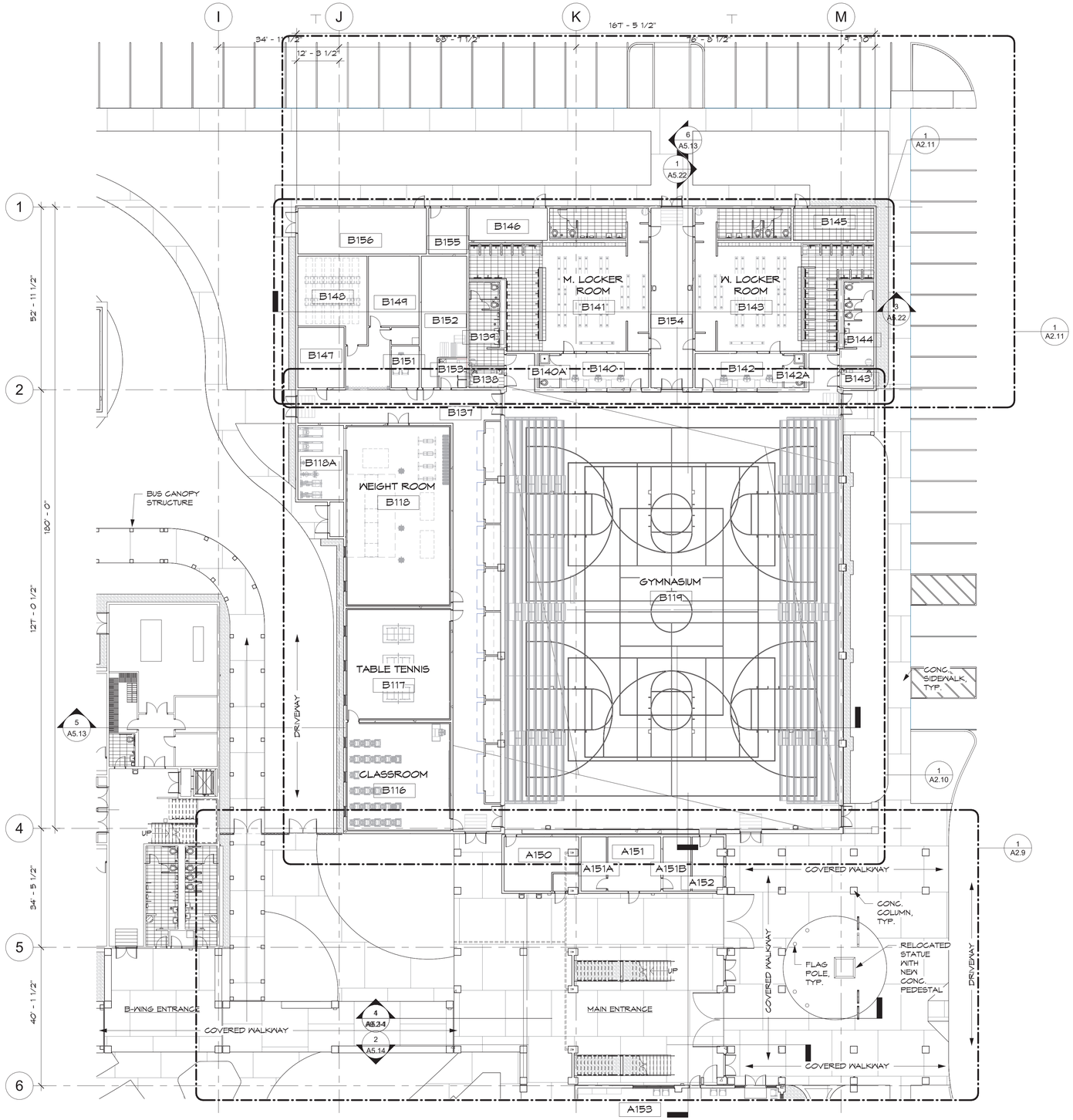
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL WEST FIELD PLAN
PROGRAMMING DOCUMENT

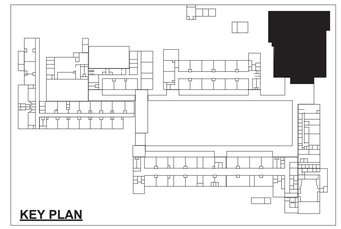
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.: No.	File

Drawing No.
A1.8
Sheet No. ____ of ____



1 B-WING GYMNASIUM LEVEL 1 PLAN

SCALE: 1/16" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

GYMNASIUM

A150	STO.
A150A	ELEC
A151	SRO
A151A	HOLDING ROOM
A151B	HOLDING ROOM
A152	TICKET BOOTH
B116	CLASSROOM
B117	TABLE TENNIS
B118	WEIGHT ROOM
B118A	AEROBICS ROOM
B119	GYMNASIUM
B119A	TICKET BOOTH
B137	HALLWAY
B138	FAMILY RR
B139	MEN'S
B140	M. PE'S OFFICE
B140A	STAFF RR
B141	M. LOCKER ROOM
B142	W. PE'S OFFICE
B142A	STAFF RR
B143	W. LOCKER ROOM
B143	FAMILY RR
B144	WOMEN'S
B145	SOLAR WATER HEATER
B146	SOLAR WATER HEATER
B147	TELECOM
B148	MAT ROOM
B149	STO.
B150	JAN.
B151	AD OFFICE
B152	STO.
B153	LAUNDRY ROOM
B154	HALLWAY
B155	ELEC
B156	MAIN ELEC

NORTH 0 8' 16' 32'

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REVISIONS

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

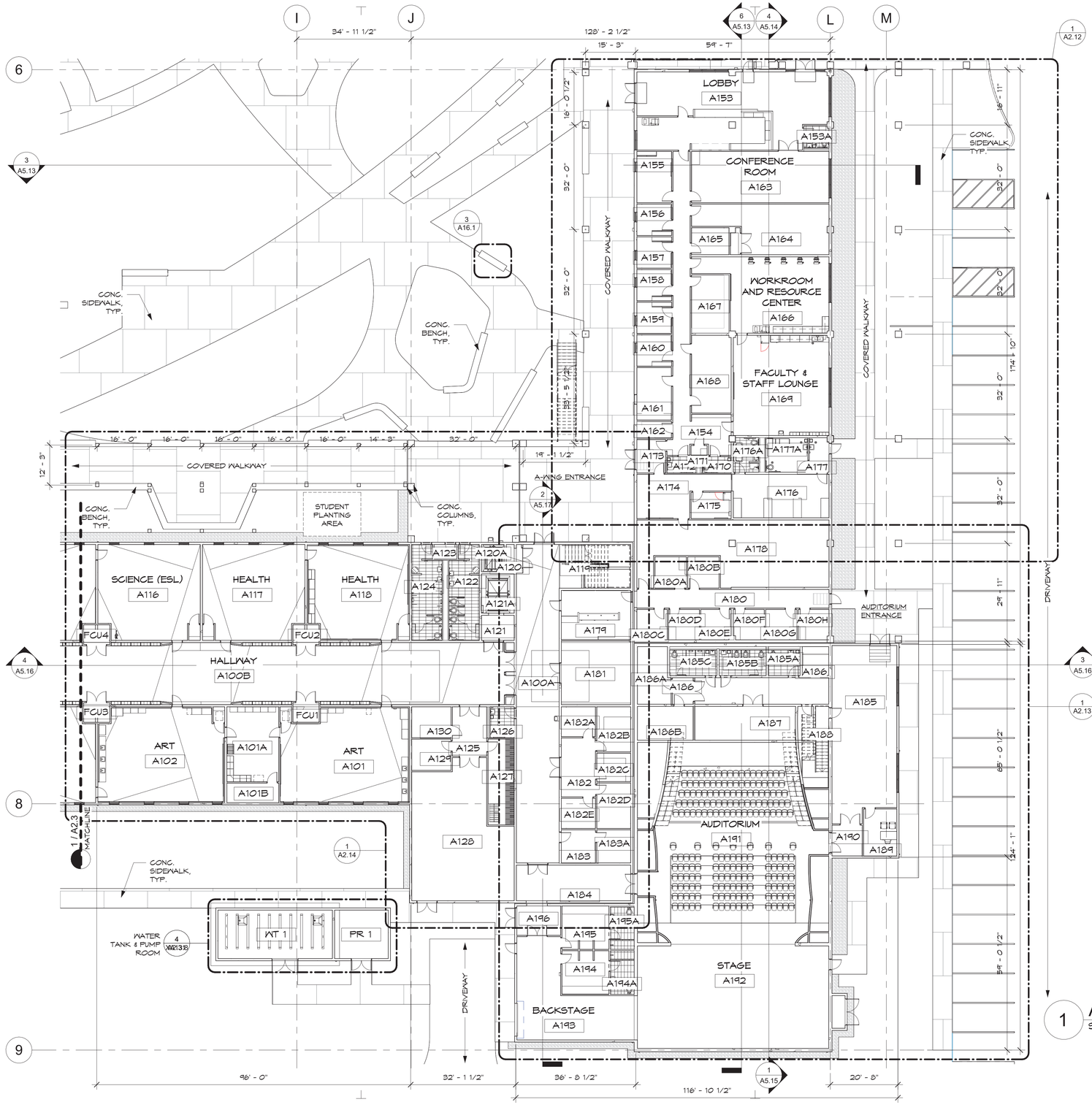
Title: ENLARGED PLAN - B-WING GYMNASIUM LEVEL 1

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.1

Sheet No. ____ of ____



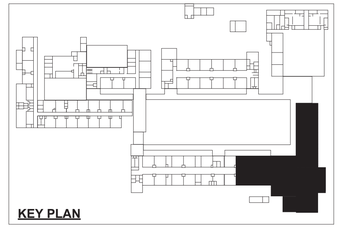
1 A-WING LEVEL 1 PLAN

SCALE: 1/16" = 1'-0"

NORTH

0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.

A-WING LEVEL 1 (EAST)	
A100A	VESTIBULE
A101	ART
A101A	ART STO.
A101B	ART STO.
A102	ART
A116	SCIENCE (ESL)
A117	HEALTH
A118	HEALTH
A120	VESTIBULE
A120A	ELEV.
A121	VESTIBULE
A121A	ELEV.
A122	WOMEN'S
A123	JAN.
A124	MEN'S
A125	INT. CORRIDOR
A126	STAFF RR
A127	STO.
A128	MECH
A129	ELEC
A130	TELECOM
A144	INT. CORRIDOR
A145	STAFF RR
A146	STO.
A179	WAITING
A181	CONF. RM
A182	CRT
A182A	CRT OFFICE
A182B	CRT OFFICE
A182C	STO.
A182D	CRT OFFICE
A182E	CRT OFFICE
A183	ESL
A183A	TESTING ROOM
A184	VESTIBULE
A200A	HALLWAY

ADMIN BUILDING	
A153	LOBBY
A153A	RESTROOM
A154	HALLWAY
A155	PRINCIPAL
A156	AP
A157	AP
A158	AP
A159	AP
A160	SPED
A161	BUSINESS
A162	STO.
A163	CONFERENCE ROOM
A164	TELECOM
A165	OFFICE
A166	WORKROOM AND RESOURCE CENTER
A167	STO.
A168	ELEC
A169	FACULTY & STAFF LOUNGE
A170	MEN'S
A171	JAN.
A172	WOMEN'S
A173	VESTIBULE
A174	WAITING
A175	NURSE
A176	SICK BAY
A176A	RR
A177	ANTE
A177A	ISOLATION
A178	CUMULATIVE FOLDER STORAGE
A180	COUNSELORS
A180A	COUNSELOR'S OFFICE
A180B	COUNSELOR'S OFFICE
A180C	COUNSELOR'S OFFICE
A180D	COUNSELOR'S OFFICE
A180E	COUNSELOR'S OFFICE
A180F	COUNSELOR'S OFFICE
A180G	COUNSELOR'S OFFICE
A180H	COUNSELOR'S OFFICE

AUDITORIUM	
A185	LOBBY
A185A	FAMILY RR
A185B	WOMEN'S
A185C	MEN'S
A185D	JAN
A186	ELEV.
A186	VESTIBULE
A186A	ELEC.
A186B	TELECOM
A187	STO.
A188	STAIRS
A189	OFFICE
A190	VESTIBULE
A191	AUDITORIUM
A192	STAGE
A193	BACKSTAGE
A194	DRESSING ROOM
A194A	DRESSING ROOM
A195	DRESSING ROOM
A195A	DRESSING ROOM
A196	VESTIBULE

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
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Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN - A-WING LEVEL 1 (EAST)
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.
A2.2
Sheet No. ____ of ____

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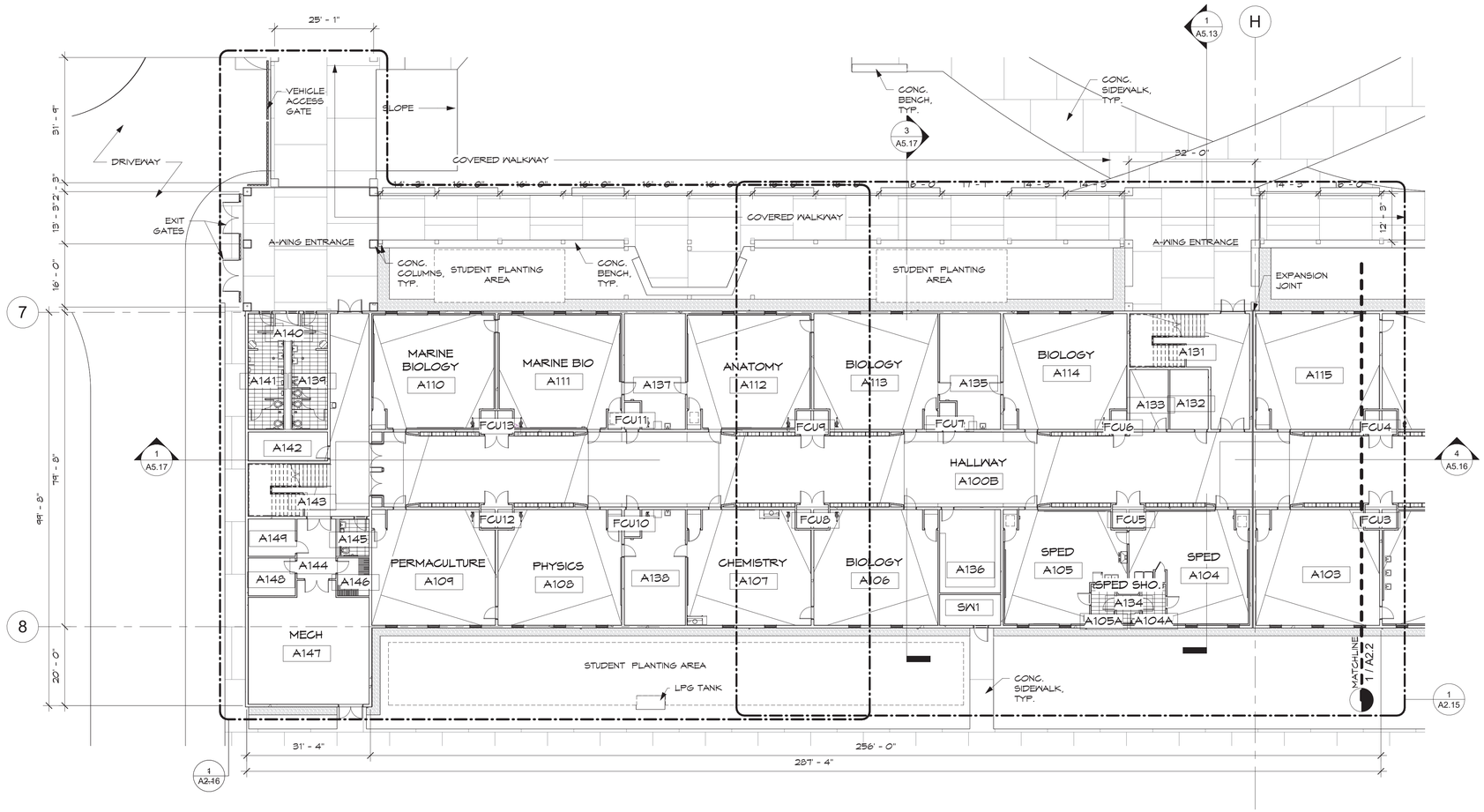
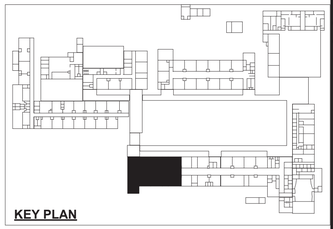


1 A-WING LEVEL 1 PLAN

SCALE: 1/16" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.

A-WING LEVEL 1 (CENTER)

A100B	HALLWAY
A103	SPED (MATH)
A104	SPED
A104A	SPED TOILET
A105	SPED
A105A	SPED TOILET
A106	BIOLOGY
A113	BIOLOGY
A114	BIOLOGY
A115	BIOLOGY
A132	TELECOM
A133	ELEC
A135	SCIENCE PREP 1
A136	STO.
SW1	SOLAR WATER HEATER

A-WING LEVEL 1 (WEST)

A100C	HALLWAY
A107	CHEMISTRY
A108	PHYSICS
A109	PERMACULTURE
A110	MARINE BIOLOGY
A111	MARINE BIO
A112	ANATOMY
A134	SPED SHO.
A137	SCIENCE PREP 2
A138	SCIENCE PREP 3
A139	WOMEN'S
A140	JAN.
A141	MEN'S
A142	SCIENCE STO.
A147	MECH
A148	ELEC
A149	TELECOM

NORTH

0 8' 16' 32'

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

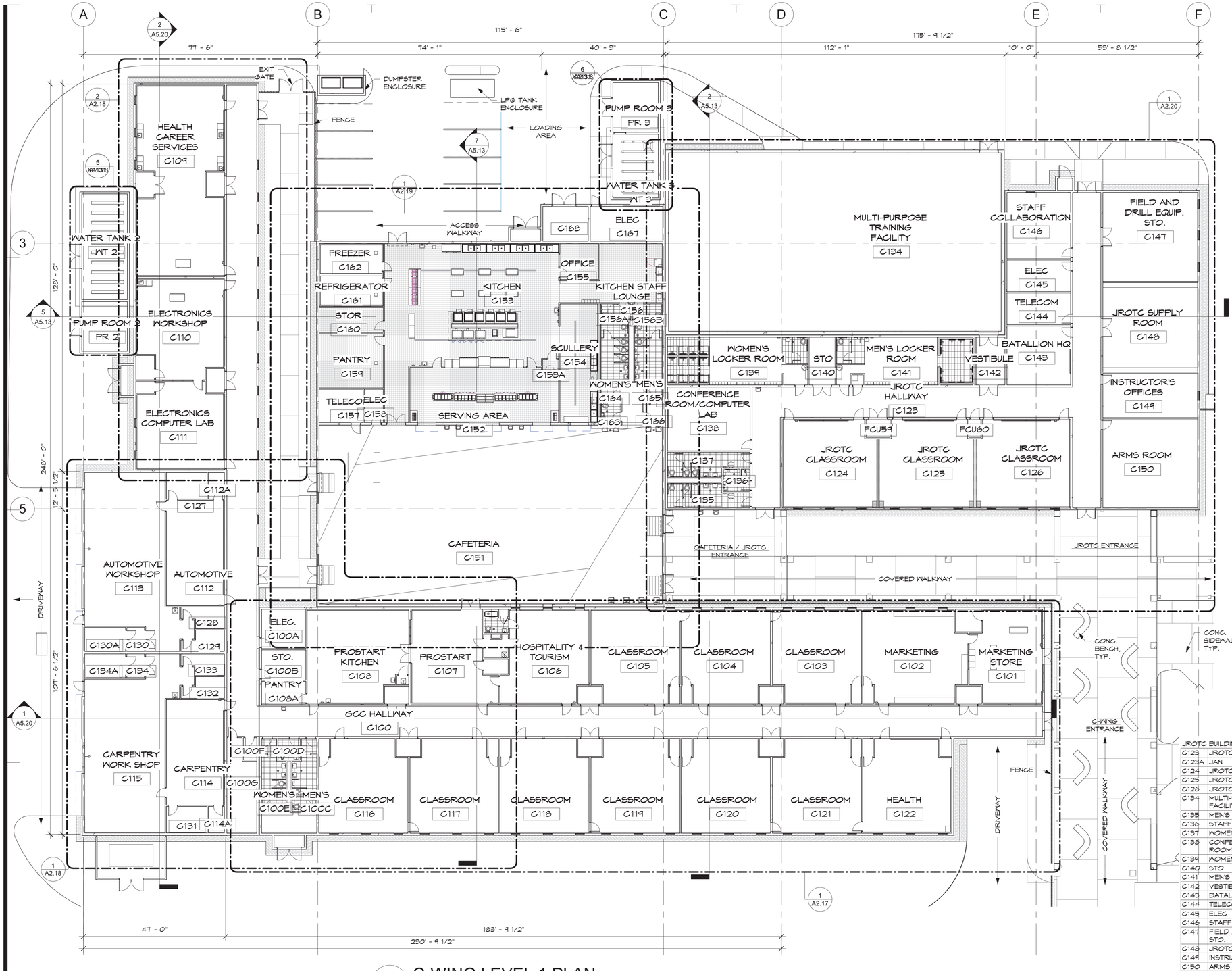
Title: ENLARGED PLAN - A-WING LEVEL 1 (WEST)
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No. A2.3

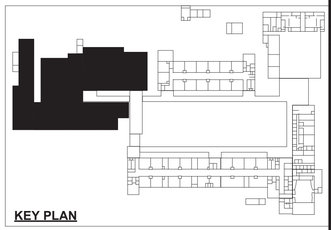
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 C-WING LEVEL 1 PLAN

SCALE: 1/16" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. C122 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT C-WING CLASSROOMS.

GCC BUILDING	
C100	GCC HALLWAY
C107	GCC (HCS)
GCC BUILDING (EAST)	
C101	MARKETING STORE
C101A	STO.
C102	MARKETING
C103	CLASSROOM
C104	CLASSROOM
C105	CLASSROOM
C106	HOSPITALITY & TOURISM
C106A	MOCK RESTROOM
C106B	LAUNDRY AREA
C106C	WATER HEATER 1
C107A	STO.
C118	CLASSROOM
C119	CLASSROOM
C120	CLASSROOM
C121	CLASSROOM
C122	HEALTH
GCC BUILDING (WEST)	
C100A	ELEC.
C100B	STO.
C100C	MEN'S
C100D	STAFF
C100E	WOMEN'S
C100F	JAN.
C100G	TELECOM
C107	PROSTART
C108	PROSTART KITCHEN
C108A	PANTRY
C108B	JAN.
C109	HEALTH CAREER SERVICES
C109A	STO.
C110	ELECTRONICS WORKSHOP
C110A	STO.
C111	ELECTRONICS COMPUTER LAB
C111A	MOCK IDF
C112	AUTOMOTIVE
C112A	STO.
C113	AUTOMOTIVE WORKSHOP
C114	CARPENTRY
C114A	STO.
C115	CARPENTRY WORK SHOP
C116	CLASSROOM
C116A	STO.
C117	CLASSROOM
C127	AUTO MOTIVE OFFICE
C128	WOMEN'S
C129	MEN'S
C130	VESTIBULE
C130A	AIR COMPRESSOR
C131	CARPENTRY OFFICE
C132	WOMEN'S
C133	MEN'S
C134	VESTIBULE
C134A	AIR COMPRESSOR

JROTC BUILDING	
C123	JROTC HALLWAY
C123A	JAN
C124	JROTC CLASSROOM
C125	JROTC CLASSROOM
C126	JROTC CLASSROOM
C134	MULTI-PURPOSE TRAINING FACILITY
C135	MEN'S
C136	STAFF
C137	WOMEN'S
C138	CONFERENCE ROOM/COMPUTER LAB
C139	WOMEN'S LOCKER ROOM
C140	STO
C141	MEN'S LOCKER ROOM
C142	VESTIBULE
C143	BATALLION HQ
C144	TELECOM
C145	ELEC
C146	STAFF COLLABORATION
C147	FIELD AND DRILL EQUIP. STO.
C148	JROTC SUPPLY ROOM
C149	INSTRUCTOR'S OFFICES
C150	ARMS ROOM

CAFETERIA	
C151	CAFETERIA
C152	SERVING AREA
C153	KITCHEN
C153A	WATER HEATER
C154	SCULLERY
C155	OFFICE
C156	KITCHEN STAFF LOUNGE
C156A	WOMEN'S
C156B	MEN'S
C157	TELECOM
C158	ELEC
C159	PANTRY
C160	STOR
C161	REFRIGERATOR
C162	FREEZER
C163	STAFF
C164	WOMEN'S
C165	MEN'S
C166	JAN.
C167	ELEC
C168	TRANSFORMER ENCLOSURE

NORTH

0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ENLARGED PLAN - C-WING LEVEL 1

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.4

Sheet No. ____ of ____

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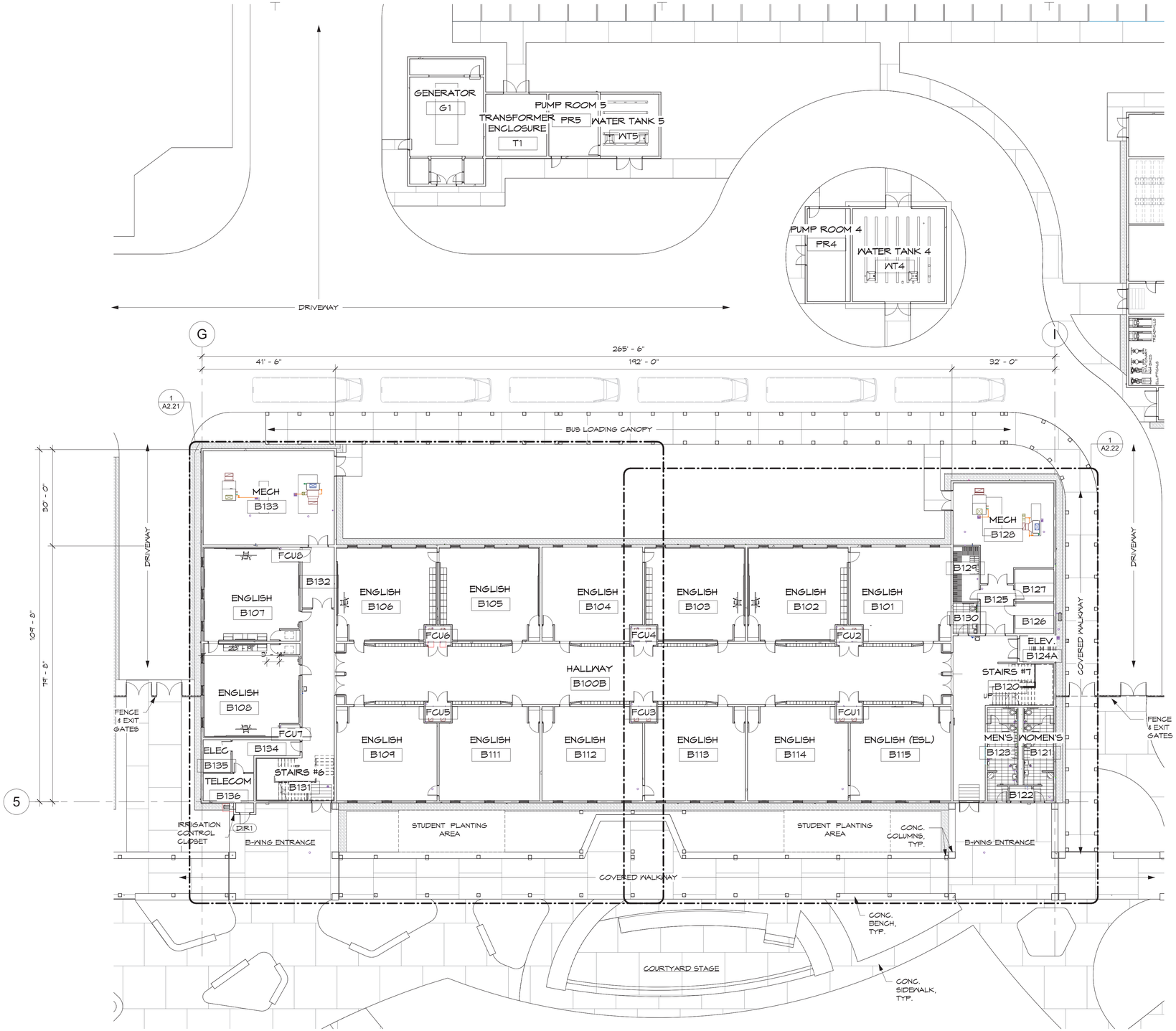
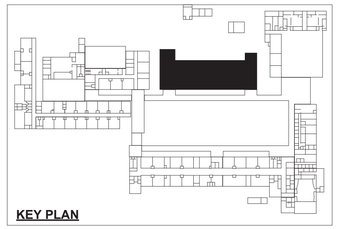


1 B-WING LEVEL 1 PLAN

SCALE: 1/16" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. B107 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT B-WING CLASSROOMS.

B-WING LEVEL 1	
B100A	VESTIBULE
B100B	HALLWAY
B100C	VESTIBULE
B-WING LEVEL 1 (EAST)	
B101	ENGLISH
B102	ENGLISH
B103	ENGLISH
B113	ENGLISH
B114	ENGLISH
B115	ENGLISH (ESL)
B120	STAIRS #7
B121	WOMEN'S
B122	JAN.
B123	MEN'S
B124	VESTIBULE
B124A	ELEV.
B125	VESTIBULE
B126	TELECOM
B127	ELEC
B128	MECH
B129	STO.
B130	STAFF RR
B-WING LEVEL 1 (WEST)	
B104	ENGLISH
B105	ENGLISH
B106	ENGLISH
B107	ENGLISH
B108	ENGLISH
B109	ENGLISH
B111	ENGLISH
B112	ENGLISH
B131	STAIRS #6
B132	VESTIBULE
B133	MECH
B134	VESTIBULE
B135	ELEC
B136	TELECOM

NORTH

0 8' 16' 32'

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

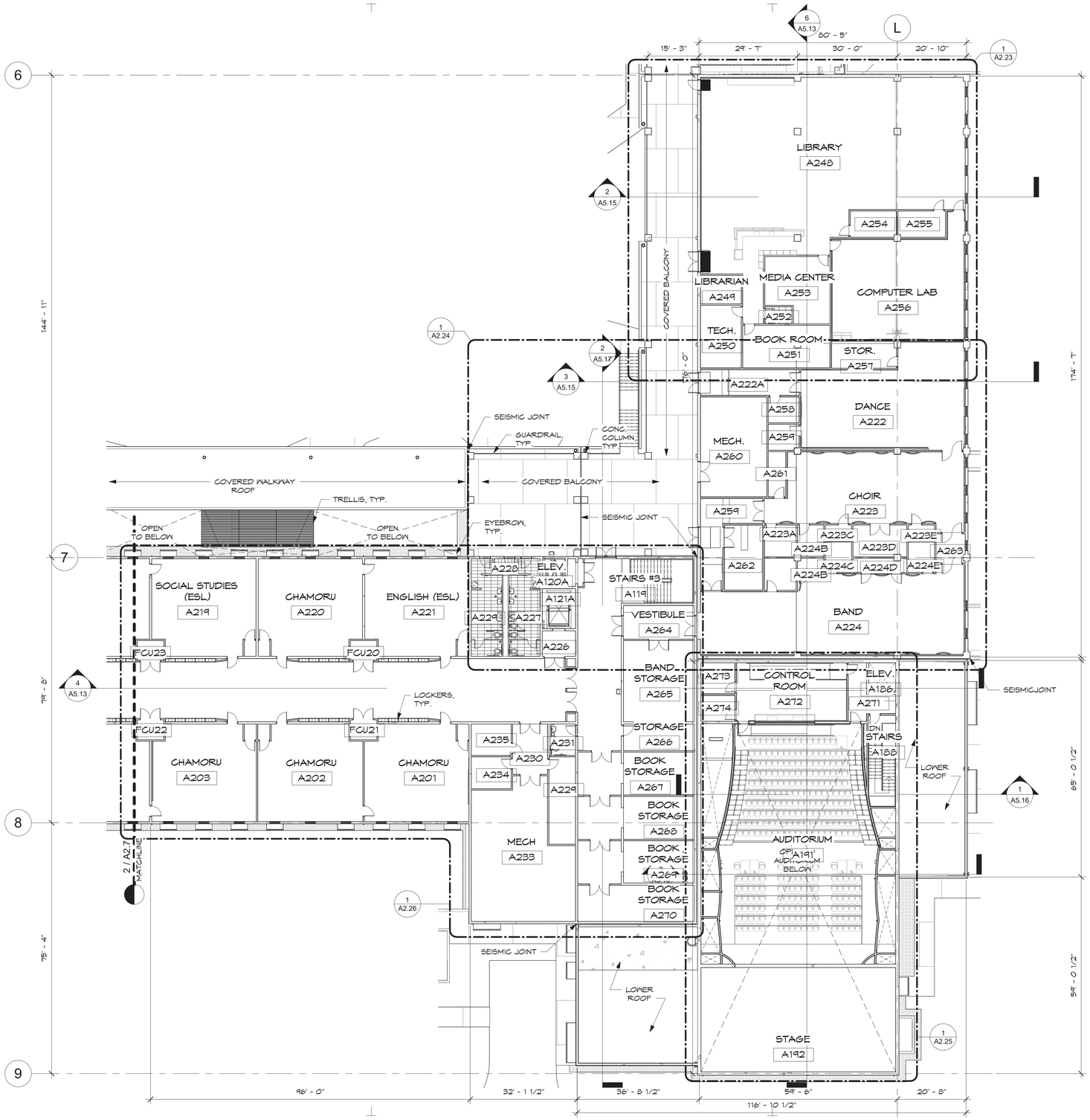
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN - B-WING LEVEL 1
PROGRAMMING DOCUMENT

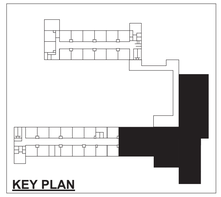
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	NO.
File	

Drawing No.
A2.5
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 A-WING LEVEL 2 PLAN
SCALE: 1/16" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.

ADMIN BUILDING LEVEL 2

A222	DANCE
A222A	VESTIBULE
A223	CHOIR
A223A	OFFICE
A223C	STOR.
A223D	STOR.
A223E	STOR.
A224	BAND
A224A	OFFICE
A224B	PRACTICE ROOM
A224B	STOR.
A224C	PRACTICE ROOM
A224D	STOR.
A224E	PRACTICE ROOM
A248	LIBRARY
A248	LIBRARIAN
A250	TECH.
A251	BOOK ROOM
A252	STAFF RR
A253	MEDIA CENTER
A254	ELEC.
A255	TELECOM
A256	COMPUTER LAB
A257	STOR.
A258	ELEC
A259	STOR.
A259	VESTIBULE
A260	MECH.
A261	STOR.
A262	RECORDING ROOM
A263	VESTIBULE

AUDITORIUM LEVEL 2

A271	LOBBY
A273	STORAGE
A274	DIMMER ROOM
A272	CONTROL ROOM

A-WING LEVEL 2 (EAST)

A201	CHAMORU
A202	CHAMORU
A203	CHAMORU
A219	SOCIAL STUDIES (ESL)
A220	CHAMORU
A221	ENGLISH (ESL)
A225	VESTIBULE
A226	VESTIBULE
A227	WOMEN'S
A228	JAN.
A229	MEN'S
A229	CHAIR STORAGE 1
A230	VESTIBULE
A231	STAFF RR
A233	MECH
A234	ELEC
A235	TELECOM
A264	VESTIBULE
A265	BAND STORAGE
A266	STORAGE
A267	BOOK STORAGE
A268	BOOK STORAGE
A269	BOOK STORAGE
A270	BOOK STORAGE

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

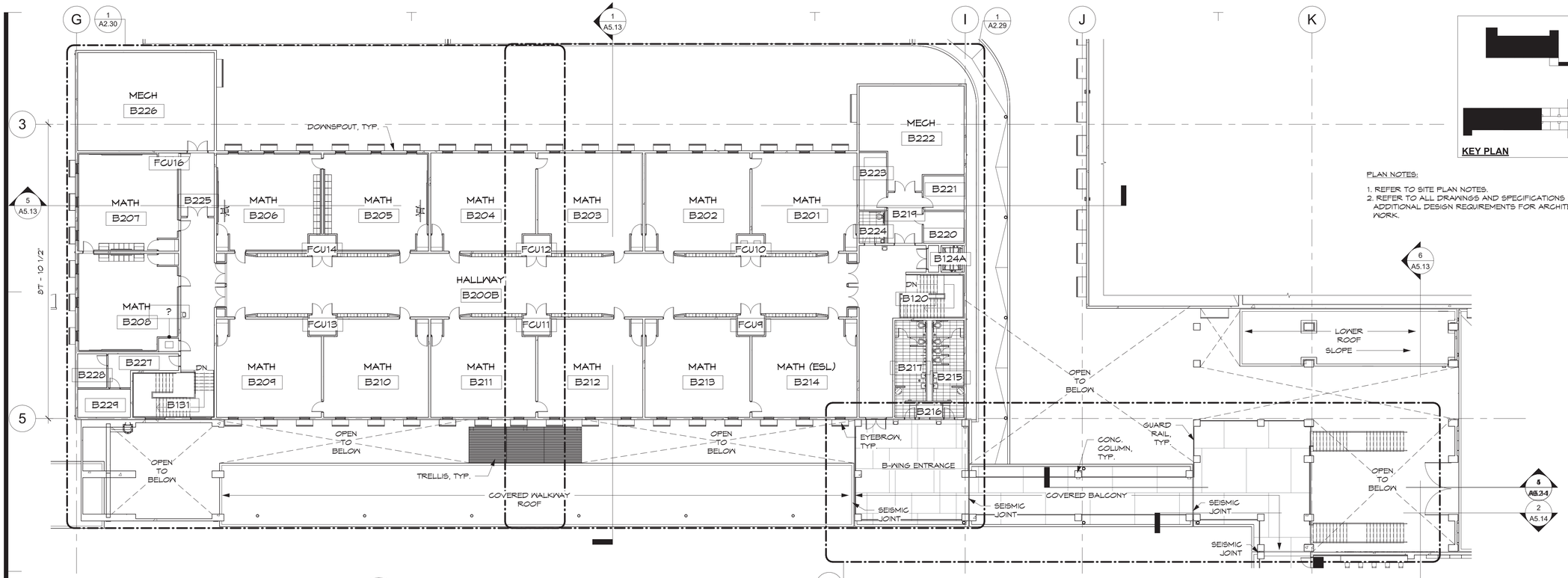
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN - A-WING LEVEL 2 (EAST)
PROGRAMMING DOCUMENT

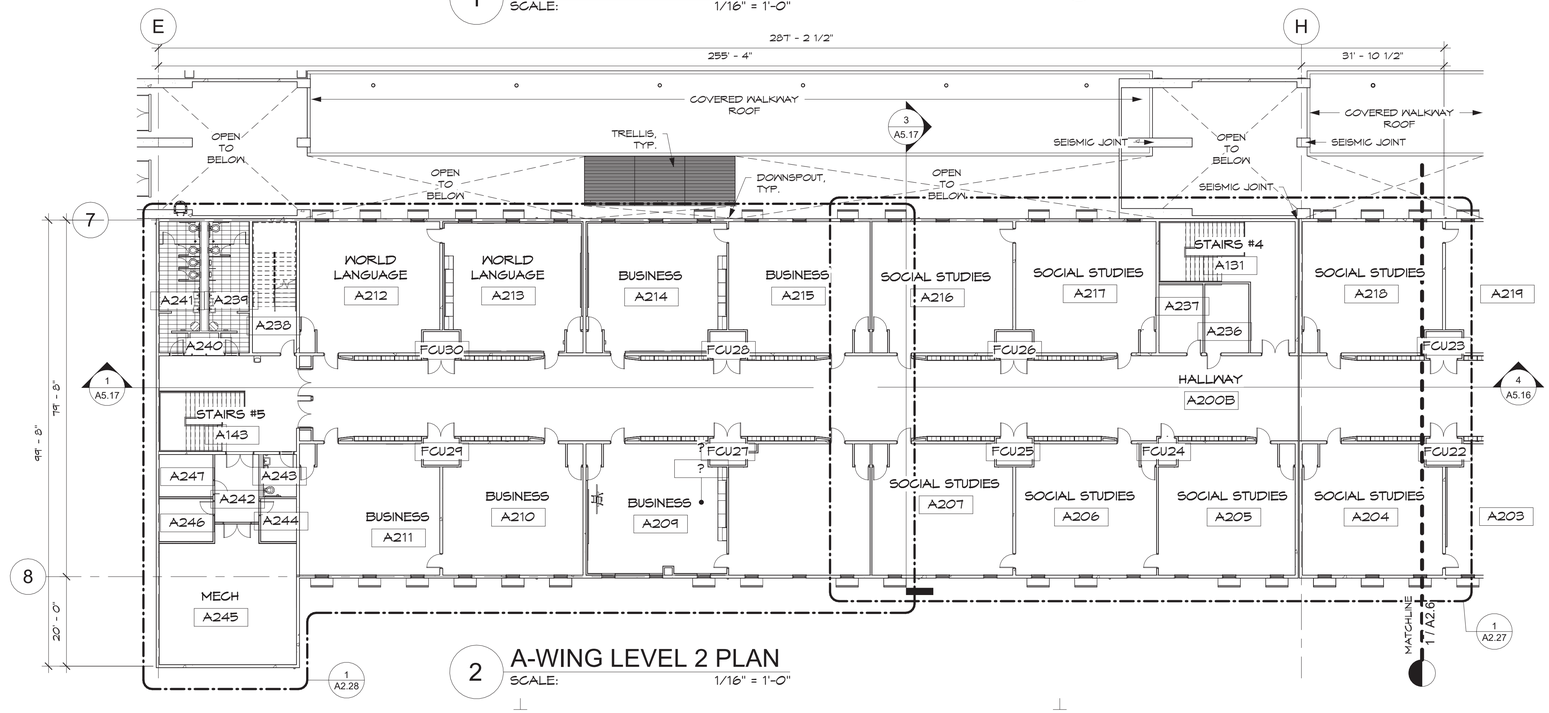
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.
A2.6
Sheet No. of



1 B-WING LEVEL 2 PLAN

SCALE: 1/16" = 1'-0"



2 A-WING LEVEL 2 PLAN

SCALE: 1/16" = 1'-0"

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.
3. RM. B101 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT B-WING CLASSROOMS.

B-WING LEVEL 2	
B200A	HALLWAY
B200B	HALLWAY
B200C	HALLWAY
B-WING LEVEL 2 (EAST)	
B201	MATH
B202	MATH
B203	MATH
B212	MATH
B213	MATH
B214	MATH (ESL)
B215	WOMEN'S
B216	JAN.
B217	MEN'S
B218	VESTIBULE
B219	VESTIBULE
B220	TELECOM
B221	ELEC
B222	MECH
B223	CHAIR STORAGE 2
B224	STAFF RR
FCU8	FCU 8
FCU10	FCU 10
FCU11	FCU 11
FCU12	FCU 12
B-WING LEVEL 2 (WEST)	
B204	MATH
B205	MATH
B206	MATH
B207	MATH
B208	MATH
B209	MATH
B210	MATH
B211	MATH
B225	VESTIBULE
B226	MECH
B227	VESTIBULE
B228	ELEC
B229	TELECOM
FCU13	FCU 13
FCU14	FCU 14
FCU15	FCU 15
FCU16	FCU 16

A-WING LEVEL 2 (WEST)	
A215	BUSINESS
A214	BUSINESS
A208	BUSINESS
A209	BUSINESS
A210	BUSINESS
A212	WORLD LANGUAGE
A213	WORLD LANGUAGE
A211	BUSINESS
A245	MECH
A247	TELECOM
A246	ELEC
A243	STAFF RR
A241	WOMEN'S
A239	MEN'S
A240	JAN.
A238	ROOF ACCESS STAIRS
A242	VESTIBULE
A244	CHAIR STORAGE 3
A200C	HALLWAY

A-WING LEVEL 2 (CENTER)	
A207	SOCIAL STUDIES
A204	SOCIAL STUDIES
A218	SOCIAL STUDIES
A216	SOCIAL STUDIES
A205	SOCIAL STUDIES
A206	SOCIAL STUDIES
A217	SOCIAL STUDIES
A237	ELEC.
A236	TELECOM
A200B	HALLWAY

NORTH 0 8' 16' 32'

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REVISIONS		
No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

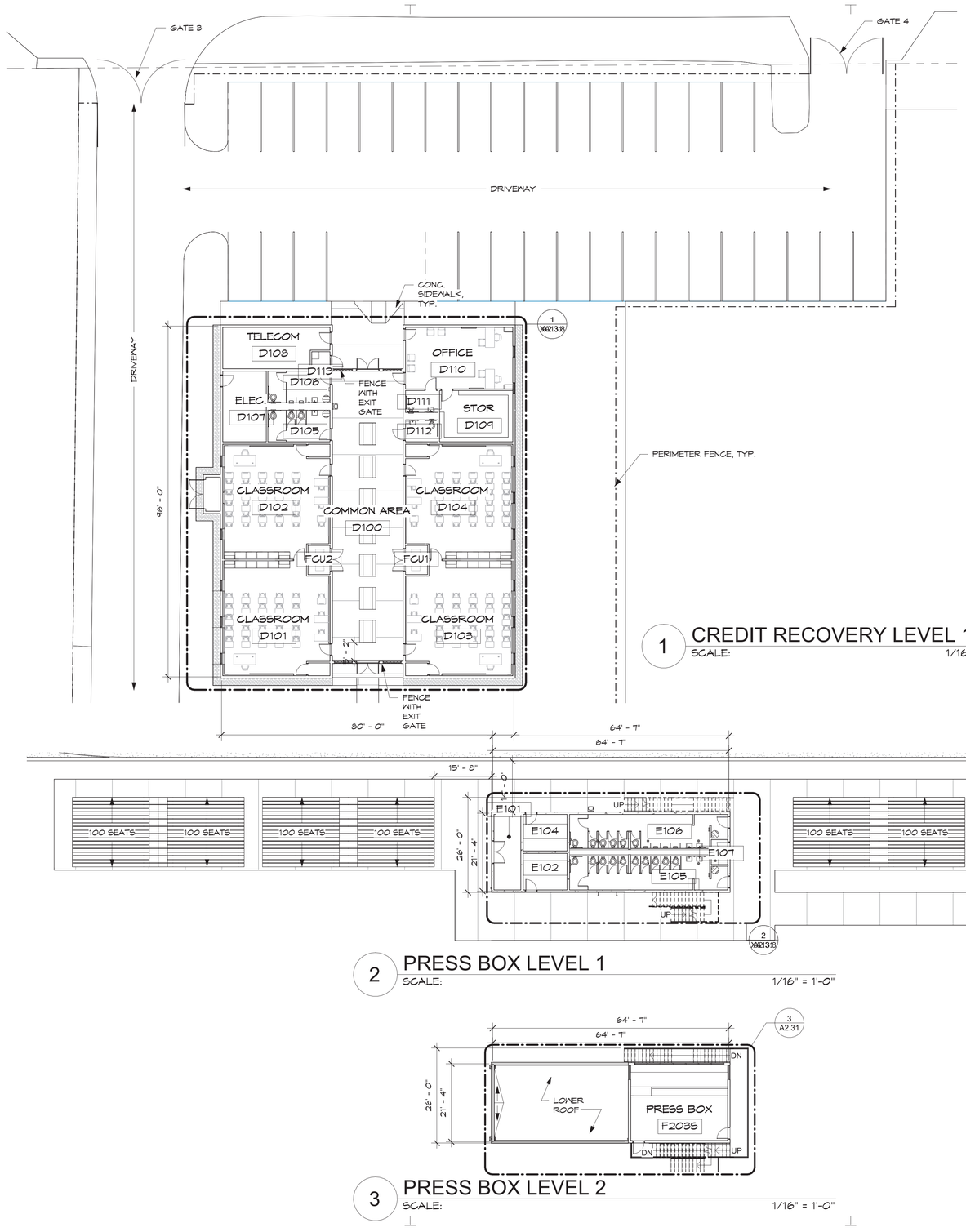
Title: ENLARGED PLANS - B-WING & A-WING (WEST) LEVEL 2

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.7

Sheet No. ____ of ____



1 CREDIT RECOVERY LEVEL 1

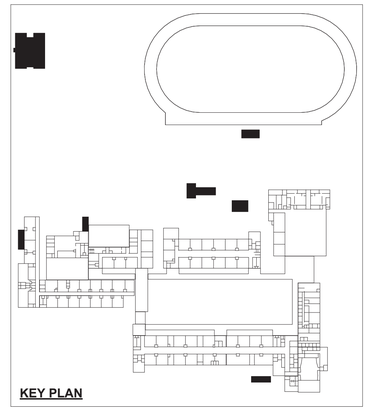
SCALE: 1/16" = 1'-0"

2 PRESS BOX LEVEL 1

SCALE: 1/16" = 1'-0"

3 PRESS BOX LEVEL 2

SCALE: 1/16" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

CREDIT RECOVERY BUILDING

D100	COMMON AREA
D101	CLASSROOM
D102	CLASSROOM
D103	CLASSROOM
D104	CLASSROOM
D105	WOMEN'S
D106	MEN'S
D107	ELEC.
D108	TELECOM
D109	STOR
D110	OFFICE
D113	JAN.

PRESS BOX

E101	STORAGE
E102	ELEC
E104	TELECOM
E105	MEN'S
E106	WOMEN'S
E107	JAN.
F2035	PRESS BOX

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ENLARGED PLANS - CREDIT RECOVERY, PRESS BOX & DUGOUT
PROGRAMMING DOCUMENT

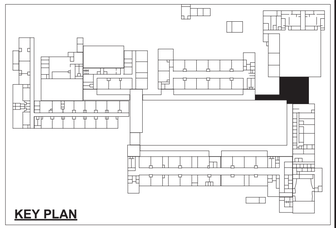
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.: A2.8

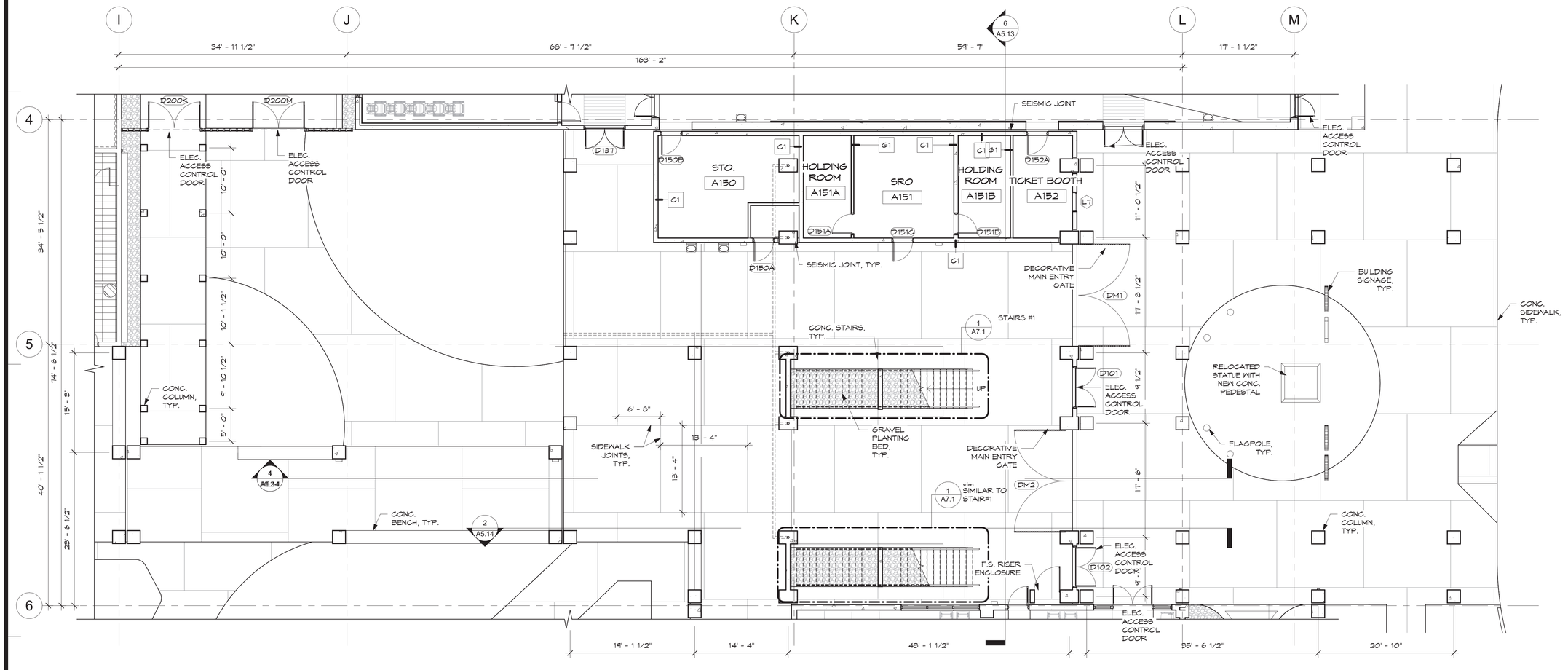
Sheet No. _____ of _____

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.



KEY PLAN



1 MAIN ENTRANCE LEVEL 1 PLAN

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
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Architecture
Planning
Interior Design

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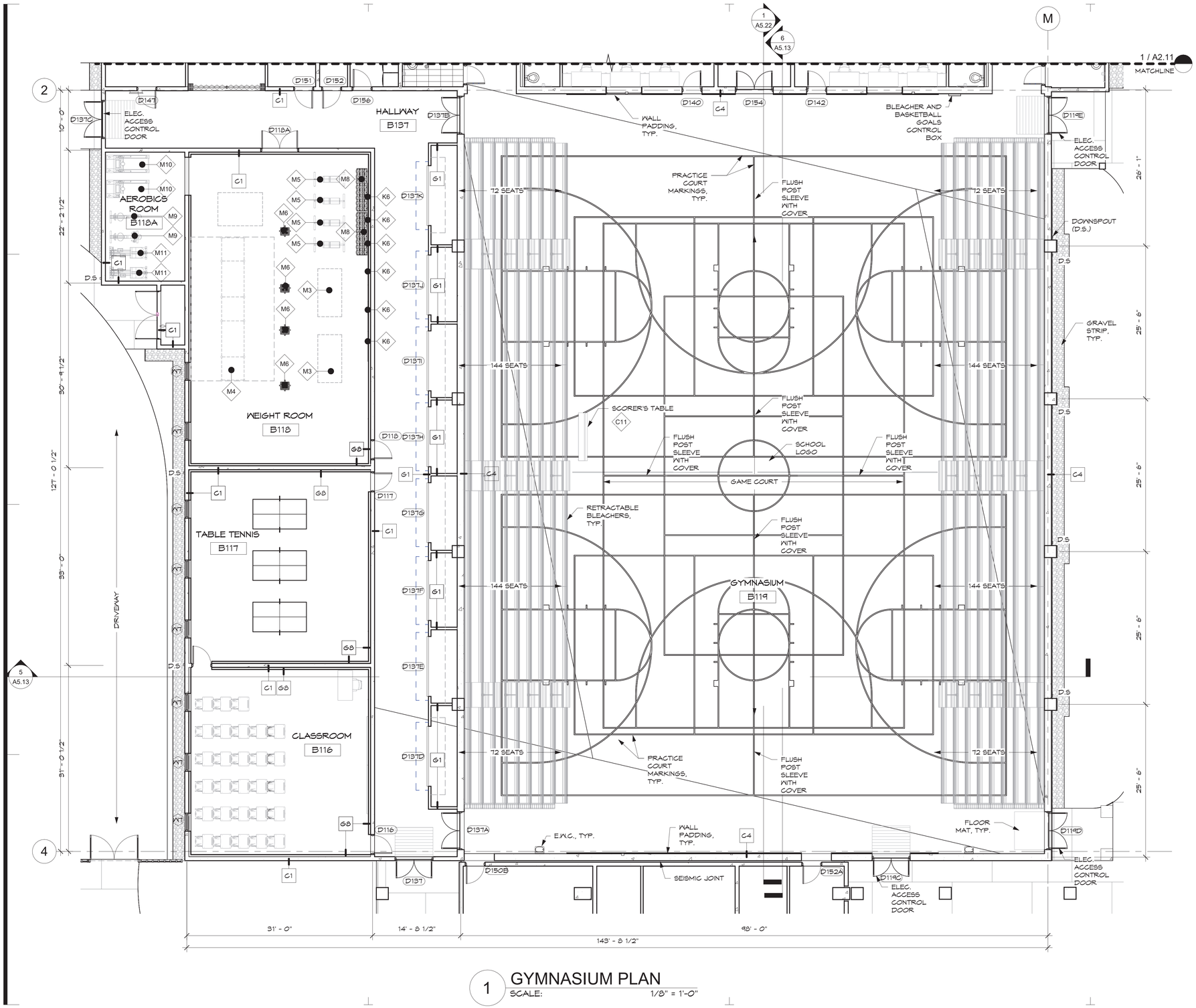
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN - MAIN ENTRANCE LEVEL 1
PROGRAMMING DOCUMENT

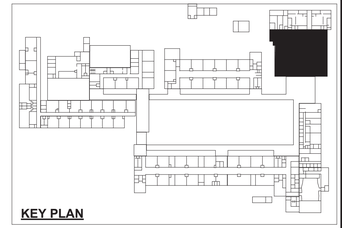
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A2.9

Sheet No. ____ of ____



1 GYMNASIUM PLAN
SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

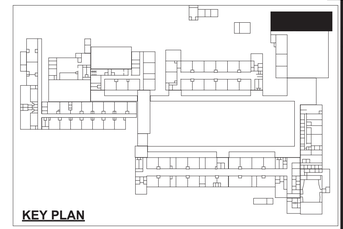
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GYMNASIUM PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.10

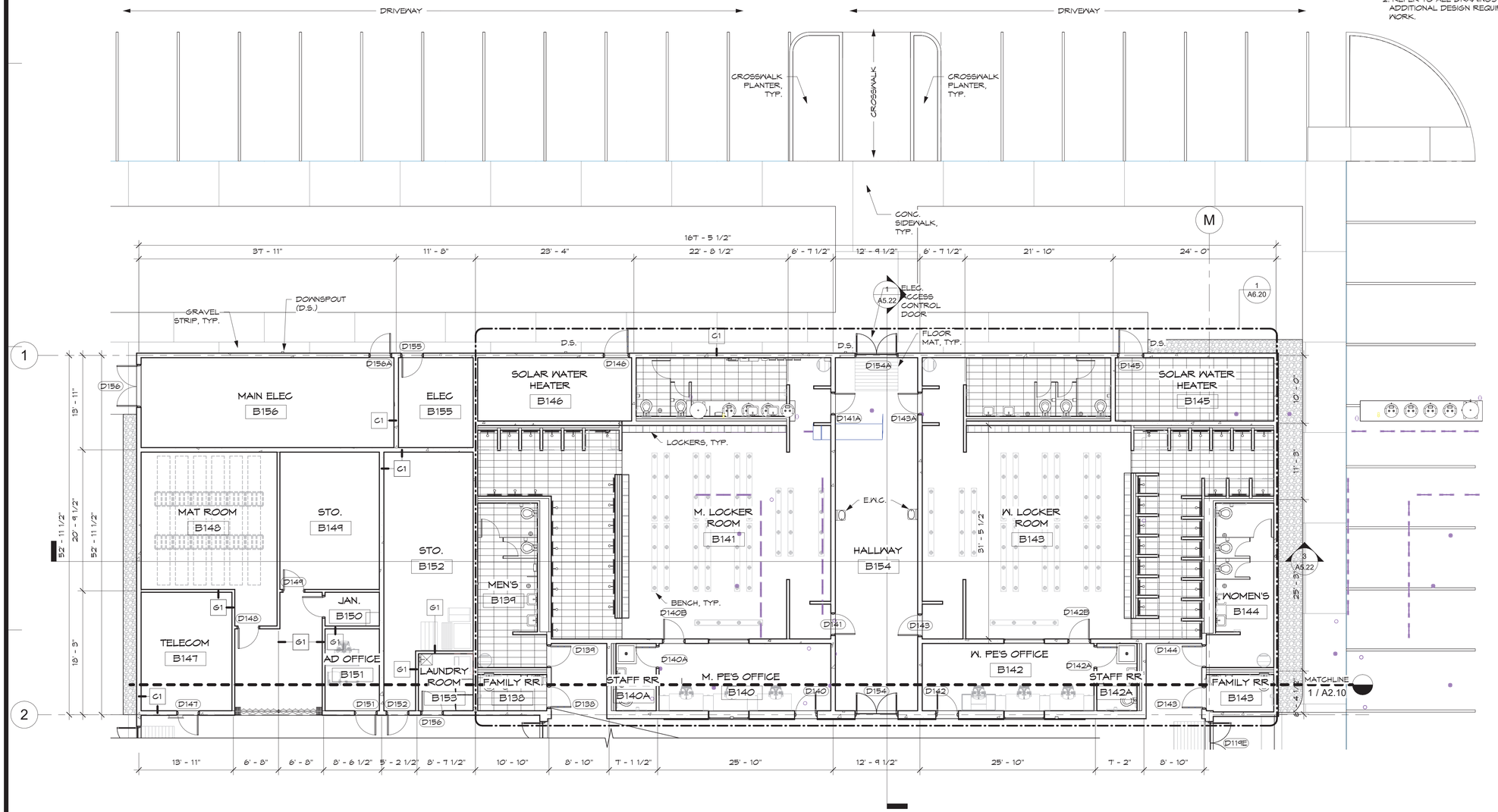
Sheet No. _____ of _____



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.



1 GYMNASIUM LOCKER ROOMS PLAN
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

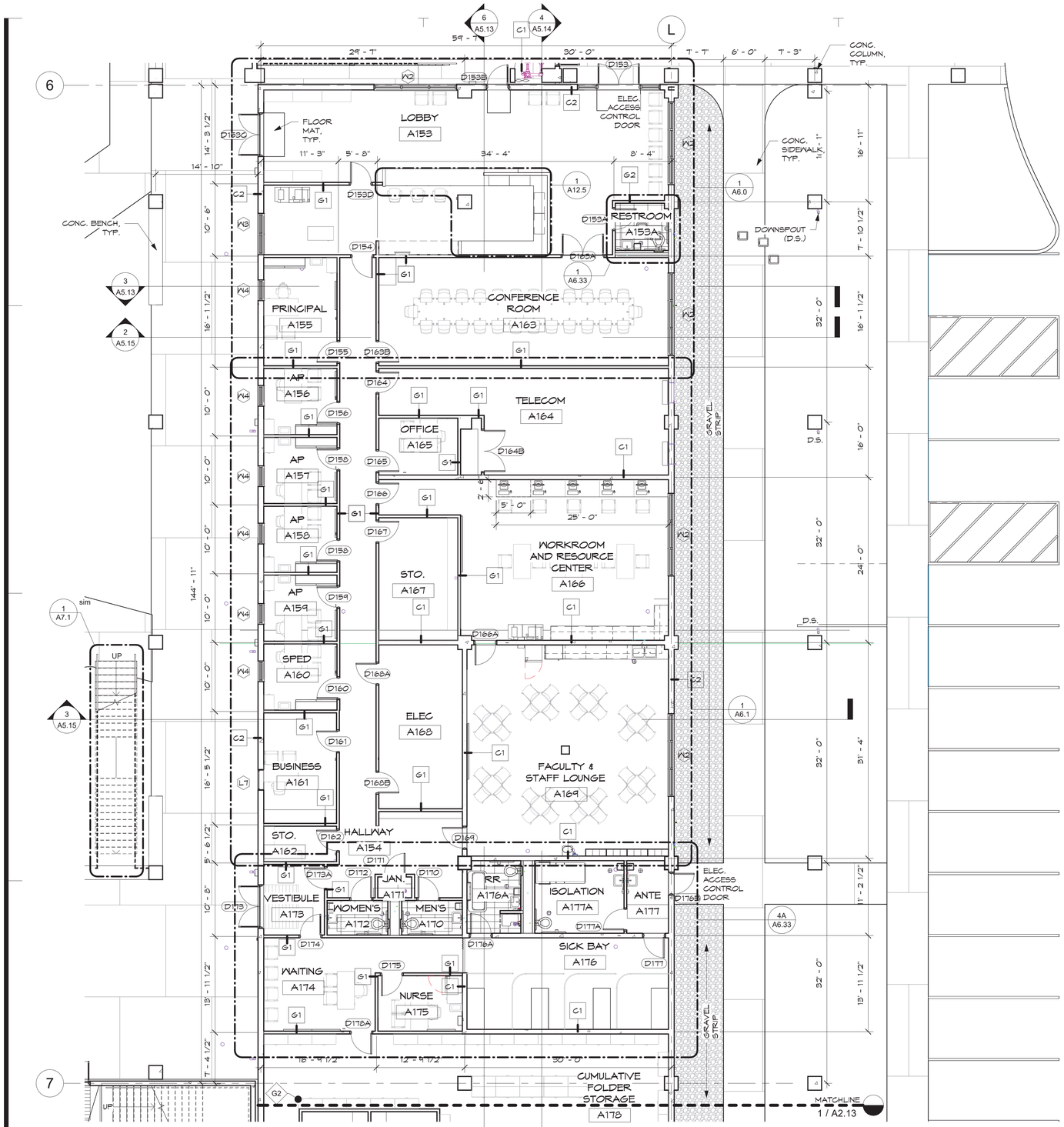
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

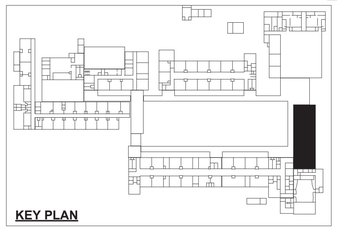
Title:
GYMNASIUM LOCKER ROOMS PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A2.11
Sheet No. ____ of ____



1 ADMIN. OFFICES PLAN
SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

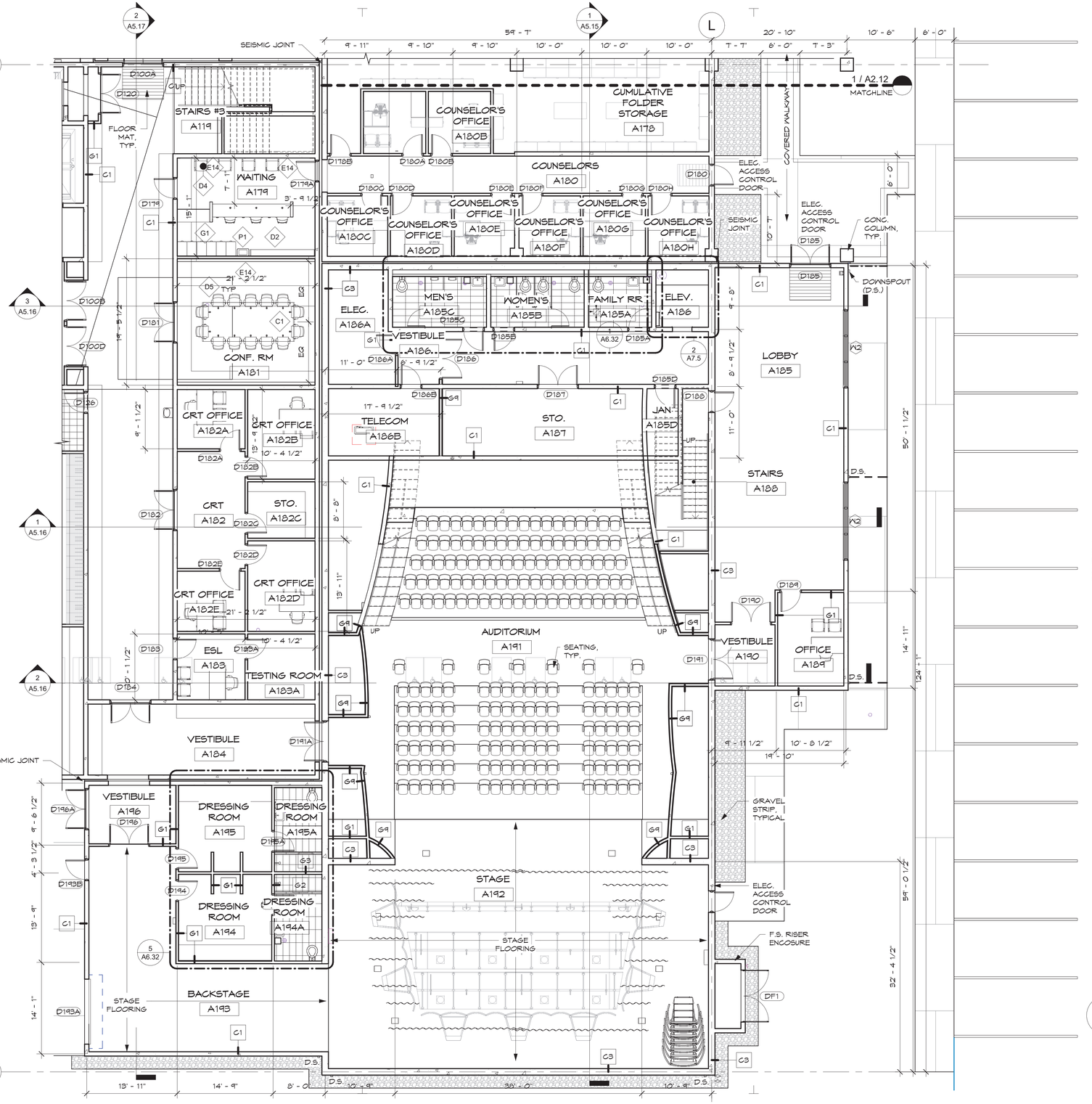
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

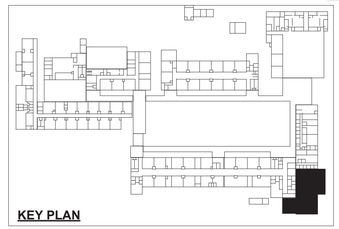
Title: ADMIN. OFFICES PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.12

Sheet No. ____ of ____





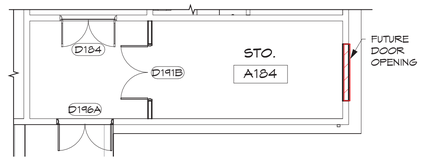
KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

AUDITORIUM NOTES:

1. PROVIDE HUSSEY QUATTRO CLASSIC SEATING, ROUND LOW BACK, CAST ALUMINUM STANDARDS, QUILTED UPHOLSTERED SEAT, INTEGRATED LED AISLE LIGHTING.
2. SLAB ON GRADE BELOW STAGE FLOORING IS APPROX. 5" LOWER THAN OTHER SLAB ON GRADE.
3. REFER TO THEATER SYSTEMS AND AUDIO VISUAL DRAWINGS FOR EQUIPMENT LOCATIONS.



2 ALT. DESIGN - VESTIBULE A184 PLAN
SCALE: 1/8" = 1'-0"

1 A-WING & AUDITORIUM LEVEL 1 PLAN
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
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Architecture
Planning
Interior Design

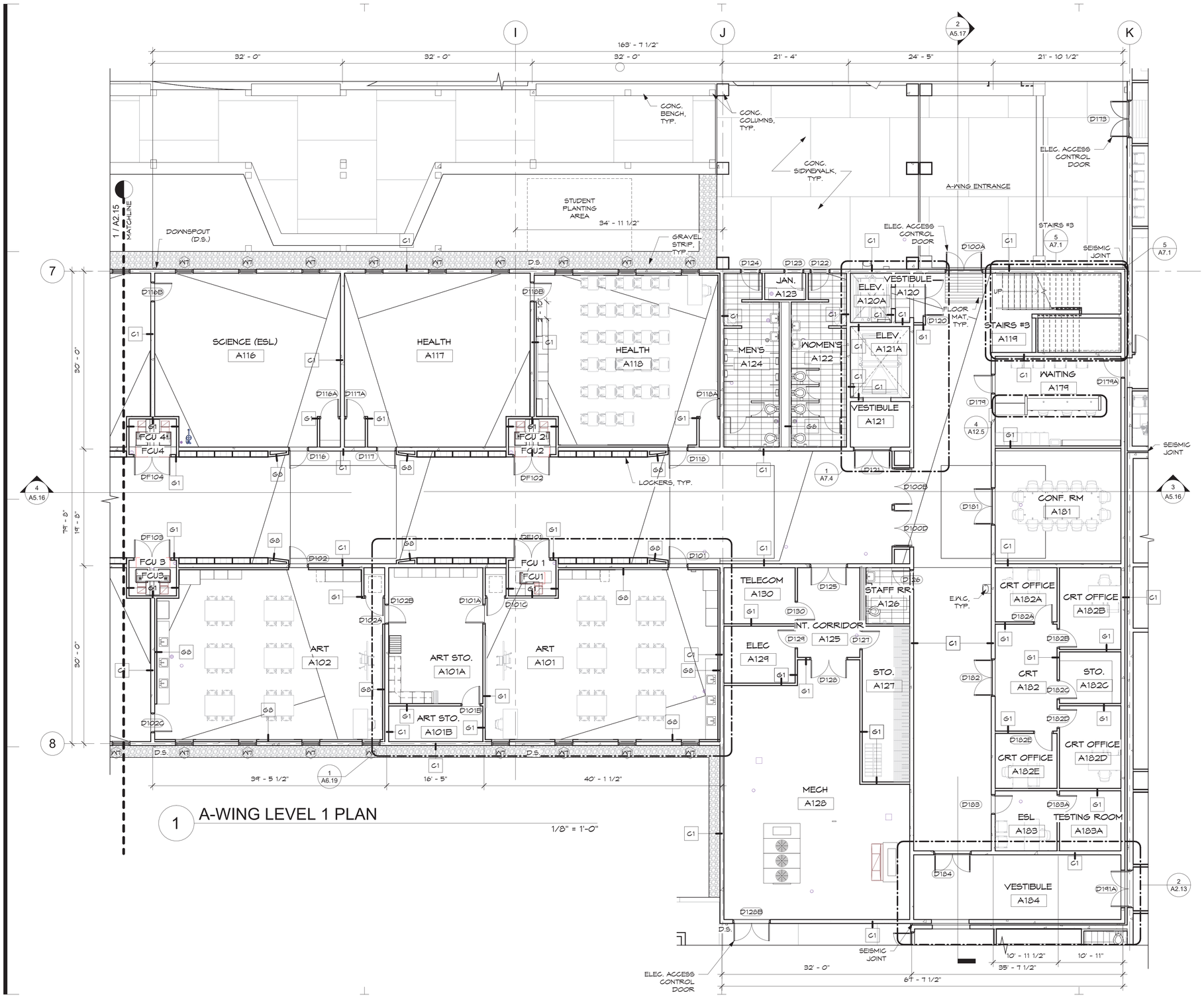
NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM LEVEL 1 PLAN
PROGRAMMING DOCUMENT

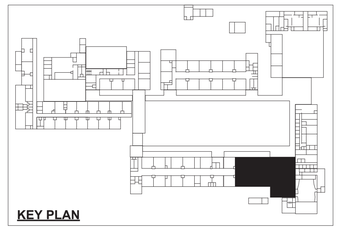
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.13
Sheet No. ____ of ____



1 A-WING LEVEL 1 PLAN

1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects
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Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

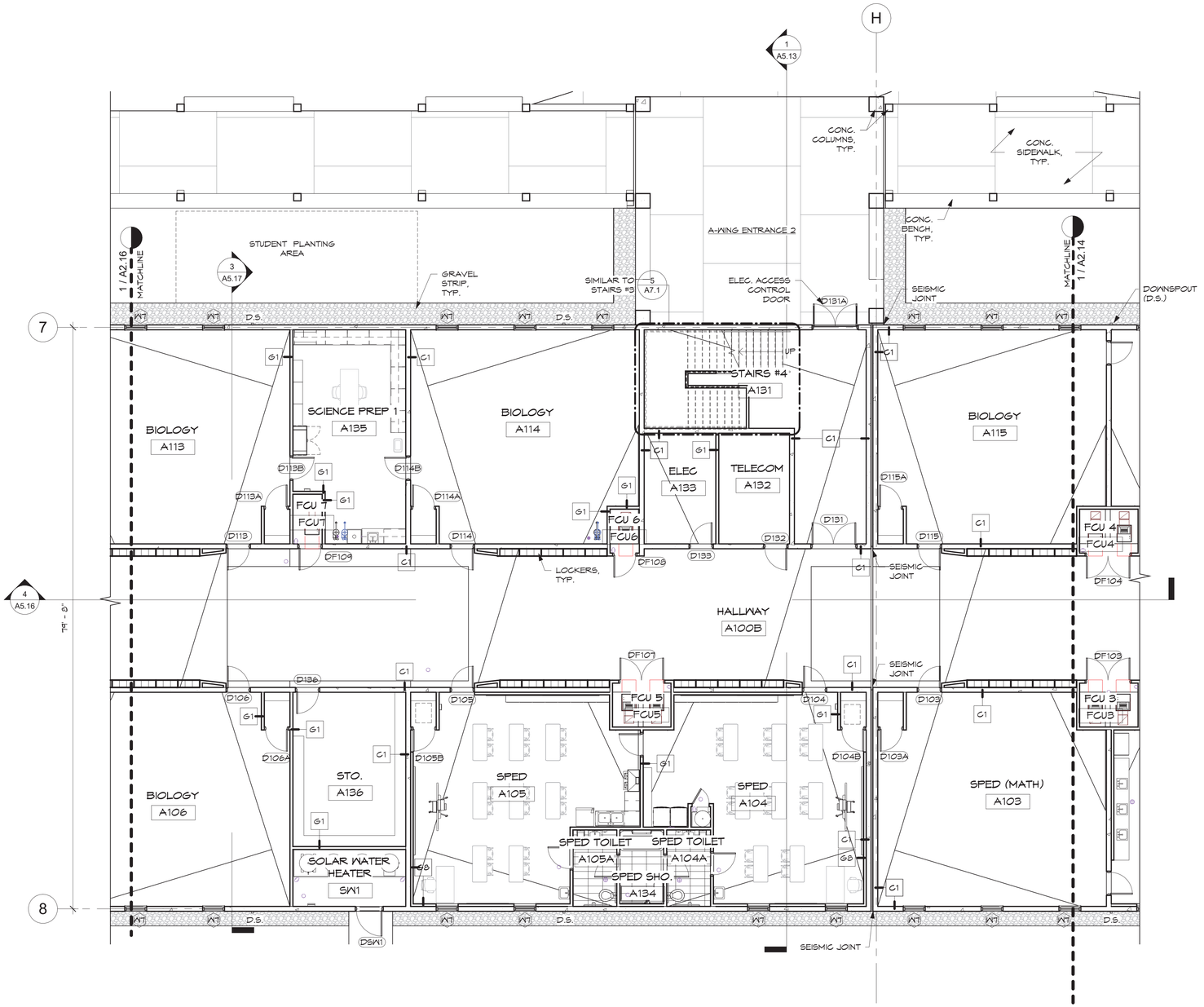
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
A101 - A102, A116 - A118
PROGRAMMING DOCUMENT

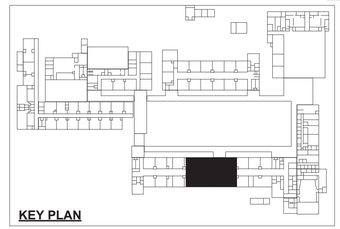
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A2.14

Sheet No. ____ of ____



1 A-WING LEVEL 1 PLAN
SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

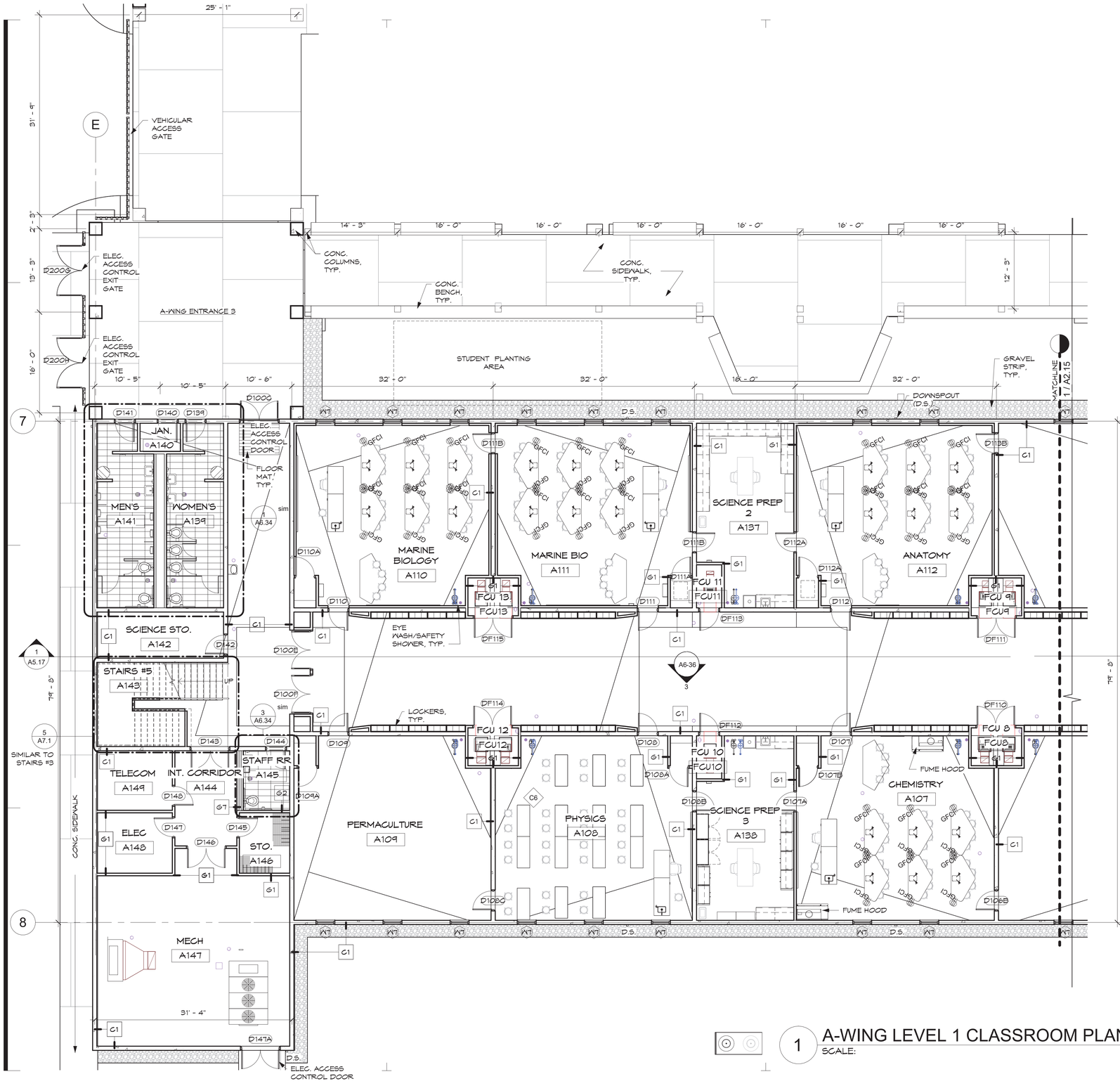
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS A103 - A105, A114 - A115
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	NO.
File	

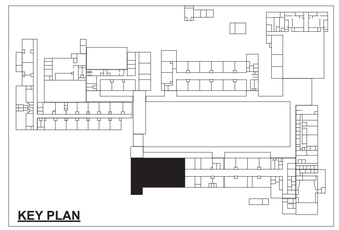
Drawing No.
A2.15
Sheet No. ____ of ____

NORTH
0' 4' 8' 16'
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 A-WING LEVEL 1 CLASSROOM PLANS

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

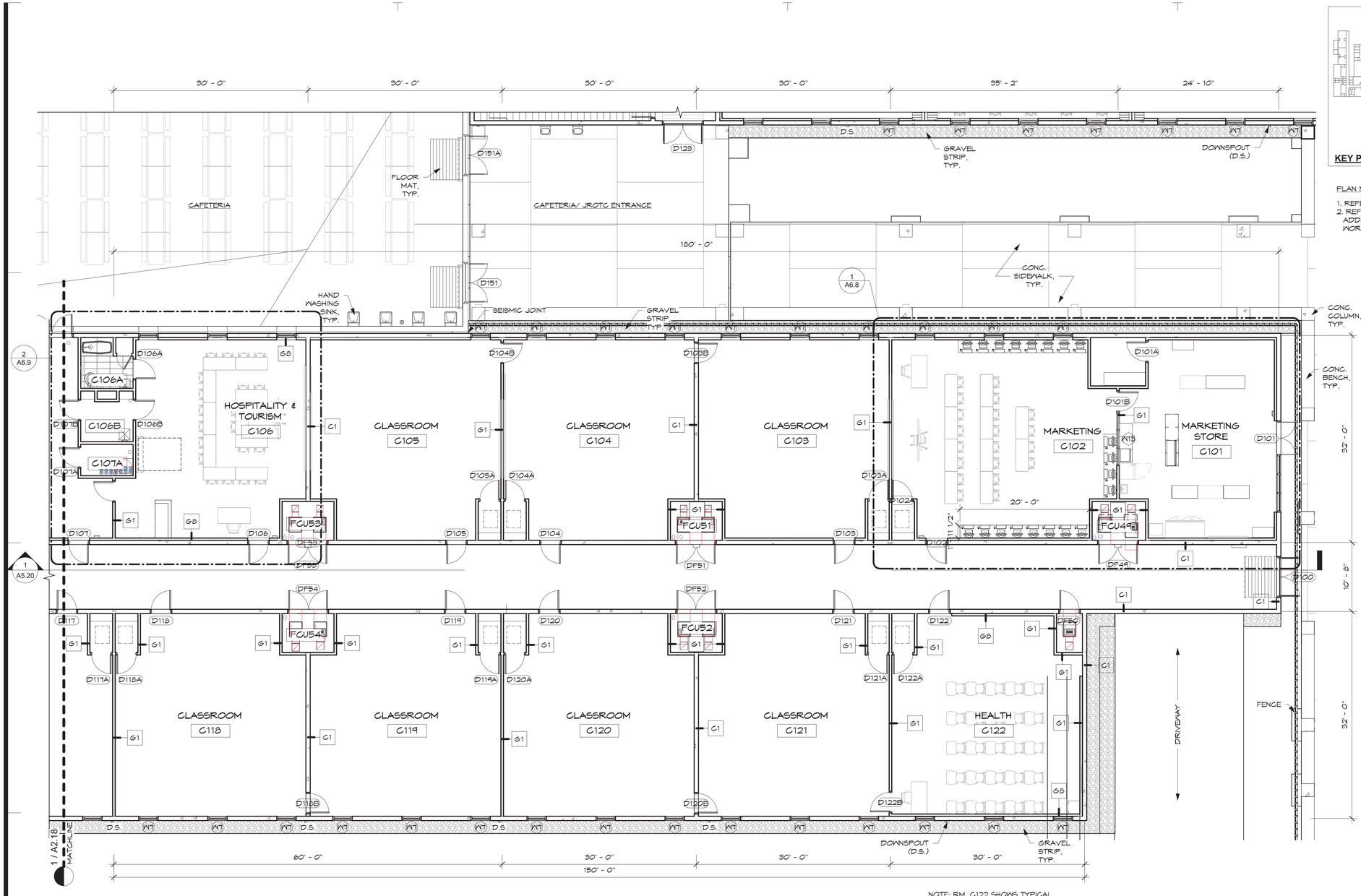
Title: CLASSROOM PLANS A107 - A112

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A2.16

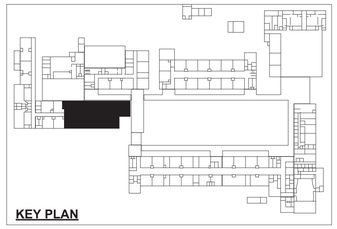
Sheet No. _____ of _____



NOTE: RM. C122 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT C-WING CLASSROOMS.

1 C-WING CLASSROOMS PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

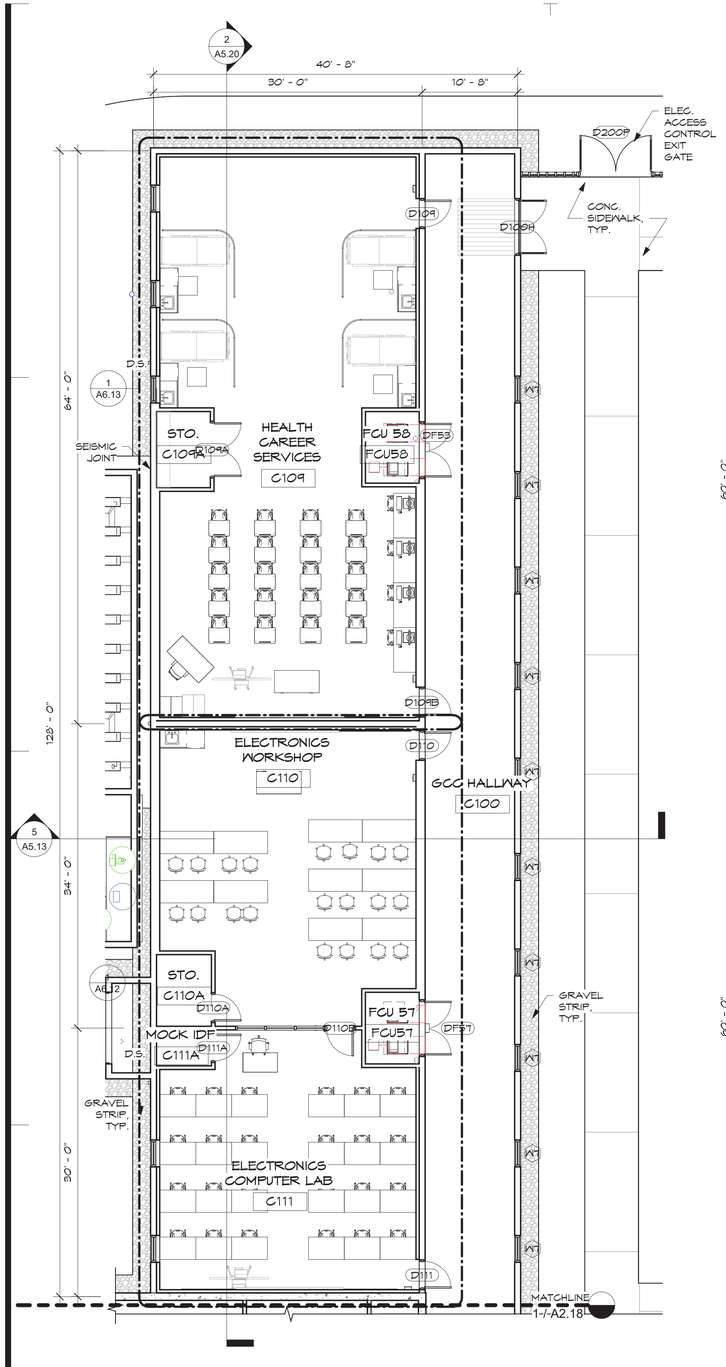
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
C101 - C106, C118 - C122
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File:	

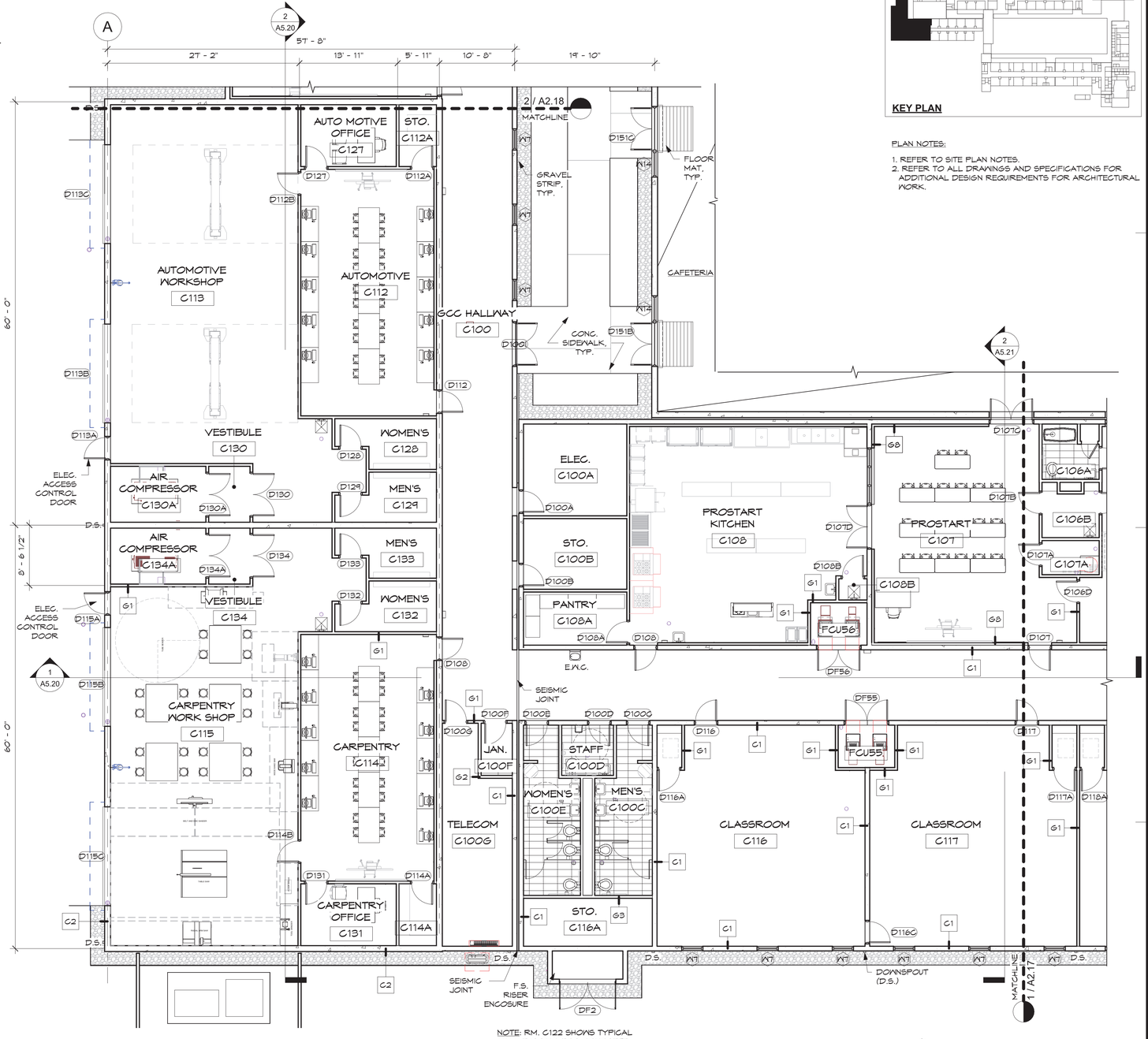
Drawing No.:
A2.17

Sheet No. ____ of ____



2 C-WING CLASSROOMS PLAN

SCALE: 1/8" = 1'-0"



NOTE: RM. C122 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT C-WING CLASSROOMS.

1 C-WING CLASSROOMS PLAN

SCALE: 1/8" = 1'-0"

KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

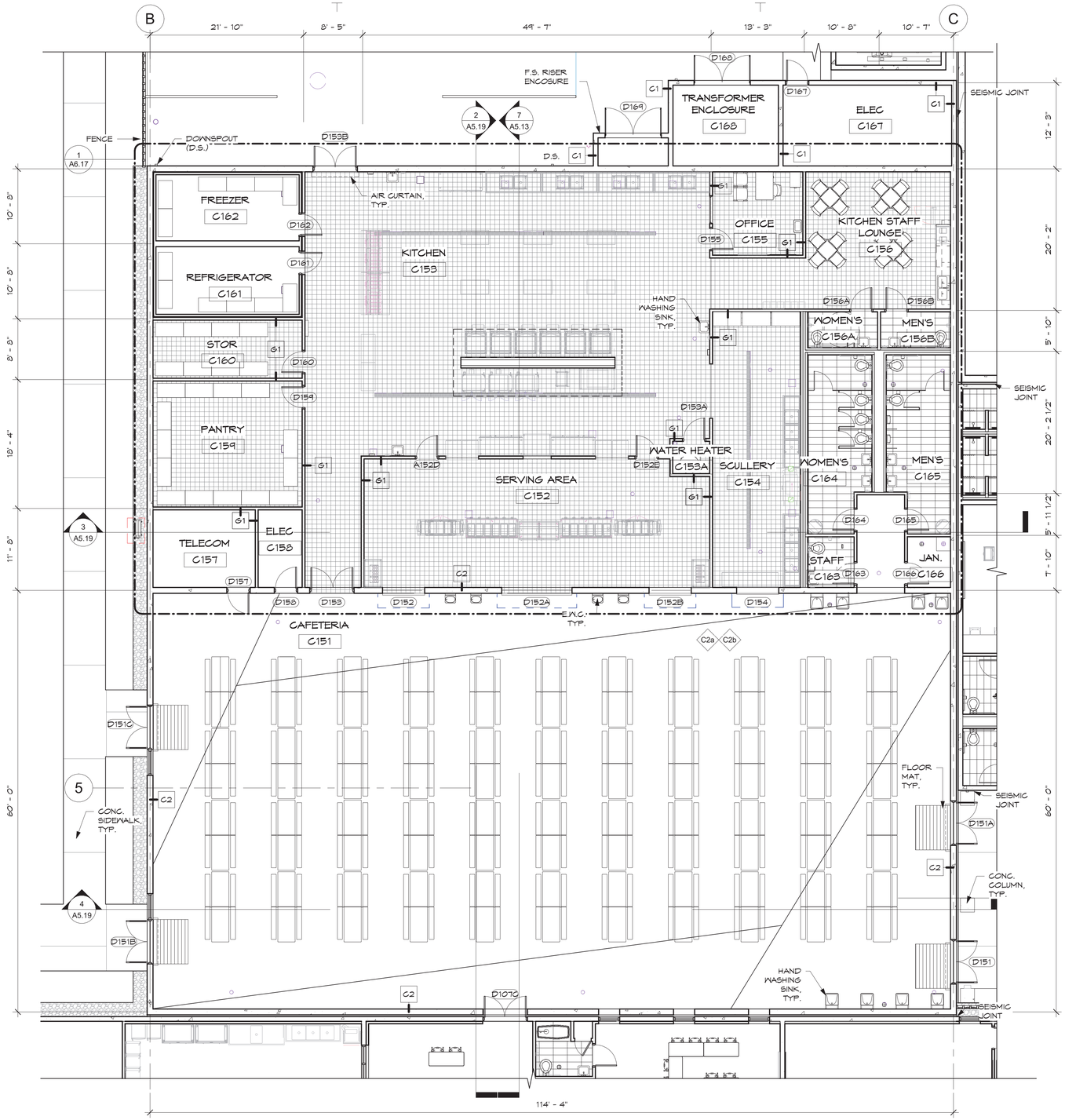
Title: CLASSROOM PLANS C107 - C111, C113, C115 - C117

PROGRAMMING DOCUMENT

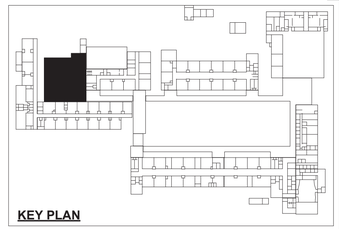
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No. A2.18

Sheet No. ____ of ____



1 CAFETERIA PLAN
SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

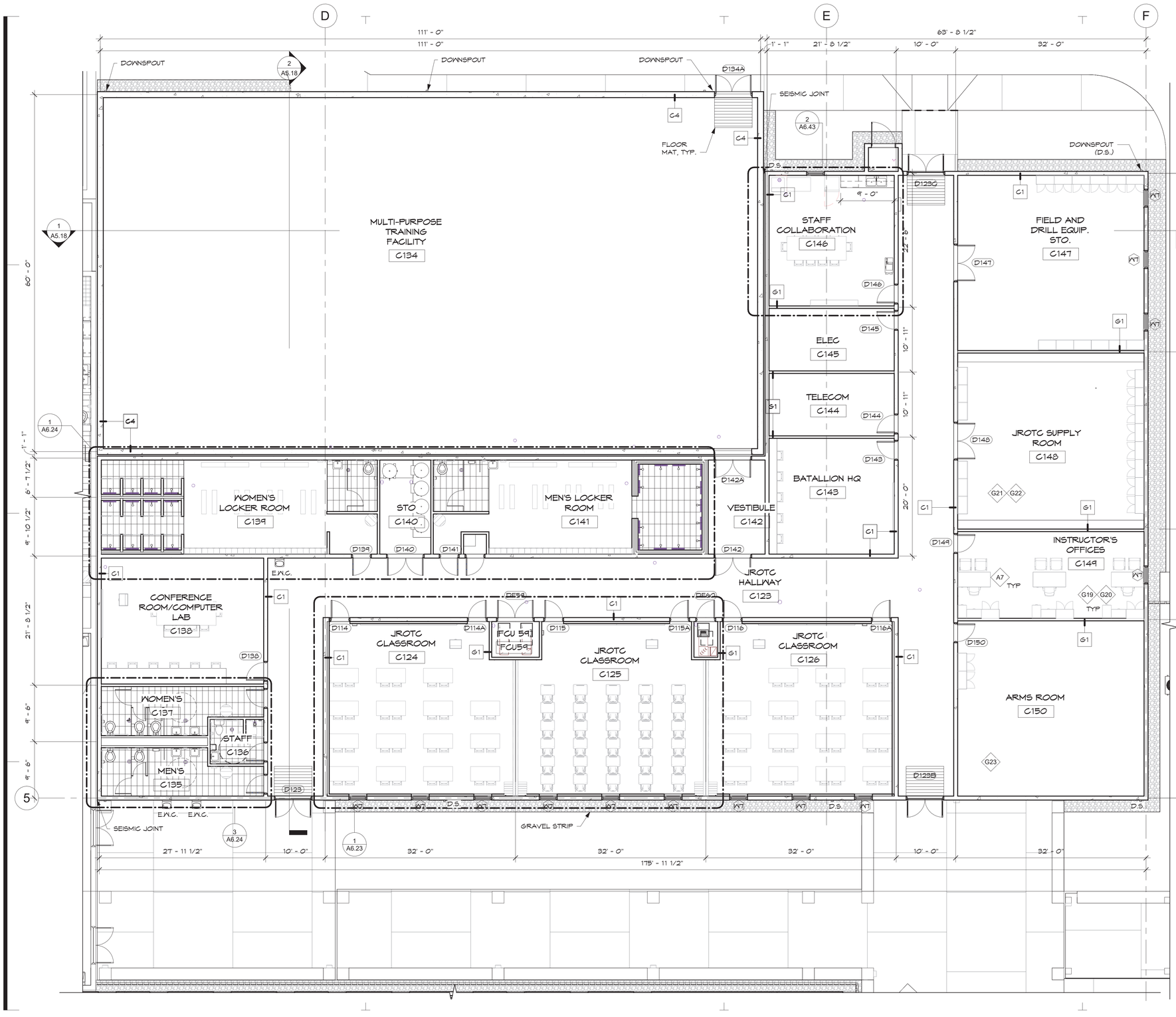
NOT FOR CONSTRUCTION

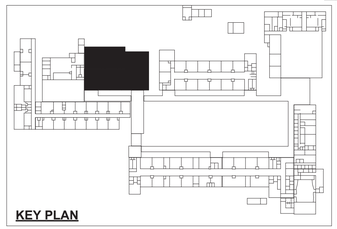
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CAFETERIA PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A2.19
Sheet No. ____ of ____





KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

1 C-WING PLAN (JROTC)

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

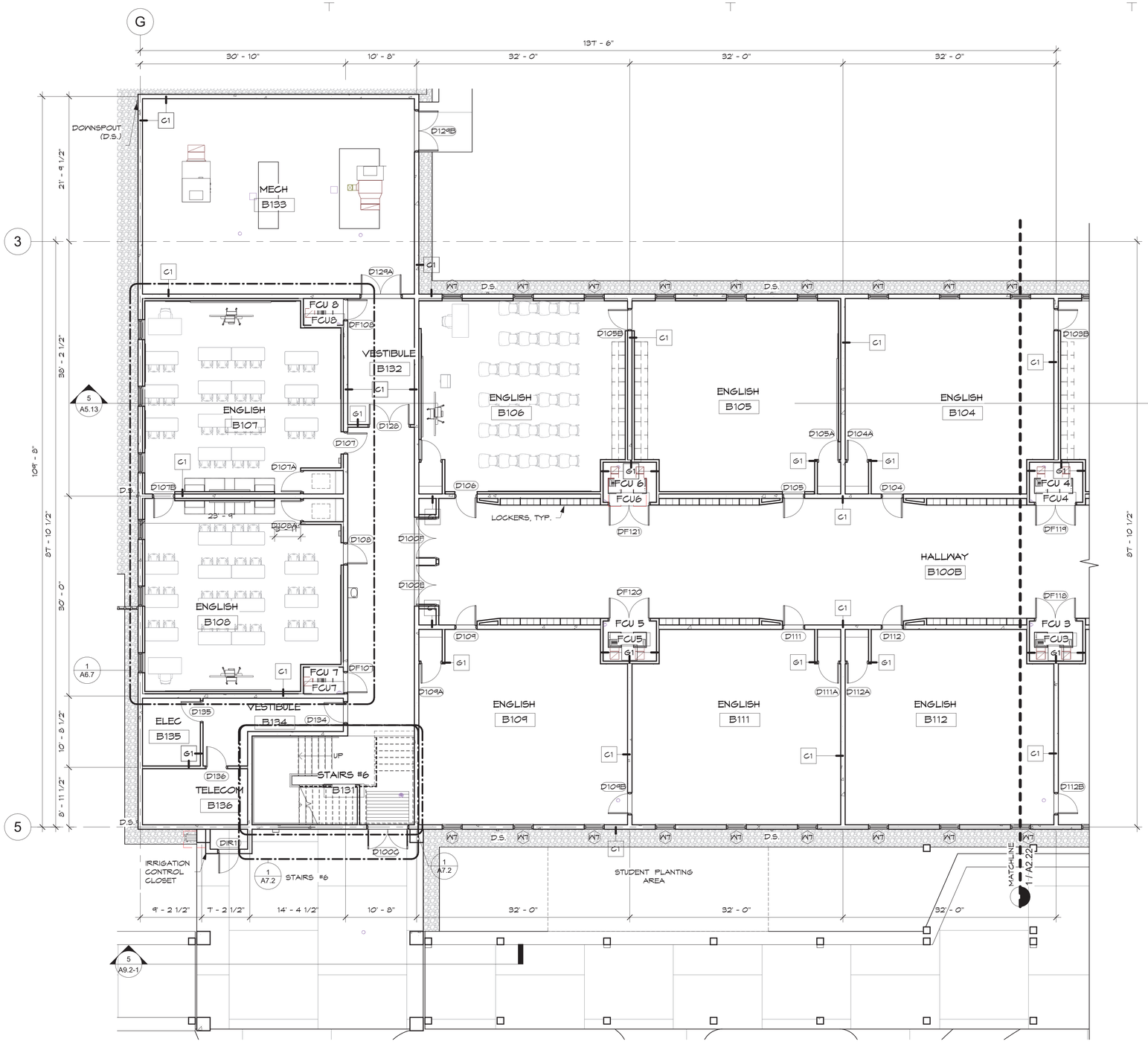
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
C124 - C126 (JROTC)
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

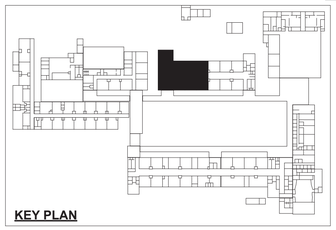
Drawing No.: A2.20

Sheet No. ____ of ____



1 B-WING LEVEL 1 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

REVISIONS		
No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
B104 - B109, B111-B112

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

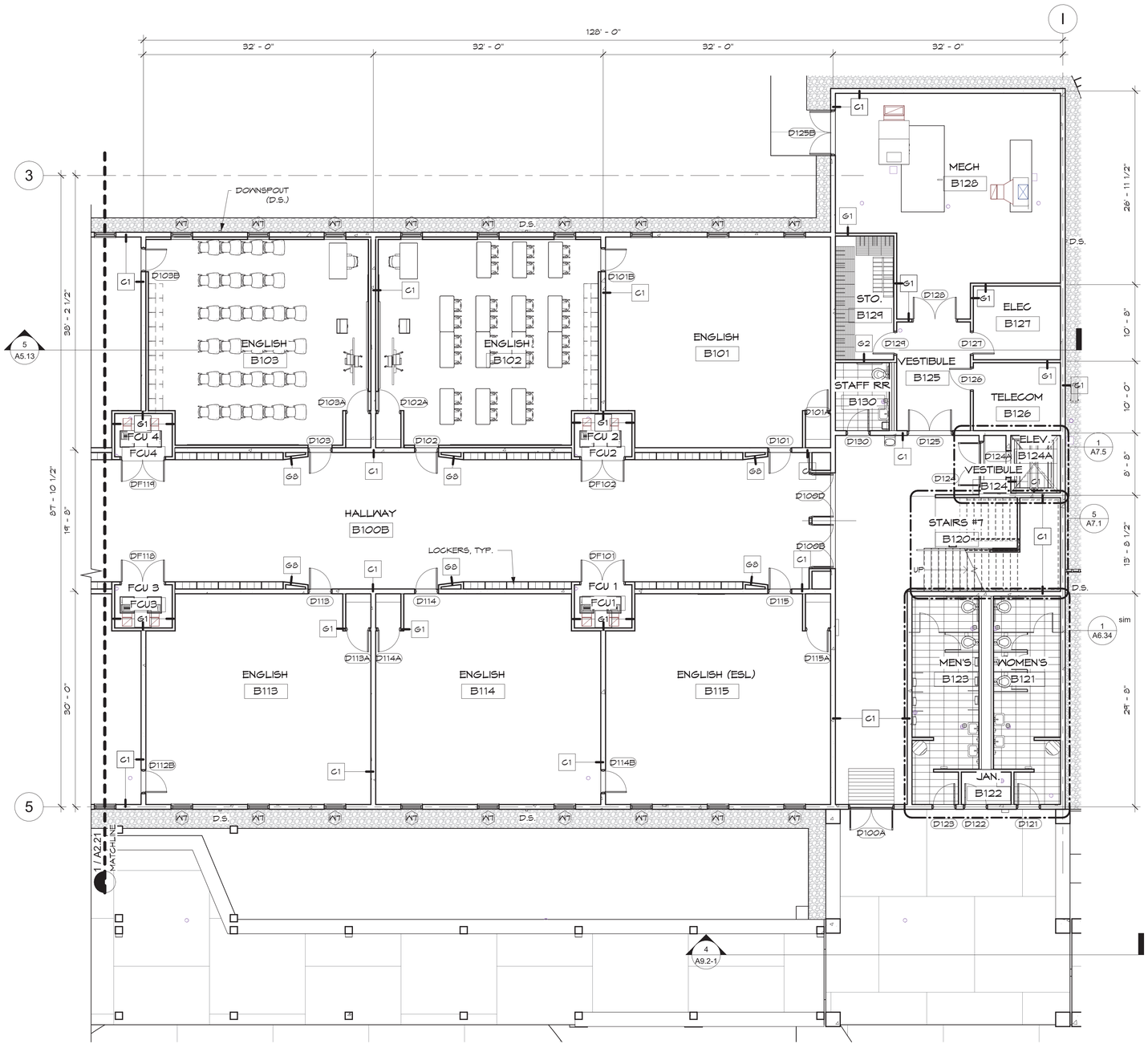
Drawing No.:
A2.21

Sheet No. _____ of _____

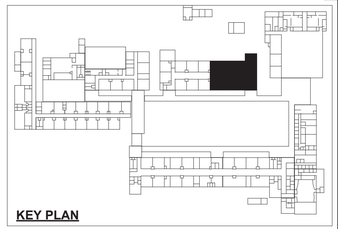
NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 B-WING LEVEL 1 PLAN
SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

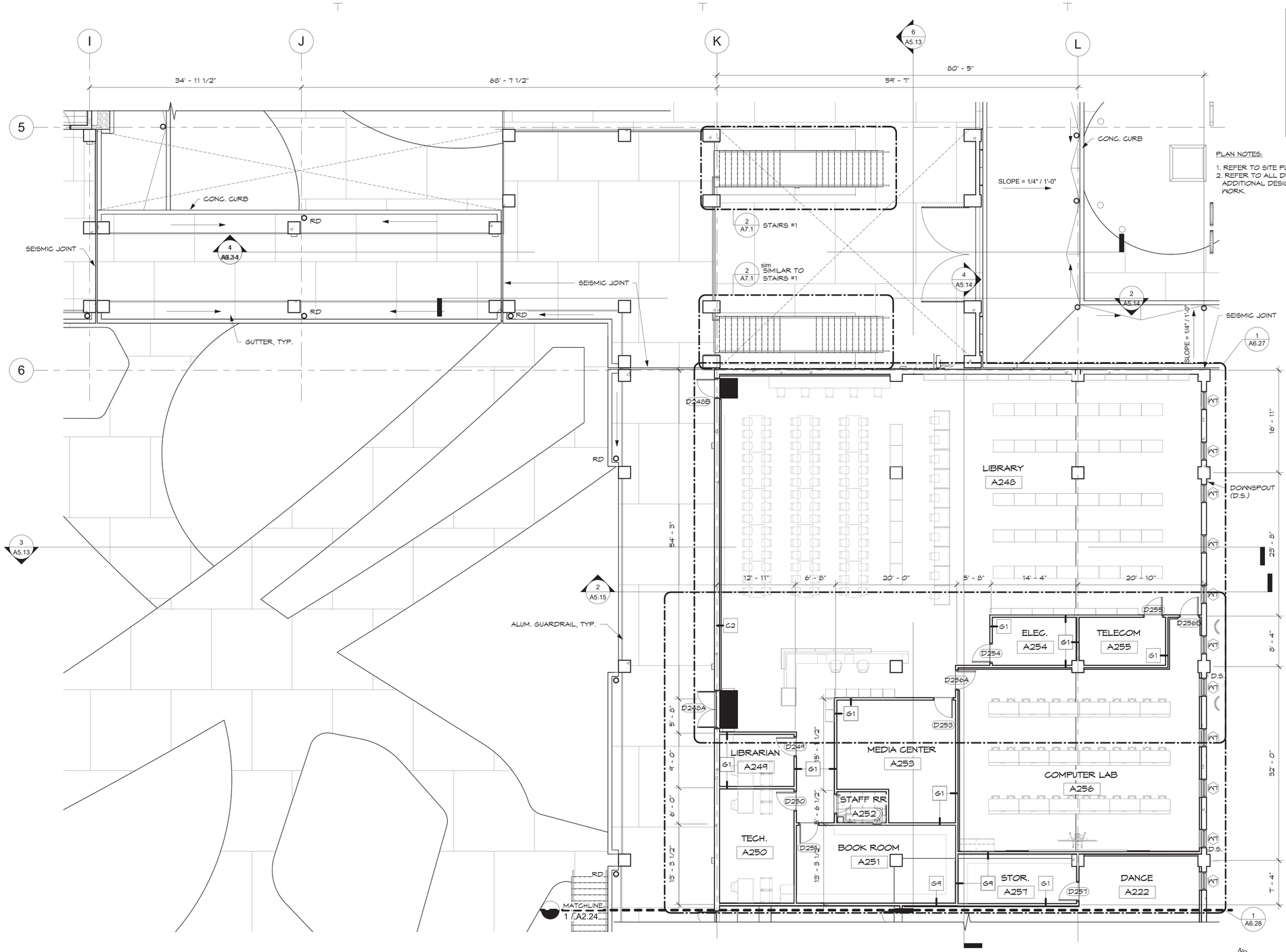
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS B101 - B103, B113 - B115
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File:	

Drawing No.
A2.22
Sheet No. ____ of ____

NORTH
0' 4' 8' 16'
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 A-WING LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

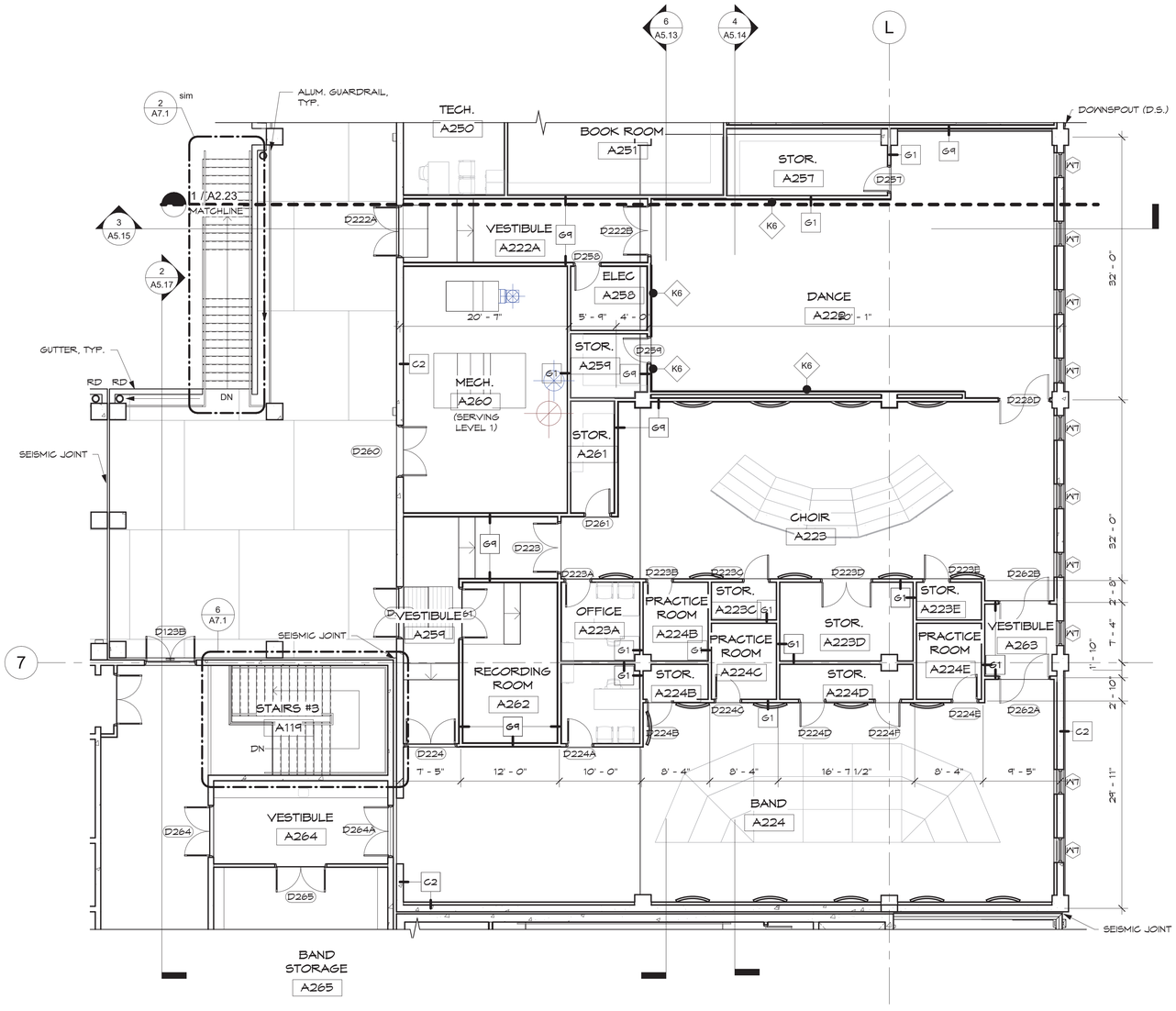
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
LIBRARY PLAN
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

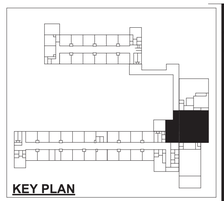
Drawing No.
A2.23

Sheet No. _____ of _____



1 CHOIR & BAND PLAN - LEVEL 2

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

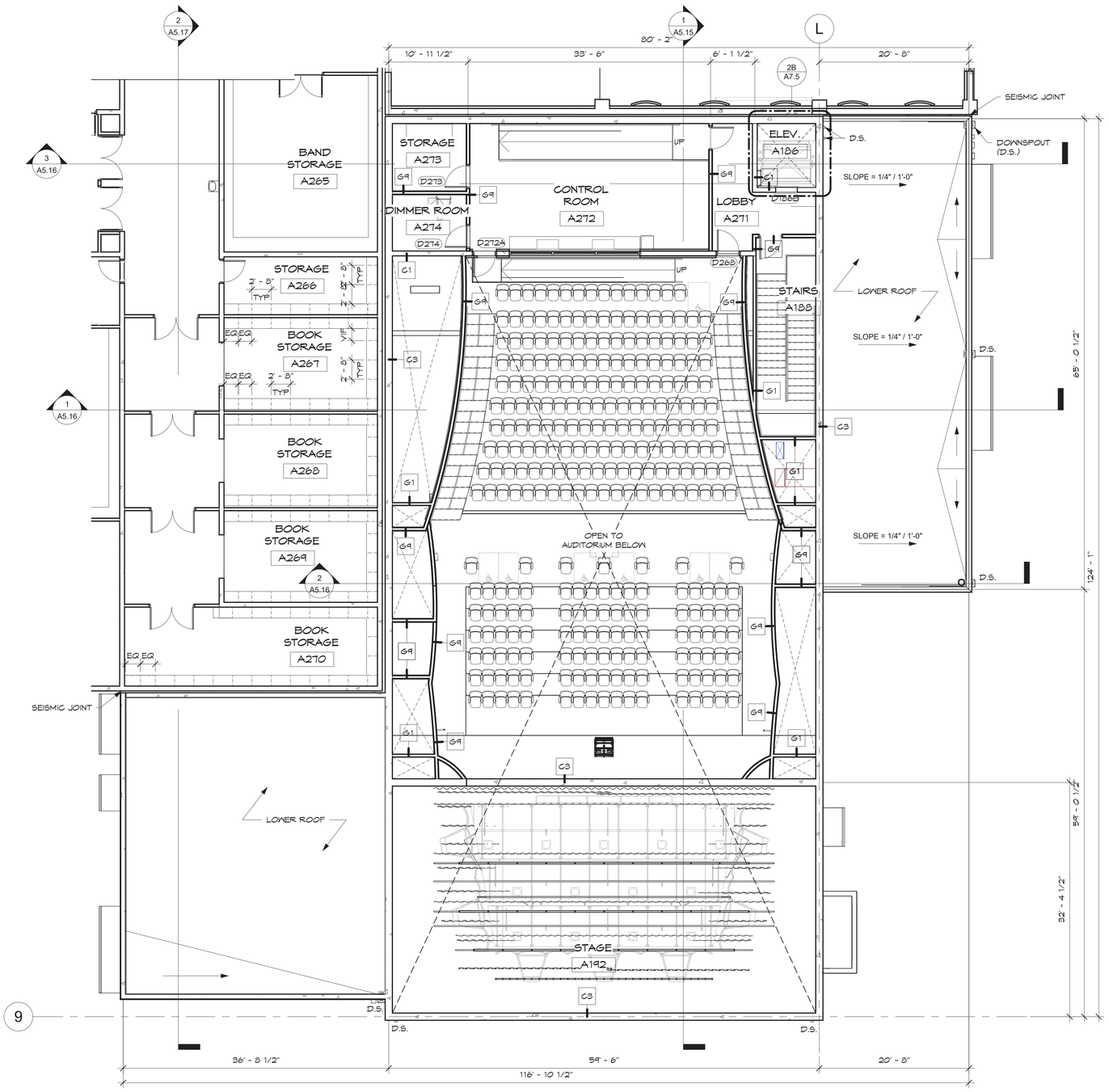
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
DANCE, CHOIR, BAND
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

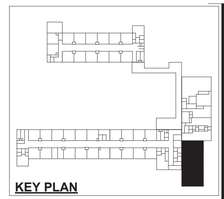
Drawing No.: A2.24

Sheet No. _____ of _____



1 AUDITORIUM LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM LEVEL 2 PLAN

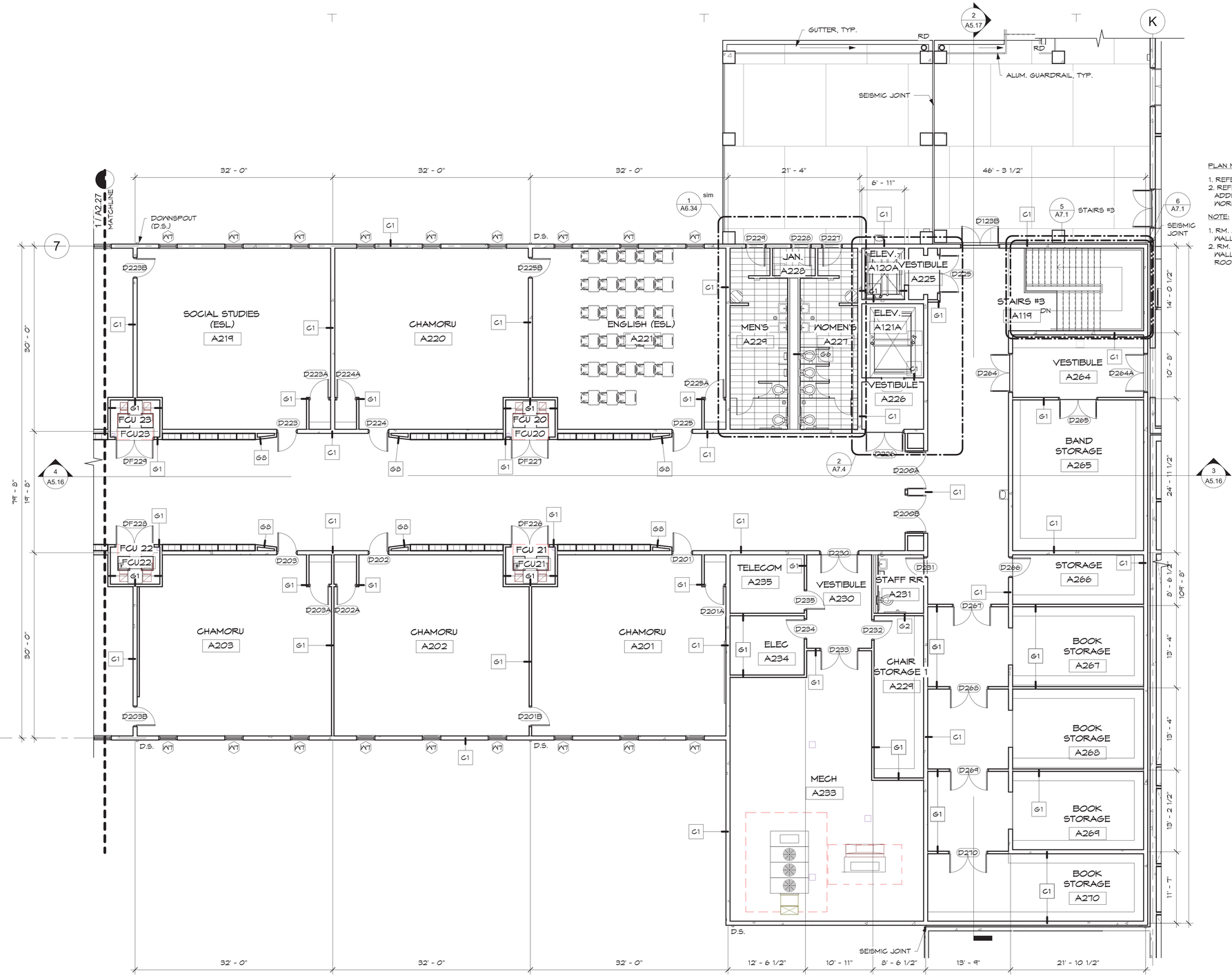
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

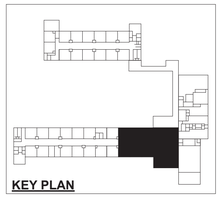
Drawing No.: A2.25

Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 A-WING LEVEL 2 PLAN
SCALE: 1/8" = 1'-0"



PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

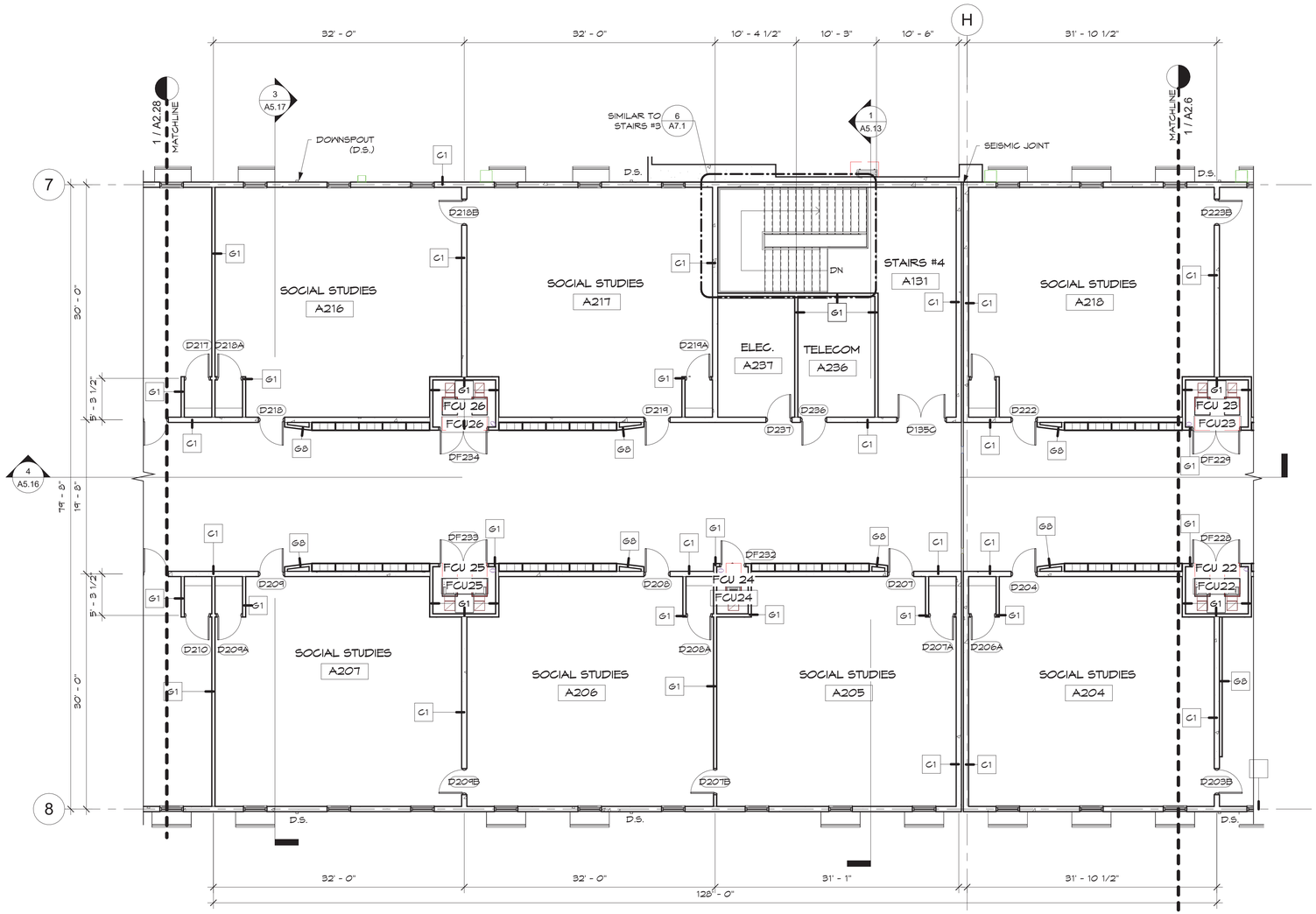
Project :
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title :
CLASSROOM PLANS A201 - A203, A219 - A221
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

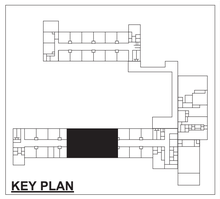
Drawing No.
A2.26
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 A-WING LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

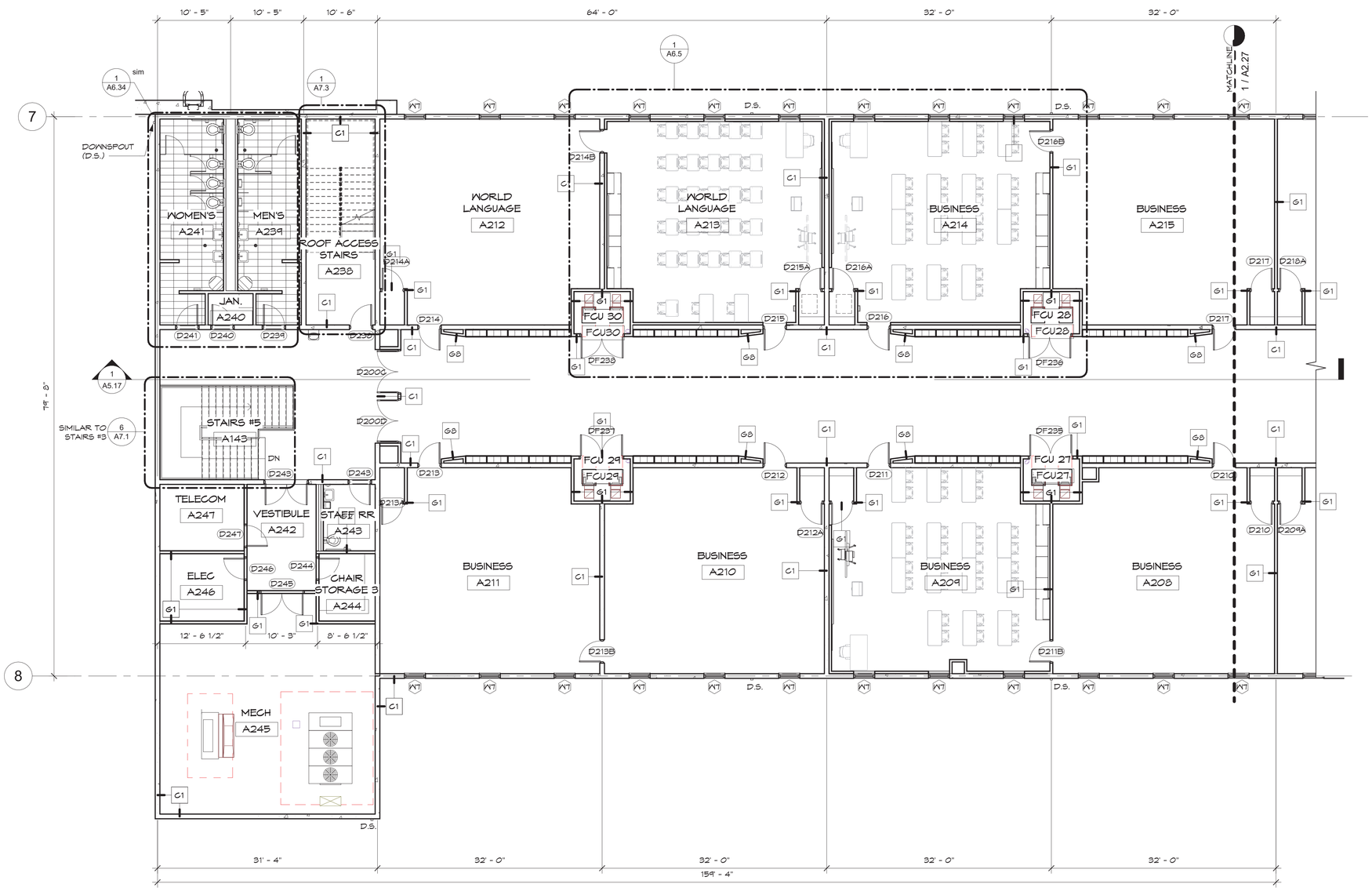
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS A204 - A207, A216 - A218
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

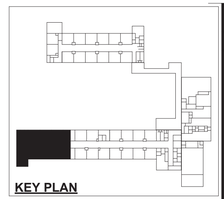
Drawing No.
A2.27

Sheet No. of



1 A-WING LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. A118 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS.
2. RM. A111 SHOWS TYPAL WALL FURRING FOR CONCRETE WALLS AT A-WING CLASSROOMS ADJACENT TO PREP ROOMS.

NORTH

0' 4' 8' 16'

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

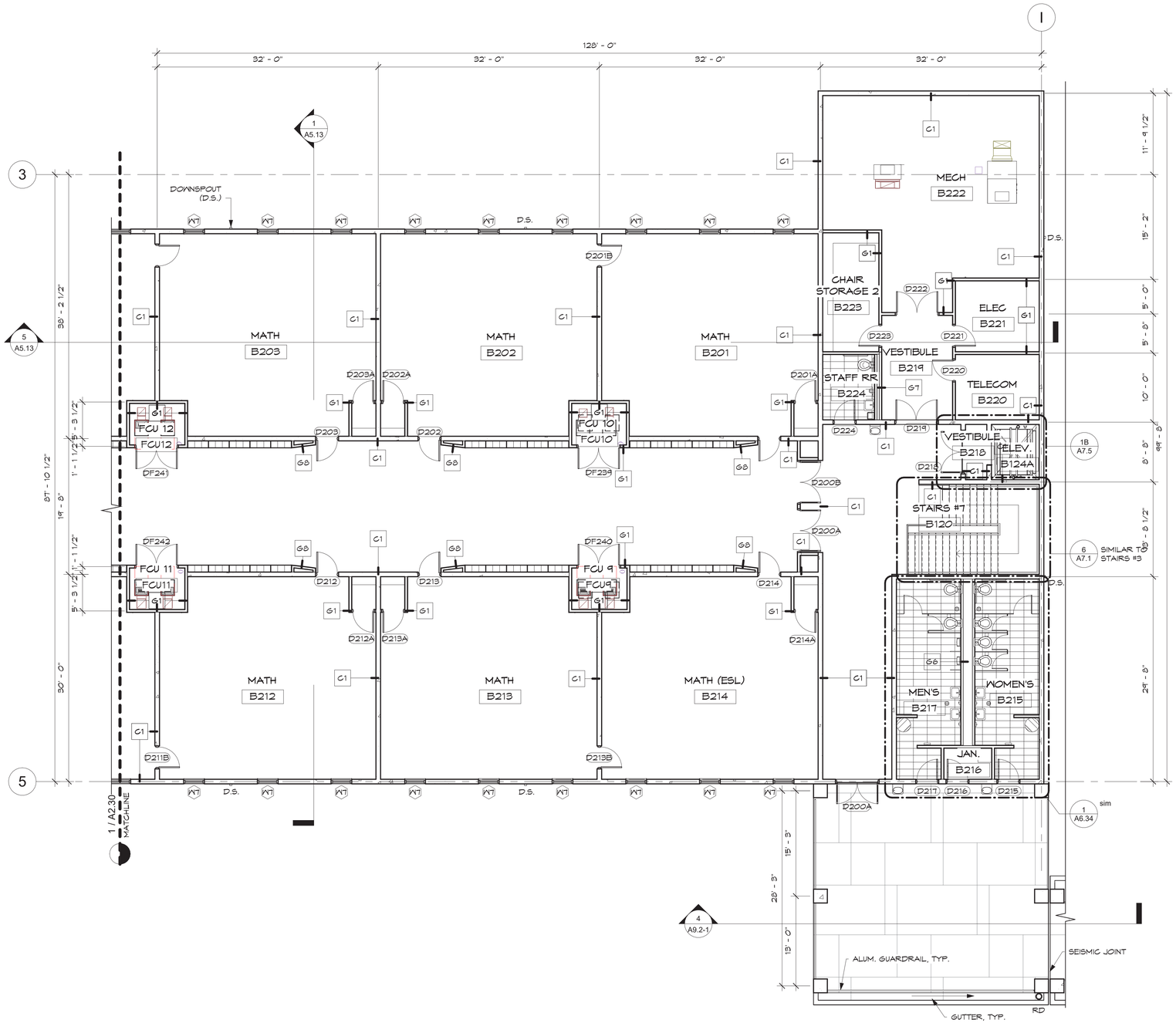
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
A208 - A215
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

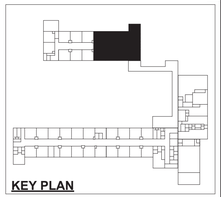
Drawing No.
A2.28

Sheet No. ____ of ____



1 B-WING LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. B107 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT B-WING CLASSROOMS.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

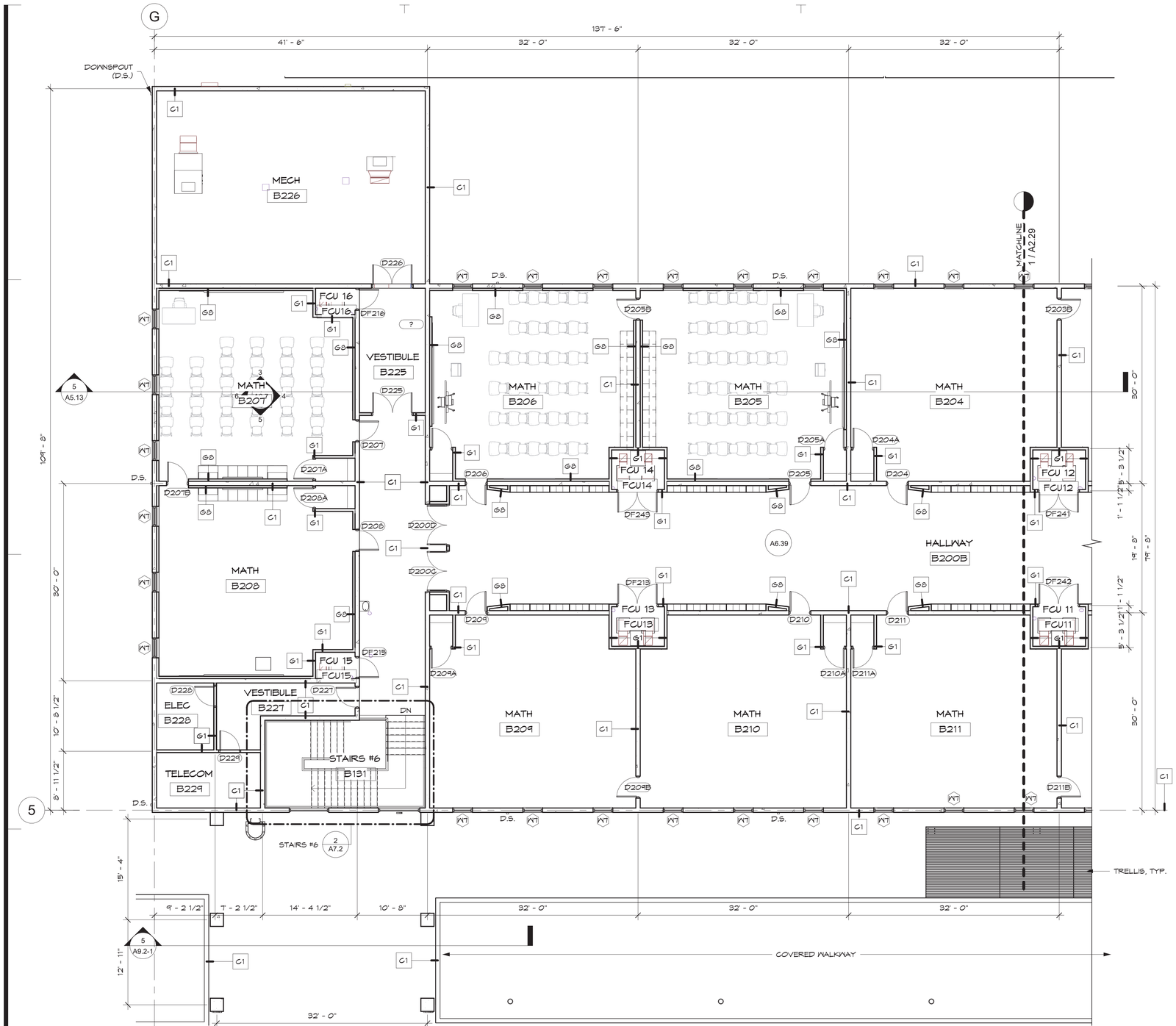
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
B201 - B203, B212 - B214
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

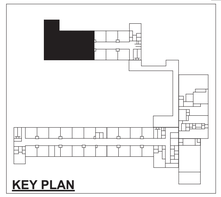
Drawing No.
A2.29

Sheet No. _____ of _____



1 B-WING LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

PLAN NOTES:

1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NOTE:

1. RM. B107 SHOWS TYPICAL WALL FURRING FOR CONCRETE WALLS AT B-WING CLASSROOMS.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects

100 Cliff Business Center, P.O. Box EA, Agana, GU 96910

Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM PLANS
B204 - B211

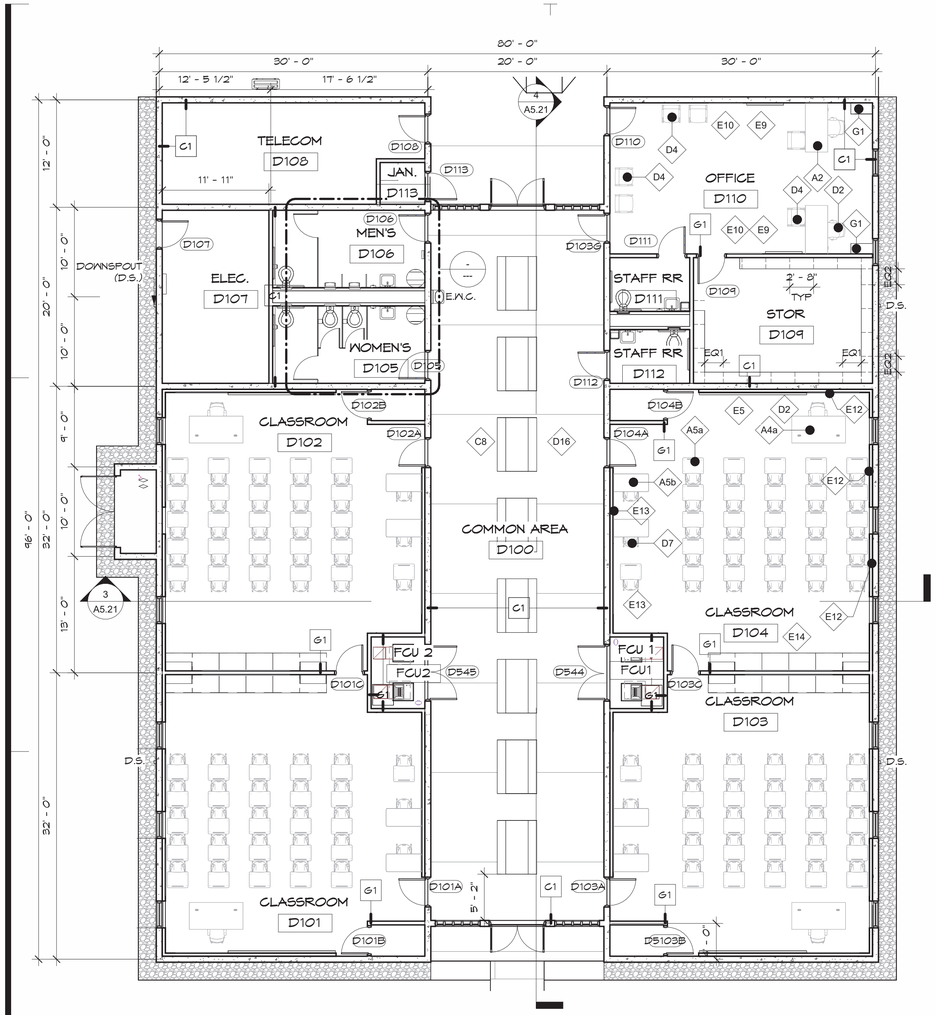
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

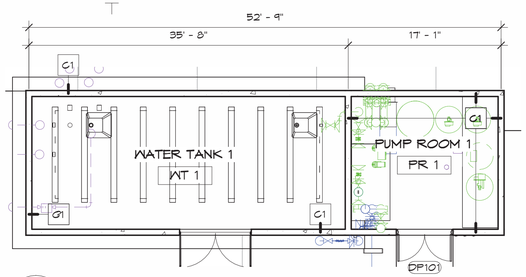
Drawing No.

A2.30

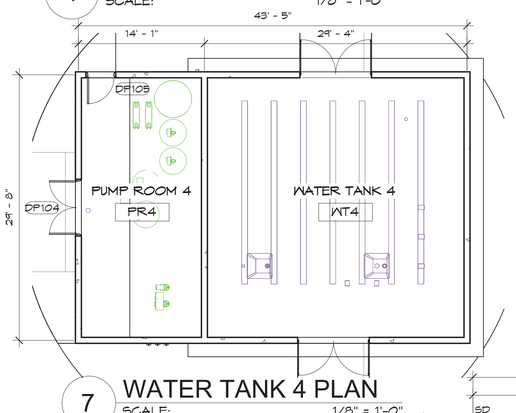
Sheet No. _____ of _____



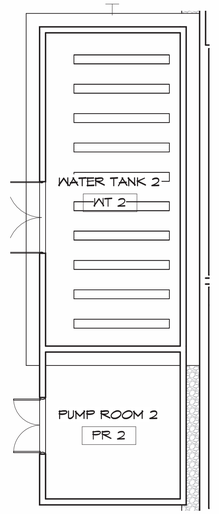
1 CREDIT RECOVERY PLAN
SCALE: 1/8" = 1'-0"



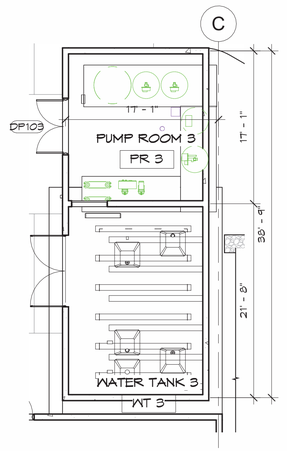
4 WATER TANK 1 PLAN
SCALE: 1/8" = 1'-0"



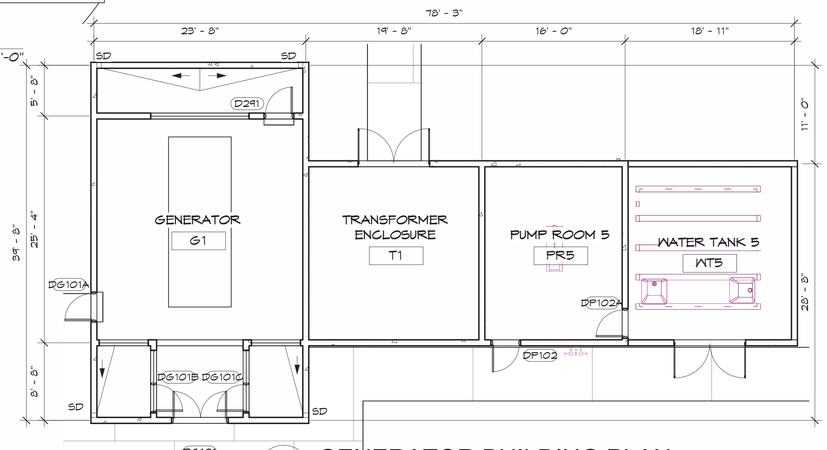
7 WATER TANK 4 PLAN
SCALE: 1/8" = 1'-0"



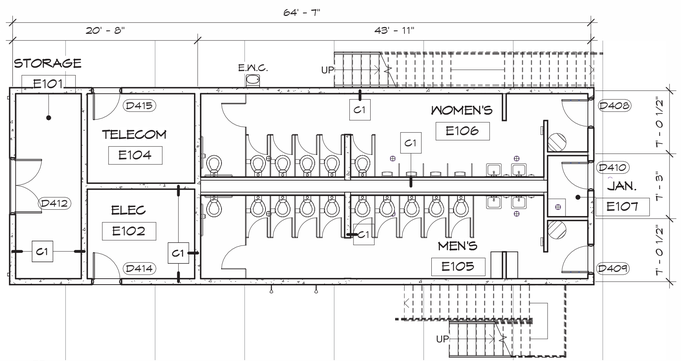
5 WATER TANK 2 PLAN
SCALE: 1/8" = 1'-0"



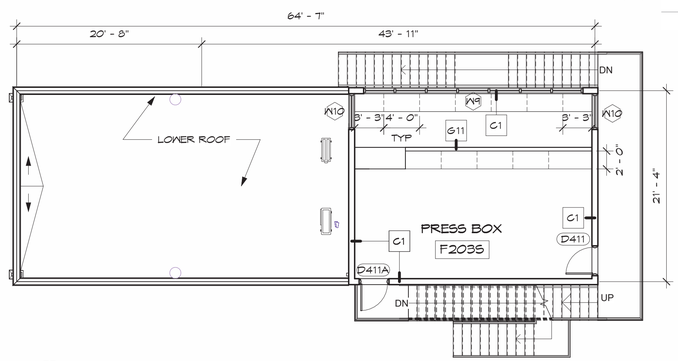
6 WATER TANK 3 PLAN
SCALE: 1/8" = 1'-0"



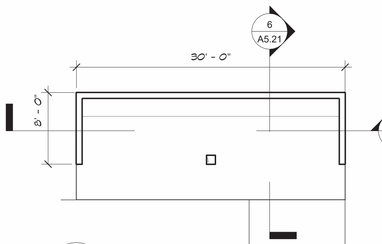
8 GENERATOR BUILDING PLAN
SCALE: 1/8" = 1'-0"



2 PRESS BOX LEVEL 1 PLAN
SCALE: 1/8" = 1'-0"



3 PRESS BOX LEVEL 2 PLAN
SCALE: 1/8" = 1'-0"



9 DUG OUT PLAN
SCALE: 1/8" = 1'-0"

PLAN NOTES:
1. REFER TO SITE PLAN NOTES.
2. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DESIGN REQUIREMENTS FOR ARCHITECTURAL WORK.

NORTH
0' 4' 8' 16'
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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REVISIONS

No.	Description	Date

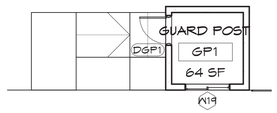
TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

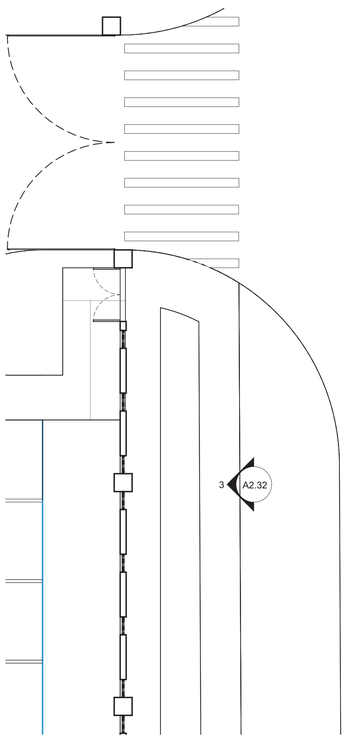
Title:
CREDIT RECOVERY, PRESS BOX, AND PUMP ROOM PLANS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

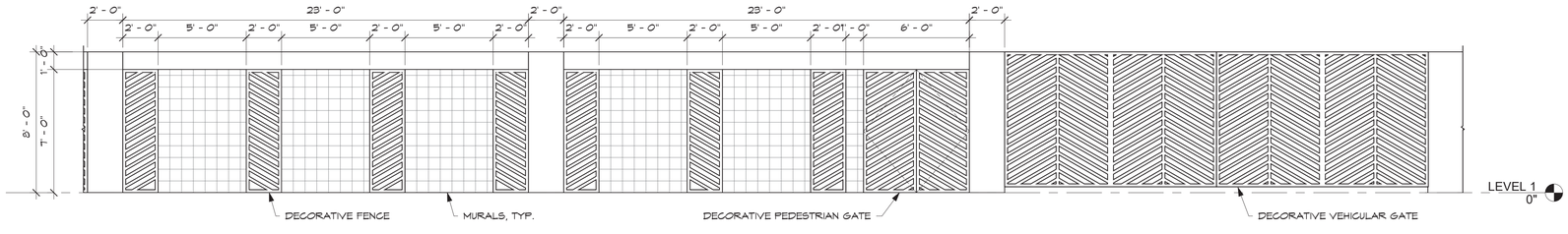
Drawing No.
A2.31
Sheet No. of



1 ENLARGED GUARD HOUSE PLAN
SCALE: 1/8" = 1'-0"



2 ENLARGED DECORATIVE GATE PLAN
SCALE: 1/8" = 1'-0"



3 DECORATIVE FENCE TYP. ELEVATION
SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

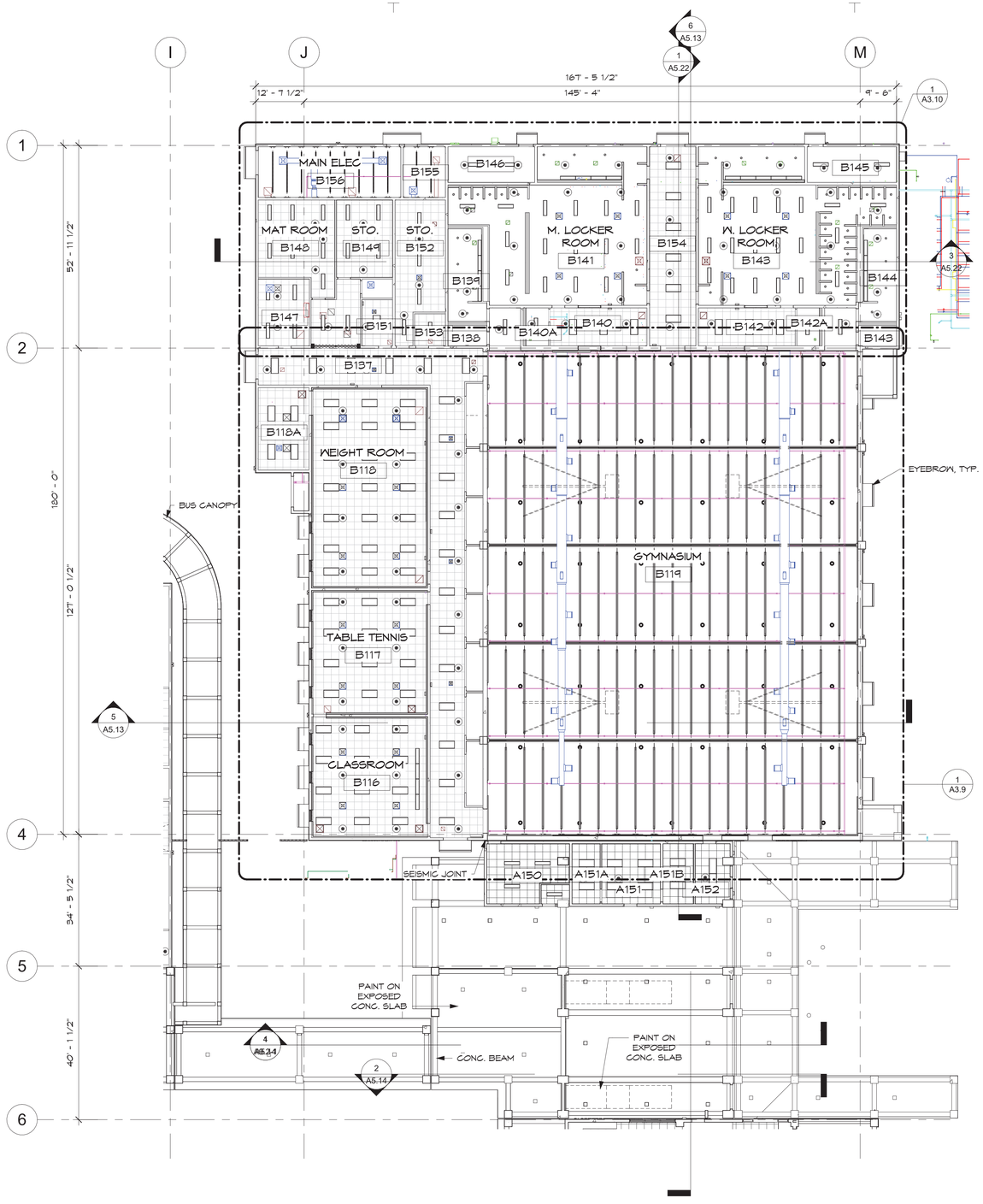
Title:
GUARD HOUSE, DECORATIVE FENCE

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	09/16/22
Project No.:	No.
File	

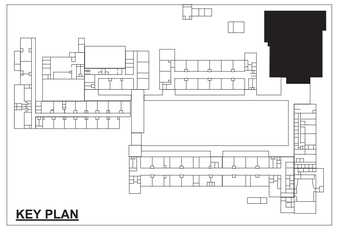
Drawing No.
A2.32

Sheet No. _____ of _____



1 B-WING GYMNASIUM LEVEL 1 RCP

SCALE: 1/16" = 1'-0"



KEY PLAN

LEGEND

- LIGHT, CEILING RECESS MOUNTED
- LIGHT, CEILING RECESS MOUNTED
- LIGHT, CEILING RECESS MOUNTED
- FIRE SPRINKLER, PENDENT
- MECHANICAL DIFFUSER

GYMNASIUM

A150	STO.
A150A	ELEC
A151	SRO
A151A	HOLDING ROOM
A151B	HOLDING ROOM
A152	TICKET BOOTH
B116	CLASSROOM
B117	TABLE TENNIS
B118	WEIGHT ROOM
B118A	AEROBICS ROOM
B119	GYMNASIUM
B119A	TICKET BOOTH
B137	HALLWAY
B138	FAMILY RR
B139	MEN'S
B140	M. PE'S OFFICE
B140A	STAFF RR
B141	M. LOCKER ROOM
B142	W. PE'S OFFICE
B142A	STAFF RR
B143	W. LOCKER ROOM
B143	FAMILY RR
B144	WOMEN'S
B145	SOLAR WATER HEATER
B146	SOLAR WATER HEATER
B147	TELECOM
B148	MAT ROOM
B149	STO.
B150	JAN.
B151	AD OFFICE
B152	STO.
B153	LAUNDRY ROOM
B154	HALLWAY
B155	ELEC
B156	MAIN ELEC

NORTH

0 8' 16' 32'

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-6772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP - B-WING GYMNASIUM LEVEL 1
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/16" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A3.1
Sheet No. of

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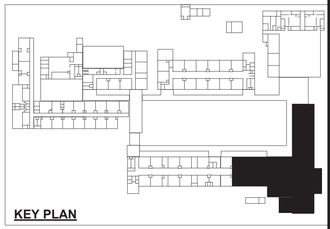

KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 1 (EAST)

A100A	VESTIBULE
A101	ART
A101A	ART STO.
A101B	ART STO.
A102	ART
A116	SCIENCE (ESL)
A117	HEALTH
A118	HEALTH
A120	VESTIBULE
A120A	ELEV.
A121	VESTIBULE
A121A	ELEV.
A122	WOMEN'S
A123	JAN.
A124	MEN'S
A125	INT. CORRIDOR
A126	STAFF RR
A127	STO.
A128	MECH
A129	ELEC
A130	TELECOM
A144	INT. CORRIDOR
A145	STAFF RR
A146	STO.
A179	WAITING
A181	CONF. RM
A182	CRT
A182A	CRT OFFICE
A182B	CRT OFFICE
A182C	STO.
A182D	CRT OFFICE
A182E	CRT OFFICE
A183	ESL
A183A	TESTING ROOM
A184	VESTIBULE
A200A	HALLWAY

ADMIN BUILDING

A153	LOBBY
A153A	RESTROOM
A154	HALLWAY
A155	PRINCIPAL
A156	AP
A157	AP
A158	AP
A159	AP
A160	SPED
A161	BUSINESS
A162	STO.
A163	CONFERENCE ROOM
A164	TELECOM
A165	OFFICE
A166	WORKROOM AND RESOURCE CENTER
A167	STO.
A168	ELEC
A169	FACULTY & STAFF LOUNGE
A170	MEN'S
A171	JAN.
A172	WOMEN'S
A173	VESTIBULE
A174	WAITING
A175	NURSE
A176	SICK BAY
A176A	RR
A177	ANTE
A177A	ISOLATION
A178	CUMULATIVE FOLDER STORAGE
A180	COUNSELORS
A180A	COUNSELOR'S OFFICE
A180B	COUNSELOR'S OFFICE
A180C	COUNSELOR'S OFFICE
A180D	COUNSELOR'S OFFICE
A180E	COUNSELOR'S OFFICE
A180F	COUNSELOR'S OFFICE
A180G	COUNSELOR'S OFFICE
A180H	COUNSELOR'S OFFICE

AUDITORIUM

A185	LOBBY
A185A	FAMILY RR
A185B	WOMEN'S
A185C	MEN'S
A185D	JAN
A186	ELEV.
A186	VESTIBULE
A186A	ELEC.
A186B	TELECOM
A187	STO.
A188	STAIRS
A189	OFFICE
A190	VESTIBULE
A191	AUDITORIUM
A192	STAGE
A193	BACKSTAGE
A194	DRESSING ROOM
A194A	DRESSING ROOM
A195	DRESSING ROOM
A195A	DRESSING ROOM
A196	VESTIBULE

1 **A-WING LEVEL 1 RCP**
SCALE: 1/16" = 1'-0"

NORTH 0 8' 16' 32'

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-6772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP - A-WING LEVEL 1 (EAST)
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
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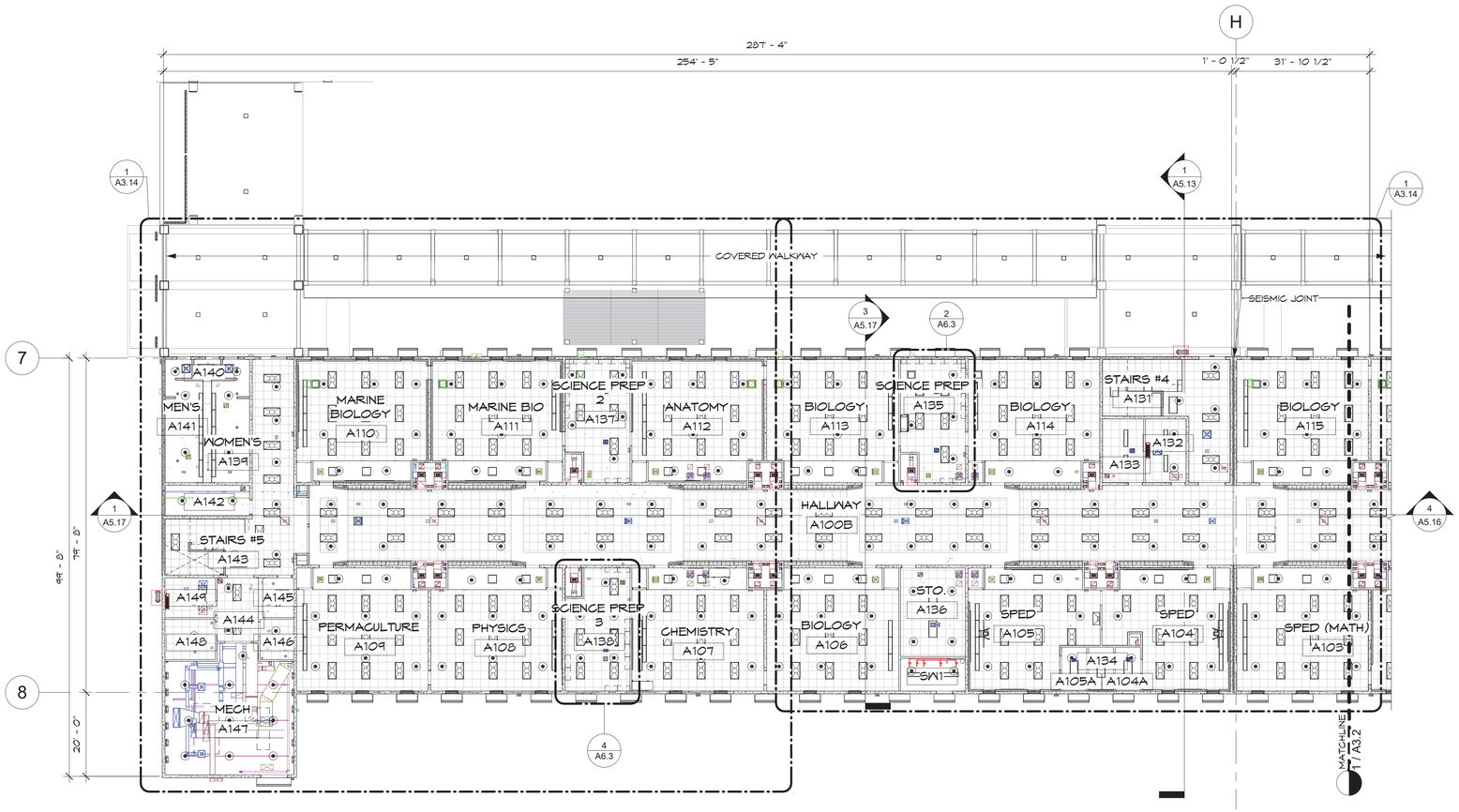
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

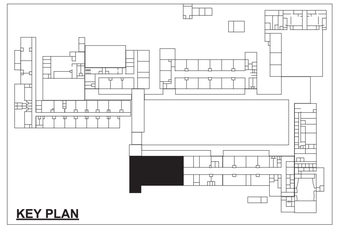
Drawing No.
A3.2

Sheet No. of



1 A-WING LEVEL 1 RCP

SCALE: 1/16" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 1 (CENTER)

A100B	HALLWAY
A103	SPED (MATH)
A104	SPED
A104A	SPED TOILET
A105	SPED
A105A	SPED TOILET
A106	BIOLOGY
A113	BIOLOGY
A114	BIOLOGY
A115	BIOLOGY
A132	TELECOM
A133	ELEC
A135	SCIENCE PREP 1
A136	STO.
SW1	SOLAR WATER HEATER

A-WING LEVEL 1 (WEST)

A100C	HALLWAY
A107	CHEMISTRY
A108	PHYSICS
A109	PERMACULTURE
A110	MARINE BIOLOGY
A111	MARINE BIO
A112	ANATOMY
A134	SPED SHO.
A137	SCIENCE PREP 2
A138	SCIENCE PREP 3
A139	WOMEN'S
A140	JAN.
A141	MEN'S
A142	SCIENCE STO.
A147	MECH
A148	ELEC
A149	TELECOM

NORTH 0 8' 16' 32'

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REVISIONS

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP - A-WING LEVEL 1 (WEST)
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	NO.
File	

Drawing No.
A3.3
Sheet No. ____ of ____

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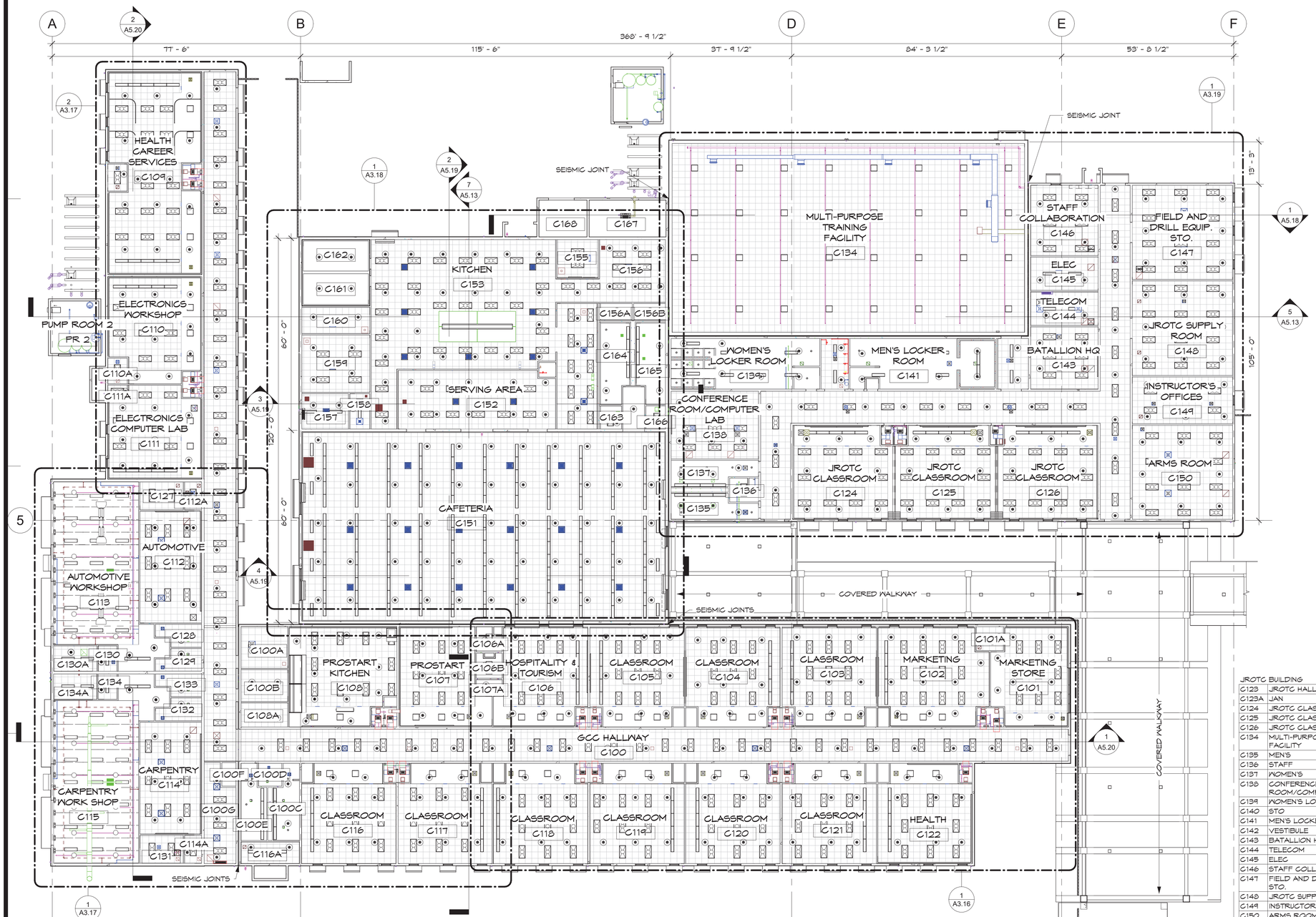
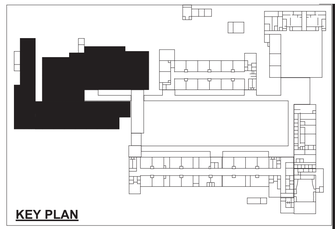


1 C-WING LEVEL 1 RCP

SCALE: 1/16" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

GCC BUILDING	
C100	GCC HALLWAY
C107	GCC (HCS)
GCC BUILDING (EAST)	
C101	MARKETING STORE
C101A	STO.
C102	MARKETING
C103	CLASSROOM
C104	CLASSROOM
C105	CLASSROOM
C106	HOSPITALITY & TOURISM
C106A	MOCK RESTROOM
C106B	LAUNDRY AREA
C106C	WATER HEATER 1
C107A	STO.
C118	CLASSROOM
C119	CLASSROOM
C120	CLASSROOM
C121	CLASSROOM
C122	HEALTH
GCC BUILDING (WEST)	
C100A	ELEC.
C100B	STO.
C100C	MEN'S
C100D	STAFF
C100E	WOMEN'S
C100F	JAN.
C100G	TELECOM
C107	PROSTART
C108	PROSTART KITCHEN
C108A	PANTRY
C108B	JAN.
C109	HEALTH CAREER SERVICES
C109A	STO.
C110	ELECTRONICS WORKSHOP
C110A	STO.
C111	ELECTRONICS COMPUTER LAB
C111A	MOCK IDF
C112	AUTOMOTIVE
C112A	STO.
C113	AUTOMOTIVE WORKSHOP
C114	CARPENTRY
C114A	STO.
C115	CARPENTRY WORK SHOP
C116	CLASSROOM
C116A	STO.
C117	CLASSROOM
C127	AUTO MOTIVE OFFICE
C128	WOMEN'S
C129	MEN'S
C130	VESTIBULE
C130A	AIR COMPRESSOR
C131	CARPENTRY OFFICE
C132	WOMEN'S
C133	MEN'S
C134	VESTIBULE
C134A	AIR COMPRESSOR

JROTC BUILDING	
C123	JROTC HALLWAY
C123A	JAN
C124	JROTC CLASSROOM
C125	JROTC CLASSROOM
C126	JROTC CLASSROOM
C134	MULTI-PURPOSE TRAINING FACILITY
C135	MEN'S
C136	STAFF
C137	WOMEN'S
C138	CONFERENCE ROOM/COMPUTER LAB
C139	WOMEN'S LOCKER ROOM
C140	STO
C141	MEN'S LOCKER ROOM
C142	VESTIBULE
C143	BATALLION HQ
C144	TELEGOM
C145	ELEC
C146	STAFF COLLABORATION
C147	FIELD AND DRILL EQUIP. STO.
C148	JROTC SUPPLY ROOM
C149	INSTRUCTOR'S OFFICES
C150	ARMS ROOM

CAFETERIA	
C151	CAFETERIA
C152	SERVING AREA
C153	KITCHEN
C153A	WATER HEATER
C154	SCULLERY
C155	OFFICE
C156	KITCHEN STAFF LOUNGE
C156A	WOMEN'S
C156B	MEN'S
C157	TELEGOM
C158	ELEC
C159	PANTRY
C160	STOR
C161	REFRIGERATOR
C162	FREEZER
C163	STAFF
C164	WOMEN'S
C165	MEN'S
C166	JAN.
C167	ELEC
C168	TRANSFORMER ENCLOSURE

NORTH

0 8' 16' 32'

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No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP - C-WING LEVEL 1

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
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Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A3.4

Sheet No. _____ of _____

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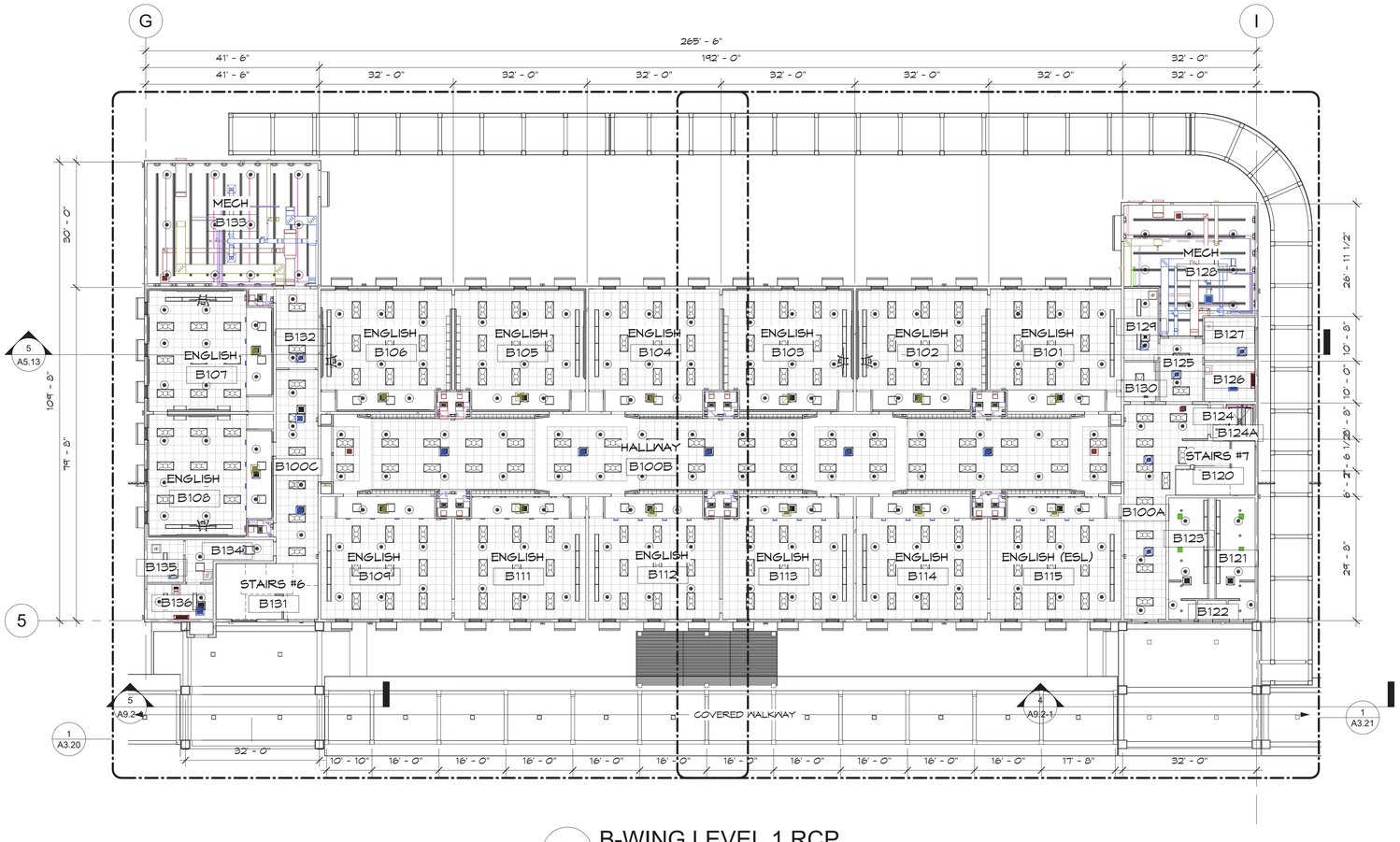
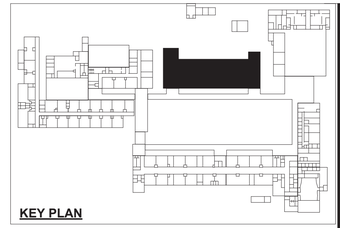


1 B-WING LEVEL 1 RCP

SCALE: 1/16" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

B-WING LEVEL 1	
B100A	VESTIBULE
B100B	HALLWAY
B100C	VESTIBULE
B-WING LEVEL 1 (EAST)	
B101	ENGLISH
B102	ENGLISH
B103	ENGLISH
B113	ENGLISH
B114	ENGLISH
B115	ENGLISH (ESL)
B120	STAIRS #7
B121	WOMEN'S
B122	JAN.
B123	MEN'S
B124	VESTIBULE
B124A	ELEV.
B125	VESTIBULE
B126	TELECOM
B127	ELEC
B128	MECH
B129	STO.
B130	STAFF RR
B-WING LEVEL 1 (WEST)	
B104	ENGLISH
B105	ENGLISH
B106	ENGLISH
B107	ENGLISH
B108	ENGLISH
B109	ENGLISH
B111	ENGLISH
B112	ENGLISH
B131	STAIRS #6
B132	VESTIBULE
B133	MECH
B134	VESTIBULE
B135	ELEC
B136	TELECOM

NORTH 0 8' 16' 32'

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP - B-WING LEVEL 1
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.
A3.5
Sheet No. ____ of ____

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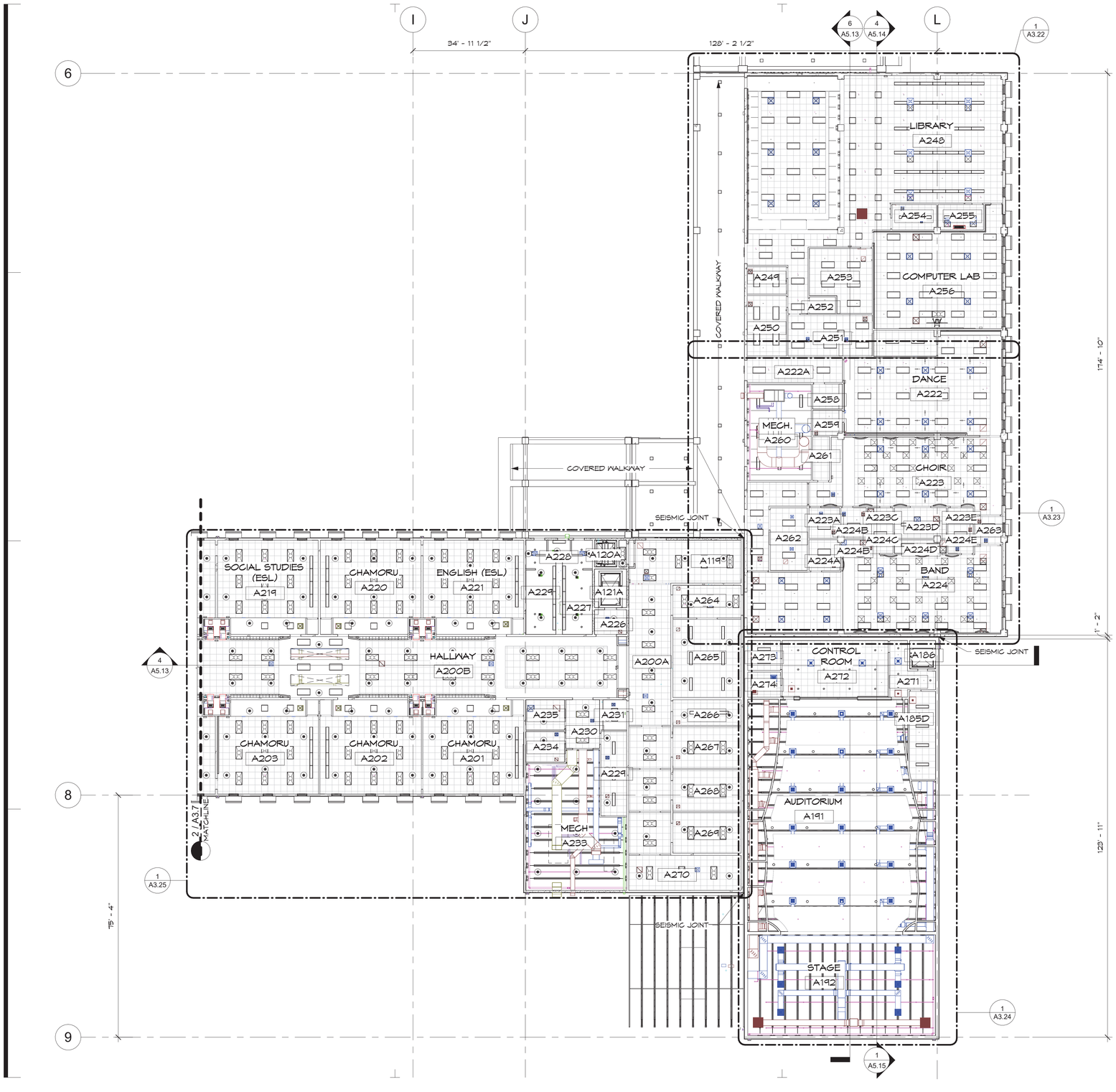

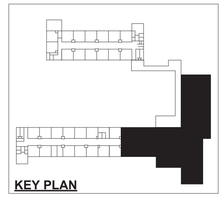

KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

ADMIN BUILDING LEVEL 2

A222	DANCE
A222A	VESTIBULE
A223	CHOIR
A223A	OFFICE
A223C	STOR.
A223D	STOR.
A223E	STOR.
A224	BAND
A224A	OFFICE
A224B	PRACTICE ROOM
A224B	STOR.
A224C	PRACTICE ROOM
A224D	STOR.
A224E	PRACTICE ROOM
A248	LIBRARY
A249	LIBRARIAN
A250	TECH.
A251	BOOK ROOM
A252	STAFF RR
A253	MEDIA CENTER
A254	ELEC.
A255	TELECOM
A256	COMPUTER LAB
A257	STOR.
A258	ELEC
A259	STOR.
A259	VESTIBULE
A260	MECH.
A261	STOR.
A262	RECORDING ROOM
A263	VESTIBULE

AUDITORIUM LEVEL 2

A271	LOBBY
A273	STORAGE
A274	DIMMER ROOM
A272	CONTROL ROOM

A-WING LEVEL 2 (EAST)

A201	CHAMORU
A202	CHAMORU
A203	CHAMORU
A219	SOCIAL STUDIES (ESL)
A220	CHAMORU
A221	ENGLISH (ESL)
A225	VESTIBULE
A226	VESTIBULE
A227	WOMEN'S
A228	JAN.
A229	MEN'S
A229	CHAIR STORAGE 1
A230	VESTIBULE
A231	STAFF RR
A233	MECH
A234	ELEC
A235	TELECOM
A264	VESTIBULE
A265	BAND STORAGE
A266	STORAGE
A267	BOOK STORAGE
A268	BOOK STORAGE
A269	BOOK STORAGE
A270	BOOK STORAGE

1 A-WING LEVEL 2 RCP
SCALE: 1/16" = 1'-0"

NORTH 0 8' 16' 32'

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

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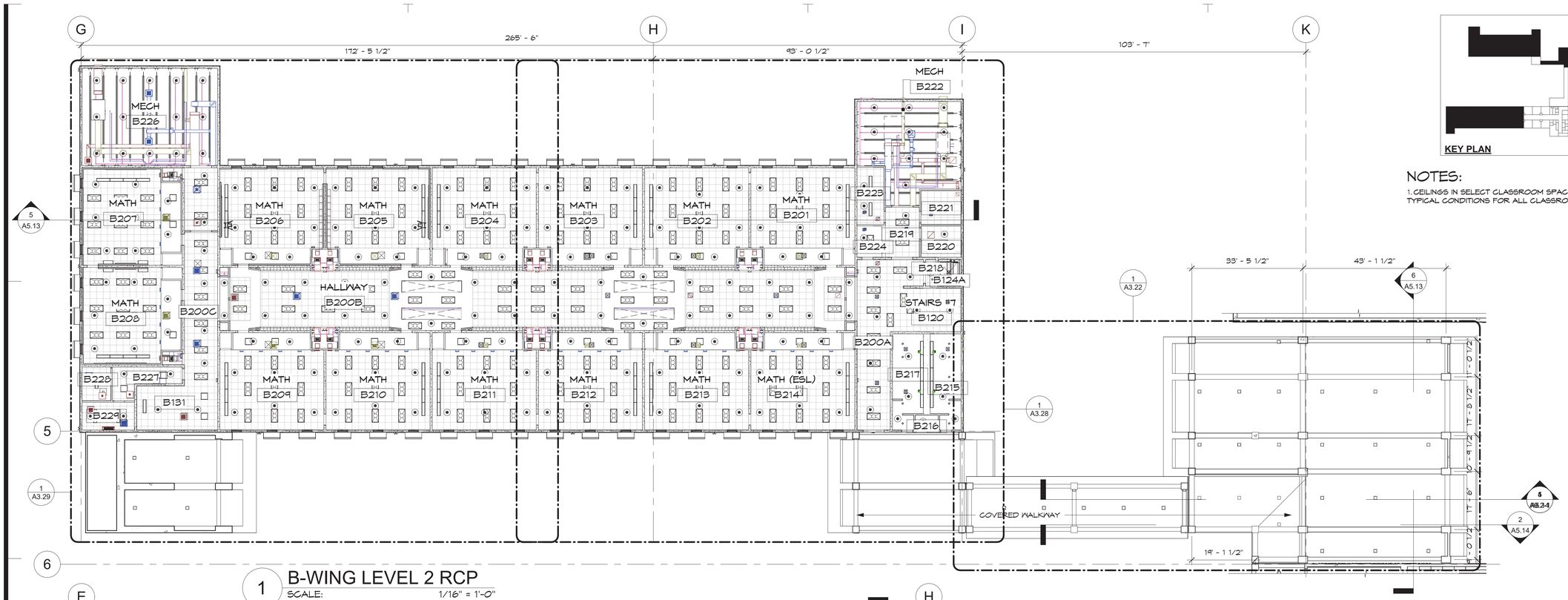
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP- A-WING LEVEL 2 (EAST)
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A3.6
Sheet No. ____ of ____

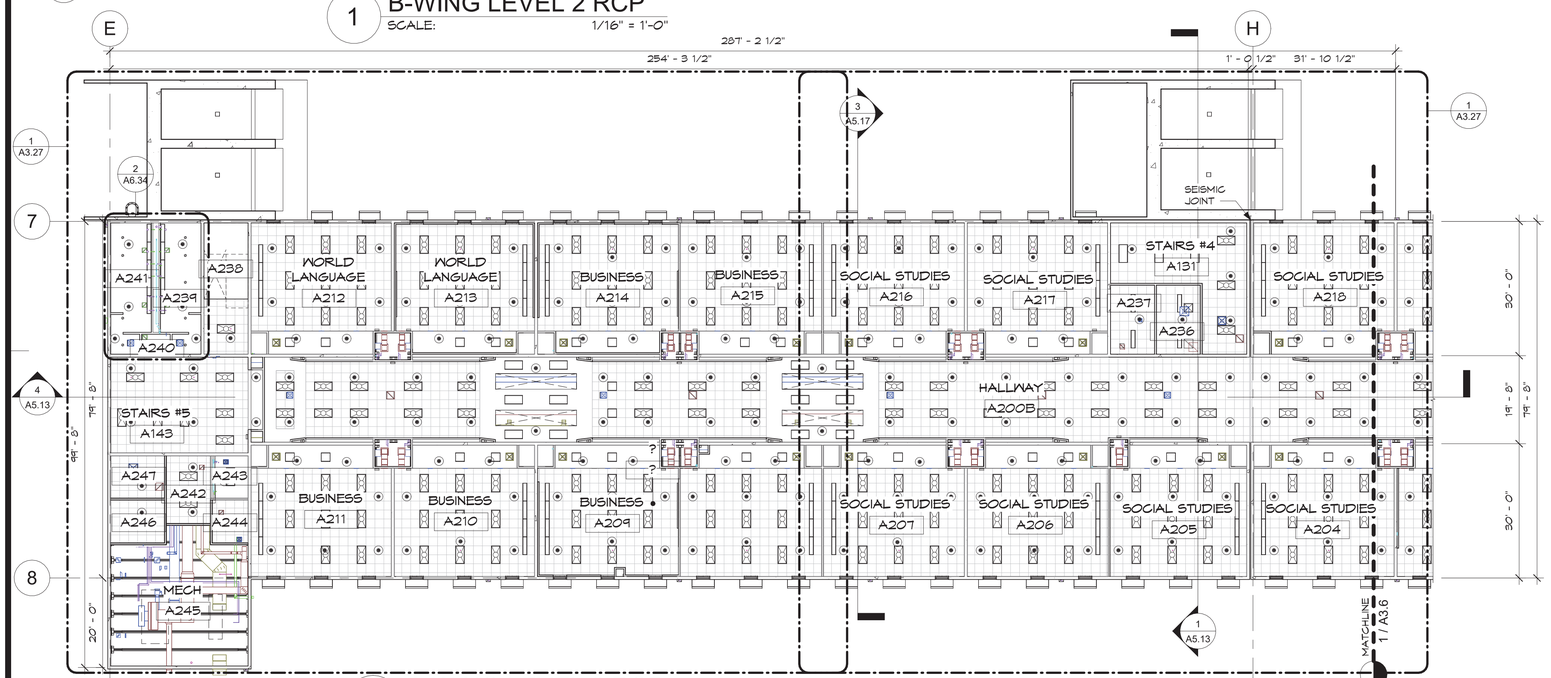


NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

1 B-WING LEVEL 2 RCP

SCALE: 1/16" = 1'-0"



2 A-WING LEVEL 2 RCP

SCALE: 1/16" = 1'-0"

B-WING LEVEL 2	
B200A	HALLWAY
B200B	HALLWAY
B200C	HALLWAY
B-WING LEVEL 2 (EAST)	
B201	MATH
B202	MATH
B203	MATH
B212	MATH
B213	MATH
B214	MATH (ESL)
B215	WOMEN'S
B216	JAN.
B217	MEN'S
B218	VESTIBULE
B219	VESTIBULE
B220	TELECOM
B221	ELEC
B222	MECH
B223	CHAIR STORAGE 2
B224	STAFF RR
FCU9	FCU 9
FCU10	FCU 10
FCU11	FCU 11
FCU12	FCU 12
B-WING LEVEL 2 (WEST)	
B204	MATH
B205	MATH
B206	MATH
B207	MATH
B208	MATH
B209	MATH
B210	MATH
B211	MATH
B225	VESTIBULE
B226	MECH
B227	VESTIBULE
B228	ELEC
B229	TELECOM
FCU13	FCU 13
FCU14	FCU 14
FCU15	FCU 15
FCU16	FCU 16

A-WING LEVEL 2 (WEST)	
A215	BUSINESS
A214	BUSINESS
A208	BUSINESS
A209	BUSINESS
A210	BUSINESS
A212	WORLD LANGUAGE
A213	WORLD LANGUAGE
A211	BUSINESS
A245	MECH
A247	TELECOM
A246	ELEC
A243	STAFF RR
A241	WOMEN'S
A239	MEN'S
A240	JAN.
A238	ROOF ACCESS STAIRS
A242	VESTIBULE
A244	CHAIR STORAGE 3
A200C	HALLWAY
A-WING LEVEL 2 (CENTER)	
A207	SOCIAL STUDIES
A204	SOCIAL STUDIES
A218	SOCIAL STUDIES
A216	SOCIAL STUDIES
A205	SOCIAL STUDIES
A206	SOCIAL STUDIES
A217	SOCIAL STUDIES
A231	ELEC
A236	TELECOM
A200B	HALLWAY

NORTH

0 8' 16' 32'

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
Planning
Interior Design

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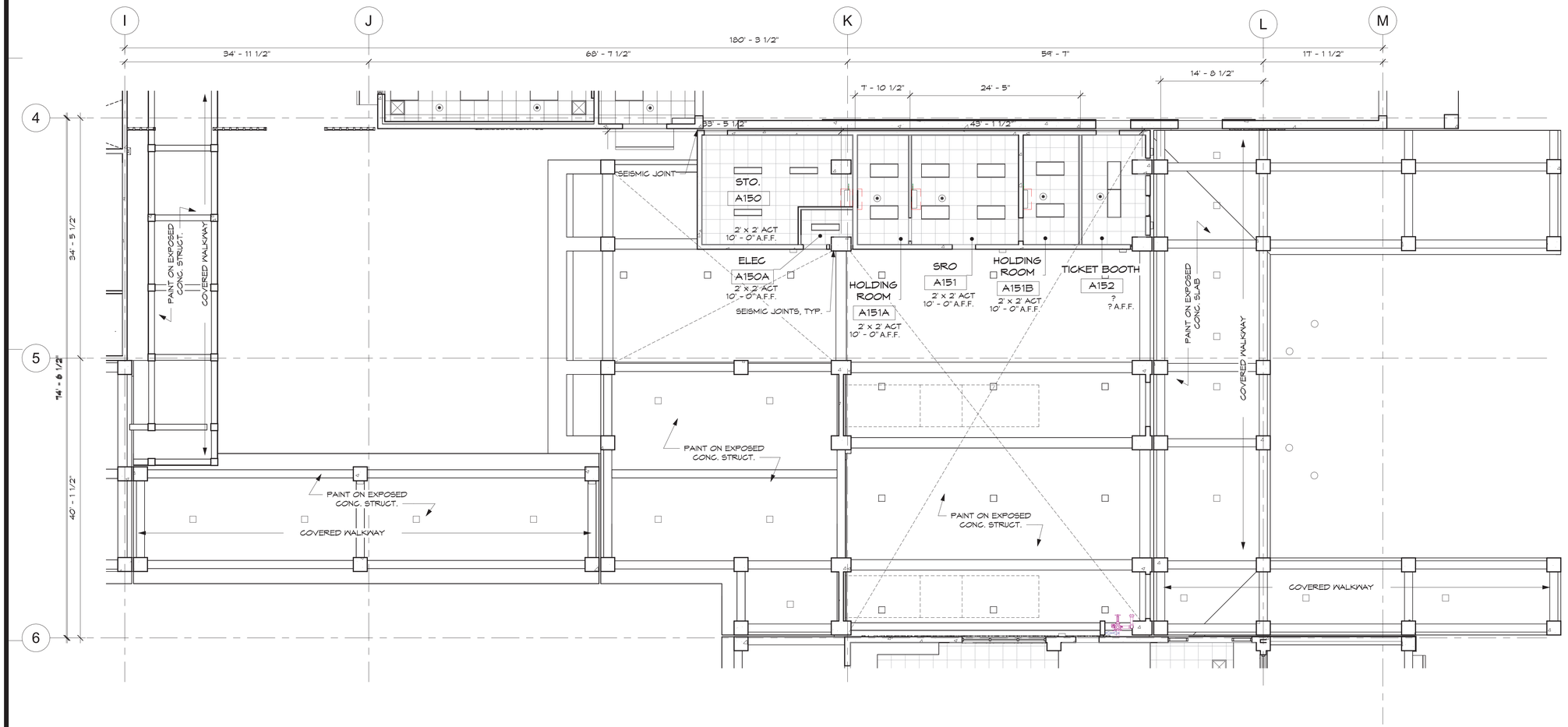
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCPS - B-WING & A-WING (WEST) LEVEL 2
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File:	

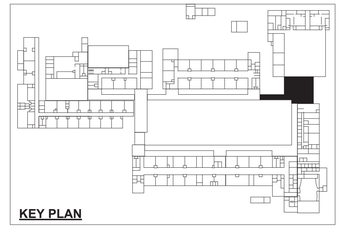
Drawing No.:
A3.7

Sheet No. _____ of _____



1 MAIN ENTRANCE LEVEL 1 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH 0' 4' 8' 16'

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No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED RCP - MAIN ENTRANCE LEVEL 1
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A3.8
Sheet No. of

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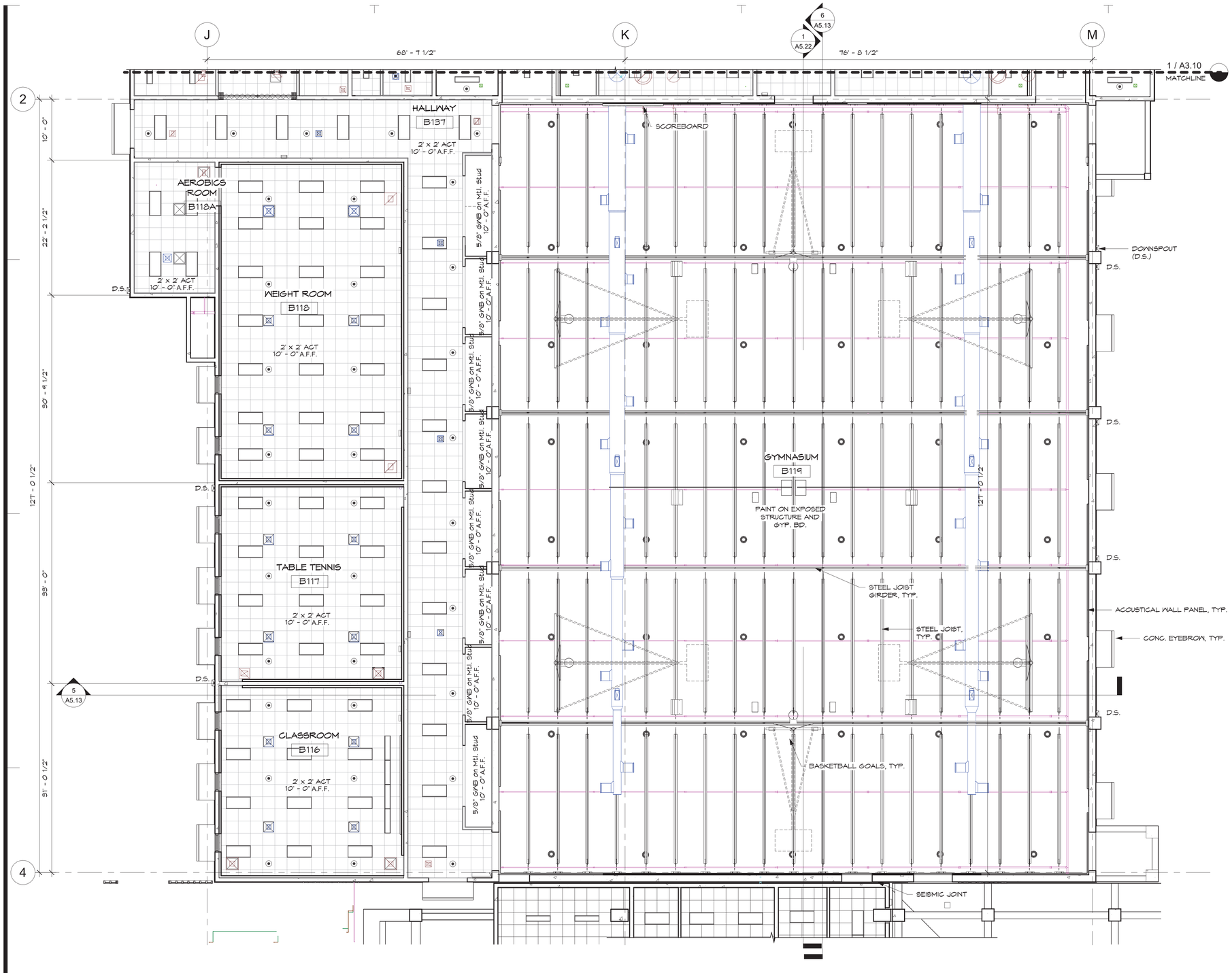
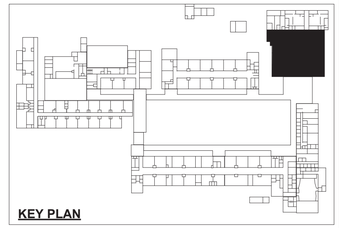


1 GYMNASIUM RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

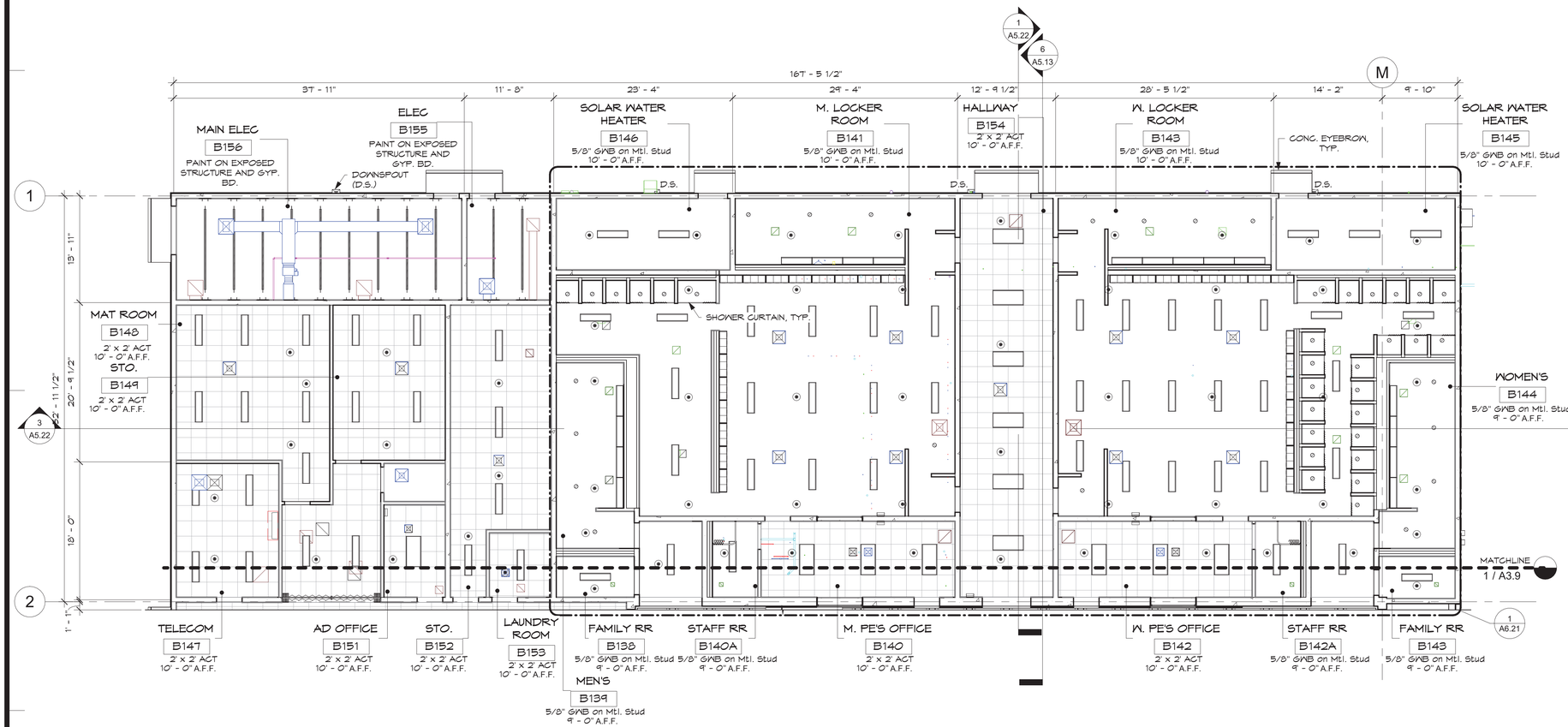
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM RCP
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

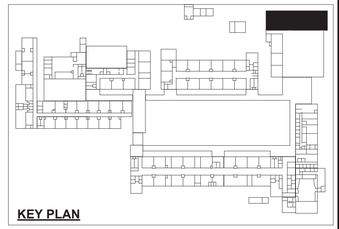
Drawing No.
A3.9
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 GYMNASIUM LOCKER ROOMS RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM LOCKER ROOMS RCP
PROGRAMMING DOCUMENT

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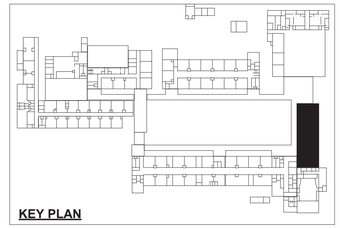
Date:	3/31/25
Project No.: No.	File

Drawing No.
A3.10
Sheet No. ____ of ____



1 ADMIN. OFFICES RCP
SCALE: 1/8" = 1'-0"



KEY PLAN

ADMIN BUILDING	
A153	LOBBY
A153A	RESTROOM
A154	HALLWAY
A155	PRINCIPAL
A156	AP
A157	AP
A158	AP
A159	AP
A160	SPED
A161	BUSINESS
A162	STO.
A163	CONFERENCE ROOM
A164	TELECOM
A165	OFFICE
A166	WORKROOM AND RESOURCE CENTER
A167	STO.
A168	ELEC
A169	FACULTY & STAFF LOUNGE
A170	MEN'S
A171	JAN.
A172	WOMEN'S
A173	VESTIBULE
A174	WAITING
A175	NURSE
A176	SICK BAY
A176A	RR
A177	ANTE
A177A	ISOLATION
A178	CUMULATIVE FOLDER STORAGE
A180	COUNSELORS
A180A	COUNSELOR'S OFFICE
A180B	COUNSELOR'S OFFICE
A180C	COUNSELOR'S OFFICE
A180D	COUNSELOR'S OFFICE
A180E	COUNSELOR'S OFFICE
A180F	COUNSELOR'S OFFICE
A180G	COUNSELOR'S OFFICE
A180H	COUNSELOR'S OFFICE

NORTH
0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ADMIN. OFFICES RCP
PROGRAMMING DOCUMENT

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Checked:	RM/TP
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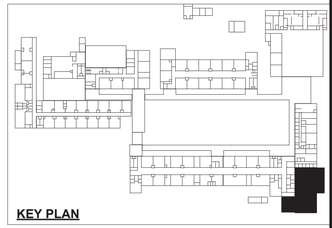
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A3.11
Sheet No. ____ of ____



NOTE:: GYP. BD. FURRING IS CONTINUOUS ABOVE AUDITORIUM CEILING CLOUDS



KEY PLAN

A-WING LEVEL 1 (EAST)

A100A	VESTIBULE
A101	ART
A101A	ART STO.
A101B	ART STO.
A102	ART
A116	SCIENCE (ESL)
A117	HEALTH
A118	HEALTH
A120	VESTIBULE
A120A	ELEV.
A121	VESTIBULE
A121A	ELEV.
A122	WOMEN'S
A123	JAN.
A124	MEN'S
A125	INT. CORRIDOR
A126	STAFF RR
A127	STO.
A128	MECH
A129	ELEC
A130	TELECOM
A144	INT. CORRIDOR
A145	STAFF RR
A146	STO.
A179	WAITING

ADMIN BUILDING

A178	CUMULATIVE FOLDER STORAGE
A180	COUNSELORS
A180A	COUNSELOR'S OFFICE
A180B	COUNSELOR'S OFFICE
A180C	COUNSELOR'S OFFICE
A180D	COUNSELOR'S OFFICE
A180E	COUNSELOR'S OFFICE
A180F	COUNSELOR'S OFFICE
A180G	COUNSELOR'S OFFICE
A180H	COUNSELOR'S OFFICE

AUDITORIUM

A185	LOBBY
A185A	FAMILY RR
A185B	WOMEN'S
A185C	MEN'S
A185D	JAN
A186	ELEV.
A186	VESTIBULE
A186A	ELEC.
A186B	TELECOM
A187	STO.
A188	STAIRS
A189	OFFICE
A190	VESTIBULE
A191	AUDITORIUM
A192	STAGE
A193	BACKSTAGE
A194	DRESSING ROOM
A194A	DRESSING ROOM
A195	DRESSING ROOM
A195A	DRESSING ROOM
A196	VESTIBULE

A-WING & AUDITORIUM LEVEL 1 RCP

1 SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'

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Architecture
Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM LEVEL 1 RCP
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.: No.	File

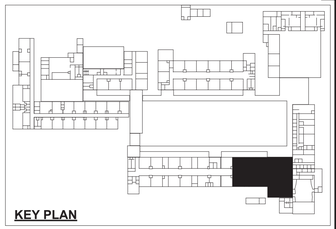
Drawing No.: A3.12
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 A-WING LEVEL 1 RCP
SCALE: 1/8" = 1'-0"

2 ATL. DESIGN - VESTIBULE A184 RCP
SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 1 (EAST)

A100A	VESTIBULE
A101	ART
A101A	ART STO.
A101B	ART STO.
A102	ART
A116	SCIENCE (ESL)
A117	HEALTH
A118	HEALTH
A120	VESTIBULE
A120A	ELEV.
A121	VESTIBULE
A121A	ELEV.
A122	WOMEN'S
A123	JAN.
A124	MEN'S
A125	INT. CORRIDOR
A126	STAFF RR
A127	STO.
A128	MECH
A129	ELEC
A130	TELECOM
A144	INT. CORRIDOR
A145	STAFF RR
A146	STO.
A179	WAITING
A181	CONF. RM
A182	CRT
A182A	CRT OFFICE
A182B	CRT OFFICE
A182C	STO.
A182D	CRT OFFICE
A182E	CRT OFFICE
A183	ESL
A183A	TESTING ROOM
A184	VESTIBULE
A200A	HALLWAY

NORTH 0' 4' 8' 16'

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Architecture
Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CLASSROOM RCPS A101 - A102, A116 - A118
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No. A3.13

Sheet No. ____ of ____

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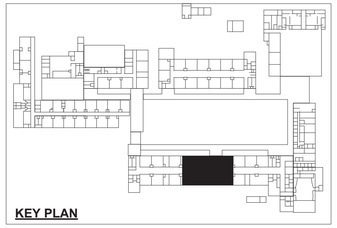
1 A-WING LEVEL 1 RCP
SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 1 (CENTER)	
A100B	HALLWAY
A103	SPED (MATH)
A104	SPED
A104A	SPED TOILET
A105	SPED
A105A	SPED TOILET
A106	BIOLOGY
A113	BIOLOGY
A114	BIOLOGY
A115	BIOLOGY
A132	TELECOM
A133	ELEC
A135	SCIENCE PREP 1
A136	STO.
SW1	SOLAR WATER HEATER

NORTH 0' 4' 8' 16'

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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: CLASSROOM RCPS A103 - A105, A114 - A115
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No. A3.14

Sheet No. ____ of ____

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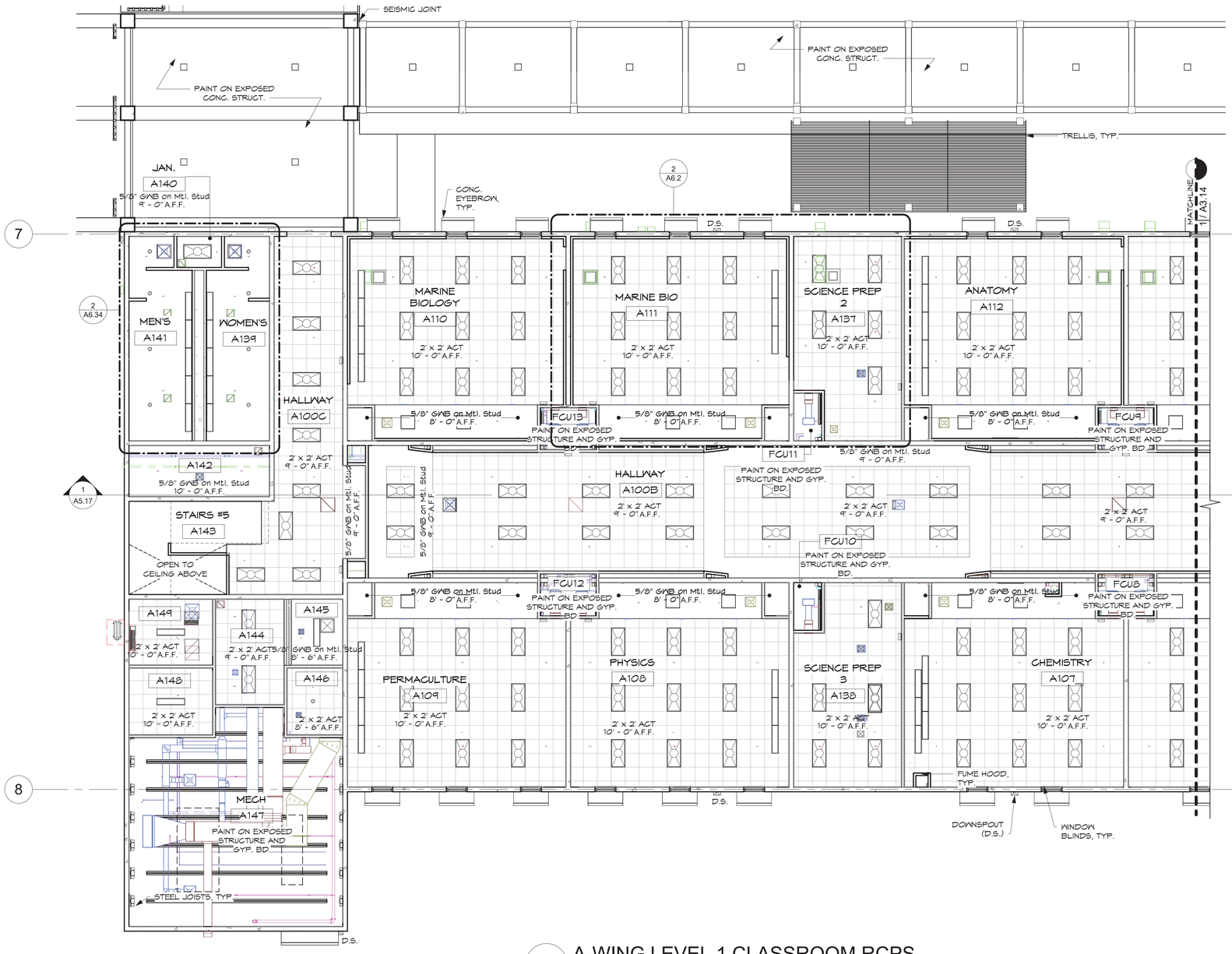
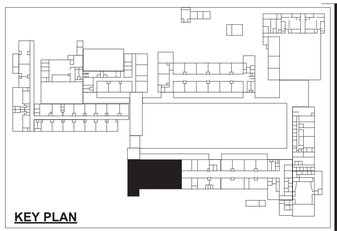


1 A-WING LEVEL 1 CLASSROOM RCPS

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 1 (WEST)	
A100C	HALLWAY
A107	CHEMISTRY
A108	PHYSICS
A109	PERMACULTURE
A110	MARINE BIOLOGY
A111	MARINE BIO
A112	ANATOMY
A134	SPED SHO.
A137	SCIENCE PREP 2
A138	SCIENCE PREP 3
A139	WOMEN'S
A140	JAN.
A141	MEN'S
A142	SCIENCE STO.
A147	MECH
A148	ELEC
A149	TELECOM
A-WING LEVEL 1 (EAST)	
A127	JAN.

NORTH 0' 4' 8' 16'

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Architecture
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Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS
A107 - A112
PROGRAMMING DOCUMENT

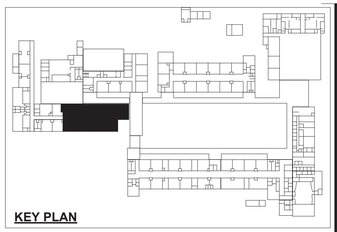
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	NO.
File	

Drawing No.
A3.15
Sheet No. ____ of ____



1 C-WING CLASSROOMS RCPS

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

GCC BUILDING (EAST)

C101	MARKETING STORE
C101A	STO.
C102	MARKETING
C103	CLASSROOM
C104	CLASSROOM
C105	CLASSROOM
C106	HOSPITALITY & TOURISM
C106A	MOCK RESTROOM
C106B	LAUNDRY AREA
C106C	WATER HEATER 1
C107A	STO.
C118	CLASSROOM
C119	CLASSROOM
C120	CLASSROOM
C121	CLASSROOM
C122	HEALTH

NORTH 0' 4' 8' 16'

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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: CLASSROOM RCPS C101 - C106, C118 - C122

PROGRAMMING DOCUMENT

Designed:	TRMA
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File	

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Sheet No. _____ of _____

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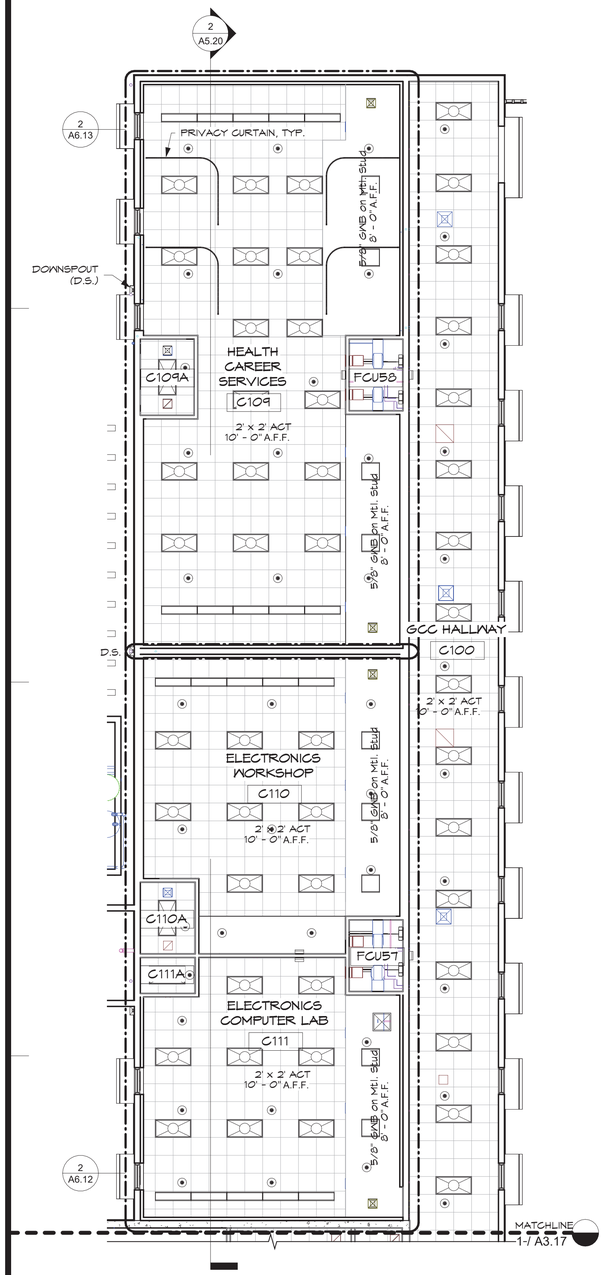
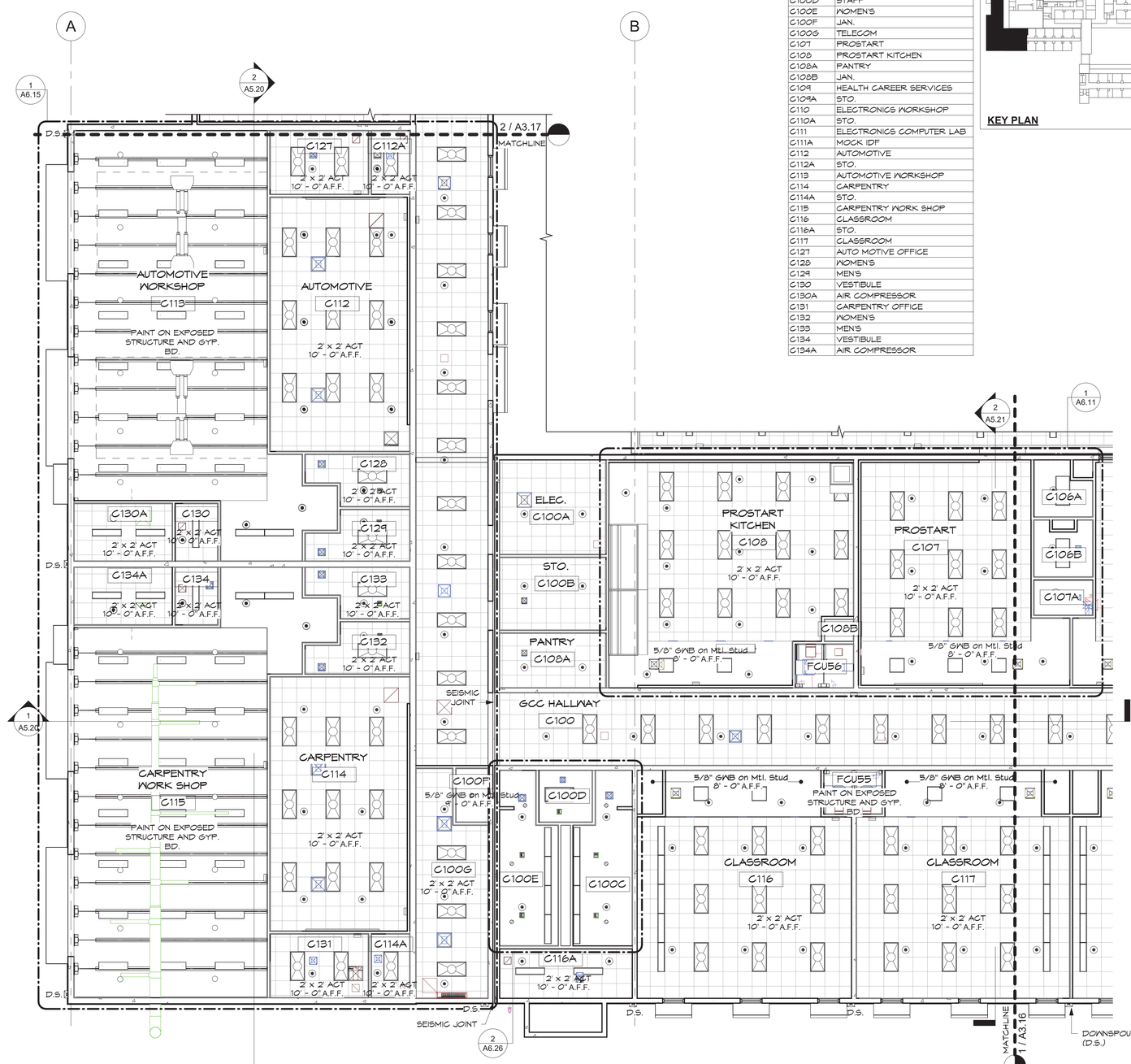


2 C-WING CLASSROOMS RCP

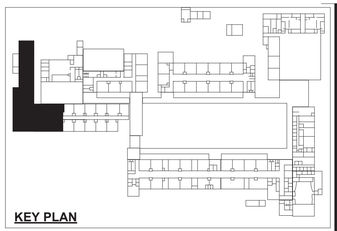
SCALE: 1/8" = 1'-0"



1 C-WING CLASSROOMS RCP

SCALE: 1/8" = 1'-0"

GCC BUILDING (WEST)	
C100A	ELEC.
C100B	STO.
C100C	MEN'S
C100D	STAFF
C100E	WOMEN'S
C100F	JAN.
C100G	TELECOM
C107	PROSTART
C108	PROSTART KITCHEN
C108A	PANTRY
C108B	JAN.
C109	HEALTH CAREER SERVICES
C109A	STO.
C110	ELECTRONICS WORKSHOP
C110A	STO.
C111	ELECTRONICS COMPUTER LAB
C111A	MOCK IDF
C112	AUTOMOTIVE
C112A	STO.
C113	AUTOMOTIVE WORKSHOP
C114	CARPENTRY
C114A	STO.
C115	CARPENTRY WORK SHOP
C116	CLASSROOM
C116A	STO.
C117	CLASSROOM
C127	AUTO MOTIVE OFFICE
C128	WOMEN'S
C129	MEN'S
C130	VESTIBULE
C130A	AIR COMPRESSOR
C131	CARPENTRY OFFICE
C132	WOMEN'S
C133	MEN'S
C134	VESTIBULE
C134A	AIR COMPRESSOR



KEY PLAN

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Architecture
Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS
C107 - C111, C113,
C115 - C117
PROGRAMMING DOCUMENT

Designed:	TRMA
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Drawing No.
A3.17
Sheet No. of

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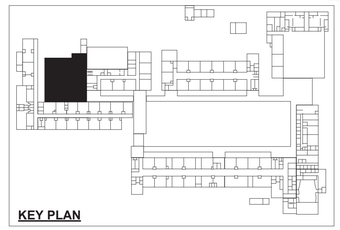
1 CAFETERIA RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

CAFETERIA	
C151	CAFETERIA
C152	SERVING AREA
C153	KITCHEN
C153A	WATER HEATER
C154	SCULLERY
C155	OFFICE
C156	KITCHEN STAFF LOUNGE
C156A	WOMEN'S
C156B	MEN'S
C157	TELECOM
C158	ELEC
C159	PANTRY
C160	STOR
C161	REFRIGERATOR
C162	FREEZER
C163	STAFF
C164	WOMEN'S
C165	MEN'S
C166	JAN.
C167	ELEC
C168	TRANSFORMER ENCLOSURE

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CAFETERIA RCP
PROGRAMMING DOCUMENT

Designed:	TRMA
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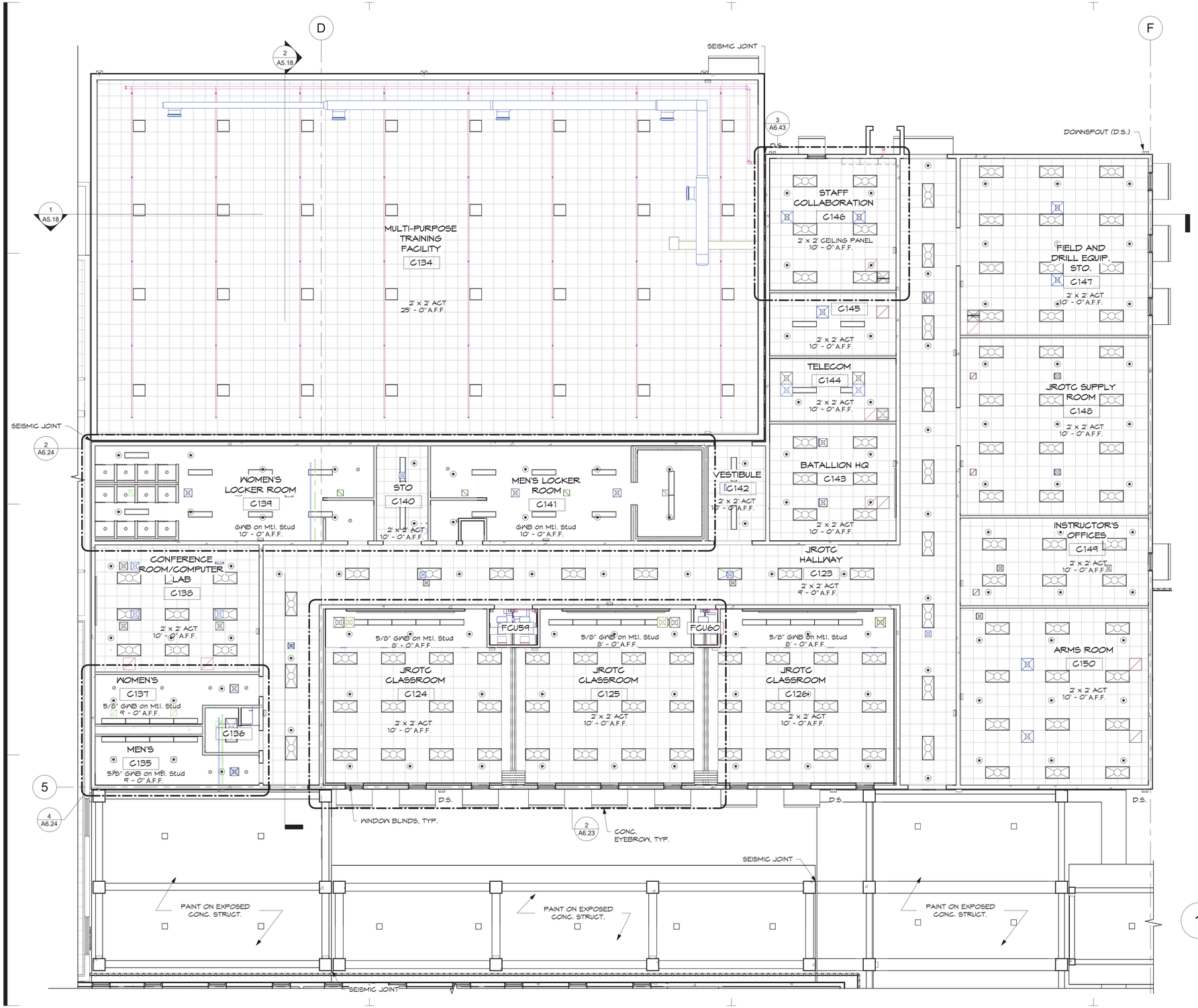
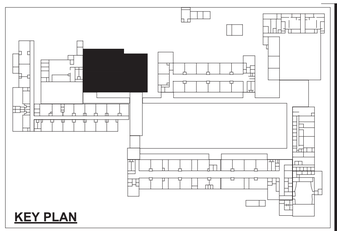
Drawing No.
A3.18
Sheet No. ____ of ____



1 C-WING PLAN (JROTC)
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

JROTC BUILDING

C123	JROTC HALLWAY
C123A	JAN
C124	JROTC CLASSROOM
C125	JROTC CLASSROOM
C126	JROTC CLASSROOM
C134	MULTI-PURPOSE TRAINING FACILITY
C135	MEN'S
C136	STAFF
C137	WOMEN'S
C138	CONFERENCE ROOM/COMPUTER LAB
C139	WOMEN'S LOCKER ROOM
C140	STO
C141	MEN'S LOCKER ROOM
C142	VESTIBULE
C143	BATALLION HQ
C144	TELECOM
C145	ELEC
C146	STAFF COLLABORATION
C147	FIELD AND DRILL EQUIP. STO
C148	JROTC SUPPLY ROOM
C149	INSTRUCTOR'S OFFICES
C150	ARMS ROOM

REVISIONS

No.	Description	Date

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Interior Design

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: CLASSROOM RCPS C124 - C126 (JROTC)

PROGRAMMING DOCUMENT

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Checked:	RM/TP
Supv:	CTC
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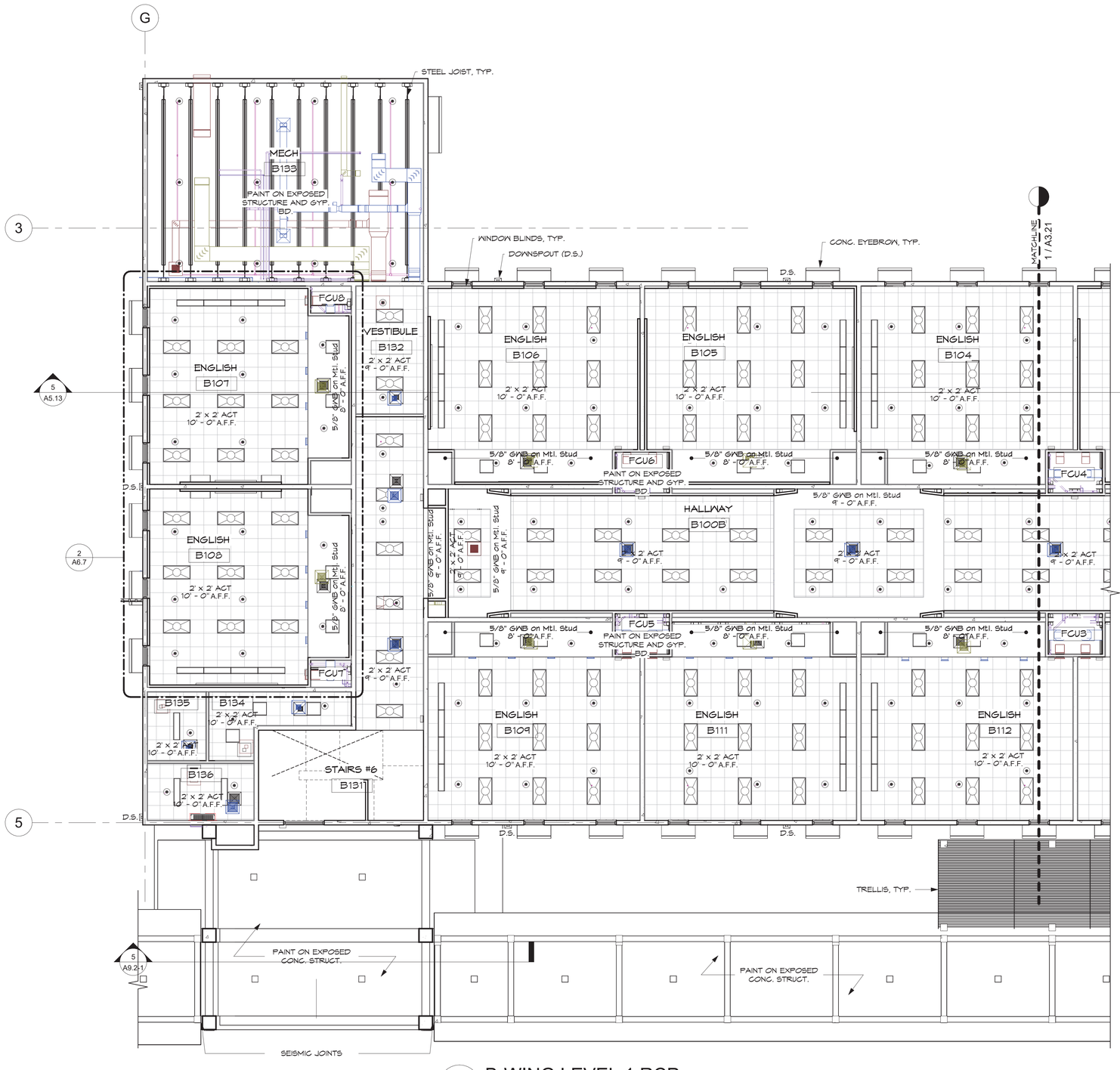
Date:	3/31/25
Project No.	No.
File	

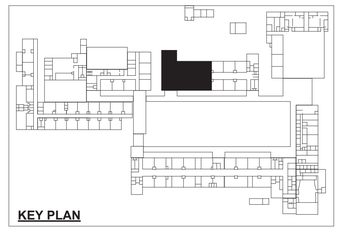
Drawing No. A3.19

Sheet No. ____ of ____



1 B-WING LEVEL 1 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

B-WING LEVEL 1 (WEST)

B104	ENGLISH
B105	ENGLISH
B106	ENGLISH
B107	ENGLISH
B108	ENGLISH
B109	ENGLISH
B111	ENGLISH
B112	ENGLISH
B131	STAIRS #6
B132	VESTIBULE
B133	MECH
B134	VESTIBULE
B135	ELEC
B136	TELECOM

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS
B104 - B109, B111-B112
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

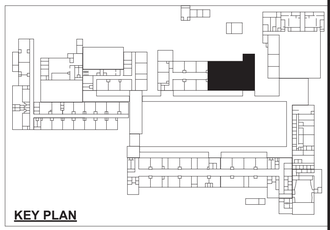
Drawing No.
A3.20
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 B-WING LEVEL 1 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

B-WING LEVEL 1 (EAST)

B101	ENGLISH
B102	ENGLISH
B103	ENGLISH
B113	ENGLISH
B114	ENGLISH
B115	ENGLISH (ESL)
B120	STAIRS #7
B121	WOMEN'S
B122	JAN.
B123	MEN'S
B124	VESTIBULE
B124A	ELEV.
B125	VESTIBULE
B126	TELECOM
B127	ELEC
B128	MECH
B129	STO.
B130	STAFF RR

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

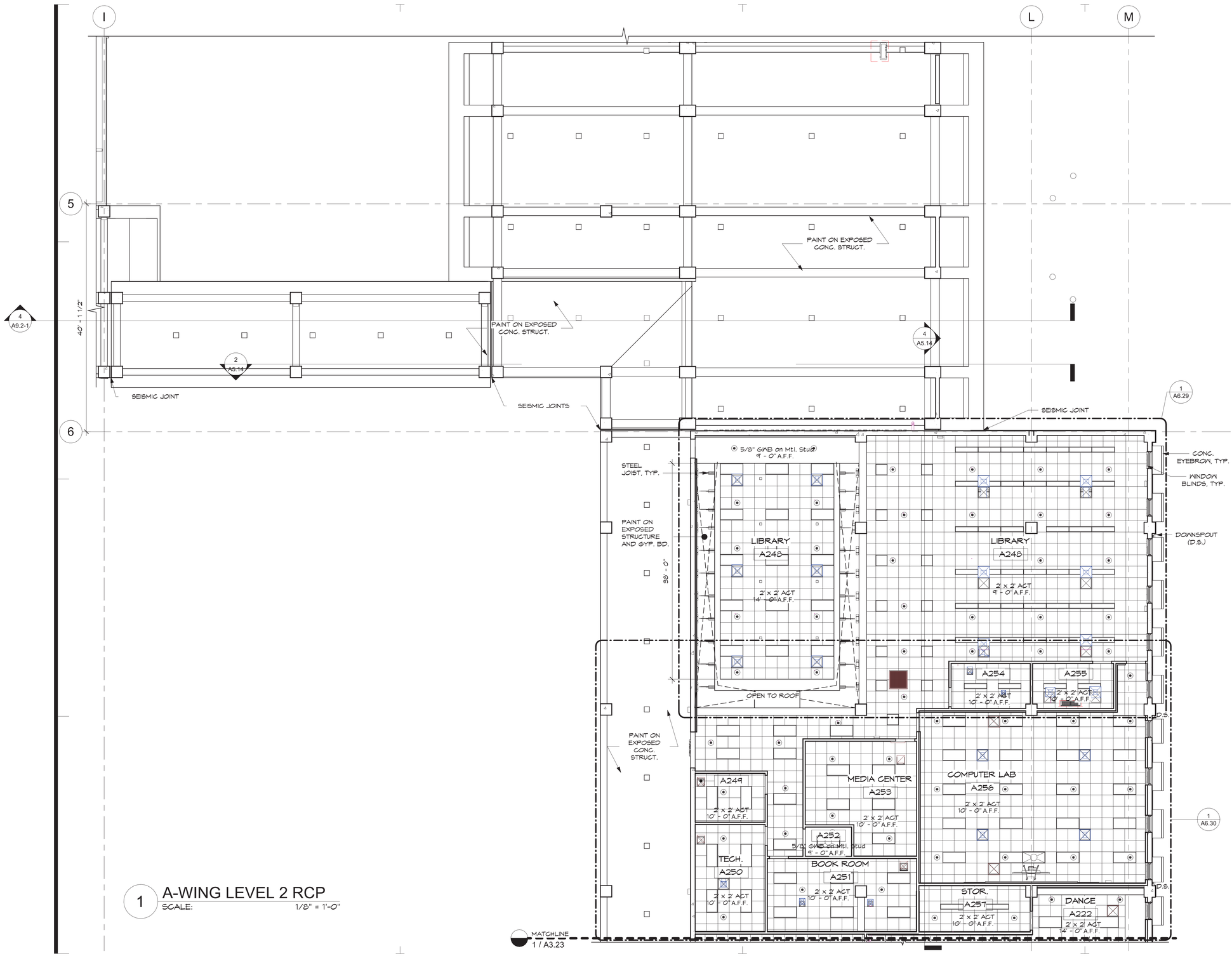
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

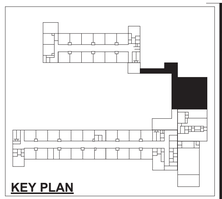
Title:
CLASSROOM RCPS B101 - B103, B113 - B115
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A3.21
Sheet No. of



1 A-WING LEVEL 2 RCP
SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

ADMIN BUILDING LEVEL 2	
A248	LIBRARY
A249	LIBRARIAN
A250	TECH.
A251	BOOK ROOM
A252	STAFF RR
A253	MEDIA CENTER
A254	ELEC.
A255	TELECOM
A256	COMPUTER LAB
A257	STOR.
A258	ELEC
A259	STOR.
A259	VESTIBULE

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
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Architecture
Planning
Interior Design

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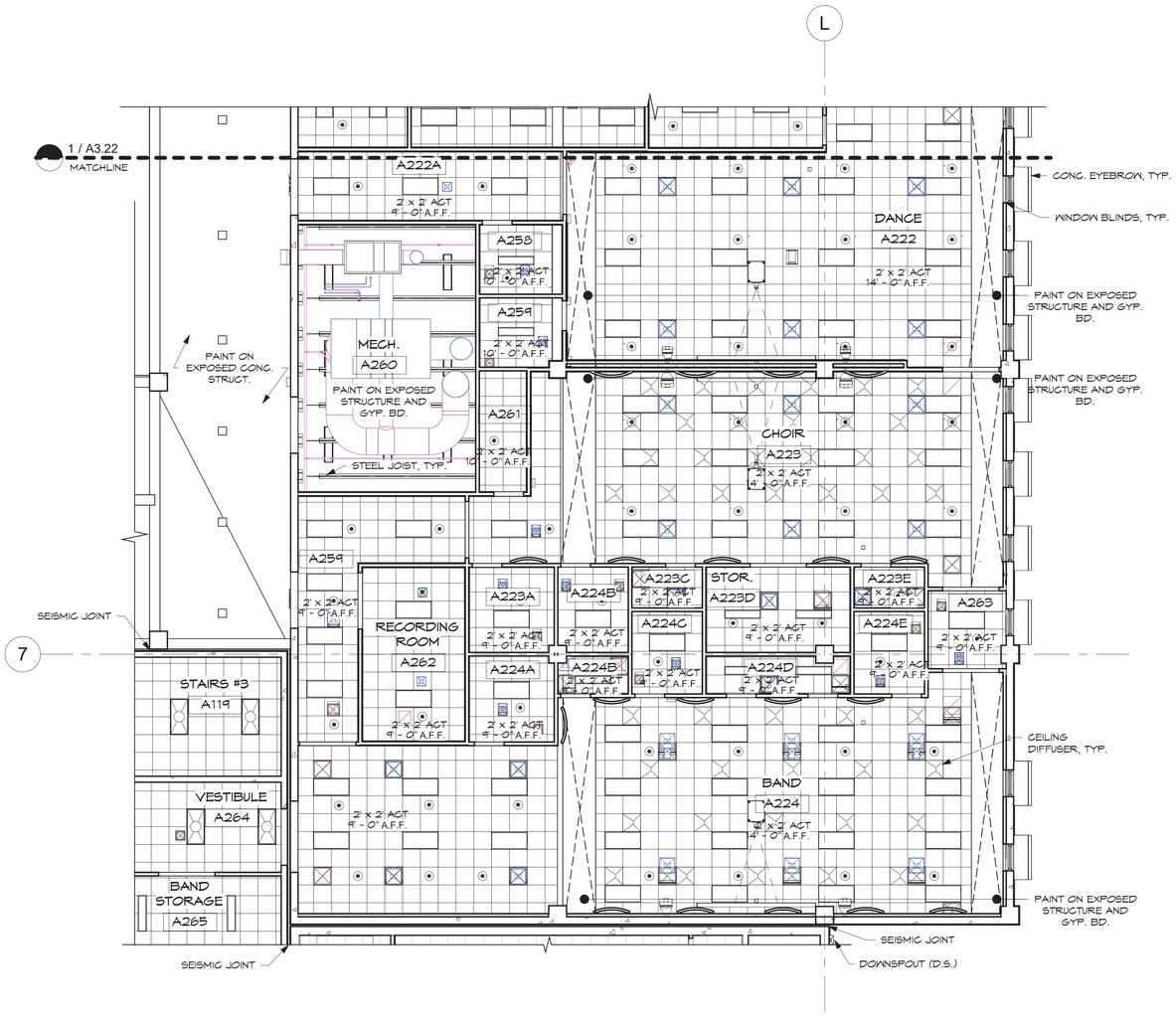
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
LIBRARY RCP
PROGRAMMING DOCUMENT

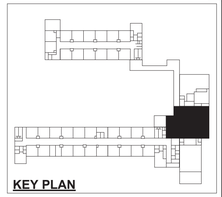
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A3.22
Sheet No. ____ of ____



1 CHOIR & BAND RCP - LEVEL 2

SCALE: 1/8" = 1'-0"



KEY PLAN

A-WING LEVEL 2 (EAST)

A264	VESTIBULE
A265	BAND STORAGE

ADMIN BUILDING LEVEL 2

A222	DANCE
A222A	VESTIBULE
A223	CHOIR
A223A	OFFICE
A223C	STOR.
A223D	STOR.
A223E	STOR.
A224	BAND
A224A	OFFICE
A224B	PRACTICE ROOM
A224B	STOR.
A224C	PRACTICE ROOM
A224D	STOR.
A224E	PRACTICE ROOM
A260	MECH.
A261	STOR.
A262	RECORDING ROOM
A263	VESTIBULE

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Architecture
Planning
Interior Design

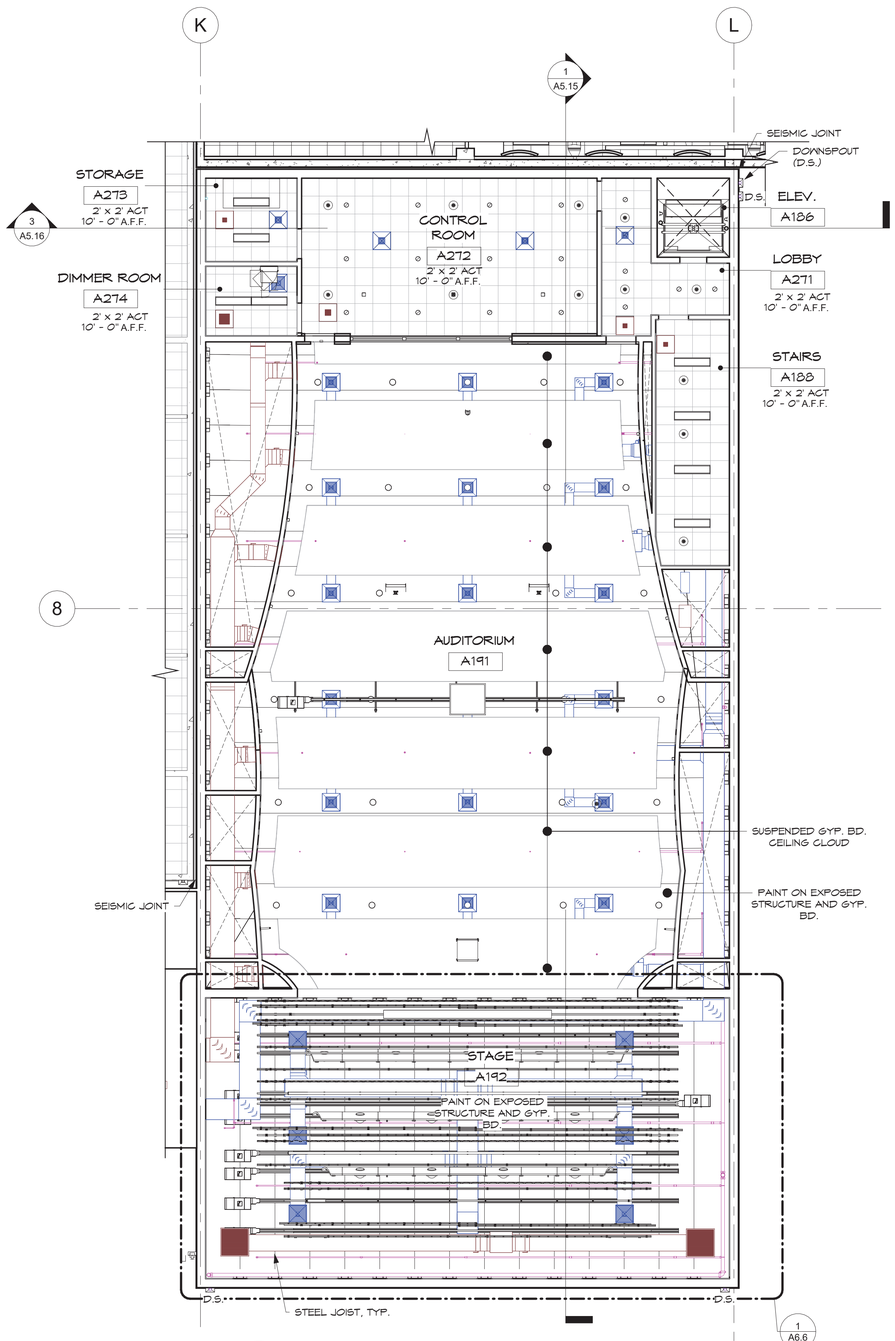
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS
DANCE, CHOIR, BAND
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.: No.	File:

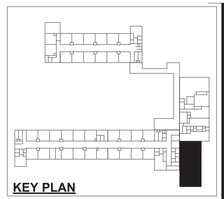
Drawing No.
A3.23
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 AUDITORIUM LEVEL 2 PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

REVISIONS		
No.	Description	Date

TRMA

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM LEVEL 2 PLAN

PROGRAMMING DOCUMENT

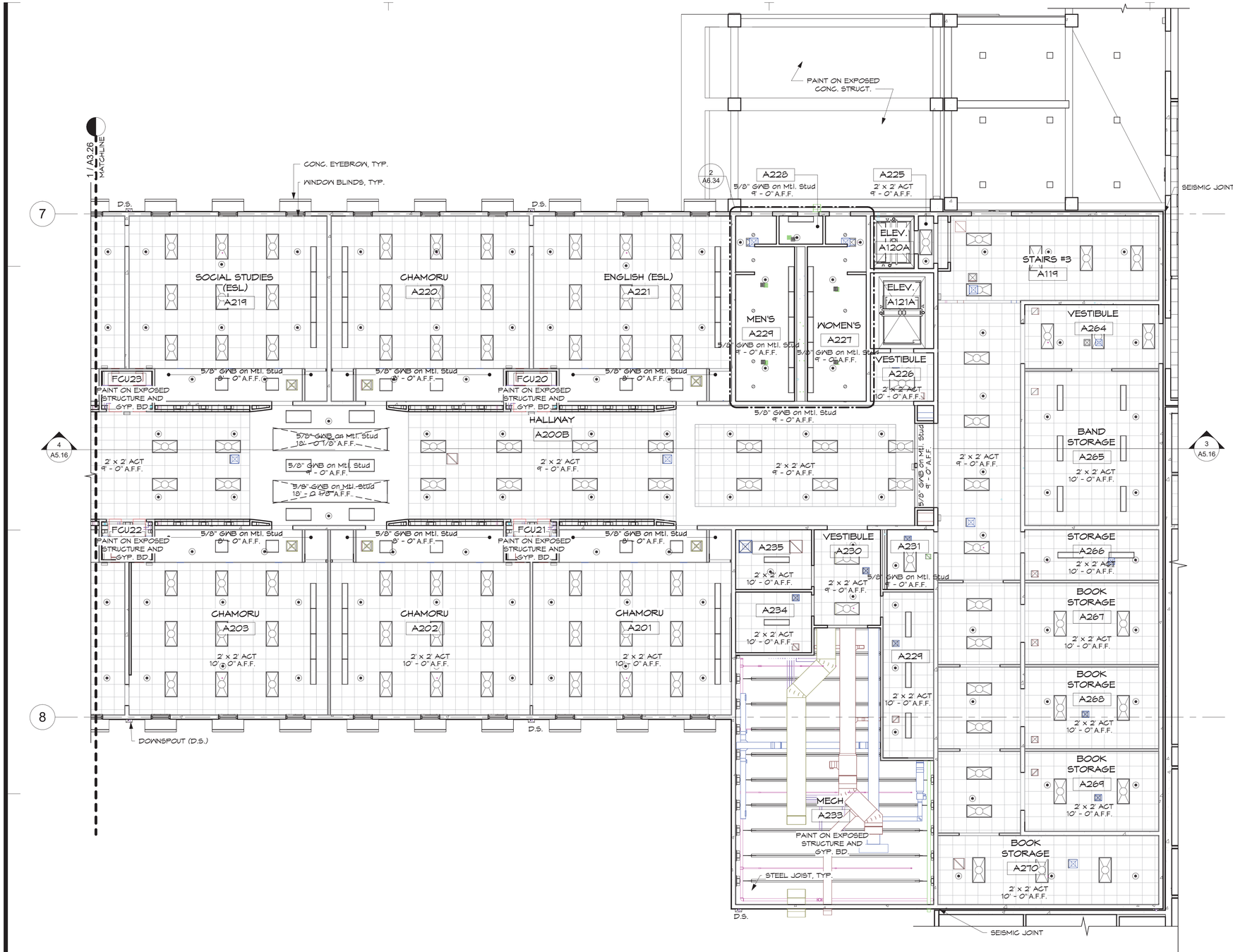
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A3.24

Sheet No. _____ of _____

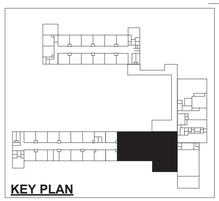
NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 A-WING LEVEL 2 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 2 (EAST)

A201	CHAMORU
A202	CHAMORU
A203	CHAMORU
A219	SOCIAL STUDIES (ESL)
A220	CHAMORU
A221	ENGLISH (ESL)
A225	VESTIBULE
A226	VESTIBULE
A227	WOMEN'S
A228	JAN.
A229	MEN'S
A234	CHAIR STORAGE 1
A230	VESTIBULE
A231	STAFF RR
A233	MECH
A234	ELEC
A235	TELECOM
A264	VESTIBULE
A265	BAND STORAGE
A266	STORAGE
A267	BOOK STORAGE
A268	BOOK STORAGE
A269	BOOK STORAGE
A270	BOOK STORAGE

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: CLASSROOM RCPS A201 - A203, A219 - A221

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No. A3.25

Sheet No. _____ of _____

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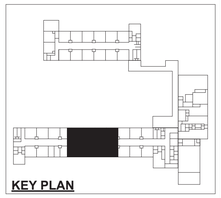
1 A-WING LEVEL 2 RCP
SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

A-WING LEVEL 2 (CENTER)

A207	SOCIAL STUDIES
A204	SOCIAL STUDIES
A218	SOCIAL STUDIES
A216	SOCIAL STUDIES
A205	SOCIAL STUDIES
A206	SOCIAL STUDIES
A217	SOCIAL STUDIES
A237	ELEC.
A236	TELECOM
A200B	HALLWAY

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS A204 - A207, A216 - A218
PROGRAMMING DOCUMENT

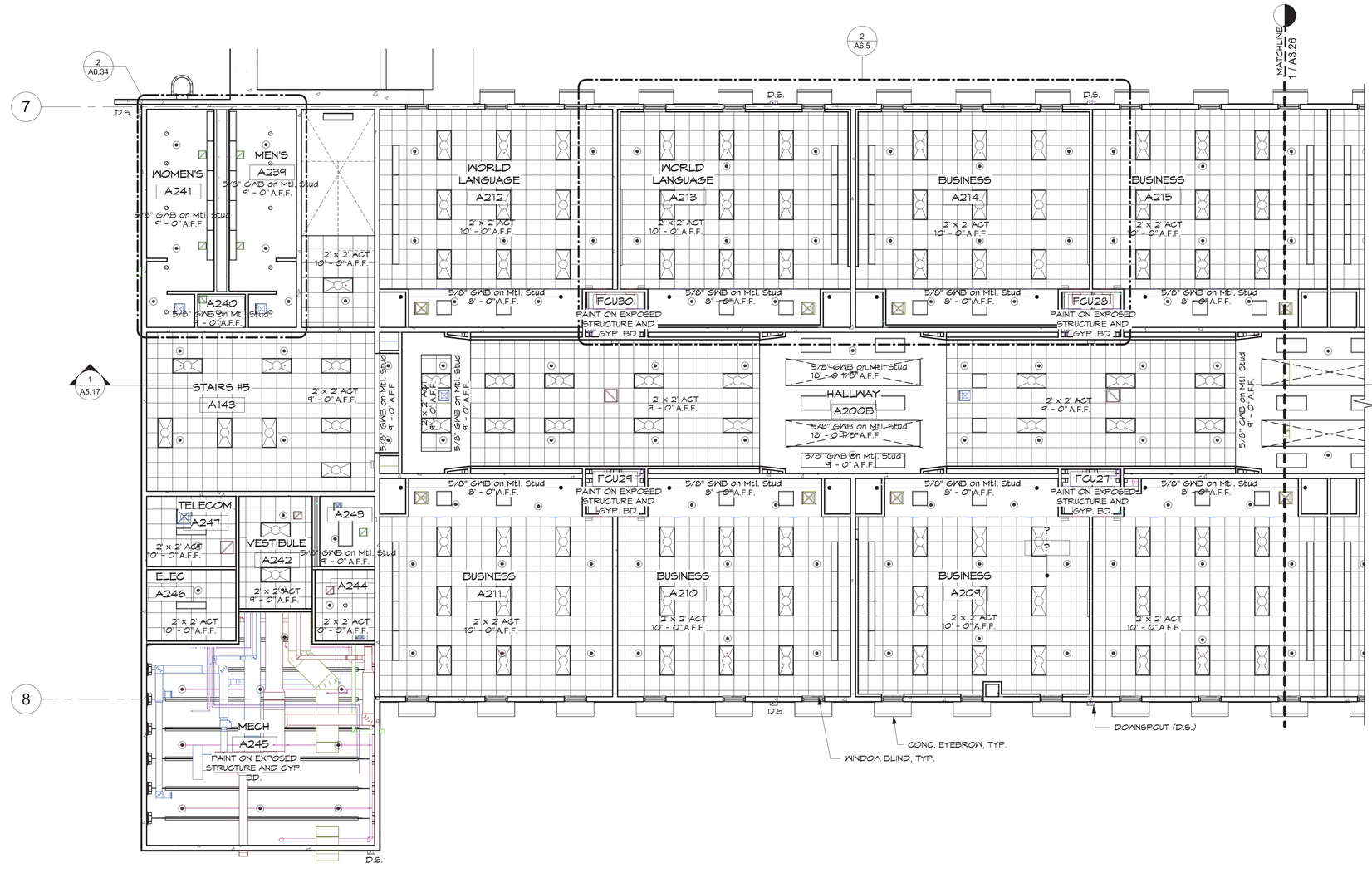
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A3.26
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

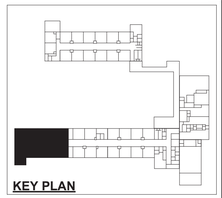
NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.



1 A-WING LEVEL 2 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

A-WING LEVEL 2 (WEST)

A215	BUSINESS
A214	BUSINESS
A208	BUSINESS
A209	BUSINESS
A210	BUSINESS
A212	WORLD LANGUAGE
A213	WORLD LANGUAGE
A211	BUSINESS
A245	MECH
A247	TELECOM
A246	ELEC
A243	STAFF RR
A241	WOMEN'S
A239	MEN'S
A240	JAN.
A238	ROOF ACCESS STAIRS
A242	VESTIBULE
A244	CHAIR STORAGE 3
A200C	HALLWAY

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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TRMA

Taniguchi Ruth Makio Architects

100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS
A208 - A215

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A3.27

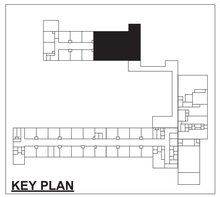
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 B-WING LEVEL 2 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

B-WING LEVEL 2 (EAST)

B201	MATH
B202	MATH
B203	MATH
B212	MATH
B213	MATH
B214	MATH (ESL)
B215	WOMEN'S
B216	JAN.
B217	MEN'S
B218	VESTIBULE
B219	VESTIBULE
B220	TELECOM
B221	ELEC
B222	MECH
B223	CHAIR STORAGE 2
B224	STAFF RR
FCU9	FCU 9
FCU10	FCU 10
FCU11	FCU 11
FCU12	FCU 12

NORTH 0' 4' 8' 16'

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REVISIONS		
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Tel.: (671) 475-6772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS
B201 - B203, B212 - B214
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

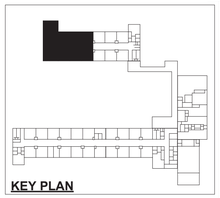
Drawing No.:
A3.28

Sheet No. _____ of _____



1 B-WING LEVEL 2 RCP

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

B-WING LEVEL 2 (WEST)	
B204	MATH
B205	MATH
B206	MATH
B207	MATH
B208	MATH
B209	MATH
B210	MATH
B211	MATH
B225	VESTIBULE
B226	MECH
B227	VESTIBULE
B228	ELEC
B229	TELECOM
FCU13	FCU 13
FCU14	FCU 14
FCU15	FCU 15
FCU16	FCU 16

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

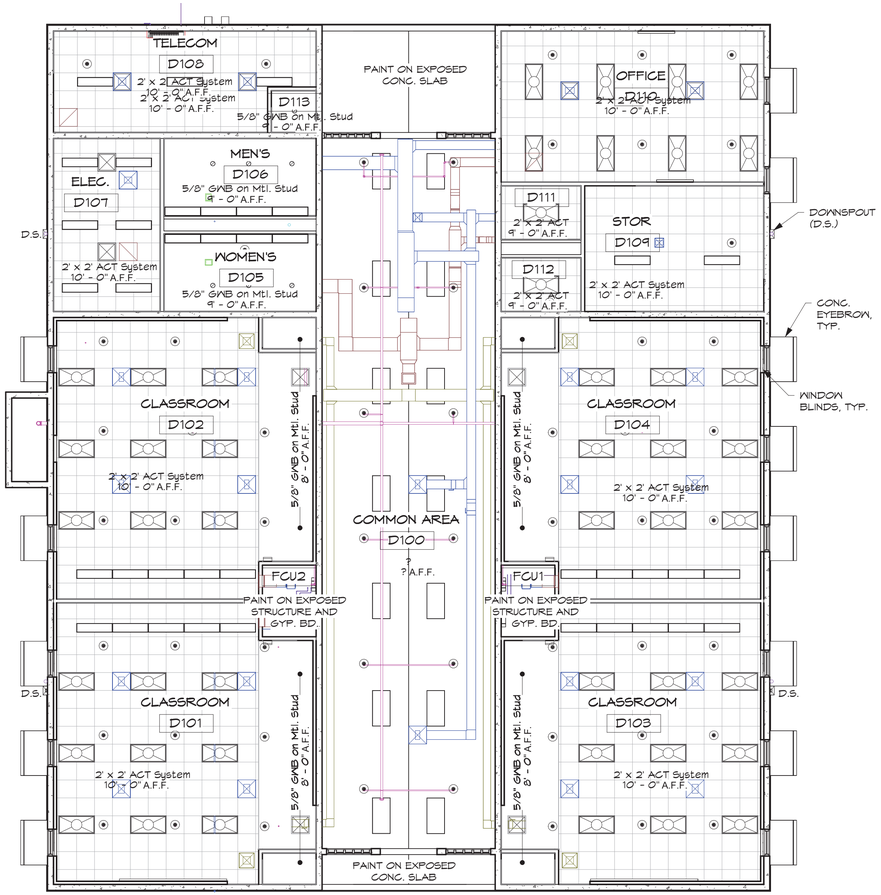
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CLASSROOM RCPS B204 - B211
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

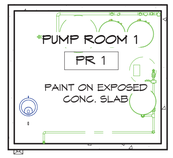
Drawing No.
A3.29
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

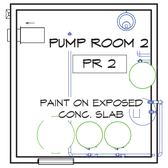


1 ENLARGED CREDIT RECOVERY RCP
SCALE: 1/8" = 1'-0"

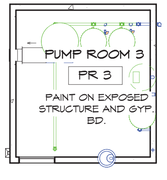
CREDIT RECOVERY BUILDING	
D100	COMMON AREA
D101	CLASSROOM
D102	CLASSROOM
D103	CLASSROOM
D104	CLASSROOM
D105	WOMEN'S
D106	MEN'S
D107	ELEC.
D108	TELECOM
D109	STOR
D110	OFFICE
D113	JAN.



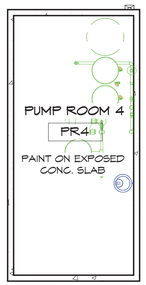
4 PUMP ROOM 1 RCP
SCALE: 1/8" = 1'-0"



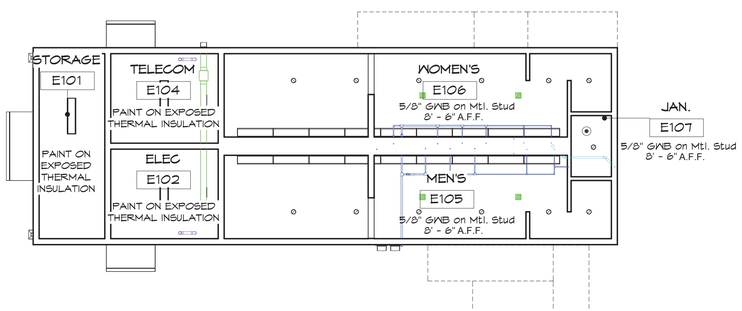
5 PUMP ROOM 2 RCP
SCALE: 1/8" = 1'-0"



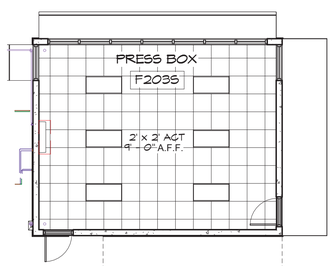
6 PUMP ROOM 3 RCP
SCALE: 1/8" = 1'-0"



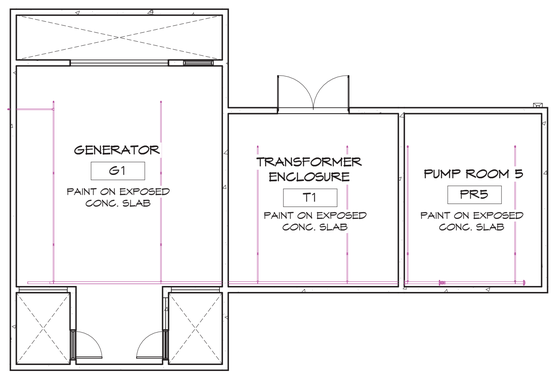
7 PUMP ROOM 4 RCP
SCALE: 1/8" = 1'-0"



2 PRESS BOX ENLARGED - LEVEL 1
SCALE: 1/8" = 1'-0"



3 PRESS BOX ENLARGED - LEVEL 2
SCALE: 1/8" = 1'-0"



8 GENERATOR BUILDING RCP
SCALE: 1/8" = 1'-0"

NOTES:

1. CEILINGS IN SELECT CLASSROOM SPACES ARE TYPICAL CONDITIONS FOR ALL CLASSROOMS.

NORTH

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

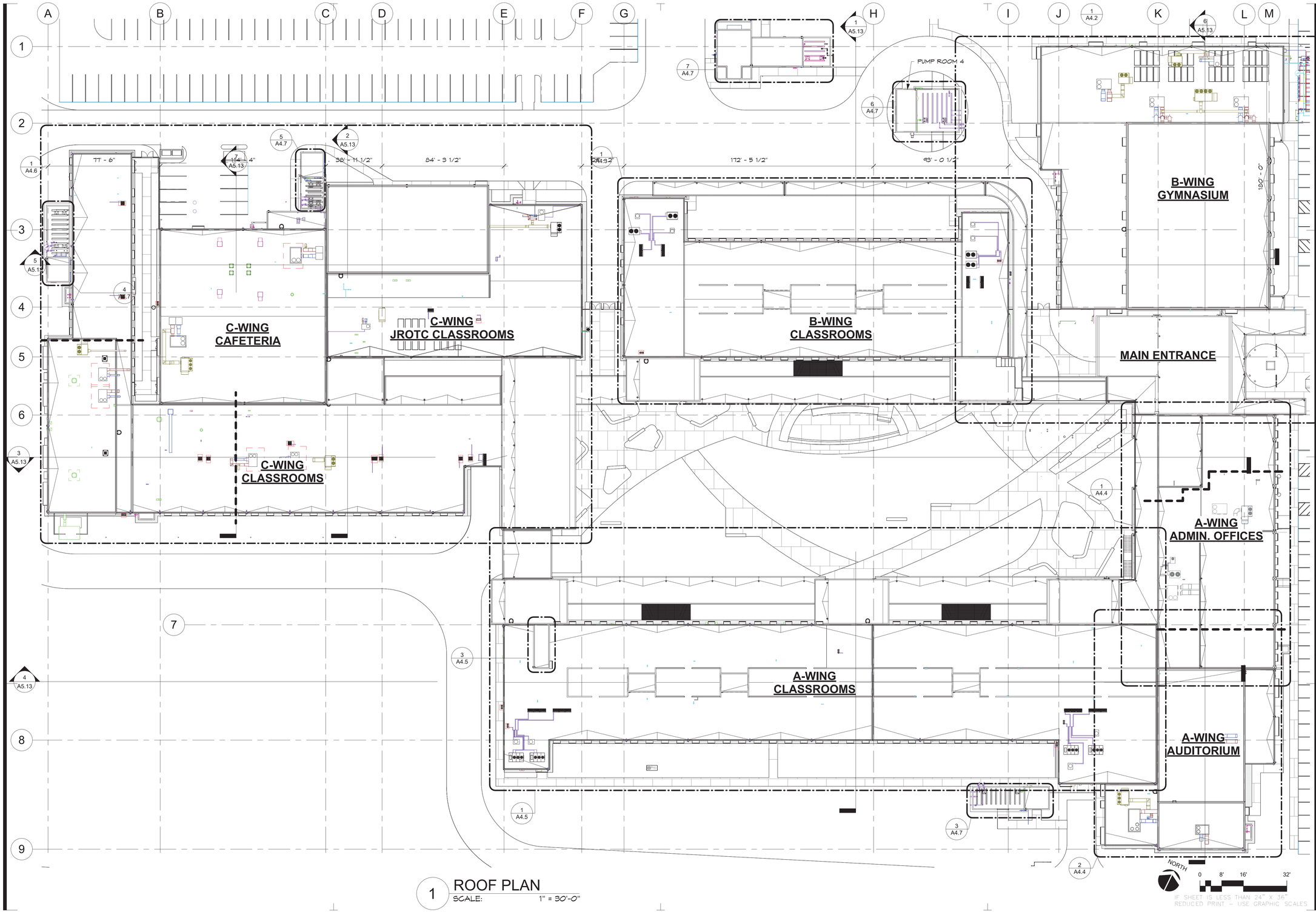
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CREDIT RECOVERY, PRESS BOX, AND PUMP ROOM RCPS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A3.30

Sheet No. _____ of _____



1 ROOF PLAN
SCALE: 1" = 30'-0"

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

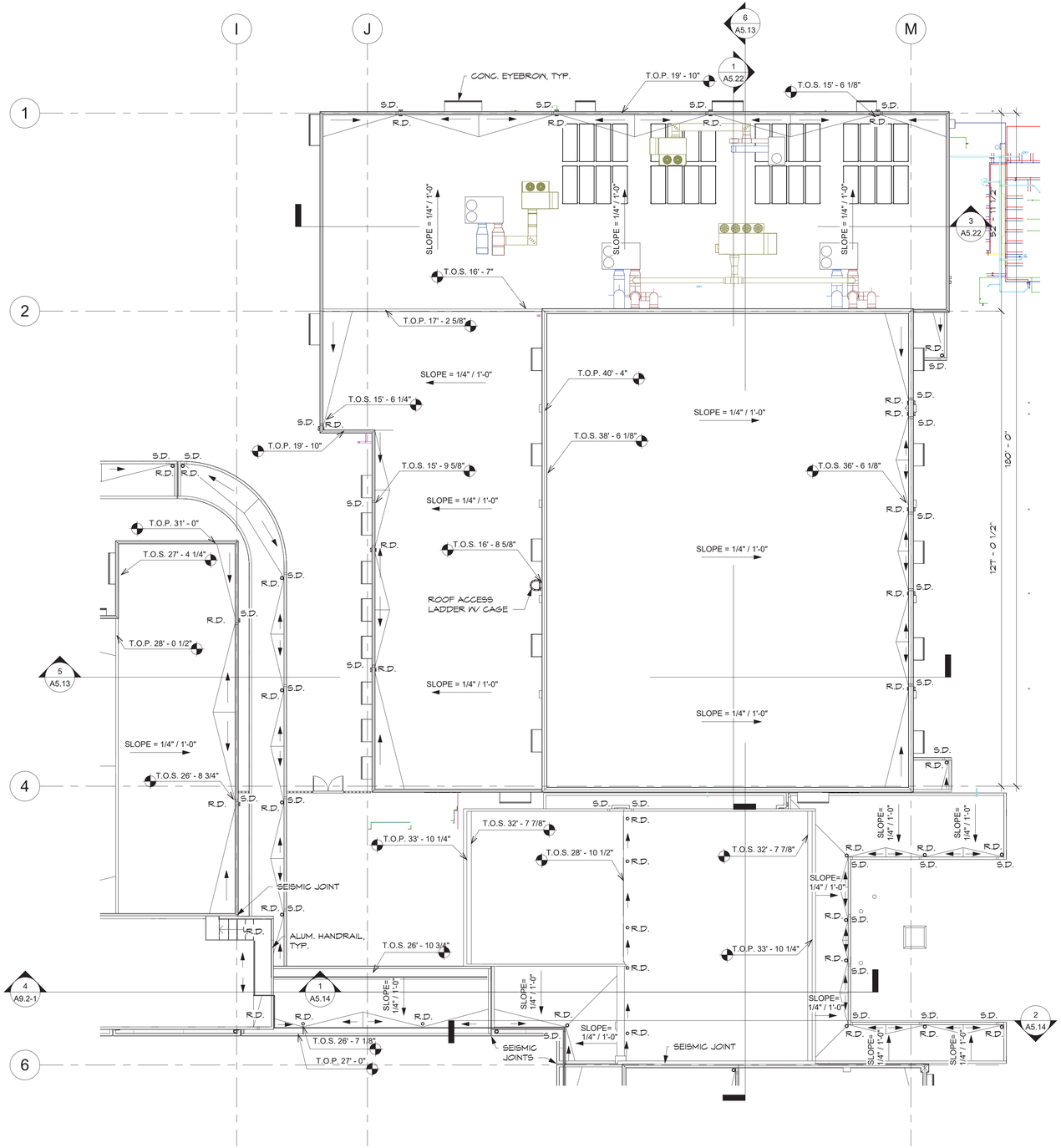
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL ROOF PLAN
PROGRAMMING DOCUMENT

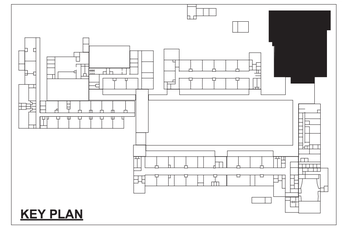
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1" = 30'-0"
Date:	3/31/25
Project No.: No.	File

Drawing No.
A4.1
Sheet No. of



1 GYMNASIUM ROOF PLAN

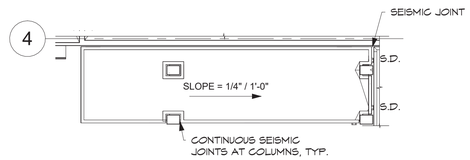
SCALE: 1/16" = 1'-0"



KEY PLAN

ROOF PLAN NOTES:

1. PROVIDE ELASTOMERIC ROOF COATING FOR ALL CONC. ROOF STRUCTURE.



2 SRO OFFICE ROOF PLAN

SCALE: 1/16" = 1'-0"

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Architecture
Planning
Interior Design

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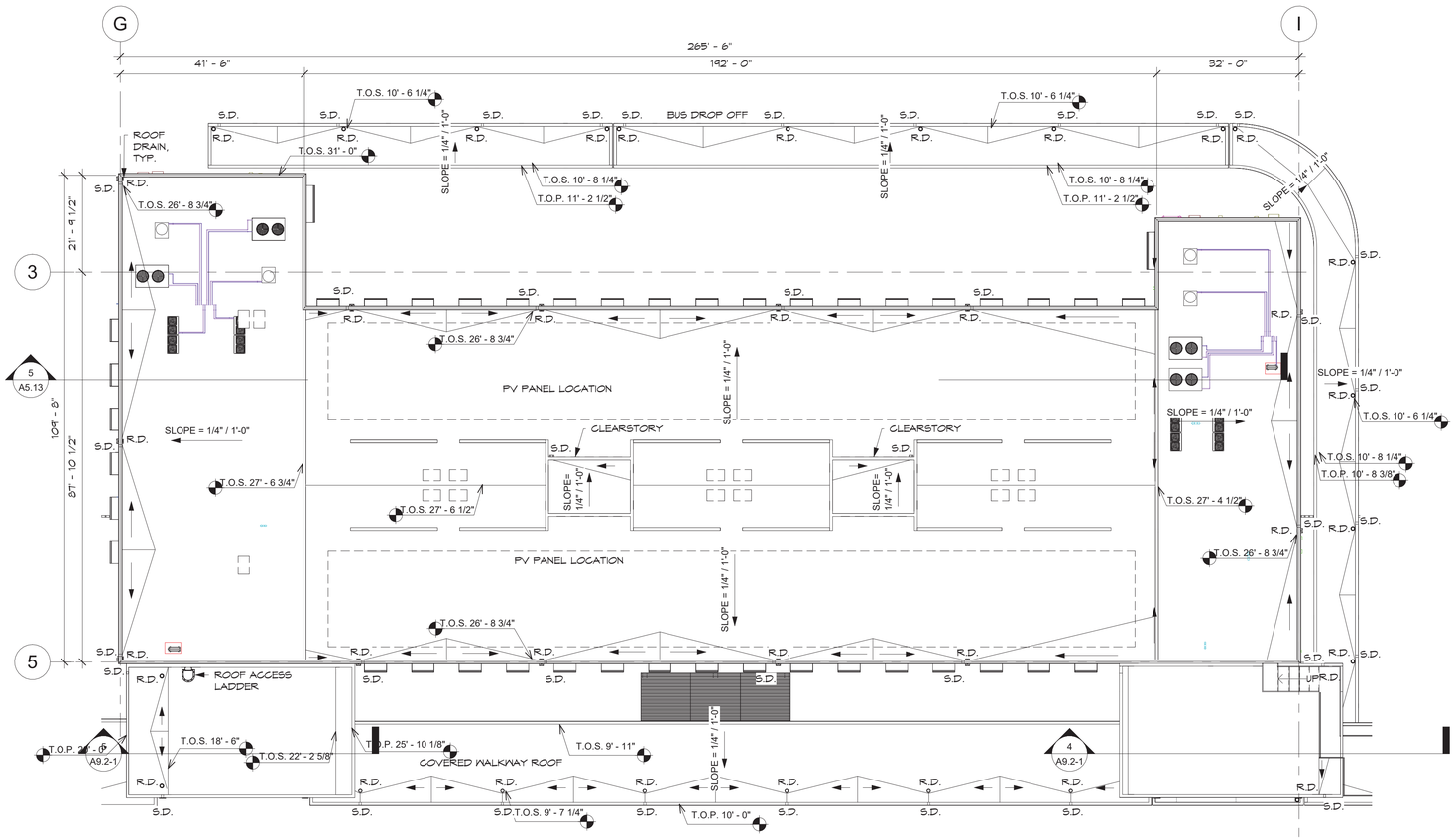
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED ROOF PLAN - GYMNASIUM
PROGRAMMING DOCUMENT

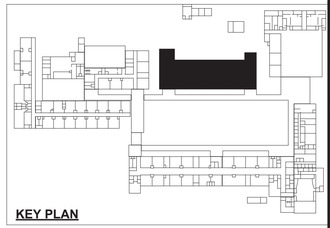
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A4.2
Sheet No. ____ of ____



1 B-WING ROOF PLAN (CLASSROOMS)

SCALE: 1/16" = 1'-0"



KEY PLAN

ROOF PLAN NOTES:

1. PROVIDE ELASTOMERIC ROOF COATING FOR ALL CONC. ROOF STRUCTURE.

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

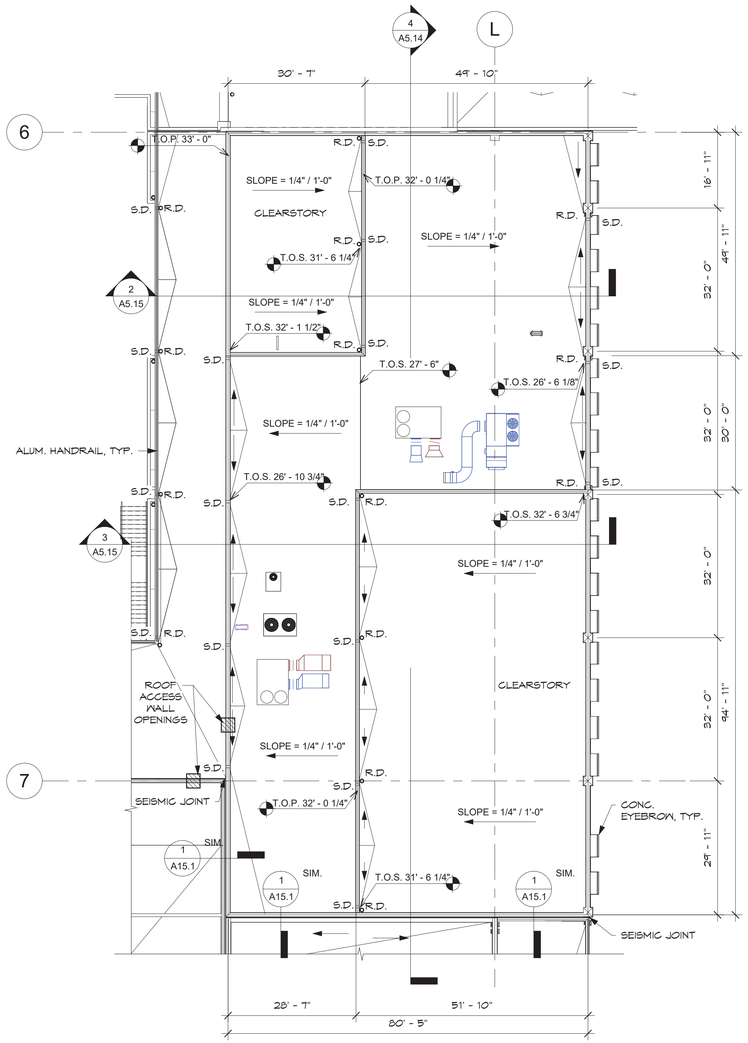
Title: ENLARGED ROOF PLAN - B-WING CLASSROOMS

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

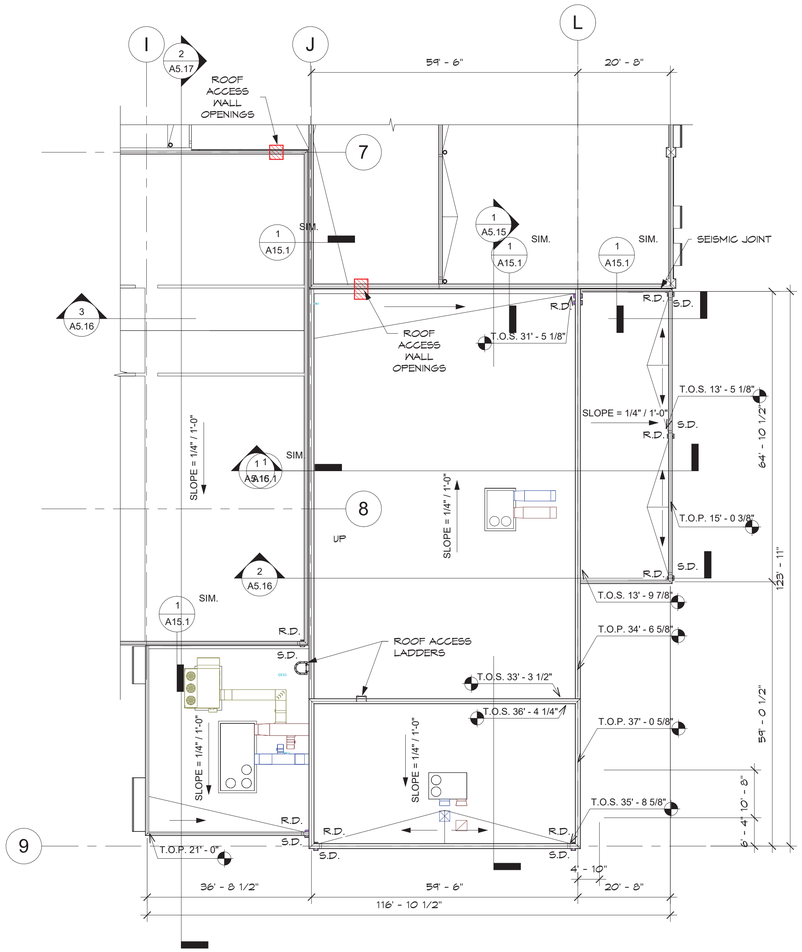
Drawing No. A4.3

Sheet No. ____ of ____



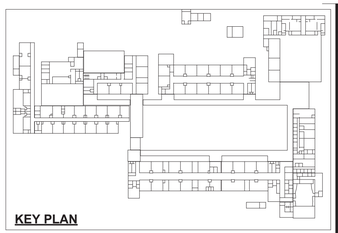
1 A-WING ROOF PLAN (ADMIN. OFFICES)

SCALE: 1/16" = 1'-0"



2 A-WING ROOF PLAN (AUDITORIUM)

SCALE: 1/16" = 1'-0"



KEY PLAN

ROOF PLAN NOTES:

1. PROVIDE ELASTOMERIC ROOF COATING FOR ALL CONC. ROOF STRUCTURE.

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ENLARGED ROOF PLANS - A-WING (ADMIN. OFFICES & AUDITORIUM)
PROGRAMMING DOCUMENT

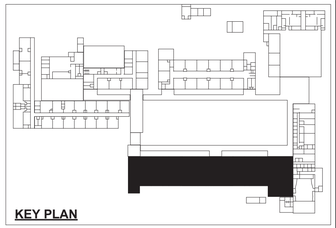
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

Drawing No. A4.4

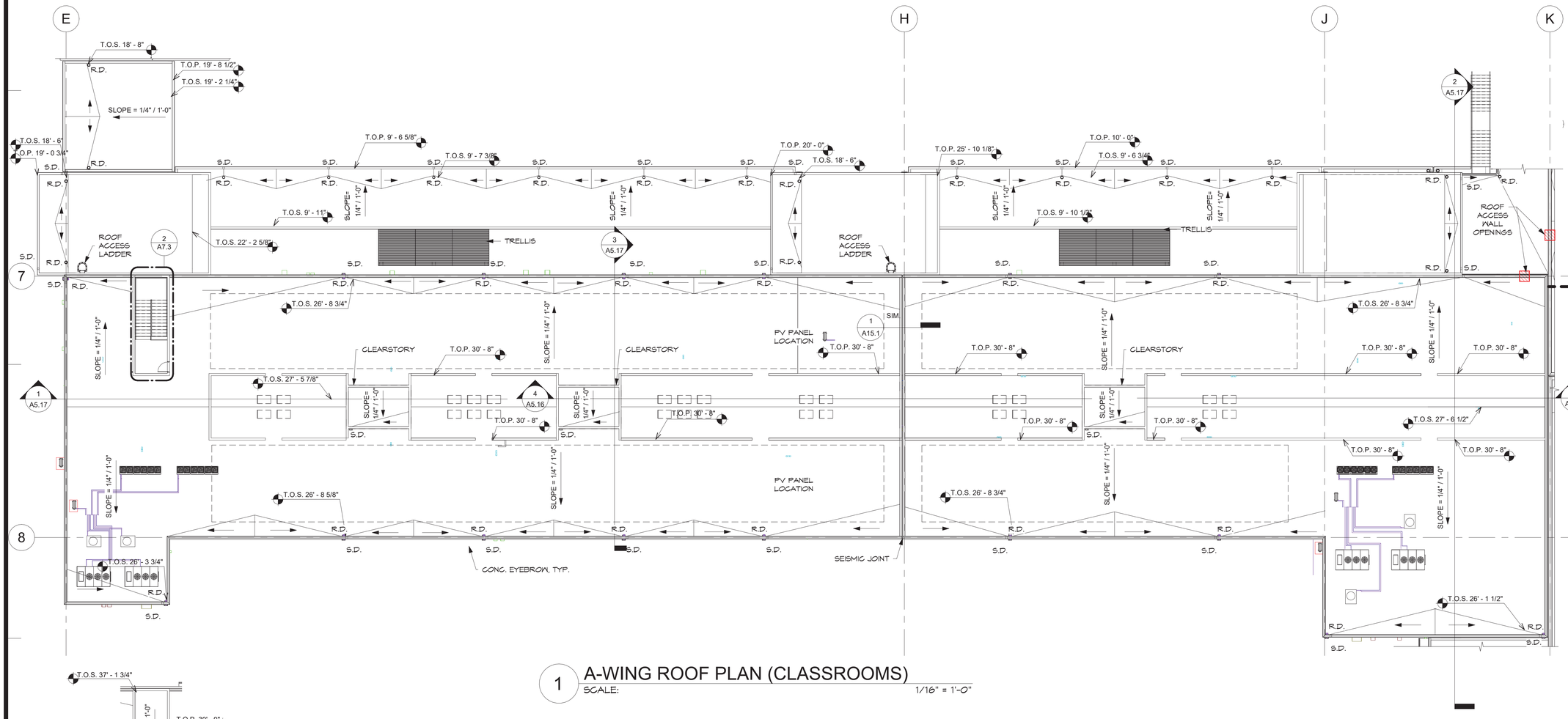
Sheet No. ____ of ____

ROOF PLAN NOTES:

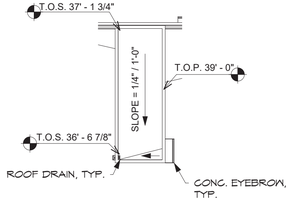
1. PROVIDE ELASTOMERIC ROOF COATING FOR ALL CONC. ROOF STRUCTURE.



KEY PLAN



1 A-WING ROOF PLAN (CLASSROOMS)
SCALE: 1/16" = 1'-0"



3 ROOF STAIR ACCESS ROOF
SCALE: 1/16" = 1'-0"

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

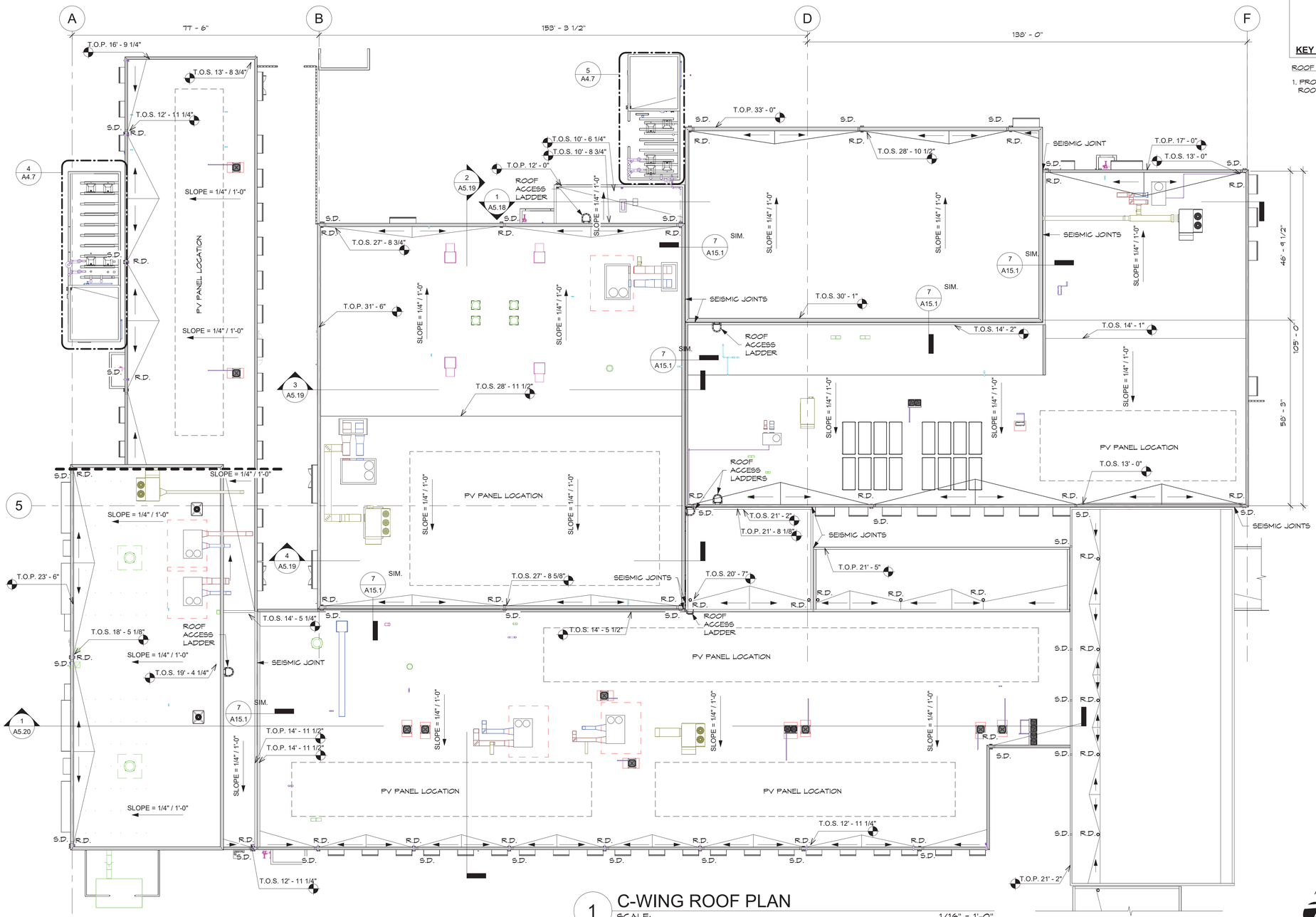
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ENLARGED ROOF PLAN - A-WING CLASSROOMS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

Drawing No. A4.5

Sheet No. ____ of ____

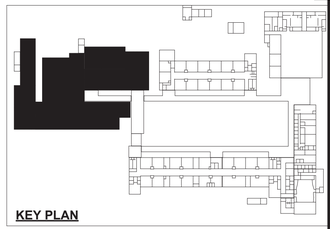


1 C-WING ROOF PLAN

SCALE: 1/16" = 1'-0"

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



KEY PLAN

ROOF PLAN NOTES:

1. PROVIDE ELASTOMERIC ROOF COATING FOR ALL CONC. ROOF STRUCTURE.

REVISIONS		
No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED ROOF PLAN - C-WING
PROGRAMMING DOCUMENT

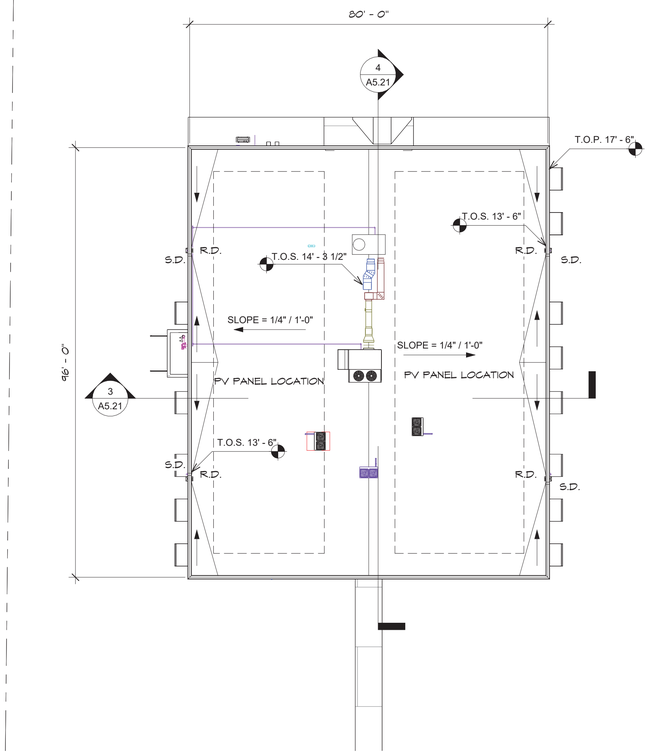
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A4.6
Sheet No. ____ of ____

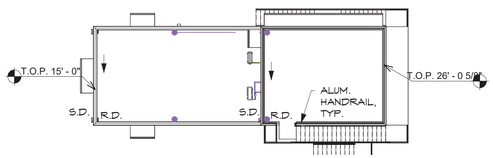
NOT FOR CONSTRUCTION

ROOF PLAN NOTES:

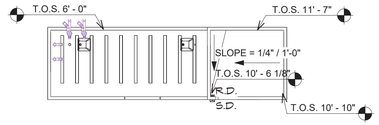
1. PROVIDE ELASTOMERIC ROOF COATING FOR ALL CONC. ROOF STRUCTURE.



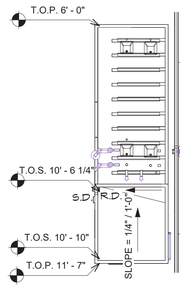
1 CREDIT RECOVERY ROOF PLAN
SCALE: 1/16" = 1'-0"



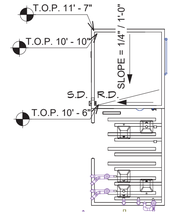
2 PRESS BOX ROOF PLAN
SCALE: 1/16" = 1'-0"



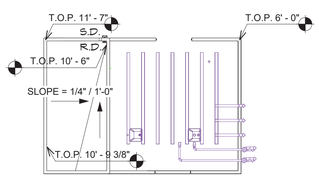
3 PUMP ROOM 1 ROOF PLAN
SCALE: 1/16" = 1'-0"



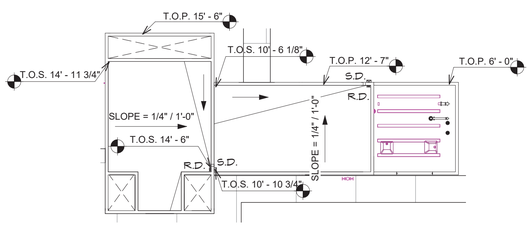
4 PUMP ROOM 2 ROOF PLAN
SCALE: 1/16" = 1'-0"



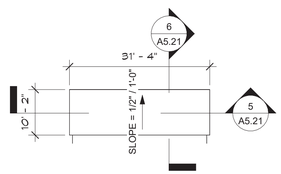
5 PUMP ROOM 3 ROOF PLAN
SCALE: 1/16" = 1'-0"



6 PUMP ROOM 4 ROOF PLAN
SCALE: 1/16" = 1'-0"



7 GENERATOR BUILDING ROOF
SCALE: 1/16" = 1'-0"



8 DUG OUT ROOF
SCALE: 1/16" = 1'-0"

NORTH 0 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

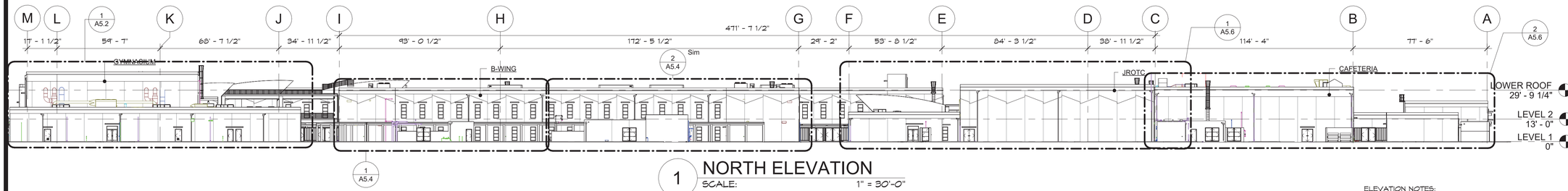
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ENLARGED ROOF PLANS - CREDIT RECOVERY, PRESS BOX, PUMP ROOMS PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A4.7

Sheet No. _____ of _____

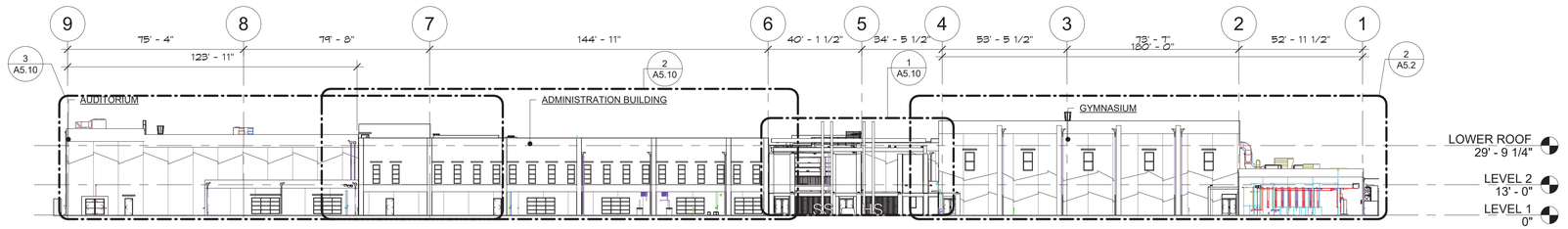


1 NORTH ELEVATION

SCALE: 1" = 30'-0"

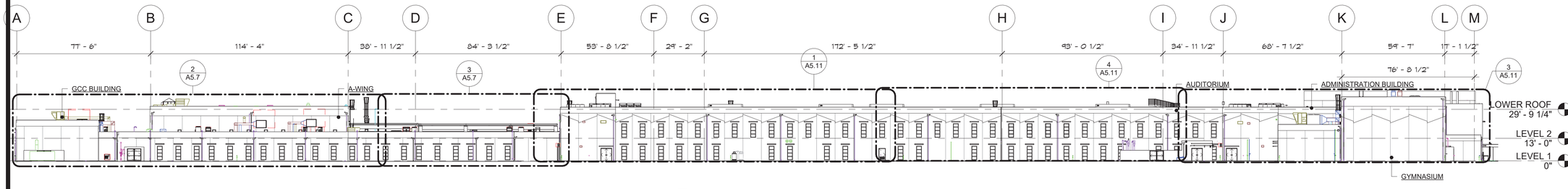
ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



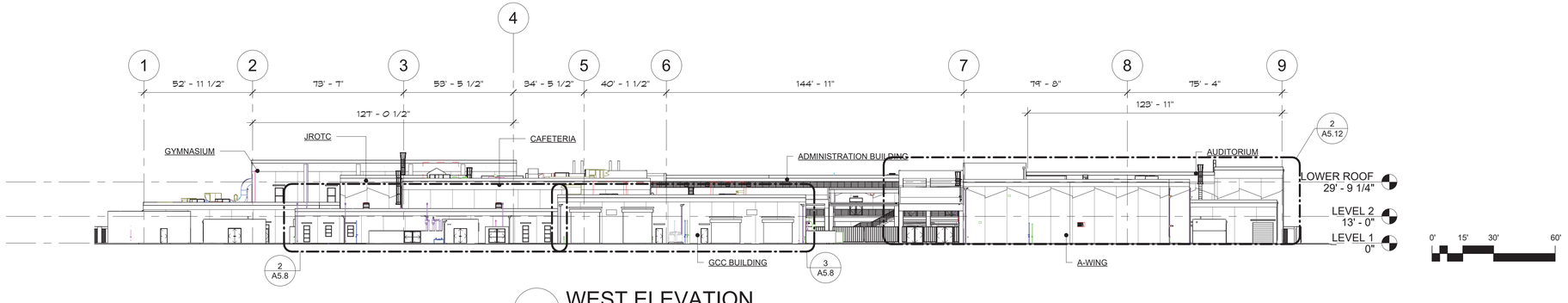
2 EAST ELEVATION

SCALE: 1" = 30'-0"



3 SOUTH ELEVATION

SCALE: 1" = 30'-0"



4 WEST ELEVATION

SCALE: 1" = 30'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS
PROGRAMMING DOCUMENT

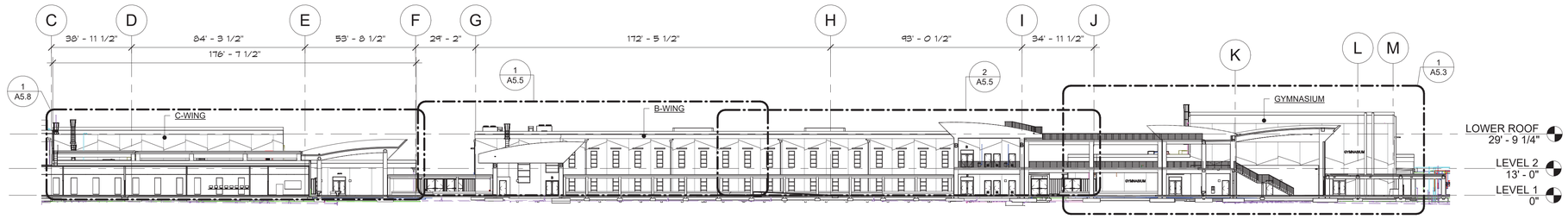
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.1-1

Sheet No. _____ of _____

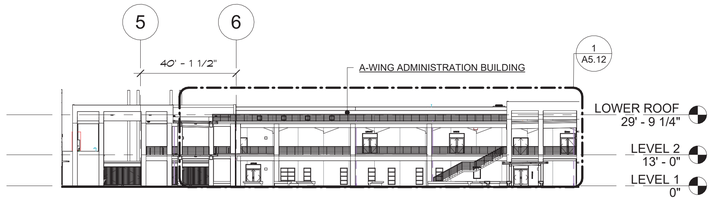
ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



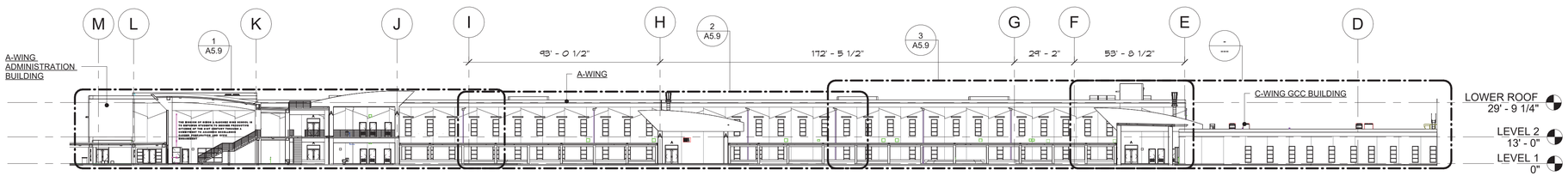
1 COURTYARD ELEVATION - A

SCALE: 1" = 30'-0"



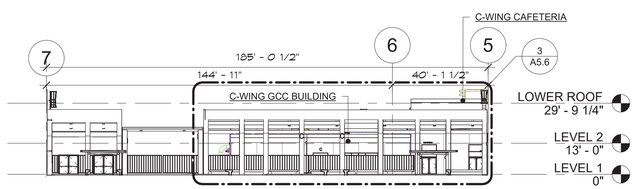
2 COURTYARD ELEVATION - B

SCALE: 1" = 30'-0"



3 COURTYARD ELEVATION - C

SCALE: 1" = 30'-0"



4 COURTYARD - D

SCALE: 1" = 30'-0"

0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

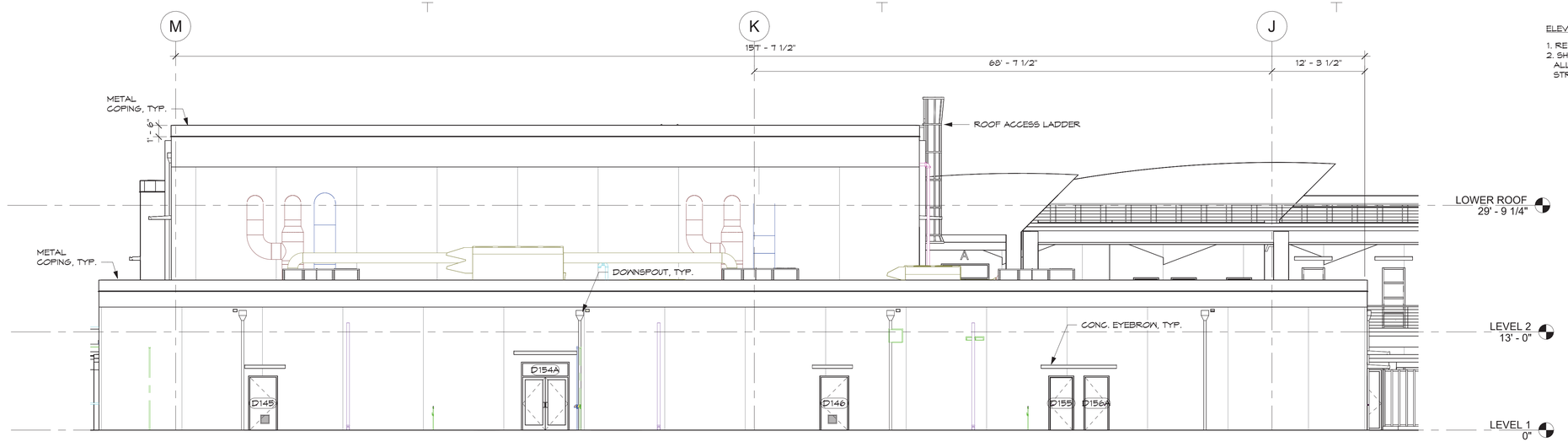
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

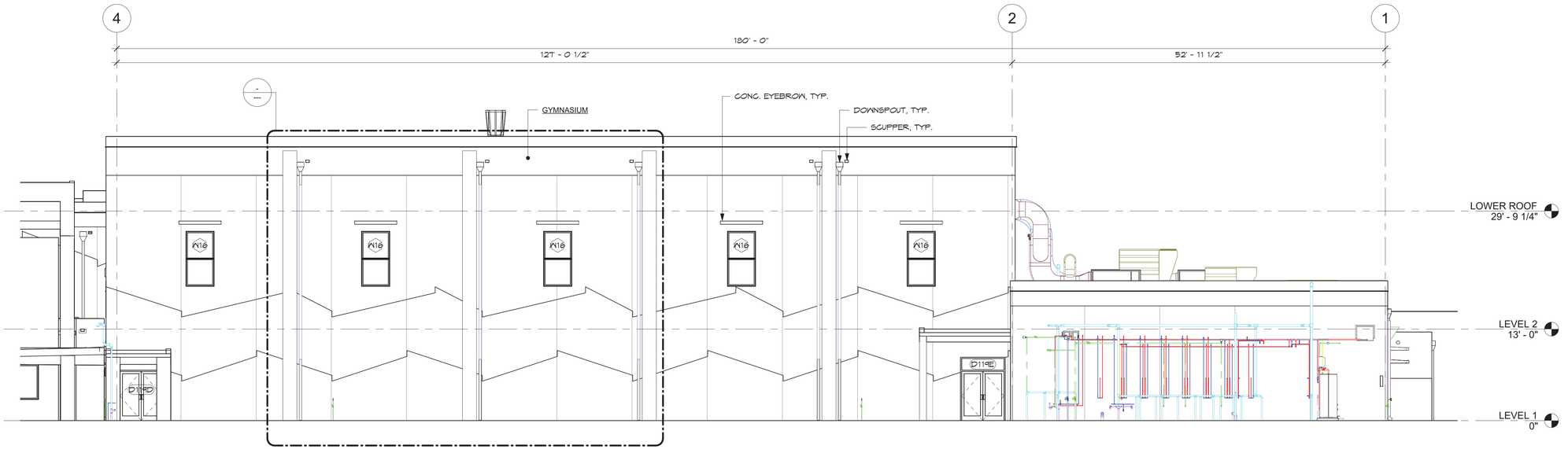
Title:
COURTYARD ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A5.1-2
Sheet No. ____ of ____



1 ENLARGED ELEVATION - GYM NORTH
SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - GYM EAST
SCALE: 1/8" = 1'-0"

ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

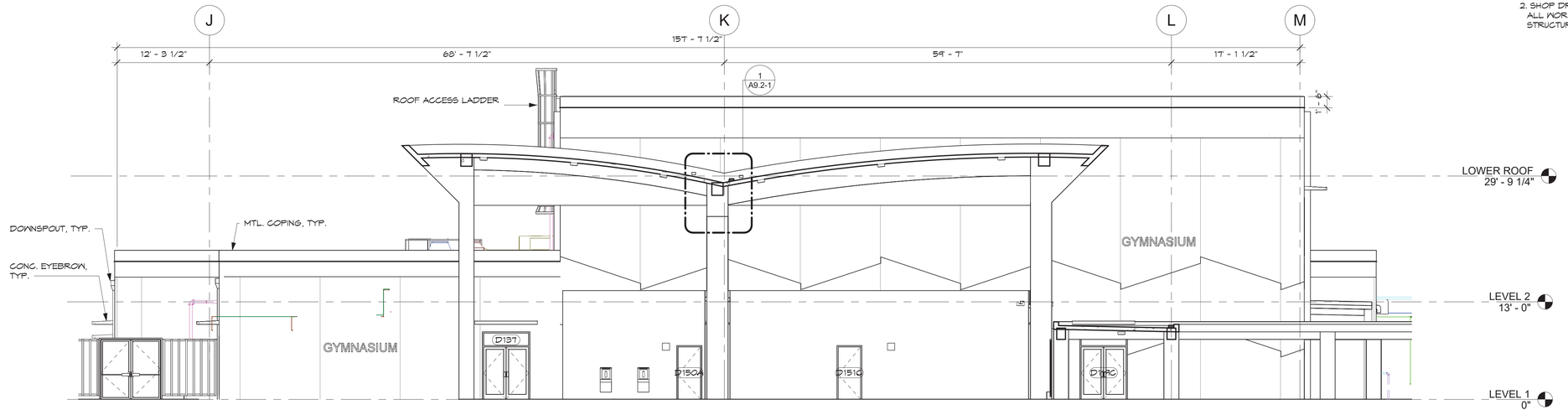
Title:
BUILDING ELEVATIONS - GYMNASIUM
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

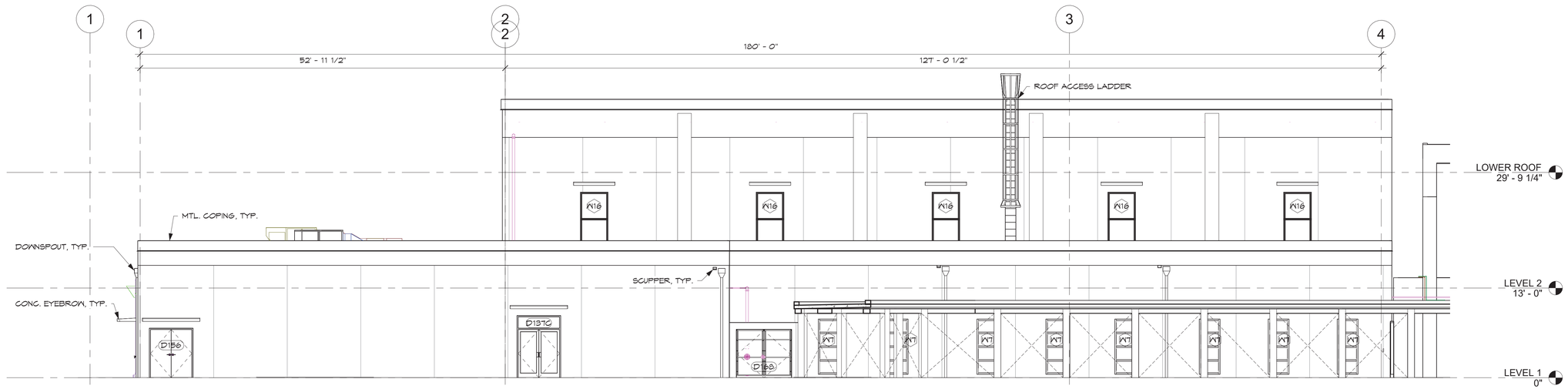
Drawing No.
A5.2
Sheet No. ____ of ____

ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



1 ENLARGED ELEVATION - GYM SOUTH
SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - GYM WEST
SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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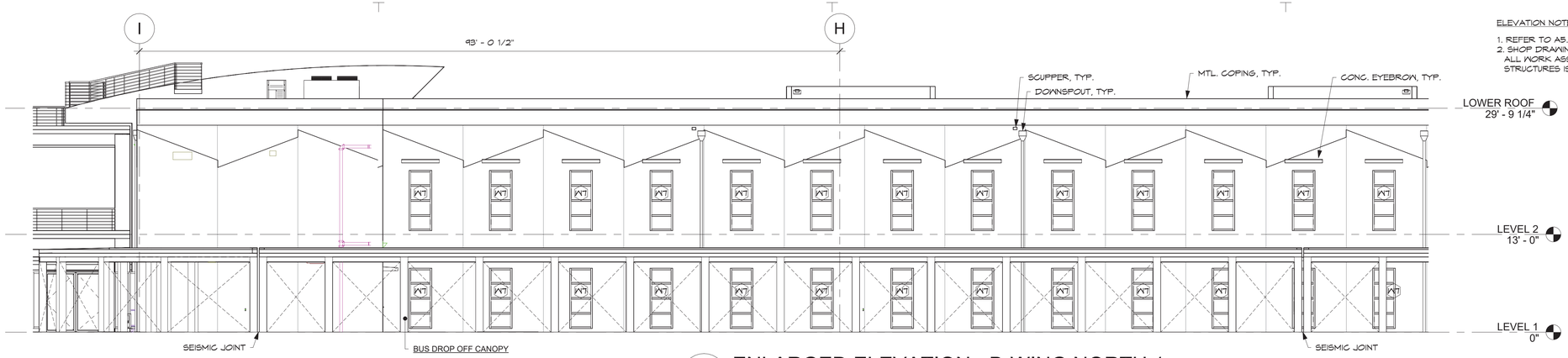
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS - GYMNASIUM
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A5.3
Sheet No. ____ of ____

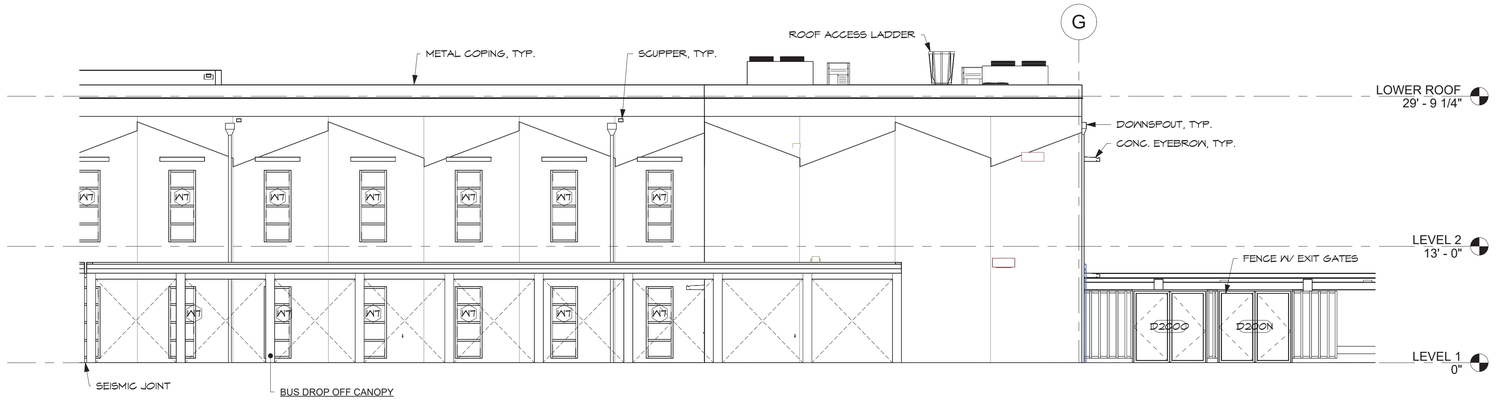


ELEVATION NOTES:

1. REFER TO A5.3.2 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.

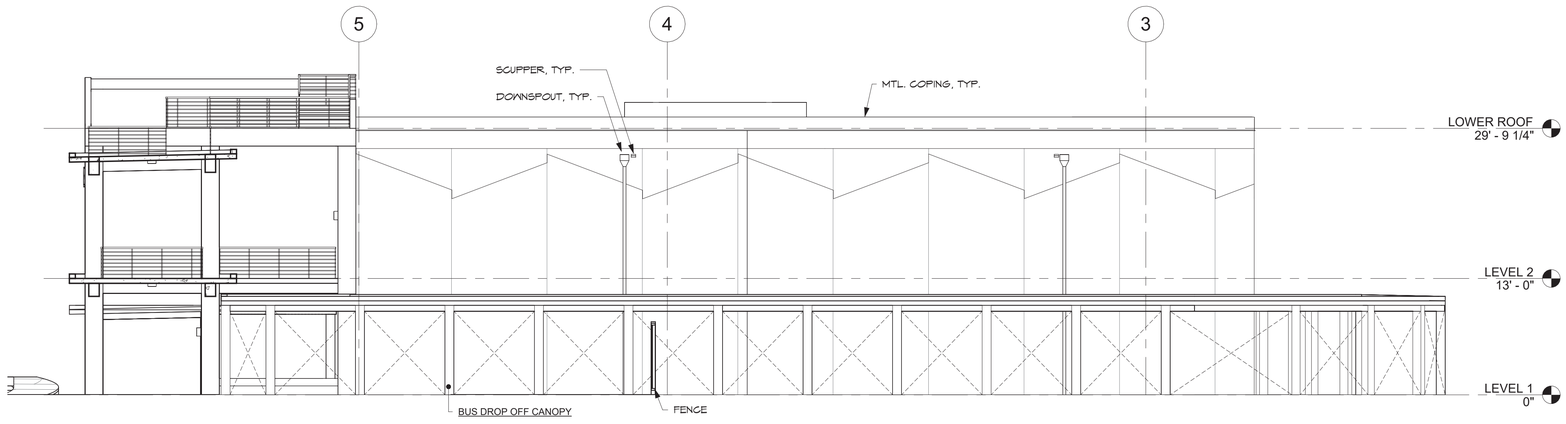
1 ENLARGED ELEVATION - B-WING NORTH 1

SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - B-WING NORTH 2

SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - B-WING EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS - B-WING
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File:	

Drawing No.
A5.4
Sheet No. ____ of ____

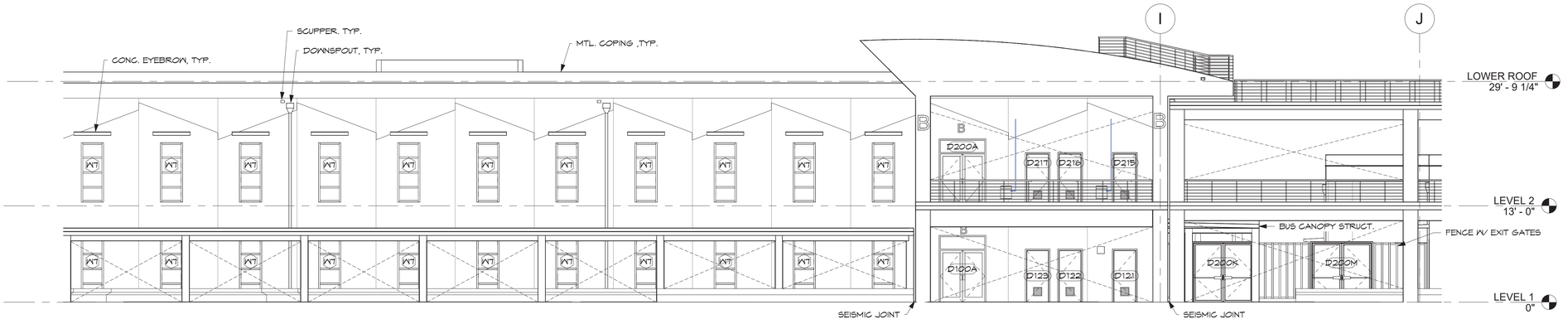


ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.

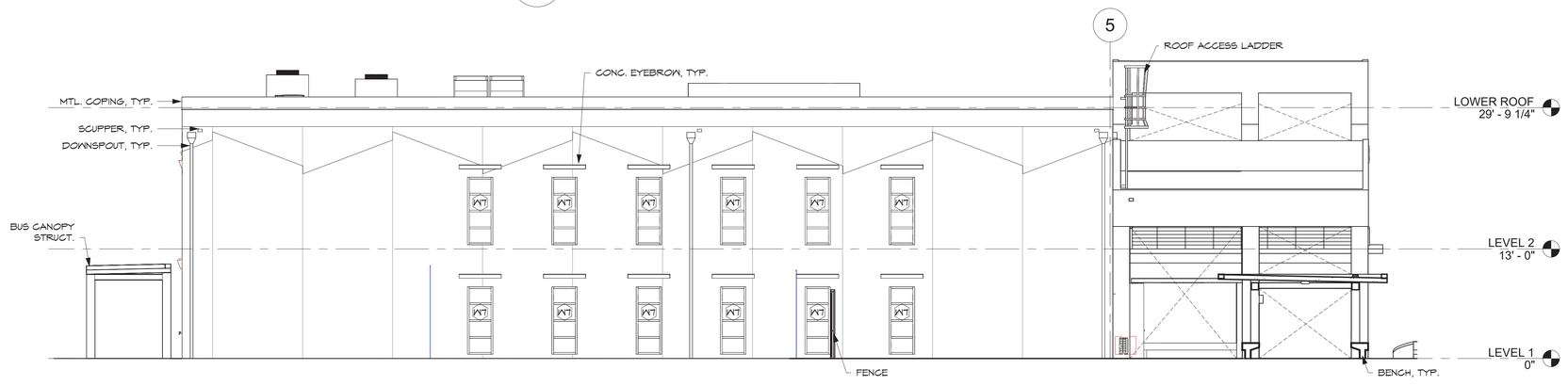
1 ENLARGED ELEVATION - B-WING SOUTH 1

SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - B-WING SOUTH 2

SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - B-WING WEST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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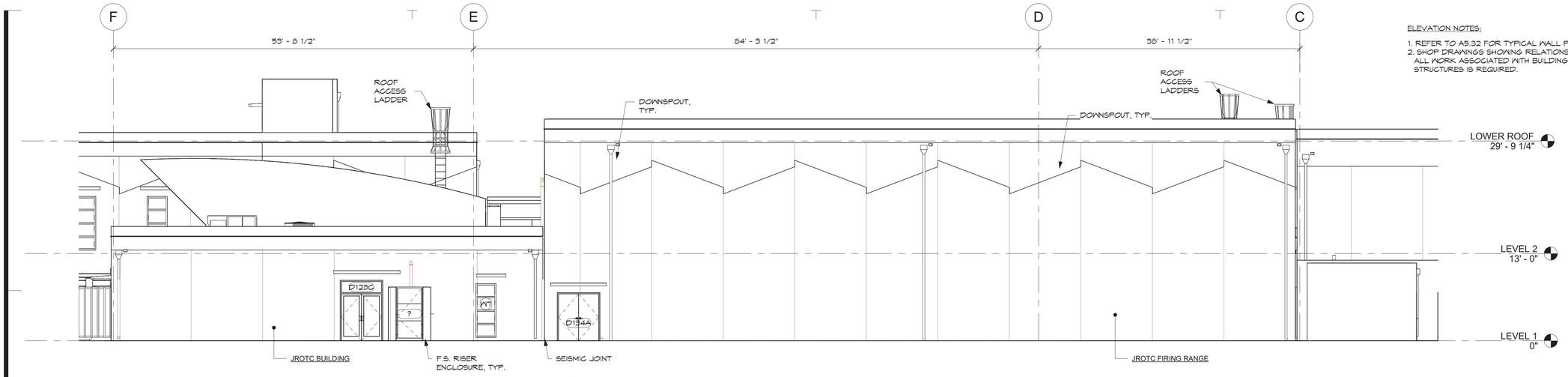
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS - B-WING
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.5

Sheet No. _____ of _____

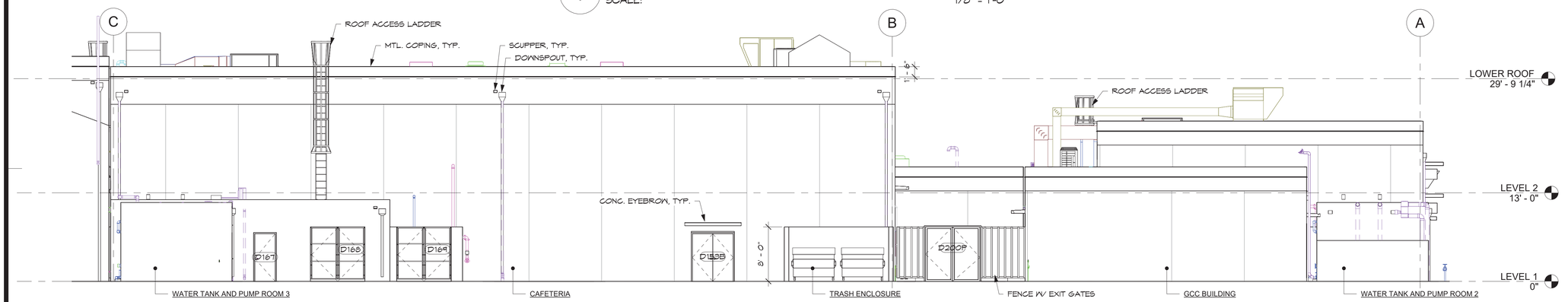


ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.

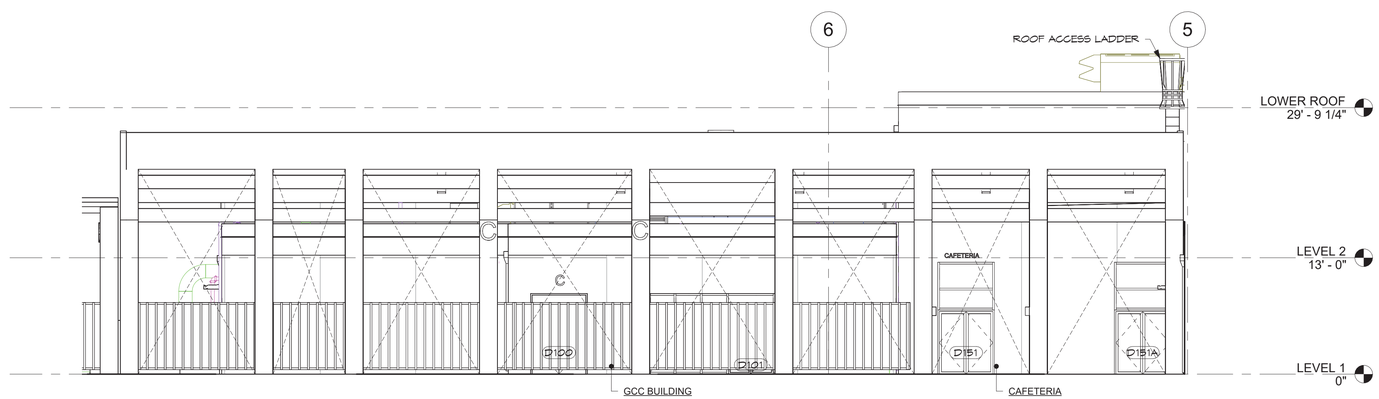
1 ENLARGED ELEVATION - C-WING NORTH

SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - C-WING NORTH 2

SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - C-WING EAST

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: BUILDING ELEVATIONS - C-WING

PROGRAMMING DOCUMENT

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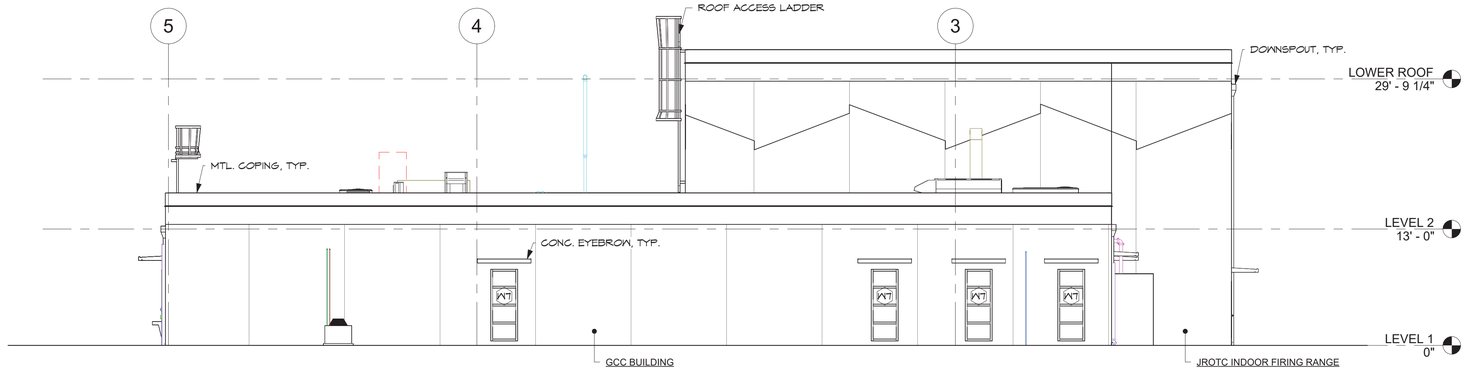
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A5.6

Sheet No. ____ of ____

ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



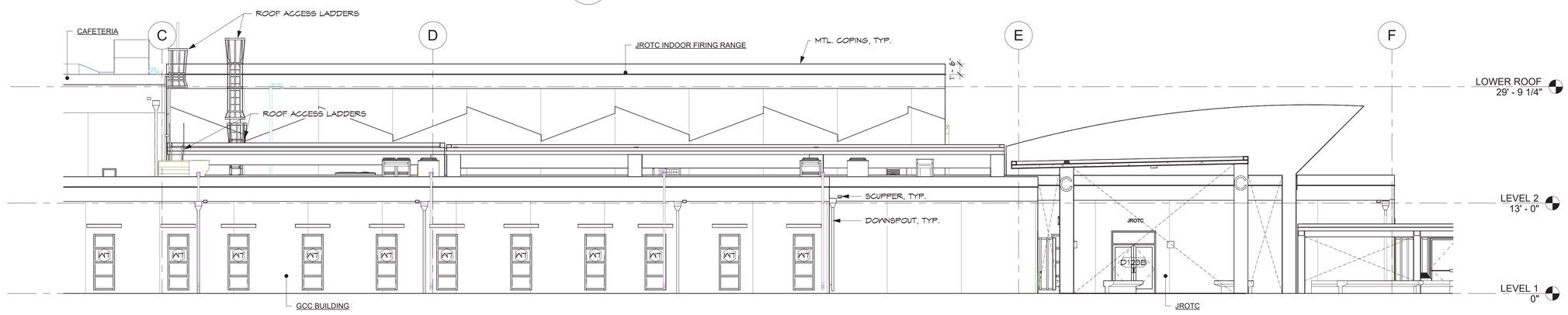
1 ENLARGED ELEVATION - C-WING EAST 2

SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - C-WING SOUTH 1

SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - C-WING SOUTH 2

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS - C-WING
PROGRAMMING DOCUMENT

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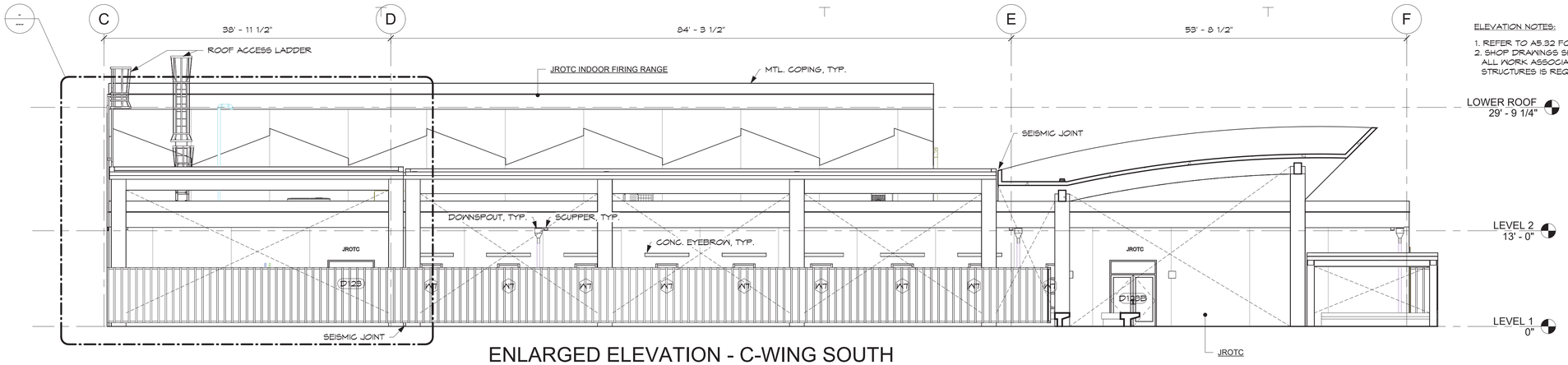
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A5.7

Sheet No. ____ of ____

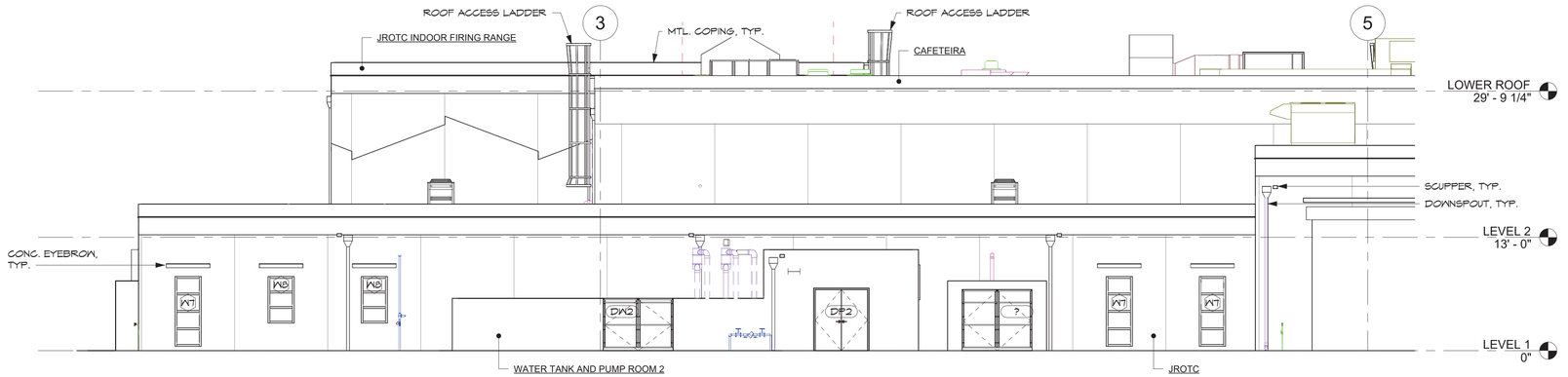


ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.

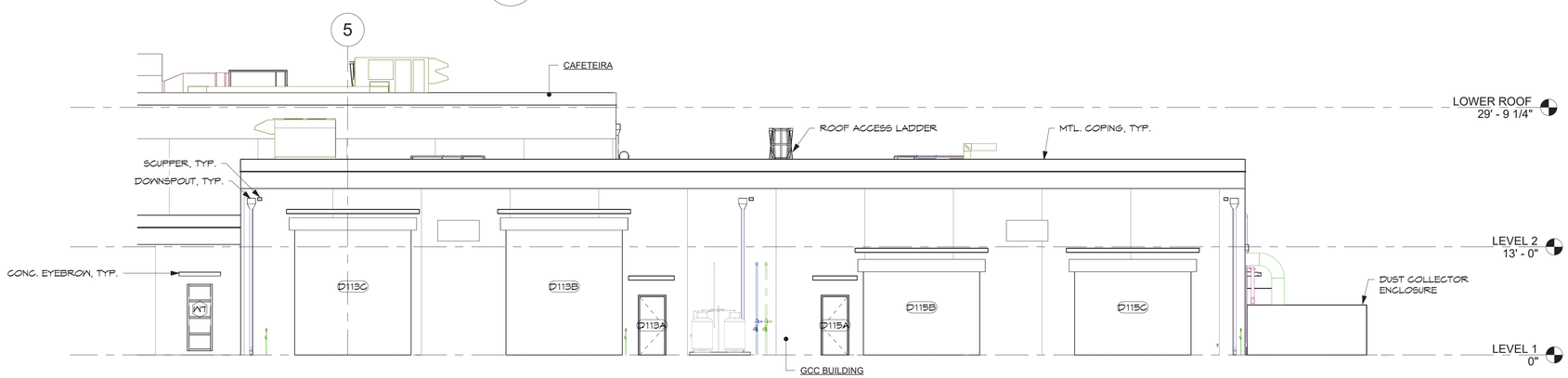
1 ENLARGED ELEVATION - C-WING SOUTH (JROTC)

SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - C-WING WEST 1

SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - C-WING WEST 2

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS - C-WING
PROGRAMMING DOCUMENT

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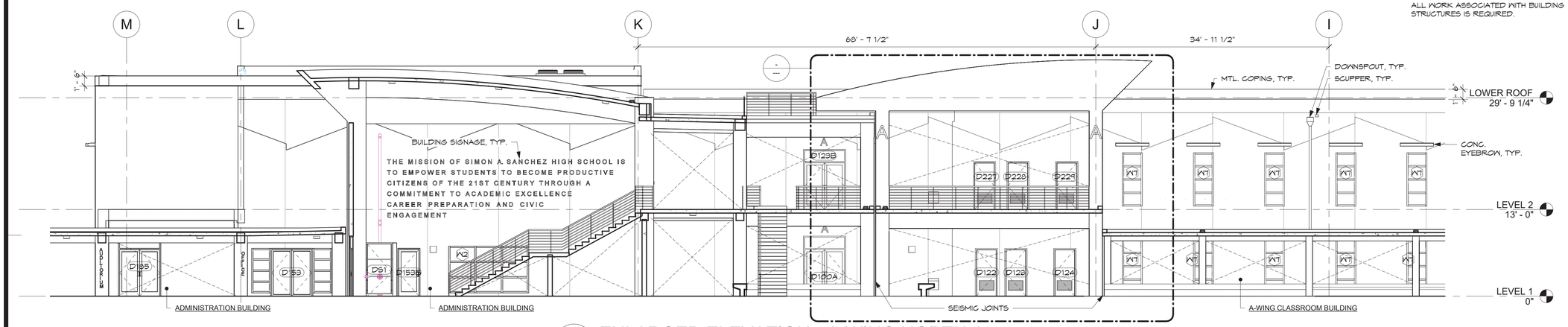
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

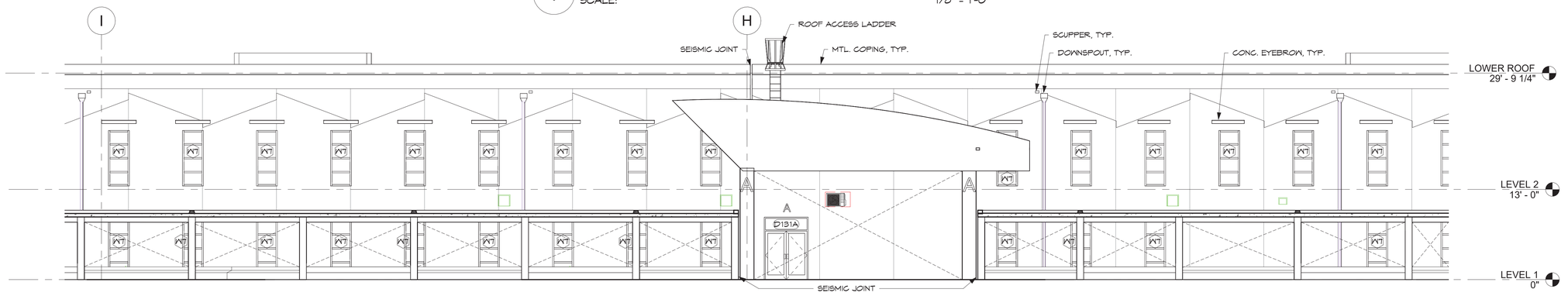
Drawing No.
A5.8
Sheet No. of

ELEVATION NOTES:

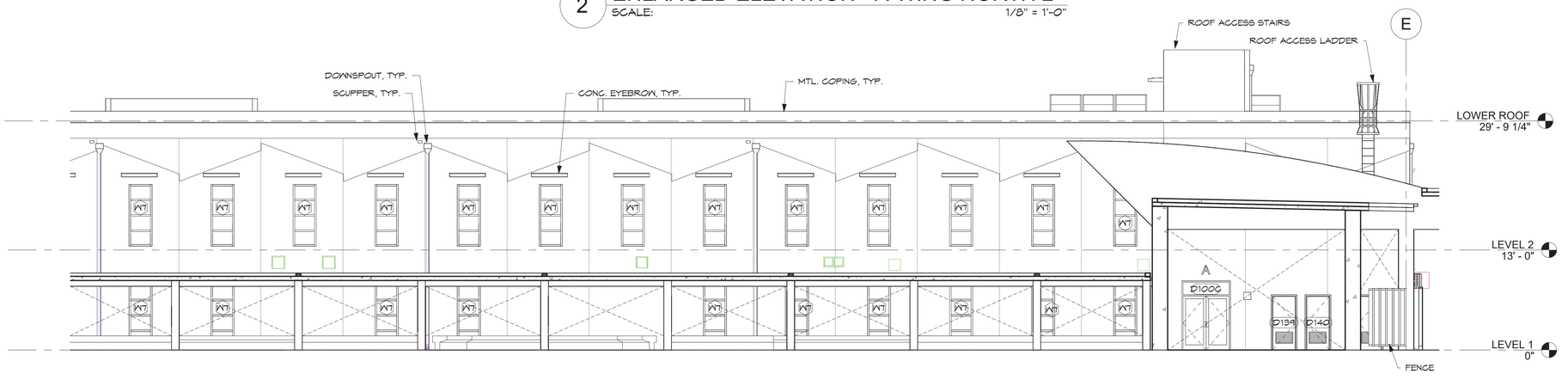
1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



1 ENLARGED ELEVATION - A-WING NORTH 1
SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - A-WING NORTH 2
SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - A-WING NORTH 3
SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BUILDING ELEVATIONS - A-WING
PROGRAMMING DOCUMENT

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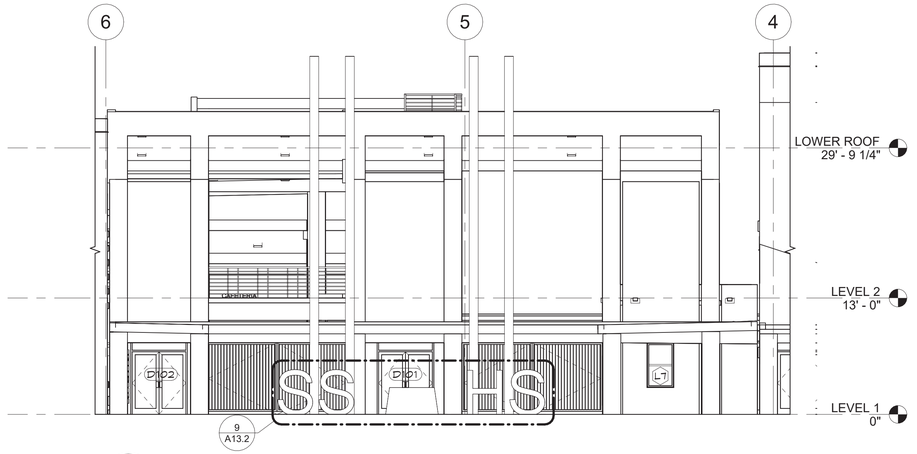
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.:
A5.9
Sheet No. of

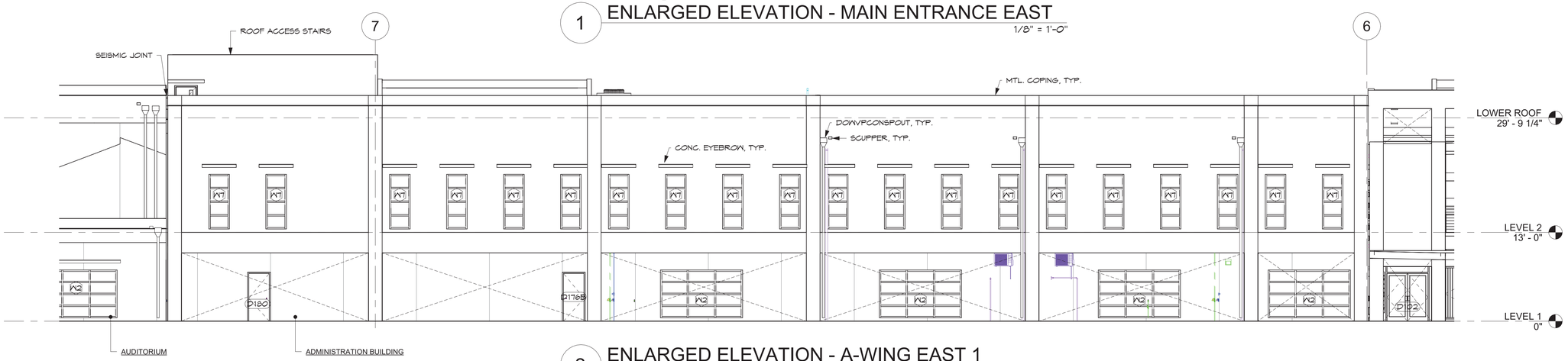
ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



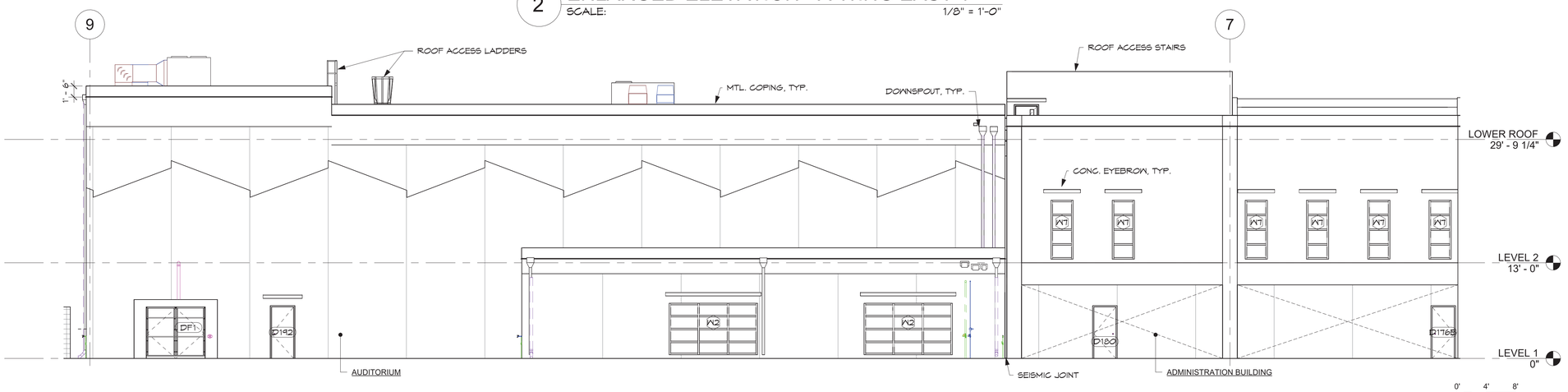
1 ENLARGED ELEVATION - MAIN ENTRANCE EAST

1/8" = 1'-0"



2 ENLARGED ELEVATION - A-WING EAST 1

SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - A-WING EAST 2

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED ELEVATIONS - A-WING

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.:
A5.10

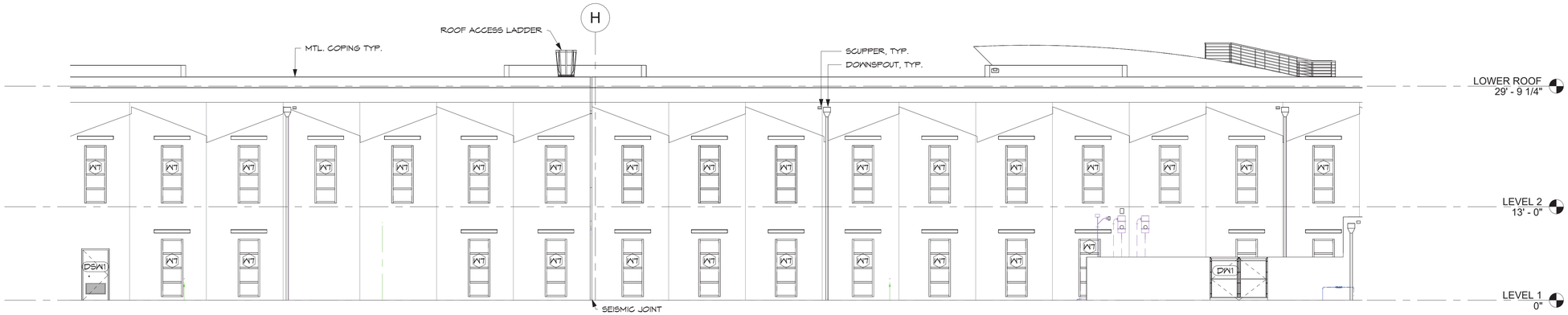
Sheet No. _____ of _____

ELEVATION NOTES:

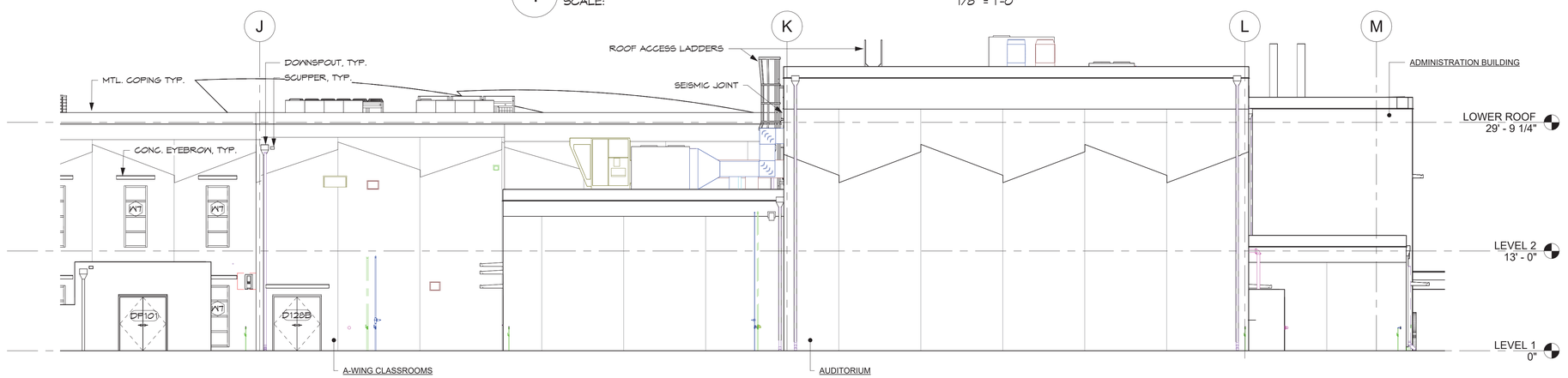
1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



1 ENLARGED ELEVATION - A-WING SOUTH 1
SCALE: 1/8" = 1'-0"



4 ENLARGED ELEVATION - A-WING SOUTH 2
SCALE: 1/8" = 1'-0"



3 ENLARGED ELEVATION - A-WING SOUTH 3
SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

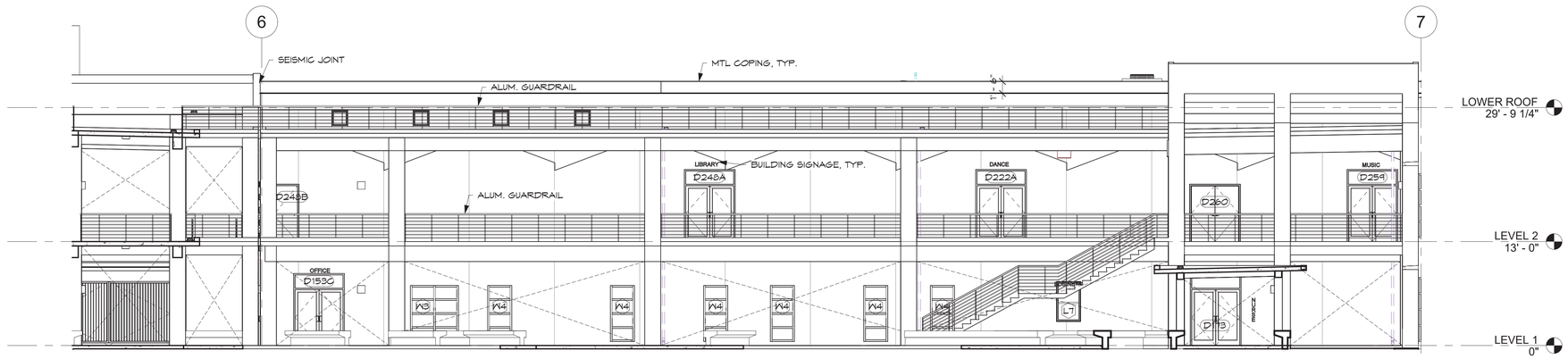
Title:
ENLARGED ELEVATIONS - A-WING
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.11
Sheet No. of

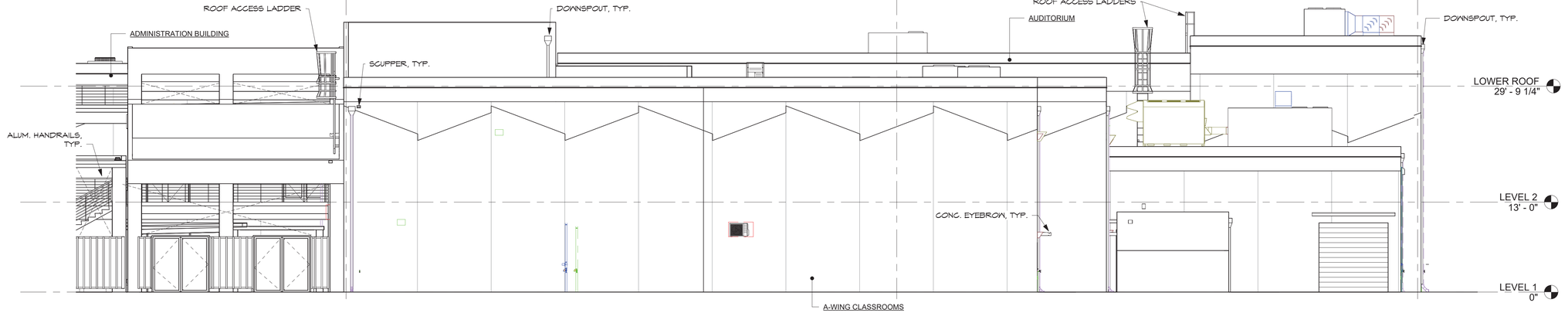
ELEVATION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.



1 ENLARGED ELEVATION - A-WING WEST 1

SCALE: 1/8" = 1'-0"



2 ENLARGED ELEVATION - A-WING WEST 2

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

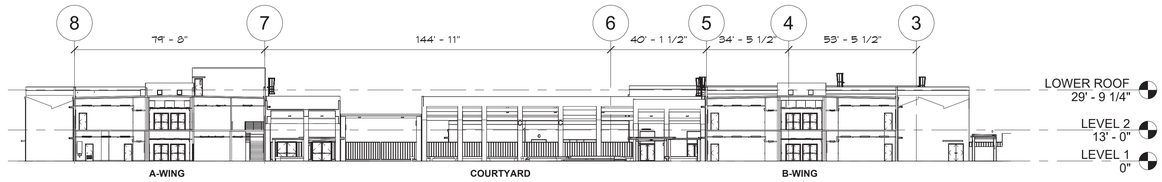
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED ELEVATIONS - A-WING

PROGRAMMING DOCUMENT

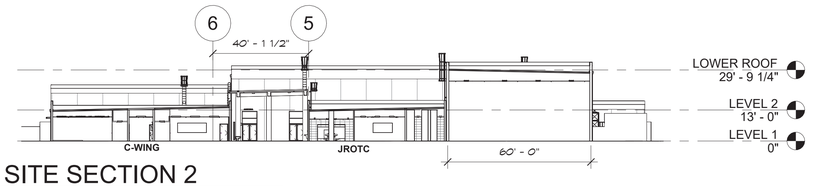
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.
A5.12
Sheet No. ____ of ____



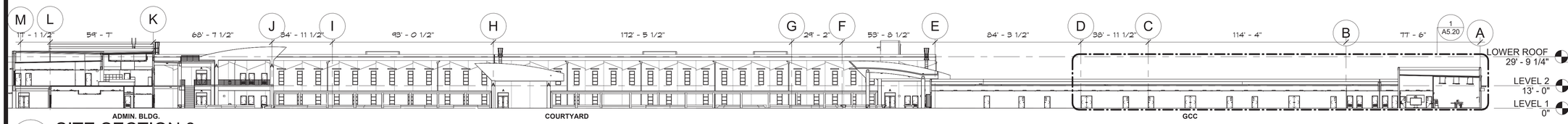
1 SITE SECTION 1

SCALE: 1" = 30'-0"



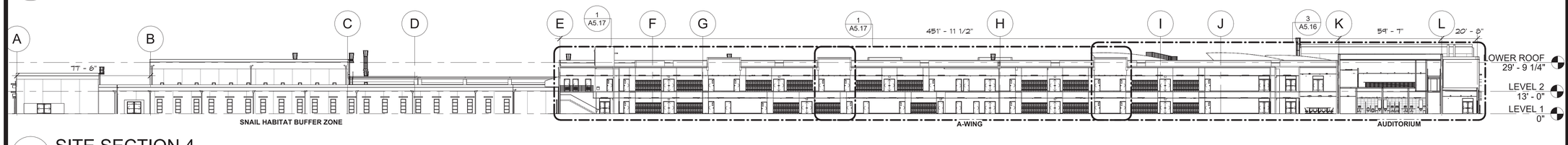
2 SITE SECTION 2

SCALE: 1" = 30'-0"



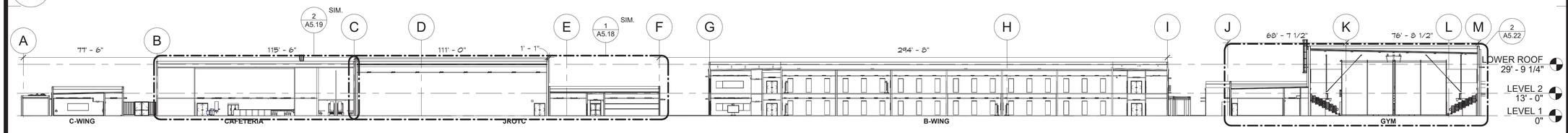
3 SITE SECTION 3

SCALE: 1" = 30'-0"



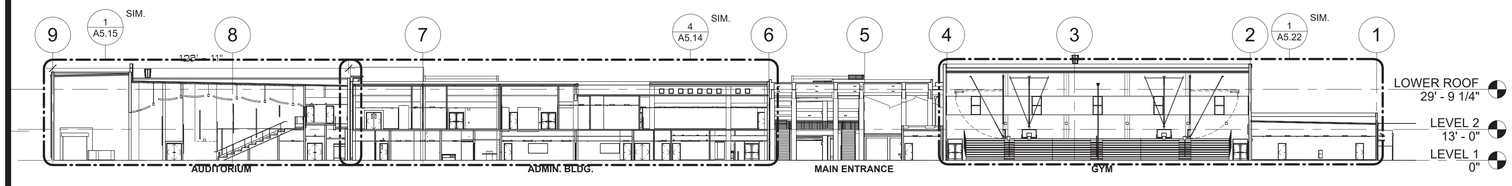
4 SITE SECTION 4

SCALE: 1" = 30'-0"



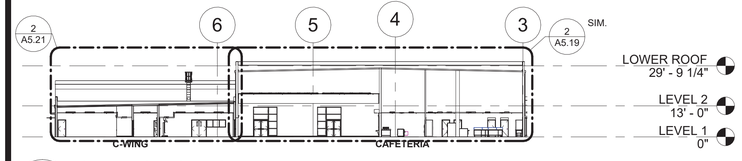
5 SITE SECTION 5

SCALE: 1" = 30'-0"



6 SITE SECTION 6

SCALE: 1" = 30'-0"



7 SITE SECTION 7

SCALE: 1" = 30'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
3. PROVIDE ELASTOMERIC ROOF COATING AT ALL ROOF STRUCTURES & GUTTERS.
4. PROVIDE CONTINUOUS THERMAL INSULATION AT THE UNDERSIDE OF THE ROOF STRUCTURE AT ALL INTERIOR SPACES.

0' 15' 30' 60'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

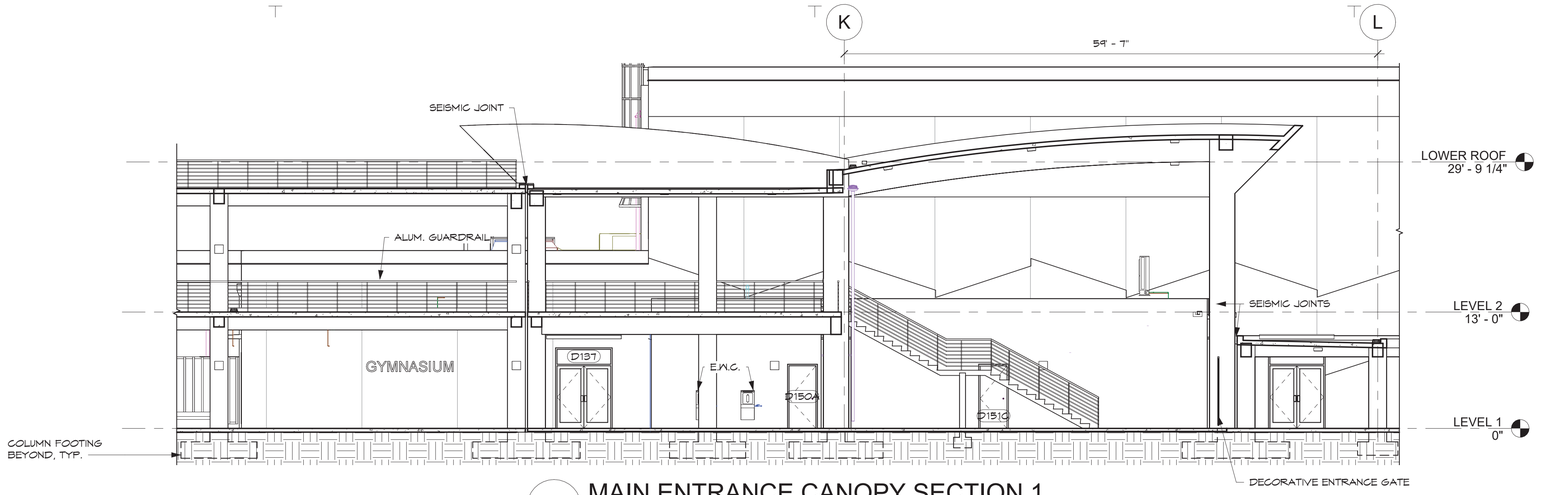
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE SECTIONS
PROGRAMMING DOCUMENT

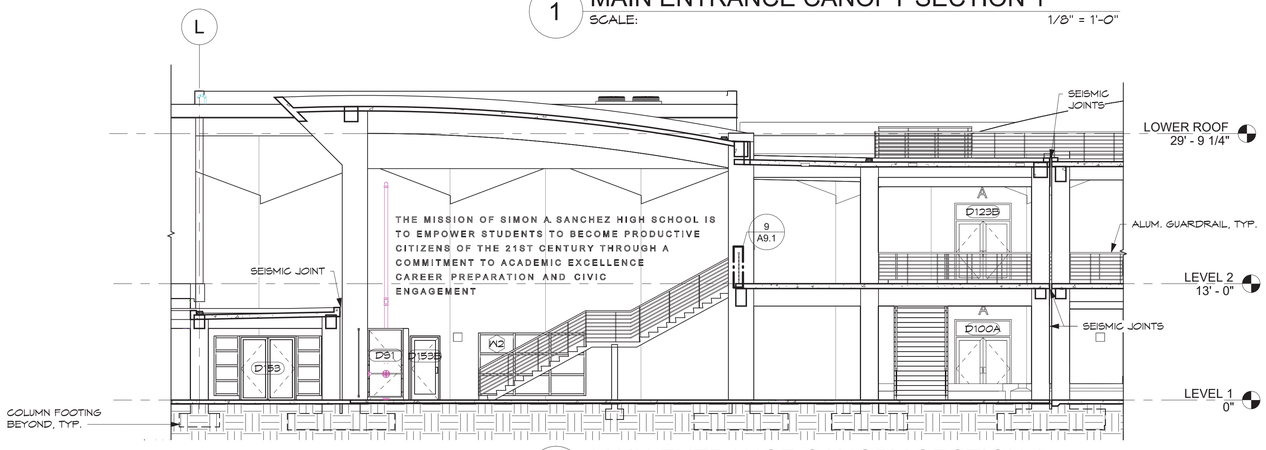
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.13

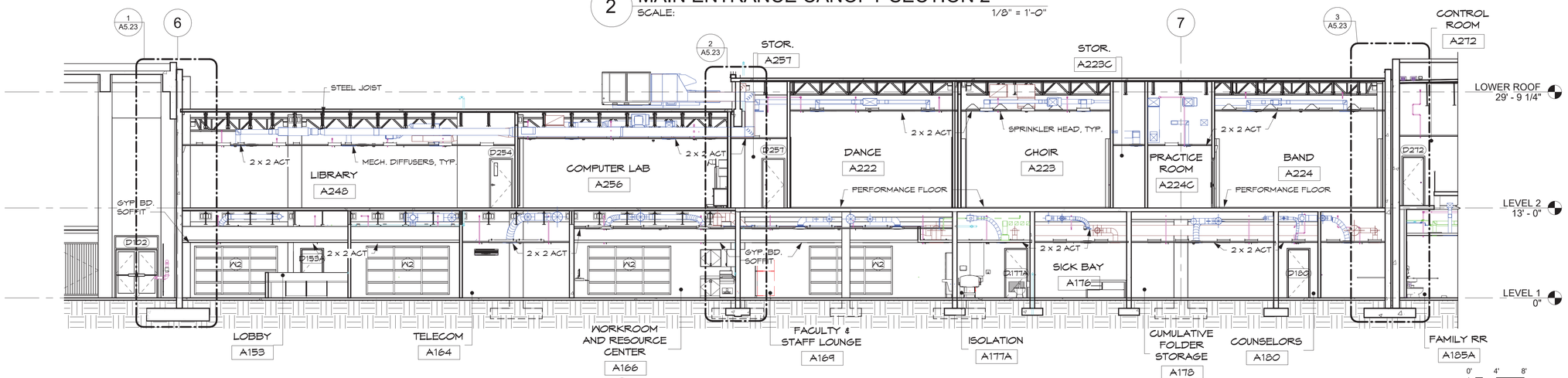
Sheet No. of



1 MAIN ENTRANCE CANOPY SECTION 1
SCALE: 1/8" = 1'-0"



2 MAIN ENTRANCE CANOPY SECTION 2
SCALE: 1/8" = 1'-0"



4 ADMIN BUILDING SECTION 1
SCALE: 1/8" = 1'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
3. PROVIDE ELASTOMERIC ROOF COATING AT ALL ROOF STRUCTURES & GUTTERS.
4. PROVIDE CONTINUOUS THERMAL INSULATION AT THE UNDERSIDE OF THE ROOF STRUCTURE AT ALL INTERIOR SPACES.

REVISIONS

No.	Description	Date

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

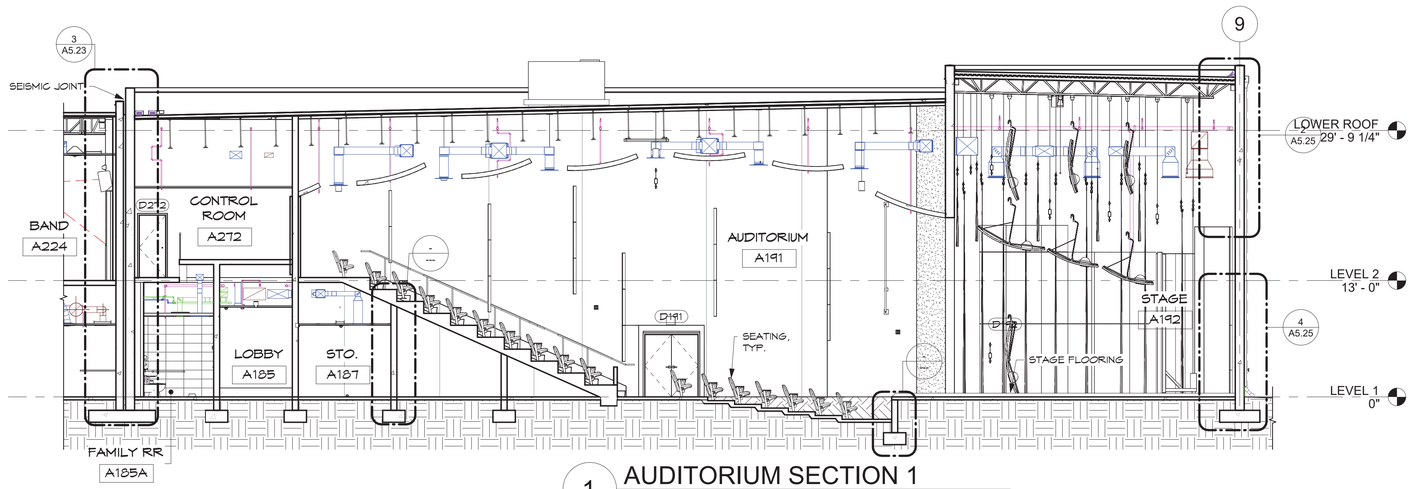
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MAIN ENTRANCE/ ADMINISTRATION BUILDING SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

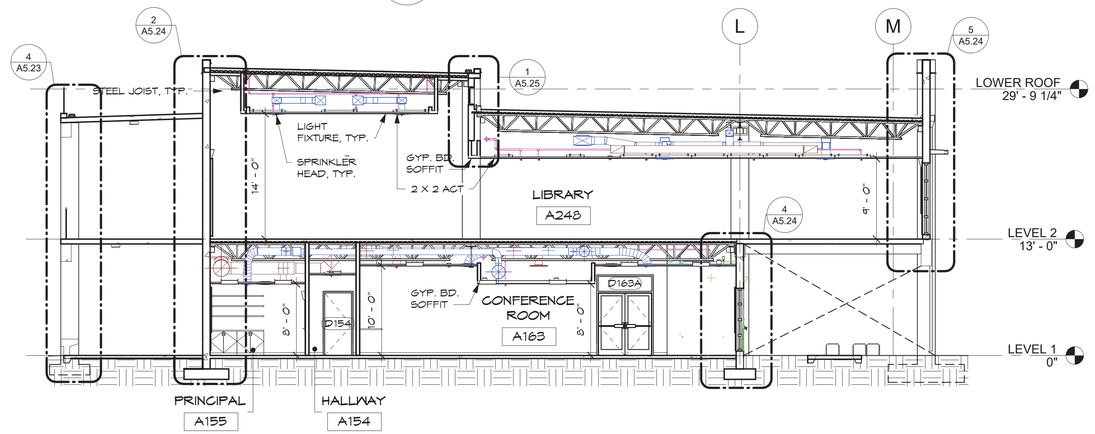
Drawing No.
A5.14
Sheet No. ____ of ____

0' 4' 8' 16'
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



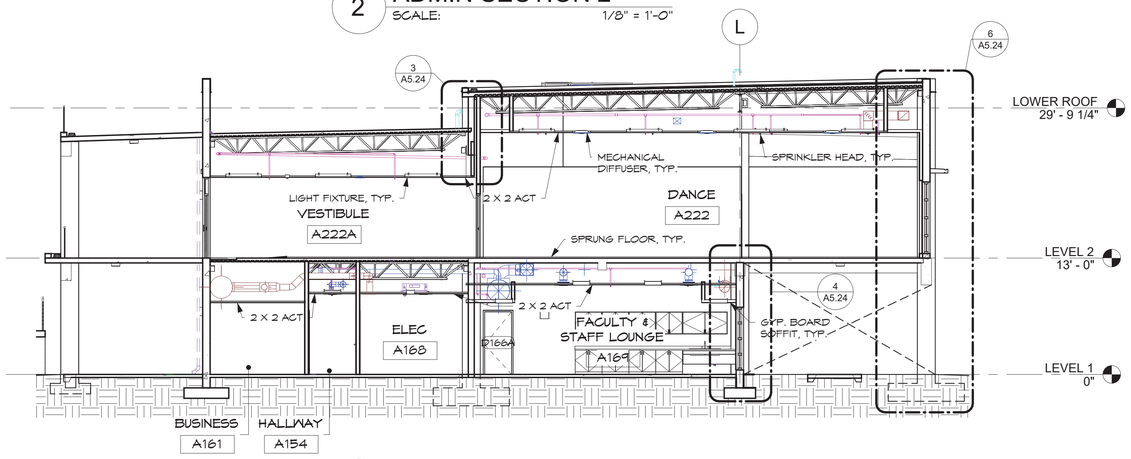
1 AUDITORIUM SECTION 1

SCALE: 1/8" = 1'-0"



2 ADMIN SECTION 2

SCALE: 1/8" = 1'-0"



3 ADMIN SECTION 3

SCALE: 1/8" = 1'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
3. PROVIDE ELASTOMERIC ROOF COATING AT ALL ROOF STRUCTURES & GUTTERS.
4. PROVIDE CONTINUOUS THERMAL INSULATION AT THE UNDERSIDE OF THE ROOF STRUCTURE AT ALL INTERIOR SPACES.

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

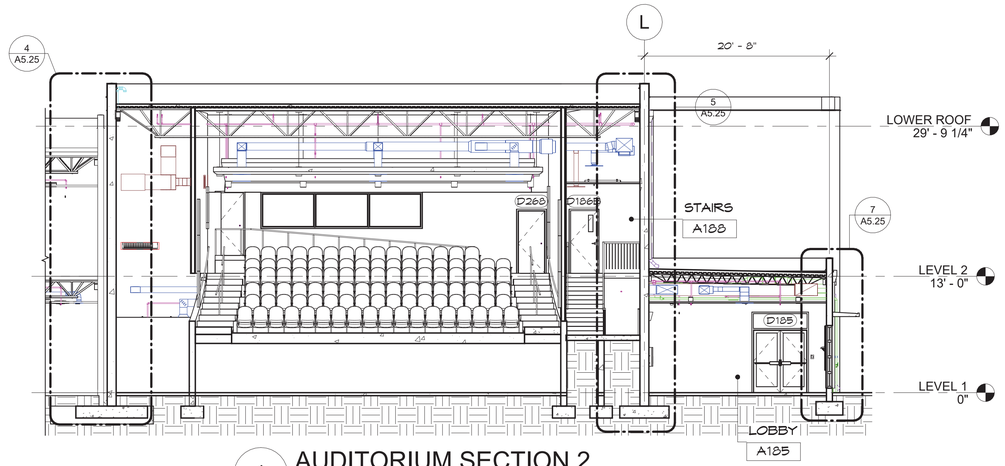
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ADMINISTRATION BUILDING & AUDITORIUM SECTIONS PROGRAMMING DOCUMENT

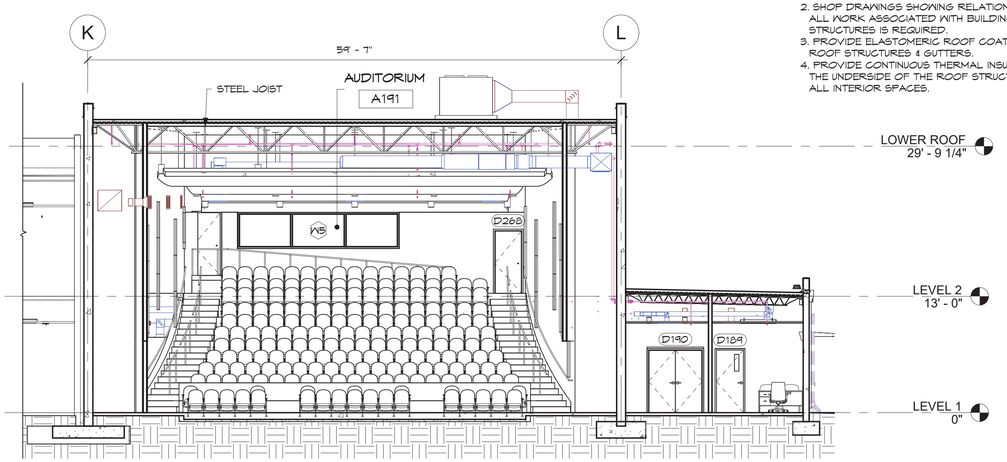
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No. A5.15

Sheet No. _____ of _____



1 AUDITORIUM SECTION 2
SCALE: 1/8" = 1'-0"



2 AUDITORIUM SECTION 3
SCALE: 1/8" = 1'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
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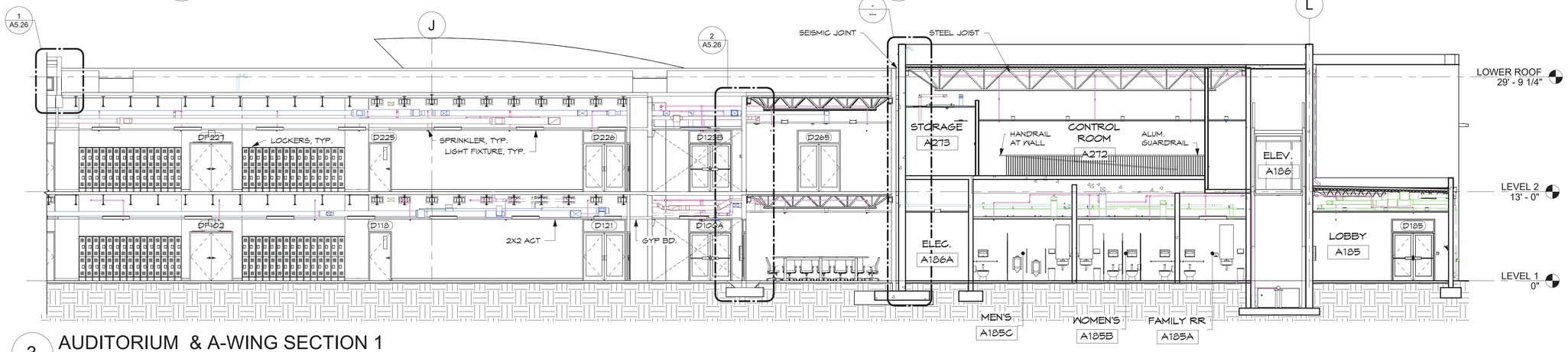
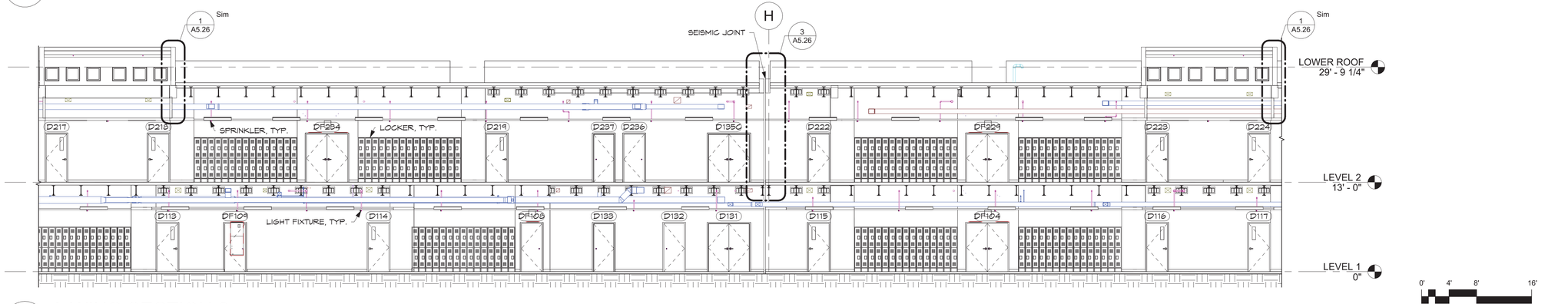


3 AUDITORIUM & A-WING SECTION 1
SCALE: 1/8" = 1'-0"



4 A-WING SECTION 2
SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Architecture
Planning
Interior Design

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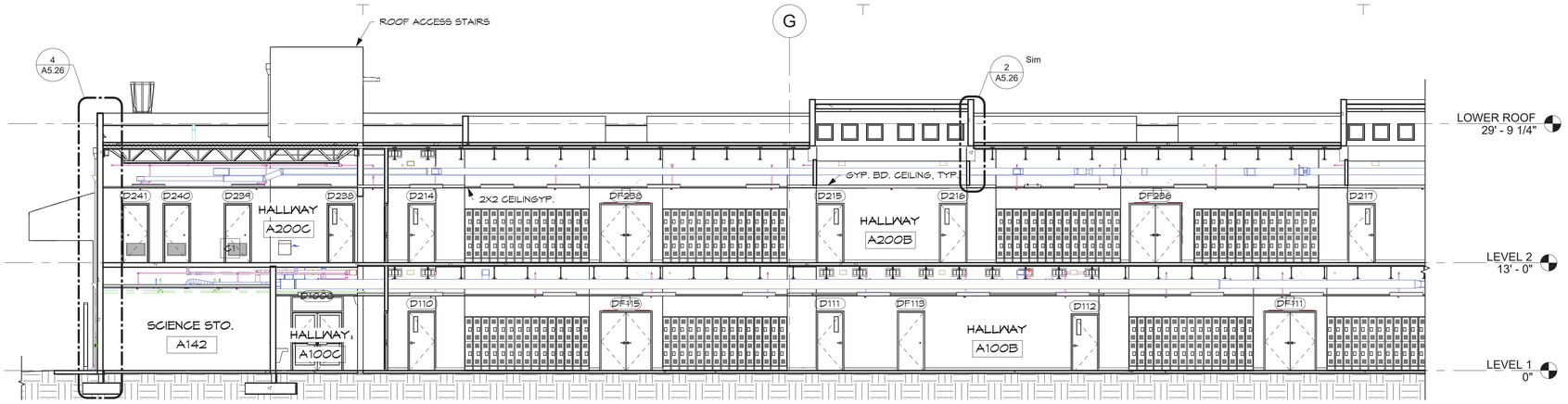
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM & A-WING SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.16
Sheet No. ____ of ____



SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
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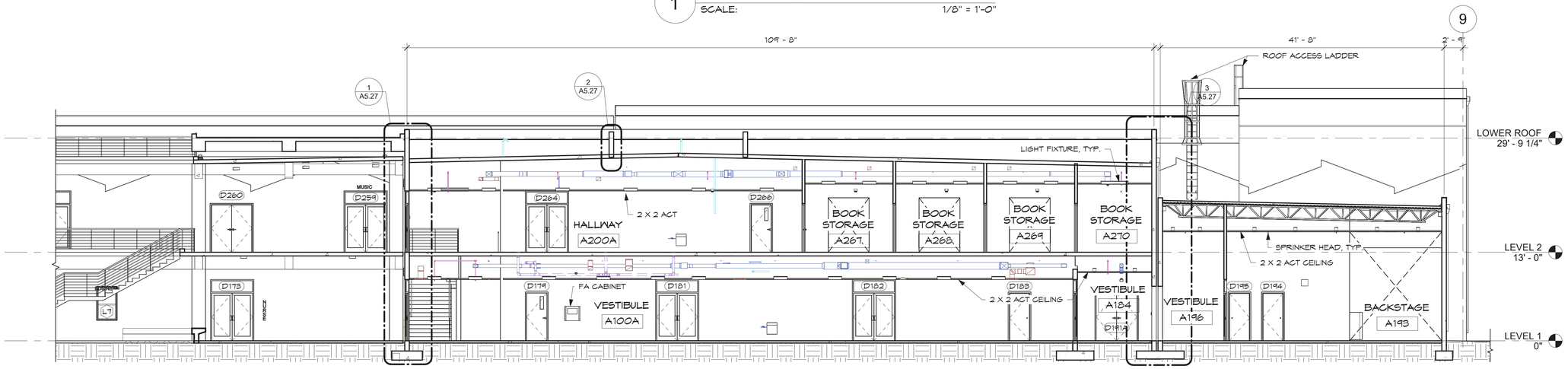
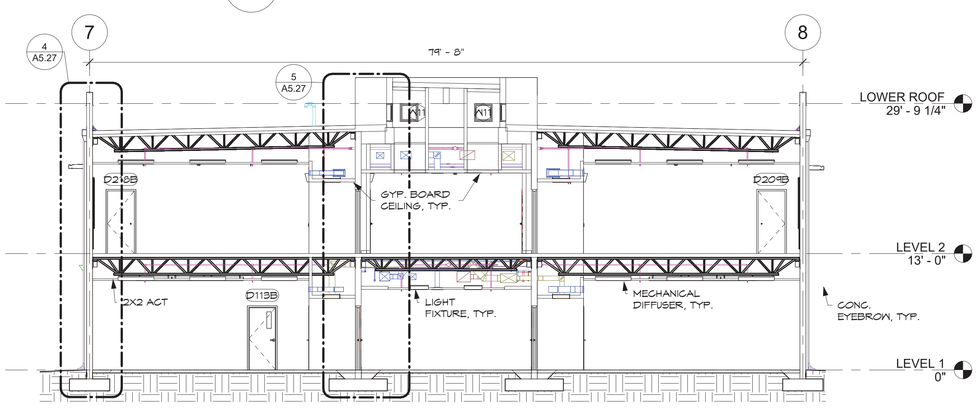
1 A-WING SECTION 3

SCALE: 1/8" = 1'-0"



2 A-WING SECTION 4

SCALE: 1/8" = 1'-0"



3 A-WING SECTION 5

SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.17
Sheet No. ____ of ____

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
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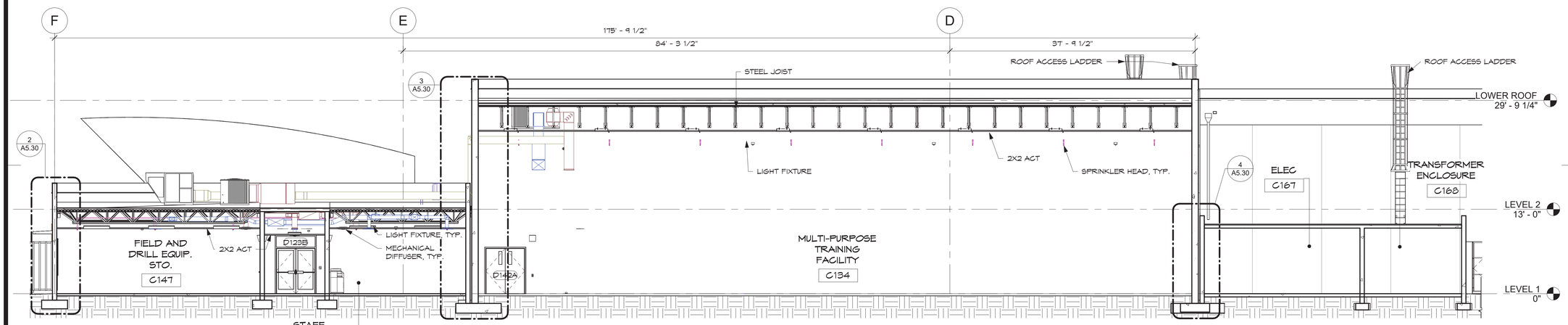
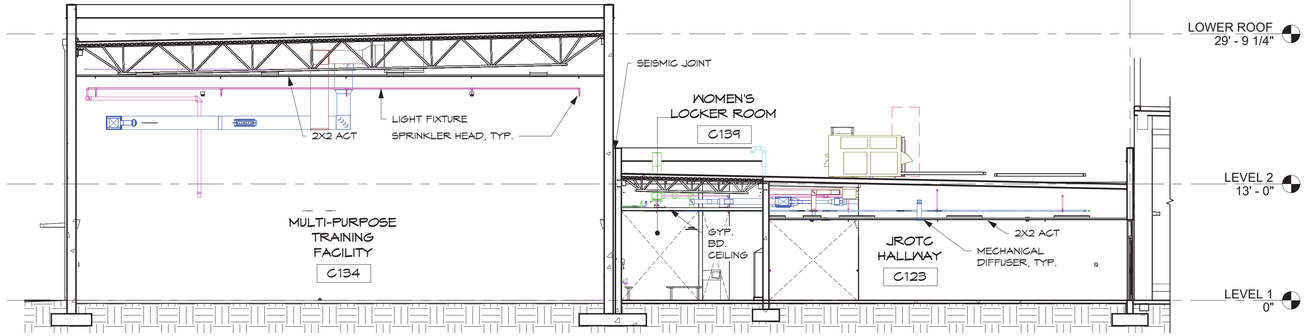


1 JROTC SECTION 1
SCALE: 1/8" = 1'-0"



2 JROTC SECTION 2
SCALE: 1/8" = 1'-0"

0' 4' 8' 16'
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Architecture
Planning
Interior Design

Project :
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title :
JROTC SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.18
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
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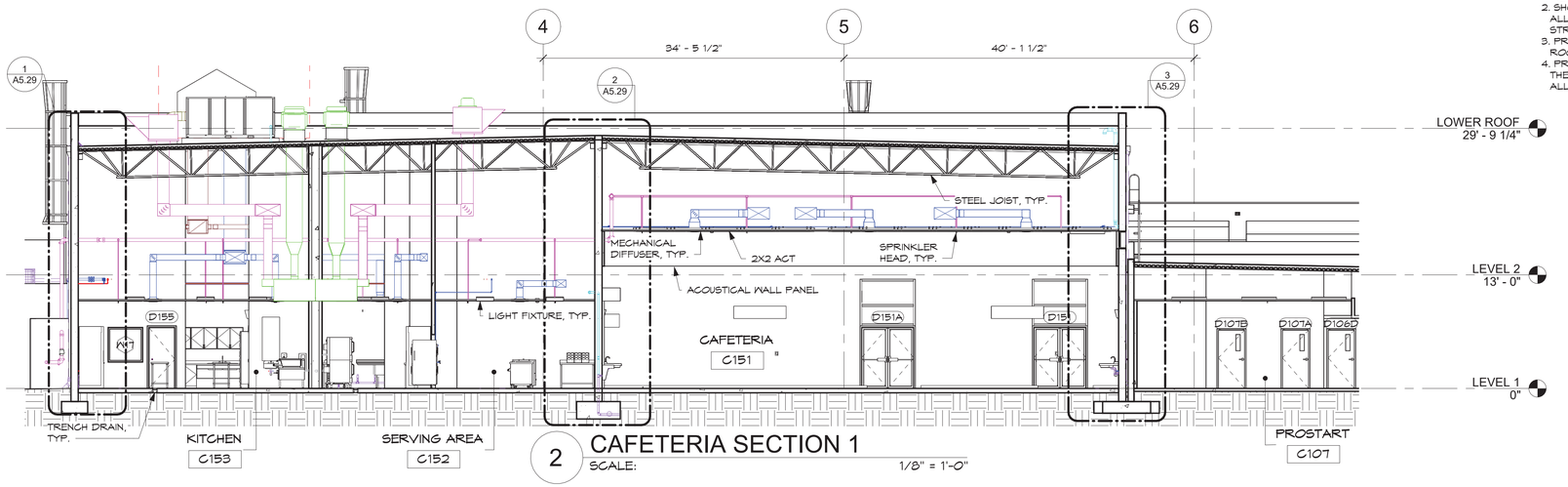
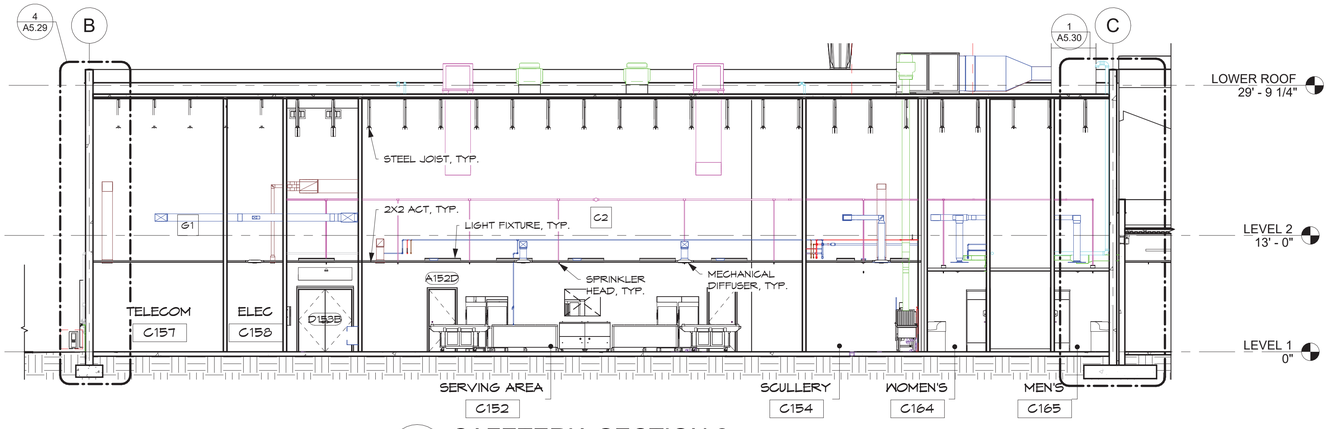
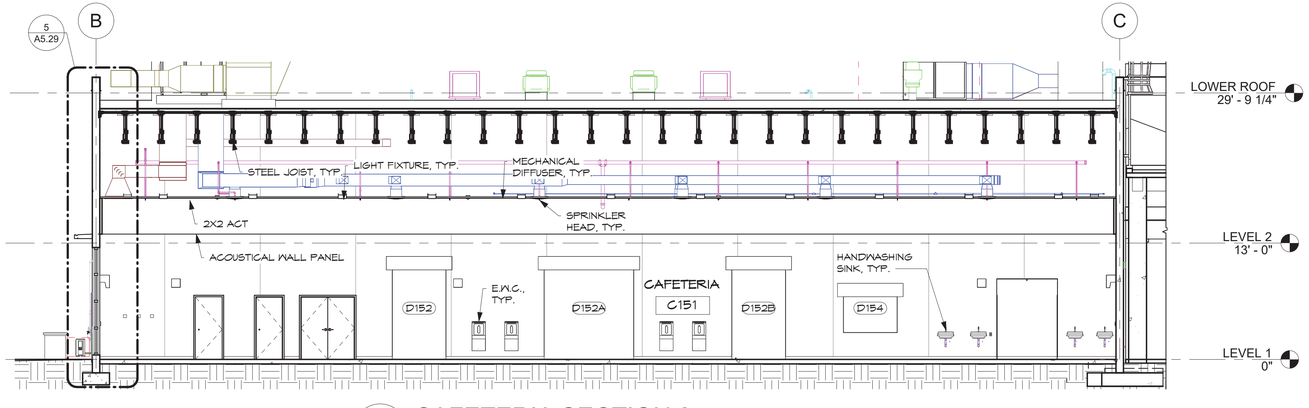


2 CAFETERIA SECTION 1
SCALE: 1/8" = 1'-0"



3 CAFETERIA SECTION 2
SCALE: 1/8" = 1'-0"



4 CAFETERIA SECTION 3
SCALE: 1/8" = 1'-0"

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

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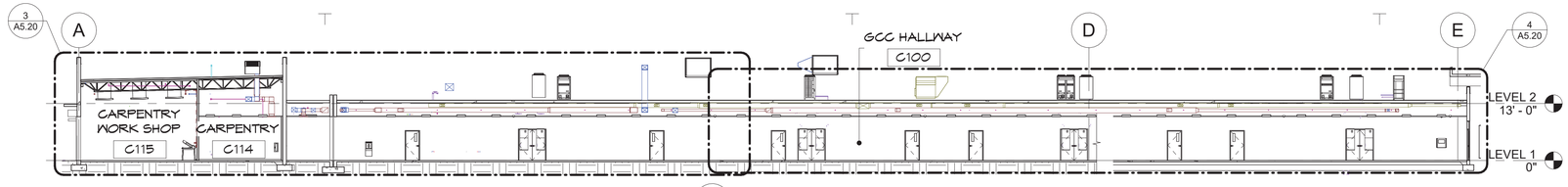
Project :
GDOE
SIMON SANCHEZ HIGH SCHOOL

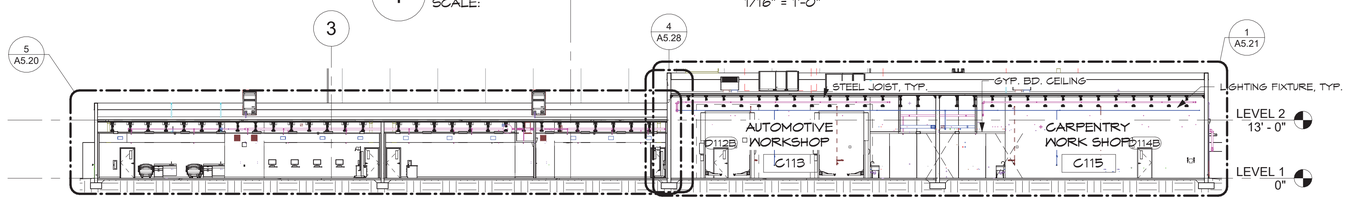
Title :
CAFETERIA SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

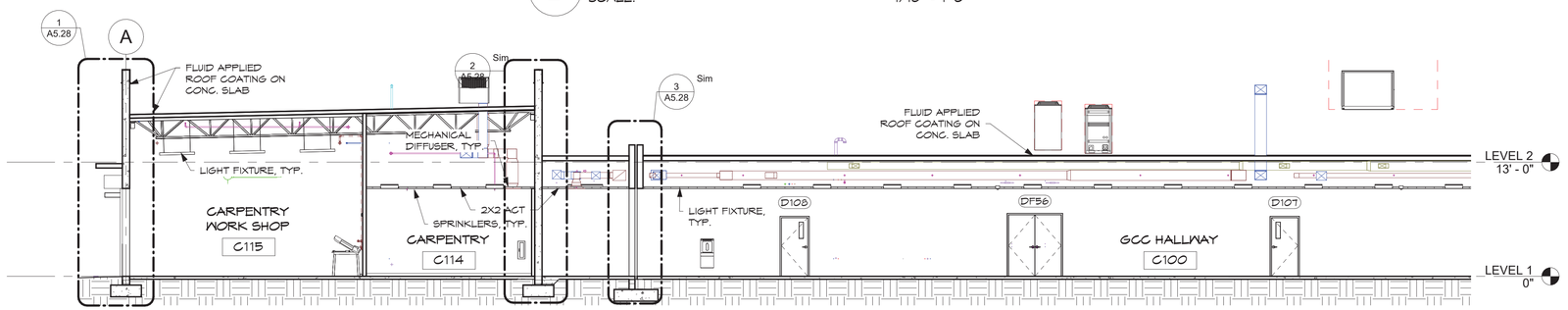
Drawing No.
A5.19
Sheet No. _____ of _____



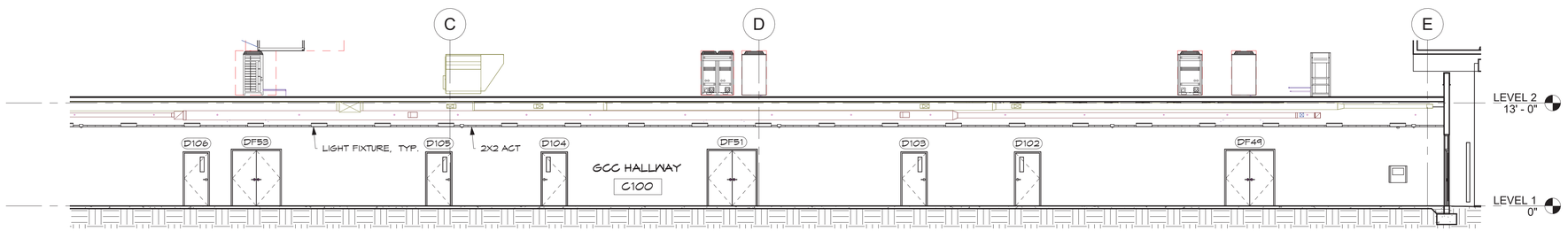
1 GCC SECTION 1
SCALE: 1/16" = 1'-0"



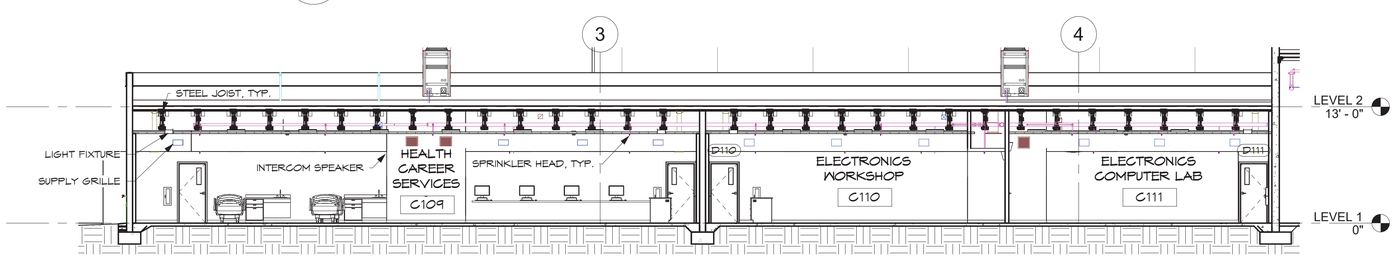
2 GCC SECTION 2
SCALE: 1/16" = 1'-0"



3 ENLARGED GCC SECTION 1
SCALE: 1/8" = 1'-0"



4 ENLARGED GCC SECTION 1
SCALE: 1/8" = 1'-0"



5 ENLARGED GCC SECTION 2
SCALE: 1/8" = 1'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
3. PROVIDE ELASTOMERIC ROOF COATING AT ALL ROOF STRUCTURES & GUTTERS.
4. PROVIDE CONTINUOUS THERMAL INSULATION AT THE UNDERSIDE OF THE ROOF STRUCTURE AT ALL INTERIOR SPACES.

0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

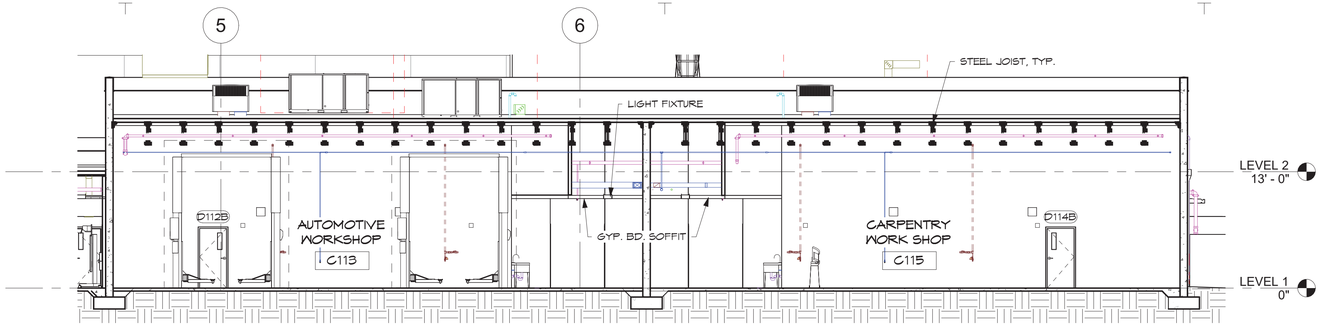
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC & CREDIT RECOVERY BUILDING SECTIONS
PROGRAMMING DOCUMENT

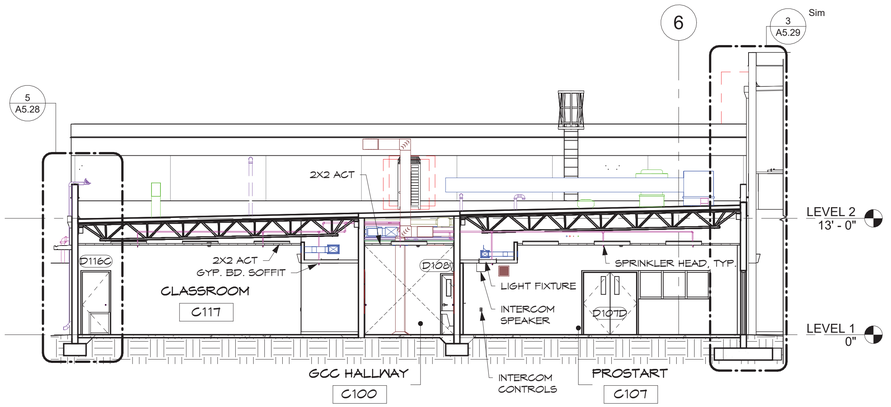
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.20

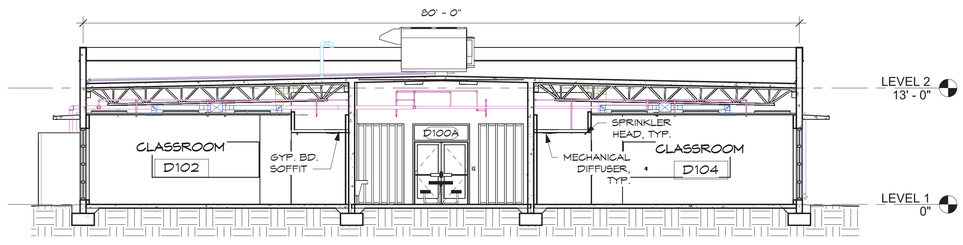
Sheet No. ____ of ____



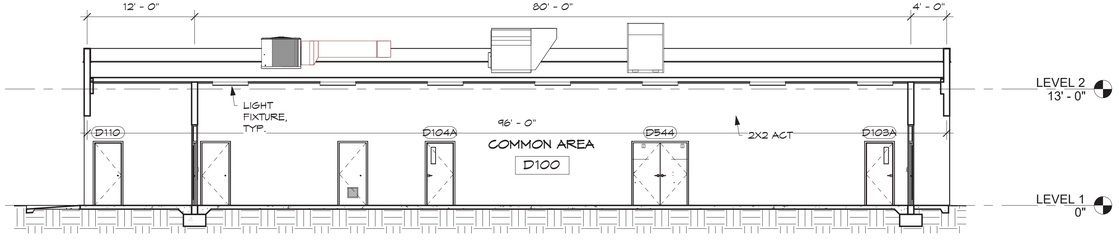
1 ENLARGED GCC SECTION 2
SCALE: 1/8" = 1'-0"



2 GCC SECTION 3
SCALE: 1/8" = 1'-0"



3 CREDIT RECOVERY SECTION 1
SCALE: 1/8" = 1'-0"



4 CREDIT RECOVERY SECTION 2
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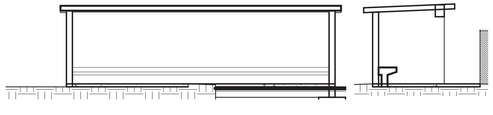


5 DUG OUT SECTION 1
SCALE: 1/8" = 1'-0"

6 DUG OUT SECTION 2
SCALE: 1/8" = 1'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
3. PROVIDE ELASTOMERIC ROOF COATING AT ALL ROOF STRUCTURES & GUTTERS.
4. PROVIDE CONTINUOUS THERMAL INSULATION AT THE UNDERSIDE OF THE ROOF STRUCTURE AT ALL INTERIOR SPACES.

0' 4' 8' 16'
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

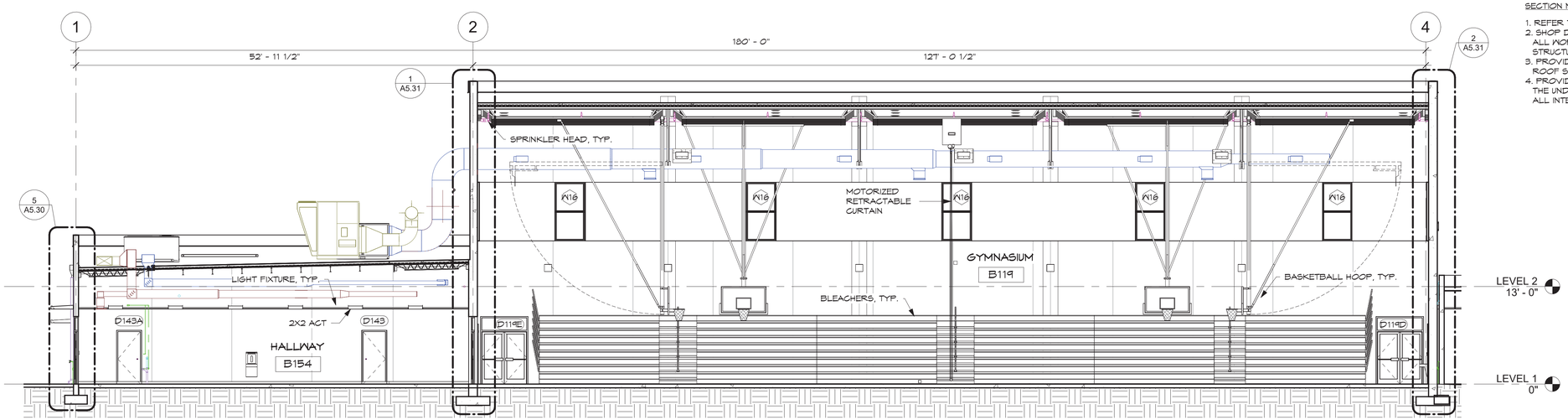
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

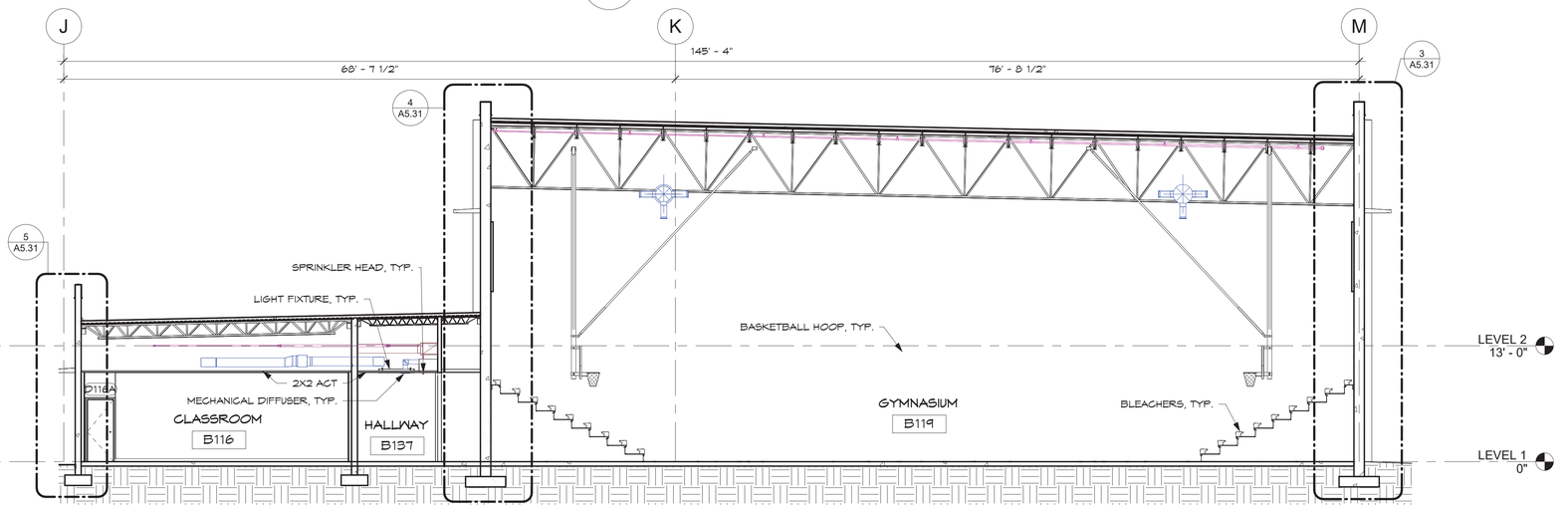
Title:
GCC, CREDIT RECOVERY, & DUG OUT SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

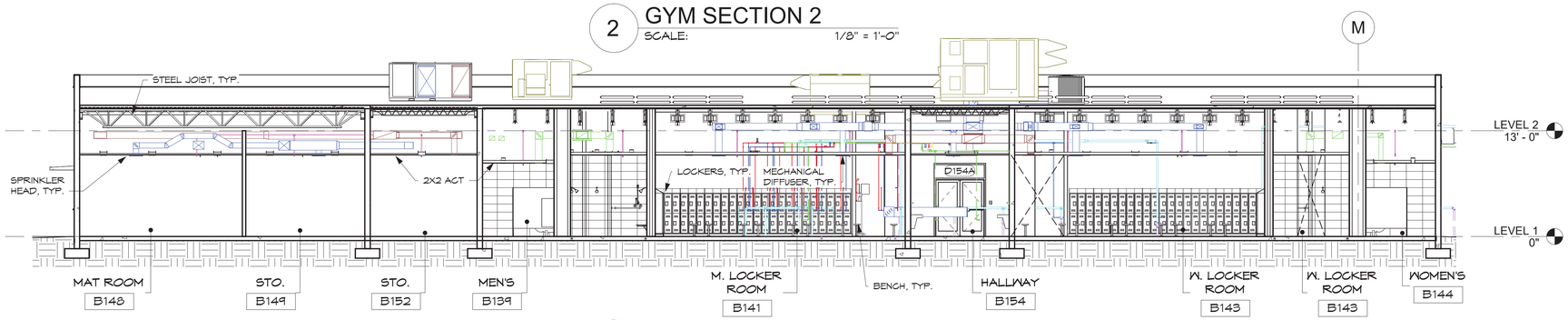
Drawing No.
A5.21
Sheet No. of



1 GYM SECTION 1
SCALE: 1/8" = 1'-0"



2 GYM SECTION 2
SCALE: 1/8" = 1'-0"



3 GYM SECTION 3
SCALE: 1/8" = 1'-0"

SECTION NOTES:

1. REFER TO A5.32 FOR TYPICAL WALL PATTERNS.
2. SHOP DRAWINGS SHOWING RELATIONSHIPS OF ALL WORK ASSOCIATED WITH BUILDING STRUCTURES IS REQUIRED.
3. PROVIDE ELASTOMERIC ROOF COATING AT ALL ROOF STRUCTURES & GUTTERS.
4. PROVIDE CONTINUOUS THERMAL INSULATION AT THE UNDERSIDE OF THE ROOF STRUCTURE AT ALL INTERIOR SPACES.

REVISIONS

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A5.22
Sheet No. ____ of ____

0' 4' 8' 16'
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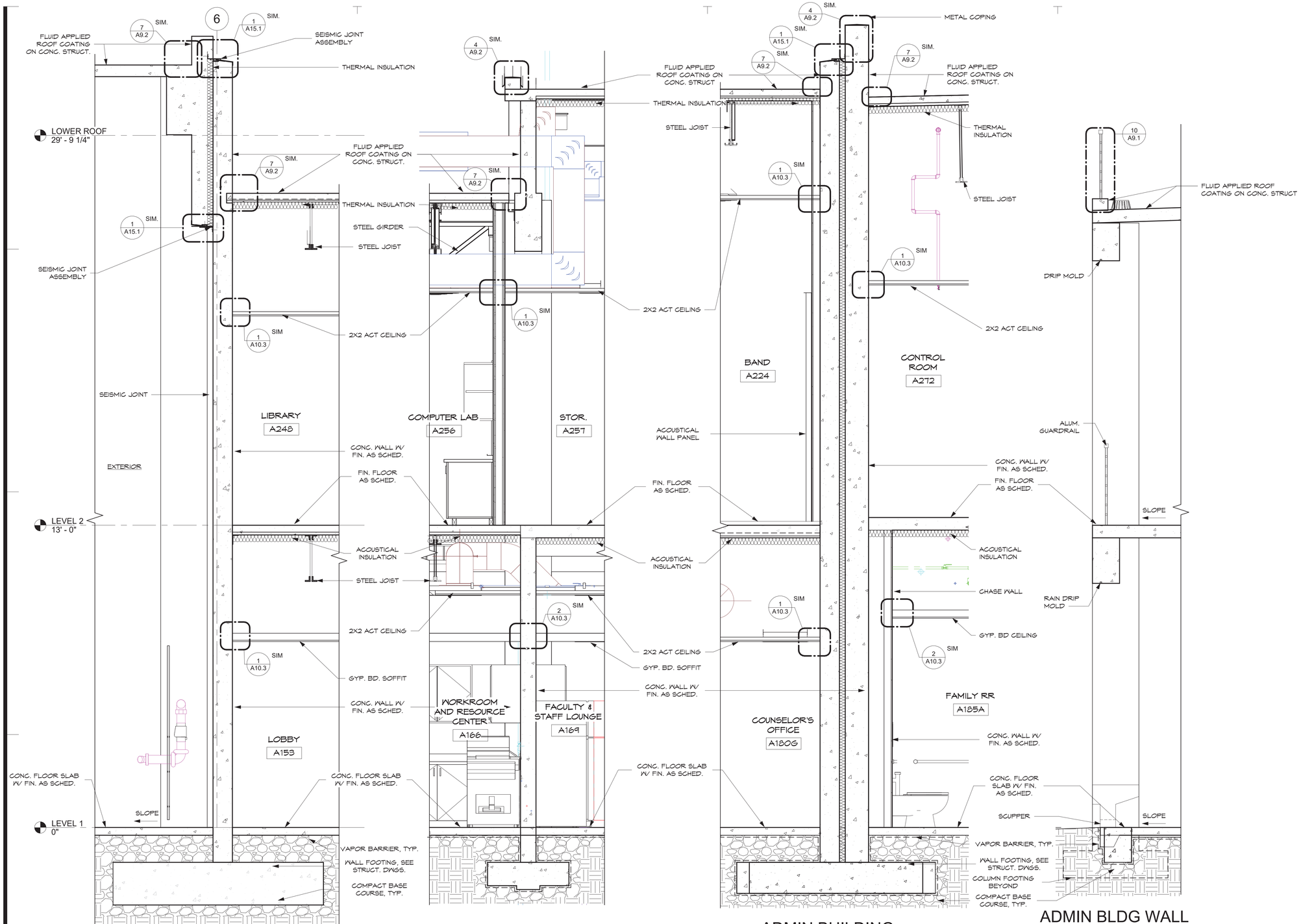

1 ADMIN BUILDING WALL SECTION 1
SCALE: 1/2" = 1'-0"

2 ADMIN BUILDING WALL SECTION 2
SCALE: 1/2" = 1'-0"

3 ADMIN BUILDING WALL SECTION 3
SCALE: 1/2" = 1'-0"

4 ADMIN BLDG WALL SECTION 4
SCALE: 1/2" = 1'-0"

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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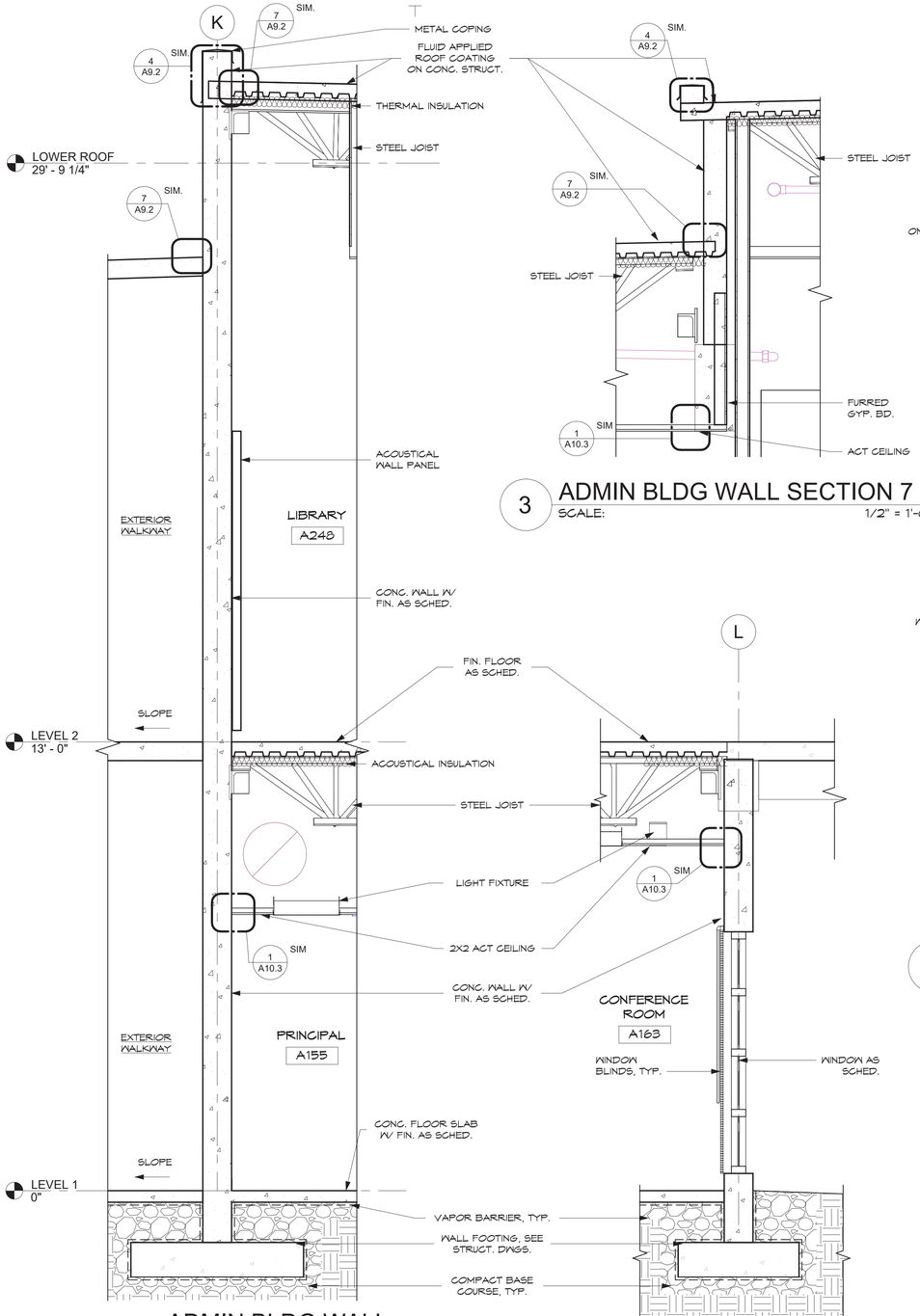
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: WALL SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No. A5.23

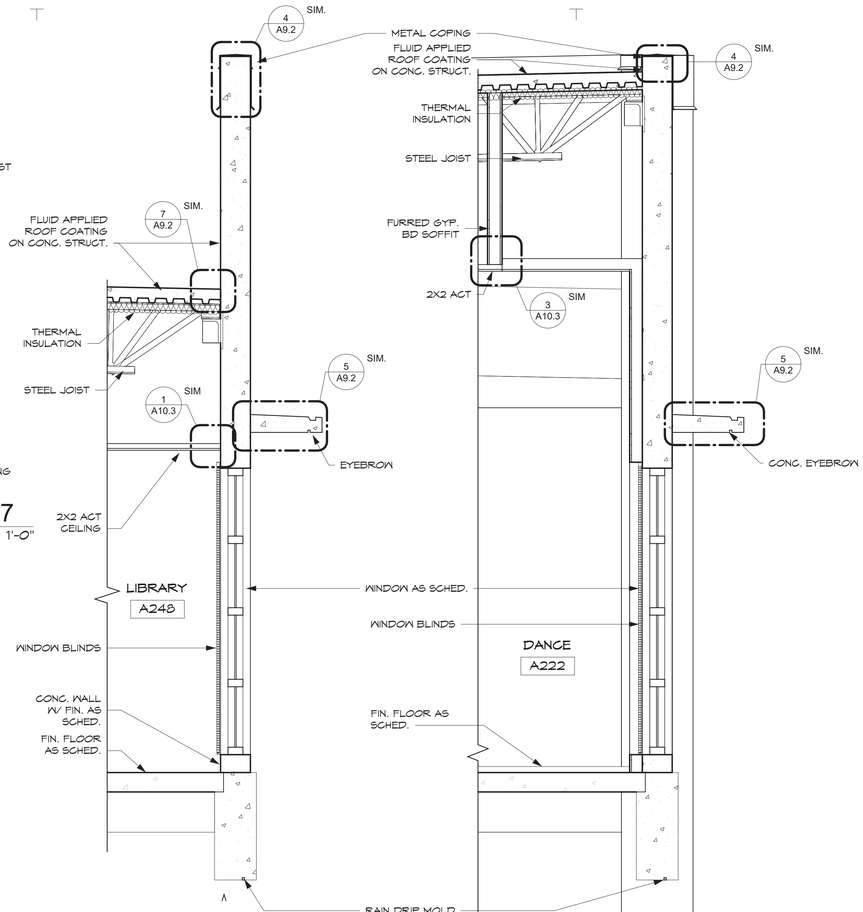
Sheet No. ____ of ____



2 ADMIN BLDG WALL SECTION 6
SCALE: 1/2" = 1'-0"

4 ADMIN BLDG WALL SECTION 8
SCALE: 1/2" = 1'-0"

3 ADMIN BLDG WALL SECTION 7
SCALE: 1/2" = 1'-0"



5 ADMIN BLDG WALL SECTION 9
SCALE: 1/2" = 1'-0"

6 ADMIN BLDG WALL SECTION 10
SCALE: 1/2" = 1'-0"

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Architecture
Planning
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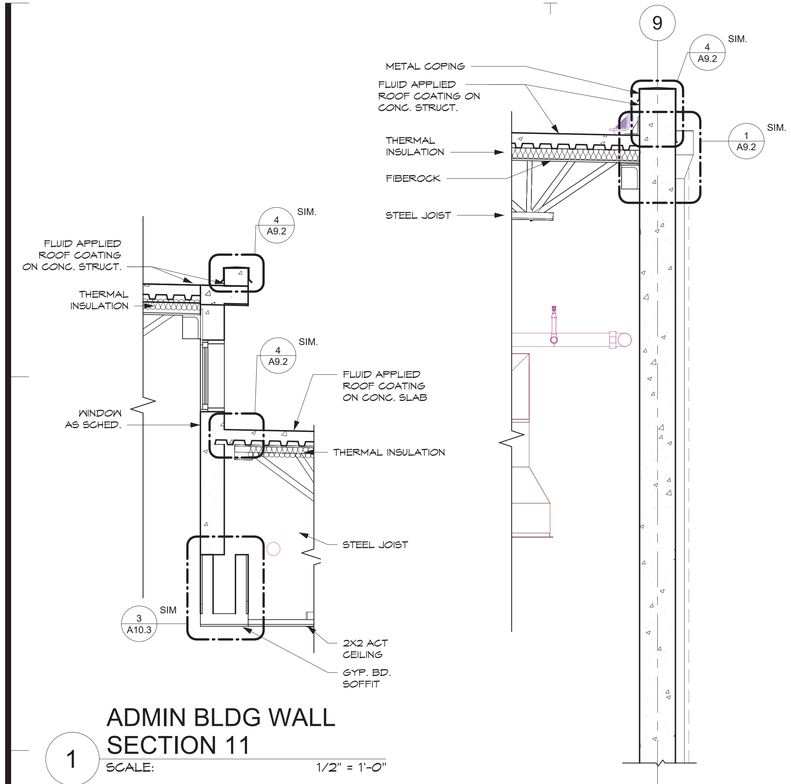
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WALL SECTIONS
PROGRAMMING DOCUMENT

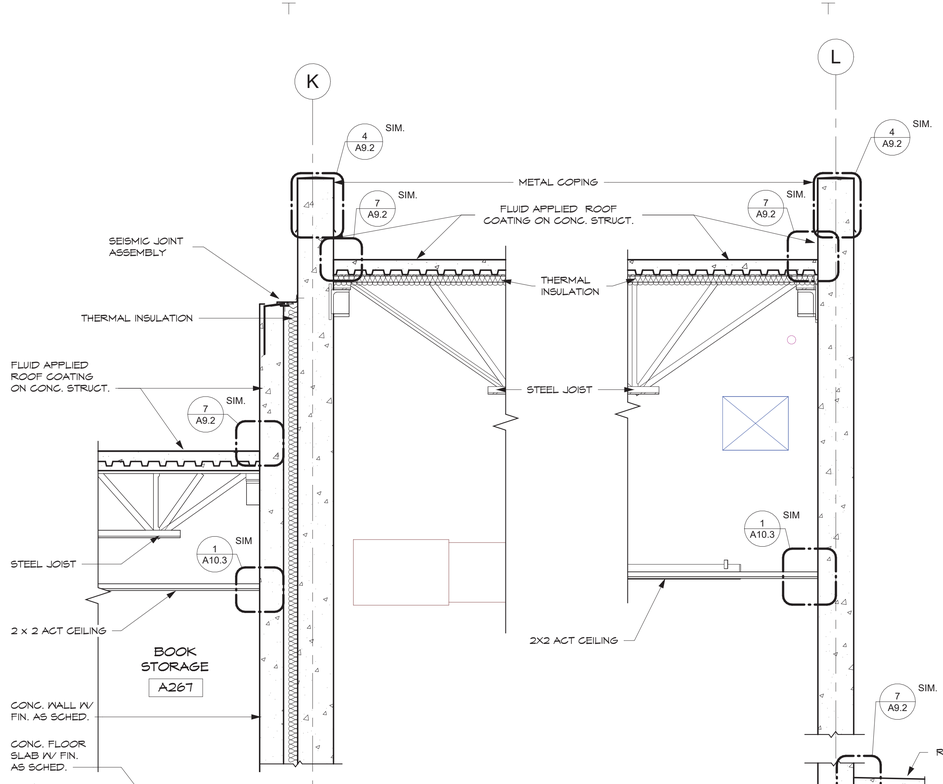
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.24
Sheet No. of



1 ADMIN BLDG WALL SECTION 11

SCALE: 1/2" = 1'-0"



4 AUDITORIUM WALL SECTION 1

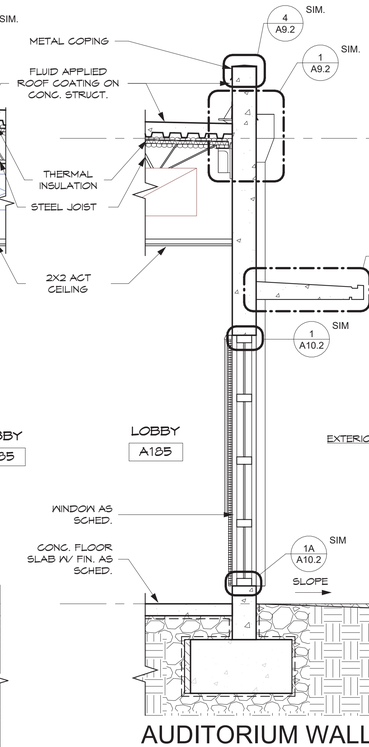
SCALE: 1/2" = 1'-0"

3 AUDITORIUM WALL SECTION 2

SCALE: 1/2" = 1'-0"

5 AUDITORIUM WALL SECTION 3

SCALE: 1/2" = 1'-0"



7 AUDITORIUM WALL SECTION 4

SCALE: 1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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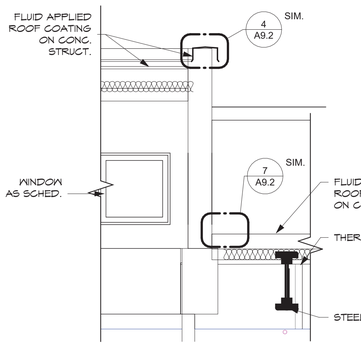
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WALL SECTIONS
PROGRAMMING DOCUMENT

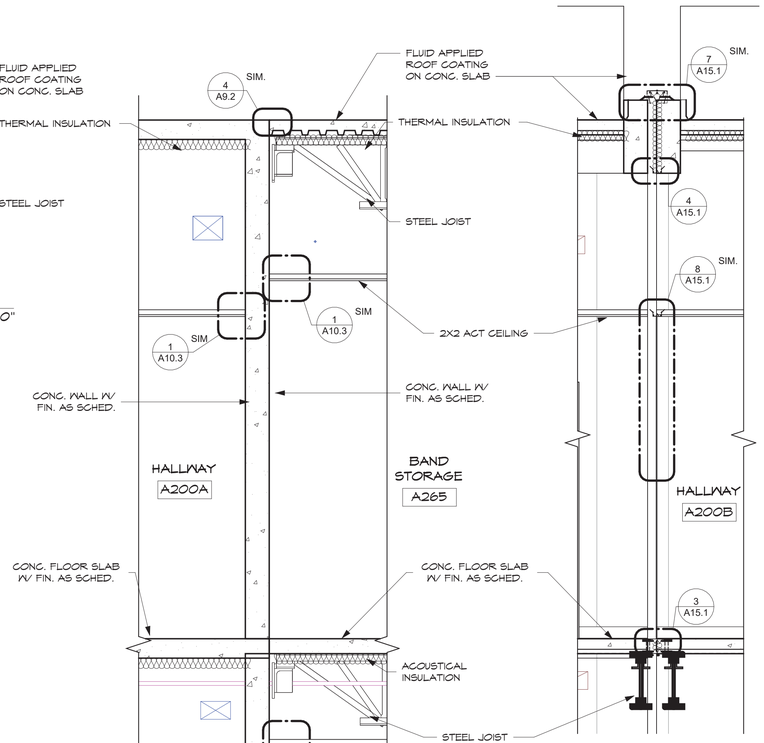
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.25
Sheet No. of



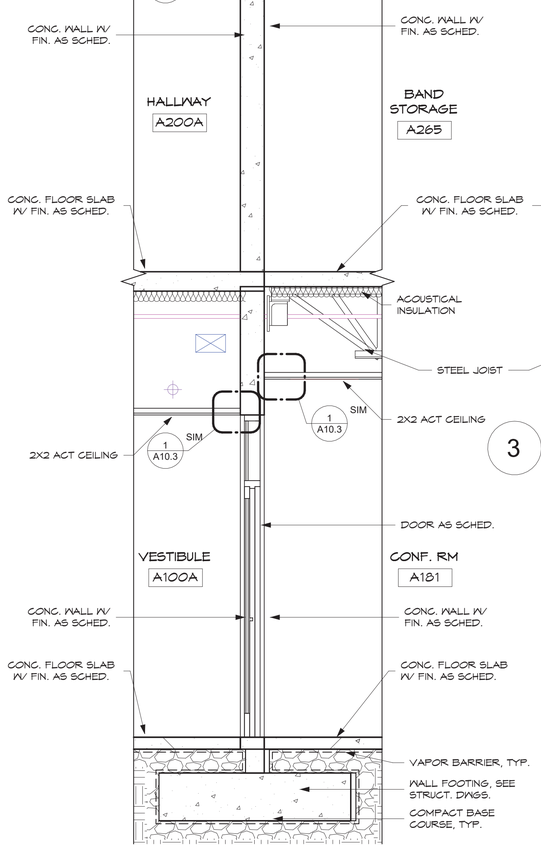
1 A-WING WALL SECTION 1

SCALE: 1/2" = 1'-0"



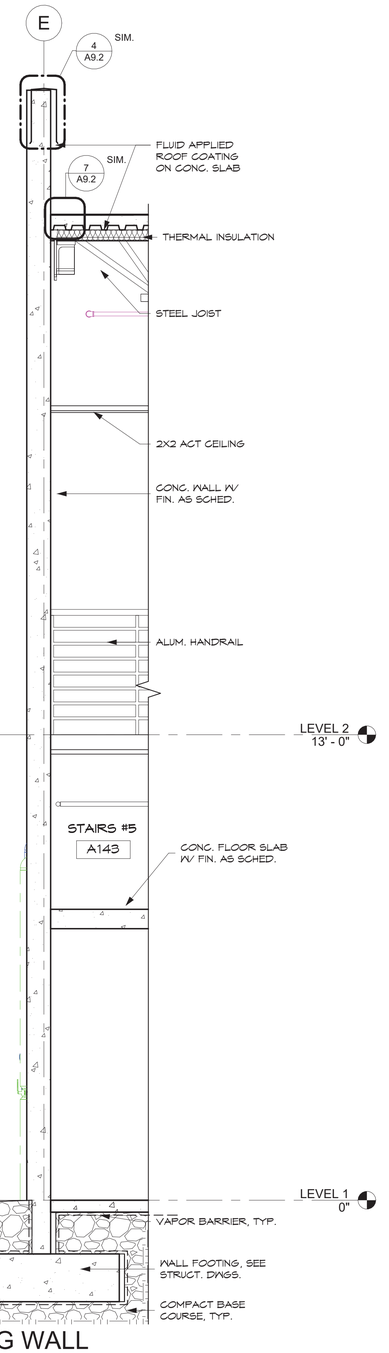
3 A-WING WALL SECTION 3

SCALE: 1/2" = 1'-0"



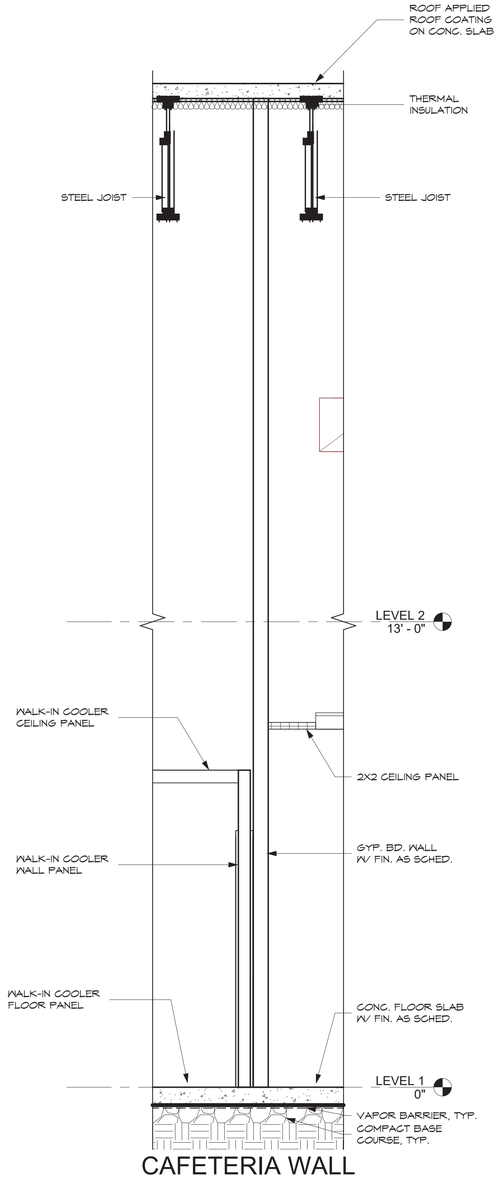
2 A-WING WALL SECTION 2

SCALE: 1/2" = 1'-0"



4 A-WING WALL SECTION 4

SCALE: 1/2" = 1'-0"



5 CAFETERIA WALL SECTION

SCALE: 1/2" = 1'-0"

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: WALL SECTIONS

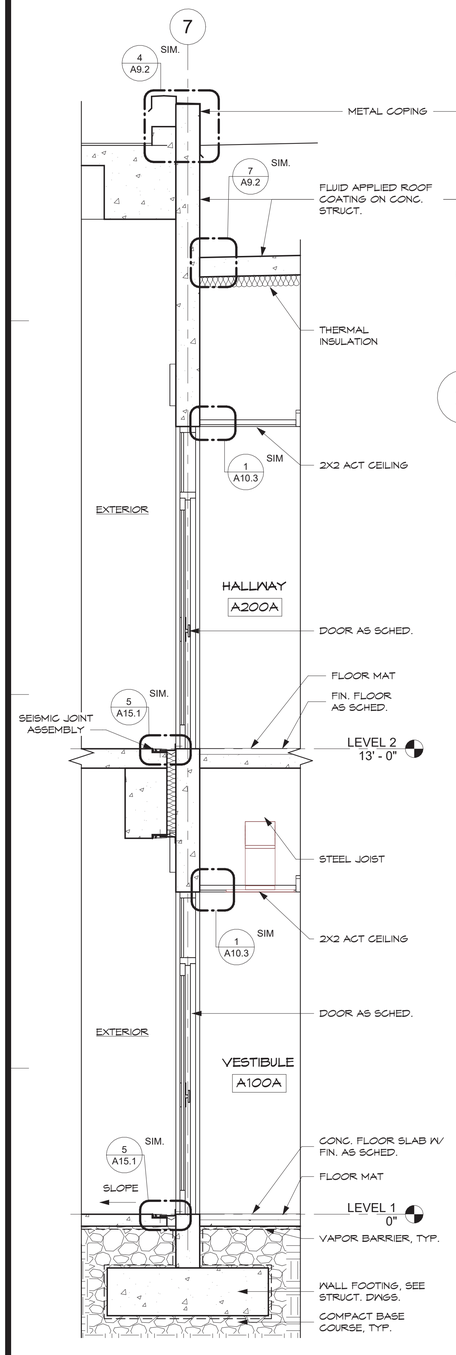
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A5.26

Sheet No. ____ of ____

NOT FOR CONSTRUCTION

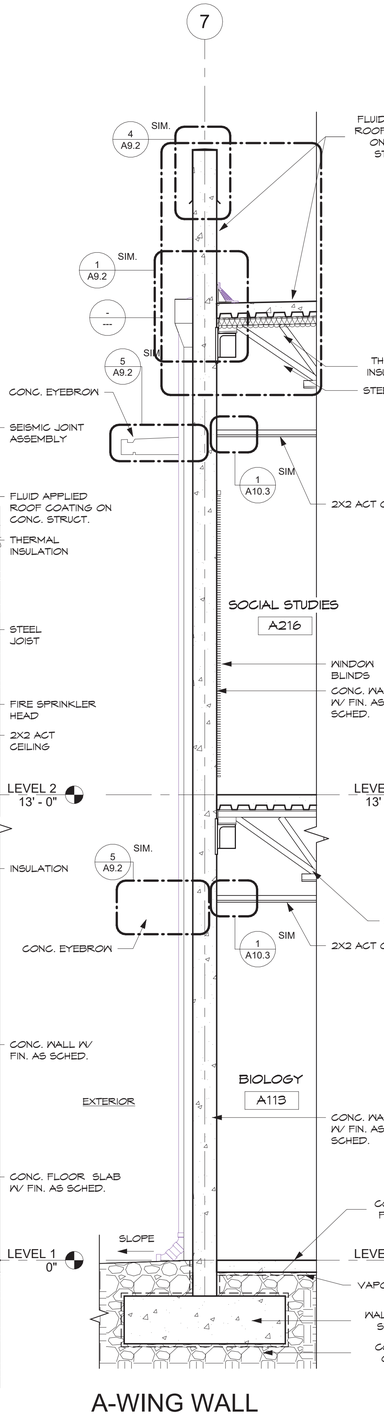


1 A-WING WALL SECTION 5
SCALE: 1/2" = 1'-0"

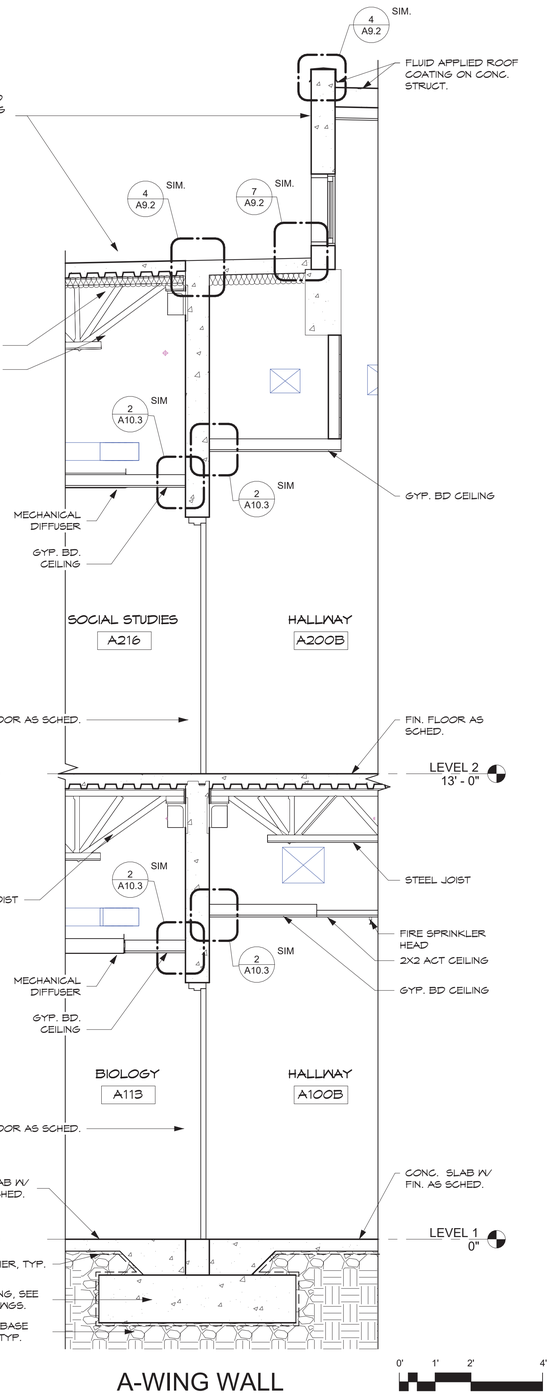


2 A-WING WALL SECTION 6
SCALE: 1/2" = 1'-0"

3 A-WING WALL SECTION 7
SCALE: 1/2" = 1'-0"



4 A-WING WALL SECTION 8
SCALE: 1/2" = 1'-0"



5 A-WING WALL SECTION 9
SCALE: 1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Architecture
Planning
Interior Design

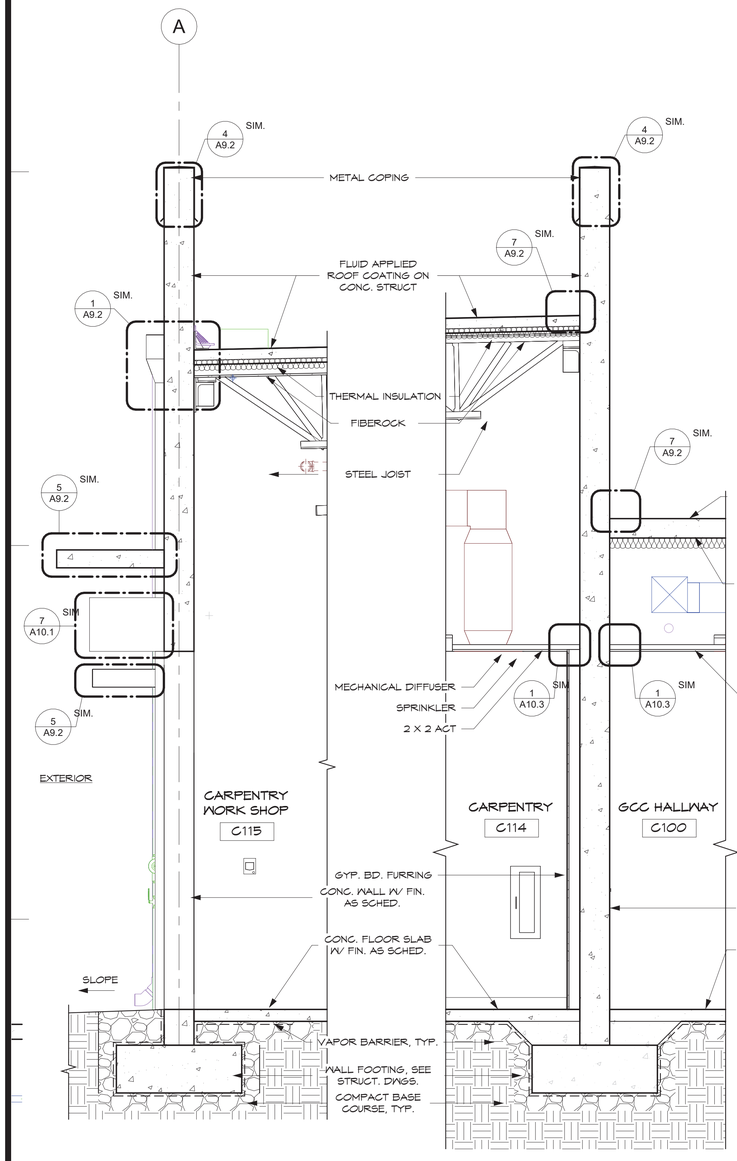
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WALL SECTIONS
PROGRAMMING DOCUMENT

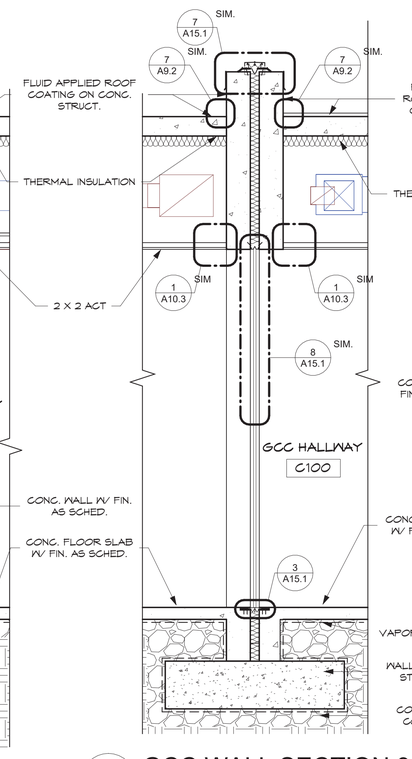
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No:	No.
File	

Drawing No.
A5.27
Sheet No. ____ of ____

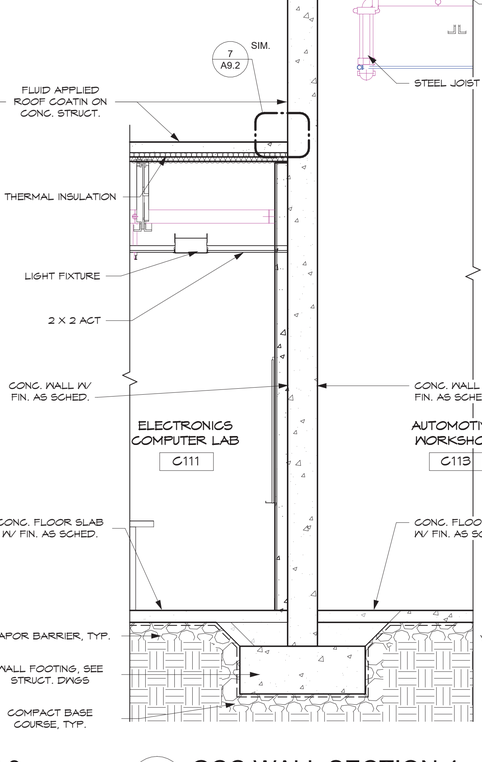


1 GCC WALL SECTION 1
SCALE: 1/2" = 1'-0"

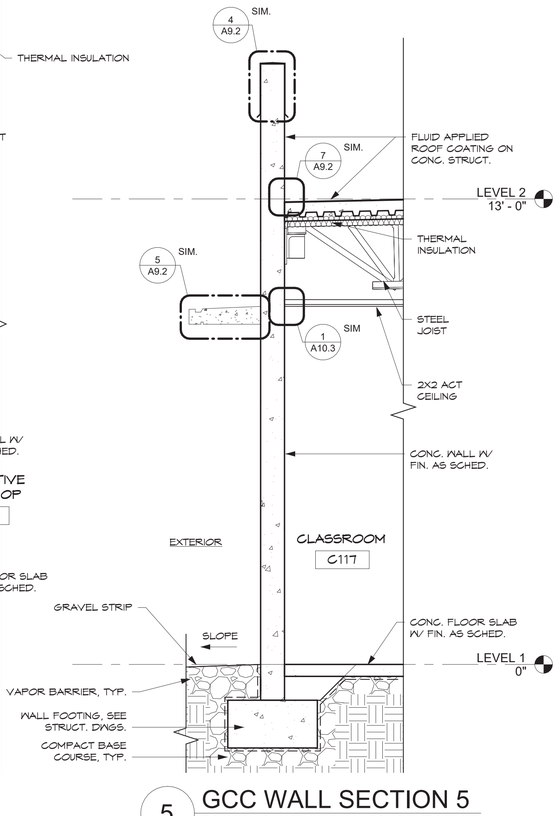
2 GCC WALL SECTION 2
SCALE: 1/2" = 1'-0"



3 GCC WALL SECTION 3
SCALE: 1/2" = 1'-0"



4 GCC WALL SECTION 4
SCALE: 1/2" = 1'-0"



5 GCC WALL SECTION 5
SCALE: 1/2" = 1'-0"

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Architecture
Planning
Interior Design

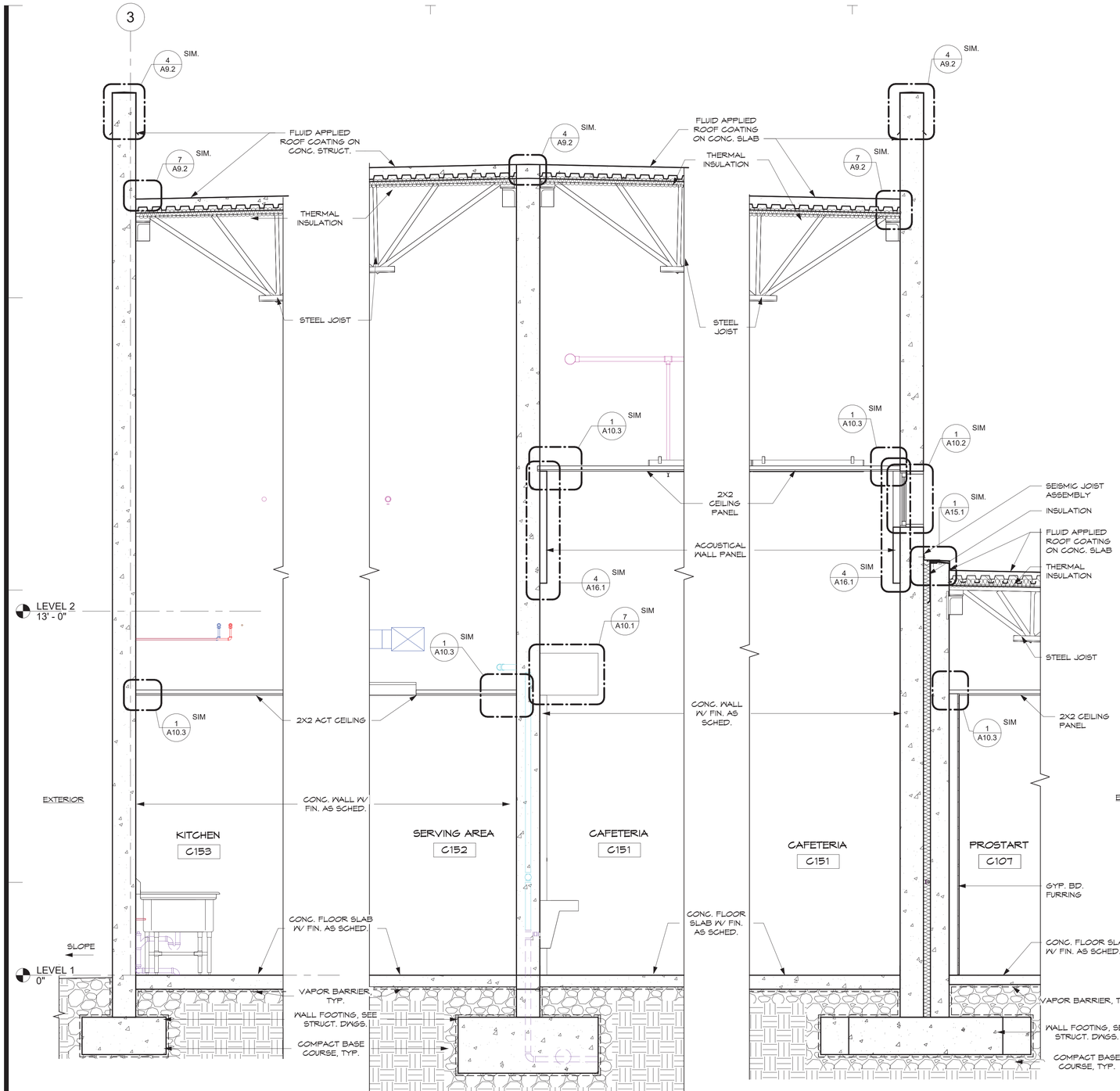
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WALL SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.28
Sheet No. of



1 CAFETERIA WALL SECTION 1
SCALE: 1/2" = 1'-0"

2 CAFETERIA WALL SECTION 2
SCALE: 1/2" = 1'-0"

3 CAFETERIA WALL SECTION 3
SCALE: 1/2" = 1'-0"

4 CAFETERIA WALL SECTION 4
SCALE: 1/2" = 1'-0"

5 CAFETERIA WALL SECTION 5
SCALE: 1/2" = 1'-0"

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Architecture
Planning
Interior Design

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

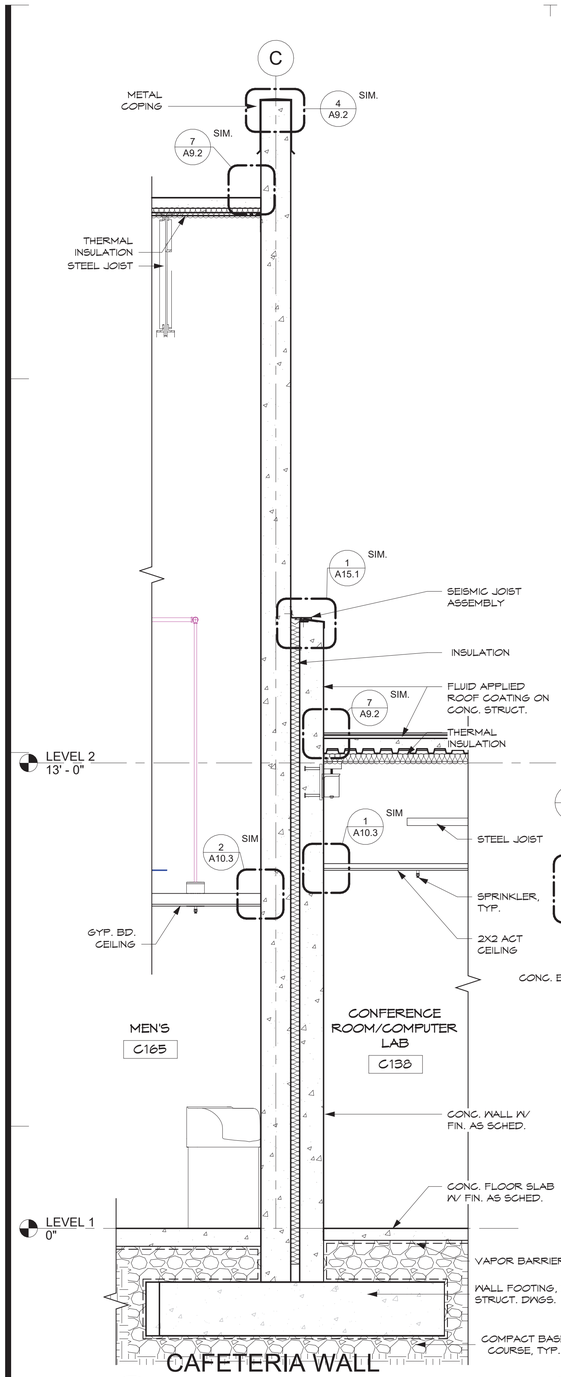
Title: WALL SECTIONS

PROGRAMMING DOCUMENT

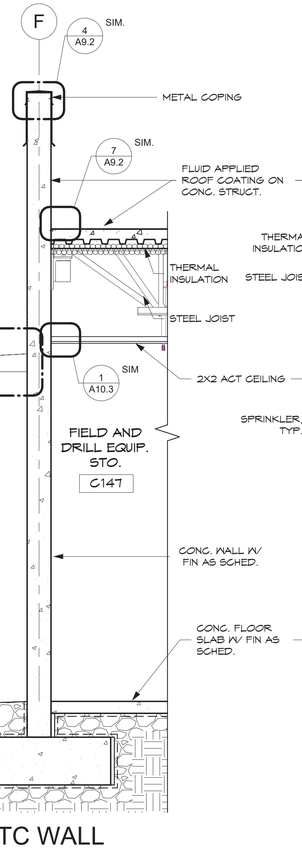
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A5.29

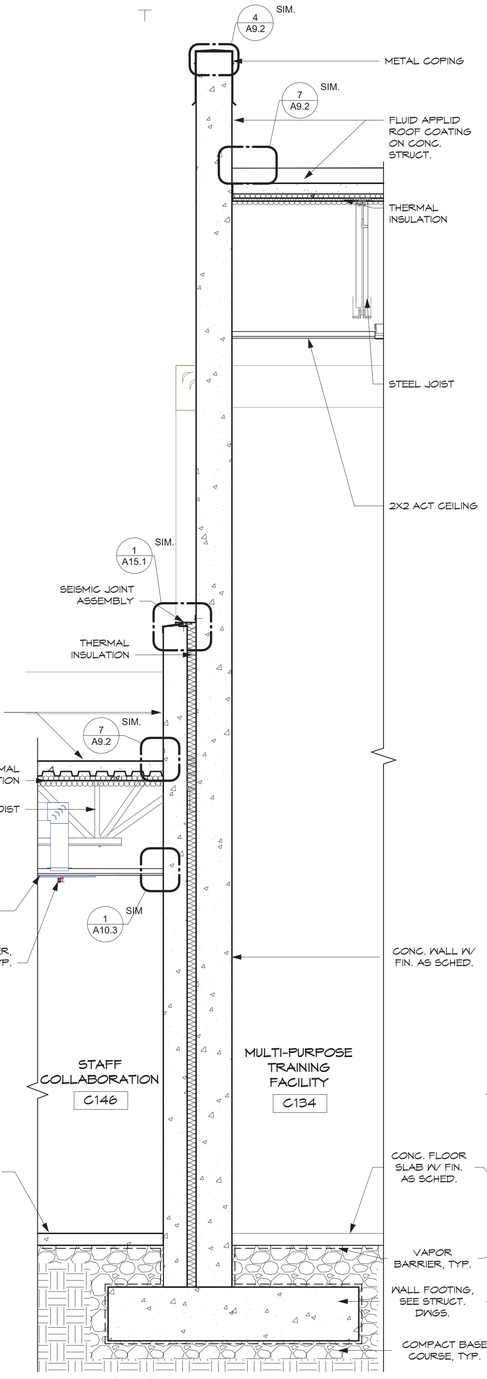
Sheet No. _____ of _____



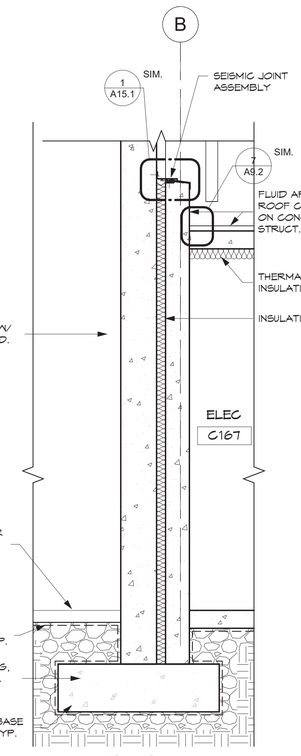
1 CAFETERIA WALL SECTION 5
SCALE: 1/2" = 1'-0"



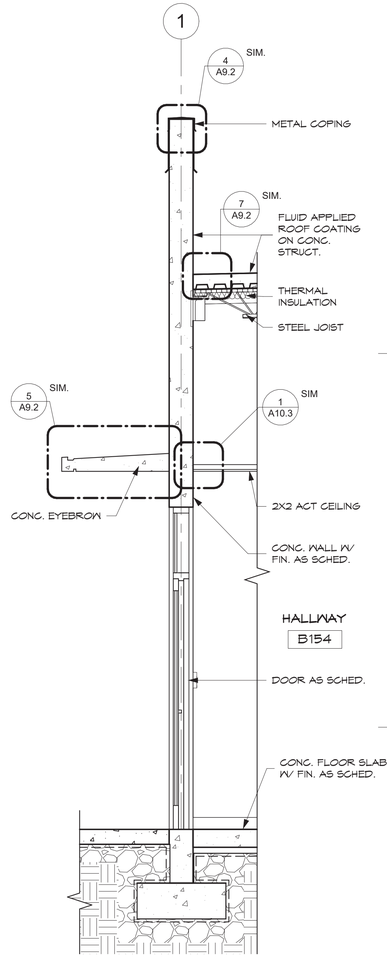
2 JROTC WALL SECTION 1
SCALE: 1/2" = 1'-0"



3 JROTC WALL SECTION 2
SCALE: 1/2" = 1'-0"



4 JROTC WALL SECTION 3
SCALE: 1/2" = 1'-0"



5 GYM WALL SECTION 1
SCALE: 1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISIONS

No.	Description	Date

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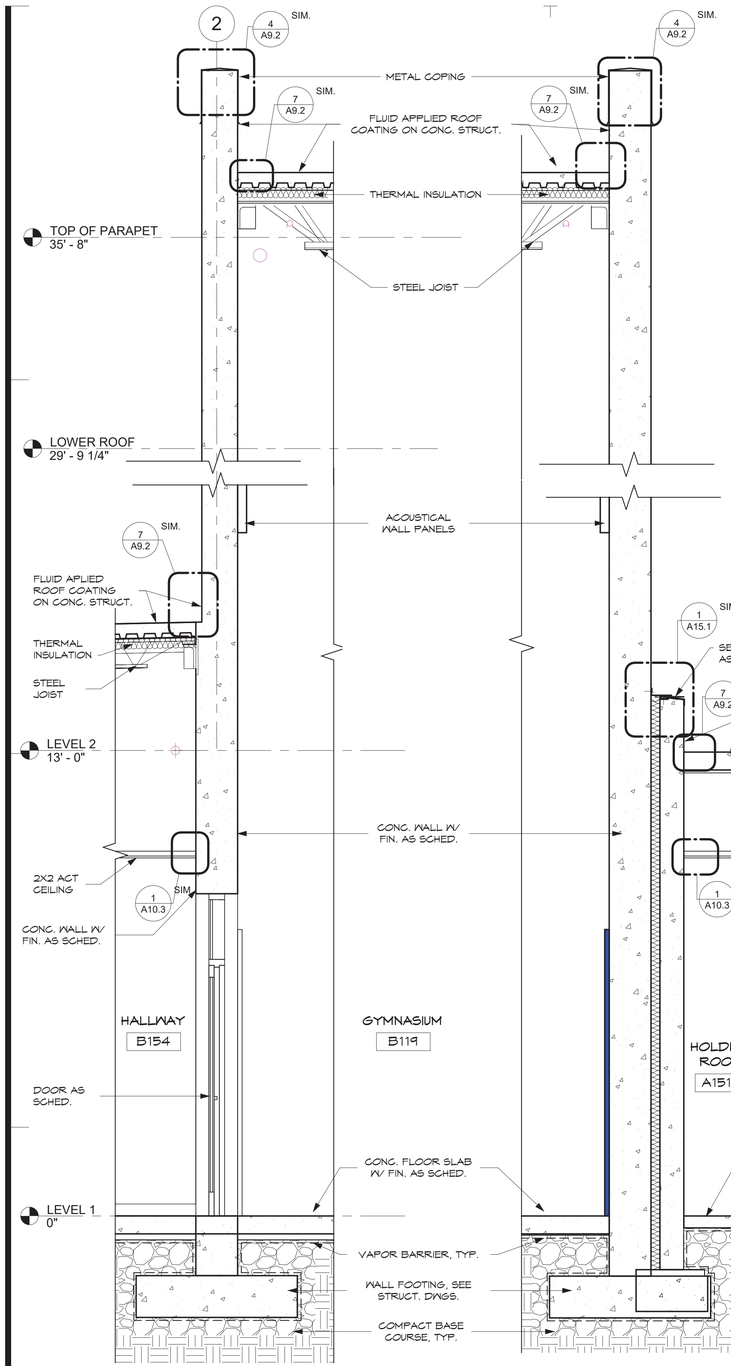
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

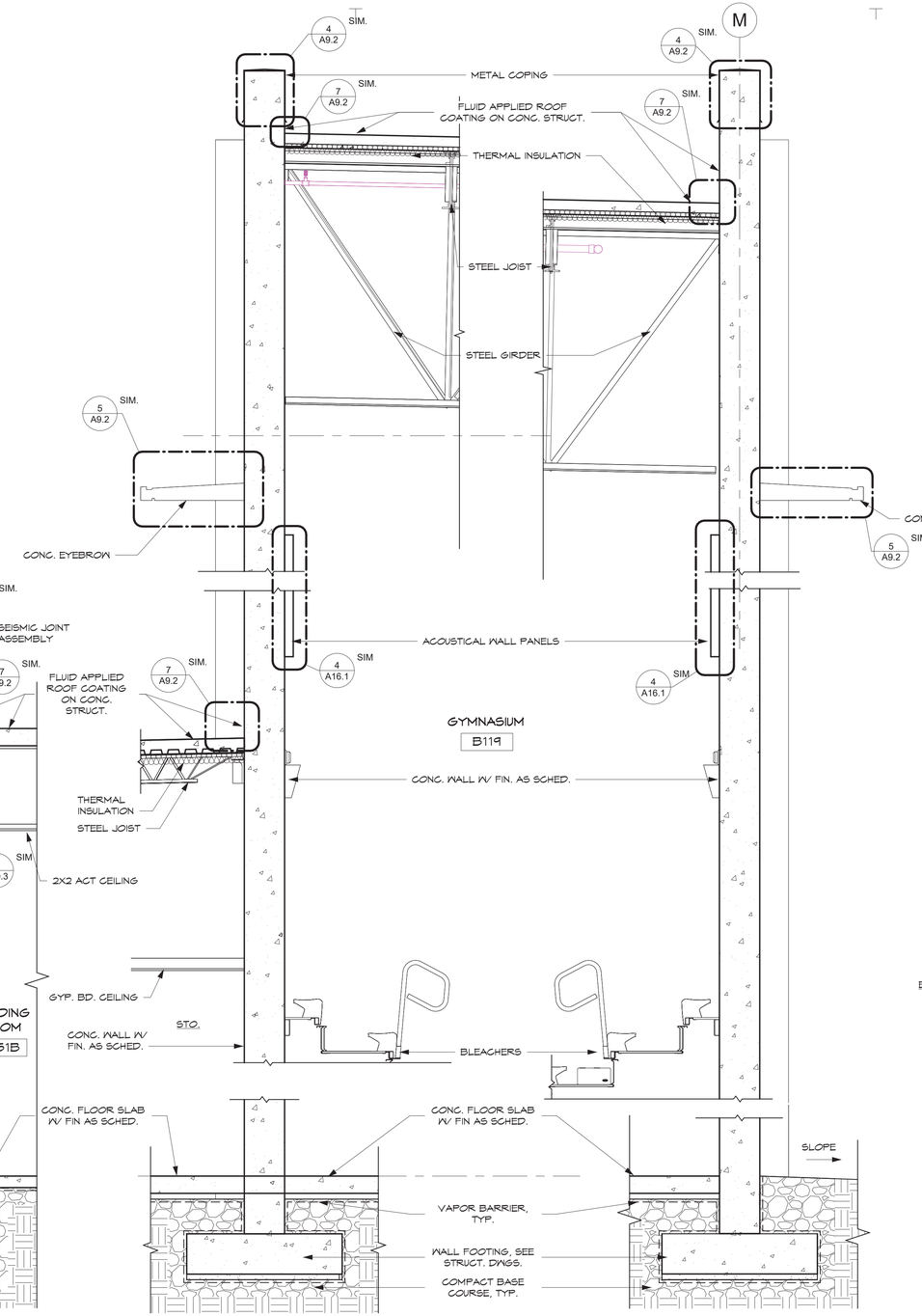
Title:
WALL SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A5.30
Sheet No. of



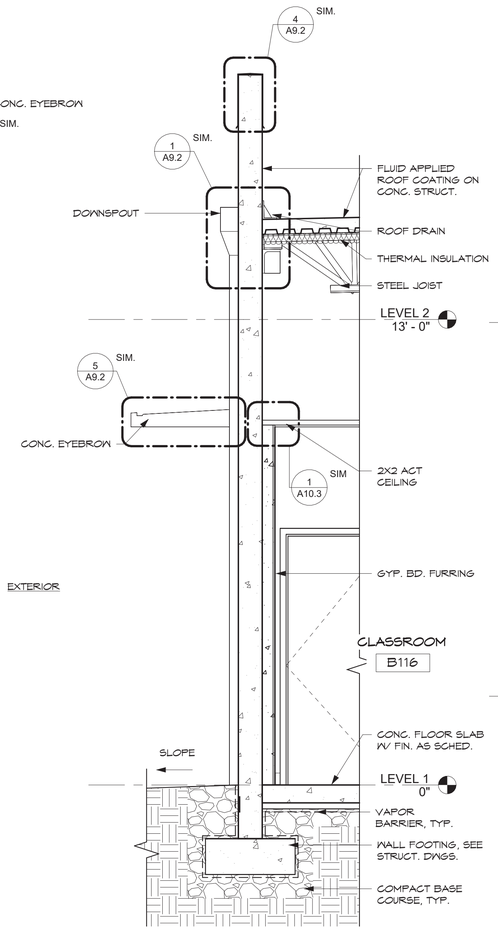
1 GYM WALL SECTION 2
SCALE: 1/2" = 1'-0"



2 GYM WALL SECTION 3
SCALE: 1/2" = 1'-0"

3 GYM WALL SECTION 4
SCALE: 1/2" = 1'-0"

4 GYM WALL SECTION 5
SCALE: 1/2" = 1'-0"



5 GYM WALL SECTION 6
SCALE: 1/2" = 1'-0"

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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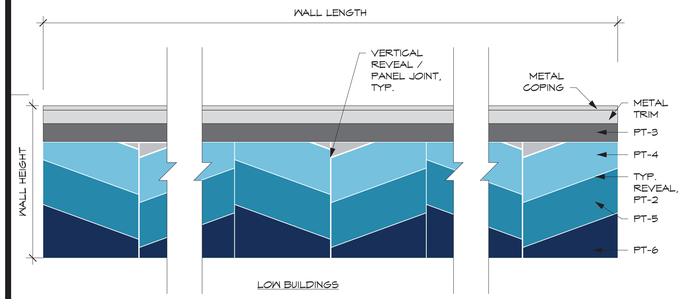
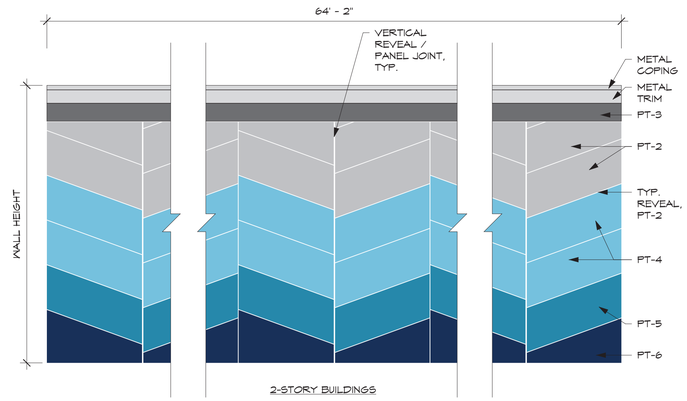
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

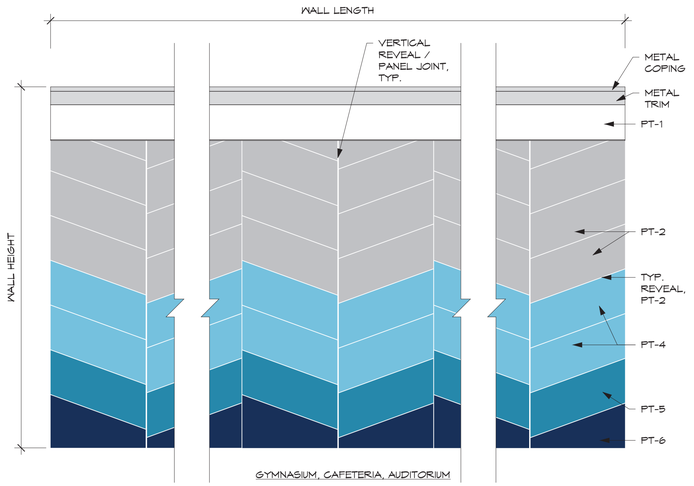
Title: WALL SECTIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/2" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A5.31
Sheet No. ____ of ____



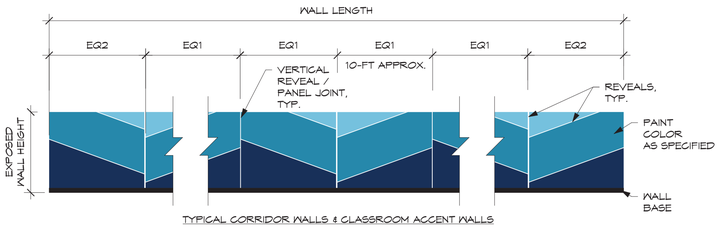


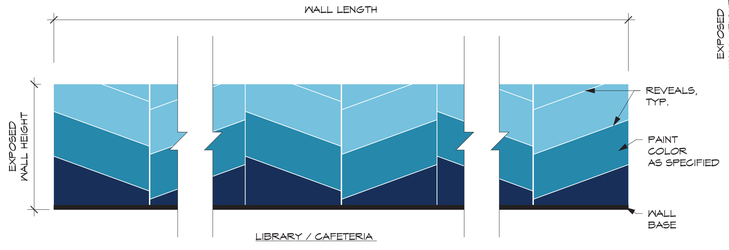


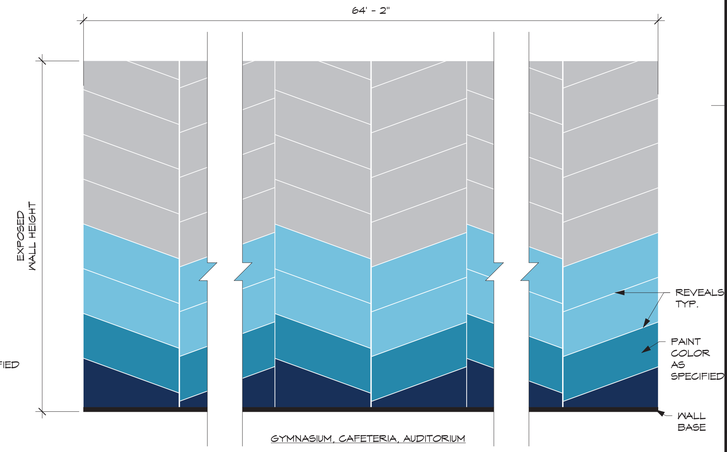
NOTE: VERTICAL PATTERN LINES / REVEALS ALIGN WITH CONC. WALL PANEL JOINTS; WALL OPENINGS AND PENETRATIONS WILL INTERRUPT THE WALL PATTERN.

1 TYPICAL WALL PATTERN (EXTERIOR)

SCALE: 1/8" = 1'-0"







NOTE: VERTICAL PATTERN LINES / REVEALS ALIGN WITH CONCRETE WALL PANEL JOINTS; WALL OPENINGS, PENETRATIONS, ETC. WILL INTERRUPT THE WALL PATTERN. LINE PATTERN WILL BE PAINTED WITH PT-1 ON INTERIOR GYP. BD. WALLS AND INTERIOR CONC. WALLS WHERE REVEALS OCCUR ON THE EXTERIOR SIDE.

2 TYPICAL WALL PATTERN (INTERIOR)

SCALE: 1/8" = 1'-0"

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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: TYPICAL WALL PATTERN

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A5.32

Sheet No. _____ of _____

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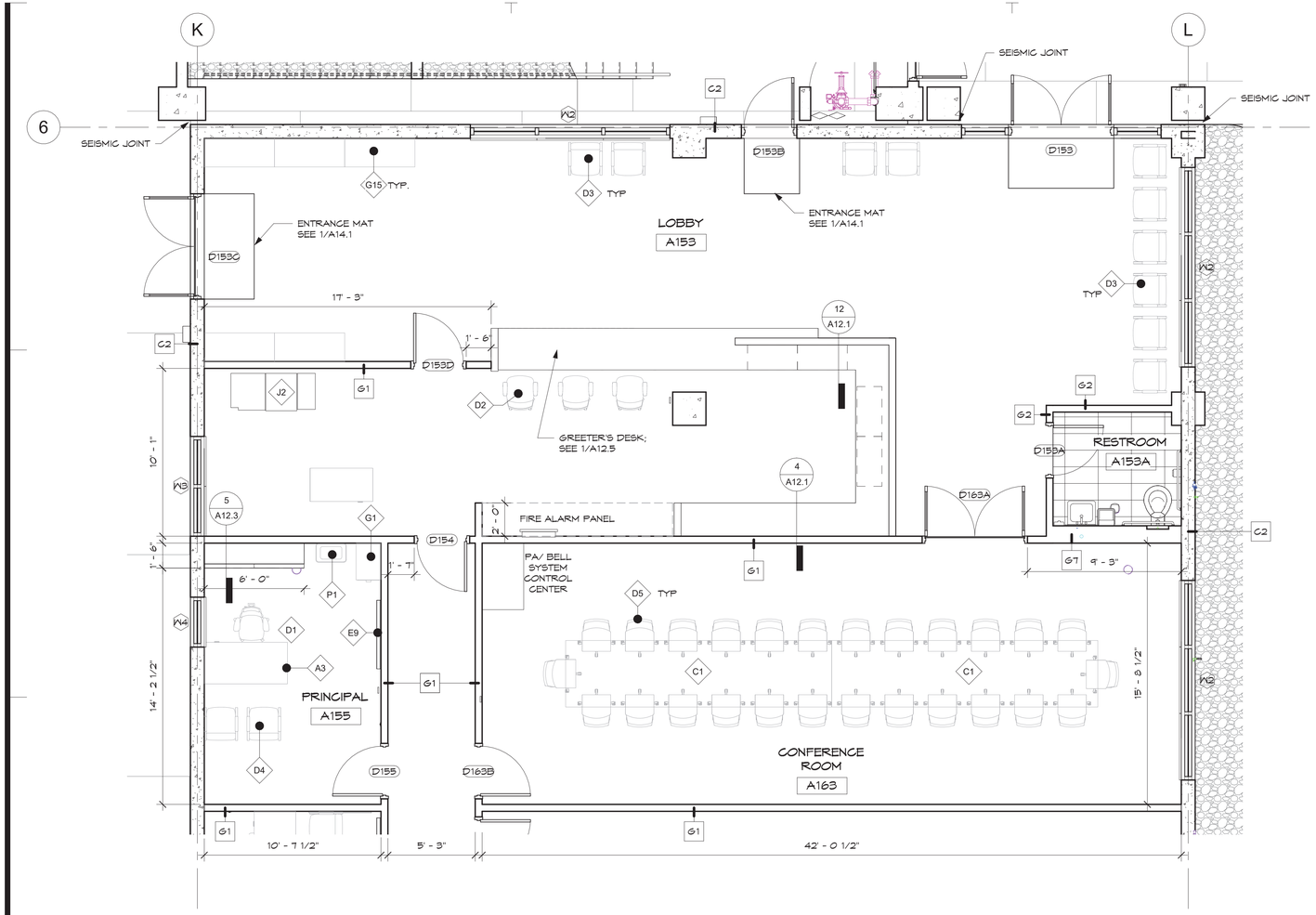

1 ADMIN DETAIL PLAN - RECEPTION

SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A0.18 AND A0.19 FOR FF&E SCHEDULE.

REVISIONS		
No.	Description	Date

TRMA

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ADMIN - RECEPTION

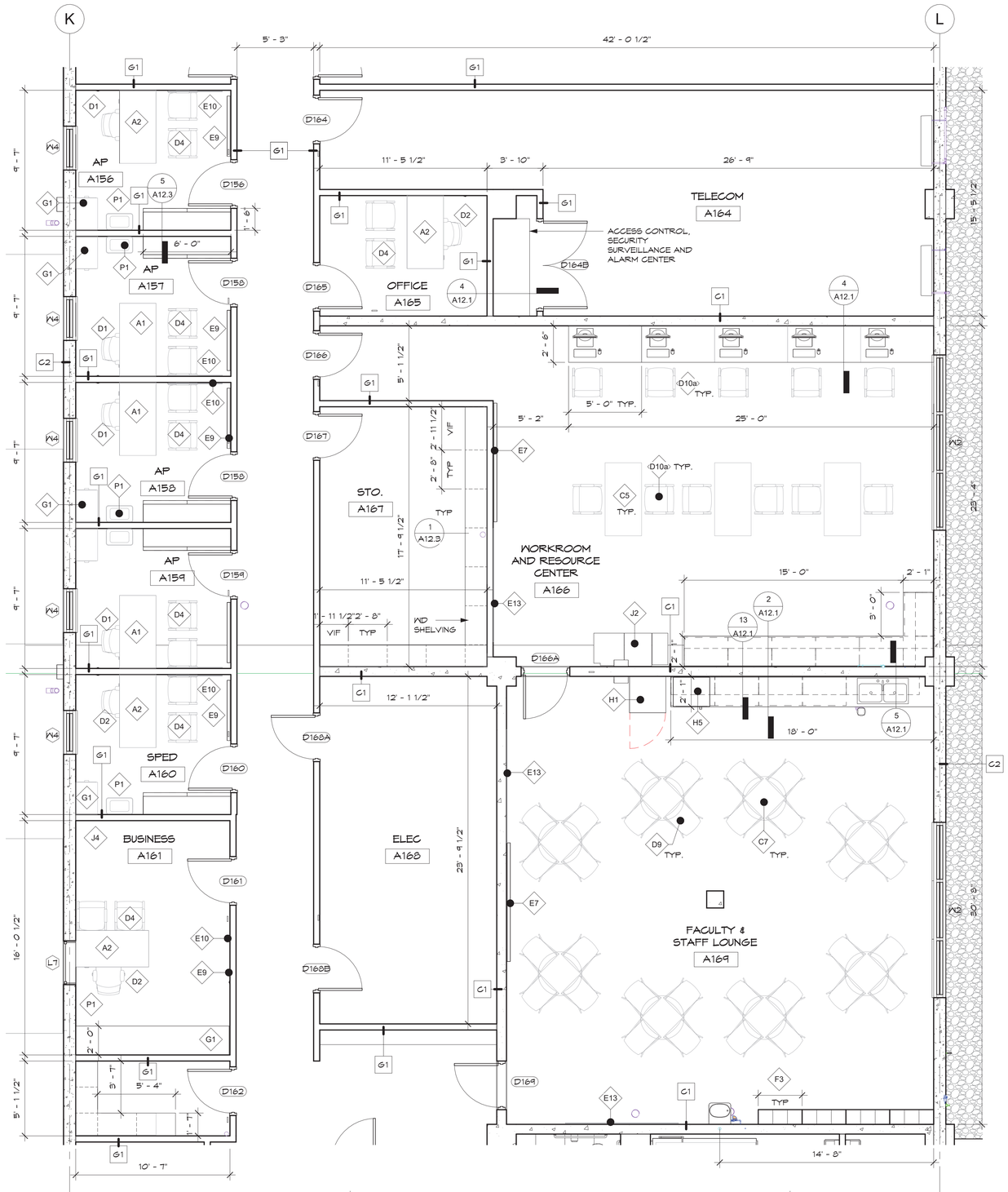
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.:
A6.0

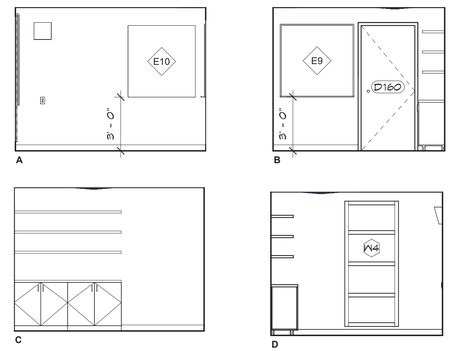
Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 ADMIN DETAIL PLAN - OFFICES

SCALE: 1/4" = 1'-0"



2 PRINCIPAL/ASSIST. PRINCIPAL INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

NOTE: TYPICAL TO ROOMS A156 & A158. ROOMS A157 & A159 SIMILAR AT OPPOSITE HAND

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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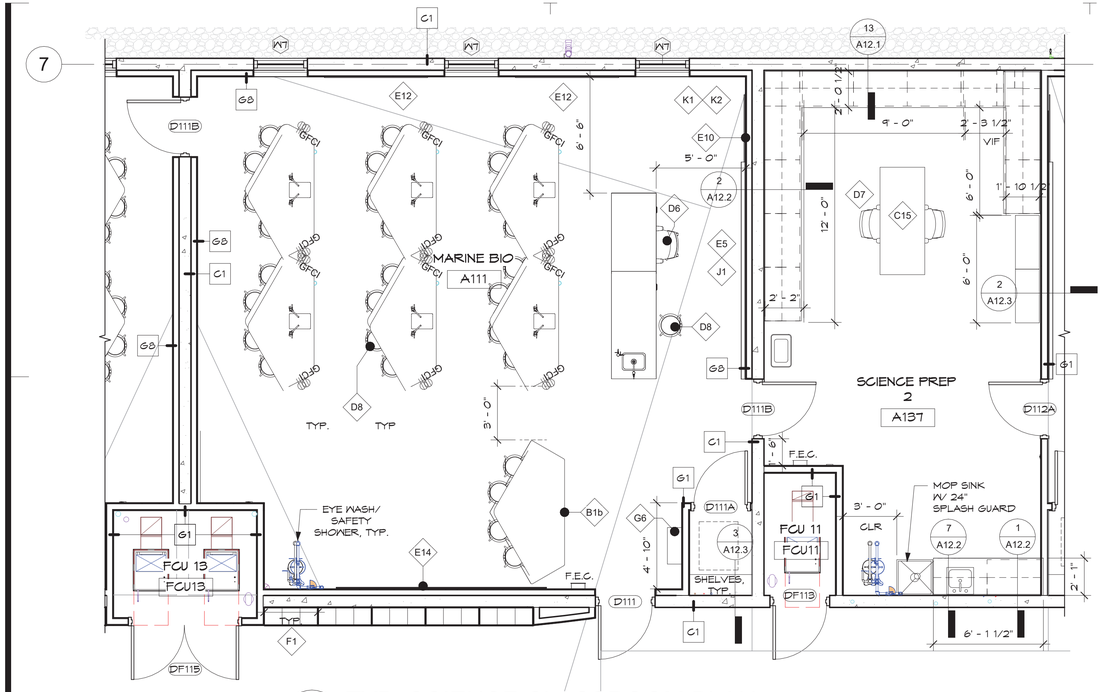
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ADMIN - OFFICES
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

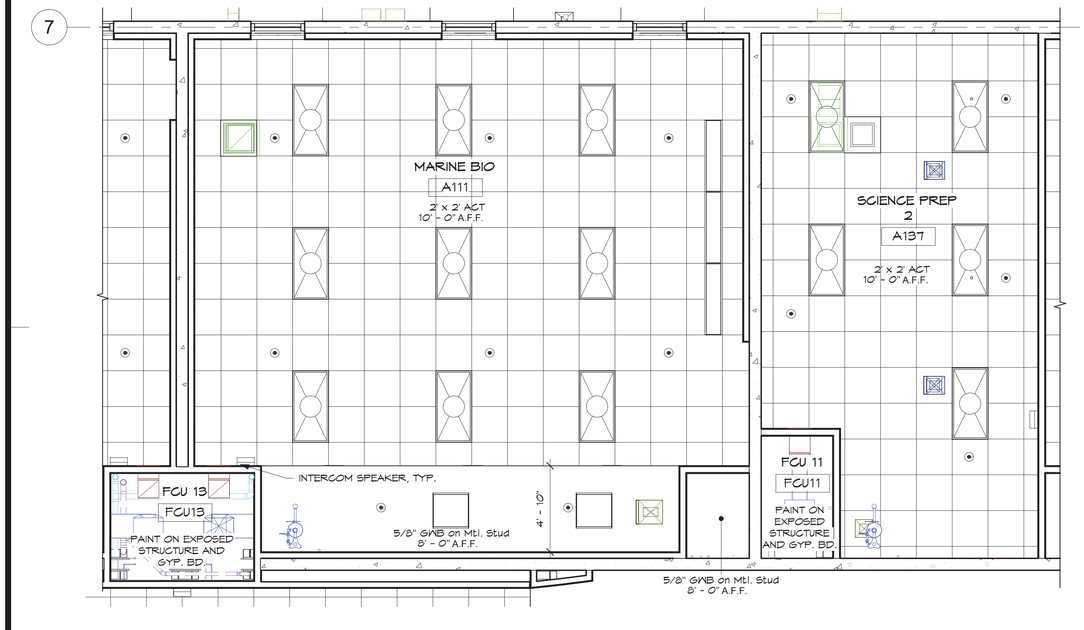
Drawing No.
A6.1

Sheet No. ____ of ____



1 TYP. SCIENCE CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



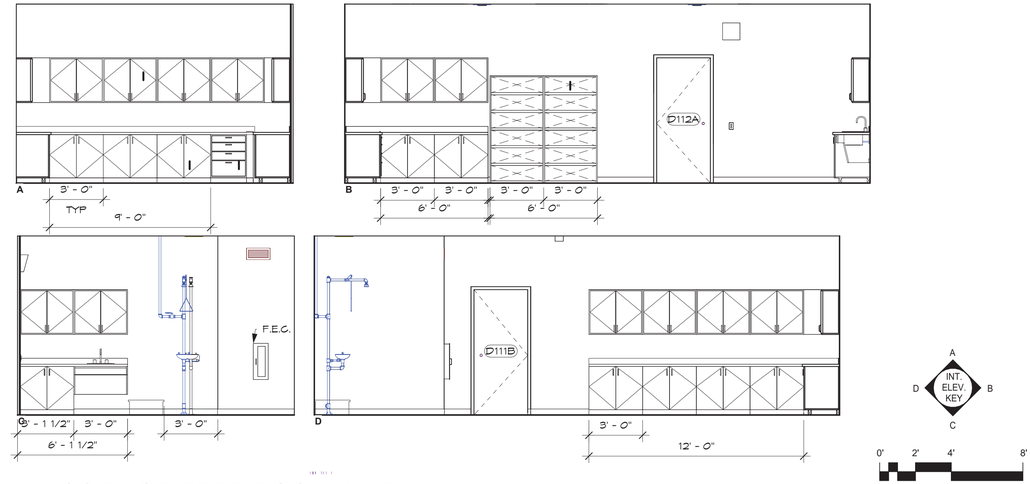
2 TYP. SCIENCE CLASSROOM RCP

SCALE: 1/4" = 1'-0"



3 SCIENCE CLASSROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



7 SCIENCE PREP ROOM 2 INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Architecture
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Interior Design

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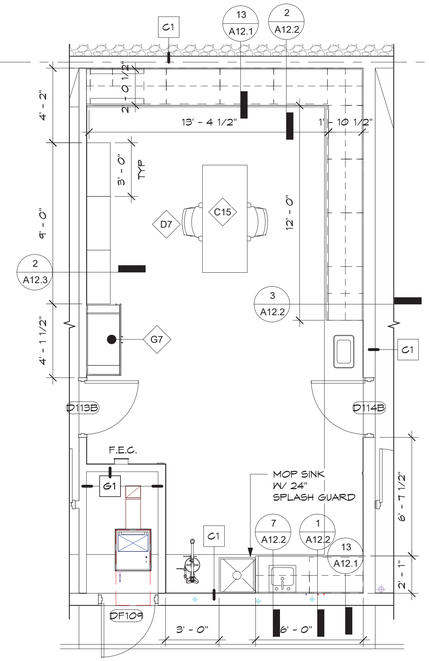
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

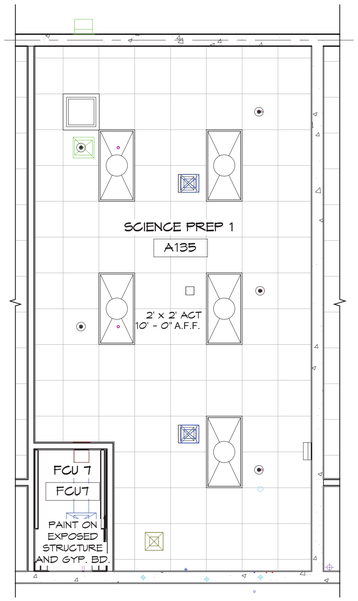
Title:
A-WING DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A6.2
Sheet No. of



1 SCIENCE PREP 1 FLOOR PLAN
SCALE: 1/4" = 1'-0"



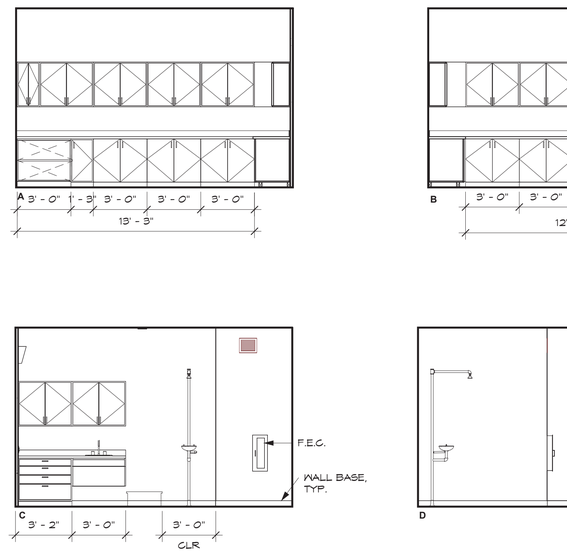
2 SCIENCE PREP 1 RCP
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

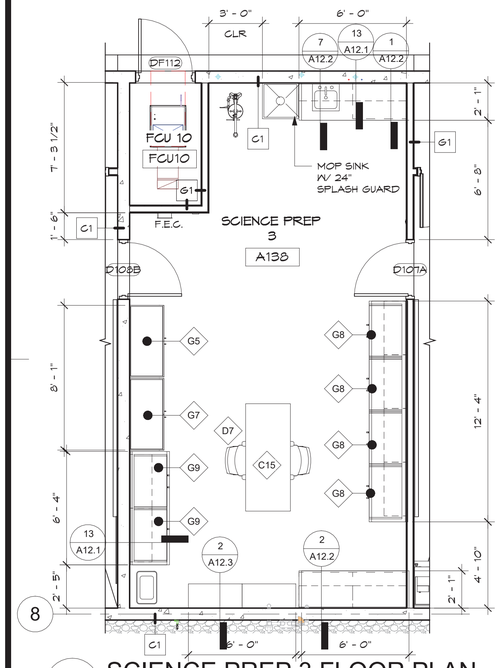
1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

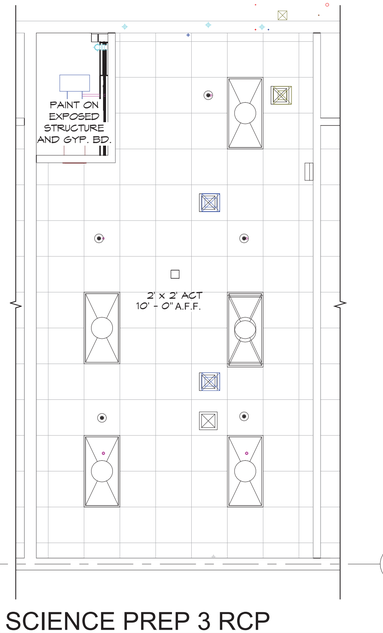
1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



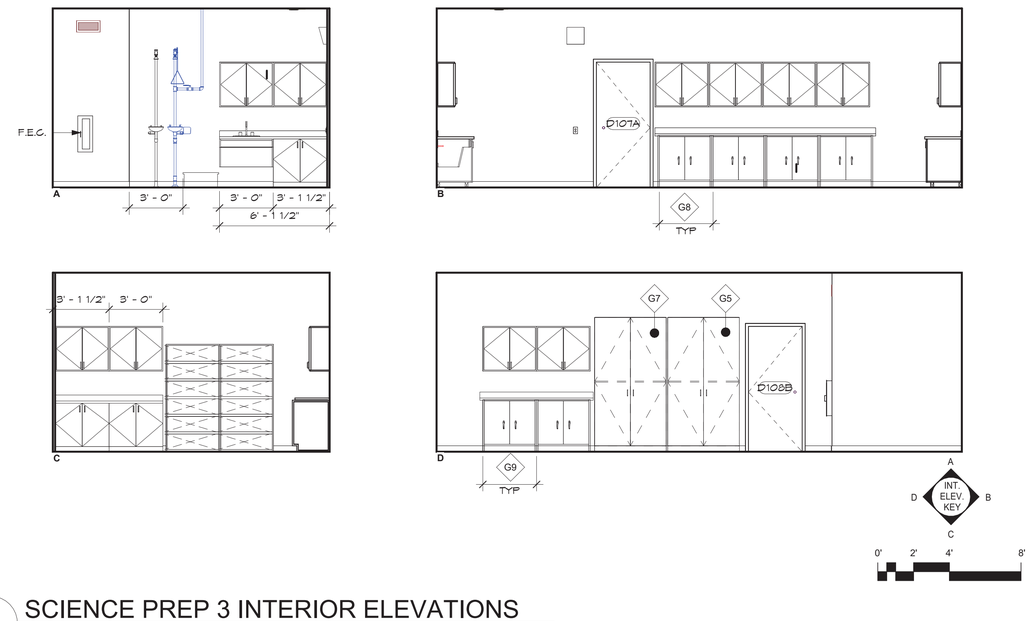
5 SCIENCE PREP 1 INTERIOR ELEVATIONS
SCALE: 1/4" = 1'-0"



3 SCIENCE PREP 3 FLOOR PLAN
SCALE: 1/4" = 1'-0"



4 SCIENCE PREP 3 RCP
SCALE: 1/4" = 1'-0"



6 SCIENCE PREP 3 INTERIOR ELEVATIONS
SCALE: 1/4" = 1'-0"

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Architecture
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Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SCIENCE PREP ROOMS
PROGRAMMING DOCUMENT

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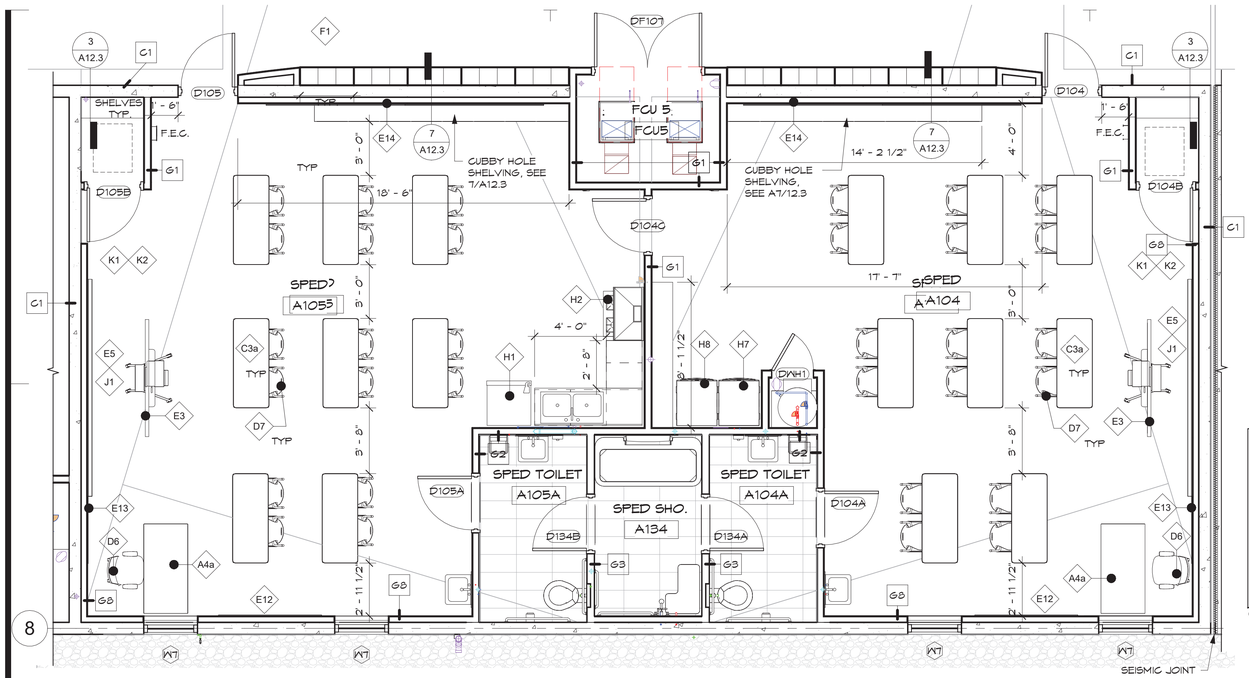
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

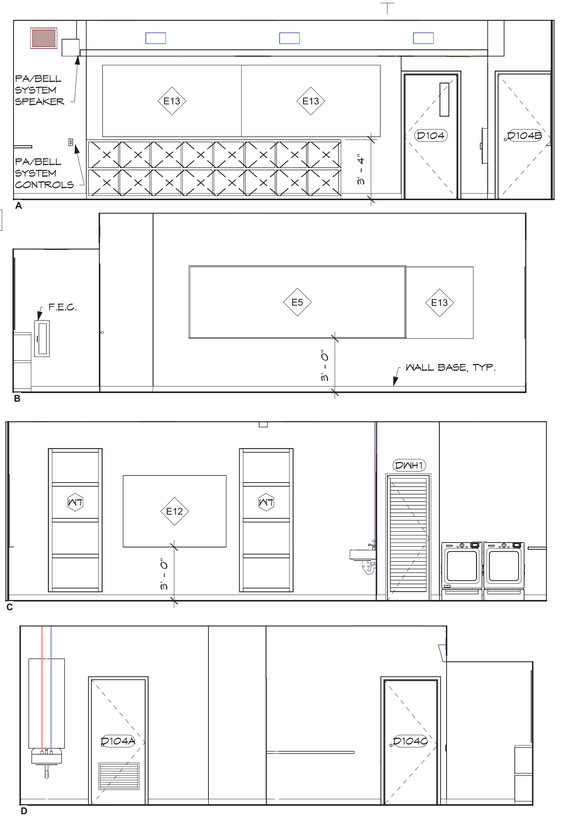
Drawing No.
A6.3
Sheet No. ____ of ____



8

1 SPED BLS CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



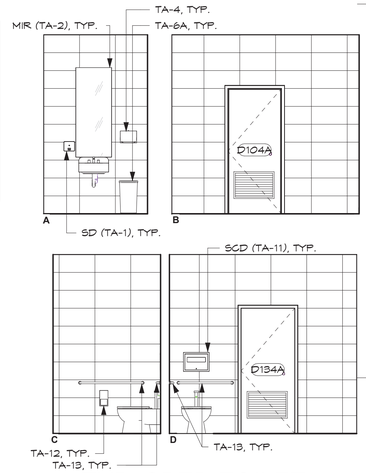
3 SPED A104 INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



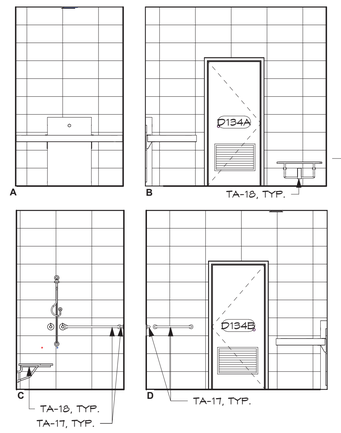
4 SPED A105 INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



5 TYP. SPED TOILET INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



6 SPED SHOWER INT. ELEVATIONS

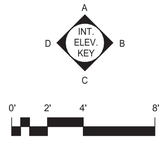
SCALE: 1/4" = 1'-0"

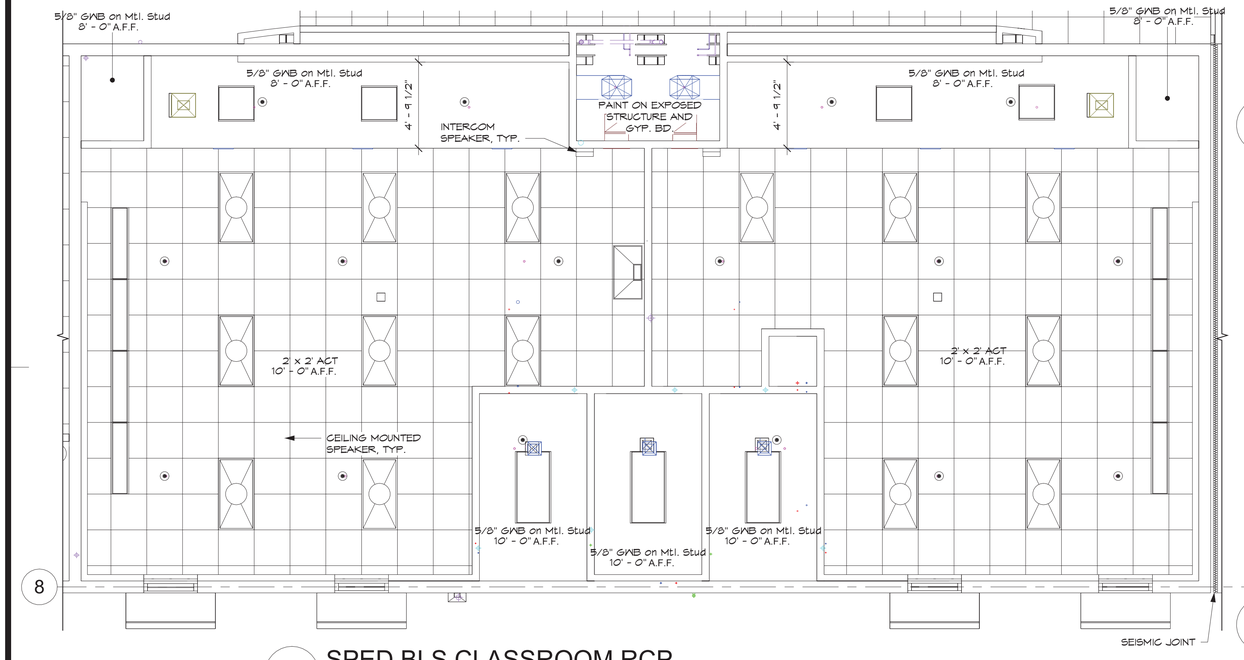
DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.





8

2 SPED BLS CLASSROOM RCP

SCALE: 1/4" = 1'-0"

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REVISIONS		
No.	Description	Date

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Architecture
Planning
Interior Design

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

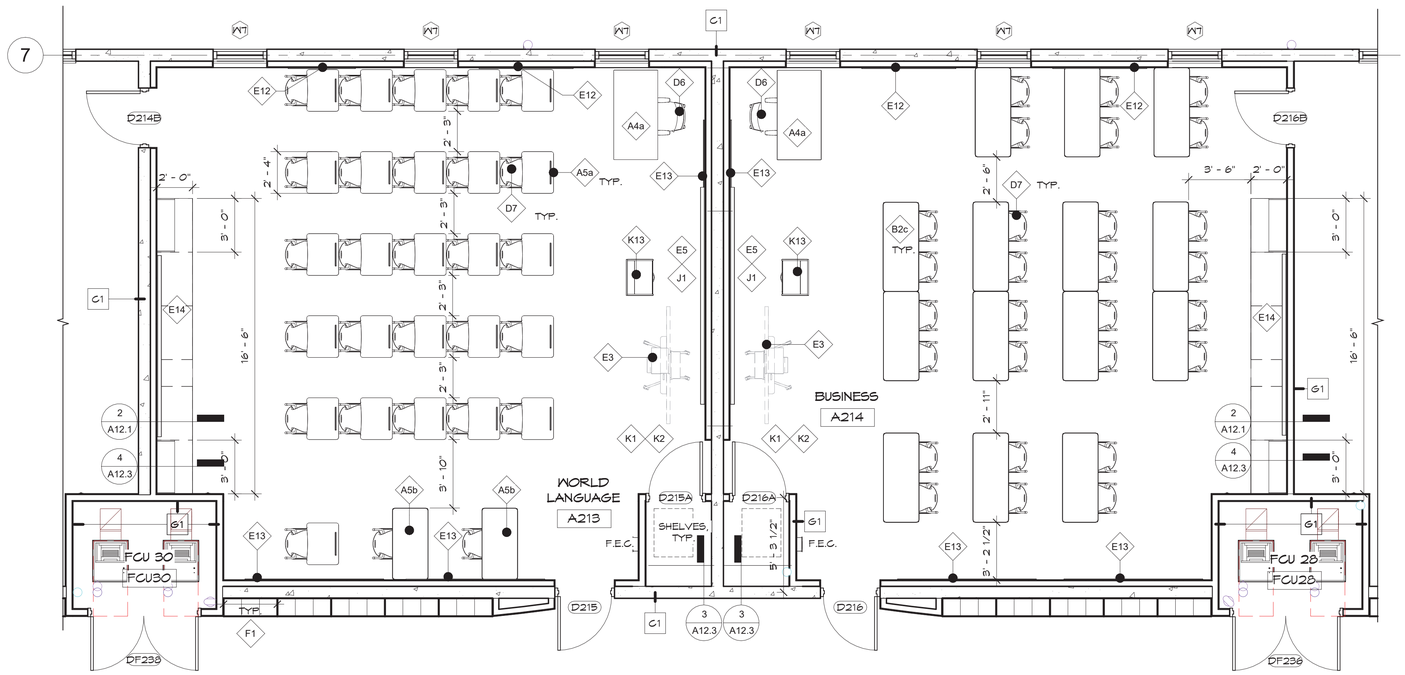
Title: A-WING DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

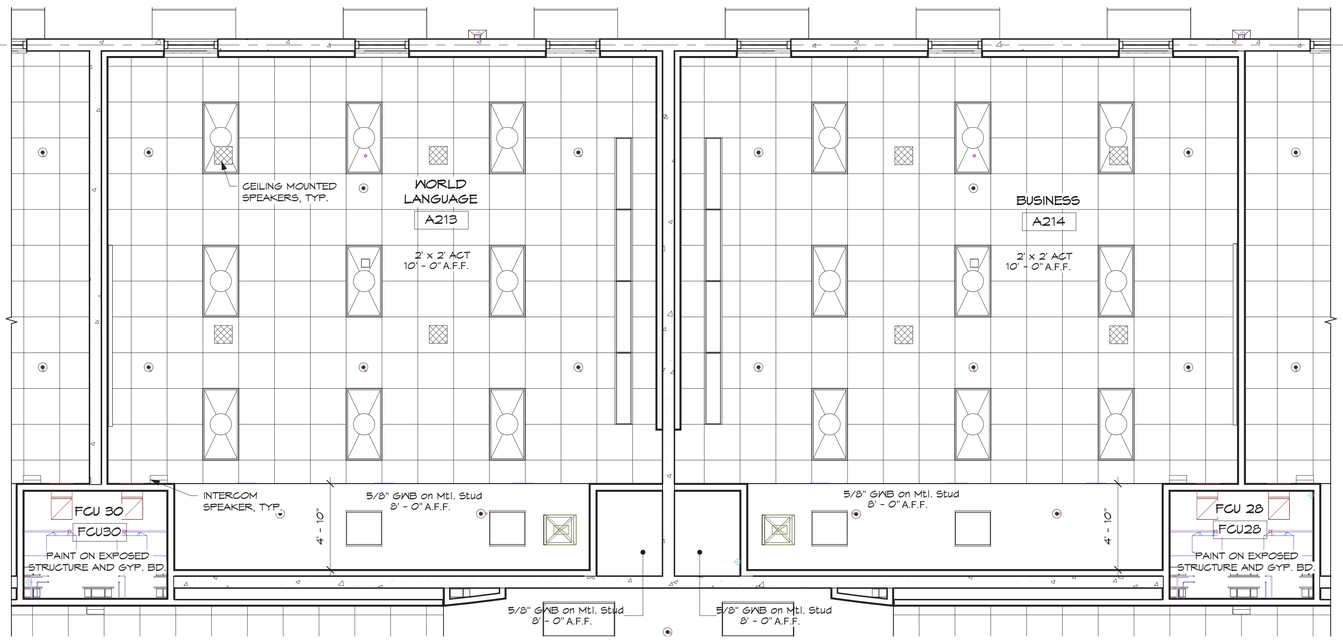
Drawing No. A6.4

Sheet No. _____ of _____



1 TYP. CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



2 TYP. A-WING CLASSROOM RCP

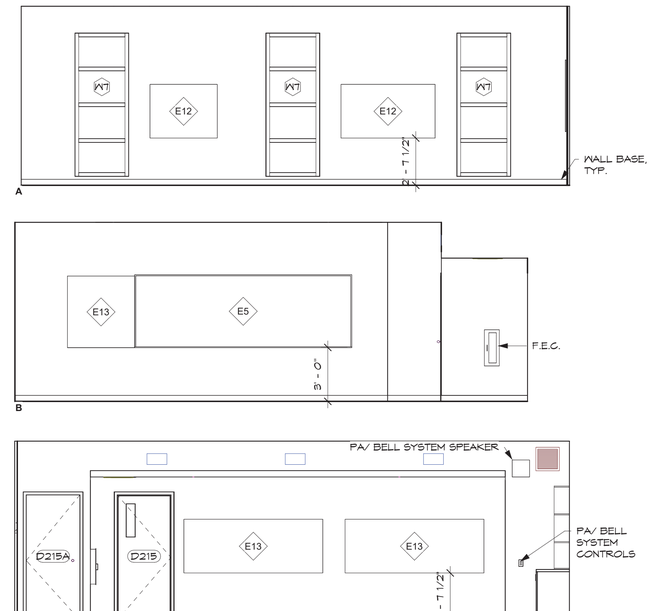
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

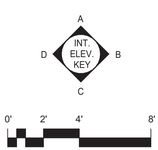
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



3 TYP. A-WING CLASSROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



0' 2' 4' 8'

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Architecture
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

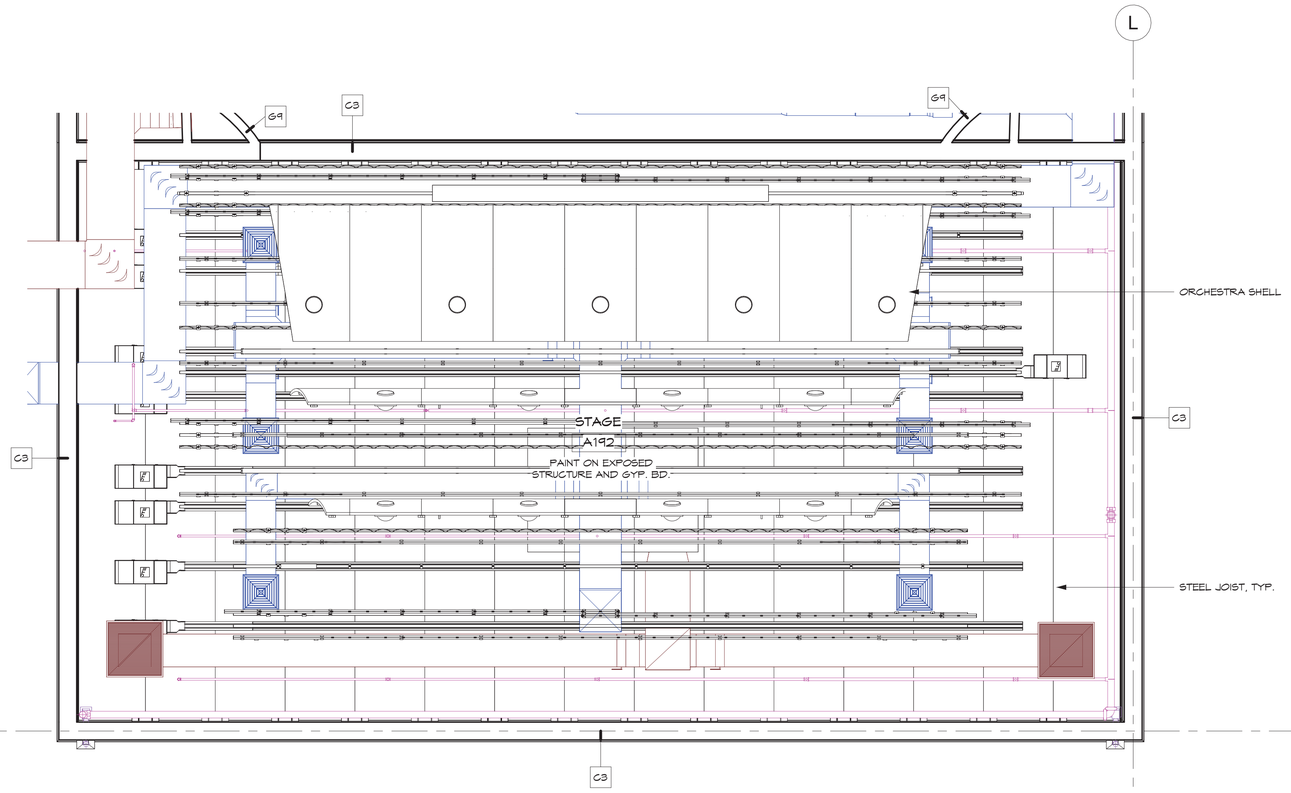
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.5

Sheet No. ____ of ____

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.



1 AUDITORIUM STAGE RCP

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects

100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

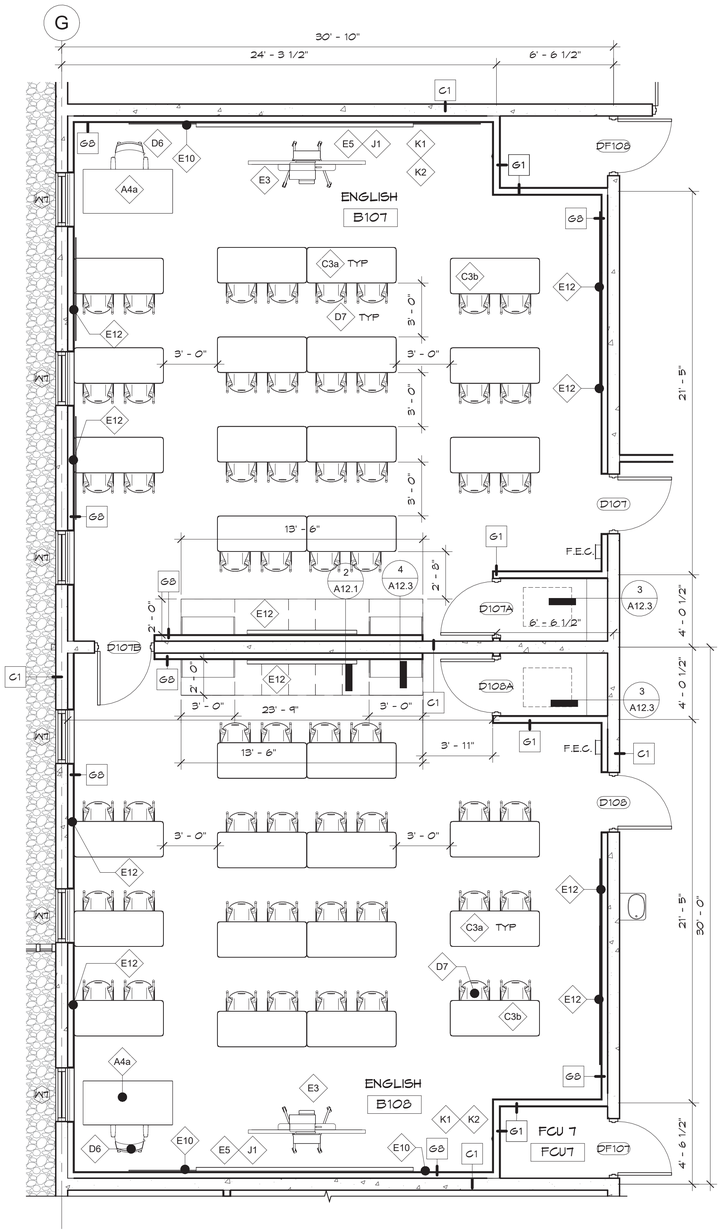
Title:
AUDITORIUM DETAIL PLANS

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTG
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

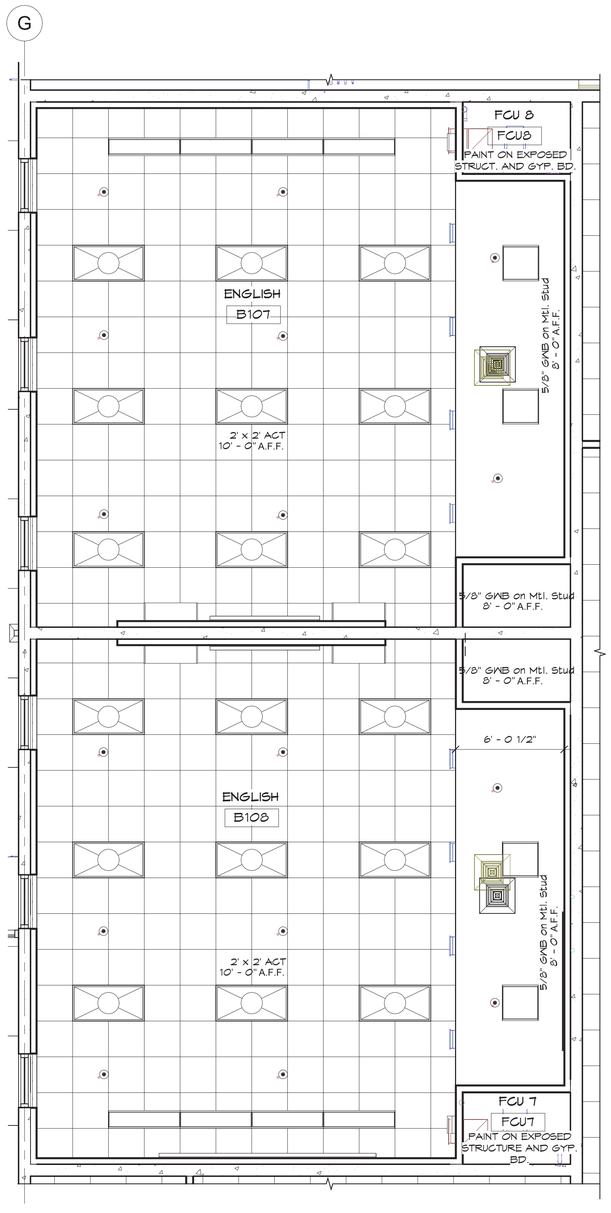
Drawing No.
A6.6

Sheet No. _____ of _____



1 TYP. CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



2 TYP. B-WING CLASSROOM RCP

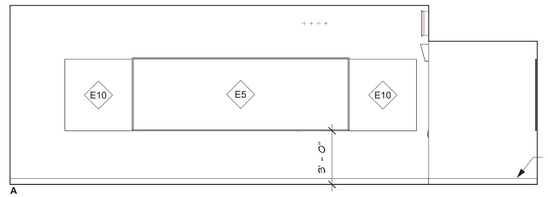
SCALE: 1/4" = 1'-0"

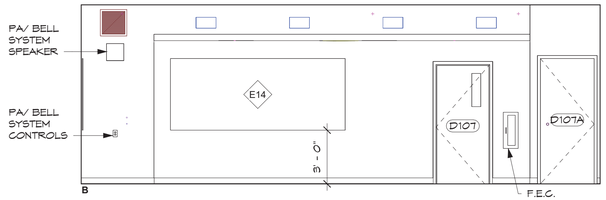
DETAIL PLAN NOTES:

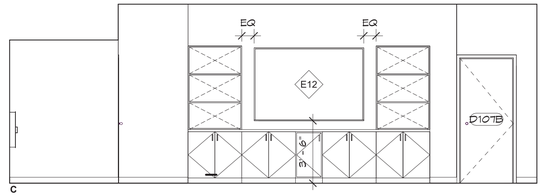
1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

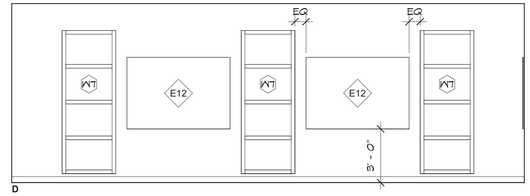
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



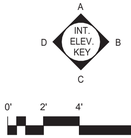






3 TYP. B-WING CLASSROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"





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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

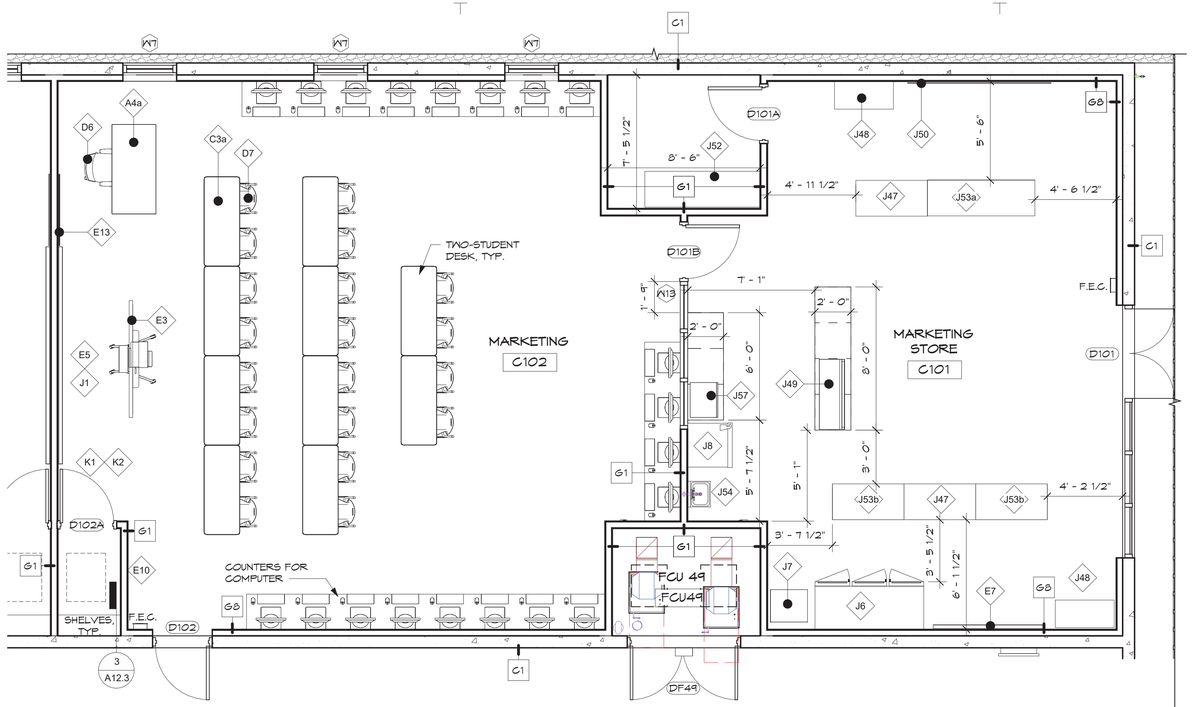
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

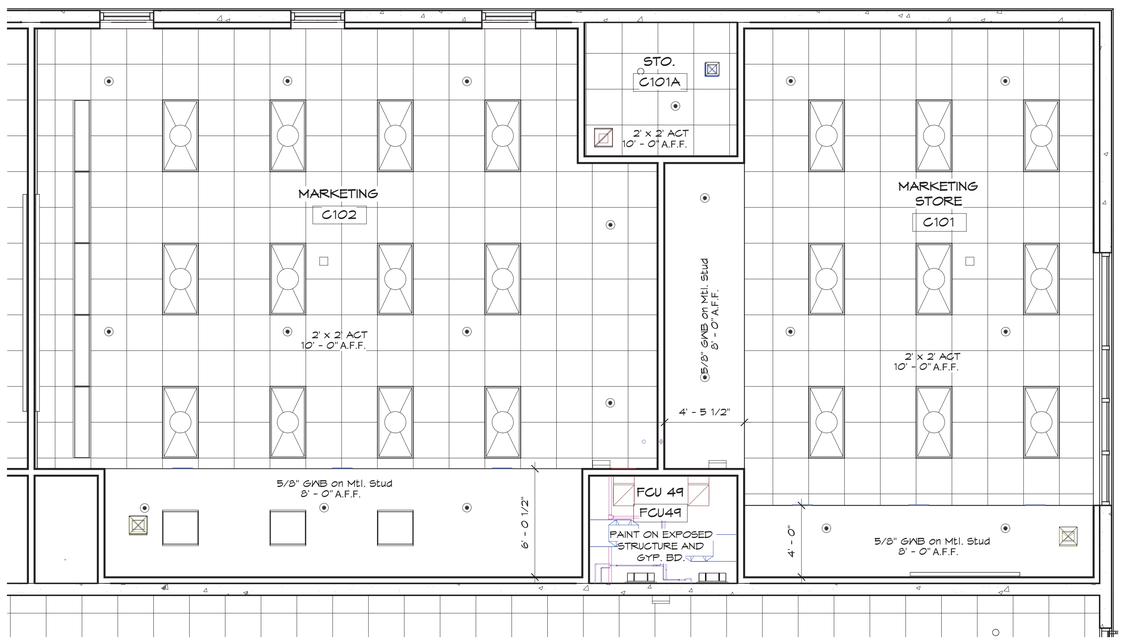
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A6.7

Sheet No. ____ of ____



1 MARKETING CLASSROOM PLAN
SCALE: 1/4" = 1'-0"



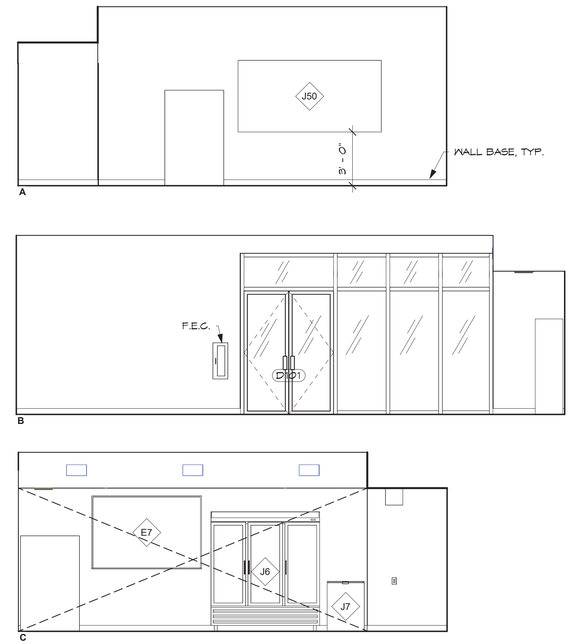
2 MARKETING CLASSROOM RCP
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

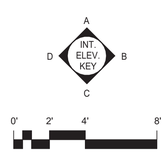
1. REFER TO A8.18 AND A8.19 FOR FF4E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



3 MARKETING STORE INTERIOR ELEVATIONS
SCALE: 1/4" = 1'-0"



IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
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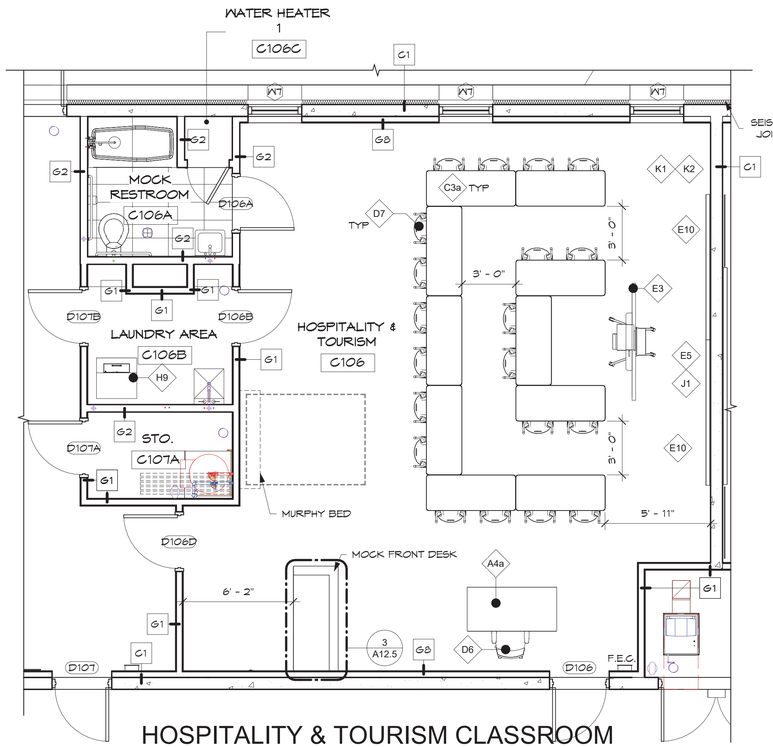
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.
A6.8
Sheet No. ____ of ____



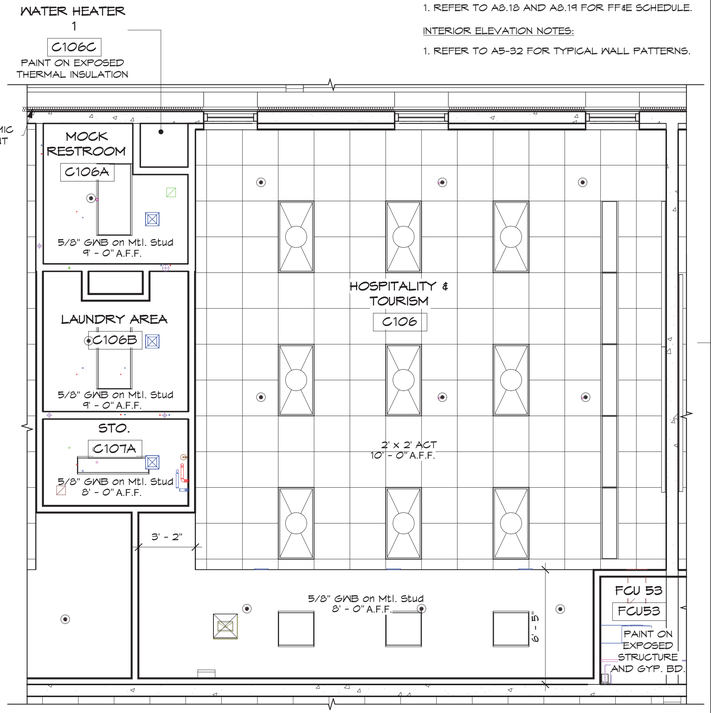
1 MARKETING CLASSROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"



2 HOSPITALITY & TOURISM CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



3 HOSPITALITY & TOURISM CLASSROOM RCP

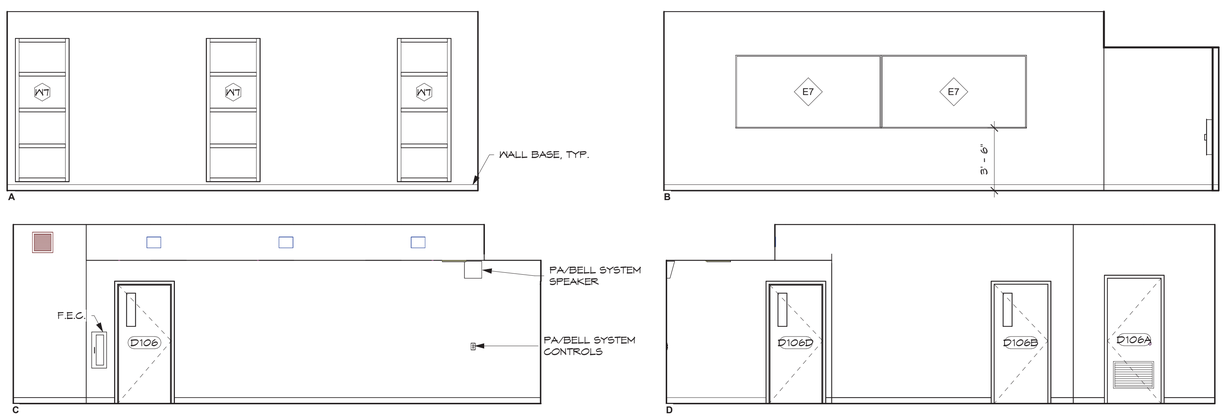
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

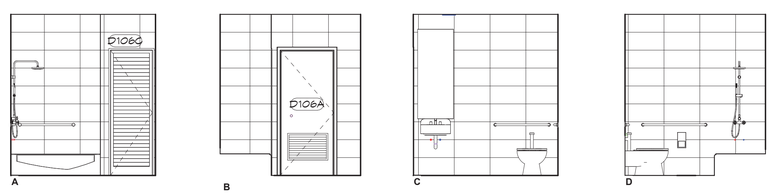
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



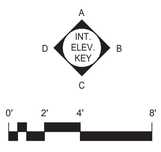
4 HOSPITALITY & TOURISM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



5 H&T RESTROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

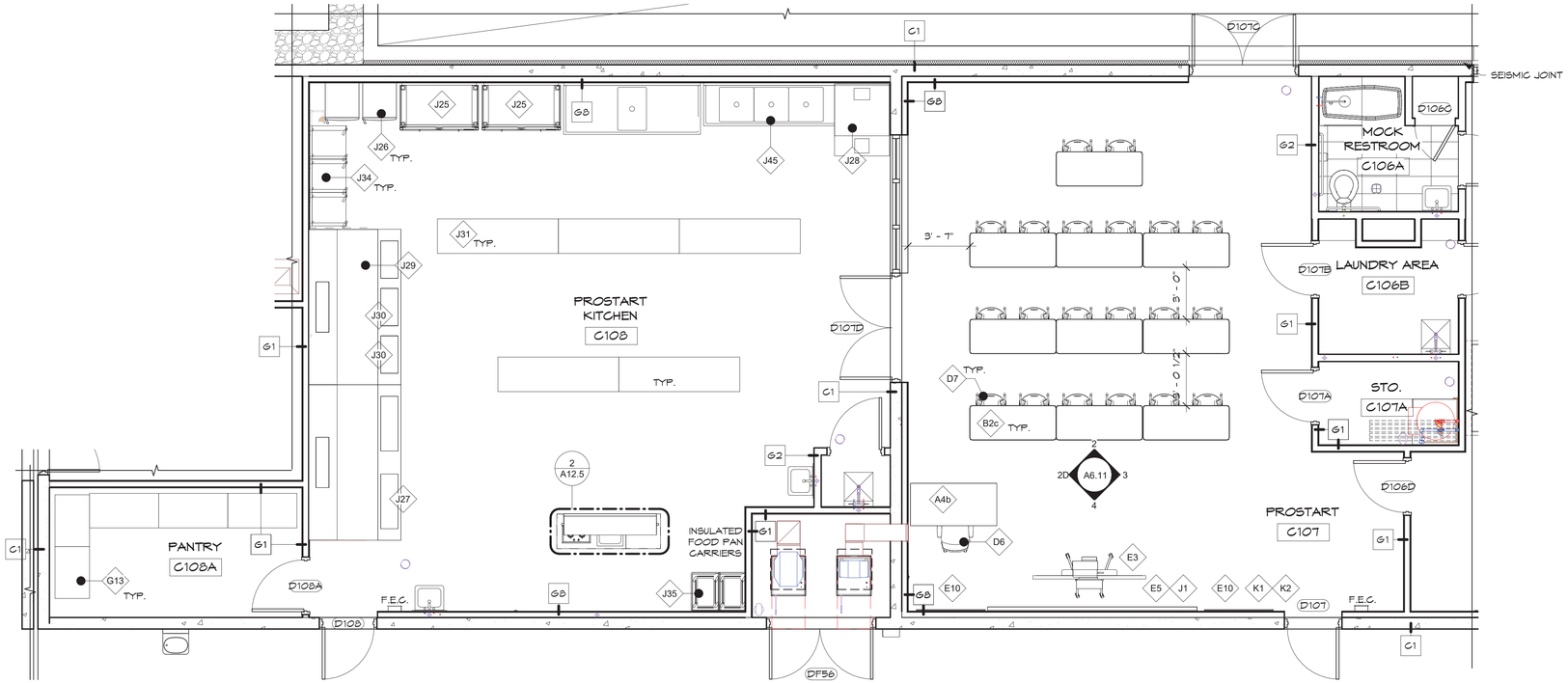
Drawing No.
A6.9
Sheet No. of

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

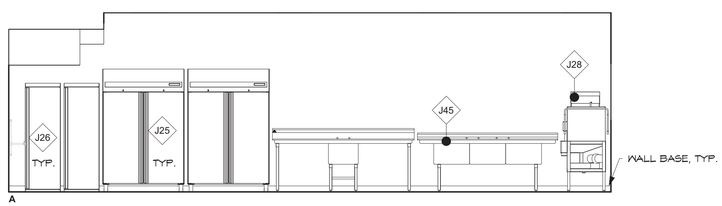
INTERIOR ELEVATION NOTES:

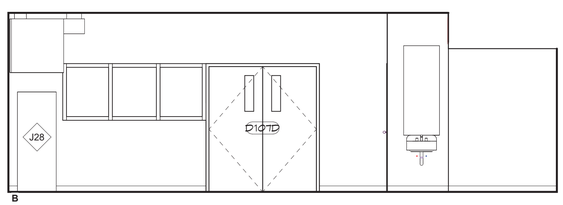
1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

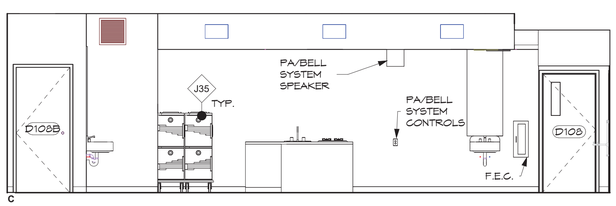


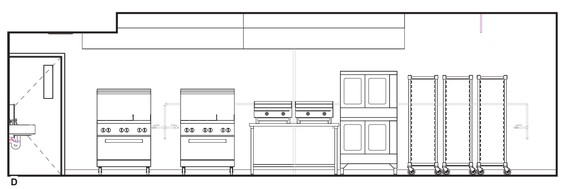
1 PROSTART CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



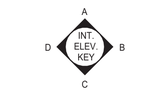






2 PROSTART KITCHEN INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS

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Architecture
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

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Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File:	

Drawing No.:
A6.10

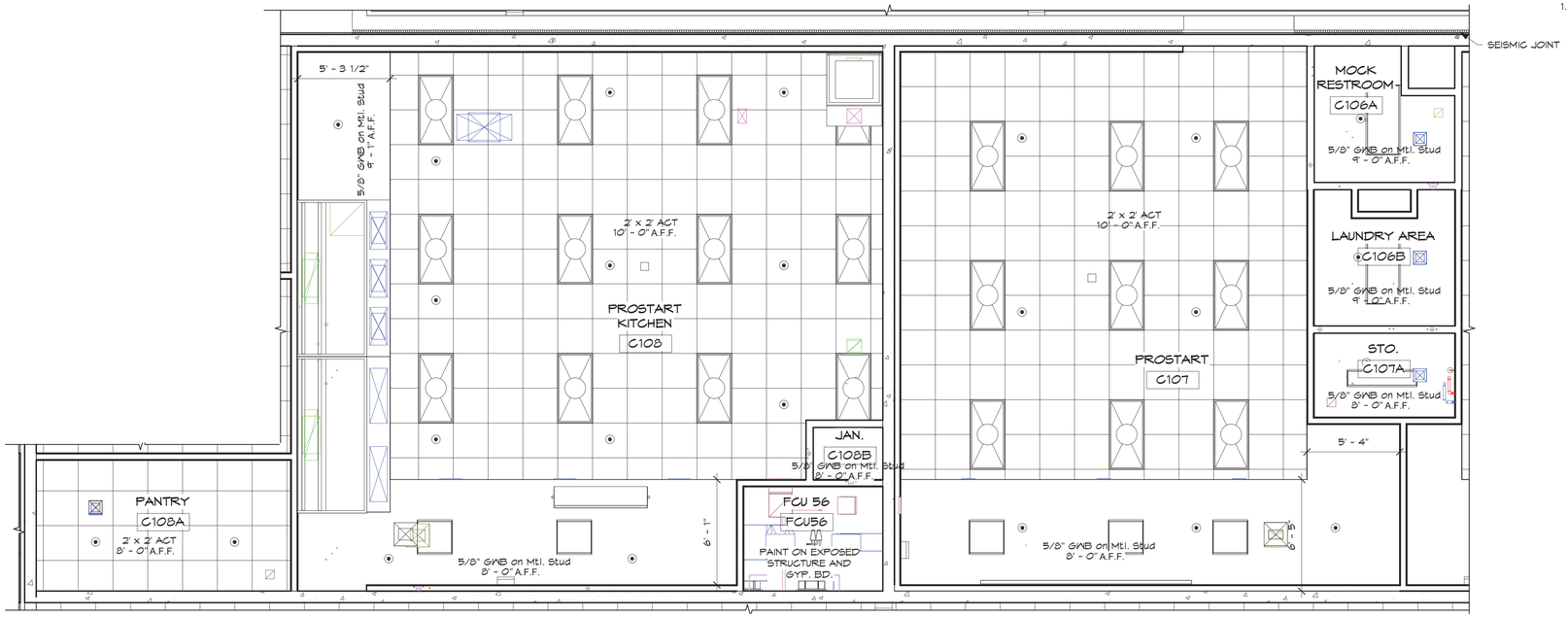
Sheet No. ____ of ____

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

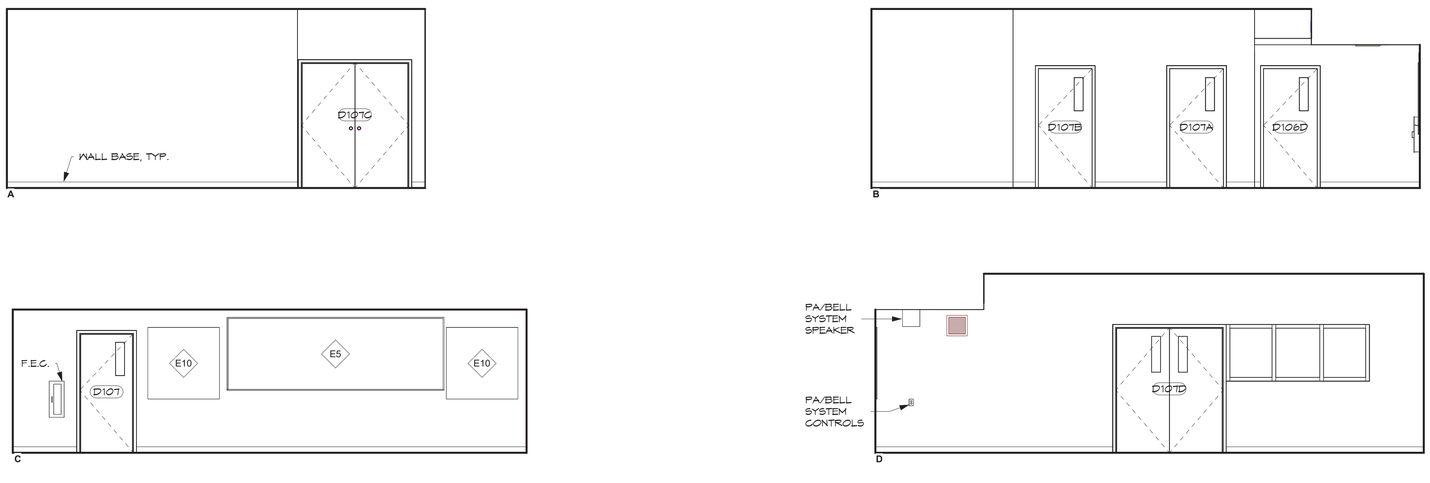
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



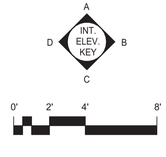
1 PROSTART CLASSROOM RCP

SCALE: 1/4" = 1'-0"



2 PROSTART CLASSROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



IF SHEET IS LESS THAN 24" X 36"
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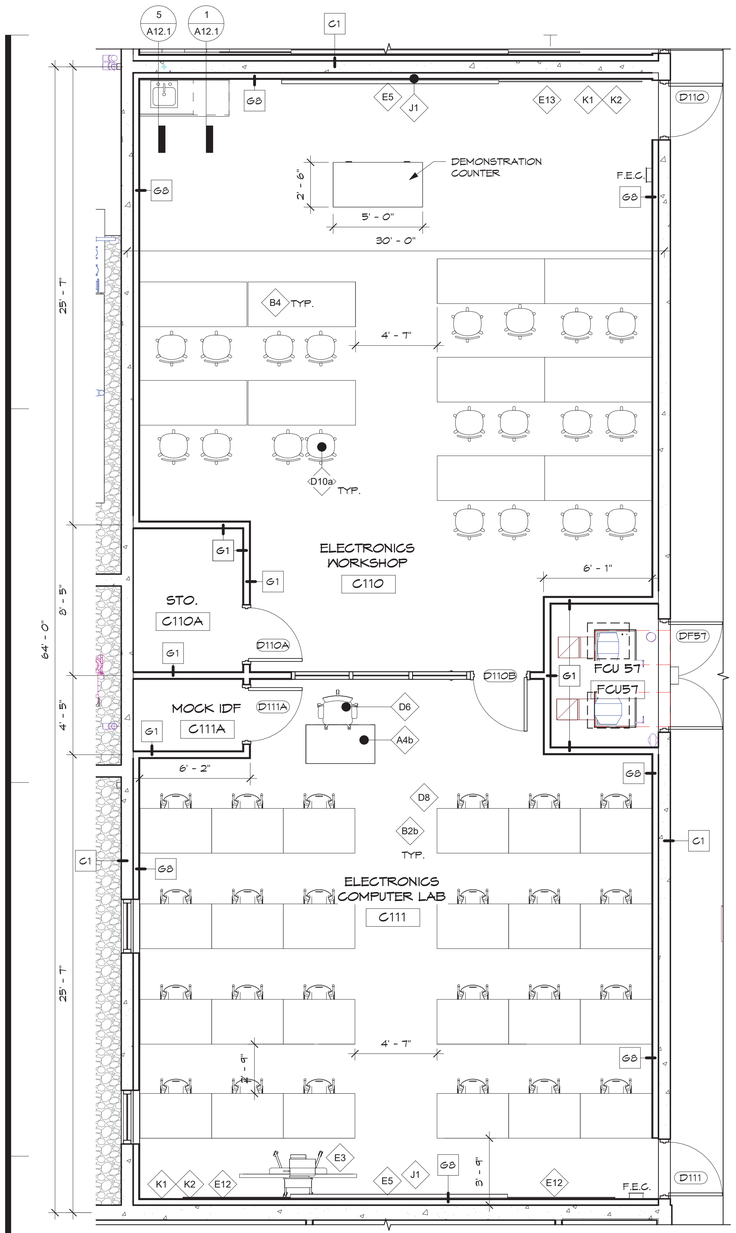
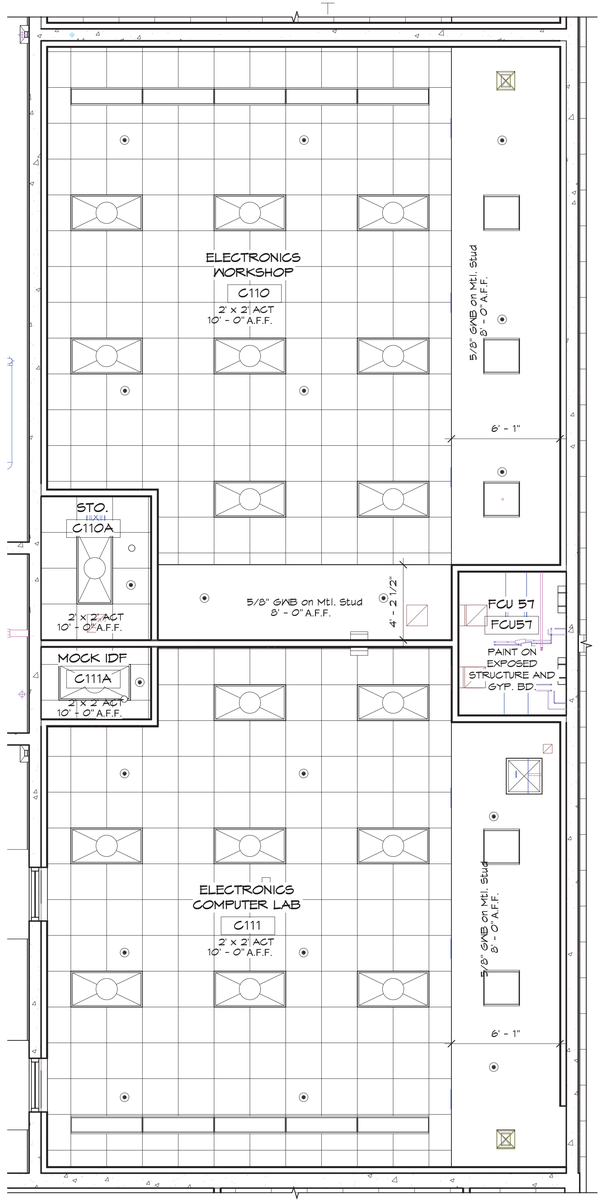
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.11

Sheet No. ____ of ____



1 ELECTRONICS CLASSROOM PLAN
SCALE: 1/4" = 1'-0"



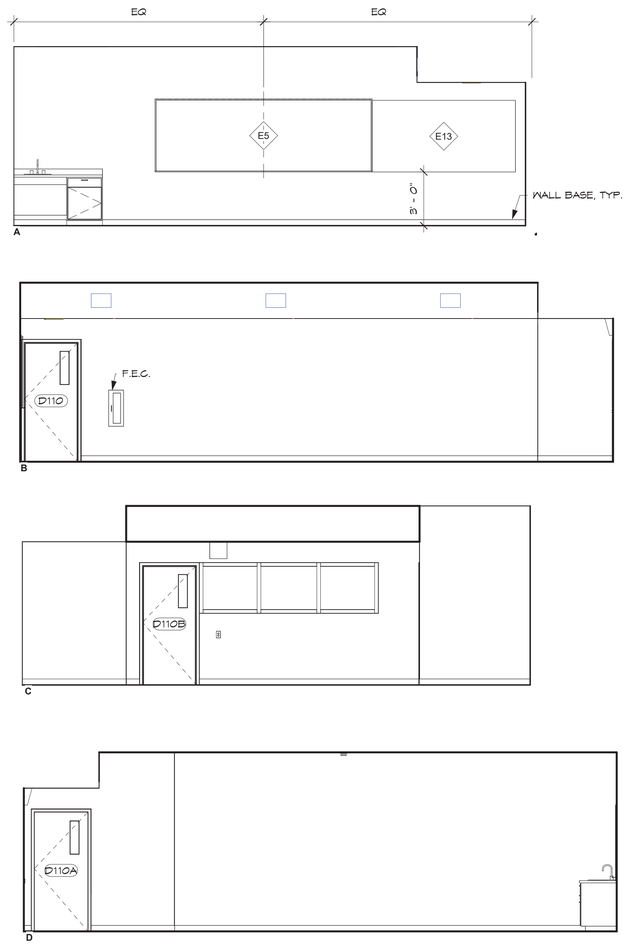
2 ELECTRONICS CLASSROOM RCP
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

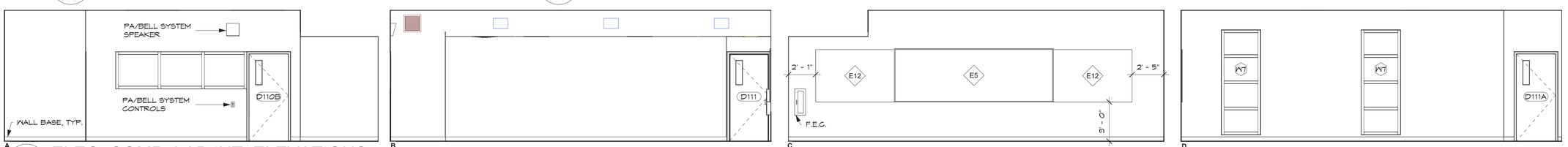
1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



3 ELEC. WORKSHOP INT. ELEVATIONS
SCALE: 1/4" = 1'-0"

A / INT. ELEV. KEY / B / C / D

0' 2' 4' 8'



4 ELEC. COMP. LAB INT. ELEVATIONS
SCALE: 1/4" = 1'-0"

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Architecture
Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
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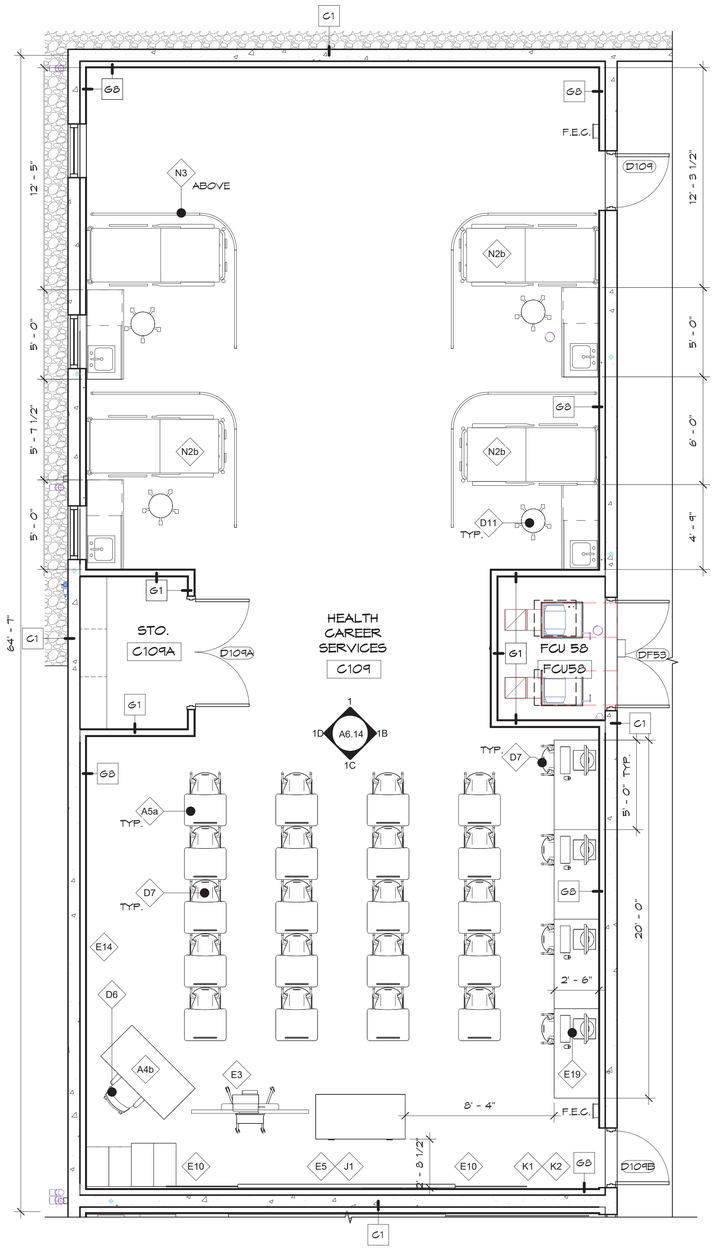
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

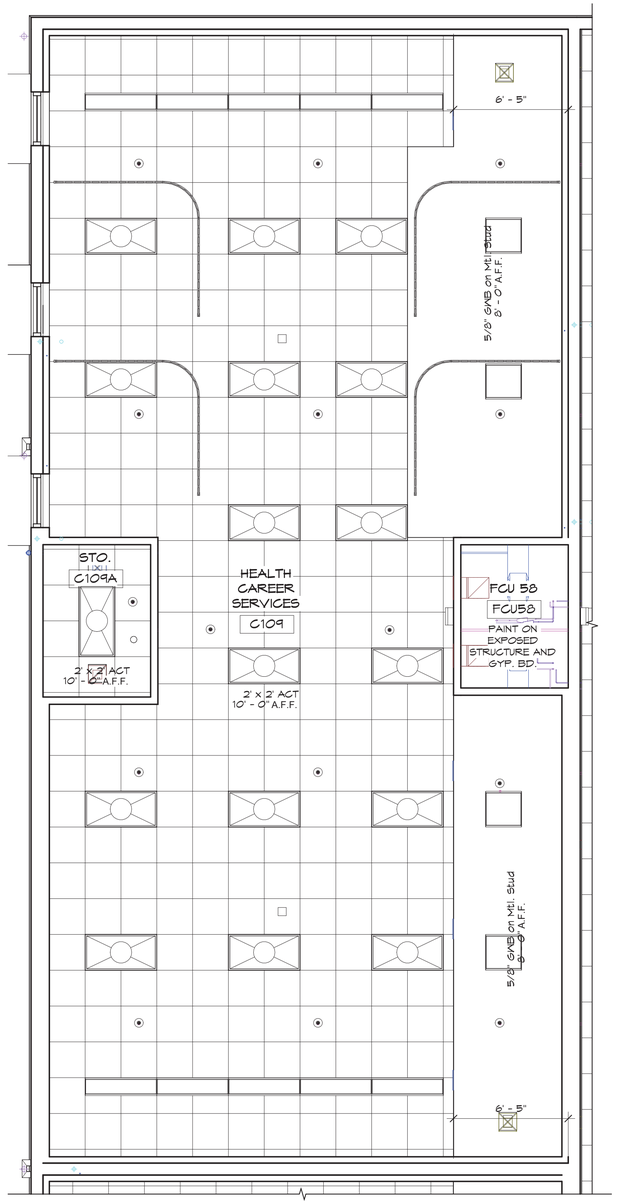
Drawing No.:
A6.12

Sheet No. ____ of ____



1 HEALTH CAREER SERVICES CLASSROOM PLAN

1/4" = 1'-0"



2 HEALTH CAREER SERVICES CLASSROOM RCP

1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

A
D INT. ELEV. KEY B
C

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

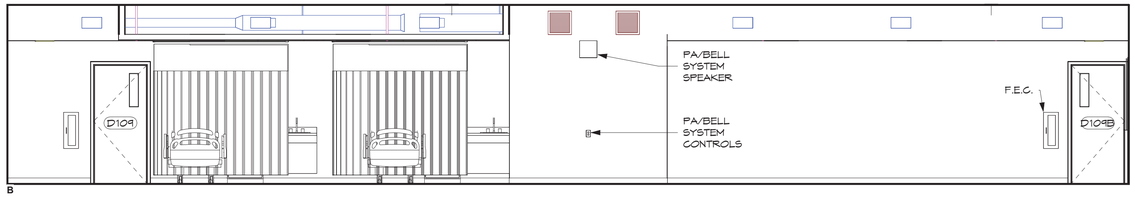
Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.13

Sheet No. of



A



B



C



D

DETAIL PLAN NOTES:

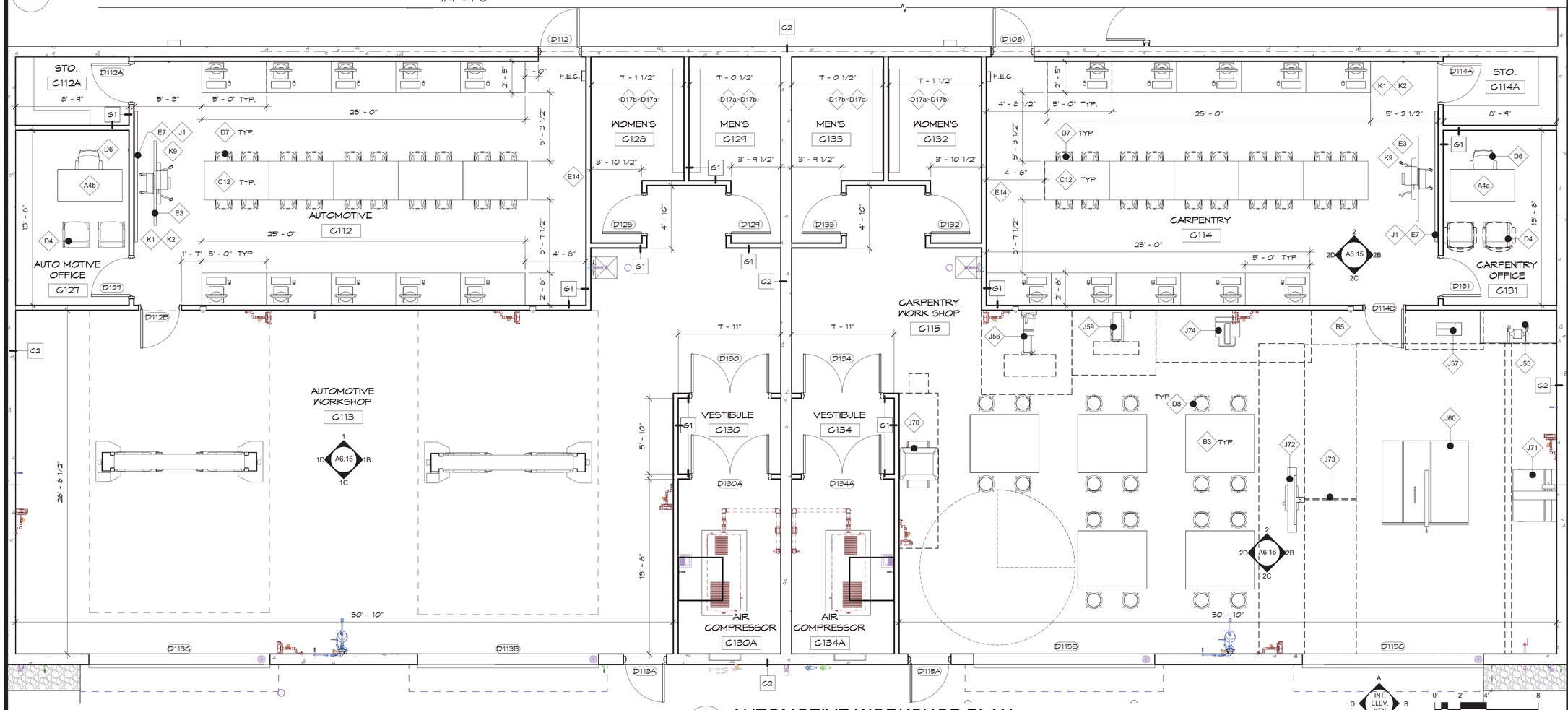
1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

1 HEALTH CAREER SERVICES INT. ELEVATIONS

1/4" = 1'-0"



2 AUTOMOTIVE WORKSHOP PLAN

SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

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NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

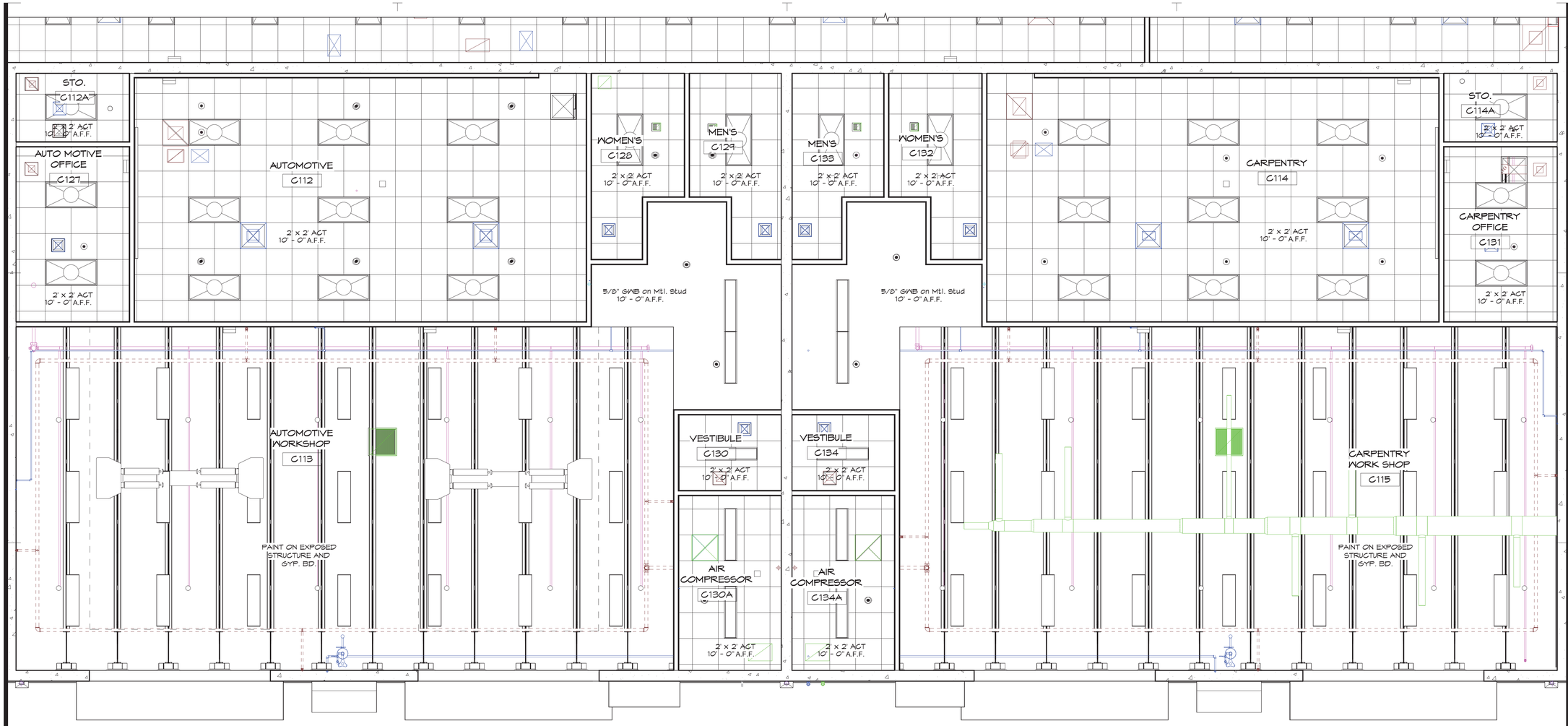
Title: GCC DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A6.14

Sheet No. ____ of ____



1 AUTOMOTIVE WORKSHIP RCP

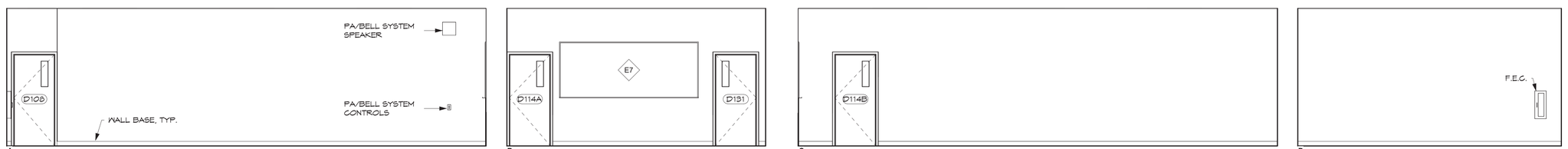
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A9.18 AND A9.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



2 TYP. GCC WORKSHOP CLASSROOM

SCALE: 1/4" = 1'-0"

A / B / C / D — INT. ELEV. KEY

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GCC DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

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Scale:	As indicated
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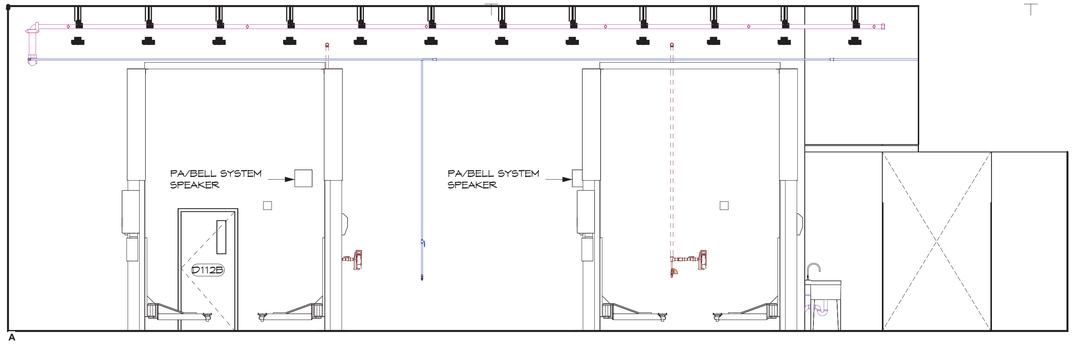
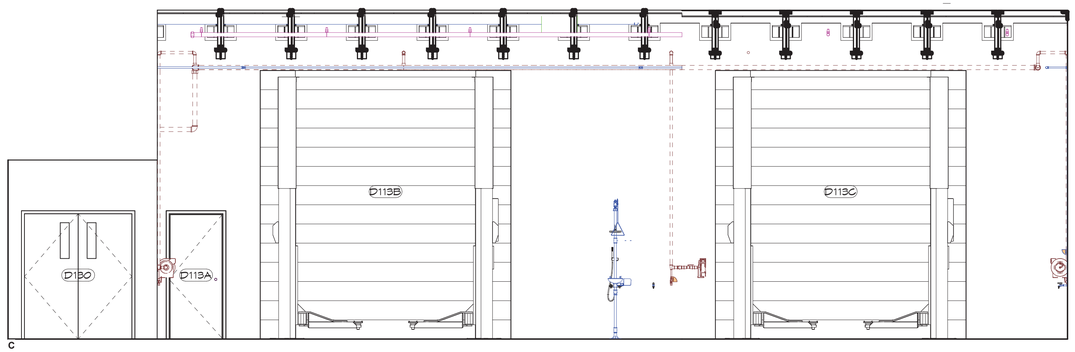
Project No.:	No.
File	

Drawing No.: A6.15

Sheet No. ____ of ____



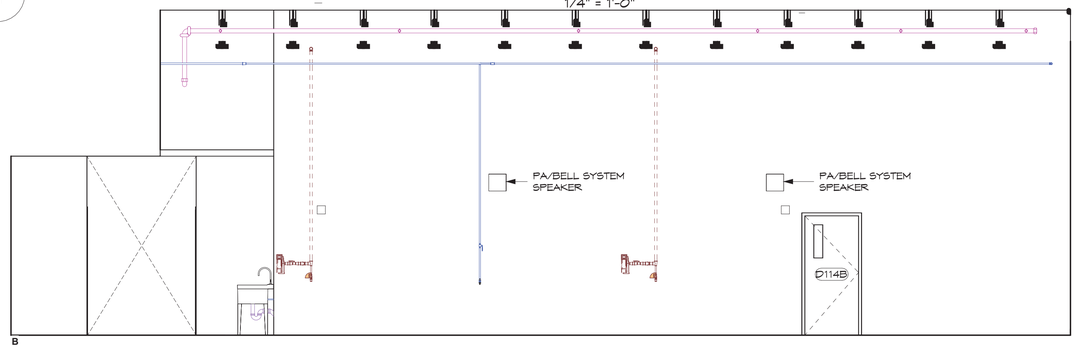
A



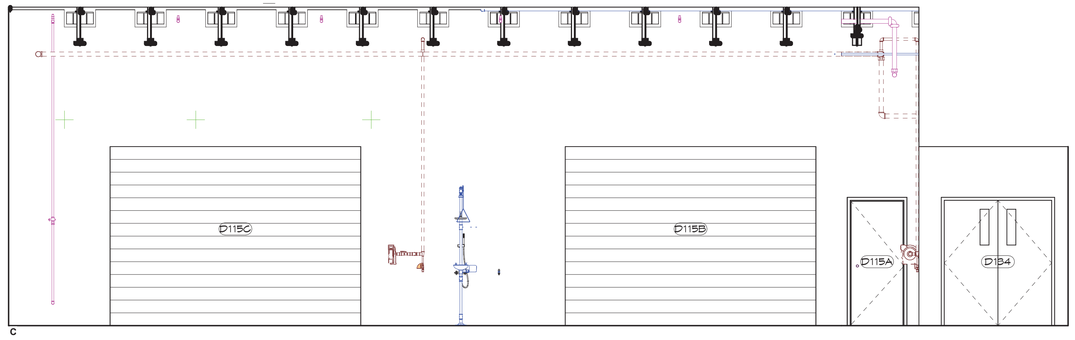
C

1 CARPENTRY WORKSHOP INT. ELEVATIONS

1/4" = 1'-0"



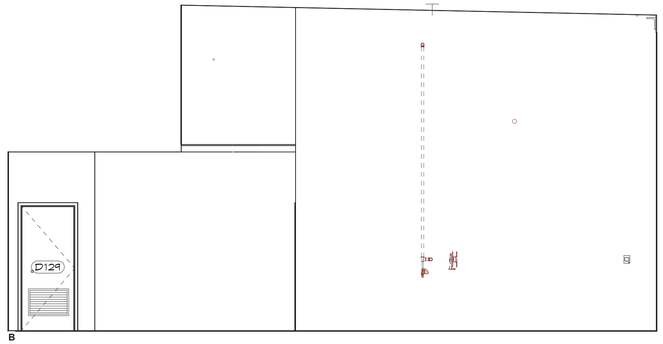
B



C

2 AUTOMOTIVE WORKSHOP INT. ELEVATIONS

1/4" = 1'-0"



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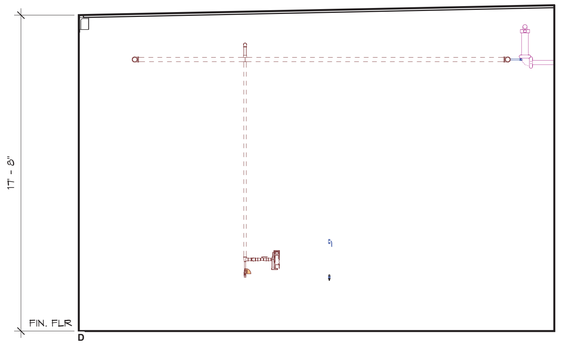

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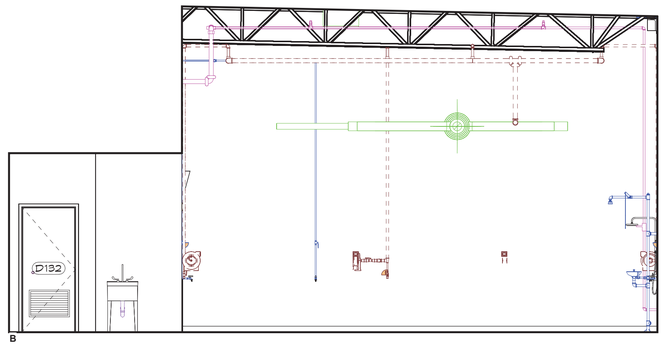
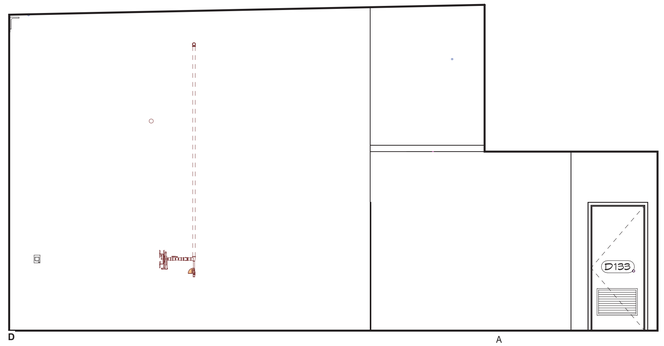


B



D



DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
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Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC INTERIOR ELEVATIONS

PROGRAMMING DOCUMENT

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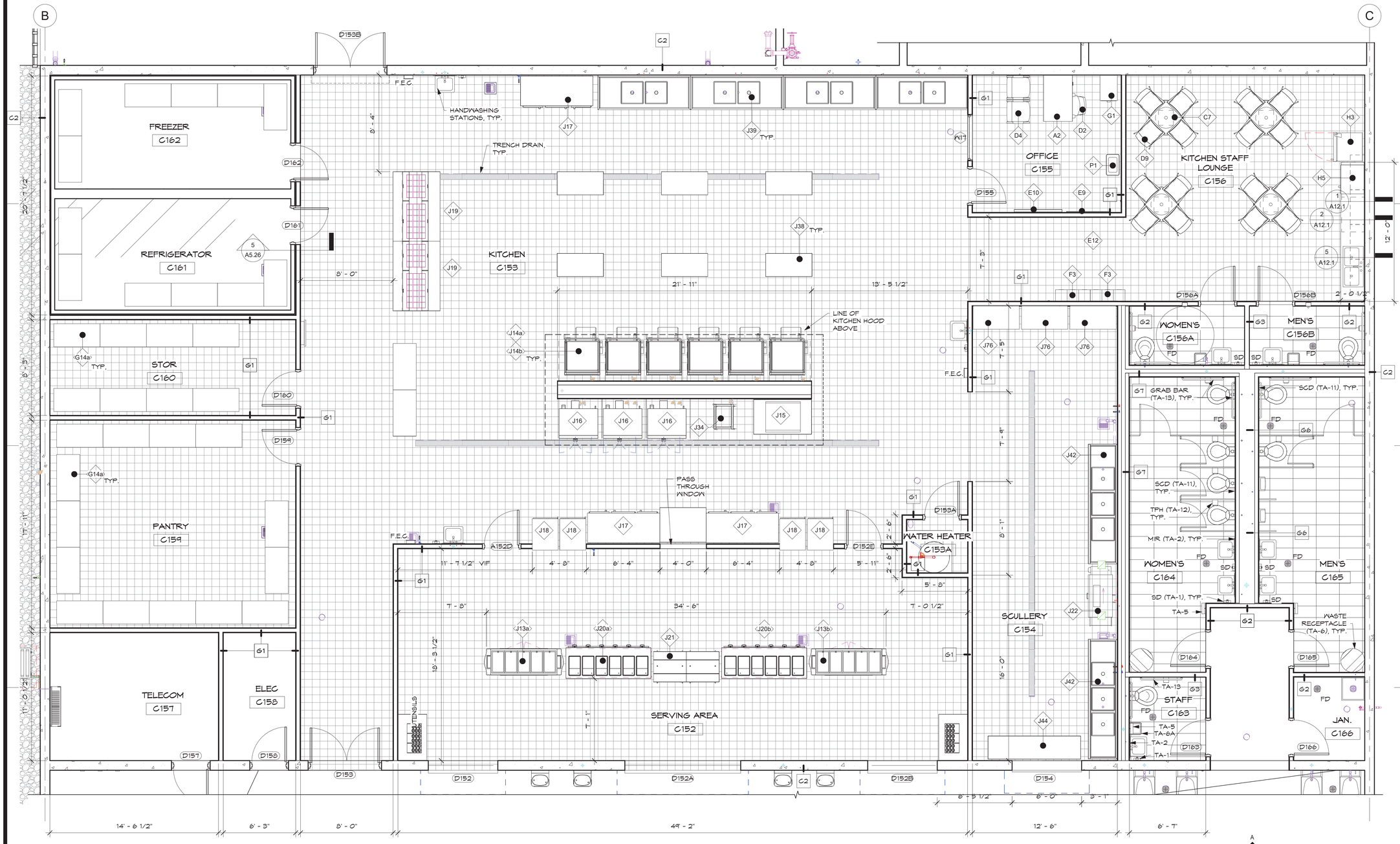
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.16

Sheet No. ____ of ____

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.



1 CAFETERIA PLAN - LEVEL 1

SCALE: 1/4" = 1'-0"

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REVISIONS

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Architecture
Planning
Interior Design

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CAFETERIA DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

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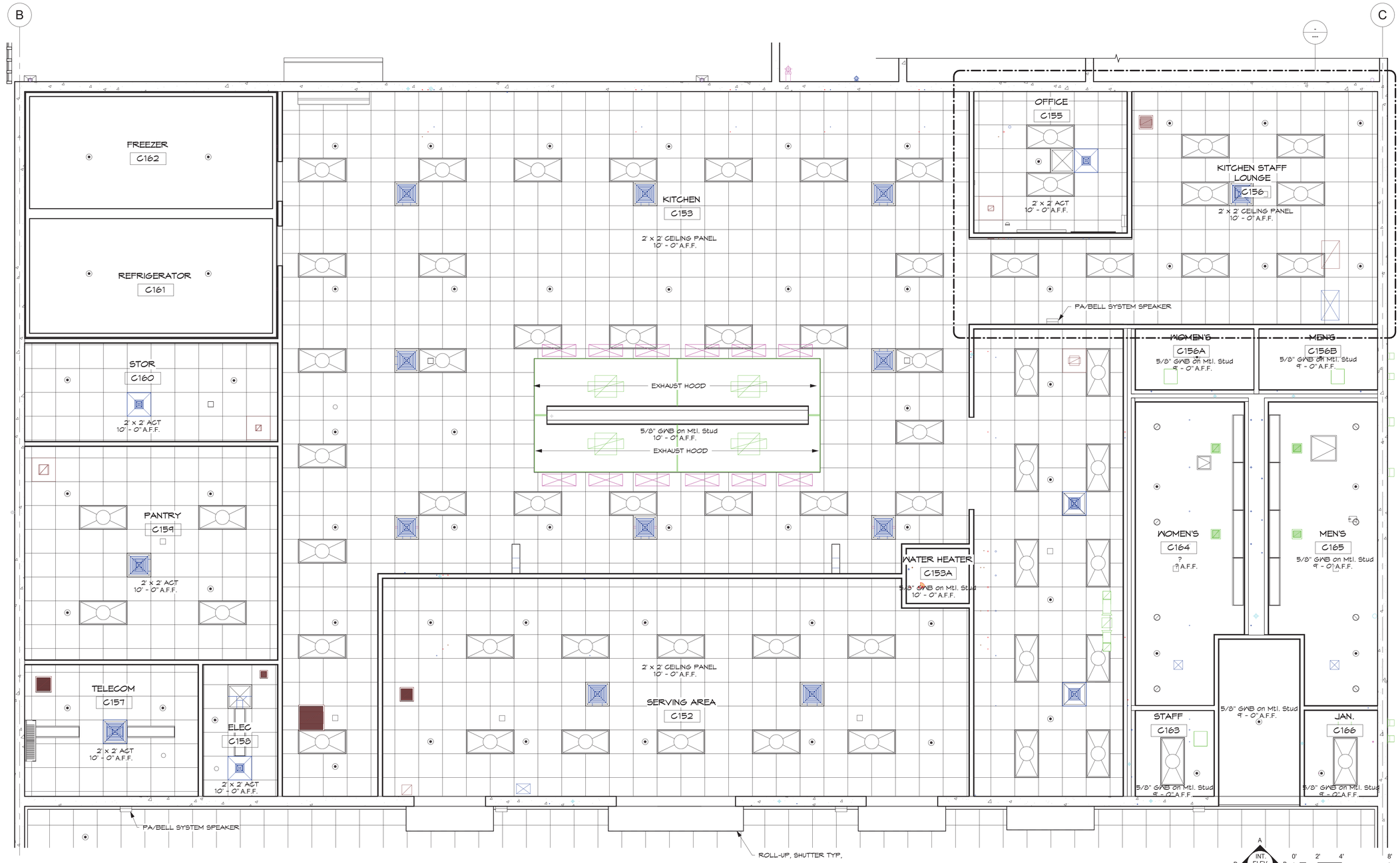
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A6.17

Sheet No. ____ of ____



1 CAFETERIA RCP

SCALE: 1/4" = 1'-0"

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REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CAFETERIA DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

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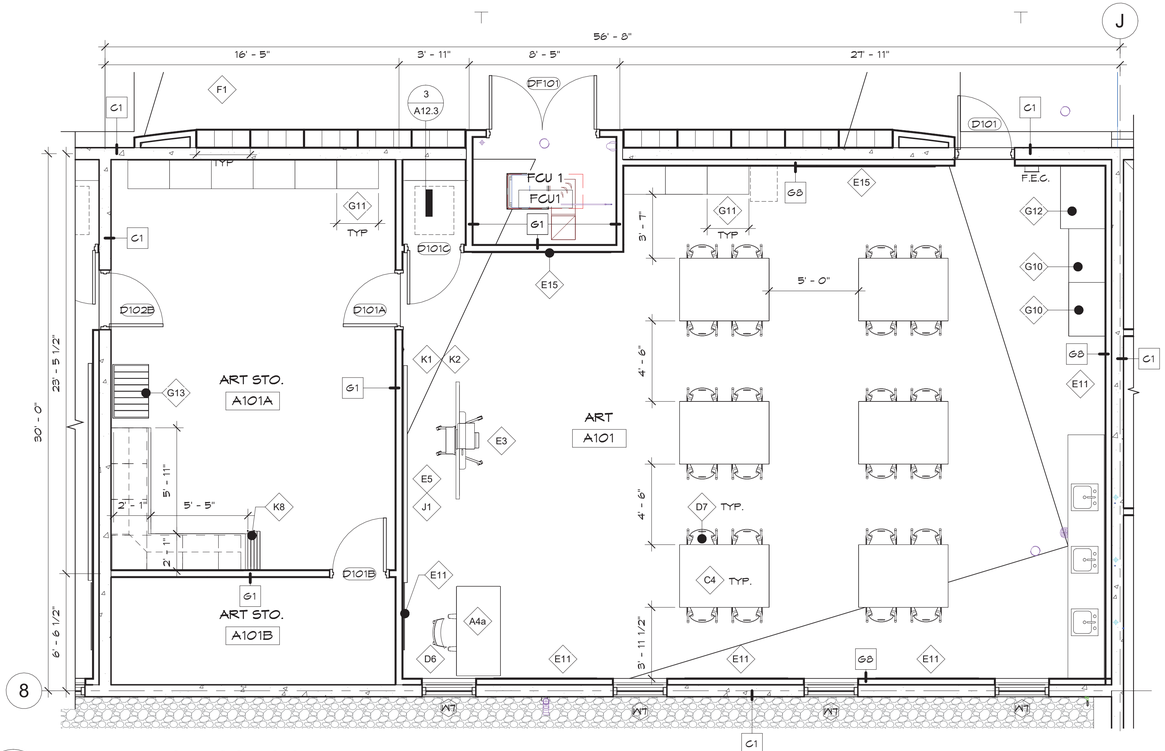
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

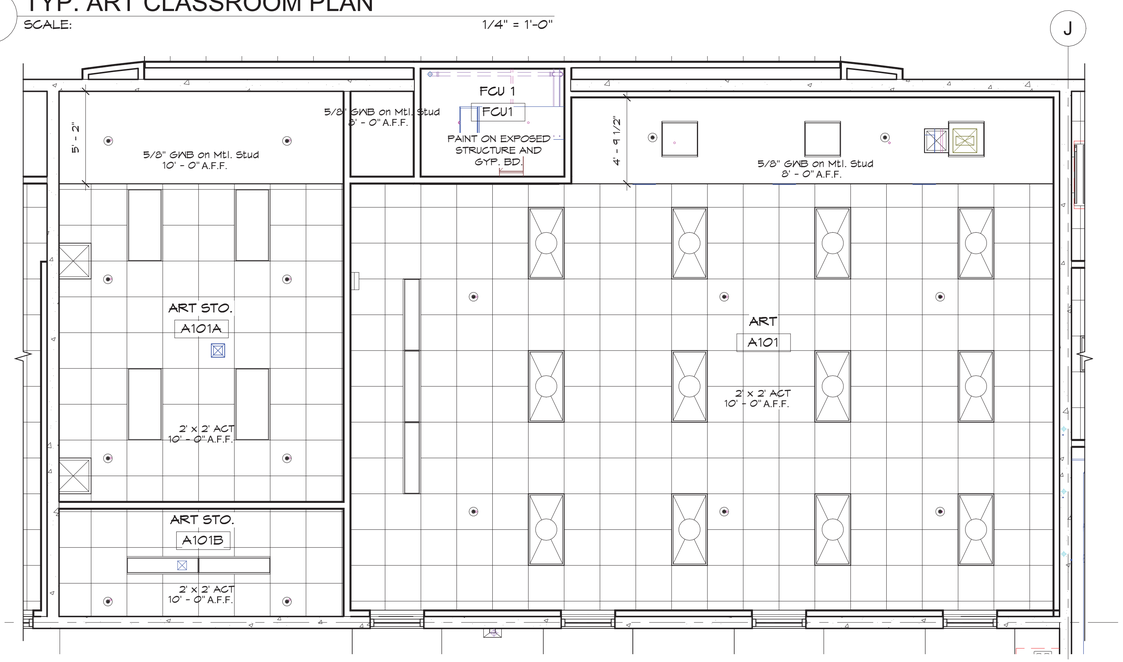
Drawing No.
A6.18

Sheet No. _____ of _____



1 TYP. ART CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



2 TYP. ART CLASSROOM RCP

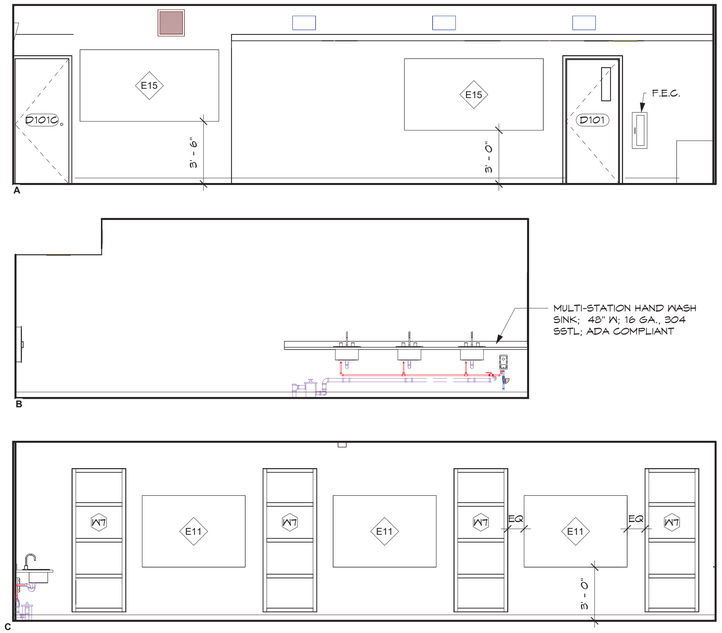
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

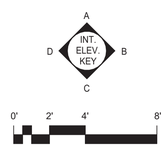
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



3 ART CLASSROOM INT. ELEVATION

SCALE: 1/4" = 1'-0"



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ART CLASSROOM DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

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Supv:	CTG
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Date:	3/31/25
Project No.:	No.
File	

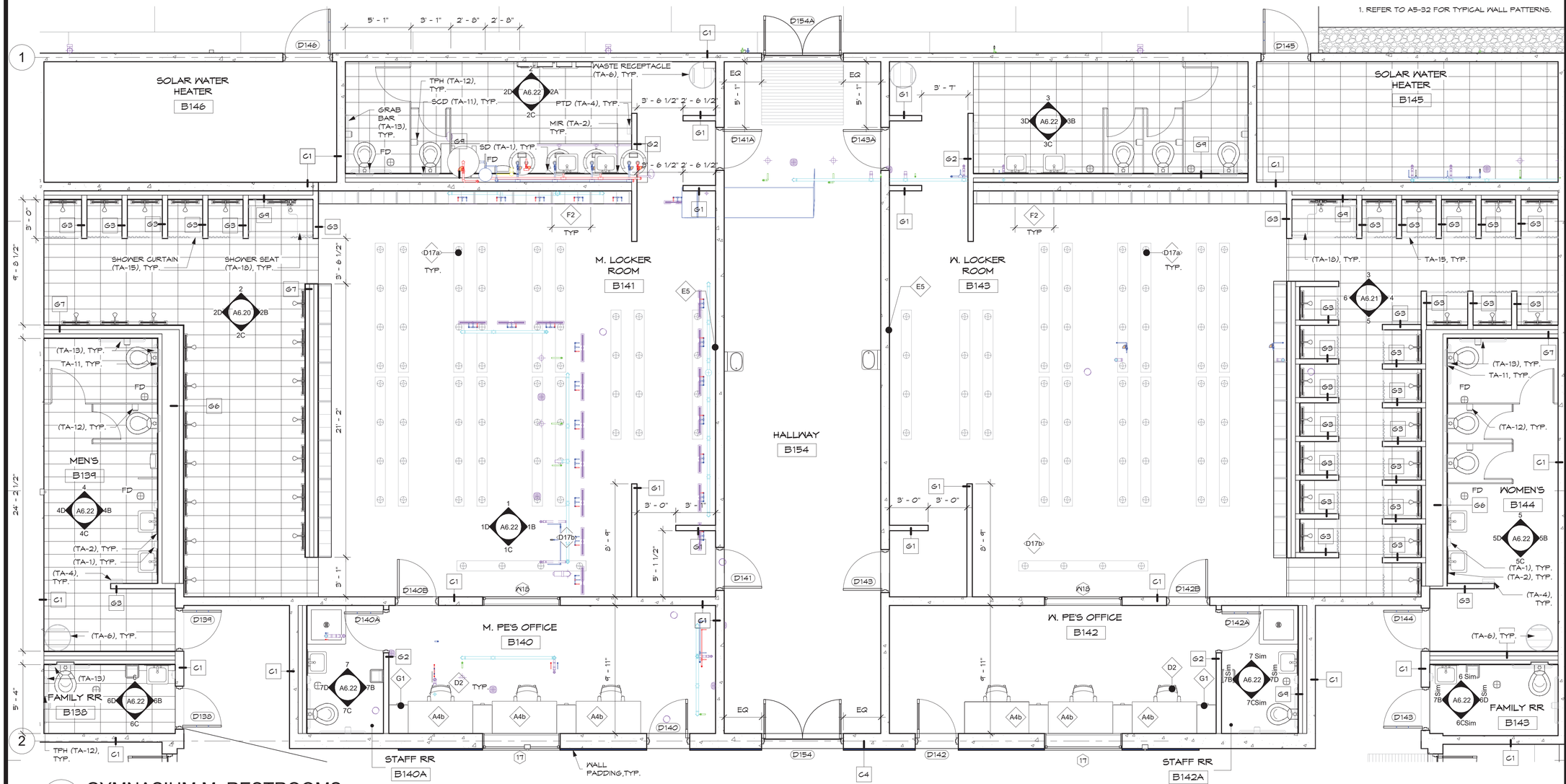
Drawing No.
A6.19
Sheet No. of

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

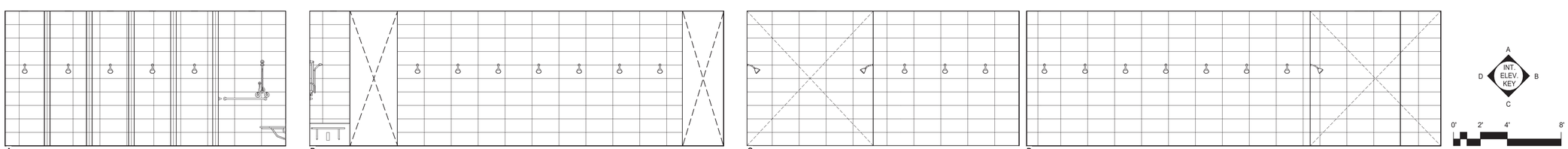
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



1 GYMNASIUM M. RESTROOMS

SCALE: 1/4" = 1'-0"



2 MEN LOCKER ROOM SHOWERS INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA

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Architecture
Planning
Interior Design

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: GYM LOCKER ROOM DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

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Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A6.20

Sheet No. ____ of ____

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

SOLAR WATER HEATER
B146
5/8" GWB on Mtl. Stud
10' - 0" A.F.F.

SHOWER CURTAIN, TYP.

M. LOCKER ROOM
B141
5/8" GWB on Mtl. Stud
10' - 0" A.F.F.

HALLWAY
B154
2' x 2' ACT
10' - 0" A.F.F.

W. LOCKER ROOM
B143
5/8" GWB on Mtl. Stud
10' - 0" A.F.F.

SOLAR WATER HEATER
B145
5/8" GWB on Mtl. Stud
10' - 0" A.F.F.

MEN'S
B139
5/8" GWB on Mtl. Stud
9' - 0" A.F.F.

WOMEN'S
B144
5/8" GWB on Mtl. Stud
9' - 0" A.F.F.

FAMILY RR
B138
5/8" GWB on Mtl. Stud
9' - 0" A.F.F.

STAFF RR
B140A
5/8" GWB on Mtl. Stud
9' - 0" A.F.F.

M. PE'S OFFICE
B140
2' x 2' ACT
10' - 0" A.F.F.
WINDOW BLINDS

W. PE'S OFFICE
B142
2' x 2' ACT
10' - 0" A.F.F.
WINDOW BLINDS

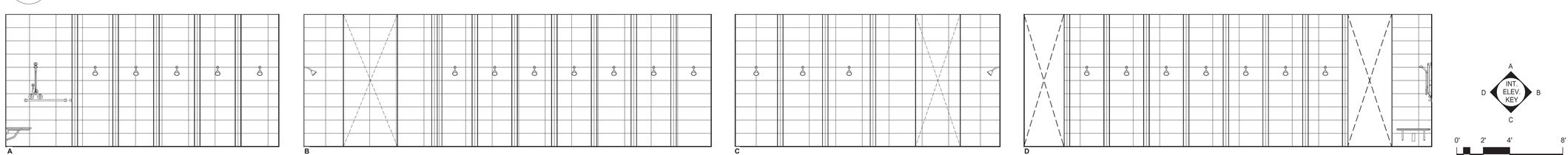
STAFF RR
B142A
5/8" GWB on Mtl. Stud
9' - 0" A.F.F.

FAMILY RR
B143
5/8" GWB on Mtl. Stud
9' - 0" A.F.F.

5/8" GWB on Mtl. Stud
10' - 0" A.F.F.

1 GYM. LOCKER ROOM RCP

SCALE: 1/4" = 1'-0"



3 WOMEN LOCKER ROOM SHOWERS INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: GYM LOCKER ROOM DETAIL PLANS AND INT. ELEVATIONS

PROGRAMMING DOCUMENT

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Drawing No.: A6.21

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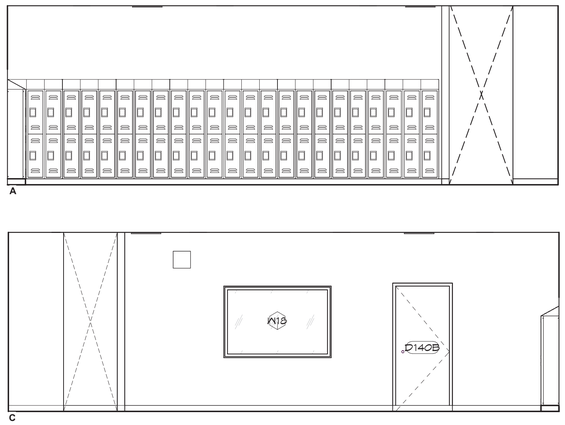
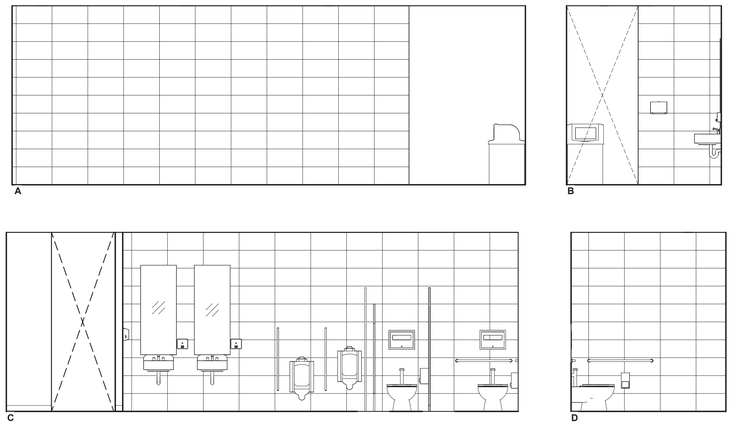


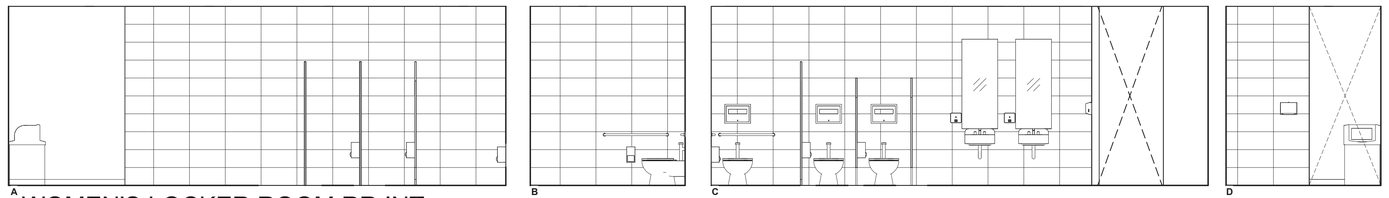
1 TYP. GYM. LOCKER ROOM IN. ELEVATIONS

SCALE: 1/4" = 1'-0"



2 MEN'S LOCKER ROOM RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



3 WOMEN'S LOCKER ROOM RR INT. ELEVATIONS

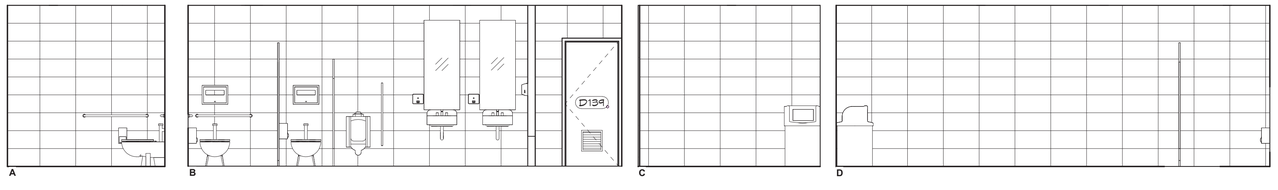
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

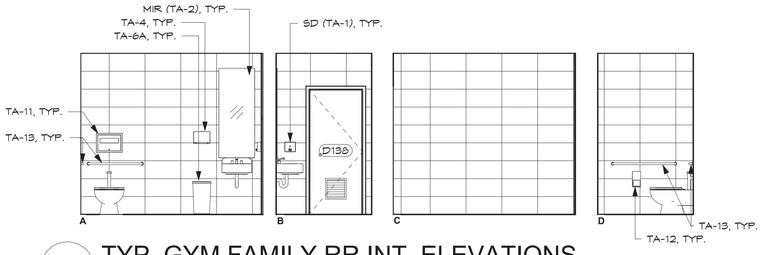
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



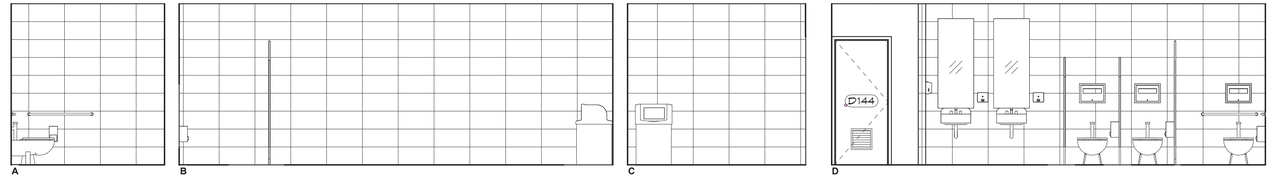
4 MENS RR B139 INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



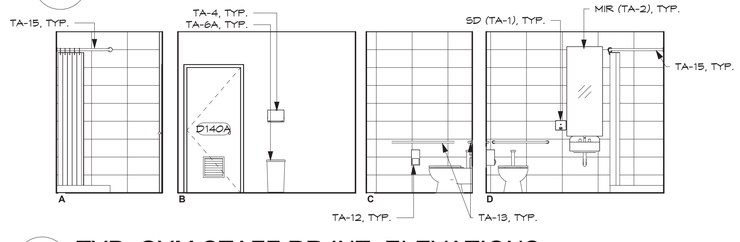
6 TYP. GYM FAMILY RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



5 WOMEN'S RR B144 INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



7 TYP. GYM STAFF RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

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REVISIONS

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TRMA

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

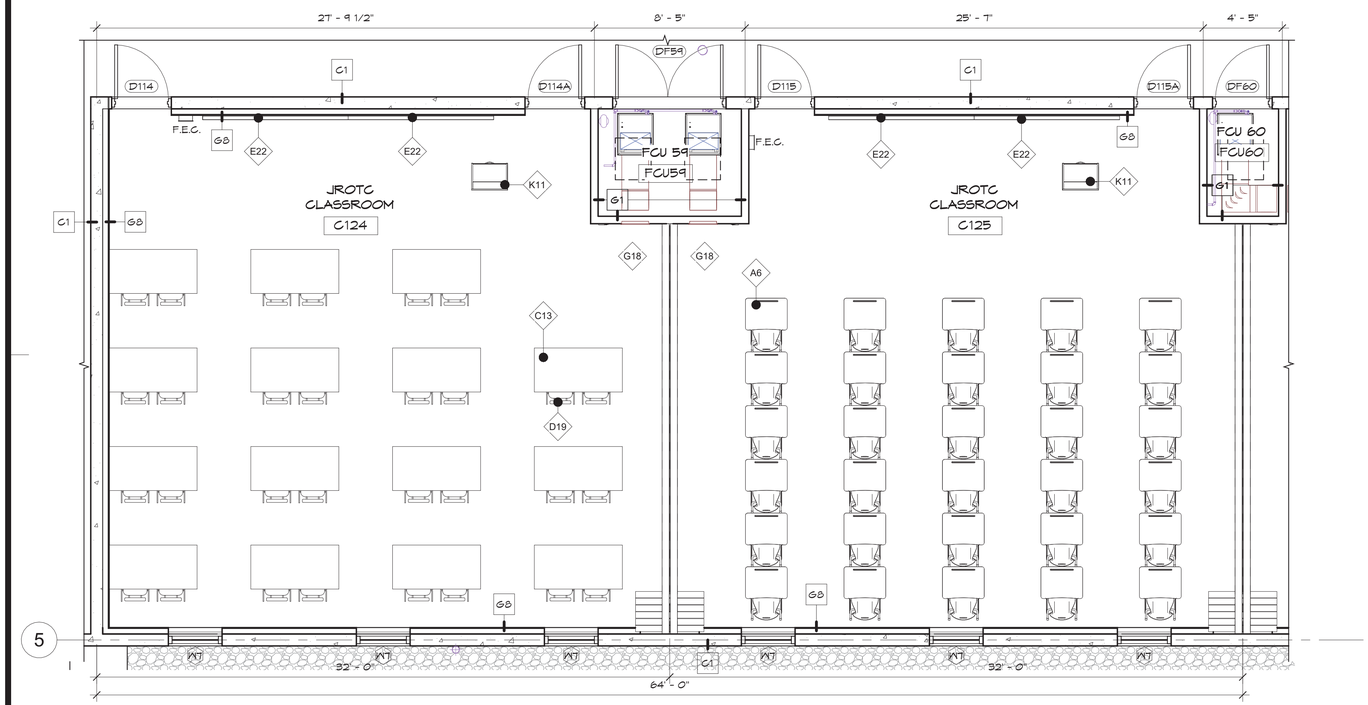
Title:
GYMNASIUM LOCKER ROOM INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.

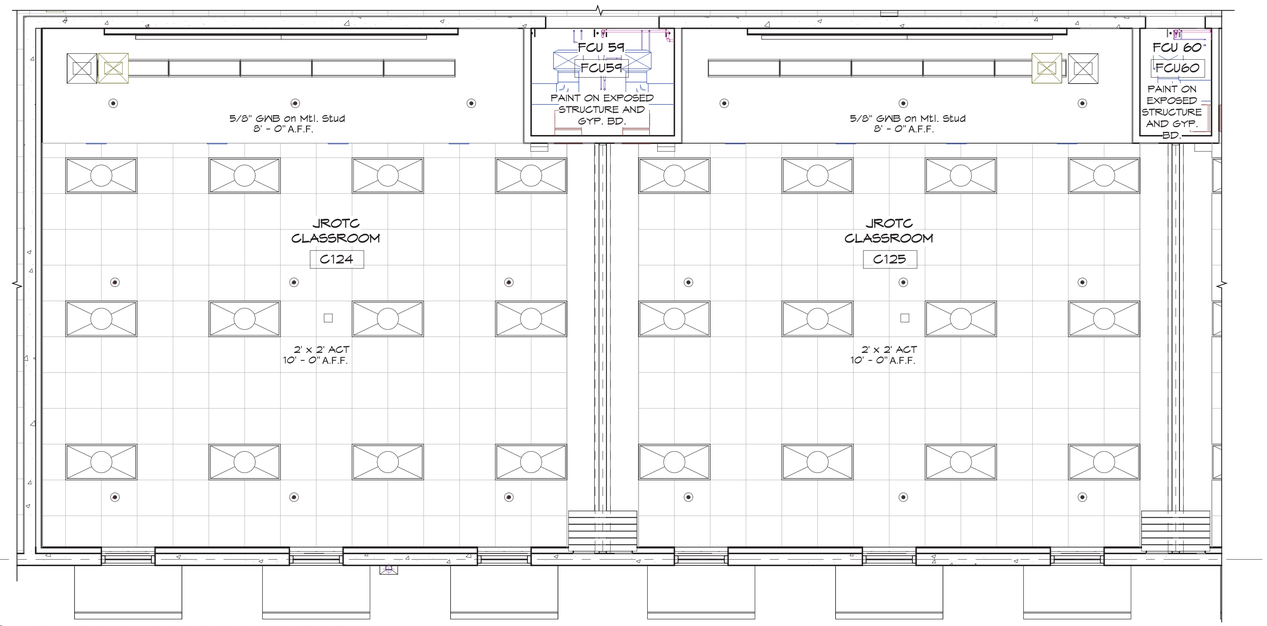
A6.22

Sheet No. _____ of _____



1 JROTC CLASSROOM PLAN

SCALE: 1/4" = 1'-0"



2 JROTC CLASSROOMS RCP

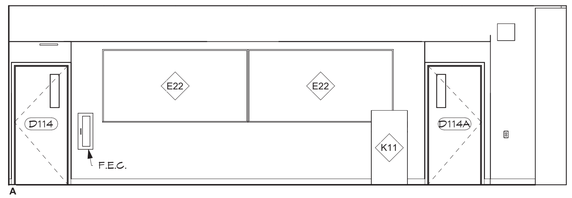
SCALE: 1/4" = 1'-0"

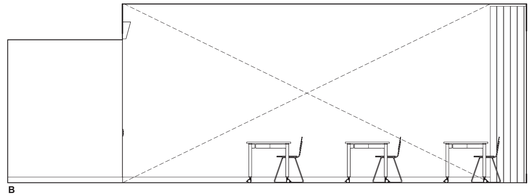
DETAIL PLAN NOTES:

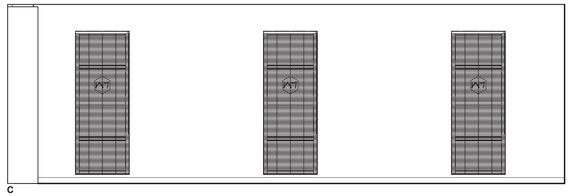
1. REFER TO A9.18 AND A9.19 FOR FF&E SCHEDULE.

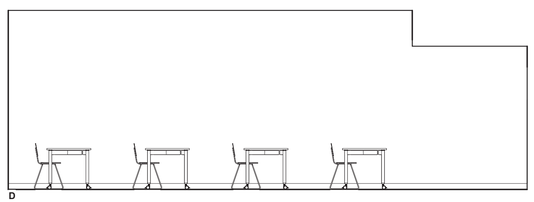
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.









3 TYP. JROTC CLASSROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
JROTC DETAIL PLANS AND INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
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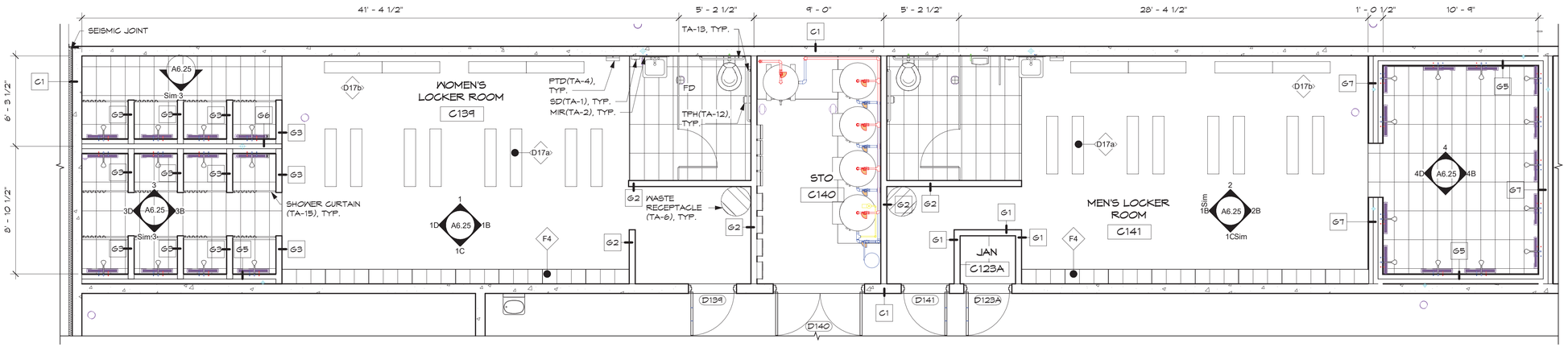
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.: No.	File

Drawing No.
A6.23

Sheet No. ____ of ____

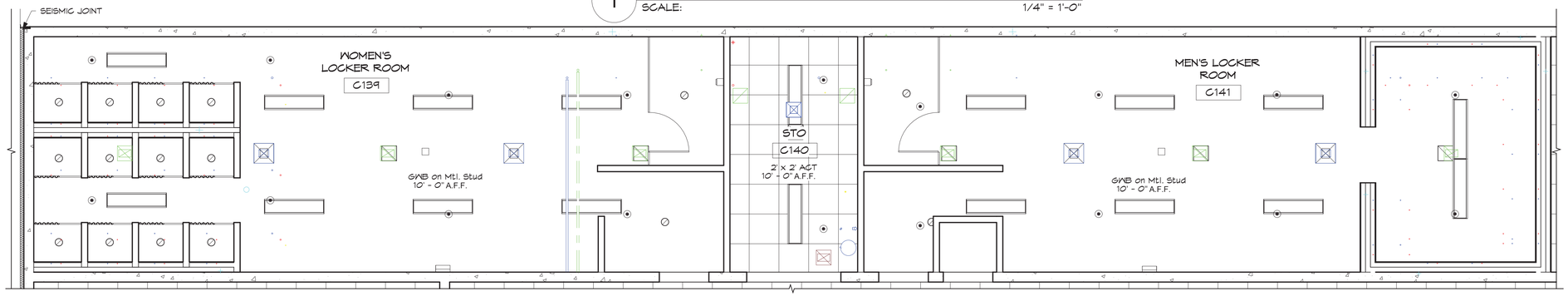
DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.



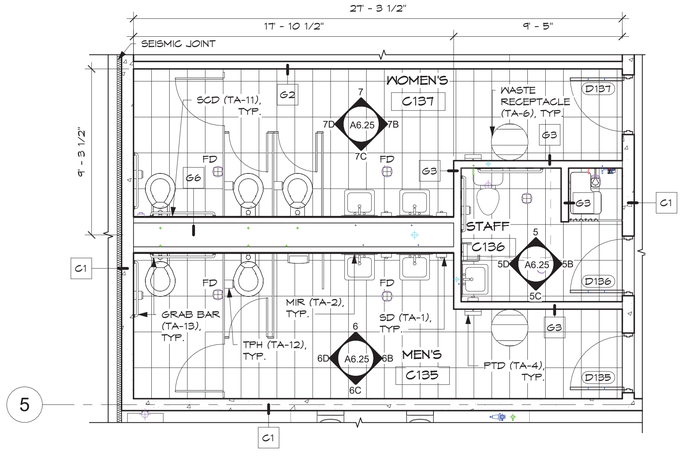
1 JROTC LOCKERROOM PLAN

SCALE: 1/4" = 1'-0"



2 JROTC LOCKER ROOMS RCP

SCALE: 1/4" = 1'-0"



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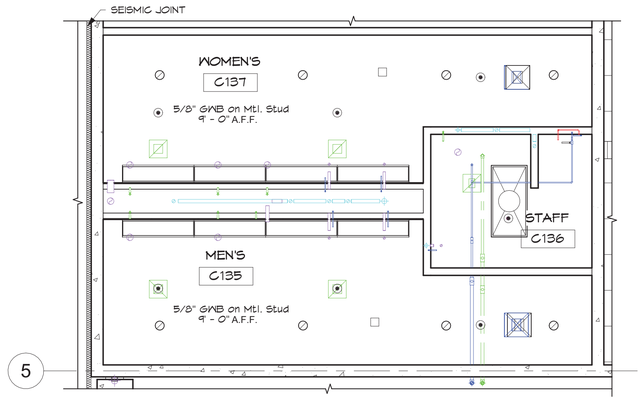
3 JROTC RESTROOM PLAN

SCALE: 1/4" = 1'-0"



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4 JROTC RESTROOMS RCP

SCALE: 1/4" = 1'-0"

A
D INT. ELEV. KEY B
C

0' 2' 4' 8'

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Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
JROTC DETAIL PLANS
PROGRAMMING DOCUMENT

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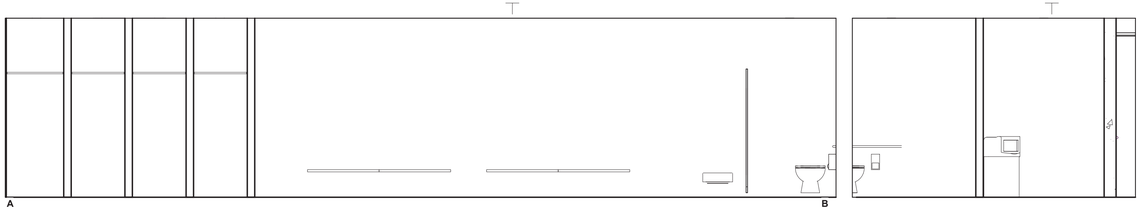
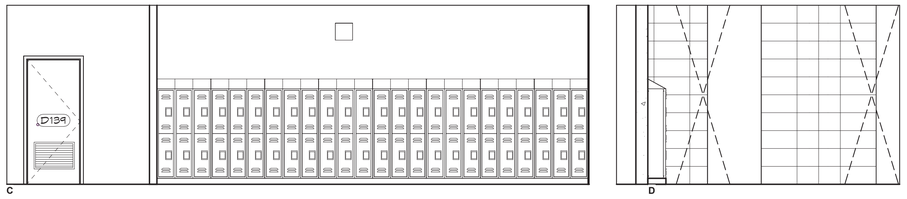
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

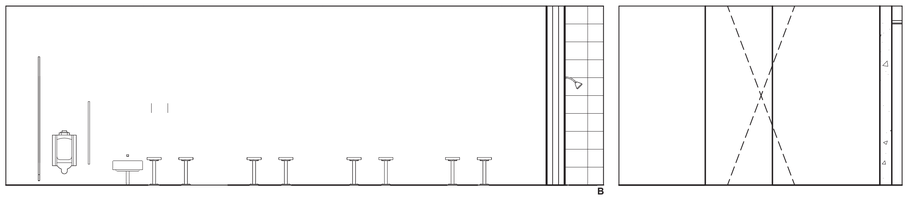
Drawing No.
A6.24
Sheet No. ____ of ____





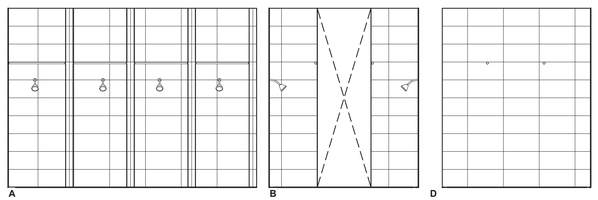
1 WOMEN'S LOCKER ROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



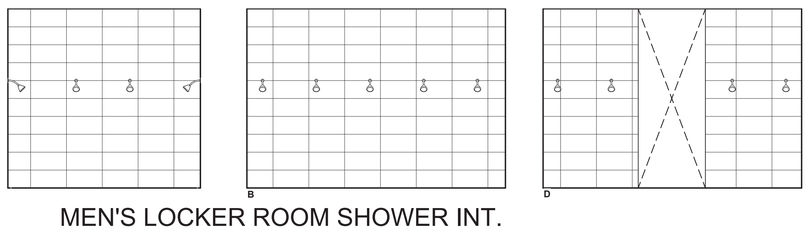
2 MEN'S LOCKER ROOM INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



3 WOMEN'S LOCKER ROOM SHOWER INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



4 MEN'S LOCKER ROOM SHOWER INT. ELEVATIONS

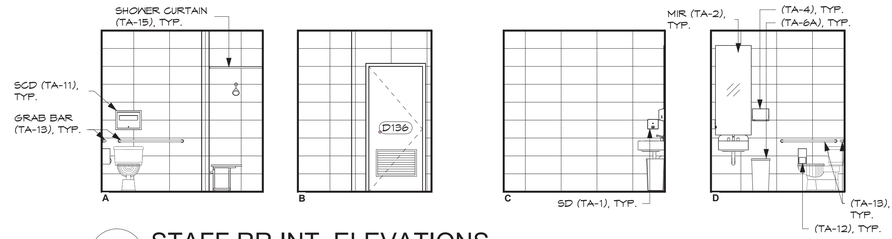
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

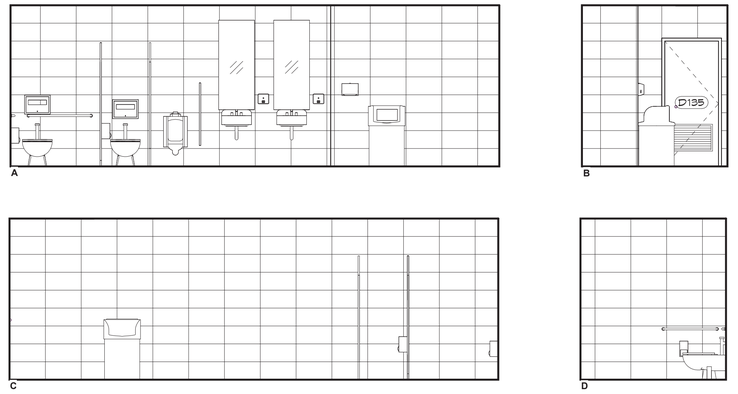
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



5 STAFF RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



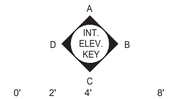
6 MEN'S RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



7 WOMEN'S RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: JROTC INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

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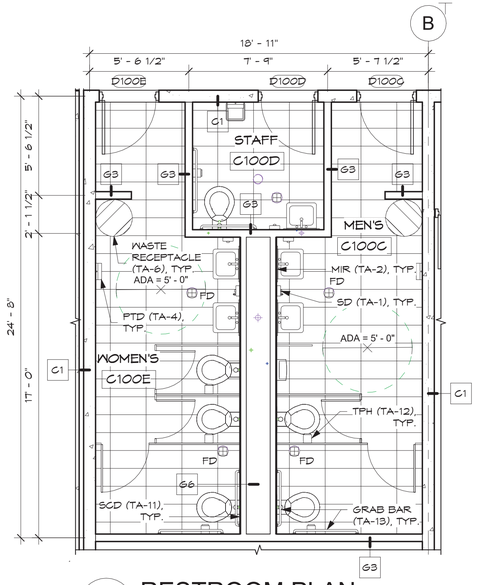
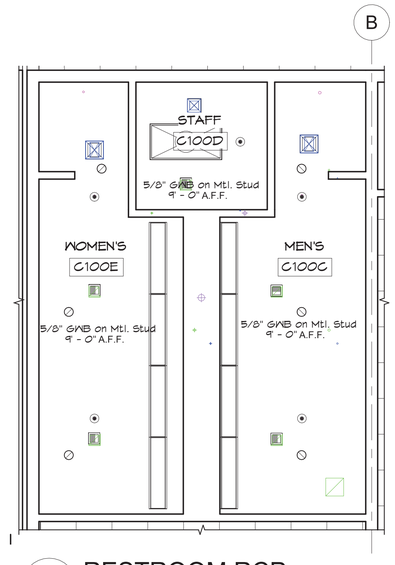
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.: A6.25

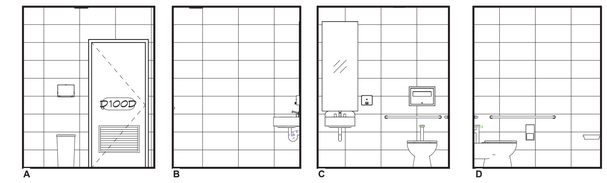
Sheet No. _____ of _____



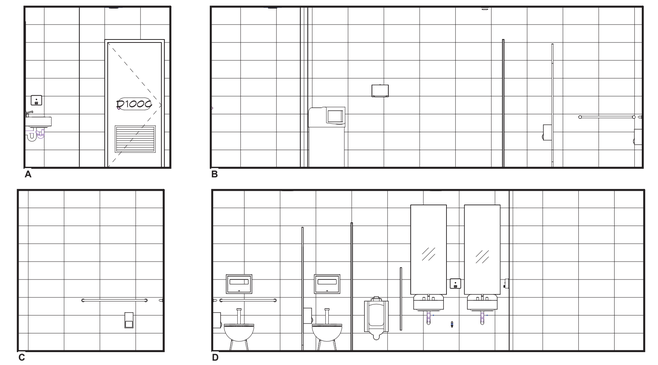
1 RESTROOM PLAN
SCALE: 1/4" = 1'-0"



2 RESTROOM RCP
SCALE: 1/4" = 1'-0"



3 GCC STAFF RR INT. ELEVATION
SCALE: 1/4" = 1'-0"



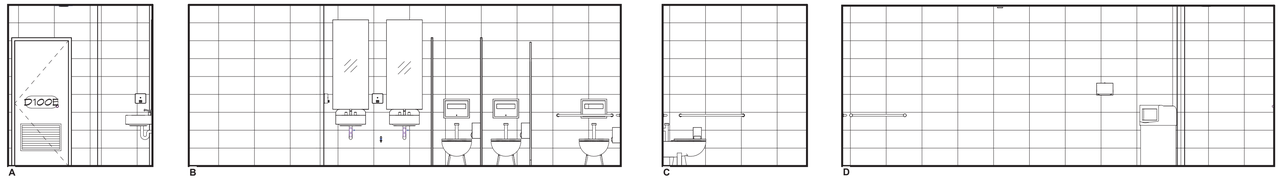
4 MEN'S RESTROOM INT. ELEVATION
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

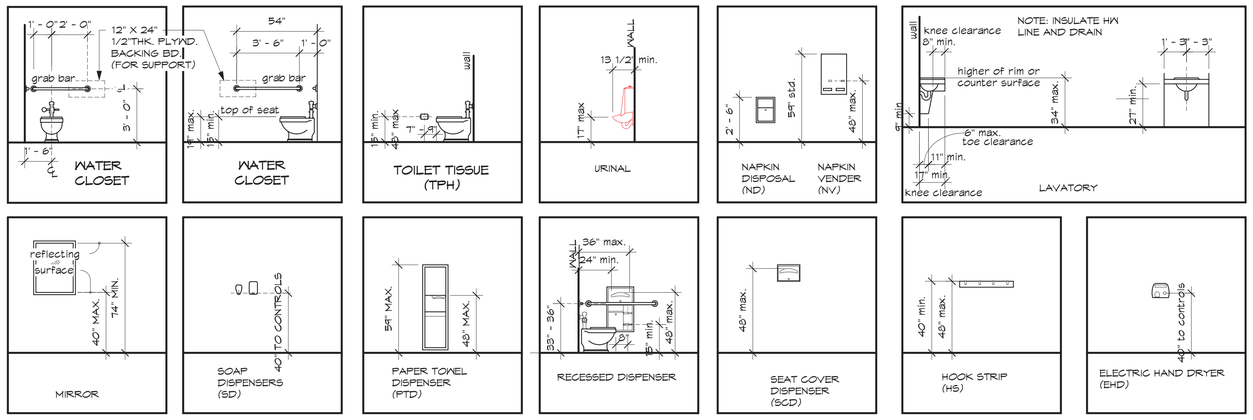
1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

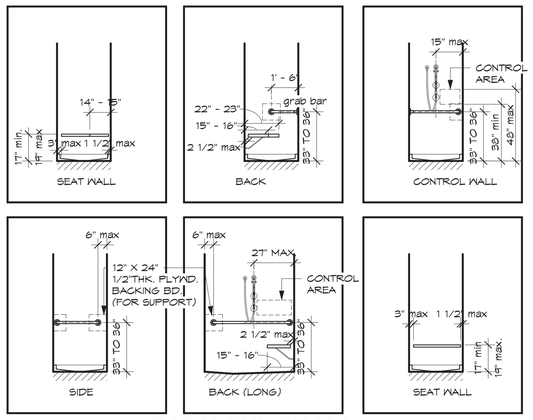


5A WOMEN'S RESTROOM INT. ELEVATION
SCALE: 1/4" = 1'-0"

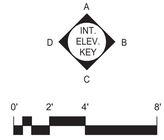


6 ADA MOUNTING HT.
SCALE: 1/4" = 1'-0"

36" X 36" STALL



30" X 60" STALL



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Architecture
Planning
Interior Design

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GCC DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

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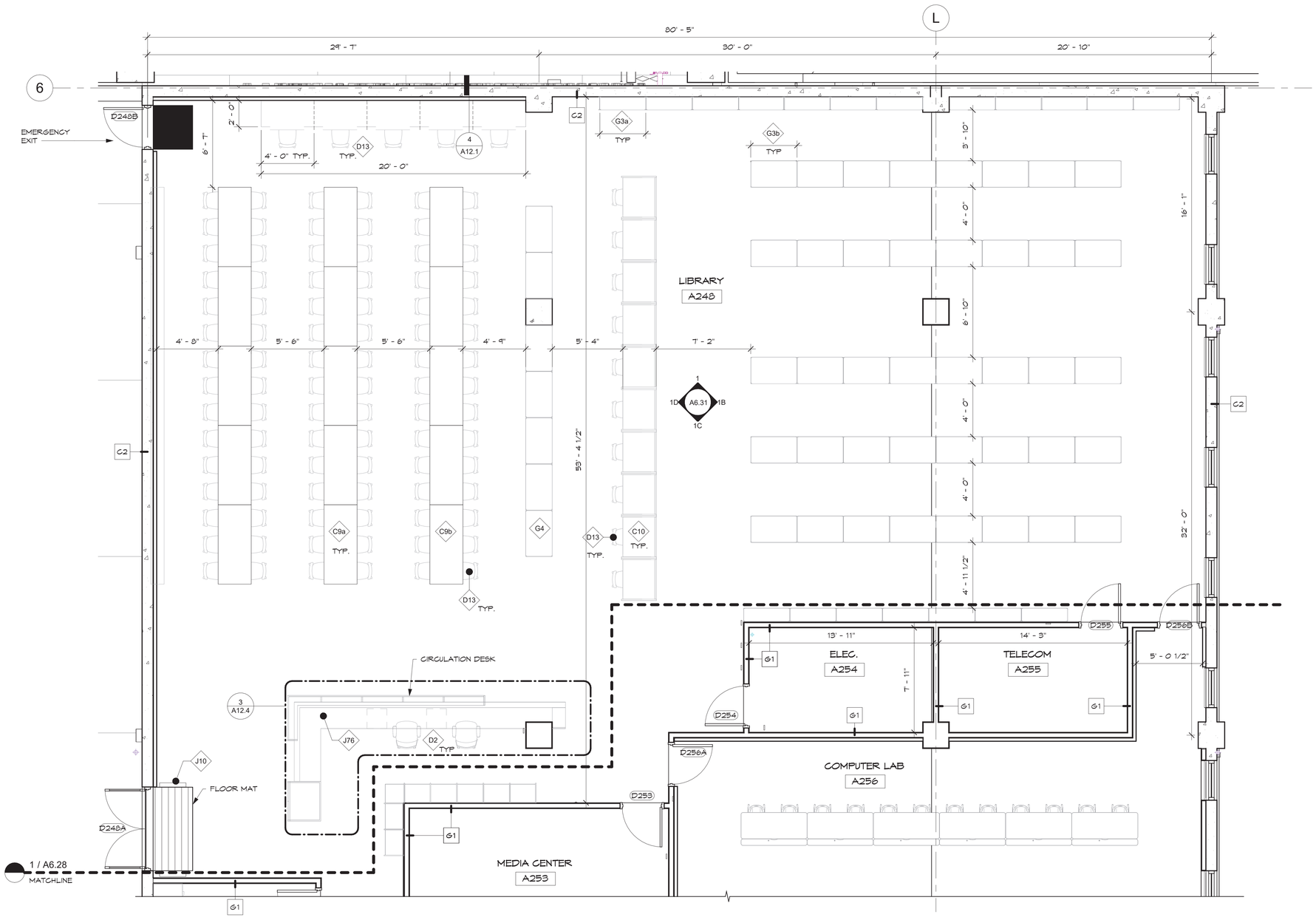
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.26
Sheet No. ____ of ____

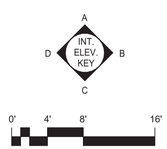
DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.



1 LIBRARY DETAIL PLAN

SCALE: 1/4" = 1'-0"



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
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Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.27

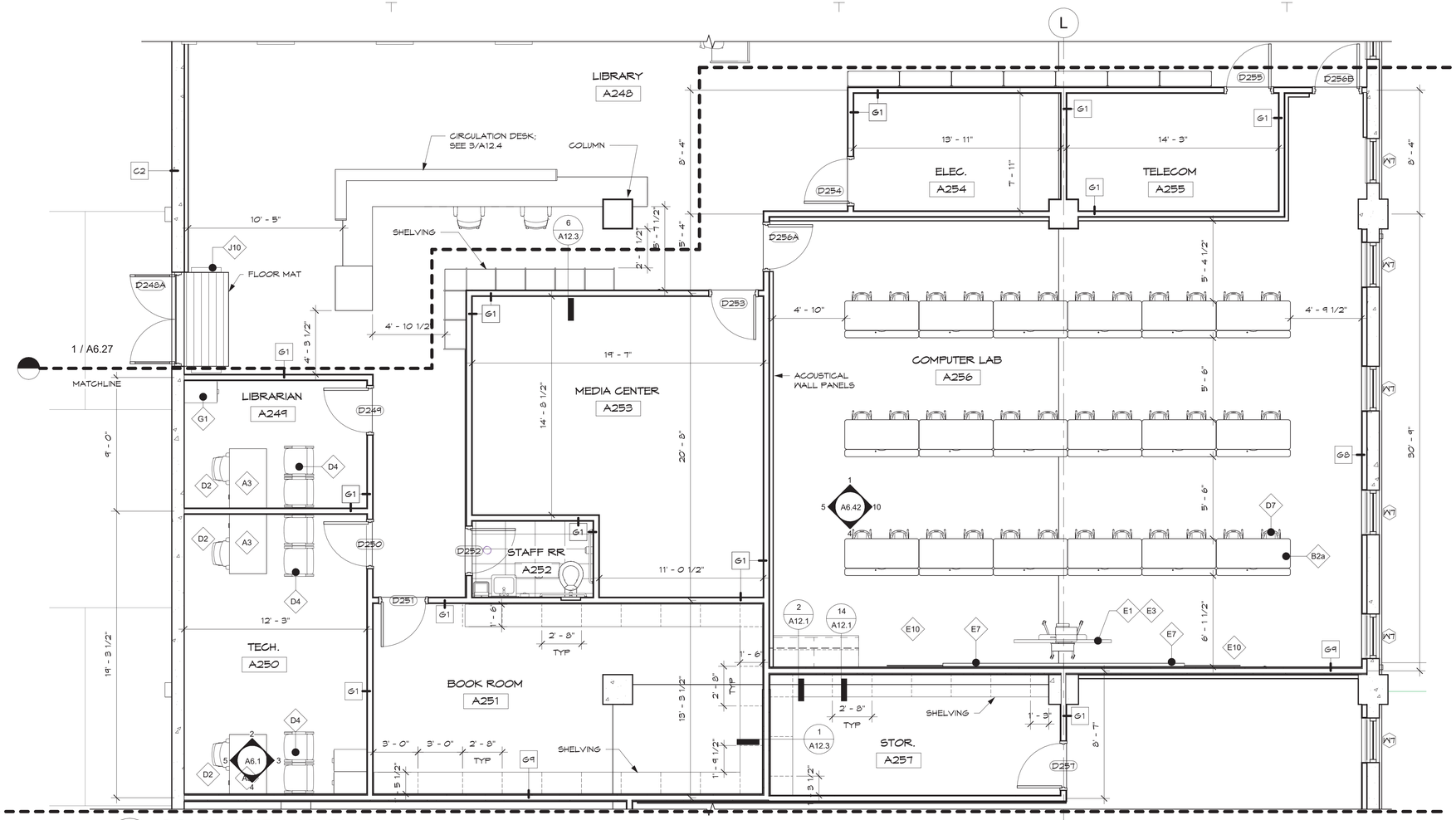
Sheet No. ____ of ____

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

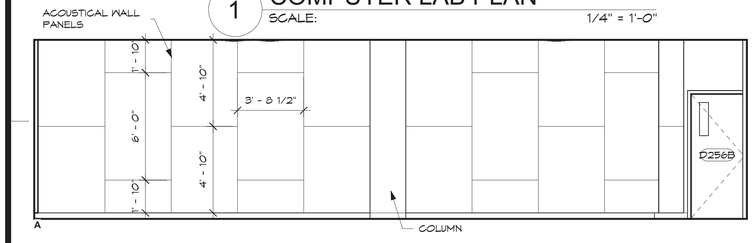
INTERIOR ELEVATION NOTES:

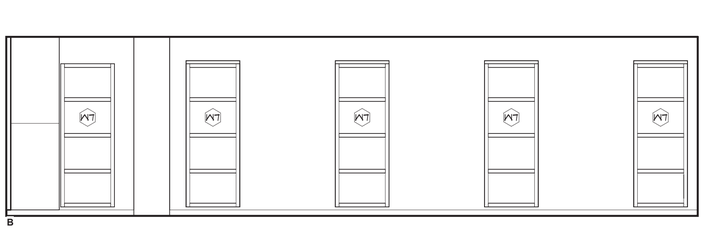
1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

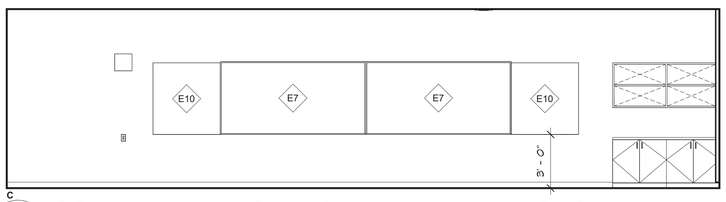


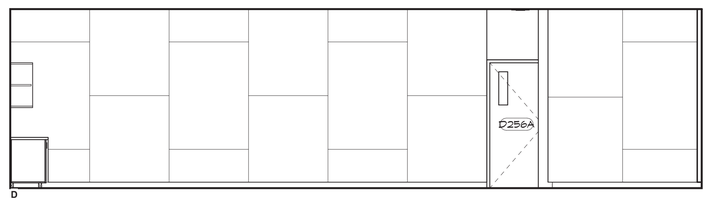
1 COMPUTER LAB PLAN

SCALE: 1/4" = 1'-0"



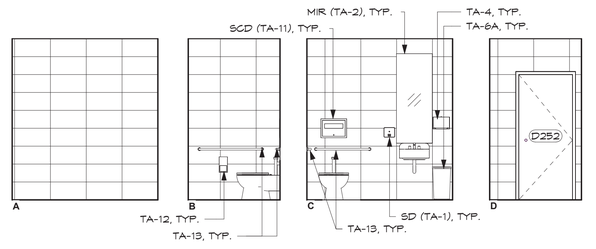






2 COMPUTER LABORATORY INT. ELEVATIONS

1/4" = 1'-0"



3 LIBRARY STAFF RESTROOM INT. ELEVATION

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

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Planning
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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS

PROGRAMMING DOCUMENT

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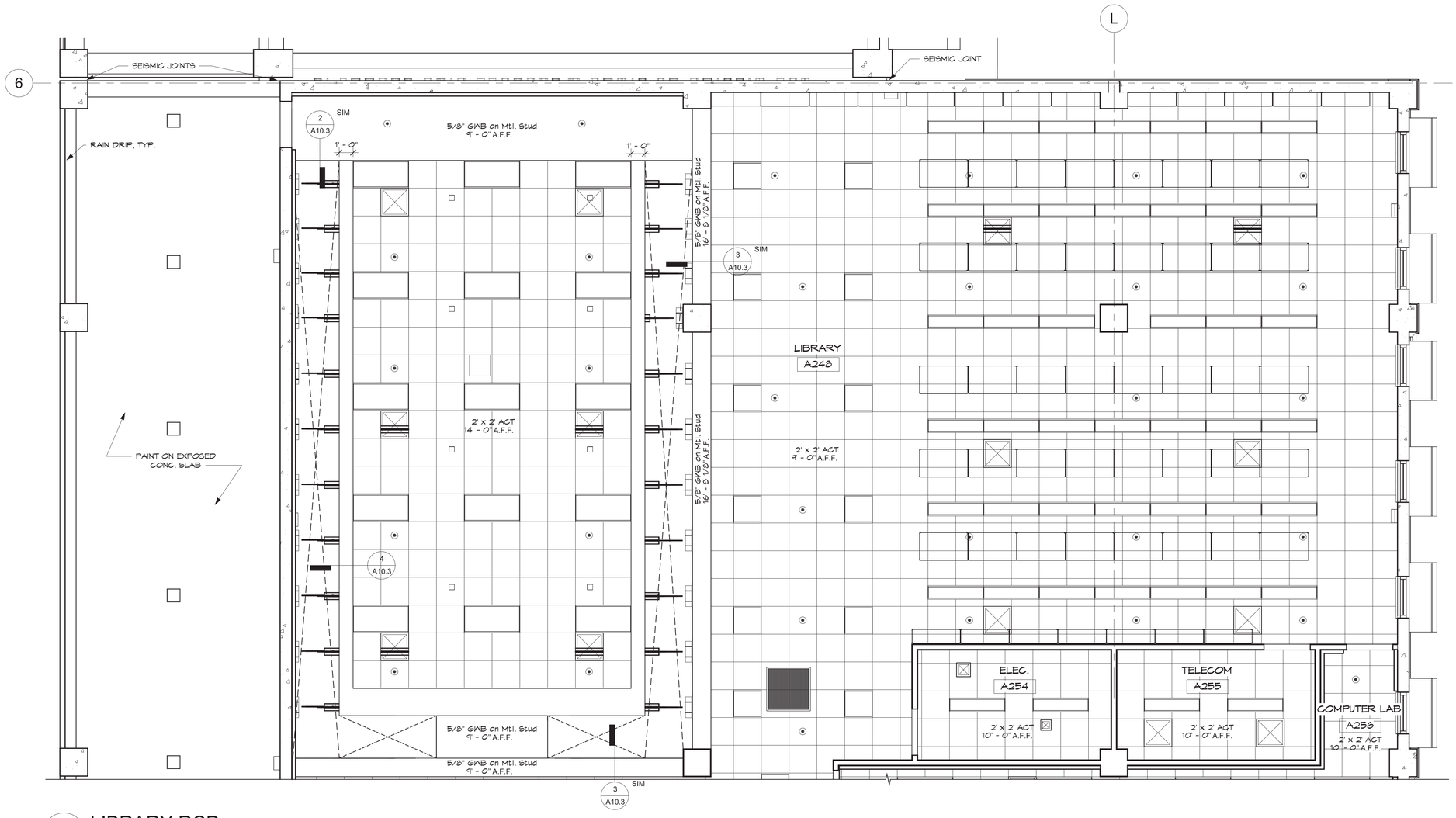
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No:	No.
File	

Drawing No. A6.28

Sheet No. _____ of _____



1 LIBRARY RCP

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

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Architecture
Planning
Interior Design

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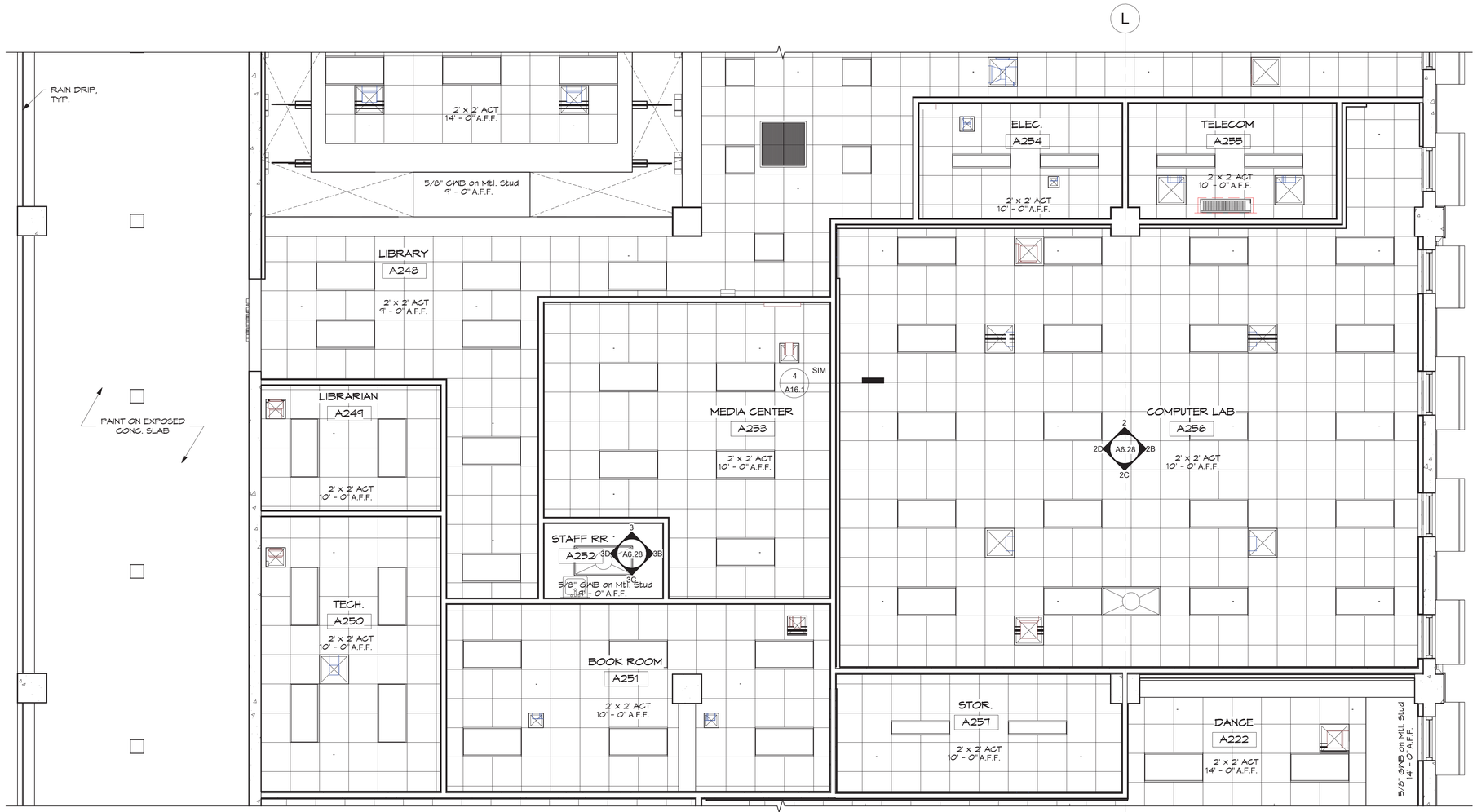
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
LIBRARY DETAIL PLANS AND INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.29

Sheet No. ____ of ____



1 COMPUTER LAB RCP

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

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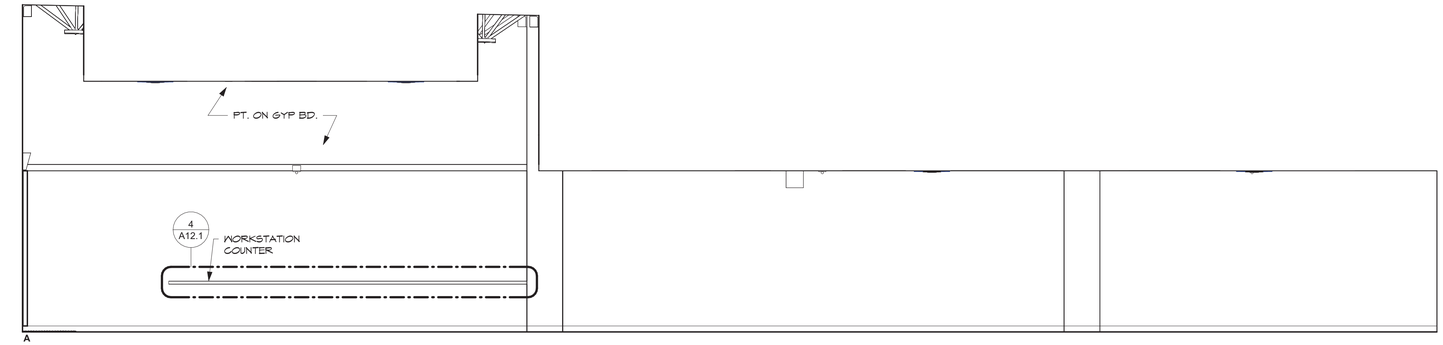
Supv:	CTC
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A6.30
Sheet No. ____ of ____



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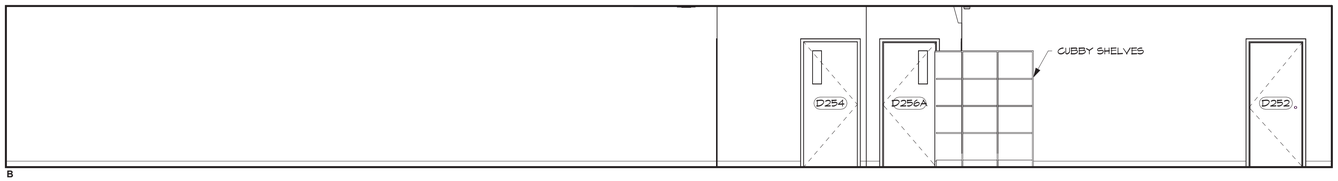

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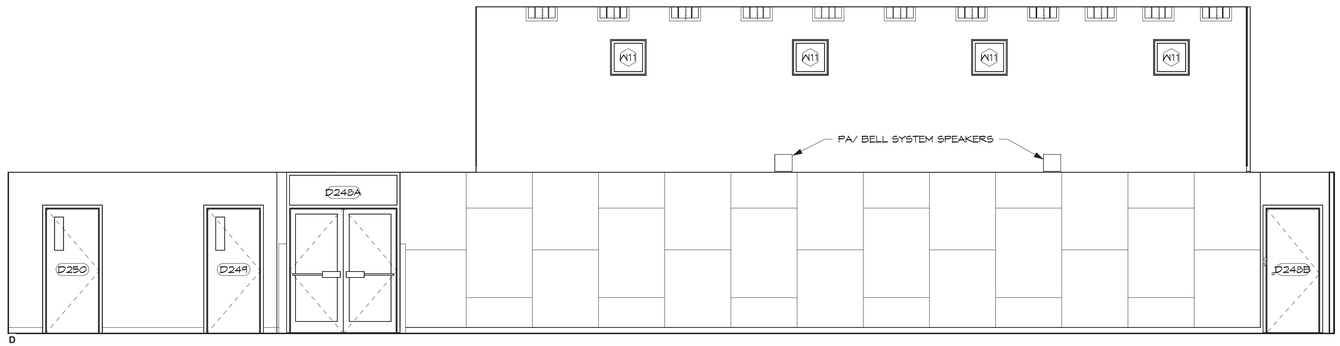


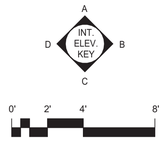
D

1 LIBRARY INT. ELEVATIONS

SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

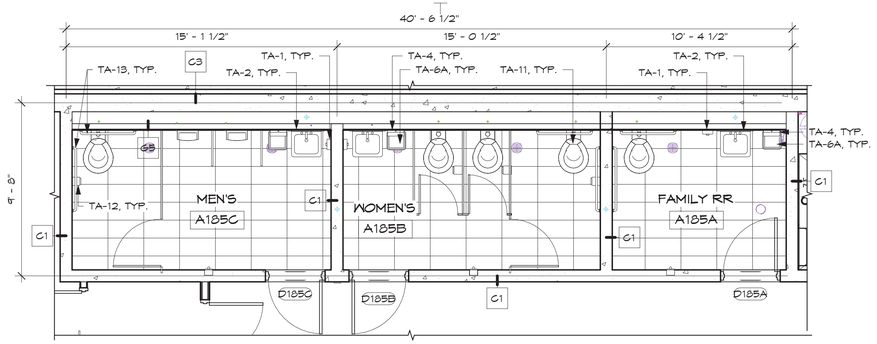
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

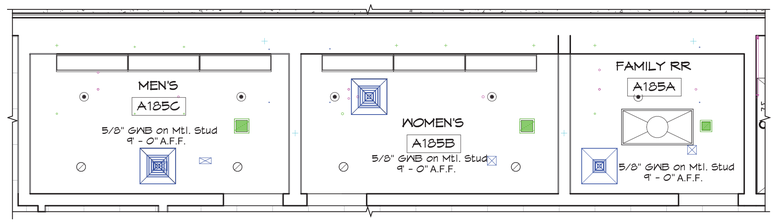
Title:
LIBRARY INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

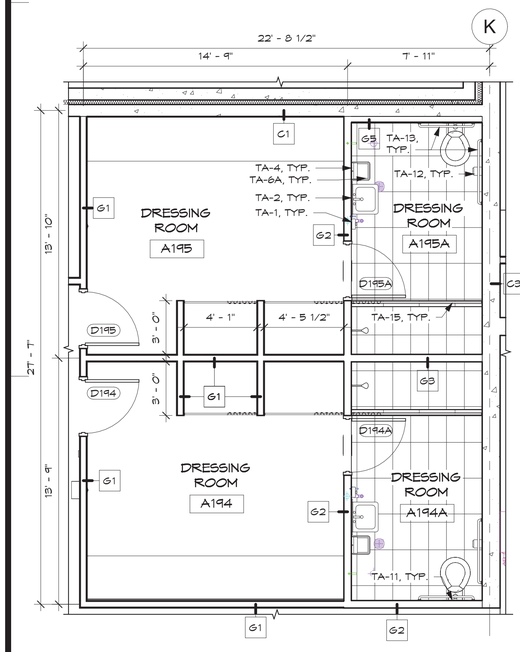
Drawing No.
A6.31
Sheet No. ____ of ____



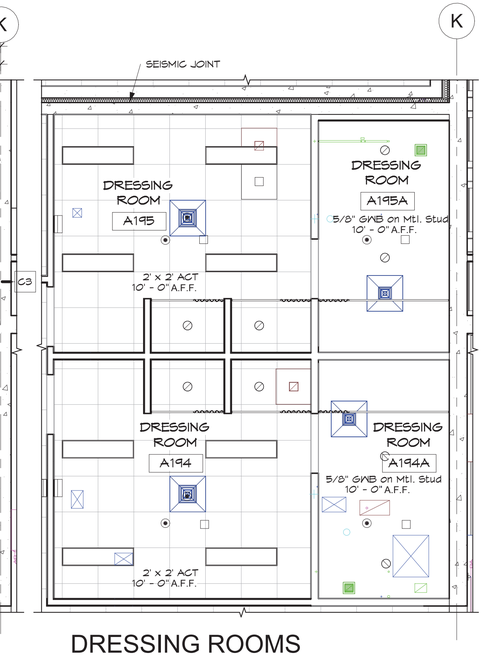
1 AUDITORIUM RESTROOM DETAIL PLAN
SCALE: 1/4" = 1'-0"



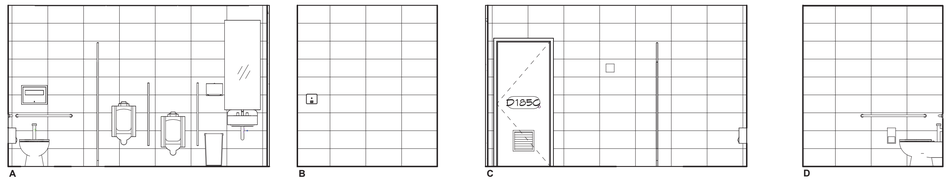
9 AUDITORIUM RESTROOM RCP
SCALE: 1/4" = 1'-0"



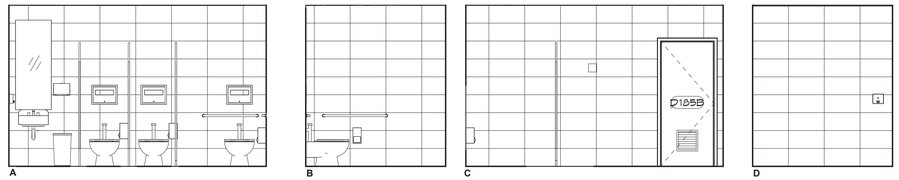
5 DRESSING ROOMS
SCALE: 1/4" = 1'-0"



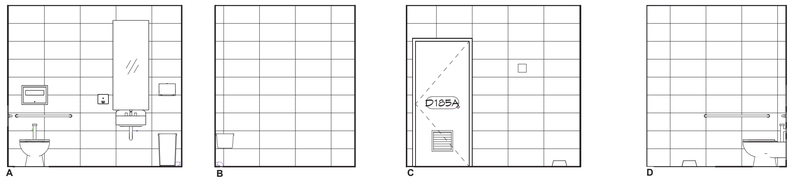
8 DRESSING ROOMS RCP
SCALE: 1/4" = 1'-0"



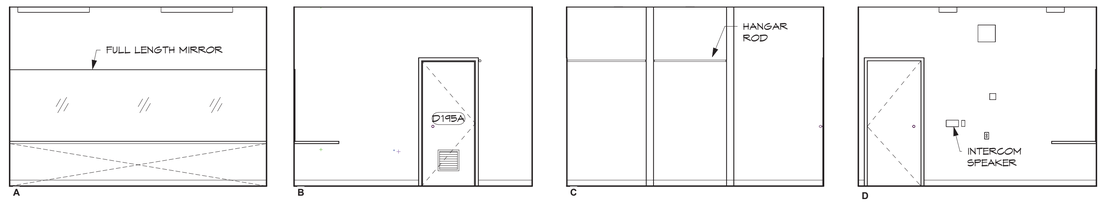
2 AUDITORIUM M. RR INT. ELEVATIONS
SCALE: 1/4" = 1'-0"



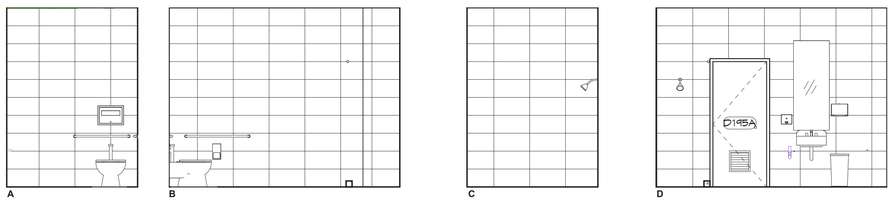
3 AUDITORIUM W. RR INT. ELEVATIONS
SCALE: 1/4" = 1'-0"



4 AUDITORIUM FAMILY RR INT. ELEVATIONS
SCALE: 1/4" = 1'-0"



6 TYP. DRESSING ROOM INT. ELEVATIONS
SCALE: 1/4" = 1'-0"



7 TYP. DRESSING ROOM RESTROOM INT. ELEVATIONS
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:
1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:
1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

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Architecture
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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM RESTROOM DETAIL PLAN
PROGRAMMING DOCUMENT

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Supv:	CTC
Scale:	As indicated
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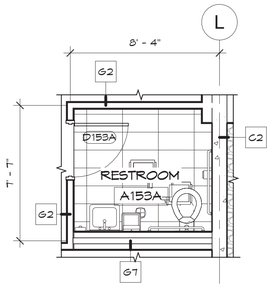
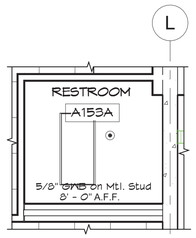
Project No:	No.
File	

Drawing No. A6.32
Sheet No. ____ of ____



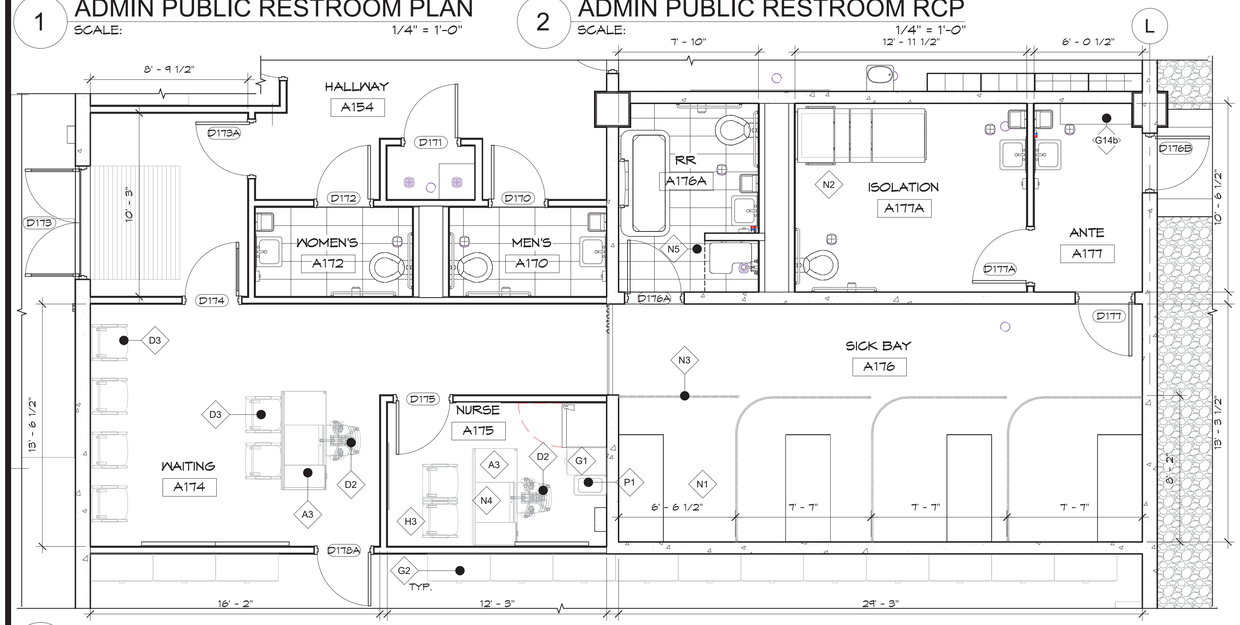


1 ADMIN PUBLIC RESTROOM PLAN

SCALE: 1/4" = 1'-0"

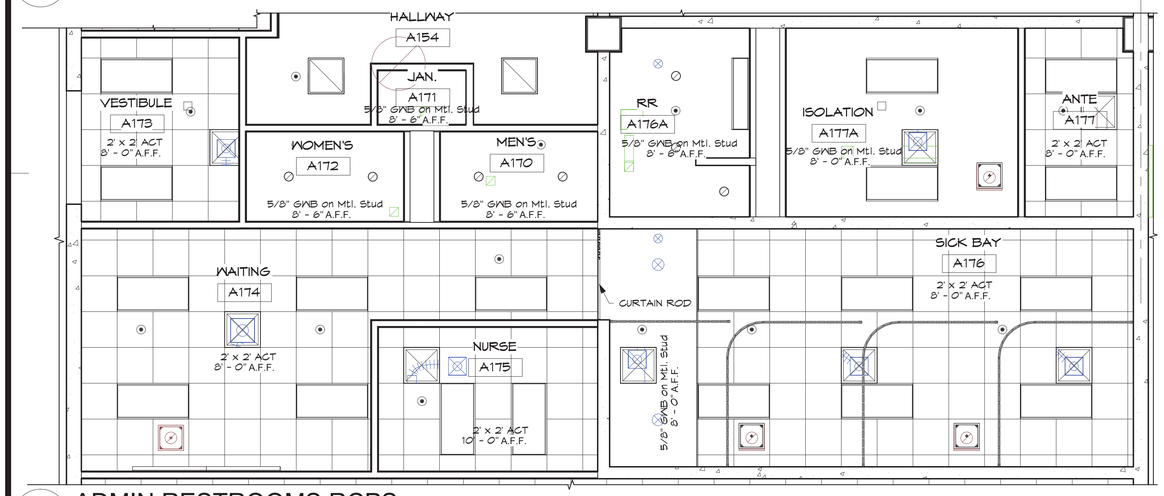
2 ADMIN PUBLIC RESTROOM RCP

SCALE: 1/4" = 1'-0"



4A ADMIN RESTROOM PLANS

SCALE: 1/4" = 1'-0"



5 ADMIN RESTROOMS RCPS

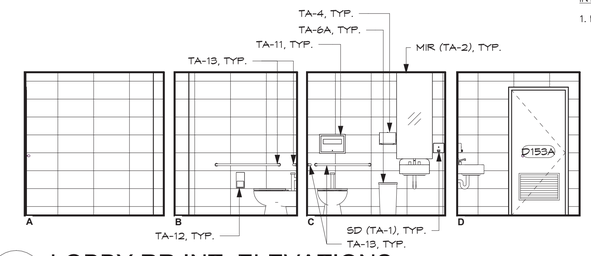
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

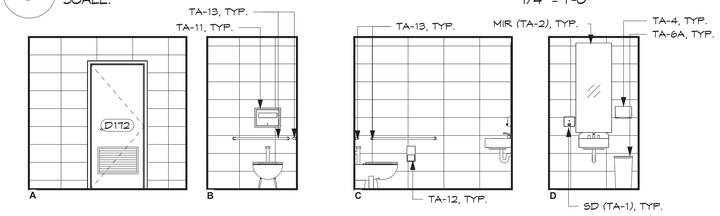
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



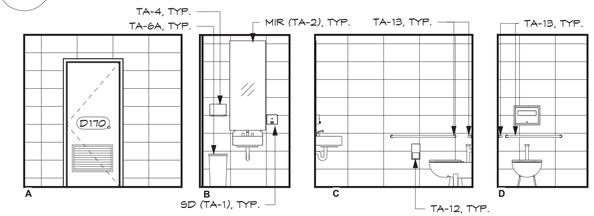
3 LOBBY RR INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



6 WOMEN'S RR A172 INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



7 MEN'S RR A170 INT. ELEVATIONS

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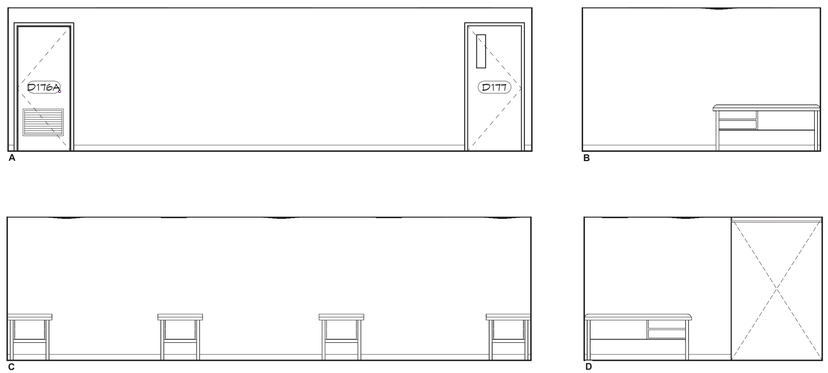
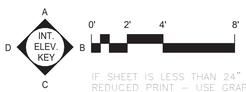


8 SICK BAY INT. ELEVATIONS

SCALE: 1/4" = 1'-0"



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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

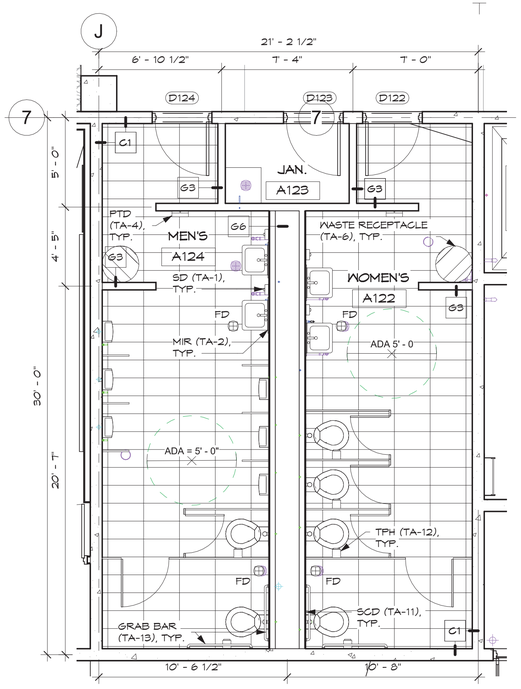
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ADMIN RESTROOM DETAIL PLANS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A6.33

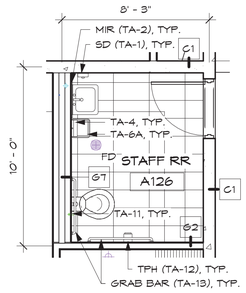
Sheet No. _____ of _____



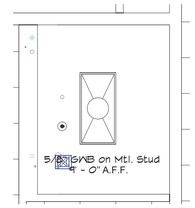
1 A-WING (EAST) RESTROOMS
SCALE: 1/4" = 1'-0"



2 A-WING (EAST) RESTROOM RCP
SCALE: 1/4" = 1'-0"



3 A-WING (EAST) STAFF RESTROOM
SCALE: 1/4" = 1'-0"



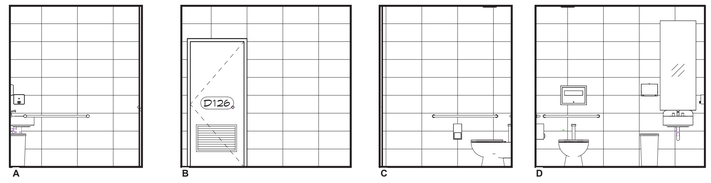
4 A-WING (EAST) STAFF RESTROOM RCP
SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

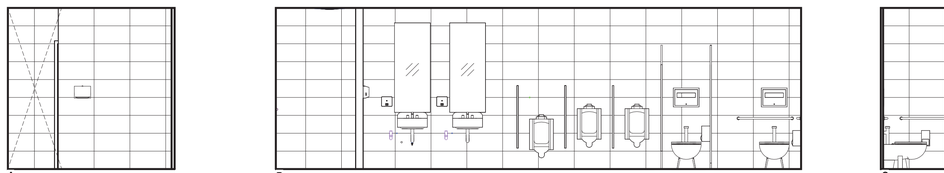
1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

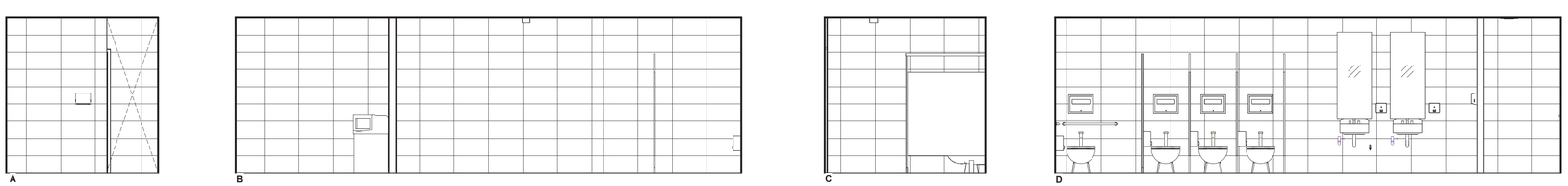
1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



5 TYP. STAFF RESTROOM INT. ELEVATION
SCALE: 1/4" = 1'-0"



6 TYP. MEN'S RESTROOM INT. ELEVATION
SCALE: 1/4" = 1'-0"



7 TYP. WOMEN'S RESTROOM INT. ELEVATIONS
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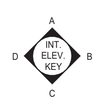



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Architecture
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Interior Design

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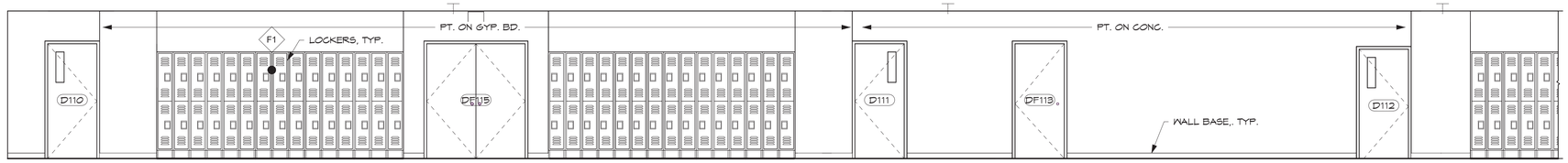
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING RESTROOM DETAIL PLANS AND INT. ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No.
A6.34

Sheet No. ____ of ____



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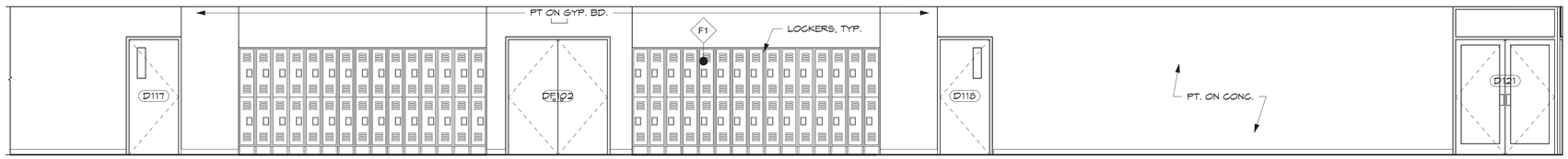
A



A



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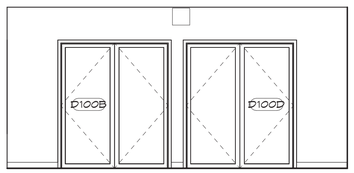

B



C

A-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 1

1

SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

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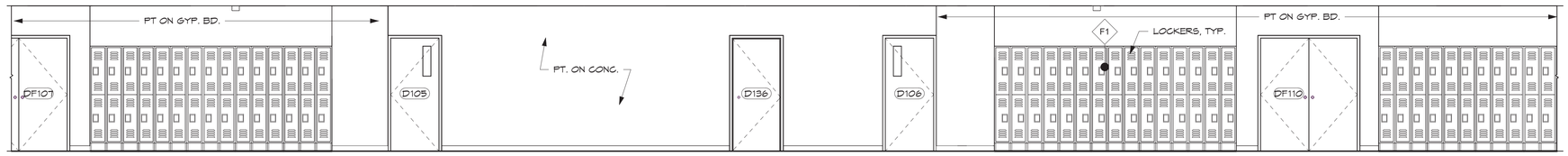
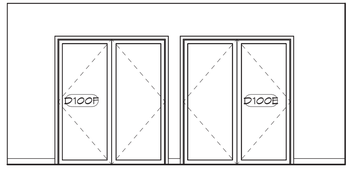
A6.35

Sheet No. _____ of _____



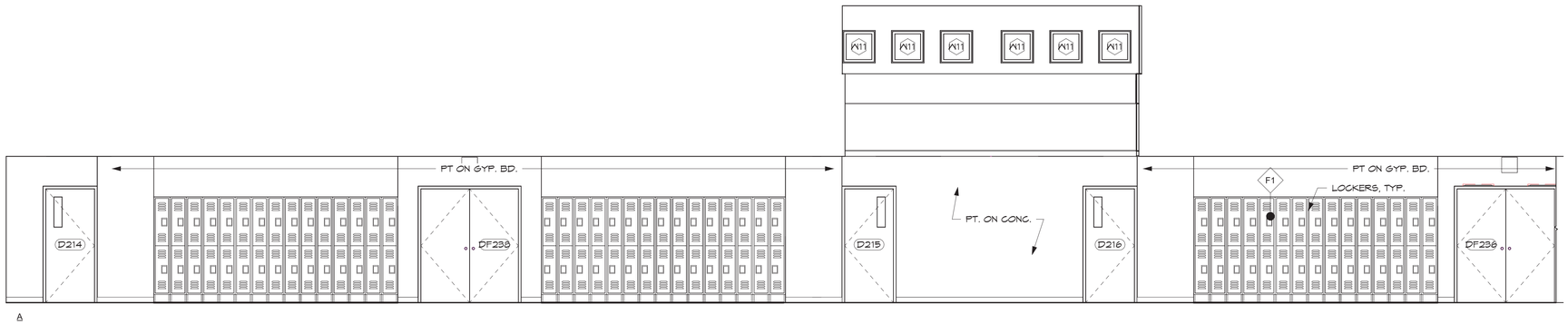






A-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 1

1 SCALE: 1/4" = 1'-0"



A-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 2

5 SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

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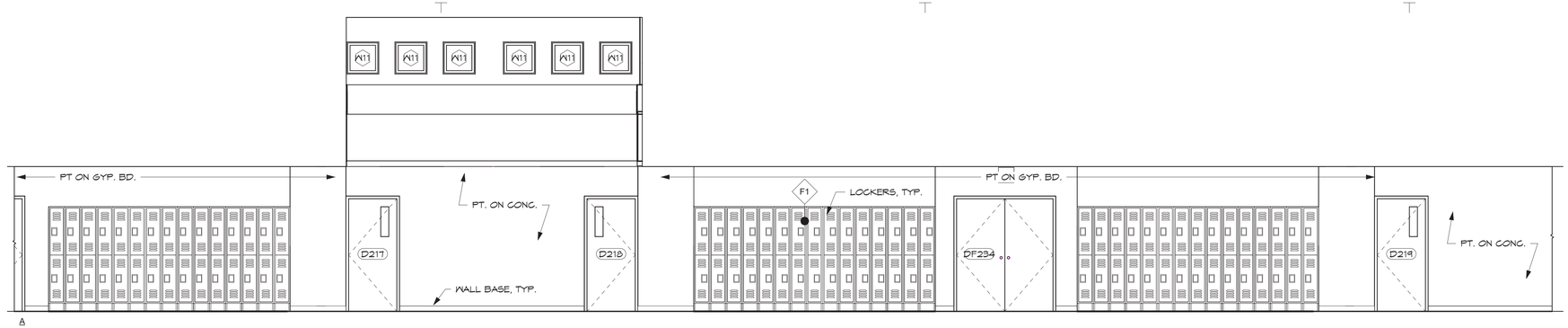
File	

Drawing No.
A6.36
Sheet No. _____ of _____



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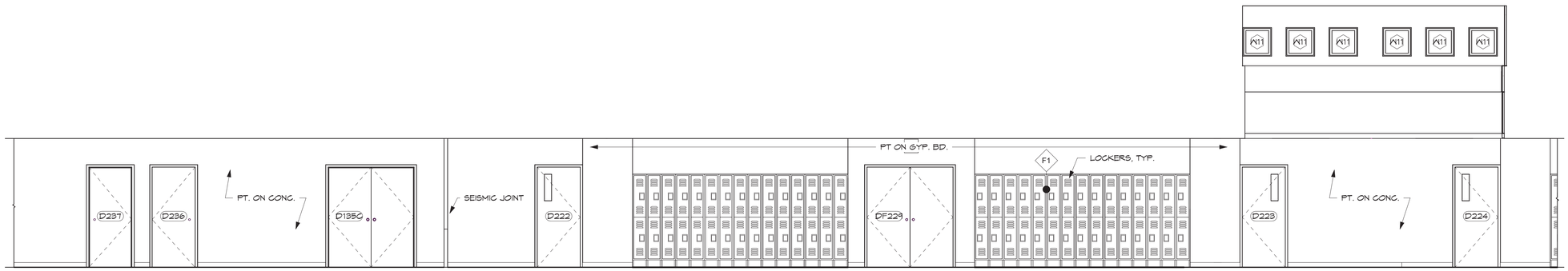

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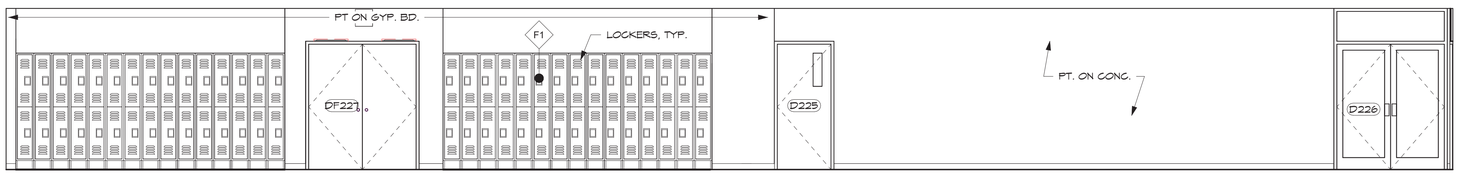

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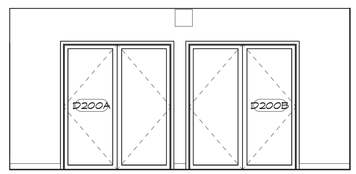

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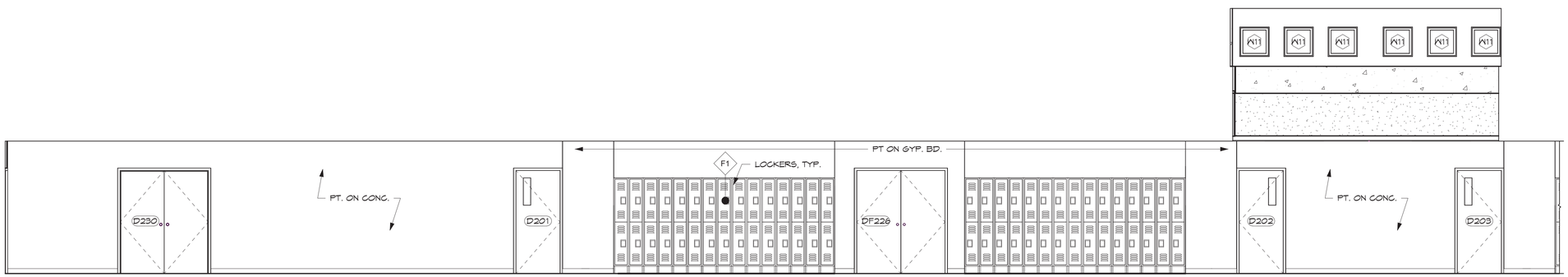

C

A-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 2

1

SCALE: 1/4" = 1'-0"

0' 2' 4' 8'

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

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Title:
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Drawing No.
A6.37

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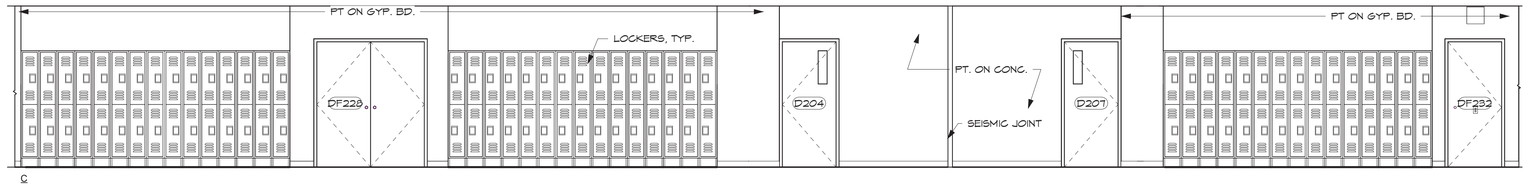

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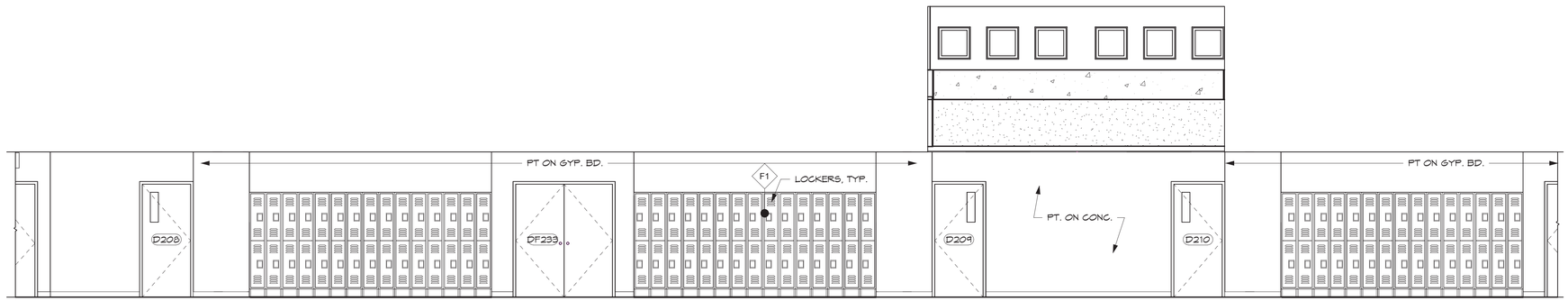

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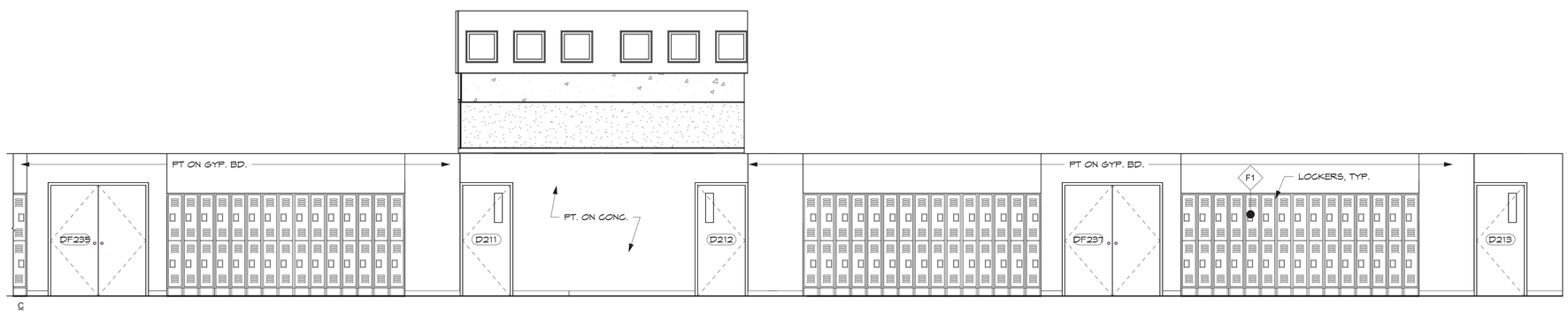

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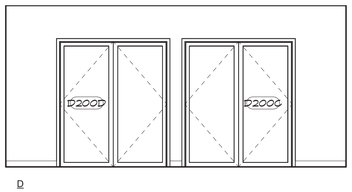

D

A-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 2

2

SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

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REVISIONS

No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

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A6.38

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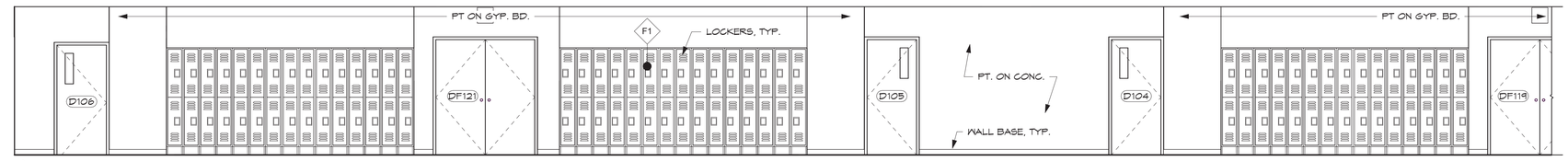

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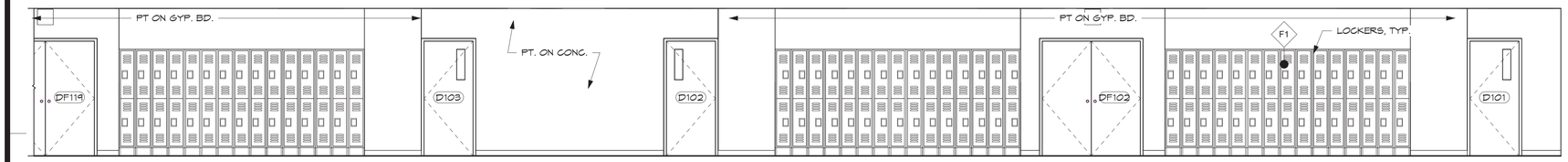

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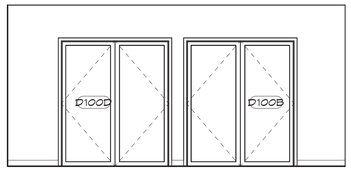

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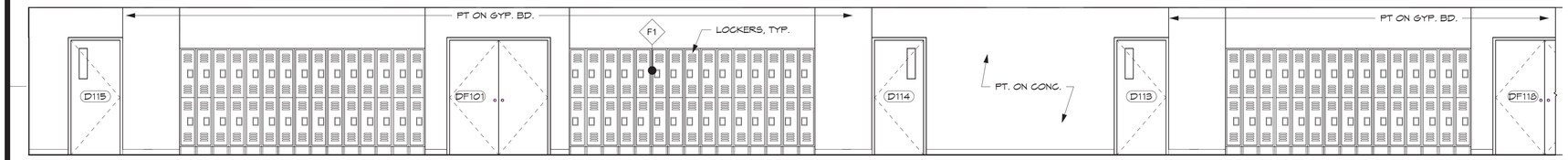

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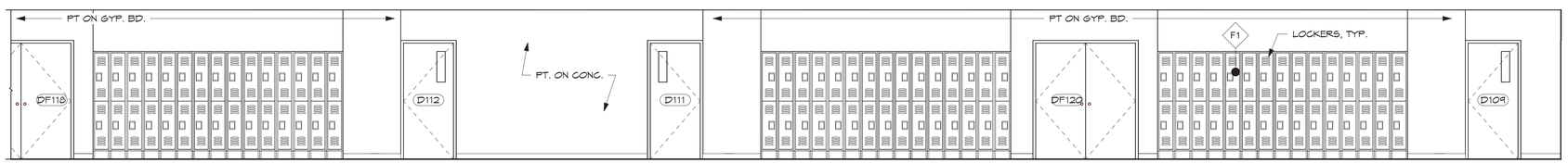

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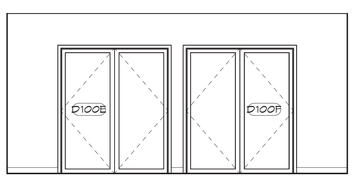

D

B-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 1

1

SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

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Title:
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Drawing No.
A6.39
Sheet No. of

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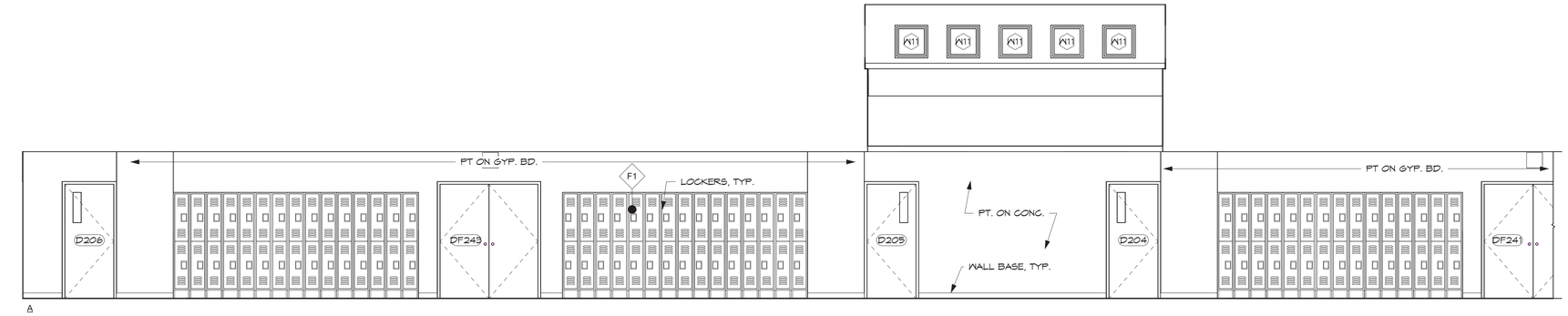

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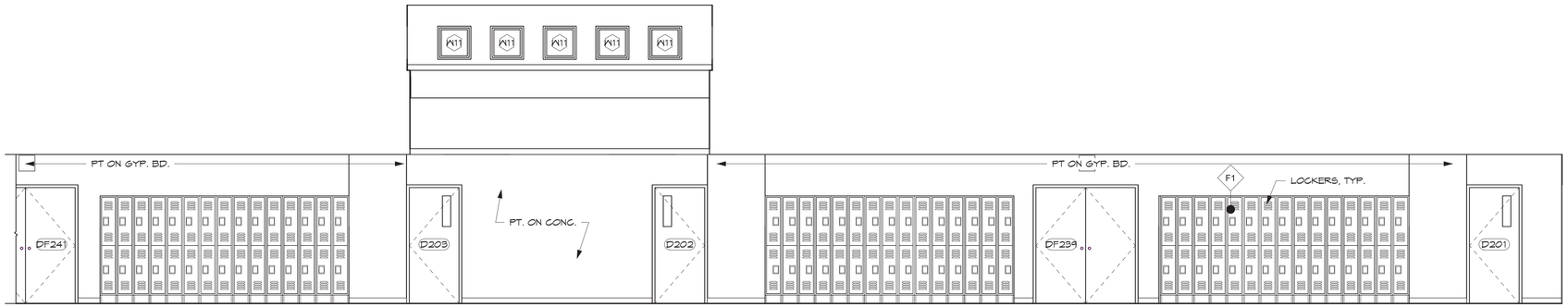

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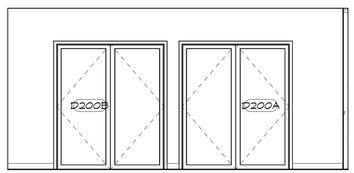

B

B-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 2

1

SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Planning
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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING INTERIOR ELEVATIONS
PROGRAMMING DOCUMENT

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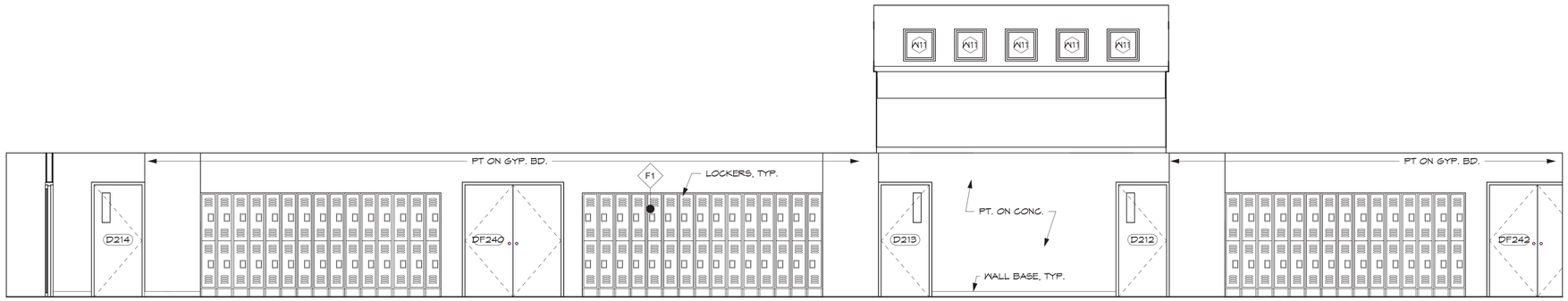
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.40

Sheet No. ____ of ____



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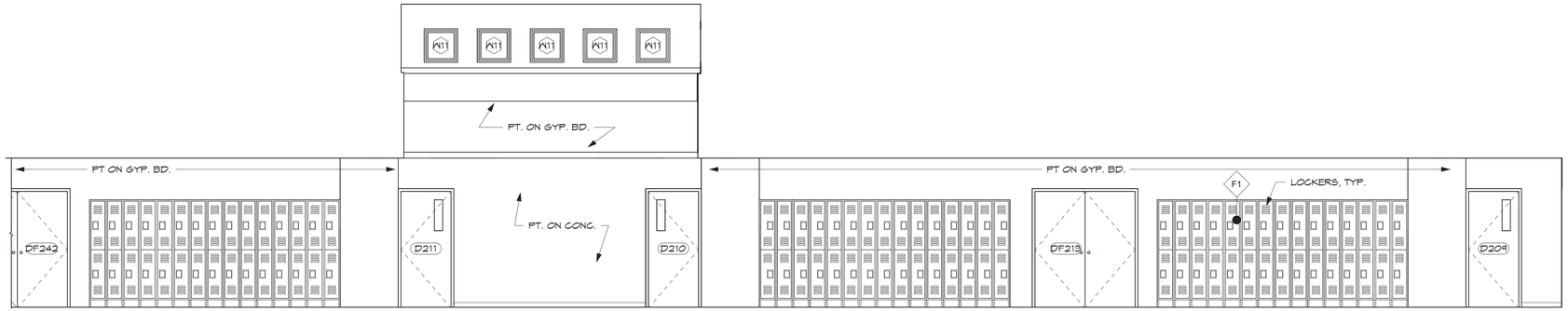

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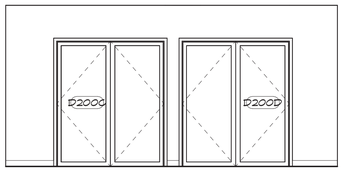

D

1 B-WING HALLWAY INTERIOR ELEVATIONS - LEVEL 2

SCALE: 1/4" = 1'-0"

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Scale:	As indicated
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Project No.	No.
File	

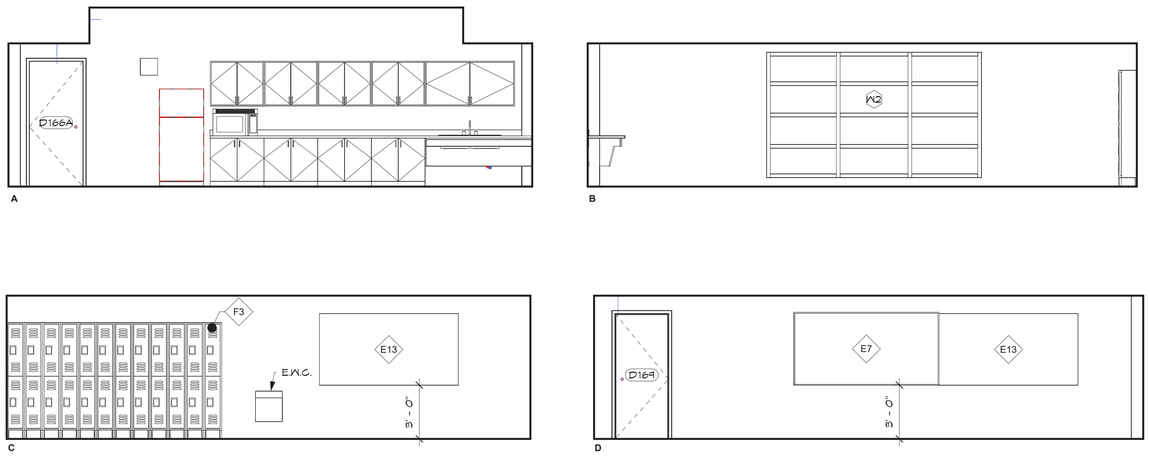
Drawing No.
A6.41

Sheet No. _____ of _____



1 WORKROOM AND RESOURCE CENTER ELEVATIONS

SCALE: 1/4" = 1'-0"



2 FACULTY & STAFF LOUNGE ELEVATIONS

SCALE: 1/4" = 1'-0"

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.

0' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Title:
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PROGRAMMING DOCUMENT

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Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.42

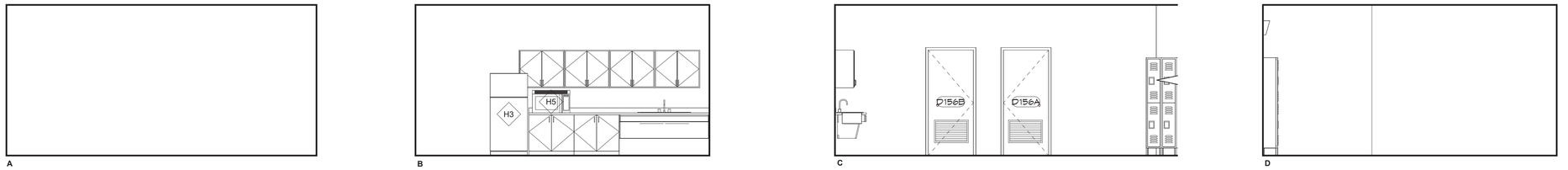
Sheet No. ____ of ____

DETAIL PLAN NOTES:

1. REFER TO A8.18 AND A8.19 FOR FF&E SCHEDULE.

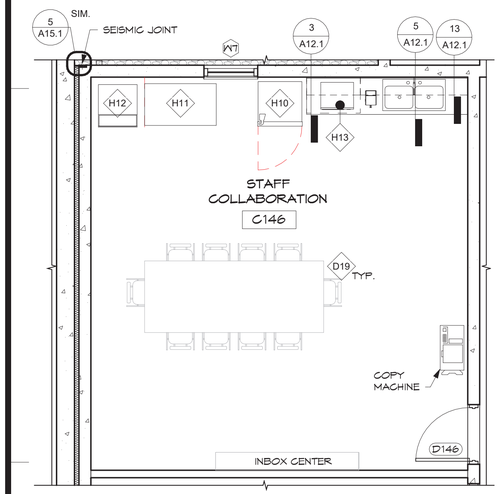
INTERIOR ELEVATION NOTES:

1. REFER TO A5-32 FOR TYPICAL WALL PATTERNS.



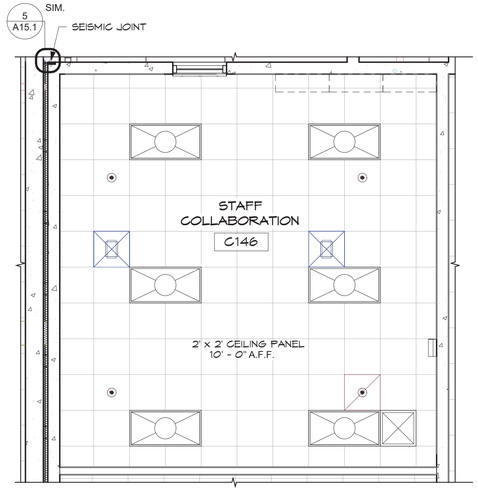
1 KITCHEN STAFF LOUNGE ELEVATIONS

SCALE: 1/4" = 1'-0"



2 JROTC STAFF COLLABORATION DETAIL PLAN

SCALE: 1/4" = 1'-0"



3 JROTC STAFF COLLABORATION RCP

SCALE: 1/4" = 1'-0"

6 JROTC STAFF COLLABORATION ELEVATIONS

SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Title:
INTERIOR ELEVATIONS

PROGRAMMING DOCUMENT

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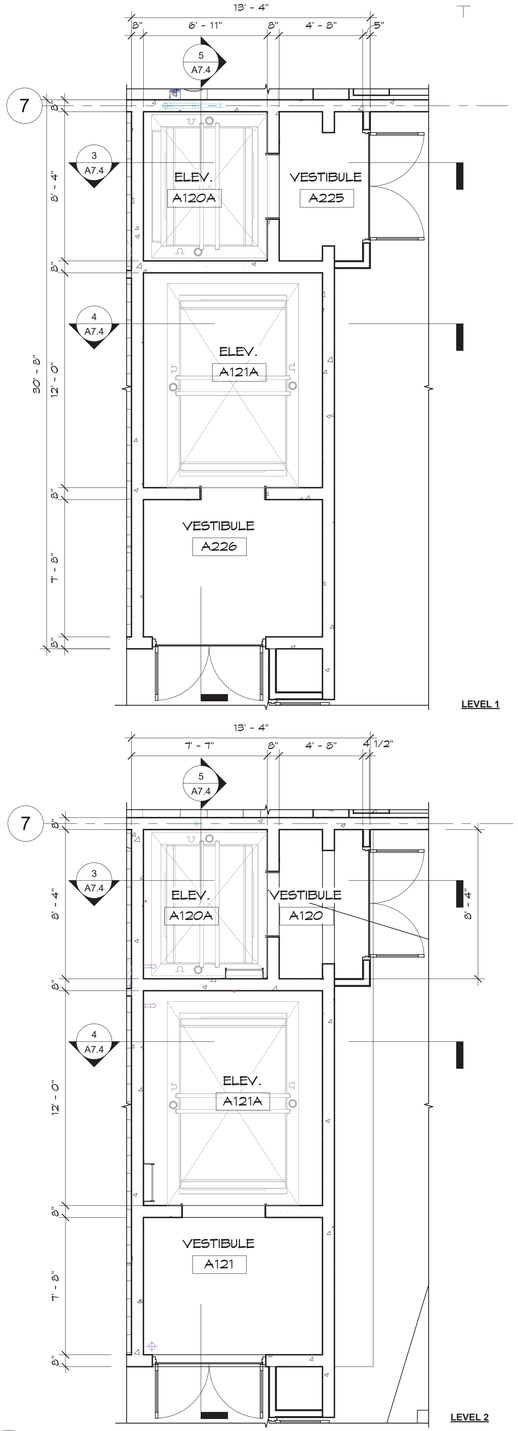
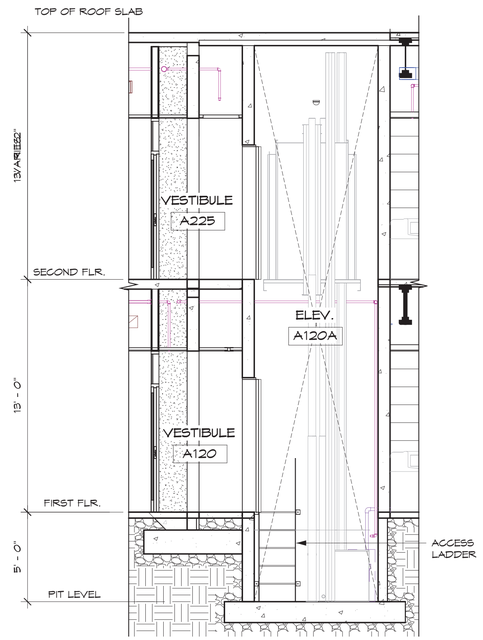
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.:	No.
File	

Drawing No.
A6.43

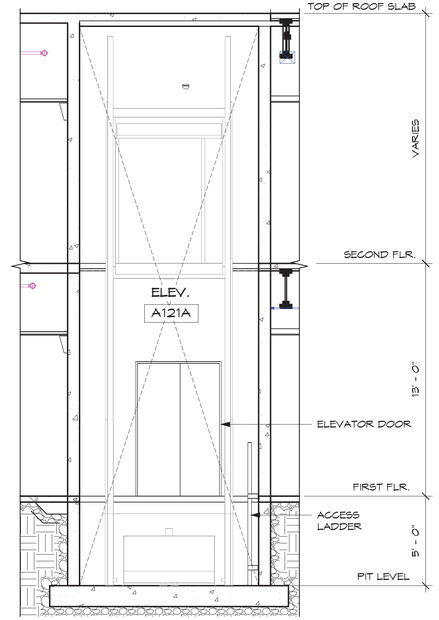
Sheet No. ____ of ____



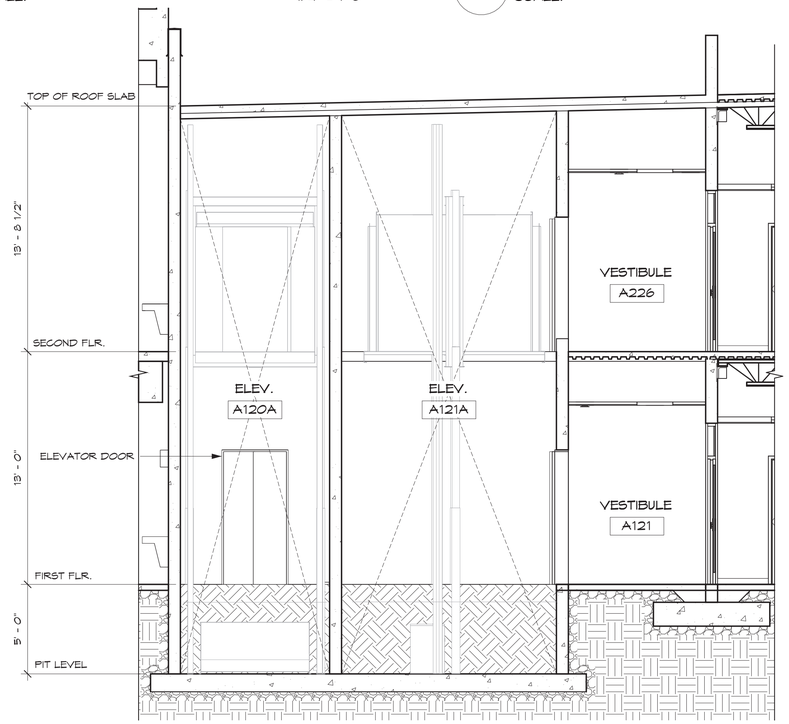
1 ELEVATOR 1 & 2 DETAIL PLANS
SCALE: 1/4" = 1'-0"



3 ELEVATOR #1 SECTION 1
SCALE: 1/4" = 1'-0"



4 ELEVATOR 2 SECTION 1
SCALE: 1/4" = 1'-0"



5 ELEV 1 & 2 SECTION
SCALE: 1/4" = 1'-0"

NOTES:

1. PROVIDE SUMP PUMP, SAFETY BEAM, AND TELEPHONE CONNECTION FOR ALL ELEVATORS.

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ELEVATOR PLANS AND SECTIONS
PROGRAMMING DOCUMENT

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A7.4

Sheet No. ____ of ____

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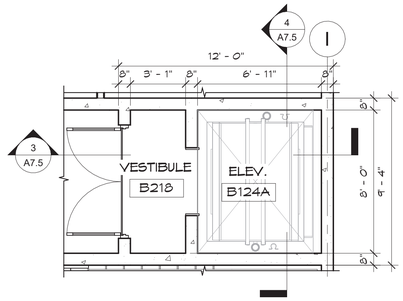
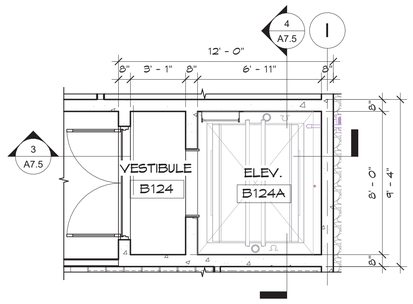
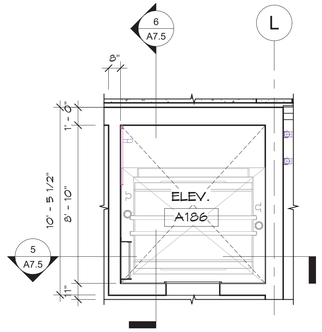




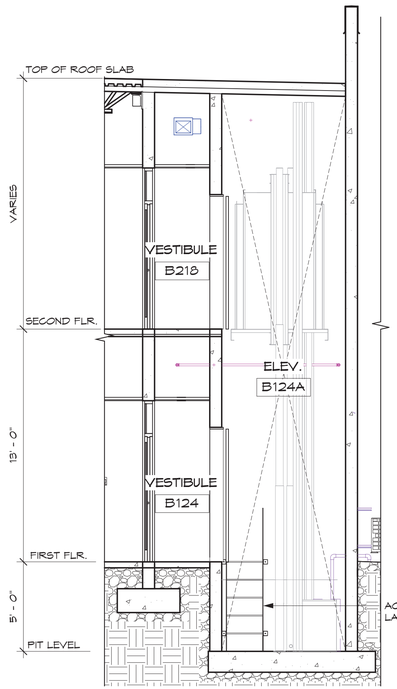
1 ELEVATOR # 3 DETAIL PLAN

SCALE: 1/4" = 1'-0"



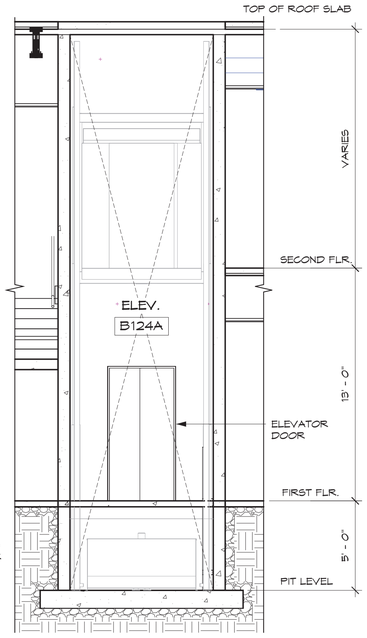
2 ELEVATOR #4 DETAIL PLAN

SCALE: 1/4" = 1'-0"



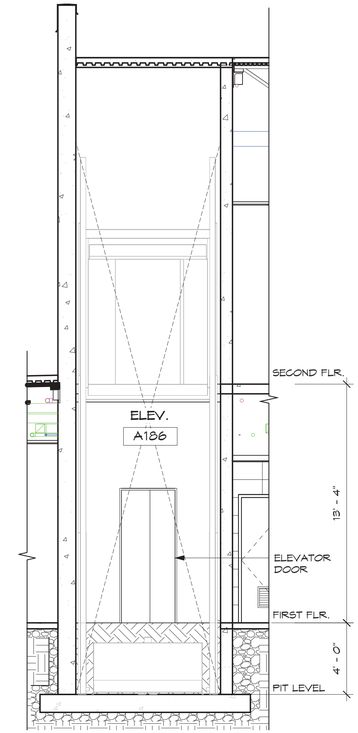
3 ELEVATOR #3 SECTION 1

SCALE: 1/4" = 1'-0"



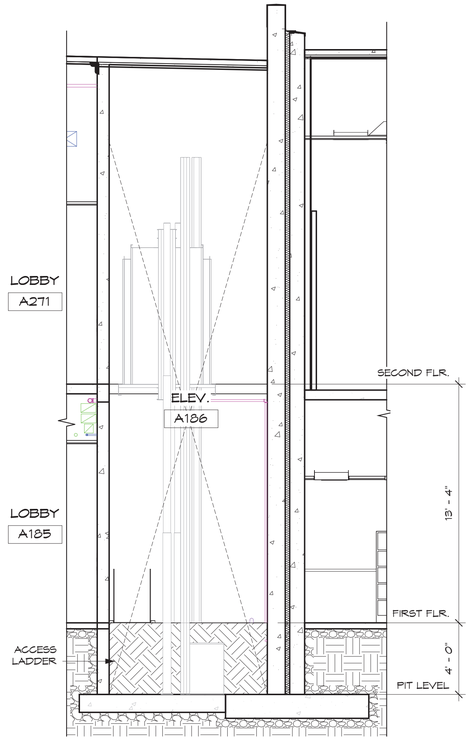
4 ELEVATOR #3 SECTION 2

SCALE: 1/4" = 1'-0"



5 ELEVATOR # 4 SECTION 1

SCALE: 1/4" = 1'-0"



6 ELEVATOR # 4 SECTION 2

SCALE: 1/4" = 1'-0"

NOTES:

1. PROVIDE SUMP PUMP, SAFETY BEAM, AND TELEPHONE CONNECTION FOR ALL ELEVATORS.

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File:	

Drawing No.: A7.5

Sheet No. _____ of _____

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FF&E SCHEDULE Sheet 1

KEY NOTE	LOCATION	DESCRIPTION	GC	OFCI	OFOI
A1	PRINCIPAL / AP OFFICES	ADMIN DESK	●		
A2	ADMINISTRATION OFFICES	ADMIN DESK	●		
A3	COUNSELOR OFFICES	ADMIN DESK	●		
A4a	CLASSROOMS	TEACHER DESK / LECTURN	●		
A4b	CLASSROOMS / OFFICES	TEACHER DESK	●		
A5a	CLASSROOMS	SINGLE STUDENT DESK	●		
A5b	CLASSROOMS	SINGLE STUDENT DESK (ADA)	●		
A6	JROTC CLASSROOMS	STUDENT DESK/ CHAIR COMBO			●
A7	JROTC INSTRUCTOR OFFICE	TEACHER DESK			●
B	SCIENCE CLASSROOM LABORATORIES	Fire Extinguisher	●		
B1a	SCIENCE CLASSROOM LABORATORIES	LABORATORY WORKSTATION	●		
B1b	LIBRARY COMPUTER LABORATORY	LABORATORY WORKSTATION (ADA)	●		
B2a	ELECTRONICS COMPUTER LABORATORY	COMPUTER STATION; 60x30	●		
B2b	BUSINESS ED. AND PROSTART CLASSROOMS	COMPUTER STATION; 48x30	●		
B2c	CARPENTRY WORKSHOP	COMPUTER STATION; 60x30			●
B3	ELECTRONICS WORKSHOP	WORKBENCH; 64x54			●
B4	CARPENTRY WORKSHOP	WORKBENCH; 72x30			●
B5	CONFERENCE ROOM	WORK TABLE; 46X24	●		
C	CAFETERIA	Manual Fire Alarm Boxes	●		
C1	CAFETERIA	CONFERENCE TABLE	●		
C2a	CLASSROOMS	CAFETERIA TABLES W/BENCH	●		
C2b	CLASSROOMS	CAFETERIA TABLES W/BENCH (ADA)	●		
C3a	ART ROOMS	2-STUDENT CLASSROOM TABLE; 60X24	●		
C3b	CHAMORU CLASSRMS, FACULTY WORK RM.	2-STUDENT CLASSROOM TABLE; 60x24 (ADA)	●		
C4	PHYSICAL SCIENCE CLASSROOMS	ART STUDIO TABLE	●		
C5	FACULTY AND STAFF LOUNGES	ACTIVITY TABLE; 60X30	●		
C6	CREDIT RECOVERY COMMON AREA	SCIENCE LABORATORY TABLE; 60x24	●		
C7	LIBRARY	CAFE TABLE; 30" ROUND	●		
C8	LIBRARY	CAFE TABLE; 46" ROUND	●		
C9a	LIBRARY	LIBRARY STUDY TABLE	●		
C9b	GYMNASIUM	LIBRARY STUDY TABLE (ADA)	●		
C10	AUTOMOTIVE / CARPENTRY CLASSROOMS	CARREL			●
C11	JROTC CLASSROOMS	SCORING TABLE	●		
C12	SCIENCE PREP ROOMS	UTILITY TABLE	●		
C13	PRINCIPAL / ASST. PRINCIPAL OFFICES	STUDENT TABLE	●		
C15	ADMINISTRATION OFFICES	SCIENCE LABORATORY TABLE; 60x24	●		
D	WAITING AREAS	Fire Department Connection	●		
D1	OFFICES	EXECUTIVE CHAIR	●		
D2	CONFERENCE ROOMS	OFFICE/TASK CHAIR	●		
D3	CLASSROOMS	RECEPTION CHAIR	●		
D4	CLASSROOMS, MISC COMPUTER STATIONS	GUEST CHAIR	●		
D5	CLASSROOMS	CONFERENCE ROOM CHAIR	●		
D6	FACULTY AND STAFF LOUNGES	TEACHER CHAIR	●		
D7	ELECTRONICS COMPUTER LABORATORY	STUDENT CHAIR	●		
D8	SICK BAY, ISOLATION ROOM	STUDENT STOOL	●		
D9	LIBRARY	CAFE CHAIR	●		
D10a	CREDIT RECOVERY, PRESS BOX, GYMNASIUM	TASK CHAIR	●		
D11	LOCKER ROOMS	MEDICAL STOOL			
D13	LOCKER ROOMS	LIBRARY CHAIR	●		
D16	JROTC CLASSROOMS	FOLDING CHAIR	●		
D17a		LOCKER BENCH			●
D17b	CLASSROOMS	LOCKER BENCH (ADA)			●
D19	CLASSROOMS	STACKABLE CHAIR	●		
E1		MULTI-MEDIA PROJECTOR; CEILING MOUNTED			
E3	ADMINISTRATION OFFICES	PROMETHEAN BOARD; MOBILE	●		
E5	CLASSROOMS AND OFFICES	MAGNETIC WHITE BOARD; 4x12	●		
E7	ART ROOMS	MAGNETIC WHITE BOARD; 4x8	●		
E9	CLASSROOMS	MAGNETIC WHITE BOARD; 4x4	●		
E10	CLASSROOMS	CORK BOARD; 4x4	●		
E11		RECYCLED RUBBER TACKBOARD; 4x6			
E12	ART ROOMS	CORK BOARD; 4x6	●		
E13	JROTC	CORK BOARD; 4x8		●	
E14	JROTC CLASSROOMS	CORK BOARD; 4x10		●	
E15	HALLWAYS	RECYCLED RUBBER TACKBOARD; 4x8	●		
E19	LOCKER ROOMS	PROJECTOR SCREEN; CEILING MOUNTED @ JROTC	●		
E22	FACULTY AND STAFF LOUNGES	WHITEBOARD; 4X8	●		
F	JROTC LOCKER ROOMS	Directional Signage		●	
F1	OFFICES AND CLASSROOMS	DOUBLE-TIER LOCKERS; STANDARD	●		
F2	CUMULATIVE FILE ROOM	DOUBLE-TIER LOCKERS; VENTED	●		
F3	LIBRARY	DOUBLE-TIER LOCKERS; STANDARD	●		
F4	LIBRARY	LOCKERS @ JROTC LOCKER ROOMS	●		
G	LIBRARY	Tactile Exit Sign	●		
G1	SCIENCE PREP ROOMS	VERTICAL FILE CABINETS (5-DRAWER)	●		
G2	SCIENCE PREP ROOMS	LATERAL FILE CABINET (4-DRAWER)	●		
G3a	SCIENCE PREP ROOMS	LIBRARY SHELVING; DOUBLE-FACED	●		
G3b	SCIENCE PREP ROOMS	LIBRARY SHELVING; SINGLE-FACED	●		

FF&E SCHEDULE Sheet 1

KEY NOTE	LOCATION	DESCRIPTION	GC	OFCI	OFOI
G4	SCIENCE PREP ROOM	PERIODICAL DISPLAY RACK	●		
G5	ART ROOMS	TOTE TRAY STORAGE CABINET	●		
G6	ART ROOMS	SAFETY GOGGLE CABINET	●		
G7	ART ROOMS	MICROSCOPE STORAGE CABINET	●		
G8	ART ROOMS	WOOD STORAGE FOR ACIDS AND CORROSIVES	●		
G9	PANTRY / DRY FOOD STORAGE	WOOD STORAGE FOR FLAMMABLES	●		
G10	PANTRY / DRY FOOD STORAGE	STORAGE CABINET (6'H) @ ART ROOM	●		
G11	LOBBY	WOOD STORAGE CABINET (7'H)	●		
G12	JROTC CLASSROOMS	FLAT FILE			●
G13	JROTC INSTRUCTOR OFFICE	VERTICAL ART RACK			●
G14a	JROTC INSTRUCTOR OFFICE	WIRE SHELVING; 24x48			●
G14b	JROTC SUPPLY ROOM	WIRE SHELVING; 14X48			●
G15	JROTC SUPPLY ROOM	TROPHY DISPLAY			●
G18	JROTC ARMS ROOM	STORAGE CABINET; MOBILE			●
G19	BLS CLASSRMS	VERTICAL FILING CABINET, 4-DRAWER	●		
G20	BLS CLASSRMS	LATERAL FILING CABINET, 4-DRAWER	●		
G21	NURSE OFFICE	STORAGE RACK	●		
G22	BLS CLASSRMS, FACULTY & STAFF LOUNGES	CLOTHING RACKS	●		
G23	BLS CLASSROOM	WEAPONS RACK	●		
H	BLS CLASSROOM	Floor Level Indication	●		
H1	PROSTART/HT LAUNDRY	REFRIGERATOR; SIDE-BY-SIDE			●
H2		RANGE			
H3		REFRIGERATOR; TOP-FREEZER			
H5		MICROWAVE			
H7		WASHER			
H8		DRYER			
H9		2-TIER WASHER/DRYER			
H10		REFRIGERATOR @JROTC			
H11		CHEST FREEZE @ JROTC			
H12		ICE MAKER @ JROTC			
H13		MICROWAVE			
I		Floor Level Tactile Sign			

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
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A8.18
Sheet No. ____ of ____

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FF&E SCHEDULE Sheet 2

KEY NOTE	LOCATION	DESCRIPTION	GC	OFCI	OFOI
J1		CLOCK			
J2	ADMIN COPY AREA, FACULTY WORK ROOM	PHOTOCOPY MACHINE		●	
J4	BUSINESS OFFICE	SAFE			●
J6	MARKETING STORE	3-DOOR REFRIGERATED MERCHANDIZER			●
J7	MARKETING STORE	COMPACT CHEST FREEZER			●
J8	MARKETING STORE	REFRIGERATOR			●
J10	LIBRARY	EXIT SECURITY ALARM		●	
J13a	CAFETERIA SERVING AREA	SERVING COUNTER, COLD FOOD			●
J13b	CAFETERIA SERVING AREA	SERVING COUNTER, COLD FOOD		●	
J14a	KITCHEN	BRAISING PAN			●
J14b	KITCHEN	BRAISING PAN		●	
J15	KITCHEN	GRIDDLE		●	
J16	KITCHEN	CONVECTION OVEN		●	
J17	KITCHEN	REACH-IN REFRIGERATOR		●	
J18	KITCHEN	HOLDING CABINET		●	
J19	KITCHEN	SALAD BAR FOOD PREPRATION TABLE		●	
J20a	CAFETERIA SERVING AREA	HOT FOOD SERVING			●
J20b	CAFETERIA SERVING AREA	HOT FOOD SERVING		●	
J21	CAFETERIA SERVING AREA	MILK COOLER			●
J22	KITCHEN	DISHWASHER			●
J25	PROSTART KITCHEN LAB	REFRIGERATOR			●
J26	PROSTART KITCHEN LAB	FREEZER			●
J27	PROSTART KITCHEN LAB	RANGE			●
J28	PROSTART KITCHEN LAB	DISHWASHER			●
J29	PROSTART KITCHEN LAB	CONVECTION OVEN			●
J30	PROSTART KITCHEN LAB	CHARBROILER			●
J31	PROSTART KITCHEN LAB	WORK TABLE; 24X72			●
J34	PROSTART KITCHEN LAB	SPEED RACKS			●
J35	KITCHEN	PAN CARRIER		●	
J38	KITCHEN	WORK TABLE; 24X48		●	
J39	KITCHEN	SSTL TABLE W/ SINK @ CAFETERIA KITCHEN		●	
J42	PROSTART KITCHEN LAB	SSTL TABLE W/3 COMPARTMENT SINK			
J44	PROSTART KITCHEN LAB	WORK TABLE; 24x96			
J45	PROSTART KITCHEN LAB	3 COMPARTMENT SINK W/ DRAINBOARDS			●
J46	PROSTART KITCHEN LAB	WORK TABLE W/SINK @ PROSTART KITCHEN			●
J47	MARKETING LAB / STORE	DISPLAY CASE; FULL-VISION			●
J48	MARKETING LAB / STORE	CURBSIDE PICK-UP WIRE SHELF			●
J49	MARKETING LAB / STORE	HOT FOOD MERCHANDIZER			●

FF&E SCHEDULE Sheet 2

KEY NOTE	LOCATION	DESCRIPTION	GC	OFCI	OFOI
J50	MARKETING LAB / STORE	SLAT WALL PANEL; 4x8			●
J52	MARKETING LAB / STORE	STEEL SHELVING UNIT			●
J53a	MARKETING LAB / STORE	CASH WRAP 72"			●
J53b	MARKETING LAB / STORE	CASH WRAP 48"			●
J54	MARKETING LAB / STORE	HAND SINK W/ SIDE SPLASH			●
J55	CARPENTRY WORK SHOP	TOOL GRINDER			●
J56	CARPENTRY WORK SHOP	METAL BAND SAW			●
J57	CARPENTRY WORK SHOP	FLOOR SHEAR			●
J59	CARPENTRY WORK SHOP	DRILL PRESS/MILLING MACHINE			●
J60	CARPENTRY WORK SHOP	TABLE SAW			●
J70	CARPENTRY WORK SHOP	PLANER			●
J71	CARPENTRY WORK SHOP	RADIAL ARM SAW			●
J72	CARPENTRY WORK SHOP	JOINTER			●
J73	CARPENTRY WORK SHOP	BELT AND DISC SANDER			●
J74	CARPENTRY WORK SHOP	WOOD BAND SAW			●
J76	LIBRARY	BOOK DENSENSITIZER			●
J	ART STORAGE ROOM	Emergency Sign	●		
K1	JROTC CLASSROOMS	US FLAG W/ WALL-MOUNTED POLE	●		
K2	HT CLASSROOM	GUAM FLAG W/ WALL-MOUNTED POLE	●		
K3	DANCE ROOM AND WEIGHT ROOM	MURPHY BED	●		
K6	ART ROOM	WALL MIRROR	●		
K8	CARPENTRY AND AUTOMOTIVE CLASSROOMS	ROOM DIVIDERS	●		
K9	JROTC INSTURCTIONAL ROOMS	PODIUM			●
K11		PODIUM			
K13	WEIGHT ROOM		●		
M3	WEIGHT ROOM	DEAD LIFT PLATFORMS	●		
M4	WEIGHT ROOM	POWER RACK	●		
M5	WEIGHT ROOM	WEIGHT BENCH	●		
M6	WEIGHT ROOM	FREE WEIGHT TREE W/ BUMPER PLATES	●		
M8	WEIGHT ROOM	DUMBBELL RACK W/ MISC WEIGHTS	●		
M9	WEIGHT ROOM	STATIONARY BIKE	●		
M10	WEIGHT ROOM	TREADMILL	●		
M11	SPED BLS CLASSRM, SICK BAY	ELLIPTICAL	●		
N1	ISOLATION ROOM	TREATMENT TABLE	●		●
N2	HCS LABORATORY CLASSROOM	BED			
N2b	HCS LABORATORY CLASSRM, SICK BAY	BED	●		
N3	NURSE OFFICE	CURTAIN SYSTEM	●		
N4	SICK BAY RESTROOM	MEDICAL CABINET	●		
N5		SHOWER CURTAIN	●		
P		Room Identification			
P1		TRASH CAN; 13-GALLON			
Q		Classroom Identification			
S		Restroom Sign			

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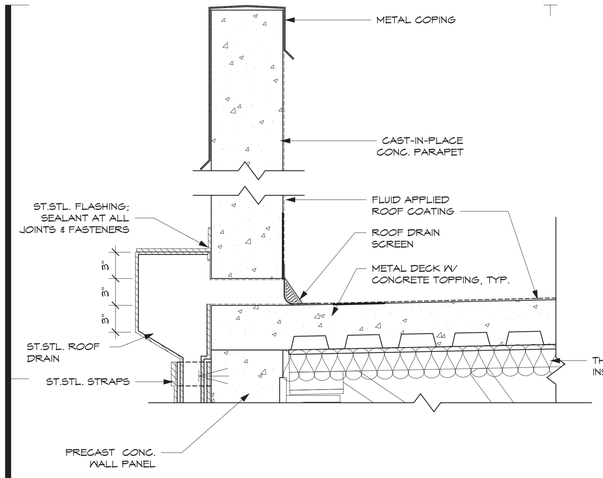
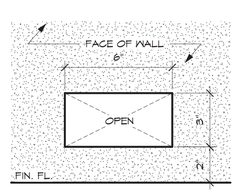


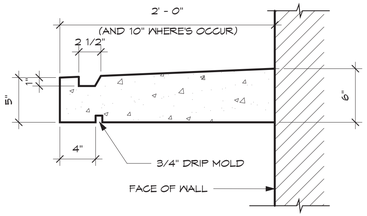
1 DOWNSPOUT DETAIL

SCALE: 1 1/2" = 1'-0"



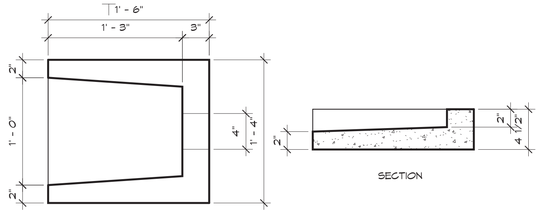
2 OVER FLOW DRAIN

SCALE: 3" = 1'-0"



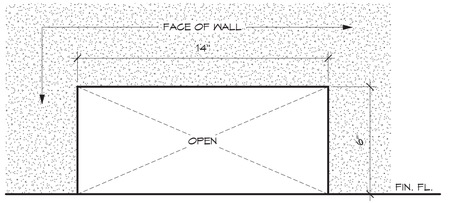
5 CONC. EYEBROW

SCALE: 1 1/2" = 1'-0"



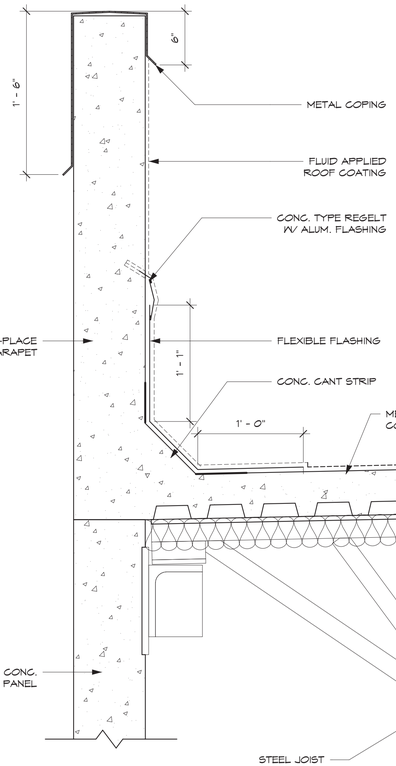
3 CONCRETE SPLASH BLOCK DETAIL

SCALE: 1 1/2" = 1'-0"



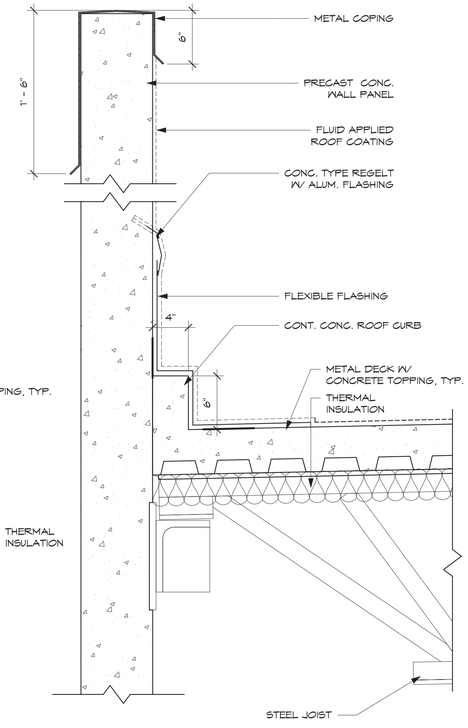
6 DRAIN HOLE DET.

SCALE: 3" = 1'-0"



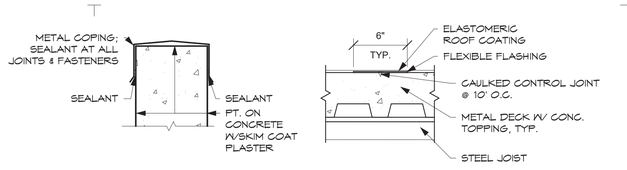
7 ROOF CORNER COATING DETAIL

SCALE: 1 1/2" = 1'-0"



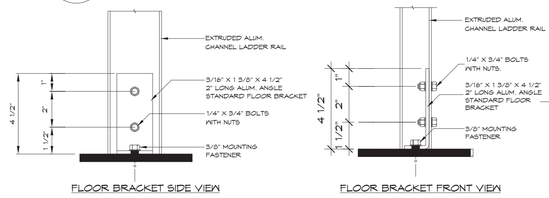
8 CONTINUOUS ROOF CURB DETAIL

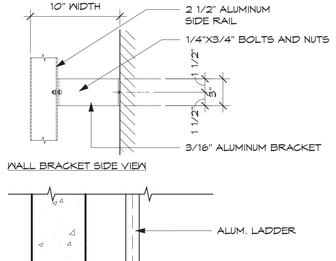
SCALE: 1 1/2" = 1'-0"

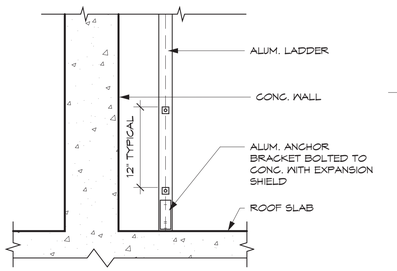


4 ROOF COPING & COATING DETAIL

SCALE: 1 1/2" = 1'-0"

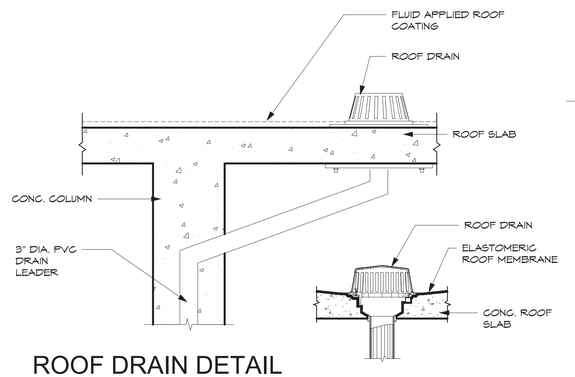






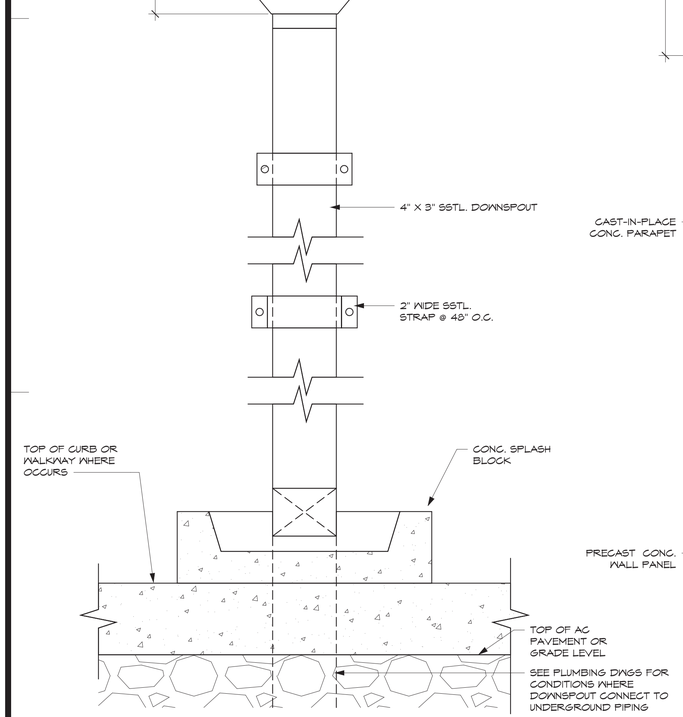
9 LADDER DETAIL

SCALE: 1 1/2" = 1'-0"



10 ROOF DRAIN DETAIL @ MAIN ENTRANCE CANOPY

SCALE: 1" = 1'-0"



1 DOWNSPOUT DETAIL

SCALE: 1 1/2" = 1'-0"

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Title: ROOF DETAILS

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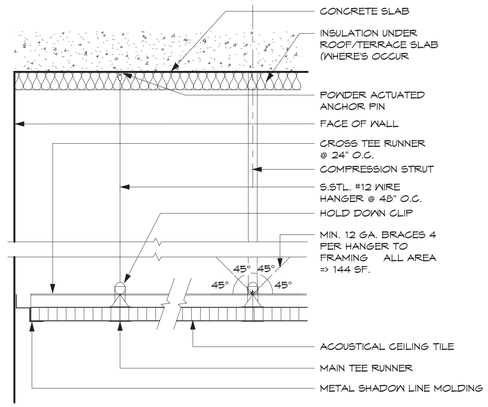
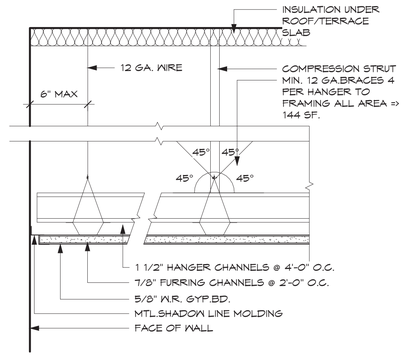
CEILING DETAILS



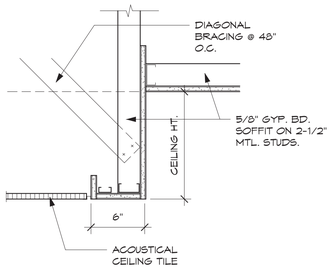
1 SUSPENDED ACOUSTICAL CEILING DETAIL

SCALE: 3" = 1'-0"



2 SUSPENDED GYP BD CEILING

SCALE: 3" = 1'-0"



3 DROP CEILING DETAIL

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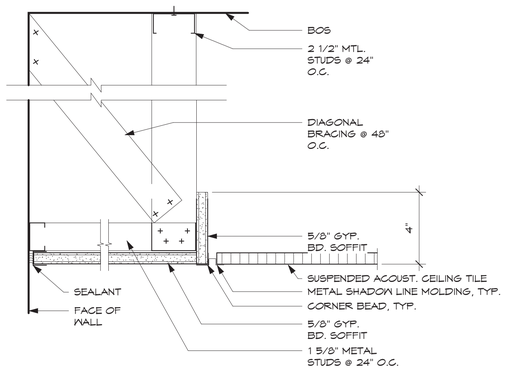
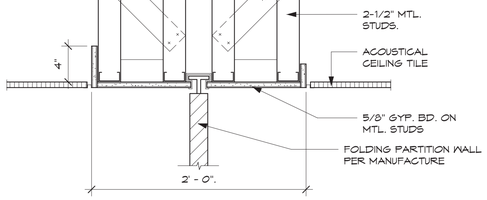


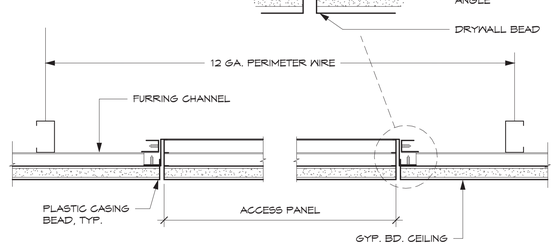
4 GYP. BD. TO ACT DET.

SCALE: 3" = 1'-0"



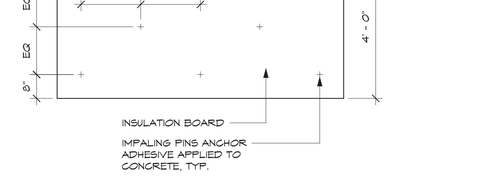
5 PARTITION TRACK DETAIL

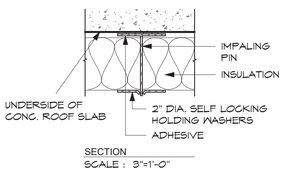
SCALE: 1 1/2" = 1'-0"



6 ACCESS PANEL DETAIL

SCALE: 3" = 1'-0"



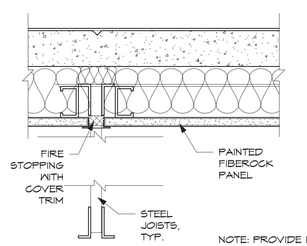


NOTES:

1. FOR ALL SUSPENDED CEILINGS GREATER THAN 1445F, PROVIDE SEISMIC BRACING-DIAGONAL SWAY BRACING AND COMPRESSION BRACING AT APPROXIMATELY 12" O.C. AND 6" FROM WALLS OR EQUIVALENT TO RESIST SEISMIC MOVEMENT. PROVIDE SOFFIT LATERAL BRACING-ALTERNATING
2. METAL FRAMING AT WALLS AND CEILINGS-22 GA.

7 INSULATION

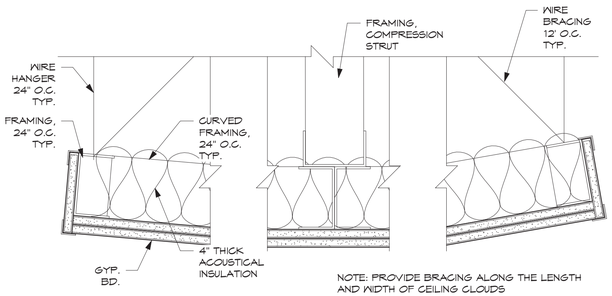
SCALE: 1/2" = 1'-0"



NOTE: PROVIDE INTUMESCENT BASE PAINT AND FINISH PAINT ON ALL EXPOSED STEEL STRUCTURE

8 EXPOSED STRUCTURE DETAIL

SCALE: 1 1/2" = 1'-0"



NOTE: PROVIDE BRACING ALONG THE LENGTH AND WIDTH OF CEILING CLOUDS

9 SUSPENDED GYP BD CEILING CLOUD

SCALE: 3" = 1'-0"

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

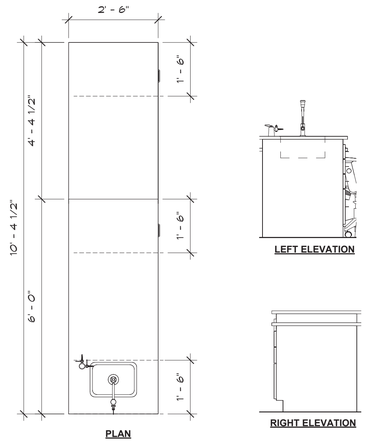
Title: CEILING DETAILS

PROGRAMMING DOCUMENT

Designed:	TRMA
Drawn:	EPJ/DLG
Checked:	RM/TP
Supv:	CTC
Scale:	As indicated
Date:	3/31/25
Project No.	No.
File	

Drawing No. A10.3

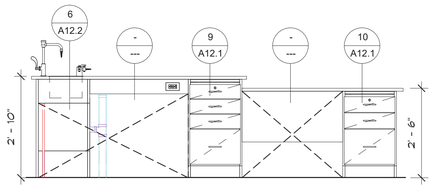
Sheet No. _____ of _____



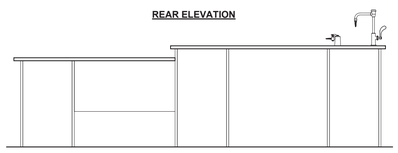
PLAN

LEFT ELEVATION

RIGHT ELEVATION



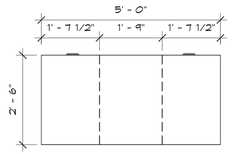
REAR ELEVATION



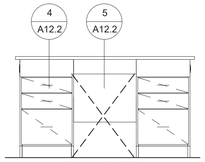
FRONT ELEVATION

1 SCIENCE DEMONSTRATION / DESK DETAIL

1/2" = 1'-0"



PLAN



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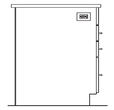

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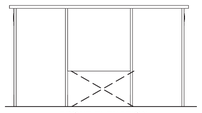
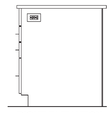


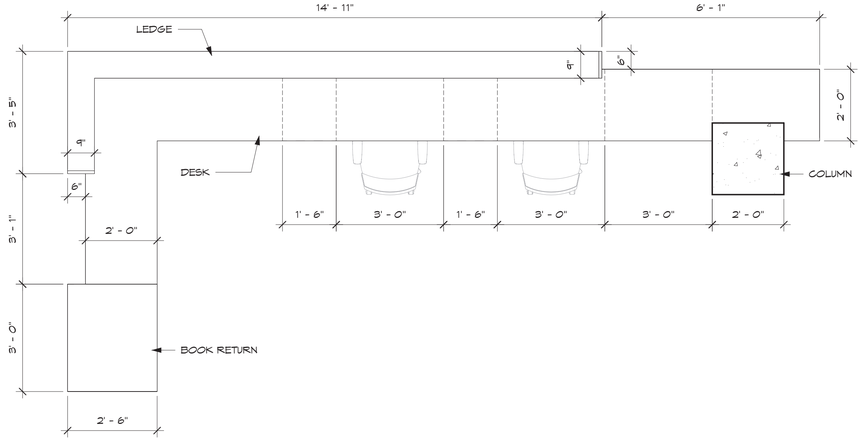
FRONT ELEVATION



RIGHT ELEVATION

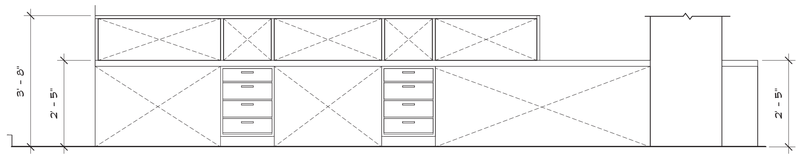
2 HCS DEMONSTRATION COUNTER DETAIL

SCALE: 1/2" = 1'-0"



3 CIRCULATION DESK PLAN

SCALE: 1/2" = 1'-0"



4 CIRCULATION DESK ELEVATION

SCALE: 1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
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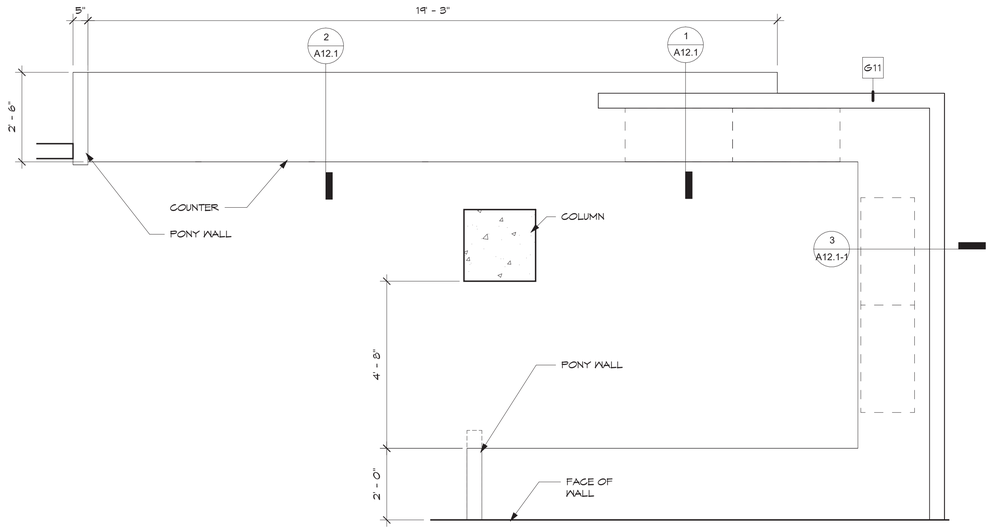
Drawing No.
A12.4

Sheet No. _____ of _____



1 FRONT DESK PLAN

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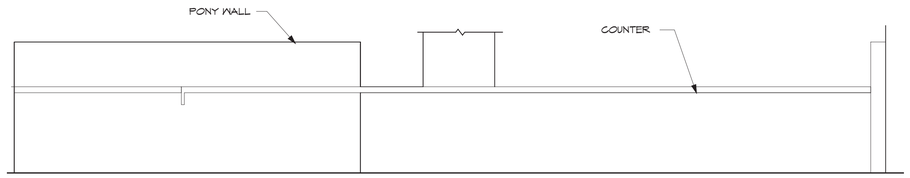
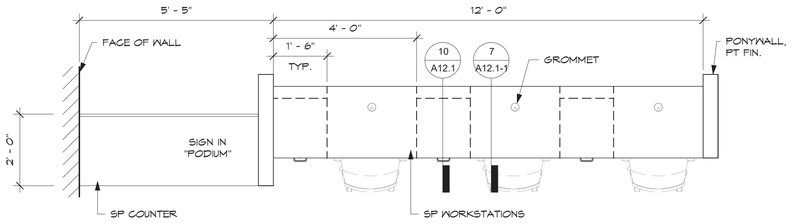
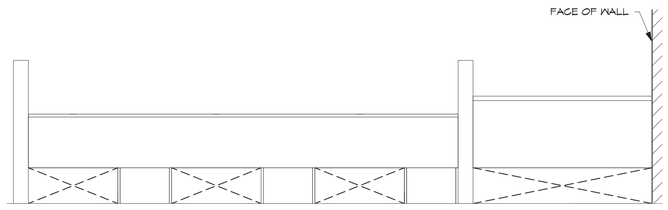


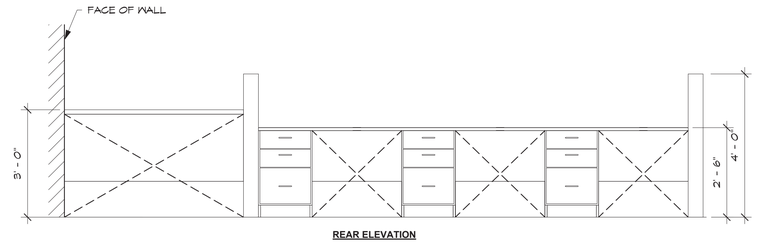
FRONT ELEVATION



PLAN



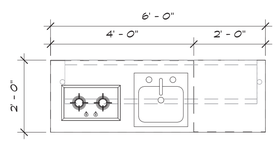
FRONT ELEVATION



REAR ELEVATION

4 COUNSELOR WAITING DESK DETAIL

SCALE: 1/2" = 1'-0"



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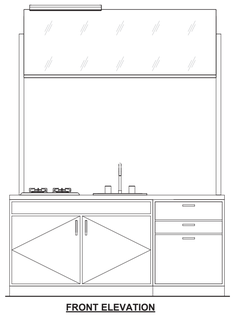

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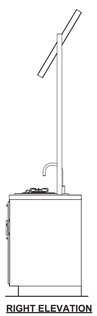
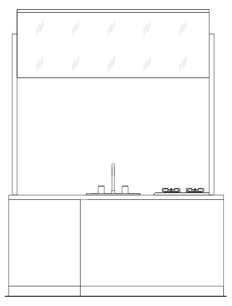


RIGHT ELEVATION



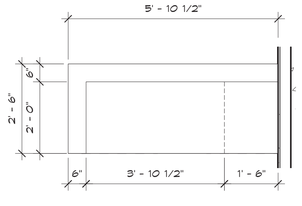
FRONT ELEVATION

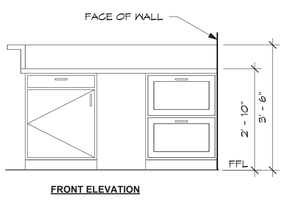


LEFT ELEVATION

2 PROSTART DEMO COUNTER DETAIL

SCALE: 1/2" = 1'-0"





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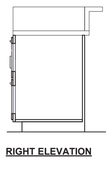
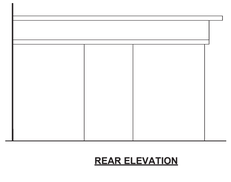


RIGHT ELEVATION



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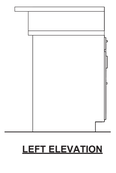

LEFT ELEVATION

3 HOSPITALITY AND TOURISM FRONT DESK PODIUM DETAIL

SCALE: 1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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File	

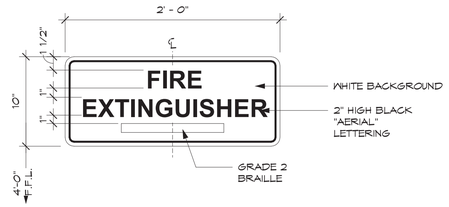
Drawing No.
A12.5

Sheet No. ____ of ____

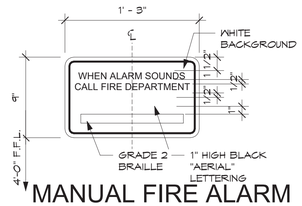


NOTE: WALL OR POST-MOUNTED. VERIFY PROJECT CONDITIONS.

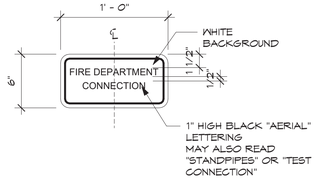
A SIGNAGE A
SCALE: 1 1/2" = 1'-0"



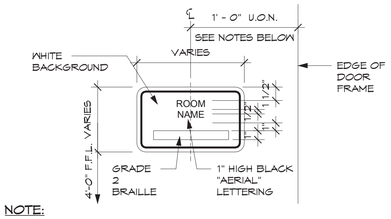
B FIRE EQUIPMENT IDENTIFICATION
SCALE: 1 1/2" = 1'-0"



C MANUAL FIRE ALARM BOXES
SCALE: 1 1/2" = 1'-0"



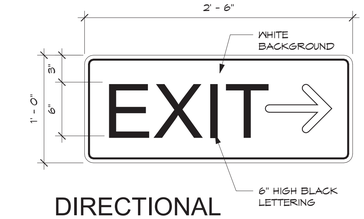
D FIRE DEPARTMENT CONNECTION
SCALE: 1 1/2" = 1'-0"



NOTE:

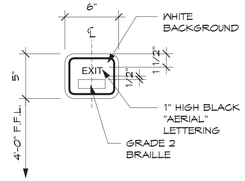
1. INSTALL SIGNAGE ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR. WHERE THERE IS NO WALL SPACE TO THE LATCH SIDE OF THE DOOR, INCLUDING AT DOUBLE DOORS, SIGNS SHALL BE PLACED ON THE NEAREST ADJACENT WALL.
2. MOUNTING LOCATION FOR SUCH SIGNAGE SHALL BE SO THAT A PERSON MAY APPROACH WITHIN 3 INCHES OF SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR.

E ROOM IDENTIFICATION
SCALE: 1 1/2" = 1'-0"

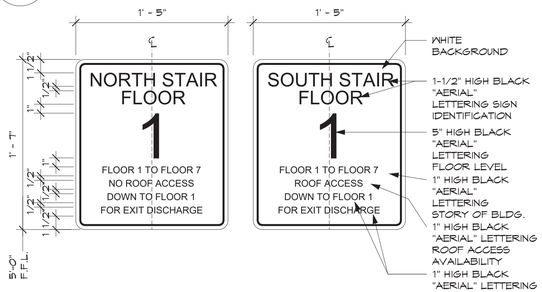


NOTE:
VERIFY DIRECTION OF ARROW WITH EGRESS PATH

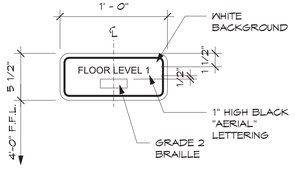
F DIRECTIONAL SIGNAGE
SCALE: 1 1/2" = 1'-0"



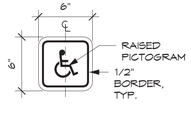
G TACTILE EXIT SIGNS
SCALE: 1 1/2" = 1'-0"



H FLOOR LEVEL IDENTIFICATION
SCALE: 1 1/2" = 1'-0"



I FLOOR LEVEL TACTILE SIGN
SCALE: 1 1/2" = 1'-0"



3 INTERNATIONAL SYMBOL OF ACCESSIBILITY
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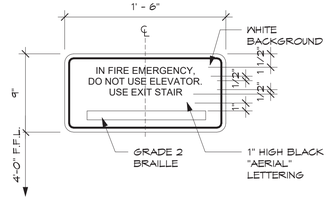
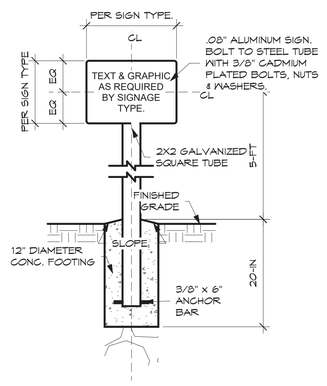


J EMERGENCY SIGN
SCALE: 1 1/2" = 1'-0"



NOTE: NO-SMOKING SIGNAGE TO BE PLACED AT ALL BUILDING ENTRANCES.

N EMERGENCY SIGN
SCALE: 1 1/2" = 1'-0"



O EMERGENCY SIGN
SCALE: 1 1/2" = 1'-0"

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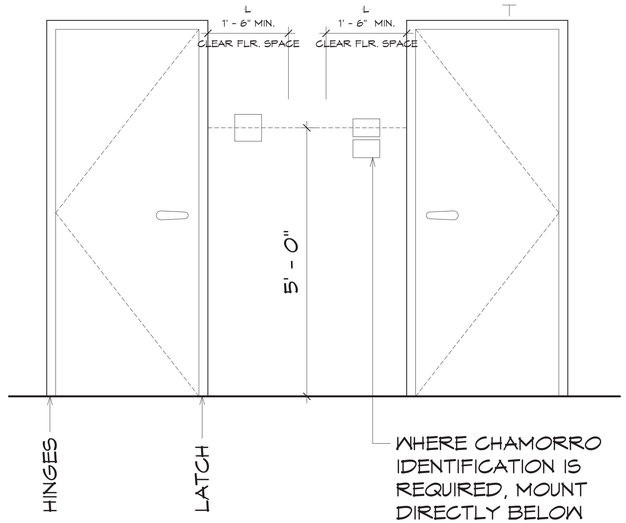
File	

Drawing No.:
A13.1

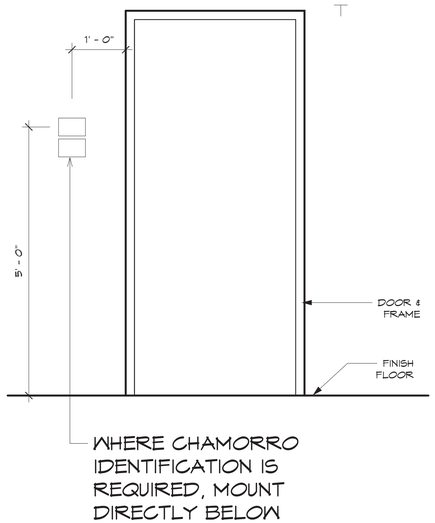
Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 TYP. RM. NUMBER
SCALE: 3/4" = 1'-0"

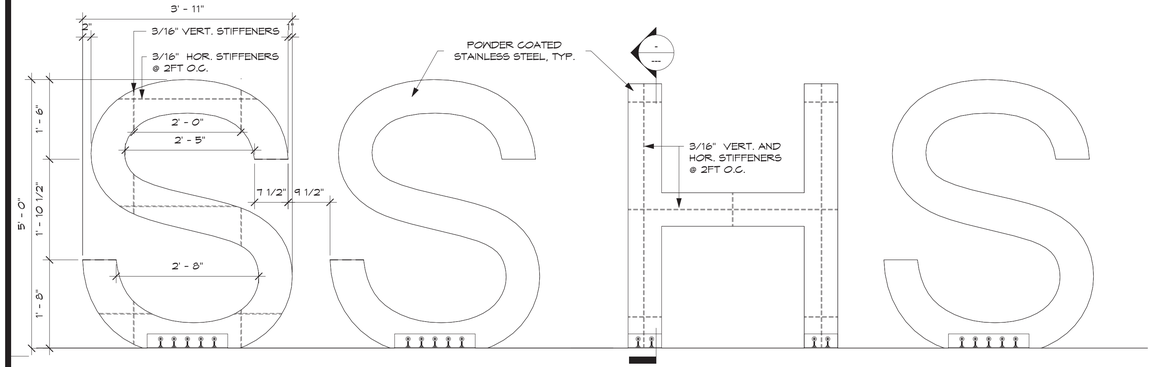
OR



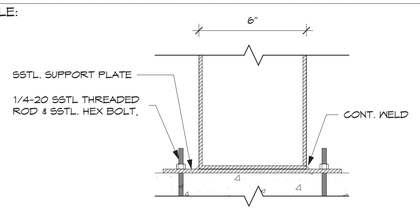
2 TYP. RM. NUMBER
SCALE: 3/4" = 1'-0"

NOTE: SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18 INCHES (455 MM) MINIMUM BY 18 INCHES (455 MM) MINIMUM, CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION.

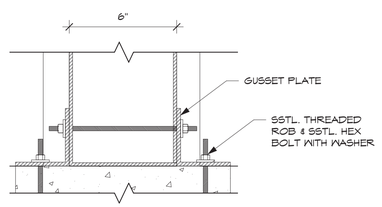
NOTE: SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED A MINIMUM OF 4'-0" ABOVE THE FINISHED FLOOR MEASURED FROM THE BASELINE OF THE LOWEST TACTILE CHARACTER AND A MAXIMUM OF 5'-0" ABOVE THE FINISHED FLOOR MEASURED FROM THE BASELINE OF THE HIGHEST TACTILE CHARACTER.



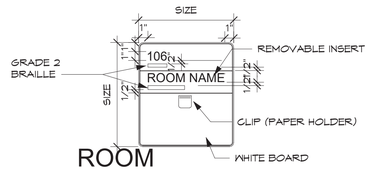
9 STANDING BUILDING SIGNAGE ELEVATION
SCALE: 3/4" = 1'-0"



13 ENLARGED SECTION DETAIL OPTION 2
SCALE: 3" = 1'-0"

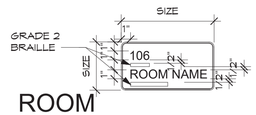


12 ENLARGED SECTION DETAIL
SCALE: 3" = 1'-0"



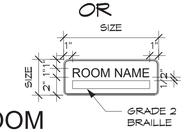
3 ROOM IDENTIFICATION
SCALE: 1 1/2" = 1'-0"

OR



4 ROOM IDENTIFICATION
SCALE: 1 1/2" = 1'-0"

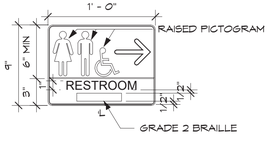
OR



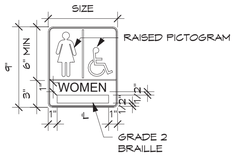
5 ROOM IDENTIFICATION
SCALE: 1 1/2" = 1'-0"

GENERAL NOTES:

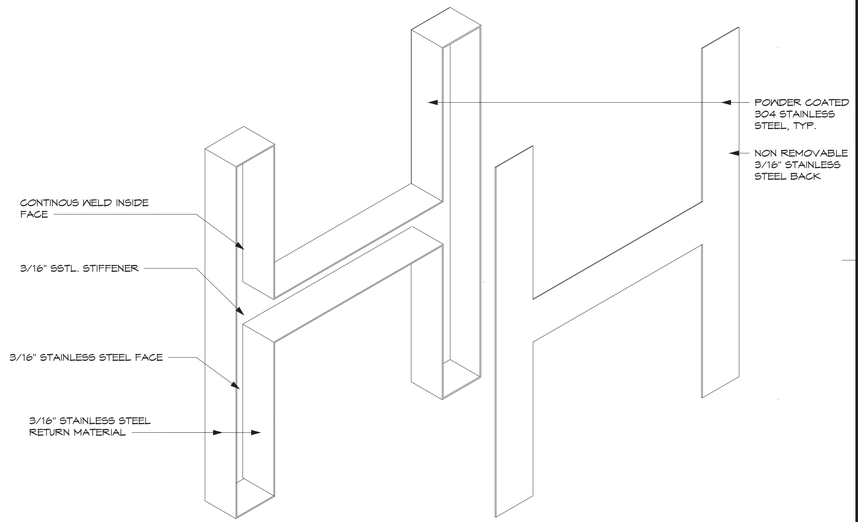
1. LETTERS AND NUMBERS SHALL BE RAISED 1/32" IN UPPER CASE SAN SERIF TYPE FONT AND ACCOMPANIED WITH GRADE 2 BRAILLE POSITION BELOW THE CORRESPONDING TEXT AND SEPERATED BY MINIMUM 3/8" FROM ANY OTHER TACTILE CHARACTER OR RAISED BORDER. RAISED CHARACTERS SHALL BE AT LEAST 5/8" HIGH, BUT NO HIGHER THAN 2", BASED ON AN UPPERCASE 'I'. PICTOGRAMS SHALL BE A MINIMUM OF 6" IN HEIGHT.
2. ROOM SIGNAGE SHALL BE MOUNTED TO THE LATCH SIDE AT 5'-0" ABOVE FINISH FLOOR MEASURED FROM THE BASELINE OF THE HIGHTEST TACTILE CHARACTER. AT DOUBLE DOORS THAT SWING OUT, MOUNT SIGNAGE BEYOND THE SWING OF THE DOOR.
3. THE CHARACTERS & BACKGROUND OF SIGNS SHALL BE EGGSHELL, MATTE, OR NON-GLARE FINISH AND SHALL CONTRAST WITH THEIR BACKGROUND AS SELECTED.
4. SIGNAGE SHALL BE PROVIDED IN CONFORMANCE TO ROOM NAME INDICATED ON ROOM FINISH SCHEDULE
5. NO-SMOKING SIGNAGE SHALL BE PROVIDED AT THE EXTERIOR OF THE BUILDING ADJACENT TO THE NORTH AND SOUTH BUILDING ENTRANCES. MOUN 5'-0" FROM THE FINISH FLOOR LEVEL TO THE BOTTOM OF THE SIGN.



6 DIRECTIONAL SIGN
SCALE: 1 1/2" = 1'-0"



7 RESTROOM SIGN
SCALE: 1 1/2" = 1'-0"



10 METAL SIGNAGE DETAIL
SCALE: 1" = 1'-0"

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REVISIONS

No.	Description	Date

TRMA
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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SIGNAGE DETAILS
PROGRAMMING DOCUMENT

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A13.2
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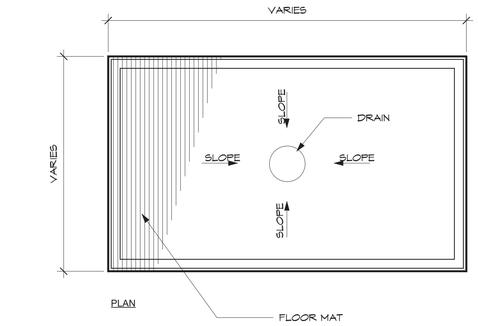
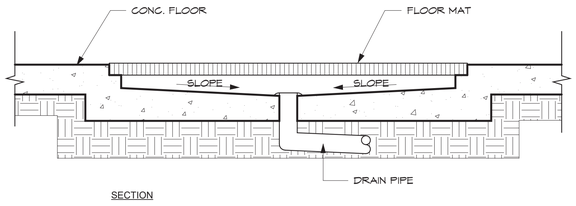
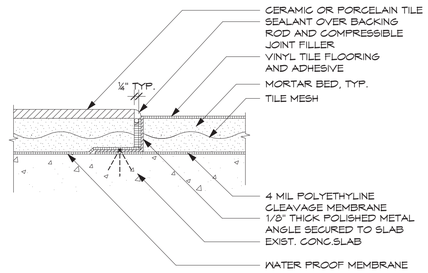




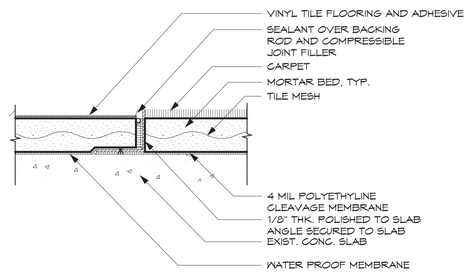
1 FLOOR MAT & DRAIN

SCALE: 1" = 1'-0"



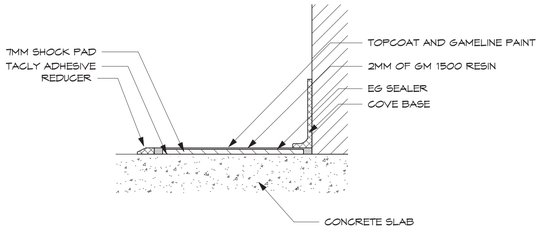
2 TILE TO VINYL

SCALE: 3" = 1'-0"



3 VINYL TO CARPET

SCALE: 3" = 1'-0"



4 ATHLETIC FLOORING

SCALE: 3" = 1'-0"

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FLOOR DETAILS
PROGRAMMING DOCUMENT

Designed:	TRMA
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A14.1

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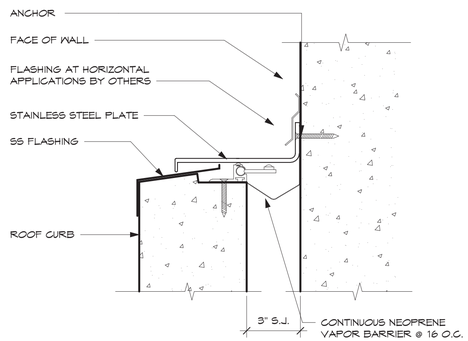
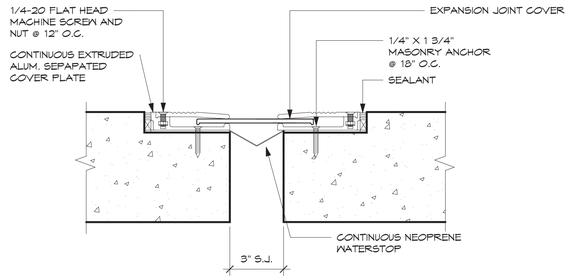


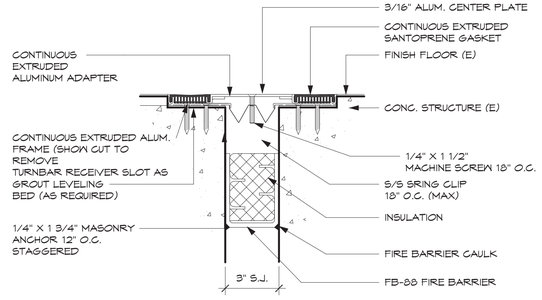
1 3" ROOF CURB TO WALL SEISMIC JOINT

SCALE: 3" = 1'-0"



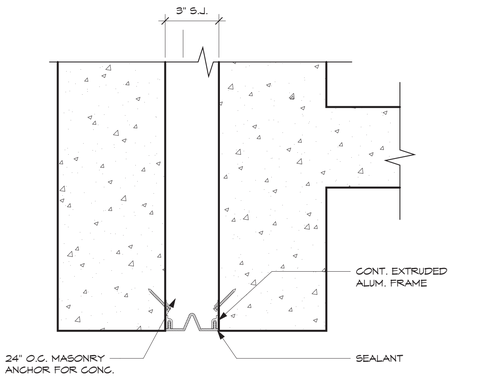
2 3" EXTERIOR FLOOR TO FLOOR COVER

SCALE: 3" = 1'-0"



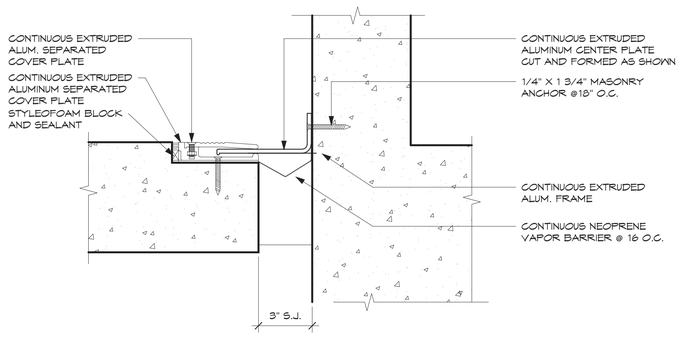
3 3" INTERIOR FLOOR TO FLOOR COVER

SCALE: 3" = 1'-0"



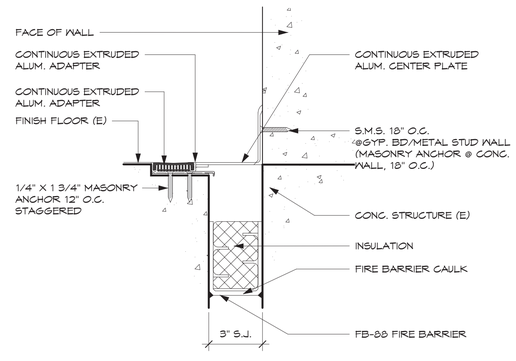
4 3" EXTERIOR CEILING SEISMIC JOINT

SCALE: 3" = 1'-0"



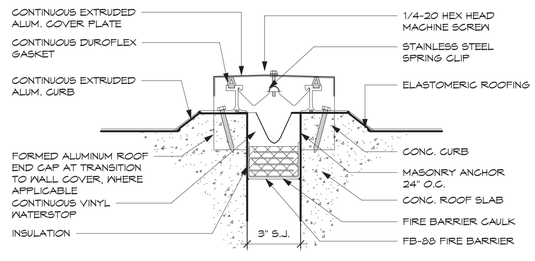
5 3" EXTERIOR FLOOR TO WALL COVER

SCALE: 3" = 1'-0"



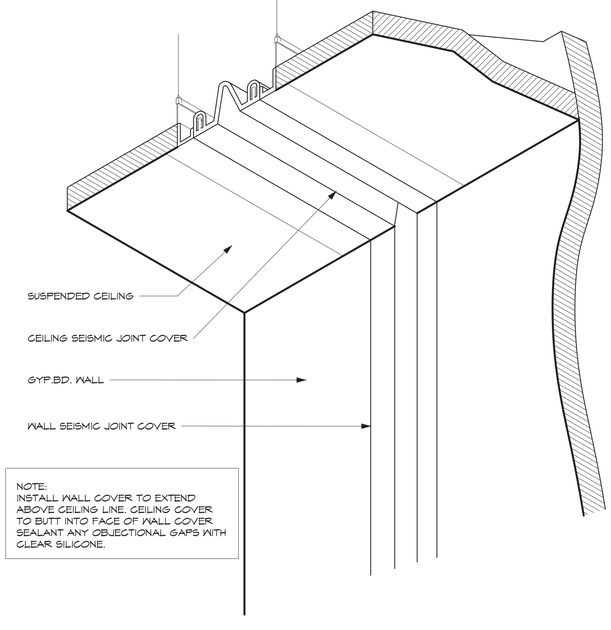
6 3" INTERIOR FLOOR TO WALL COVER

SCALE: 3" = 1'-0"



7 3" ROOF COVER

SCALE: 3" = 1'-0"



8 WALL TO CEILING COVER

SCALE: 3" = 1'-0"

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
EXPANSION DETAILS
PROGRAMMING DOCUMENT

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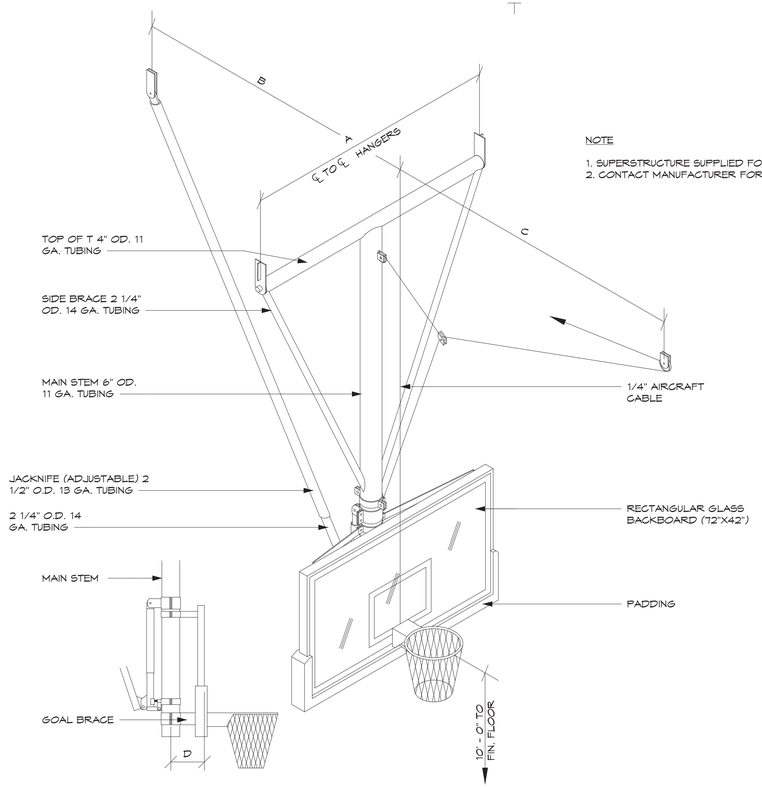
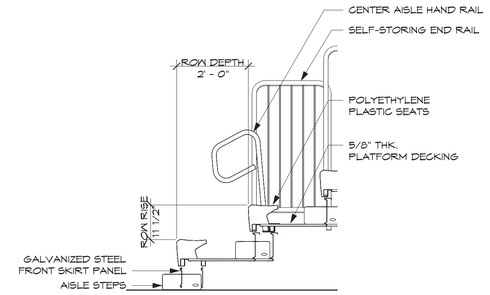


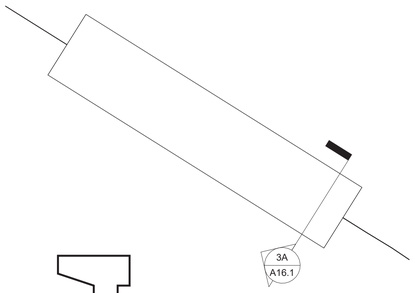
NOTE

1. SUPERSTRUCTURE SUPPLIED FOR EXISTING CONDITIONS
2. CONTACT MANUFACTURER FOR DIMENSIONS A, B, C

1 BASKETBALL GOAL
SCALE: 1/2" = 1'-0"

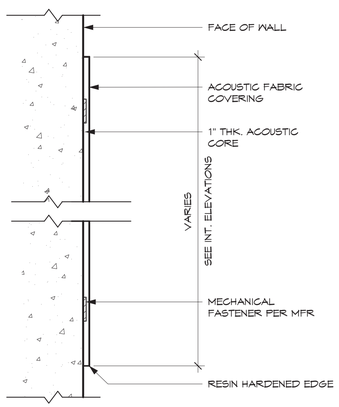


2 TELESCOPING BLEACHER DETAIL
SCALE: 1/2" = 1'-0"



SECTION

3 CONC. BENCH DETAIL
SCALE: 1/2" = 1'-0"



4 ACOUSTICAL WALL PANELS
SCALE: 1" = 1'-0"

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MISCELLANEOUS DETAILS
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GENERAL NOTES

-GENERAL CONSTRUCTION NOTES

1. OBSERVE & COMPLY WITH ALL FEDERAL AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY & ENVIRONMENTAL QUALITY.
2. THE FINISHED GRADE INDICATED HEREON SHALL MATCH OR CONNECT TO ADJACENT EXISTING GROUND AS SHOWN ON THE GRADING PLANS. ANY DISCREPANCY DISCOVERED DURING THE COURSE OF CONSTRUCTION SHALL BE IMMEDIATELY REPORTED TO THE CONSTRUCTION MANAGER.
3. ALL DEBRIS AND TRASH FROM CONSTRUCTION SHALL BE DISPOSED OF TO THE APPROVED LANDFILL SITE AND THE CONTRACTOR SHALL COMPLY WITH ALL THE REQUIREMENTS PERTAINING TO THE USE OF DISPOSAL AREA.
4. THE EXISTENCE AND LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES SHOWN IN THE PLANS ARE BASED ON THE LATEST AVAILABLE DATA DURING THE TIME OF SURVEY BUT NO GUARANTY AS TO THEIR ACCURACY. THE CONTRACTOR MUST SECURE UNDERGROUND CLEARANCES TO ALL UTILITY AGENCIES INVOLVE AND SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF EXISTING UTILITIES AND EXERCISE CAUTION WHEN EXCAVATING IN THE AREA. ANY DAMAGES TO EXISTING UTILITIES AND STRUCTURES RESULTING FROM CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT NO ADDITIONAL COST TO OWNER.
5. EXISTING UTILITIES SHALL REMAIN IN SERVICE AND IN PLACE AT ALL TIMES, UNLESS NOTED OTHERWISE. INTERRUPTION OF SERVICE SHALL BE KEPT TO A MINIMUM AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE OWNER'S REPRESENTATIVE AND UTILITY COMPANIES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO PROVIDE SAFE AND SECURE FROM POTENTIAL SLIDING, CAVE-INS, SETTLEMENT.
7. THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO AND FROM ALL DRIVEWAYS AND STREETS NEAR THE PROJECT SITE.
8. RESTORE TO THEIR ORIGINAL CONDITION EQUAL OR BETTER, ALL EXISTING IMPROVEMENTS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES, INCLUDING PAVEMENTS, EMBANKMENTS, DRIVEWAYS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, FENCES, ETC..
9. PROPERTY CORNERS AND ROAD MONUMENTS SHOWN ON THE PLANS OR DISCOVERED DURING CONSTRUCTION SHALL BE PRESERVED AND NOT TO BE DISTURBED. IN ANY CASE, IF THE CONTRACTOR DISTURBS ANY OF THESE MARKERS OR MONUMENTS, THEY SHALL BE REPAIRED AND RESTORED TO THEIR ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO OWNER.
10. THE CONTRACTOR MUST SECURE UNDERGROUND TELEPHONE, CABLE, POWER, WATER, AND WASTEWATER CLEARANCES PRIOR TO ANY EXCAVATIONS. ANY DAMAGES AND REPAIRS TO UNDERGROUND UTILITIES SHALL BE BORNE BY THE CONTRACTOR. ALL RELOCATION COSTS OR REQUESTS FOR IMPROVEMENT OF FACILITIES, INCLUDING MATERIAL & LABOR SHALL BE BURDENED BY THE CONTRACTOR OR REQUESTING AGENCY. EITHER PARTY SHALL MAKE APPLICATION & SUBMIT APPROVED RELOCATION PLANS TO RESPONSIBLE AGENCY OR AGENCIES PRIOR TO ANY RELOCATION WORK.
11. EXCAVATIONS WITHIN 5 TO 10 FEET FROM EXISTING POWER POLES AND DEEPER THAN 3 FEET SHALL HAVE TRENCH SHORING. IF EXCAVATION IS DEEPER THAN 3 FEET AND WITHIN 5 FEET FROM AN EXISTING POWER POLE, THE POWER POLE SHALL BE RELOCATED. IN ANY CASE, THE CONTRACTOR SHALL PROTECT THE INTEGRITY OF THE POLE FOUNDATION. ALL RELOCATION COSTS INCLUDING LABOR AND MATERIALS SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT/MAKE APPLICATION WITH GPA AND SUBMIT GPA APPROVED RELOCATION PLANS PRIOR TO ANY MATERIALS ISSUED OR INSPECTIONS PERFORMED BY GPA. PROVIDE 12 INCHES MINIMUM CLEARANCE BETWEEN GPA POWER CONDUITS AND ALL NEW INSTALLATIONS. THE CONTRACTOR SHALL SECURE WORK CLEARANCE WITH GPA PRIOR TO EXCAVATION.
12. ALL OTHER EXISTING UTILITY APPURTENANCES THAT ARE NOT SHOWN IN THE PLANS SUCH AS MANHOLE, VALVE BOXES, WATER METER, ETC. THAT ARE OR WILL BE AFFECTED BY THE NEW CONSTRUCTION SHALL BE ADJUSTED OR RELOCATED ACCORDINGLY.
13. LOCATION OF OTHER EXISTING UTILITY STRUCTURES THAT ARE NOT SHOWN IN THE PLANS BUT UNCOVERED DURING THE CONSTRUCTION SHALL BE RECORDED OR DOCUMENTED AND MUST BE REFLECTED IN THE AS-BUILT (RECORD) DRAWINGS.

-EROSION/TEMPORARY DUST CONTROL

1. DURING CONSTRUCTION, PREVENTIVE MEASURES SHALL BE USED TO CONTROL OR MINIMIZE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS WORK PROGRESSES. SPRINKLE OR TREAT WITH DUST SUPPRESSANT THE WORK AREA, HAUL ROADS, AND OTHER AREAS AFFECTED BY OR DISTURBED BY THE CONSTRUCTION ACTIVITIES.
2. THE CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL MEASURES TO PREVENT EROSION OR SEDIMENTATION WITHIN THE PROJECT SITE AND ADJACENT PROPERTIES. EROSION CONTROL MEASURES MAY BE FROM SILT FENCES, SAND BAGS, OR ANY OTHER MEANS BEST SUITED FOR THE INTENDED PURPOSE.
3. PROVIDE PREVENTIVE EROSION CONTROL MEASURES ON ALL CUT & FILL SLOPES AS PER GEPA AND SWPPP REQUIREMENTS.

-EROSION & SEDIMENT CONTROL INSPECTION & MAINTENANCE PRACTICES

1. ALL CONTROL MEASURES MUST BE INSPECTED AT LEAST ONCE A WEEK AND FOLLOWING ANY RAINFALL EVENT OF 0.5 INCHES OR GREATER.
2. ALL MEASURES MUST BE MAINTAINED IN GOOD WORKING ORDER. IF REPAIR IS NECESSARY, IT MUST BE INITIATED WITHIN 24 HOURS AFTER THE INSPECTIONS
3. A MAINTENANCE INSPECTION REPORT MUST BE MADE PROMPTLY AFTER EACH INSPECTION BY THE CONTRACTOR.
4. THE CONTRACTOR MUST SELECT A MINIMUM OF ONE PERSON WHO WILL BE RESPONSIBLE FOR INSPECTIONS. MAINTENANCE AND REPAIR ACTIVITIES AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.
5. PERSONNEL SELECTED FOR THE INSPECTION AND MAINTENANCE RESPONSIBILITIES MUST RECEIVE TRAINING FROM THE CONTRACTOR. THEY MUST BE TRAINED IN ALL THE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS USED ON-SITE IN GOOD WORKING ORDER.
6. THE AREA OF LAND TO BE GRADE AT ANY ONE TIME DURING DEVELOPMENT OR CONSTRUCTION MUST BE KEPT TO A MINIMUM. GRADED AREAS CANNOT REMAIN UNSTABILIZED FOR A PERIOD EXCEEDING TWO (2) MONTHS.
7. ALL DISTURBED AREAS, SLOPES, CHANNELS, DITCHES AND BANKS MUST BE STABILIZED AS SOON AS POSSIBLE AFTER THE FINAL GRADE HAS BEEN COMPLETED.
8. STORMWATER RUNOFF FROM DISTURBED AREAS OF A PROJECT MUST BE COLLECTED AND DIVERTED TO FACILITIES FOR REMOVAL OF SEDIMENT PRIOR TO DISCHARGE TO ANY SURFACE OR MAIN WATERS OF THE TERRITORY.
9. CONTRACTOR MUST PROVIDE CONCRETE WASH AREA FOR PROJECT. SEE SHEET 3/C2.2 FOR DETAIL.
10. EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE PLANS REPRESENT THE MINIMUM REQUIREMENTS. CONTRACTOR MUST ADJUST EROSION AND SEDIMENT CONTROL MEASURES TO PROVIDE THE BEST MANAGEMENT PRACTICES TO ADDRESS THE REQUIREMENTS OF GUAM PUBLIC LAW 25-12 AMEND, THE GUAM ENVIRONMENTAL SEDIMENTATION CONTROL REGULATIONS, AND AS CONSTRUCTION PHASING AND SEQUENCING REQUIRES. ANY REVISIONS AND/OR CHANGES AS A RESULT OF THESE CONDITIONS MUST REQUIRE REVIEW AND APPROVAL BY THE CONSTRUCTION MANAGER.

-ENVIRONMENTAL PROTECTION

1. ALL CONSTRUCTION ACTIVITIES MUST BE IN CONFORMANCE WITH APPLICABLE FEDERAL LAWS, REGULATIONS, ORDINANCES AND ALL APPLICABLE STATION REQUIREMENTS FOR POLLUTION CONTROL. BEST MANAGEMENT PRACTICES MUST BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.
2. NO BURNING OR BURYING OF DEBRIS AND/OR WASTE MATERIAL. EXCEPT FOR MATERIALS WHICH ARE SPECIFICALLY INDICATED ON THE PLANS OR SPECIFICATIONS AS SUITABLE FOR BACKFILL MUST BE PERMITTED ON THE SITE.
3. ALL UNUSABLE DEBRIS AND WASTE MATERIAL MUST BE TRANSPORTED TO A LANDFILL. ALL GREEN WASTE MUST BE DISPOSED FOLLOWING THE APPROVED HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) MEASURES.
4. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO PREVENT THE POLLUTION OF WATER RESOURCES FROM FUELS, OILS, BITUMENS, CALCIUM CHLORIDE, HERBICIDES, PESTICIDES, CHEMICALS, OR OTHER HARMFUL MATERIALS.

-TURF ESTABLISHMENT

1. NEWLY GRADED SLOPES AND EMBANKMENTS, LANDSCAPE AREA AND AREAS DISTURBED DURING CONSTRUCTION, EXCEPT FOR PONDING BASIN, SHALL BE PROVIDED WITH 4" THICK TOP SOIL AND PLANTED WITH SEEDS OR TURF APPROPRIATE FOR THE TYPE OF SOILS AT THE SITE. COORDINATE WITH THE ENGINEER FOR TYPE OF SEED OR PLANTINGS TO BE USED. MAKE USE OF EXISTING TOP SOILS AT THE SITE, AS MUCH AS POSSIBLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF SEEDS OR PLANTINGS UNTIL A 95% GROUND COVER IS ATTAINED.

-TRAFFIC CONTROL NOTES, AS NEEDED

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL CONFORM WITH THE LOCAL TRAFFIC REGULATIONS AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) FOR STREETS AND HIGHWAYS, PART VI – STANDARDS AND GUIDES FOR TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY, AND INCIDENT MANAGEMENT OPERATIONS.
2. DURING NON-WORKING HOURS, ALL LANES OF ROADWAY SHALL BE OPEN TO TRAFFIC. ALL TRENCHES SHALL BE COVERED WITH A SAFE NONSKID BRIDGING MATERIAL WITH SUITABLE MATERIAL AT THE EDGES TO PROVIDE A SMOOTH TRANSITION.
3. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND MARKINGS DISTURBED BY THE CONTRACTOR'S ACTIVITIES TO EXISTING CONDITIONS OR BETTER.
4. THE CONTRACTOR SHALL COORDINATE ALL TRAFFIC CONTROL PLANS WITH THE DOCOMO PACIFIC, GUAM'S REPRESENTATIVE AND DEPARTMENT OF PUBLIC WORKS.
5. COMPLY WITH GOVERNMENT OF GUAM REQUIREMENTS FOR WORK ALONGSIDE PUBLIC HIGHWAYS. SUBMIT TRAFFIC CONTROL PLAN, AS REQUIRED, TO SECURE CLEARANCES AND PERMITS.

-DRAWING UNITS

1. ALL COORDINATES, RADIUS STATIONING, AND DIMENSIONS SHOWN ARE IN FEET, UNLESS OTHERWISE NOTED.
2. CONTROL POINTS REFERENCE (STATION/OFFSET DISTANCE AND COORDINATES)
   - A. MANHOLES: AT CENTER OF STRUCTURE
   - B. INLET: AT CENTER OF INLET
   - C. HEADWALL: AT FACE / CENTER OF HEADWALL
   - D. SWALES: AT CENTER OF SWALE
   - E. CONCRETE CURB/ CONCRETE CURB & GUTTER – @ FACE OF CURB
   - F. WALKWAY – @ CORNER
   - G. FENCES/GATES – @ CENTER OF POST

LEGEND, SYMBOLS, AND ABBREVIATIONS

ABBREVIATION / SYMBOLS	DESCRIPTION	ABBREVIATION / SYMBOLS	DESCRIPTION
AC/ AC	ASPHALT CONCRETE	L	LENGTH
AP	CONCRETE APRON	*/LP	LIGHT POST
@	AT	MAX	MAXIMUM
ARCH	ARCHITECT		TREE
BC	BOTTOM OF CURB	MECH	MECHANICAL
BLDG	BUILDING	MJ	MECHANICAL JOINT
BOT	BOTTOM	MAX	MAXIMUM
BS	BOTTOM SIDEWALK	MIN	MINIMUM
BW	BOTTOM OF WALL	N	NORTH/NORTHING
	BACKFLOW PREVENTER	O.C.	ON CENTER
CB	CATCH BASIN	OD	OUTSIDE DIAMETER
CHB	CHORD BEARING	PC	POINT OF CURVATURE
CHD	CHORD DISTANCE	POC	POINT OF CONNECTION
℄	CENTER LINE	PSI	POUNDS PER SQUARE INCH
CMU	CONCRETE MASONRY UNIT	PT	POINT OF TANGENCY
CO	CLEAN OUT	PVMT	PAVEMENT
CONC	CONCRETE	PVC	POLY VINYL CHLORIDE
/CPAD	CONCRETE PAD	R	RADIUS
CPP	CONCRETE POWER POLE	RCP	REINFORCED CONCRETE PIPE
	COCONUT/PALM TREE	RWT	RAIN WATER TANK
	CONCRETE POWER POLE (CPP)		STORM DRAINAGE MANHOLE (SDMH)
CONT	CONTINUOUS	SL	SEWER LINE
Δ	DELTA		SEWER MANHOLE (SMH)
DWG/S	DRAWING/S		SHRUB
ø	DIAMETER		SIGN
DIP	DUCTILE IRON PIPE	S	SLOPE
DL	DRAINAGE LINE	SOW	SCOPE OF WORKS
------	EDGE OF VEGETATION	SQ FT/SF	SQUARE FOOT
E	EASTING/EAST		SWALE/ FLOW DIRECTION
EG	EXISTING GRADE	STA	STATION
ELEC	ELECTRIC	STD	STANDARD
EL/ELEV	ELEVATION	SYMM	SYMMETRICAL
EHH	ELECTRICAL HANDHOLE	T	TANGENCY
EMH	ELECTRICAL MANHOLE	TEL/	TELEPHONE
EXIST/(E)	EXISTING	TP/	TELEPHONE PEDESTAL
385	EXISTING CONTOUR LINE		TEMPORARY BENCHMARK
-x-x-x-	FENCE LINE		TREE
400	FINISHED CONTOUR LINE	TBD	TO BE DETERMINED
FE	FLANGED END	TC	TOP OF CURB
FFE	FINISHED FLOOR ELEVATION	THK	THICK
FG	FINISHED GRADE	TR	TOP OF RIPRAP
FL	FIRE LINE	TRN	TRANSFORMER
FT	FOOT/FEET	TS	TOP OF SIDEWALK
	FIRE HYDRANT (FH)	TW	TOP OF WALL
	GATE	TYP	TYPICAL
	GATE POST (GP)	UNO	UNLESS NOTED OTHERWISE
	GATE VALVE (GV)	VERT	VERTICAL
/GGN	GUAM GEODETIC NETWORK	WL	WATERLINE
	GUY WIRE (GW)		WATER METER (WM)
GA	GAUGE		WOODEN POWER POLE (WPP)
GALV	GALVANIZED		
INT	INTERSECTION		
Δ	INTERSECTION ANGLE		
INV	INVERT		

SURVEY NOTES

1. HORIZONTAL CONTROL SURVEY WAS BASED ON FOUND CORNERS AND GUAM GEODETIC NETWORK (GGN) MONUMENT NO. 642 AS SHOWN IN SHEET C1.3.
2. VERTICAL DATUM IS BASED ON GUAM GEODETIC NETWORK (GGN) MONUMENT NO. 642 WITH AN ELEVATION OF 451.11' MEAN SEA LEVEL (MSL).
3. BEARINGS AND DISTANCES ARE 1993 GRID AND ARE FIELD CONDITIONS.
4. ALL DISTANCES, COORDINATES, DIMENSIONS AND ELEVATIONS AS SHOWN ARE IN FEET AND DECIMALS THEREOF.
5. CONTOURS WERE DEVELOPED FROM SPOT ELEVATIONS USING STANDARD GROUND TOPOGRAPHY METHOD.

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GENERAL NOTES, LEGENDS, SYMBOLS, & ABBREVIATION

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

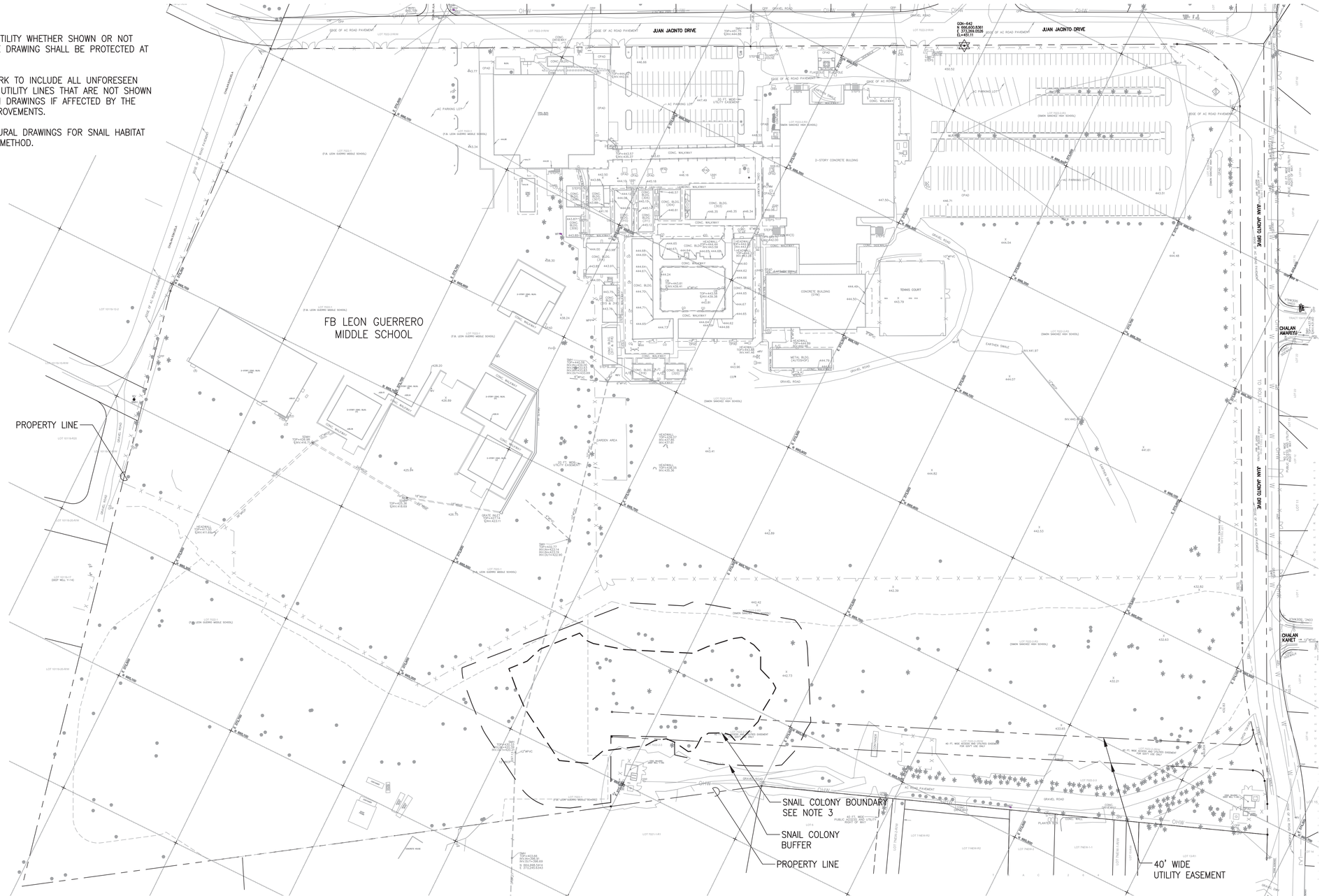
Drawing
C0.1

Sheet No. _____ of _____

NOT FOR CONSTRUCTION

NOTES:

1. ALL EXISTING UTILITY WHETHER SHOWN OR NOT SHOWN ON THE DRAWING SHALL BE PROTECTED AT ALL TIMES.
2. DEMOLITION WORK TO INCLUDE ALL UNFORESEEN UNDERGROUND UTILITY LINES THAT ARE NOT SHOWN ON THE DESIGN DRAWINGS IF AFFECTED BY THE PROPOSED IMPROVEMENTS.
3. SEE ARCHITECTURAL DRAWINGS FOR SNAIL HABITAT CONSERVATION METHOD.



OVERALL EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: 1"=80'-0"

PLAN NORTH

80' 0' 80' 160'

SCALE: 1"=80'

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Title:
OVERALL EXISTING CONDITIONS AND DEMOLITION PLAN

PROGRAMMING DOCUMENT

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Project No.	Title

Drawing
C1.0

Sheet No. _____ of _____

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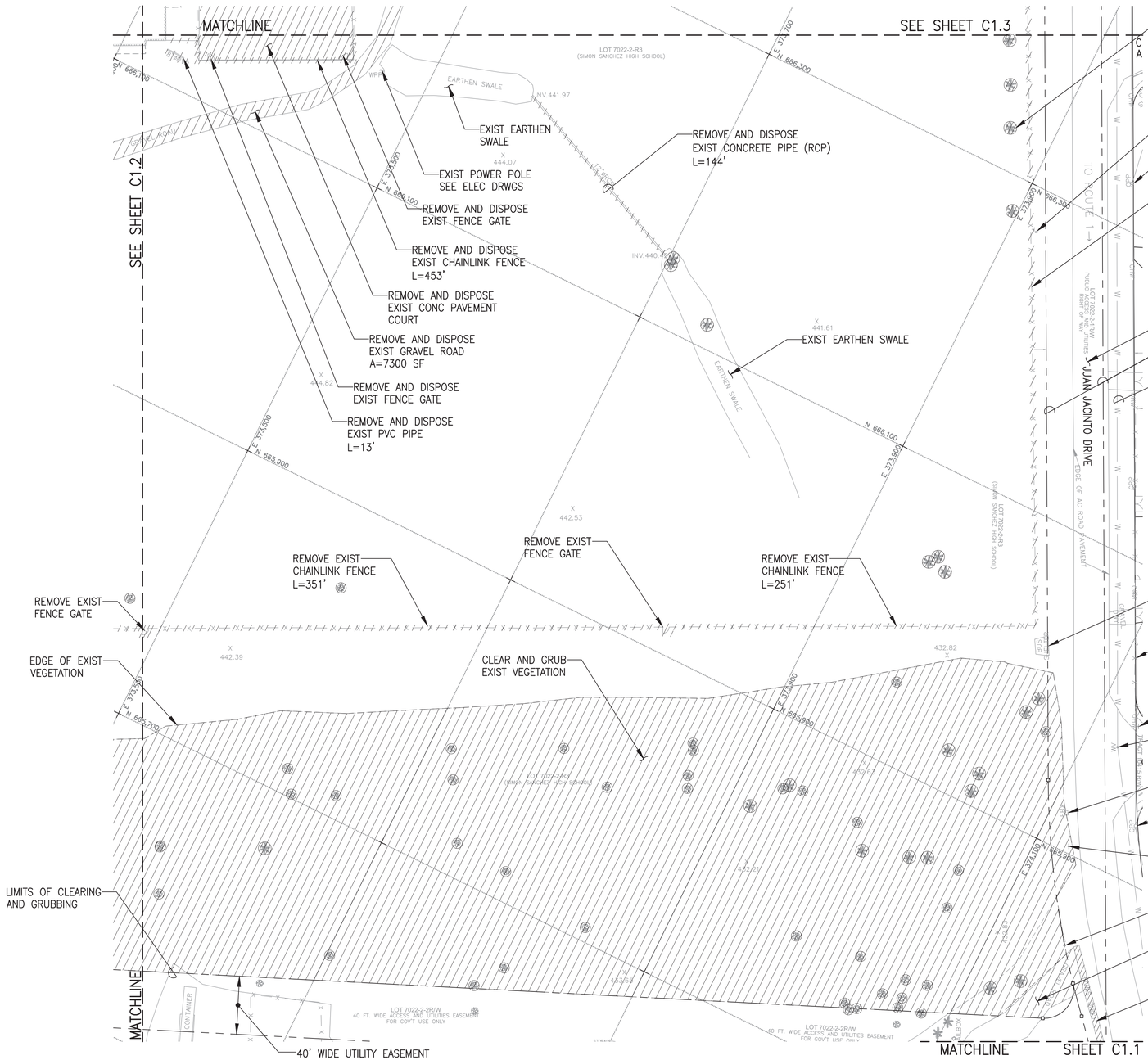


EXISTING CONDITIONS AND DEMOLITION PLAN - 1

SCALE: 1"=40'-0"

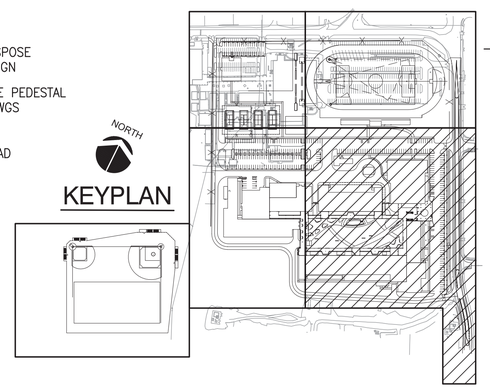
LEGEND:

DEMOLITION AREA

NOTES:

1. ALL EXISTING UTILITY WHETHER SHOWN OR NOT SHOWN ON THE DRAWING SHALL BE PROTECTED AT ALL TIMES.
2. DEMOLITION WORK TO INCLUDE ALL UNFORESEEN UNDERGROUND UTILITY LINES THAT ARE NOT SHOWN ON THE DESIGN DRAWINGS IF AFFECTED BY THE PROPOSED IMPROVEMENTS.

KEYPLAN



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Title:
EXISTING CONDITIONS AND DEMOLITION PLAN - 1
PROGRAMMING DOCUMENT

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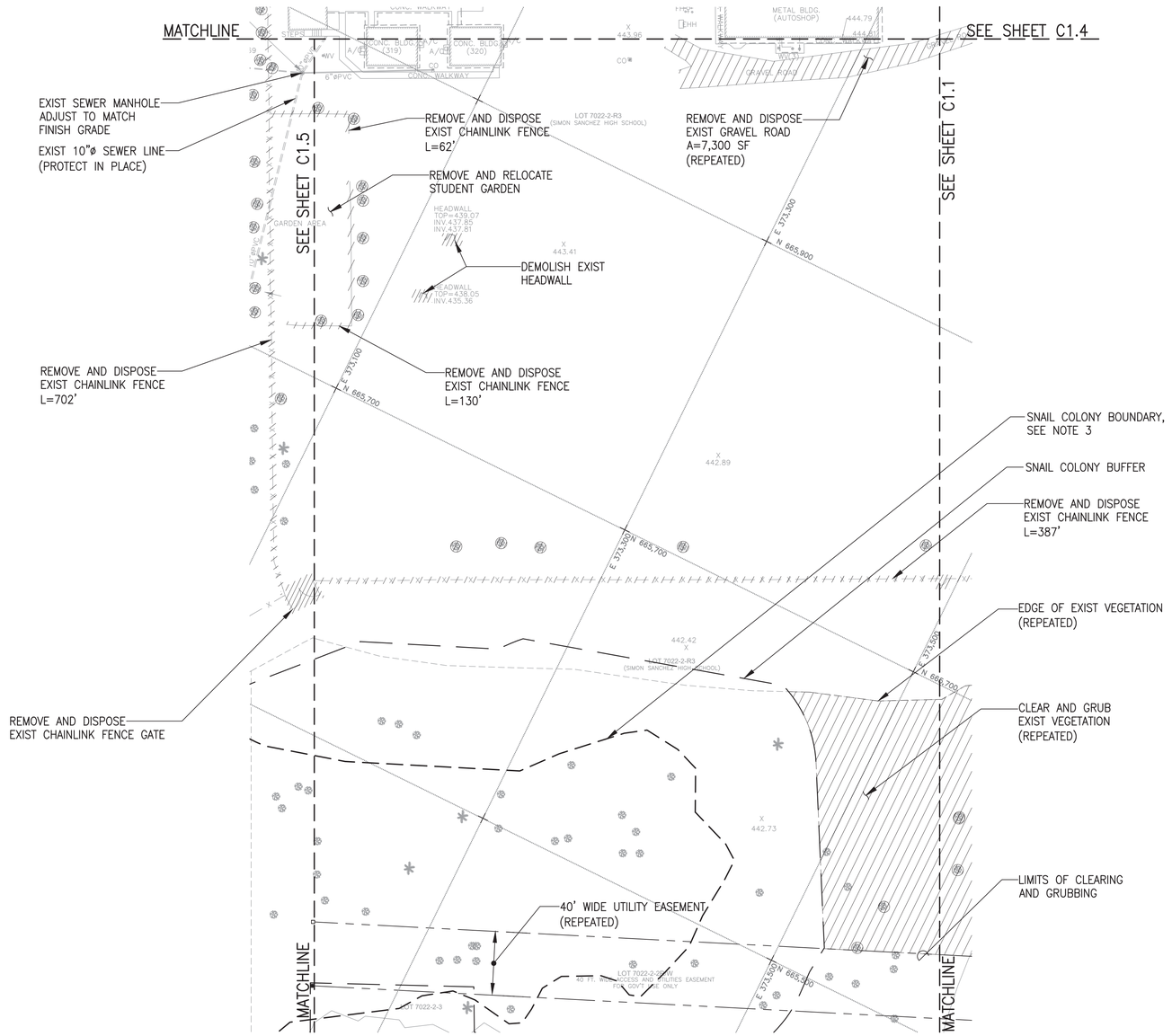
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C1.1

Sheet No: _____ of _____



EXISTING CONDITIONS AND DEMOLITION PLAN - 2

SCALE: 1"=40'-0"

PLAN NORTH

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

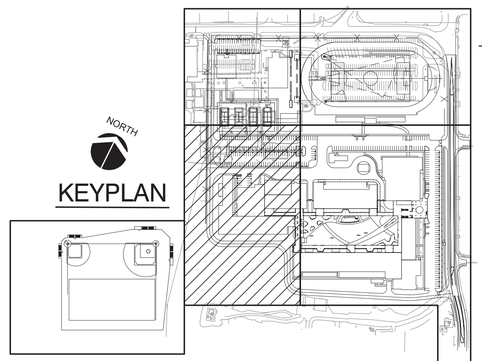
▨ – DEMOLITION AREA

NOTES:

1. ALL EXISTING UTILITY WHETHER SHOWN OR NOT SHOWN ON THE DRAWING SHALL BE PROTECTED AT ALL TIMES.
2. DEMOLITION WORK TO INCLUDE ALL UNFORESEEN UNDERGROUND UTILITY LINES THAT ARE NOT SHOWN ON THE DESIGN DRAWINGS IF AFFECTED BY THE PROPOSED IMPROVEMENTS.
3. SEE ARCHITECTURAL DRAWINGS FOR SNAIL HABITAT CONSERVATION METHOD.

NORTH

KEYPLAN



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Project:
GDOE
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Title:
EXISTING CONDITIONS AND DEMOLITION PLAN - 2
PROGRAMMING DOCUMENT

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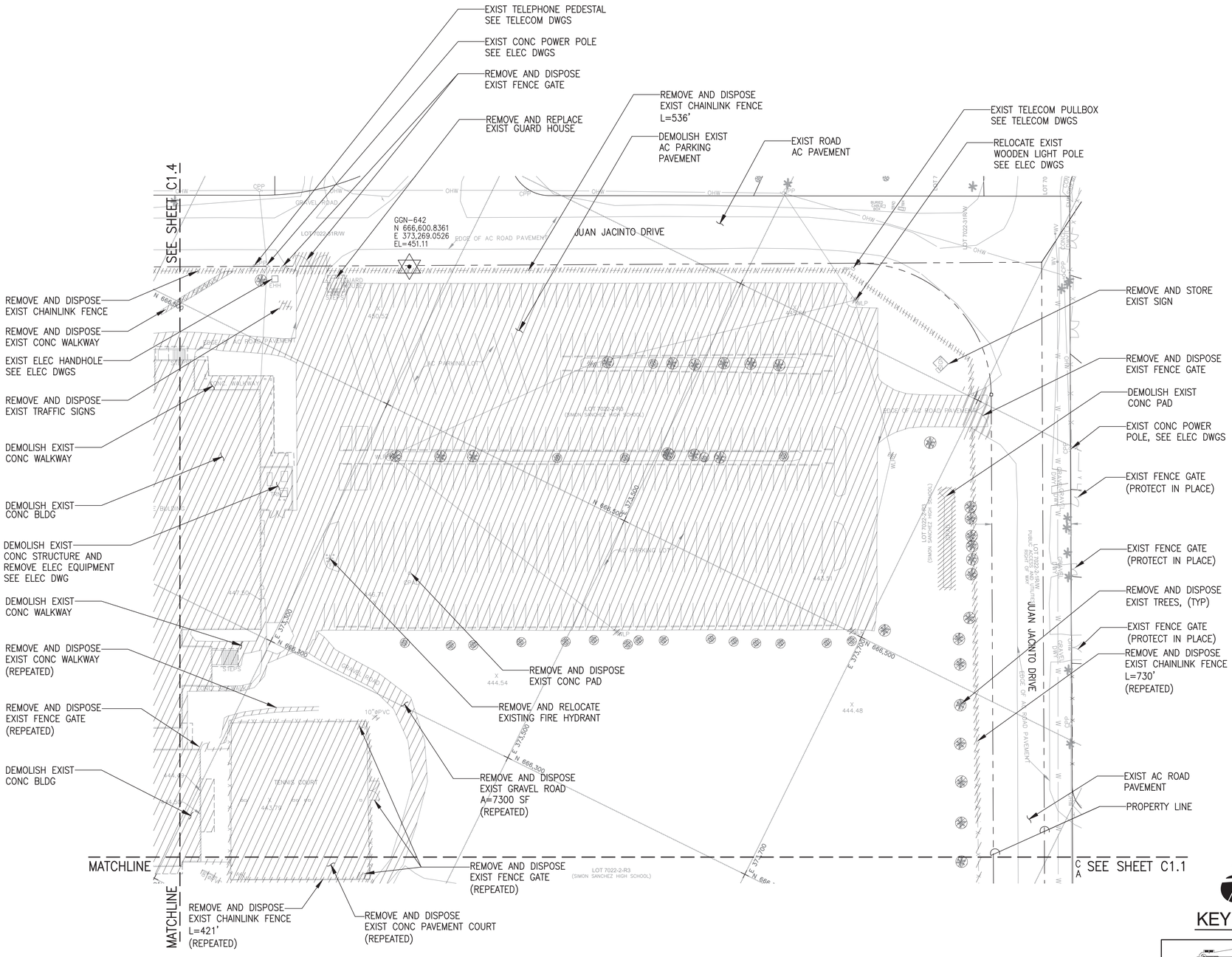
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C1.2

Sheet No. _____ of _____


EXIST TELEPHONE PEDESTAL
SEE TELECOM DWGS
EXIST CONC POWER POLE
SEE ELEC DWGS
REMOVE AND DISPOSE
EXIST FENCE GATE
REMOVE AND REPLACE
EXIST GUARD HOUSE
REMOVE AND DISPOSE
EXIST CHAINLINK FENCE
L=536'
DEMOLISH EXIST
AC PARKING
PAVEMENT
EXIST ROAD
AC PAVEMENT
EXIST TELECOM PULLBOX
SEE TELECOM DWGS
RELOCATE EXIST
WOODEN LIGHT POLE
SEE ELEC DWGS
SEE SHEET C1.4
GGN-642
N 666,600.8361
E 373,269.0526
EL=451.11
JUAN JACINTO DRIVE
REMOVE AND DISPOSE
EXIST CHAINLINK FENCE
REMOVE AND DISPOSE
EXIST CONC WALKWAY
EXIST ELEC HANDHOLE
SEE ELEC DWGS
REMOVE AND DISPOSE
EXIST TRAFFIC SIGNS
DEMOLISH EXIST
CONC WALKWAY
DEMOLISH EXIST
CONC BLDG
DEMOLISH EXIST
CONC STRUCTURE AND
REMOVE ELEC EQUIPMENT
SEE ELEC DWG
DEMOLISH EXIST
CONC WALKWAY
REMOVE AND DISPOSE
EXIST CONC WALKWAY
(REPEATED)
REMOVE AND DISPOSE
EXIST FENCE GATE
(REPEATED)
DEMOLISH EXIST
CONC BLDG
REMOVE AND DISPOSE
EXIST CONC PAD
REMOVE AND RELOCATE
EXISTING FIRE HYDRANT
REMOVE AND DISPOSE
EXIST GRAVEL ROAD
A=7300 SF
(REPEATED)
REMOVE AND DISPOSE
EXIST FENCE GATE
(REPEATED)
REMOVE AND DISPOSE
EXIST CHAINLINK FENCE
L=421'
(REPEATED)
REMOVE AND DISPOSE
EXIST CONC PAVEMENT COURT
(REPEATED)
MATCHLINE
MATCHLINE
REMOVE AND STORE
EXIST SIGN
REMOVE AND DISPOSE
EXIST FENCE GATE
DEMOLISH EXIST
CONC PAD
EXIST CONC POWER
POLE, SEE ELEC DWGS
EXIST FENCE GATE
(PROTECT IN PLACE)
EXIST FENCE GATE
(PROTECT IN PLACE)
REMOVE AND DISPOSE
EXIST TREES, (TYP)
EXIST FENCE GATE
(PROTECT IN PLACE)
REMOVE AND DISPOSE
EXIST CHAINLINK FENCE
L=730'
(REPEATED)
EXIST AC ROAD
PAVEMENT
PROPERTY LINE
C SEE SHEET C1.1
A
LOT 7022-2-R3
(SIMON SANCHEZ HIGH SCHOOL)
LOT 7022-2-R2
(SIMON SANCHEZ HIGH SCHOOL)
LOT 7022-316RW
LOT 7022-2-R1RW
LOT 70
LOT 7
N 666,500
E 373,500
E 373,300
N 666,300
E 373,700
N 666,300
E 373,700
N 666,
TENNIS COURT
BUILDING
GRAVEL ROAD
EDGE OF AC ROAD PAVEMENT
CONC WALKWAY
AC PARKING LOT
CPP
OHW
WLP
SMH
CBC
CBG
W
S
X
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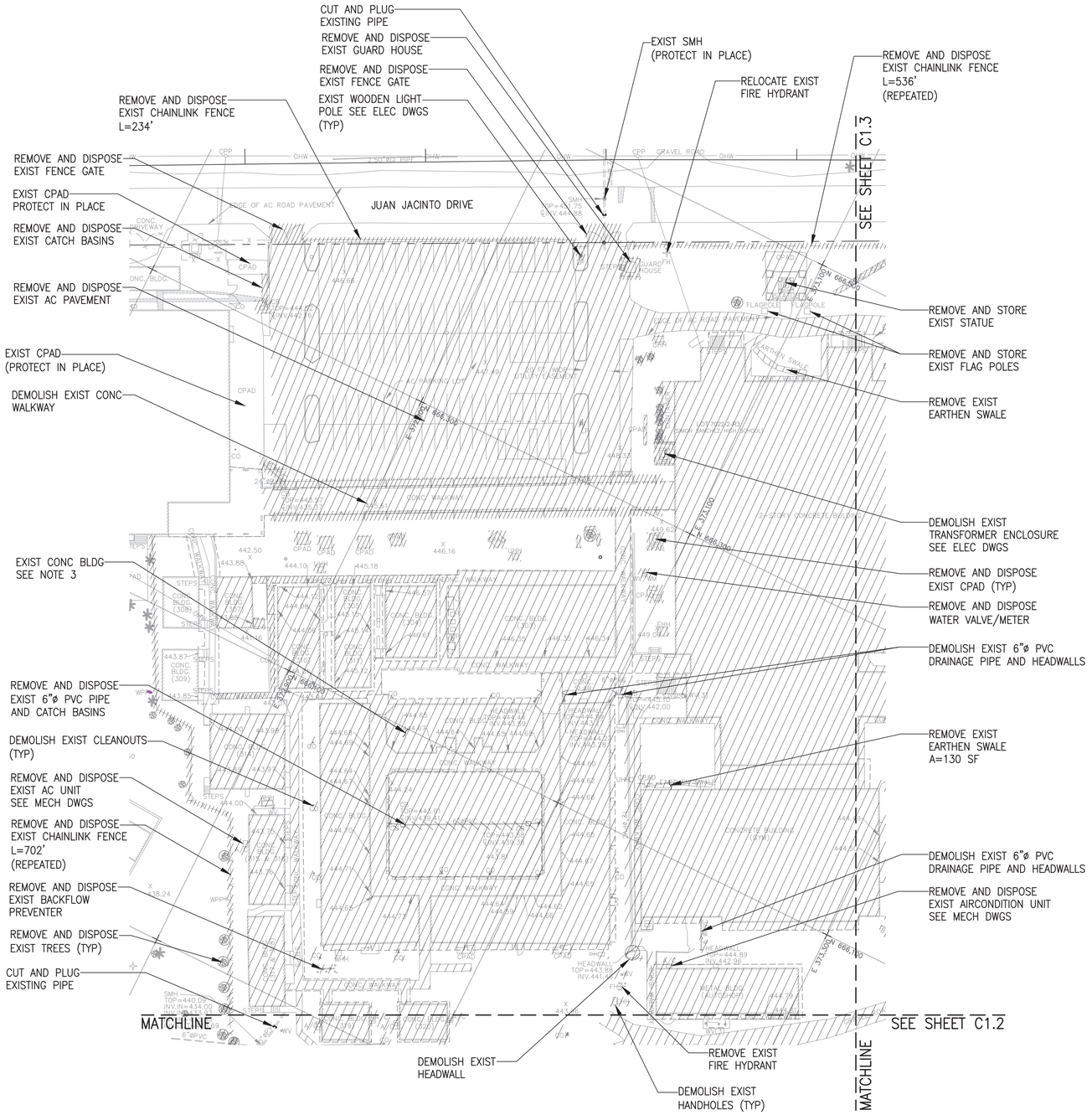


PLAN NORTH

EXISTING CONDITIONS AND DEMOLITION PLAN - 4

SCALE: 1"=40'-0"

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

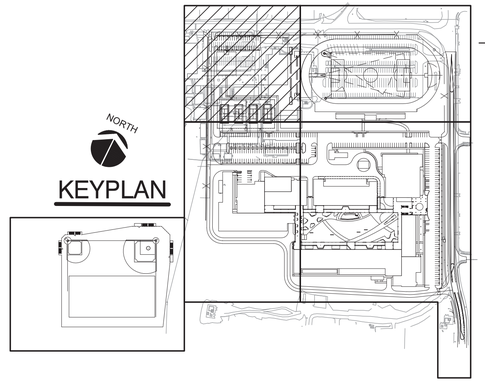
▨ – DEMOLITION AREA

NOTES:

1. ALL EXISTING UTILITY WHETHER SHOWN OR NOT SHOWN ON THE DRAWING SHALL BE PROTECTED AT ALL TIMES.
2. DEMOLITION WORK TO INCLUDE ALL UNFORESEEN UNDERGROUND UTILITY LINES THAT ARE NOT SHOWN ON THE DESIGN DRAWINGS IF AFFECTED BY THE PROPOSED IMPROVEMENTS.
3. SEE ARCHITECTURAL DRAWINGS FOR EXIST SSHS BLDG DEMOLITION.

NORTH

KEYPLAN



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
EXISTING CONDITIONS AND DEMOLITION PLAN - 4
PROGRAMMING DOCUMENT

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Project No.	Title

Drawing
C1.4

Sheet No. _____ of _____

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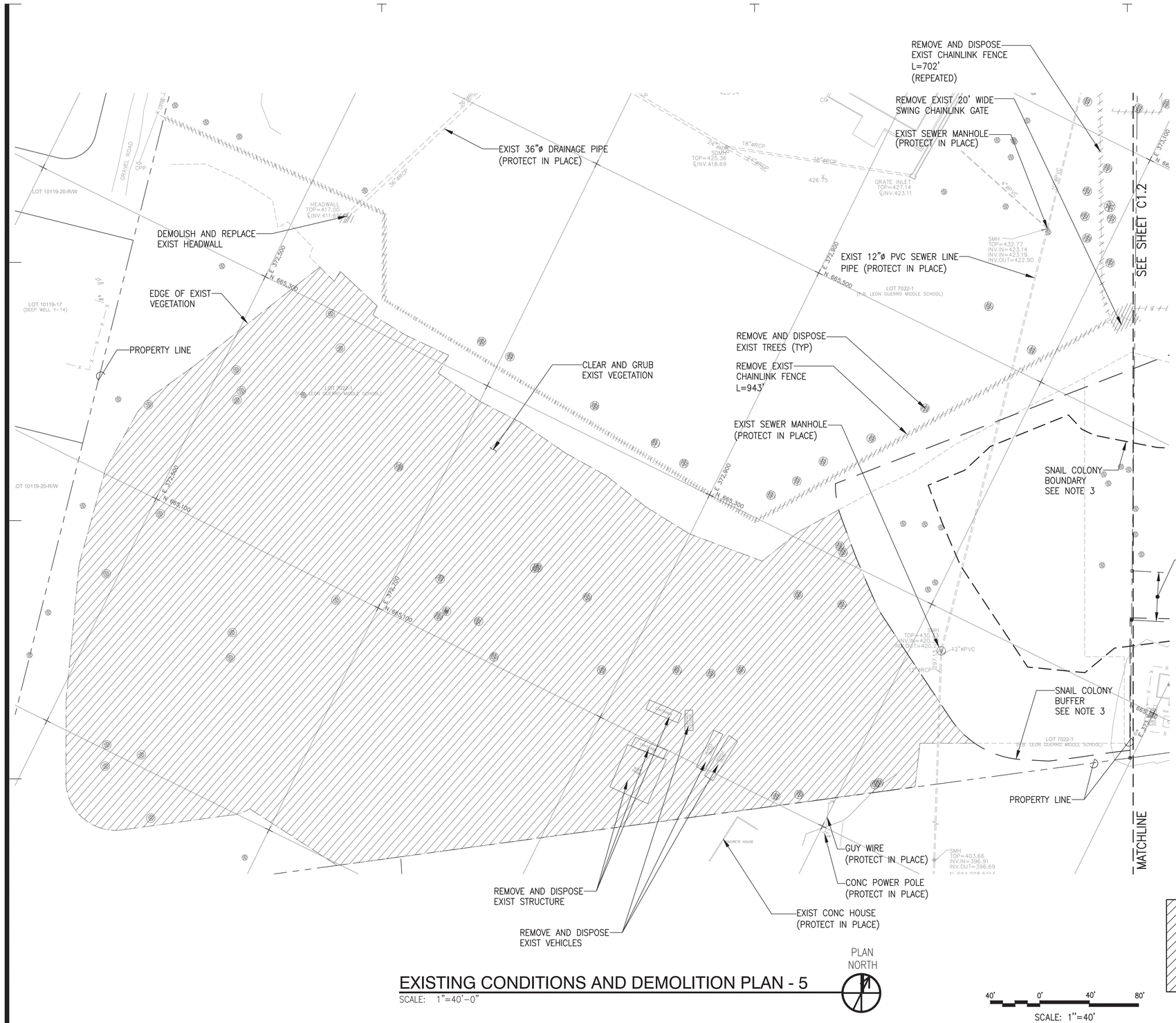

EXISTING CONDITIONS AND DEMOLITION PLAN - 5

SCALE: 1"=40'-0"

LEGEND:

▨ – DEMOLITION AREA

NOTE:

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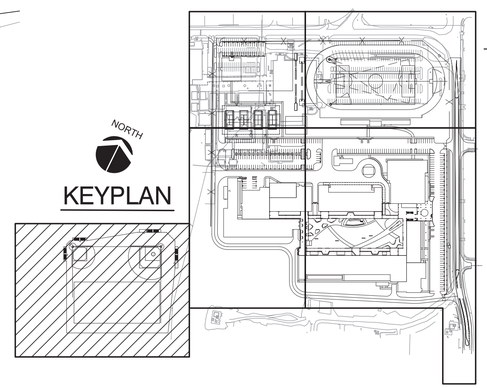
3. SEE ARCHITECTURAL DRAWINGS FOR SNAIL HABITAT CONSERVATION METHOD.

KEYPLAN



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Project:
GDOE
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Title:
EXISTING CONDITIONS AND DEMOLITION PLAN - 5
PROGRAMMING DOCUMENT

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Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C1.5

Sheet No. _____ of _____

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LEGEND:

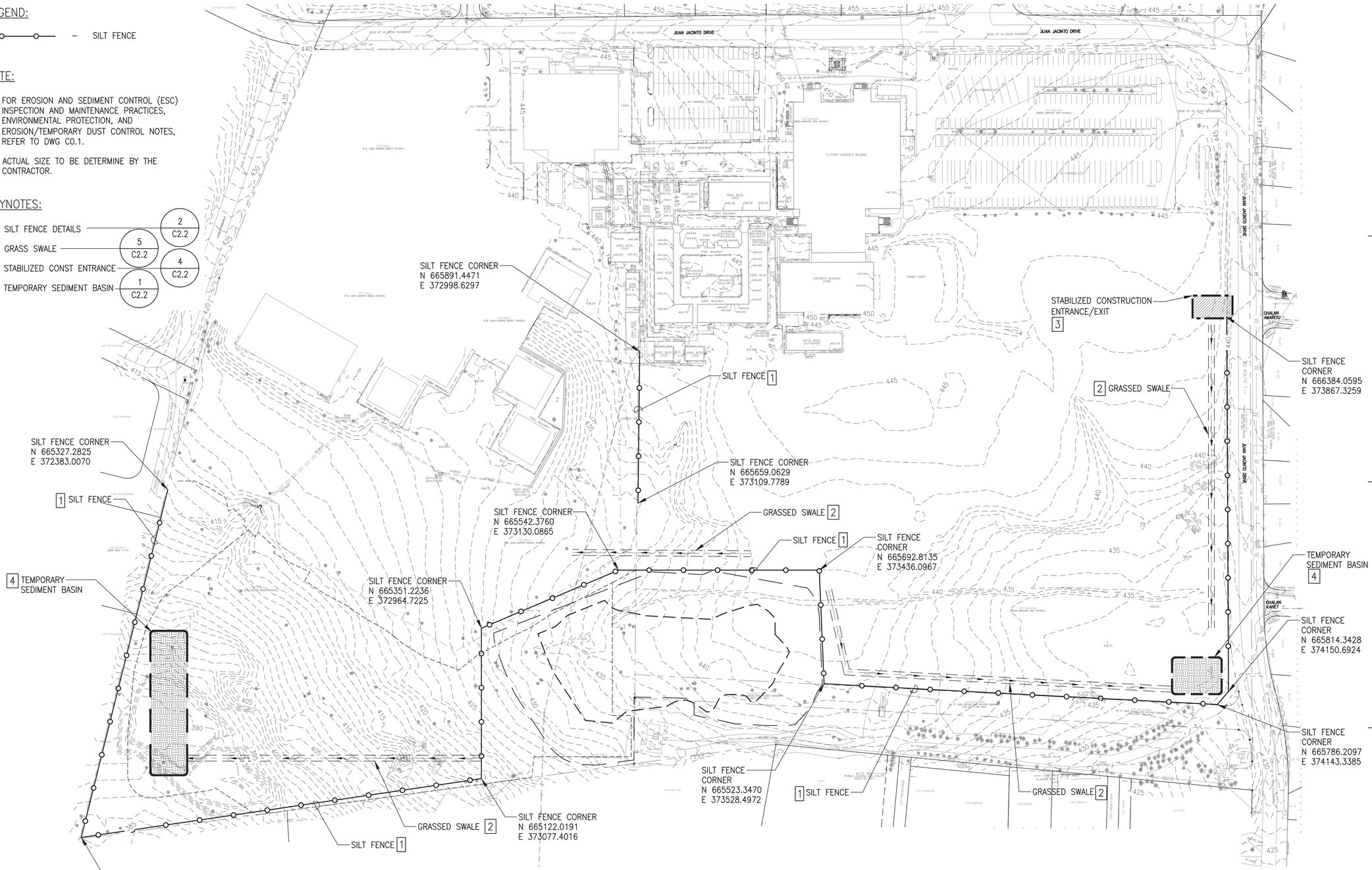
– SILT FENCE

NOTE:

1. FOR EROSION AND SEDIMENT CONTROL (ESC) INSPECTION AND MAINTENANCE PRACTICES, ENVIRONMENTAL PROTECTION, AND EROSION/TEMPORARY DUST CONTROL NOTES, REFER TO DWG C0.1.
2. ACTUAL SIZE TO BE DETERMINE BY THE CONTRACTOR.

KEYNOTES:

1. SILT FENCE DETAILS — 2 / C2.2
2. GRASS SWALE — 5 / C2.2
3. STABILIZED CONST ENTRANCE — 4 / C2.2
4. TEMPORARY SEDIMENT BASIN — 1 / C2.2



EROSION CONTROL PLAN - 1

SCALE: 1"=80'-0"

PLAN NORTH

80' 0' 80' 160'

SCALE: 1"=80'

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
EROSION CONTROL PLAN - 1

PROGRAMMING DOCUMENT

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Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C2.0

Sheet No. _____ of _____

LEGEND:

– SILT FENCE

NOTE:

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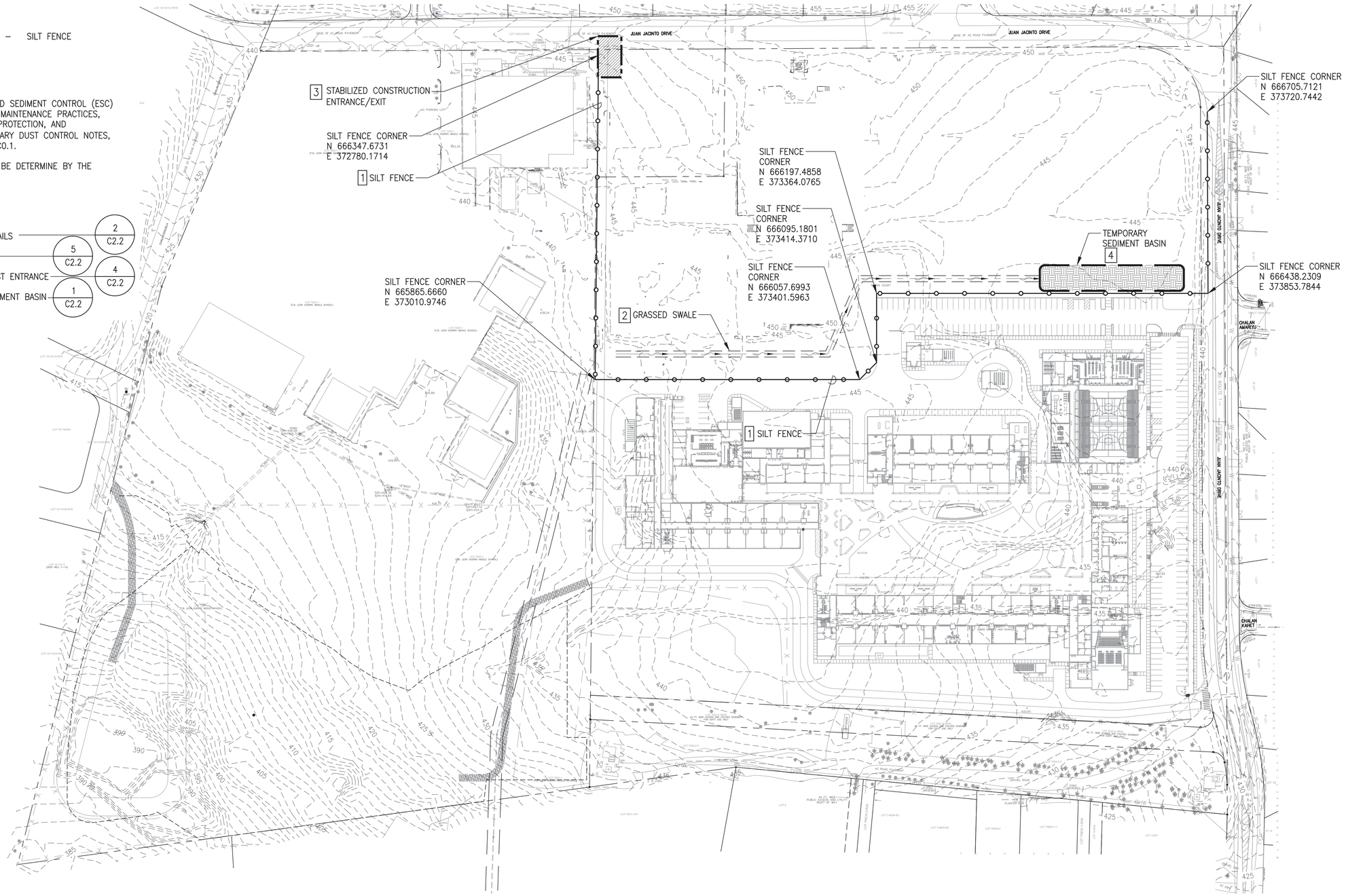
2. ACTUAL SIZE TO BE DETERMINE BY THE CONTRACTOR.

KEYNOTES:

1. SILT FENCE DETAILS — 2 / C2.2
2. GRASS SWALE — 5 / C2.2
3. STABILIZED CONST ENTRANCE — 4 / C2.2
4. TEMPORARY SEDIMENT BASIN — 1 / C2.2



EROSION CONTROL PLAN - 2
SCALE: 1"=80'-0"

PLAN NORTH

80' 0' 80' 160'
SCALE: 1"=80'

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Title:
EROSION CONTROL PLAN - 2

PROGRAMMING DOCUMENT

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Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C2.1

Sheet No: _____ of _____

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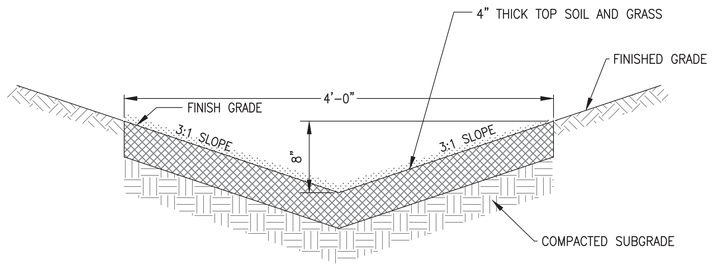
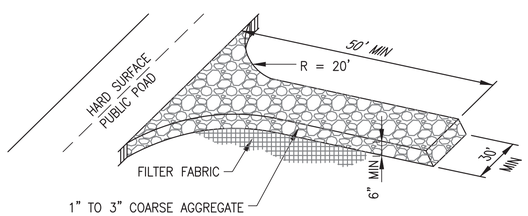


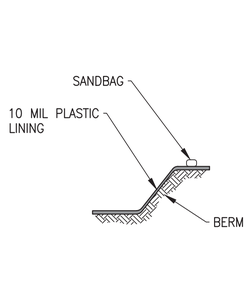
5 GRASSED SWALE (V-SHAPED)

NOT TO SCALE

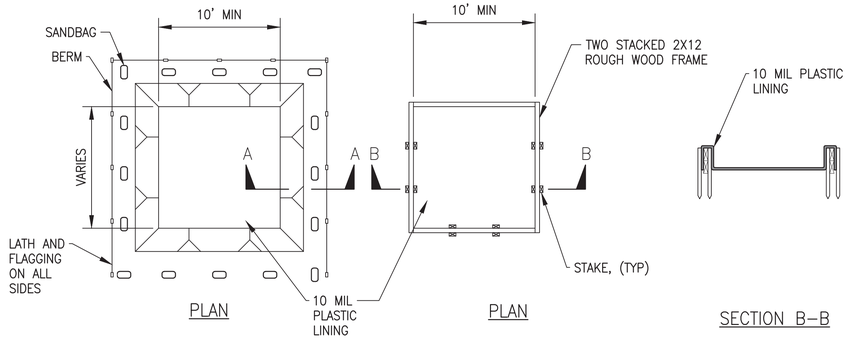


4 STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



SECTION A–A



CONCRETE VEHICLE WASH AREA
ABOVE GRADE

SECTION B–B

3 CONCRETE VEHICLE WASH AREA

NOT TO SCALE

NOTES:

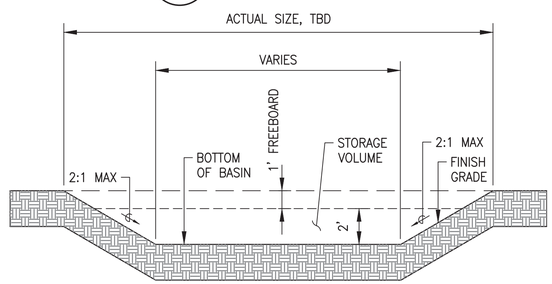
1. ACTUAL LAYOUT DETERMINE IN FIELD.
2. THE CONCRETE WASHOUT SIGN MUST BE INSTALLED WITHIN 30 FEET OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

NOTES:

1. DUST SCREEN MAY BE USED AS SILT FENCE IF GEOTEXTILE FABRIC MEETS THE SILT FENCE REQUIREMENTS.

2 SILT FENCE

NOT TO SCALE



NOTE:

1. FREEBOARD IS ADDITIONAL TO AND NOT INCLUDED IN THE MIN STORAGE VOLUME REQUIREMENT.
2. CONTRACTOR TO SIZE TEMPORARY SEDIMENT BASIN PER PROJECT REQUIREMENT.

1 TEMPORARY SEDIMENT BASIN

NOT TO SCALE

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
EROSION CONTROL DETAILS
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C2.2

Sheet No. _____ of _____

NOT FOR CONSTRUCTION

LEGEND:

- 2" THK AC PAVEMENT
- 3" THK AC PAVEMENT
- WALKWAY
- CROSSWALK

NOTES:

1. FOR SITE SECTIONS, SEE SHEET C7.1~C7.2.
2. FOR BID ITEMS SCOPE OF WORK, SEE ARCHITECTURAL SHEETS.

CONNECT TO 26' WIDE DOUBLE SWING GATE

FENCE CORNER N 666369.7317 E 372807.9028

RETAINING WALL A

JUAN JACINTO DRIVE

GGH-642 N 666,600.8361 E 373,269.0526 EL=451.11'

FENCE CORNER N 666745.1771 E 373561.5335

FENCE CORNER N 666707.5132 E 373706.4311

6' HIGH CHAINLINK FENCE

CONNECT TO EXIST FENCE

FENCE CORNER N 666347.1140 E 372779.0301

F.B.L.G. CAMPUS

CHALAN ESKUELA

CREDIT RECOVERY

SPORTS FIELD

FENCE CORNER N 665915.1204 E 372985.6558

FENCE CORNER N 665907.4812 E 372986.6646

FENCE CORNER N 666429.7229 E 373844.4000

FENCE CORNER N 665677.4276 E 373096.6928

FENCE CORNER N 666413.4578 E 373840.7876

CONNECT TO 26' WIDE DOUBLE SWING GATE

FENCE CORNER N 665222.4920 E 372497.5603

FENCE CORNER N 665379.4953 E 372370.1829

FENCE CORNER N 665385.6134 E 372503.1034

FENCE CORNER N 665666.6400 E 373074.7494

FENCE CORNER N 665569.1540 E 373139.1016

JROTC MULTIPURPOSE SPACE

GYMNASIUM

CAFETERIA

JROTC

B-WING CLASSROOMS

JUAN JACINTO DRIVE

CONNECT TO 14' WIDE DOUBLE SWING GATE

FENCE CORNER N 665396.8289 E 372525.9174

C-WING CLASSROOMS

RETAINING WALL B

FENCE CORNER N 665339.7221 E 372383.3866

CONNECT TO 14' WIDE DOUBLE SWING GATE

SOFTBALL

BASEBALL

ADMIN OFFICE

FENCE CORNER N 665207.7031 E 372466.9458

R=65'

R=65'

FENCE CORNER N 665554.5723 E 373154.8954

A-WING CLASSROOMS

AUDITORIUM

B C7.2

CONNECT TO 14' WIDE DOUBLE SWING GATE

CONNECT TO 26' WIDE DOUBLE SWING GATE

FENCE CORNER N 665126.3367 E 372446.8756

SNAIL COLONY BOUNDARY

NEW MULTI-PURPOSE FIELD

FENCE CORNER N 665214.3076 E 372514.0787

FENCE CORNER N 665682.8900 E 373415.9110

C C7.3

FENCE CORNER N 665184.5563 E 372600.8919

FENCE CORNER N 664896.2953 E 372496.6154

FENCE CORNER N 665667.8336 E 373460.0837

SNAIL COLONY BUFFER

R=65'

FENCE CORNER N 664979.5965 E 372701.6521

FENCE CORNER N 665523.4980 E 373531.0404

RETAINING WALL C

FENCE CORNER N 665756.4087 E 374075.0082

FENCE CORNER N 665796.7270 E 374137.9261

TO ROUTE 1

FENCE CORNER N 664737.5042 E 372513.5989

R=65'

FENCE CORNER N 664907.4666 E 372766.4925

FENCE CORNER N 664851.6998 E 372588.8234

FENCE CORNER N 664892.5873 E 372671.9960

PLAN NORTH

OVERALL SITE IMPROVEMENT PLAN

SCALE: 1"= 80'-0"

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NOT FOR CONSTRUCTION

REVISIONS

No.	Description	Date

TRMA

Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EL, Agana, GU 96910
Tel.: (671) 475-8772 • Fax : (671) 472-3381

Architecture
Planning
Interior Design

DCA S.A. DUEÑAS · CAMACHO
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■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL SITE IMPROVEMENT PLAN

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
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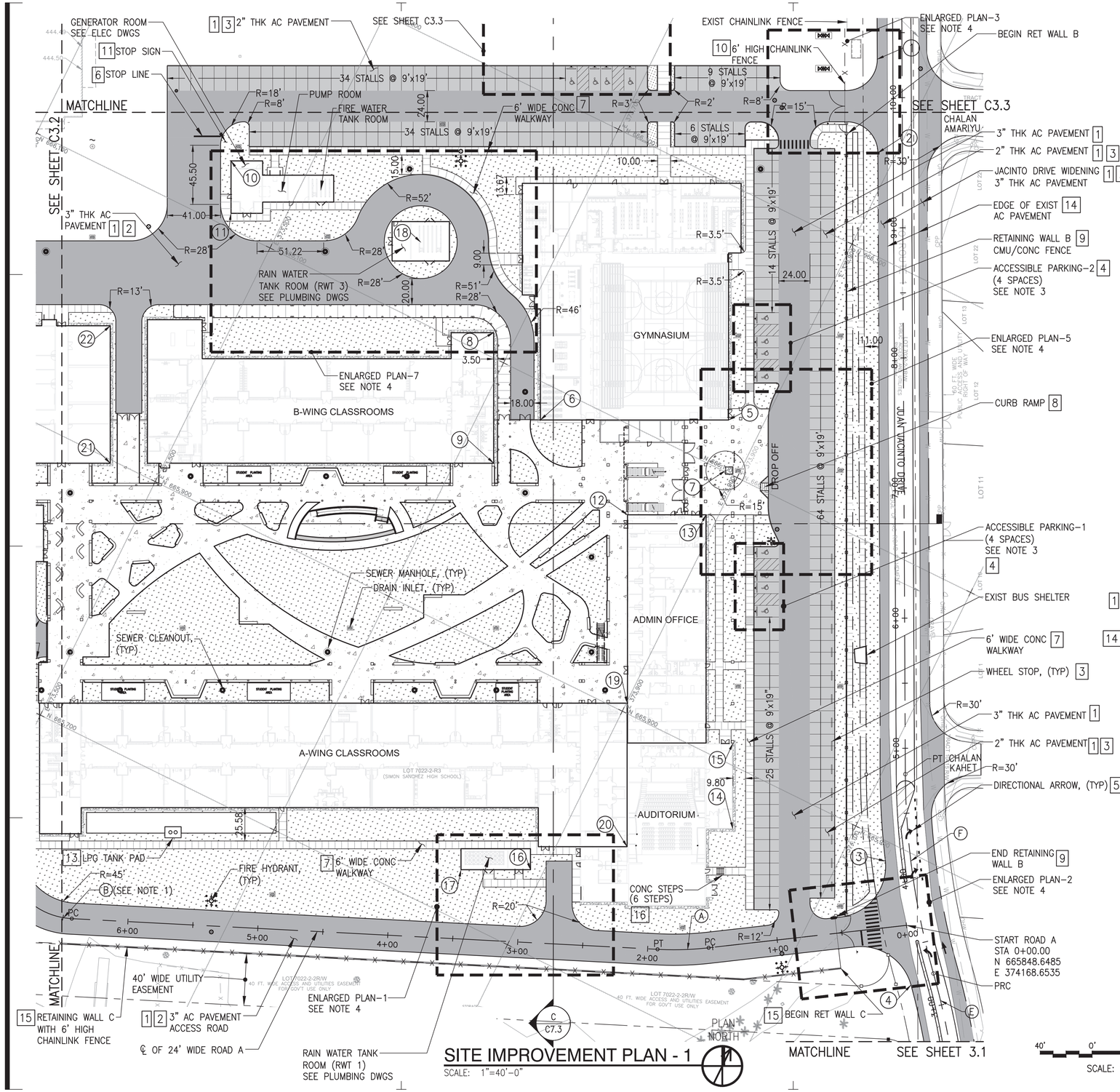
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

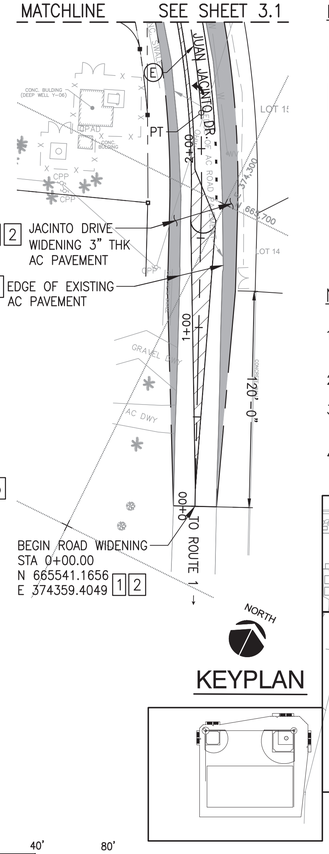
Drawing:
C3.0

Sheet No. ____ of ____



KEYNOTES:

1. PAVEMENT DETAILS — 2 / C9.8
2. TYPICAL ROAD SECTION — 1 / C9.8
3. TYPICAL PARKING STALL — 1 / C9.9
4. ACCESSIBLE PARKING DETAIL — 1 / C9.20
5. DIRECTIONAL ARROW — 6 / C9.10
6. CROSSWALK AND STOPLINE — 5 / C9.10
7. CONCRETE WALKWAY DETAILS — 2 / C9.9
8. CURB RAMP DETAIL — 5 / C9.9
9. CMU/CONC FENCE — 3 / C9.12
10. TYPICAL CHAINLINK FENCE — 1 / C9.11
11. SIGN DETAILS — 2 / C9.10
12. TRASH ENCLOSURE — 2 / C9.12
13. EQUIPMENT PAD DETAIL — 1 / C9.12
14. CONNECTION TO EXIST PAVEMENT — 3 / C9.8
15. CMU RETAINING WALL DETAILS — 4 / C9.11
16. CONC STEPS DETAIL — 2 / C9.13



LEGEND:

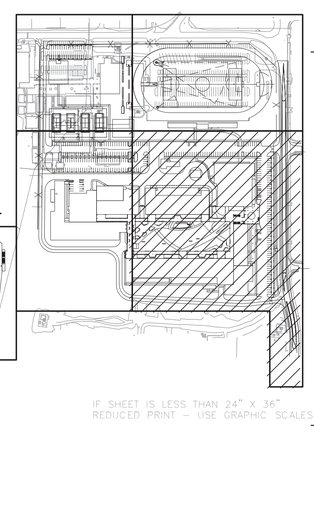
- 2" THK AC PAVEMENT
- 3" THK AC PAVEMENT
- WALKWAY
- CROSSWALK
- [#] KEYNOTE NUMBER
- (#) CONTROL NUMBER/ CURVE DATA

NOTE:

1. FOR SITE CONTROL POINTS AND CURVE DATA, REFER TO SHEET C3.2.
2. FOR SITE SECTION, SEE SHEET C7.1~C7.2.
3. FOR ACCESSIBLE PARKING SEE SHEET C9.20.
4. FOR ENLARGED PLAN SEE SHEET C9.17~C9.19.

NORTH

KEYPLAN



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P.O. Box 8900 Tamuning, Guam 96931

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE IMPROVEMENT PLAN - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
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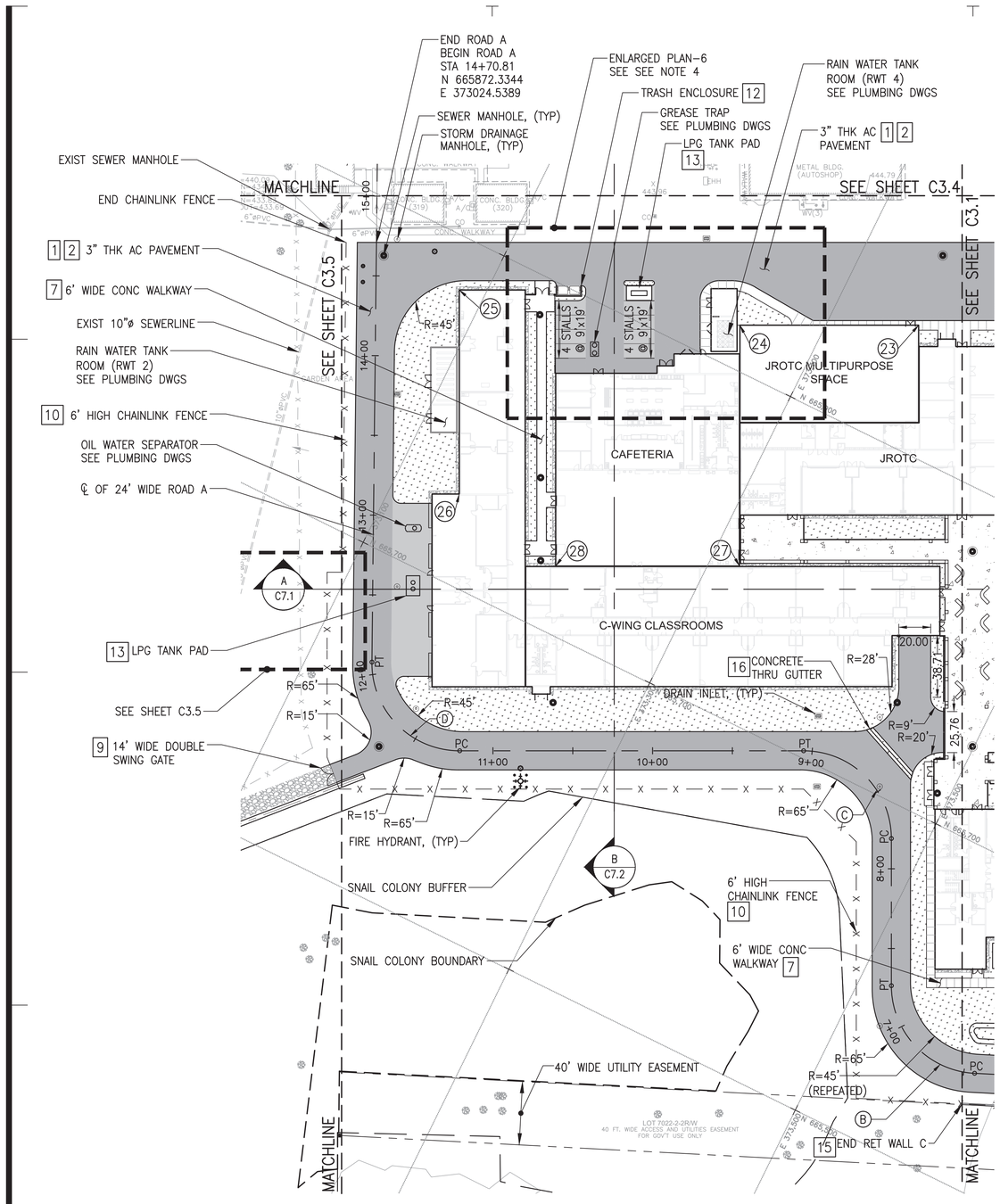
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C3.1

Sheet No: _____ of _____



PLAN NORTH

SITE IMPROVEMENT PLAN - 2

SCALE: 1"=40'-0"

SITE CONTROL POINTS			
PT	NORTHING	EASTING	DESCRIPTION
1	666436.0921	373854.8481	JUAN JACINTO DR.
2	666371.6809	373887.0250	JUAN JACINTO DR.
3	665885.7613	374132.3386	JUAN JACINTO DR.
4	665809.0175	374191.9564	JUAN JACINTO DR.
5	666136.8382	373874.6077	GYMNASIUM
6	666073.0326	373744.8185	GYMNASIUM
7	666100.8991	373889.6323	MONUMENT CENTER
8	666117.4423	373682.9641	B-WING BUILDING
9	666027.4013	373727.2291	B-WING BUILDING
10	666146.8302	373443.5802	GEN & FIRE PUMP/TANK ROOM
11	666110.6343	373461.3744	GEN & FIRE PUMP/TANK ROOM
12	666037.1803	373837.0096	ADMIN OFFICE
13	666063.8349	373891.2286	ADMIN OFFICE
14	665856.2904	374016.1956	AUDITORIUM
15	665915.2628	373987.2042	AUDITORIUM
16	665759.4978	373890.4657	RAIN WATER TANK ROOM 1
17	665735.9360	373842.5380	RAIN WATER TANK ROOM 1
18	666155.7096	373601.7042	RWT ROOM 3
19	665907.1621	373900.6491	A-WING BLDG
20	665808.1469	373949.3259	A-WING BLDG
21	665897.3606	373462.8268	JROTC BUILDING
22	665992.1878	373416.2088	JROTC BUILDING
23	665975.6964	373352.2993	FIRING RANGE
24	665926.2843	373251.7883	FIRING RANGE
25	665868.5080	373084.2594	C-WING BLDG
26	665753.6384	373140.7304	C-WING BLDG
27	665790.6435	373318.1920	CAFETERIA
28	665739.8344	373214.8393	CAFETERIA

ROAD A CURVE DATA (THIS SHEET)		
CURVE	Ⓒ	Ⓓ
PC	STA 8+18.97 N 665679.3344 E 373478.9445	STA 11+20.86 N 665609.3572 E 373211.9357
PT	STA 9+05.37 N 665704.4276 E 373405.3218	STA 12+07.85 N 665634.9848 E 373138.0533
L	86.39'	86.99'
R	55'	55'
CHB	S63° 49' 15"W	N25° 33' 38"W
CHD	77.78'	78.20'
T	55.00'	55.60'
Δ	90.00°	90.62°

ROAD A CURVE DATA (SHEET C3.1)		
CURVE	Ⓐ	Ⓑ
PC	STA 1+53.05 N 665766.0724 E 374039.7907	STA 6+43.19 N 665570.2358 E 373590.6558
PT	STA 1+92.39 N 665747.6735 E 374005.0649	STA 7+26.71 N 665596.5327 E 373519.6506
L	39.34'	83.51'
R	238.01'	55'
CHB	S66° 49' 10"W	S26° 10' 35"W
CHD	39.30'	75.72'
T	19.72'	52.19'
Δ	9.47°	87.00°

JUAN JACINTO CURVE DATA (SHEET C3.1)		
CURVE	Ⓔ	Ⓕ
PC	STA 2+20.08 N 665740.1843 E 374265.4835	
PRC	STA 3+24.91 N 665824.5706 E 374203.5760	STA 3+24.91 N 665824.5706 E 374203.5760
PT		STA 4+80.07 N 665952.4852 E 374116.6058
L	104.83'	155.16'
R	525.52'	572.26'
CHB	N36° 15' 52"W	N34° 12' 44"W
CHD	104.66'	154.68'
T	52.59'	78.06'
Δ	11.43°	15.53°

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- 3" THK AC PAVEMENT
- WALKWAY/SIDEWALK
- CROSSWALK
- # – KEYNOTE NUMBER
- #/ – CONTROL NUMBER/ CURVE DATA

KEYNOTES:

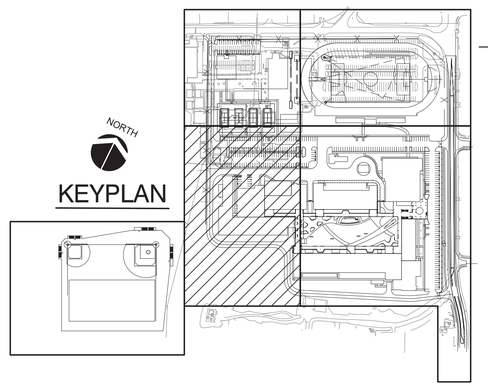
1. PAVEMENT DETAILS — 2 C9.8
2. TYPICAL ROAD SECTION — 1 C9.8
3. TYPICAL PARKING STALL — 1 C9.9
4. ACCESSIBLE PARKING DETAIL — 1 C9.20
5. DIRECTIONAL ARROW — 6 C9.10
6. CROSSWALK AND STOPLINE — 5 C9.10
7. CONCRETE WALKWAY DETAILS — 2 C9.9
8. CURB RAMP DETAIL — 5 C9.9
9. MAIN GATE DETAILS — 2 C9.11
10. TYPICAL CHAINLINK FENCE — 1 C9.11
11. SIGN DETAILS — 2 C9.10
12. TRASH ENCLOSURE — 2 C9.12
13. EQUIPMENT PAD DETAIL — 1 C9.12
14. CONNECTION TO EXIST PAVEMENT — 3 C9.8
15. CMU RETAINING WALL DETAILS — 4 C9.11
16. CONCRETE THRU GUTTER DETAIL — 2 C9.16

NOTE:

1. FOR SITE CONTROL POINTS AND CURVE DATA, REFER TO SHEET C3.2.
2. FOR SITE SECTION, SEE SHEET C7.1~C7.2.
3. FOR ACCESSIBLE PARKING SEE SHEET C9.20.
4. FOR ENLARGED PLAN SEE SHEET C9.17~C9.19.

NORTH

KEYPLAN



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■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE IMPROVEMENT PLAN - 2

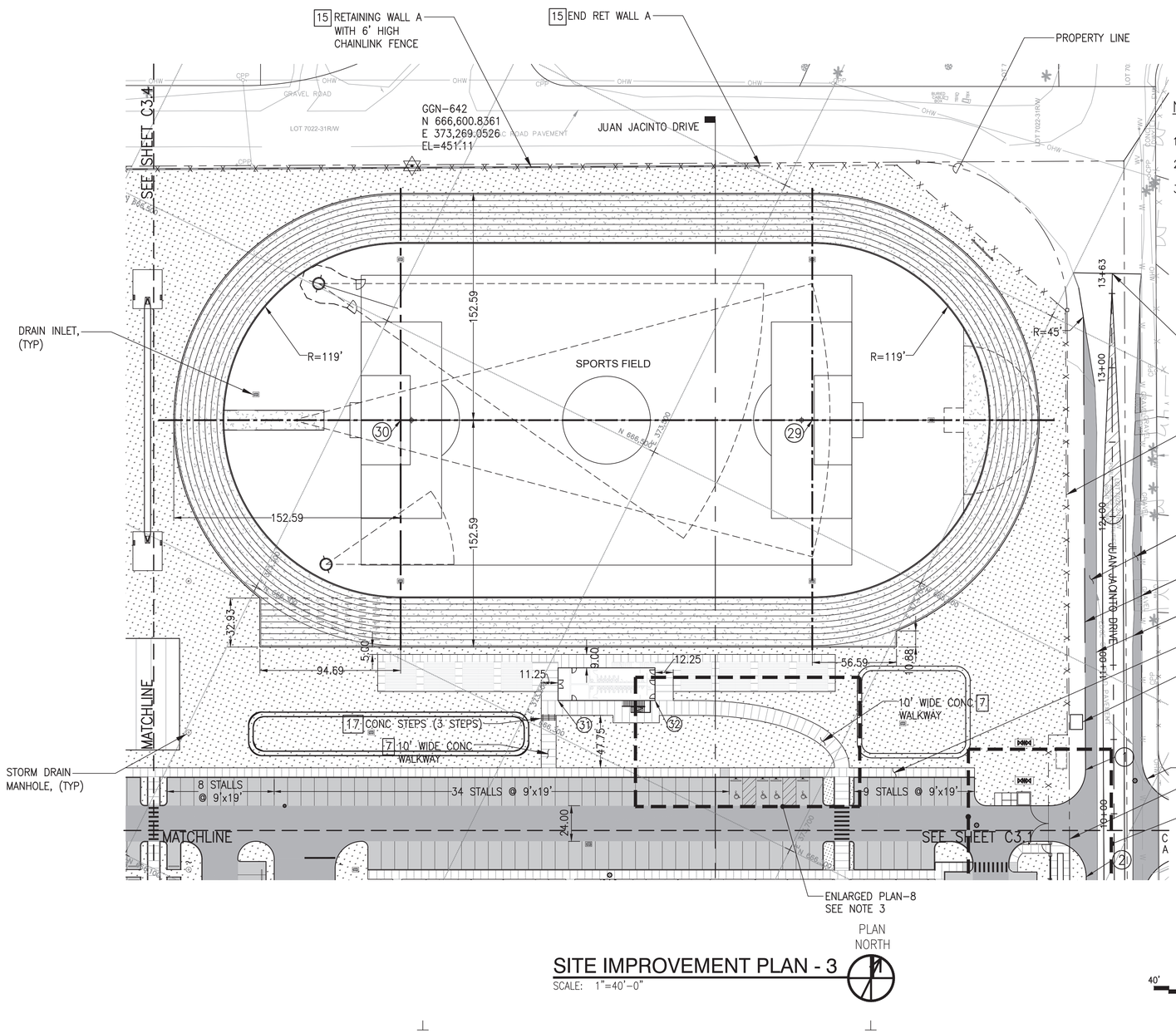
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C3.2

Sheet No. _____ of _____

SITE CONTROL POINTS			
PT	NORTHING	EASTING	DESCRIPTION
29	666566.1150	373586.1613	TRACK OVAL
30	666443.9655	373337.6929	TRACK OVAL
31	666321.4009	373515.8517	PRESS BOX
32	666350.1878	373574.4083	PRESS BOX



PLAN NORTH

SITE IMPROVEMENT PLAN - 3

SCALE: 1"=40'-0"

40' 0' 40' 80'

SCALE: 1"=40'

NOTE:

1. USE DPW'S STANDARD DESIGN OF BUS STOPS.
2. FOR ACCESSIBLE PARKING SEE SHEET C9.20.
3. FOR ENLARGED PLAN SEE SHEET C9.17~C9.19

LEGEND:

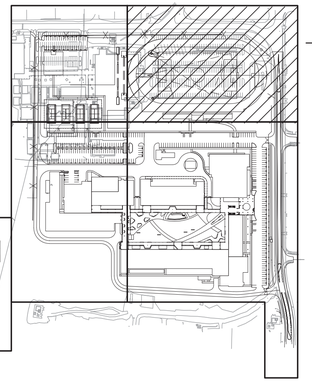
- 2" THK AC PAVEMENT
- 3" THK AC PAVEMENT
- WALKWAY/SIDEWALK
- CROSSWALK
- # – KEYNOTE NUMBER
- (#) – COORDINATE CALLOUT
- GUAM GEODETIC NETWORK (GGN) MONUMENT

KEYNOTES:

1. PAVEMENT DETAILS	2	C9.8
2. TYPICAL ROAD SECTION	1	C9.8
3. TYPICAL PARKING STALL	1	C9.9
4. ACCESSIBLE PARKING DETAIL	1	C9.20
5. DIRECTIONAL ARROW	6	C9.10
6. CROSSWALK	5	C9.10
7. CONCRETE WALKWAY DETAILS	2	C9.9
8. CURB RAMP DETAIL	5	C9.9
9. MAIN GATE DETAILS	2	C9.11
10. TYPICAL CHAINLINK FENCE	1	C9.11
11. SIGN DETAILS	2	C9.10
12. TRASH ENCLOSURE	2	C9.12
13. EQUIPMENT PAD DETAIL	1	C9.12
14. CONNECTION TO EXIST PAVEMENT	3	C9.8
15. CMU RETAINING WALL DETAILS	4	C9.11
16. RAMP AND RAILING DETAILS	1	C9.13
17. CONC STEP DETAILS	2	C9.13

NORTH

KEYPLAN



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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: SITE IMPROVEMENT PLAN - 3
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
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Supv:	EMS
Scale:	AS SHOWN
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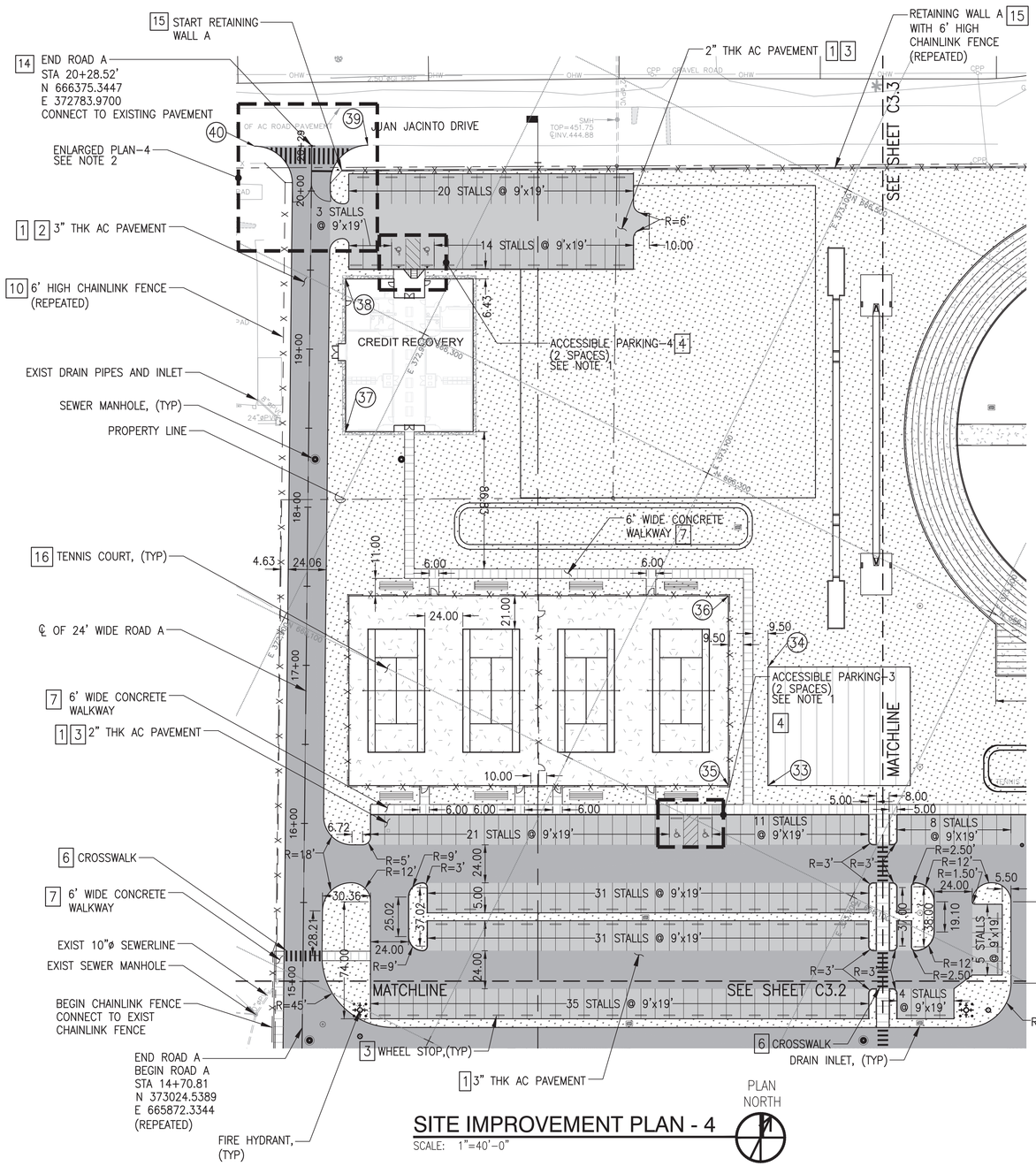
Project No.	File

Drawing: C3.3

Sheet No. _____ of _____



SITE IMPROVEMENT PLAN - 4

SCALE: 1"=40'-0"

SITE CONTROL POINTS			
PT	NORTHING	EASTING	DESCRIPTION
33	666139.5629	373221.3200	JROTC DRILL PAD
34	666206.8693	373188.2315	JROTC DRILL PAD
35	666128.5334	373198.8845	TENNIS COURT
36	666236.2237	373145.9430	TENNIS COURT
37	666222.5664	372882.8607	CREDIT RECOVERY BLDG
38	666309.3169	372840.2133	CREDIT RECOVERY BLDG
39	666391.3857	372815.5663	JUAN JACINTO DR.
40	666359.2478	372751.6017	JUAN JACINTO DR.

NOTE:

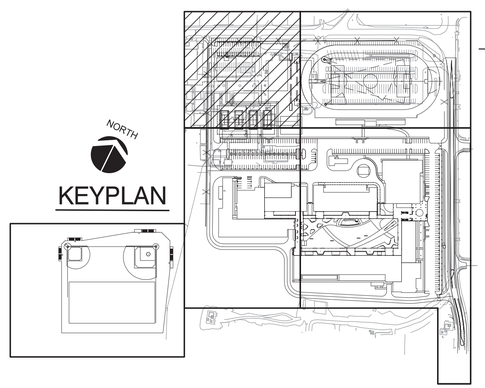
1. FOR ACCESSIBLE PARKING SEE SHEET C9.20.
2. FOR ENLARGED PLAN SEE SHEET C9.17~C9.18

LEGEND:

- 2" THK AC PAVEMENT
- 3" THK AC PAVEMENT
- WALKWAY/SIDEWALK
- CROSSWALK
- # – KEYNOTE NUMBER
- (#) – COORDINATE CALLOUT

KEYNOTES:

1. PAVEMENT DETAILS — 2 C9.8
2. TYPICAL ROAD SECTION — 1 C9.8
3. TYPICAL PARKING STALL — 1 C9.9
4. ACCESSIBLE PARKING DETAIL — 1 C9.20
5. DIRECTIONAL ARROW — 6 C9.10
6. CROSSWALK — 5 C9.10
7. CONCRETE WALKWAY DETAILS — 2 C9.9
8. CURB RAMP DETAIL — 5 C9.9
9. MAIN GATE DETAILS — 2 C9.11
10. TYPICAL CHAINLINK FENCE — 1 C9.11
11. SIGN DETAILS — 2 C9.10
12. TRASH ENCLOSURE — 2 C9.12
13. EQUIPMENT PAD DETAIL — 1 C9.12
14. CONNECTION TO EXIST PAVEMENT — 3 C9.8
15. CMU RETAINING WALL DETAILS — 4 C9.11
16. TENNIS COURT DETAILS — 1 C9.15
17. BASEBALL AND SOFT BALL FIELD DETAILS — 1 & 2 C9.14



40' 0' 40' 80'
SCALE: 1"=40'

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE IMPROVEMENT PLAN - 4
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C3.4

Sheet No. _____ of _____

SITE CONTROL POINTS			
PT	NORTHING	EASTING	DESCRIPTION
41	665334.5120	372617.8380	SOFTBALL FIELD HOME
42	665497.7485	372949.8830	BASEBALL FIELD HOME

KEYNOTES:

1. PAVEMENT DETAILS — 2 / C9.8
2. TYPICAL ROAD SECTION — 1 / C9.8
3. TYPICAL PARKING STALL — 1 / C9.9
4. ACCESSIBLE PARKING DETAIL — 1 / C9.20
5. DIRECTIONAL ARROW — 6 / C9.10
6. CROSSWALK — 5 / C9.10
7. CONCRETE WALKWAY DETAILS — 2 / C9.9
8. CURB RAMP DETAIL — 5 / C9.9
9. MAIN GATE DETAILS — 2 / C9.11
10. TYPICAL CHAINLINK FENCE — 1 / C9.11
11. SIGN DETAILS — 2 / C9.10
12. TRASH ENCLOSURE — 2 / C9.12
13. EQUIPMENT PAD DETAIL — 1 / C9.12
14. CONNECTION TO EXIST PAVEMENT — 3 / C9.8
15. CMU RETAINING WALL DETAILS — 4 / C9.11
16. TENNIS COURT DETAILS — 1 / C9.15
17. BASEBALL AND SOFTBALL FIELD DETAIL — 1 & 2 / C9.14
18. RAMP AND RAILING DETAILS — 1 / C9.13
19. CONC BLEACHER SECTION — 1 / C9.16

NOTE:

1. FOR ENLARGED PLAN SEE SHEET C9.17~C9.19.

SITE IMPROVEMENT PLAN - 5

SCALE: 1"=40'-0"

PLAN NORTH

SCALE: 1"=40'

KEYPLAN

NORTH

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
SITE IMPROVEMENT PLAN - 5
PROGRAMMING DOCUMENT

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Date:	3/31/25
Project No.	File

Drawing
C3.5

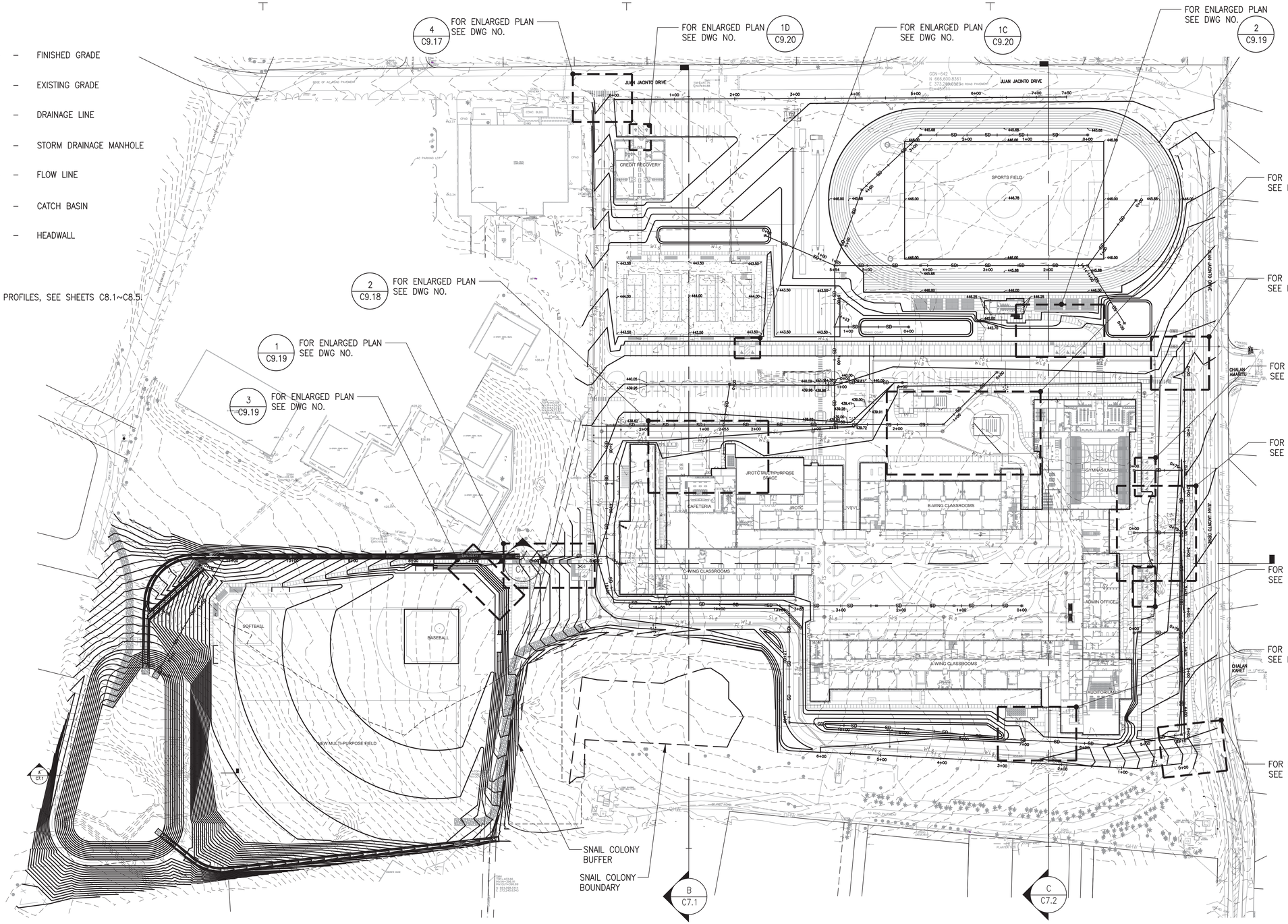
Sheet No. _____ of _____

LEGEND:

- 438 — FINISHED GRADE
- 438 — EXISTING GRADE
- SD — SD — DRAINAGE LINE
- STORM DRAINAGE MANHOLE
- FLOW LINE
- CATCH BASIN
- HEADWALL

NOTE:

1. FOR DRAINAGE PROFILES, SEE SHEETS C8.1~C8.5.



OVERALL GRADING AND DRAINAGE PLAN

SCALE: 1"=80'-0"

PLAN NORTH

80' 0' 80' 160'

SCALE: 1"=80'

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Title:
OVERALL GRADING AND DRAINAGE PLAN

PROGRAMMING DOCUMENT

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Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C4.0

Sheet No. _____ of _____

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2 CATCH BASIN CB-12 (TYPE-1)
DL-H STA 0+00.00
N 666243.8506
E 373576.9589
TOP EL=439.52'
INV EL=433.00'

6 DL STUB-OUT
N 666114.2117
E 373340.8802
PROVIDE END PLUG

1 SDMH-3
DL-M STA 0+00
DL-G STA 1+22.23 (END)
N 666109.7227
E 373343.0865
TOP EL=440.03'
DL-M INV EL=430.30'
DL-G INV EL=432.50'

DRAINAGE LINE DL-M 4

2 CATCH BASIN CB-14 (TYPE-2)
DL-M STA 0+69.61
DL-H STA 3+04.29 (END)
N 666047.2532
E 373373.7891
TOP EL=438.56'
DL-M INV EL=429.52' (IN)
DL-M INV EL=429.25' (OUT)
DL-H INV EL=430.87'

2 CATCH BASIN CB-11 (TYPE-1)
DL-G STA 0+00.00
N 666159.2382
E 373443.8077
TOP EL=438.75'
INV EL=433.72'

2 CATCH BASIN CB-13 (TYPE-1)
DL-H STA 1+23.61
N 666127.3060
E 373535.7628
TOP EL=440.25'
INV EL=432.13'

4 DRAINAGE LINE DL-M

2 CATCH BASIN CB-26 (TYPE-2)
DL-M STA 2+40.88
N 665808.2121
E 373568.5827
TOP EL=439.50'
INV EL=429.38' (IN)
INV EL=427.88' (OUT)

2 CATCH BASIN CB-25 (TYPE-2)
DL-M STA 1+12.24
N 665864.7473
E 373684.1407
TOP EL=439.50'
INV EL=434.21' (IN)
INV LE=432.21' (OUT)

2 CATCH BASIN CB-24 (TYPE-2)
DL-M STA 0+00.00
N 665914.4850
E 373784.7562
TOP EL=439.50'
INV EL=436.00'

4 DRAINAGE LINE DL-I

5 END RETAINING WALL-C STA 6+00
N 665549.6575
E 373592.1366
BW EL =439.00' (FG)

2 CATCH BASIN CB-23 (TYPE-2)
DL-I STA 8+76.99
N 665654.8801
E 373720.9171
TOP EL=436.50'
INV EL=423.82'

1 SDMH-7
DL-I STA 7+32.99
N 665703.3614
E 373856.5072
TOP EL=437.66'
INV EL=424.34'

BEGIN RETAINING WALL-C STA 0+00.00 5
N 665796.7270
E 374137.9261
BW EL =436.00'

BEGIN RETAINING WALL-B STA 0+00.00 5
N 666382.4620
E 373854.8086
BW EL=439.00'

CATCH BASIN CB-15 2
(TYPE-1)
DL-J STA 0+00.00
N 666198.0998
E 373852.6090
TOP EL=440.37'
INV EL=429.50'

CATCH BASIN CB-16 2
(TYPE-1)
DL-I STA 0+00
DL-J STA 0+78.64
N 666232.8002
E 373923.1836
TOP EL=436.65'
DL-I INV EL=428.50'
DL-J INV EL=428.50'

CATCH BASIN CB-17 2
(TYPE-1)
DL-K STA 0+00
N 666105.2131
E 373898.2730
TOP EL=440.31'
INV EL=429.00'

CATCH BASIN CB-18 2
(TYPE-1)
DL-I STA 1+03.51
DL-K STA 0+78.64
N 666139.9051
E 373968.8517
TOP EL=435.97'
DL-I INV EL=428.00'
DL-K INV EL=428.00'

CATCH BASIN CB-19 (TYPE-1)
DL-L STA 0+00.00
N 665956.3846
E 373971.4385
TOP EL=439.61'
INV EL=427.75'

CATCH BASIN CB-20 (TYPE-1)
DL-I STA 2+69.35
DL-L STA 0+78.64
N 665991.0765
E 374042.0172
TOP EL=434.87'
DL-I INV EL=426.75'
DL-L INV EL=426.75'

DRAINAGE LINE DL-I 4

CATCH BASIN CB-22 2
(TYPE-1)
DL-I STA 5+60.67
N 665771.1870
E 374014.9151
TOP EL=439.10'
INV EL=424.96'

CATCH BASIN CB-21 2
(TYPE-2)
DL-I STA 4+38.22
N 665839.5305
E 374116.5187
TOP EL=433.75'
INV EL=426.50'

END RETAINING WALL-B STA 6+16.17 5
N 665831.7493
E 374117.6360
BW EL=433.00'

LEGEND:

438	–	FINISHED GRADE
438	–	EXISTING GRADE
SD SD	–	DRAINAGE LINE
	–	STORM DRAINAGE MANHOLE
	–	FLOW LINE
	–	CATCH BASIN
	–	HEADWALL

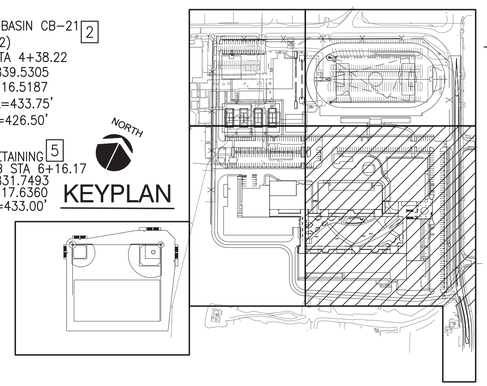
KEYNOTES:

1. STORM DRAINAGE MANHOLE (SDMH) — 2 / C9.6
2. CATCH BASIN (TYPE-1) — 1 / C9.7
3. CATCH BASIN (TYPE-2) — 2 / C9.7
4. HEADWALL (HW) — 1 / C9.6
4. DRAINAGE PIPE TRENCH — 3 / C9.7
5. RETAINING WALL WITH CHAIN LINK FENCE — 4 / C9.11
6. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3

NOTE:

1. FOR DRAINAGE PROFILES, SEE SHEETS C8.1 – C8.5

KEYPLAN



GRADING AND DRAINAGE PLAN - 1
SCALE: 1"=40'-0"

PLAN NORTH

SCALE: 1"=40'

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GRADING AND DRAINAGE PLAN - 1
PROGRAMMING DOCUMENT

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Drawing
C4.1

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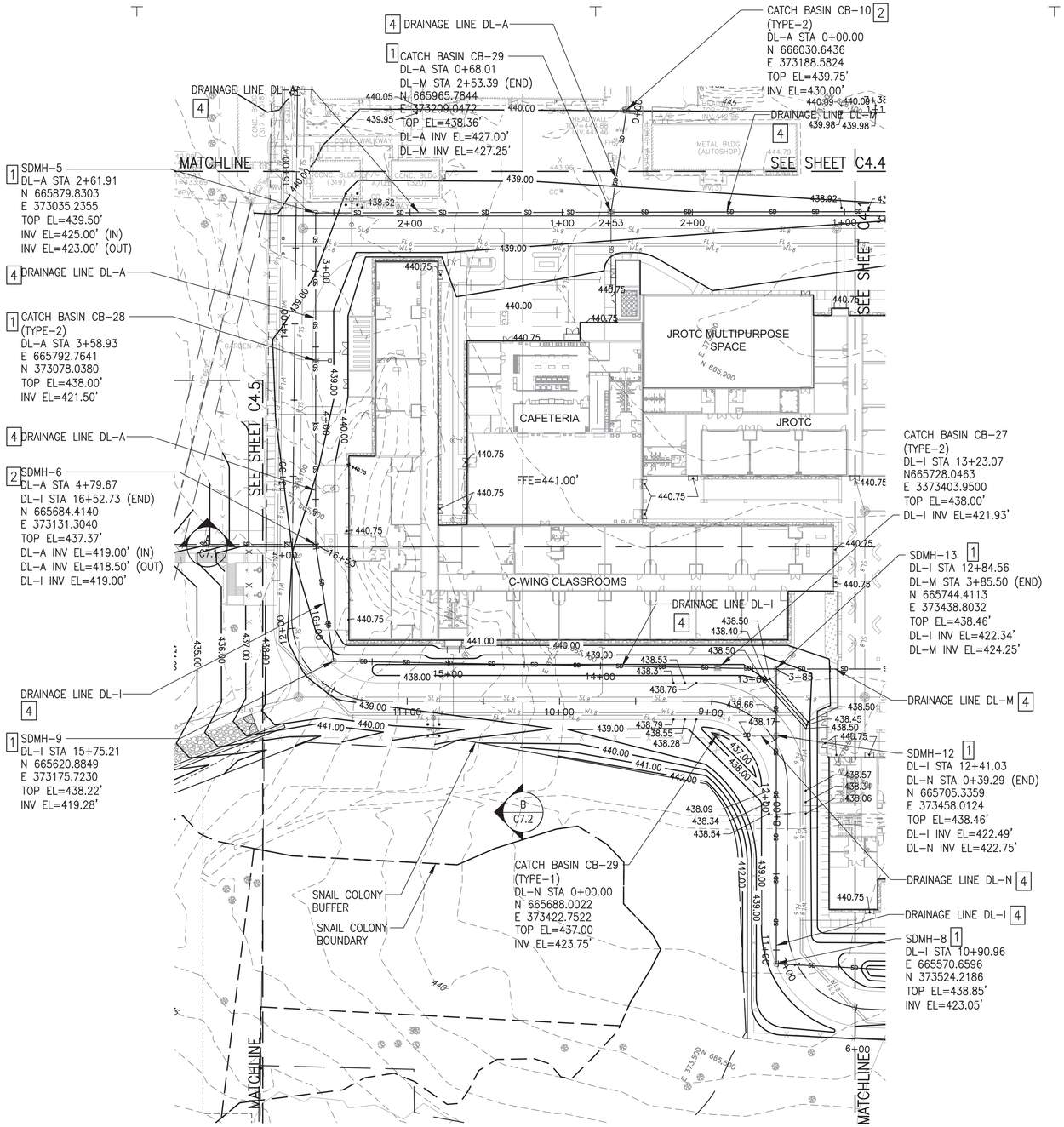


GRADING AND DRAINAGE PLAN - 2

SCALE: 1"=40'-0"

PLAN NORTH

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- 438 – FINISHED GRADE
- 438 – EXISTING GRADE
- SD SD – DRAINAGE LINE
- – STORM DRAINAGE MANHOLE
- – FLOW LINE
- – CATCH BASIN
- – HEADWALL

KEYNOTES:

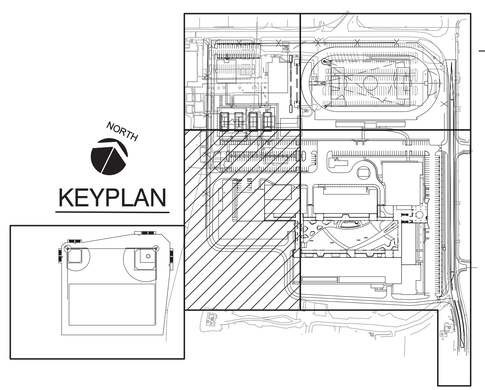
1. STORM DRAINAGE MANHOLE (SDMH) — 2 / C9.6
2. CATCH BASIN (TYPE-1) — 1 / C9.7
3. CATCH BASIN (TYPE-2) — 2 / C9.7
4. HEADWALL (HW) — 1 / C9.6
4. DRAINAGE PIPE TRENCH — 3 / C9.7
5. RETAINING WALL WITH CHAIN LINK FENCE — 4 / C9.11

NOTE:

1. FOR DRAINAGE PROFILES, SEE SHEETS C8.1 – C8.5

NORTH

KEYPLAN



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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
GRADING AND DRAINAGE PLAN - 2

PROGRAMMING DOCUMENT

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Drawing
C4.2

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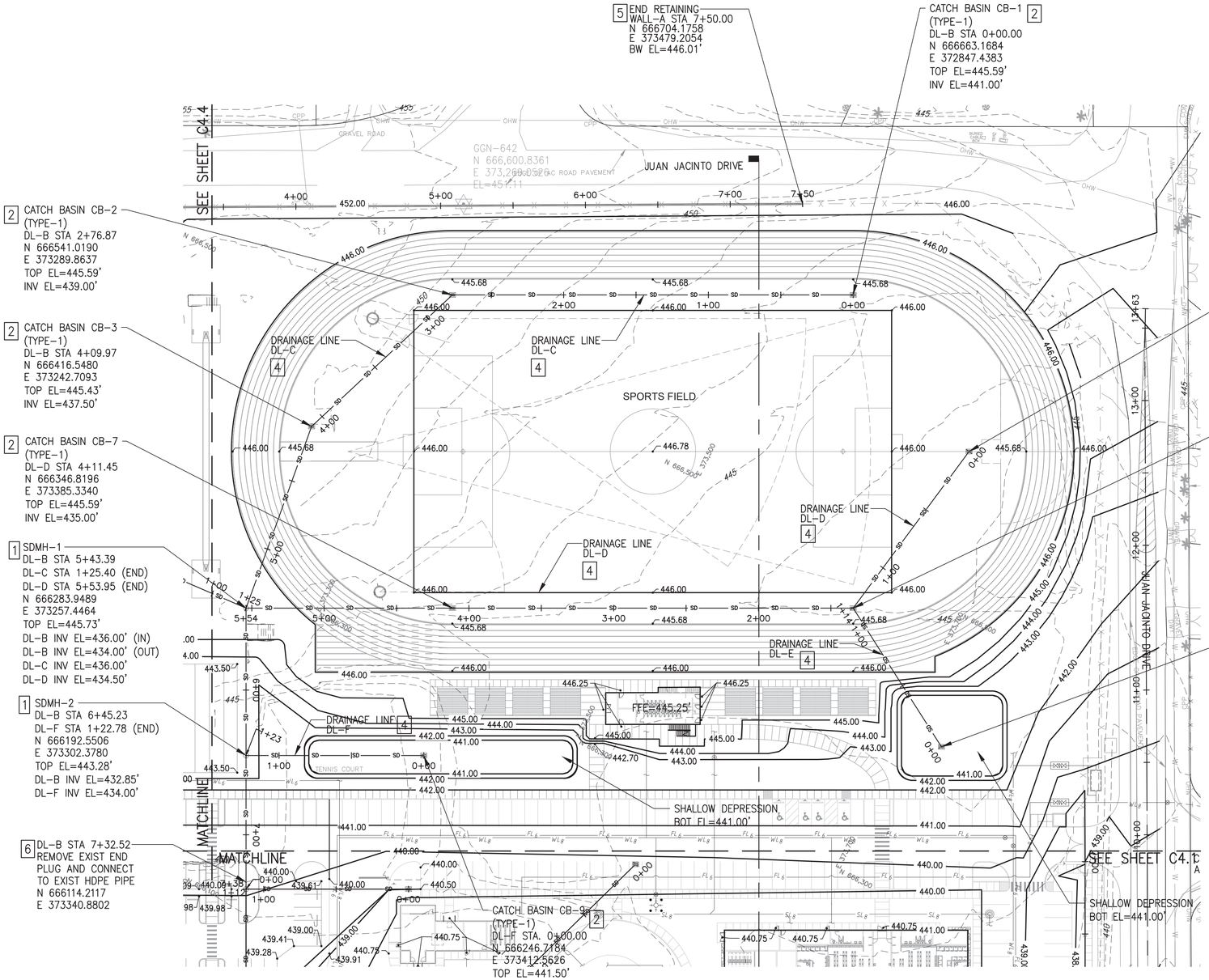


GRADING AND DRAINAGE PLAN - 3

SCALE: 1"=40'-0"

LEGEND:

- 438 – FINISHED GRADE
- 438 – EXISTING GRADE
- SD SD – DRAINAGE LINE
- – STORM DRAINAGE MANHOLE
- – FLOW LINE
- – CATCH BASIN
- – HEADWALL

KEYNOTES:

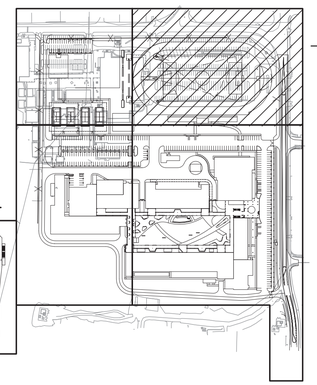
1. STORM DRAINAGE MANHOLE (SDMH) — 2 / C9.6
2. CATCH BASIN (TYPE-1) — 1 / C9.7
3. CATCH BASIN (TYPE-2) — 2 / C9.7
4. HEADWALL (HW) — 1 / C9.6
4. DRAINAGE PIPE TRENCH — 3 / C9.7
5. RETAINING WALL WITH CHAIN LINK FENCE — 4 / C9.11
6. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTE:

1. FOR DRAINAGE PROFILES, SEE SHEETS C8.1 – C8.5

NORTH

KEYPLAN



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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GRADING AND DRAINAGE PLAN - 3
PROGRAMMING DOCUMENT

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Project No.	Title

Drawing: C4.3

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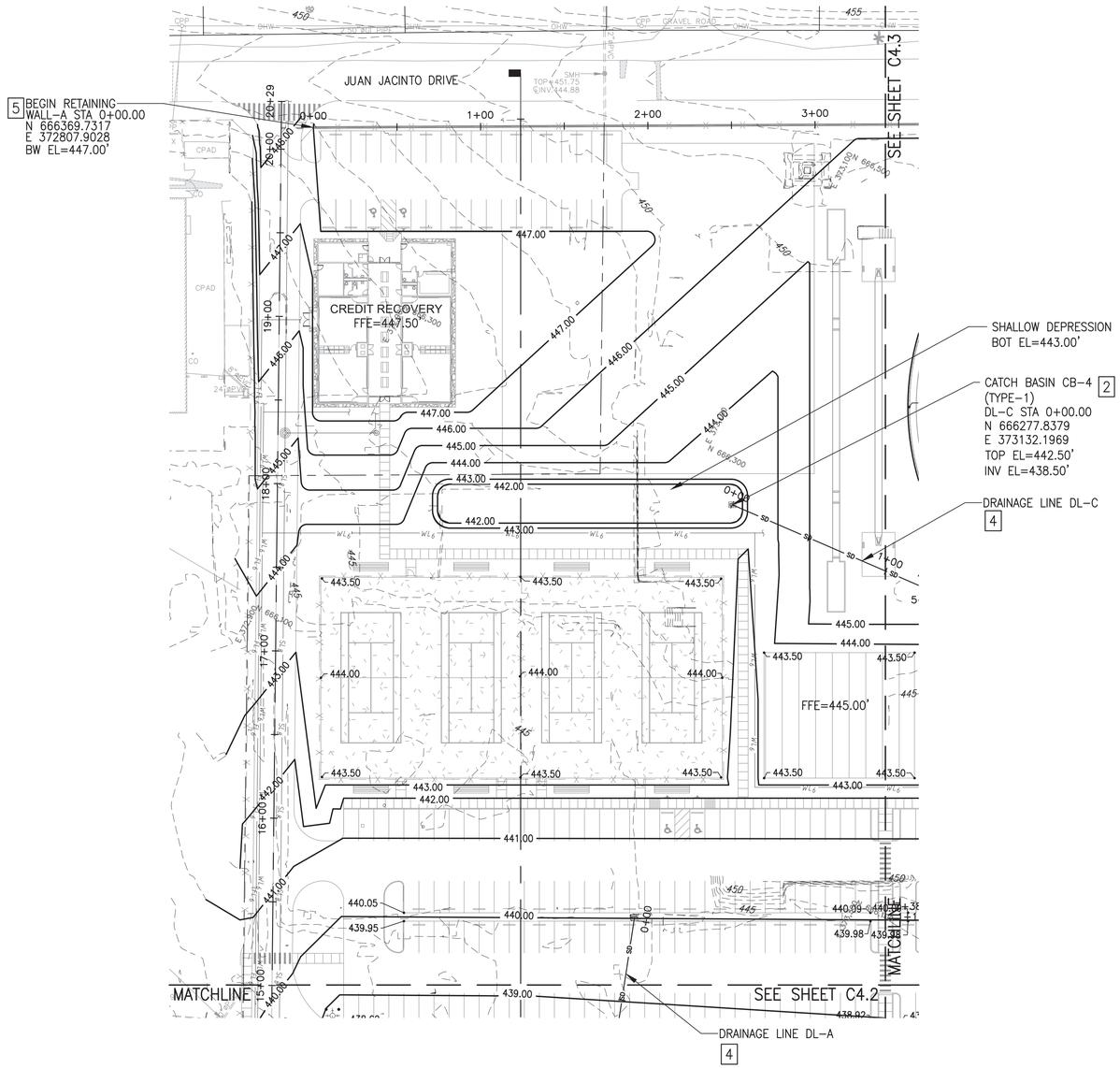


GRADING AND DRAINAGE PLAN - 4

SCALE: 1"=40'-0"

PLAN NORTH

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- 438 – FINISHED GRADE
- 438 – EXISTING GRADE
- SD SD – DRAINAGE LINE
- – STORM DRAINAGE MANHOLE
- – FLOW LINE
- – CATCH BASIN
- – HEADWALL

KEYNOTES:

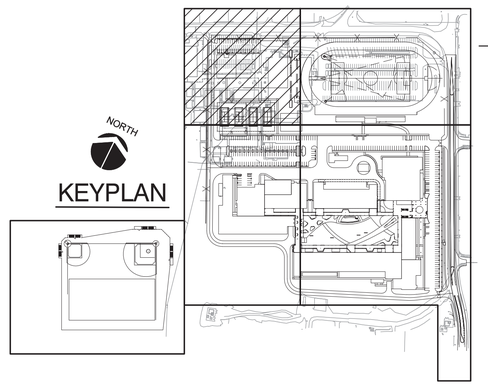
1. STORM DRAINAGE MANHOLE (SDMH) — 2 / C9.6
2. CATCH BASIN (TYPE-1) — 1 / C9.7
3. CATCH BASIN (TYPE-2) — 2 / C9.7
4. HEADWALL (HW) — 1 / C9.6
4. DRAINAGE PIPE TRENCH — 3 / C9.7
5. RETAINING WALL WITH CHAIN LINK FENCE — 4 / C9.11

NOTE:

1. FOR DRAINAGE PROFILES, SEE SHEETS C8.1 – C8.5

NORTH

KEYPLAN



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GRADING AND DRAINAGE PLAN - 4

PROGRAMMING DOCUMENT

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Date:	3/31/25

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Drawing
C4.4

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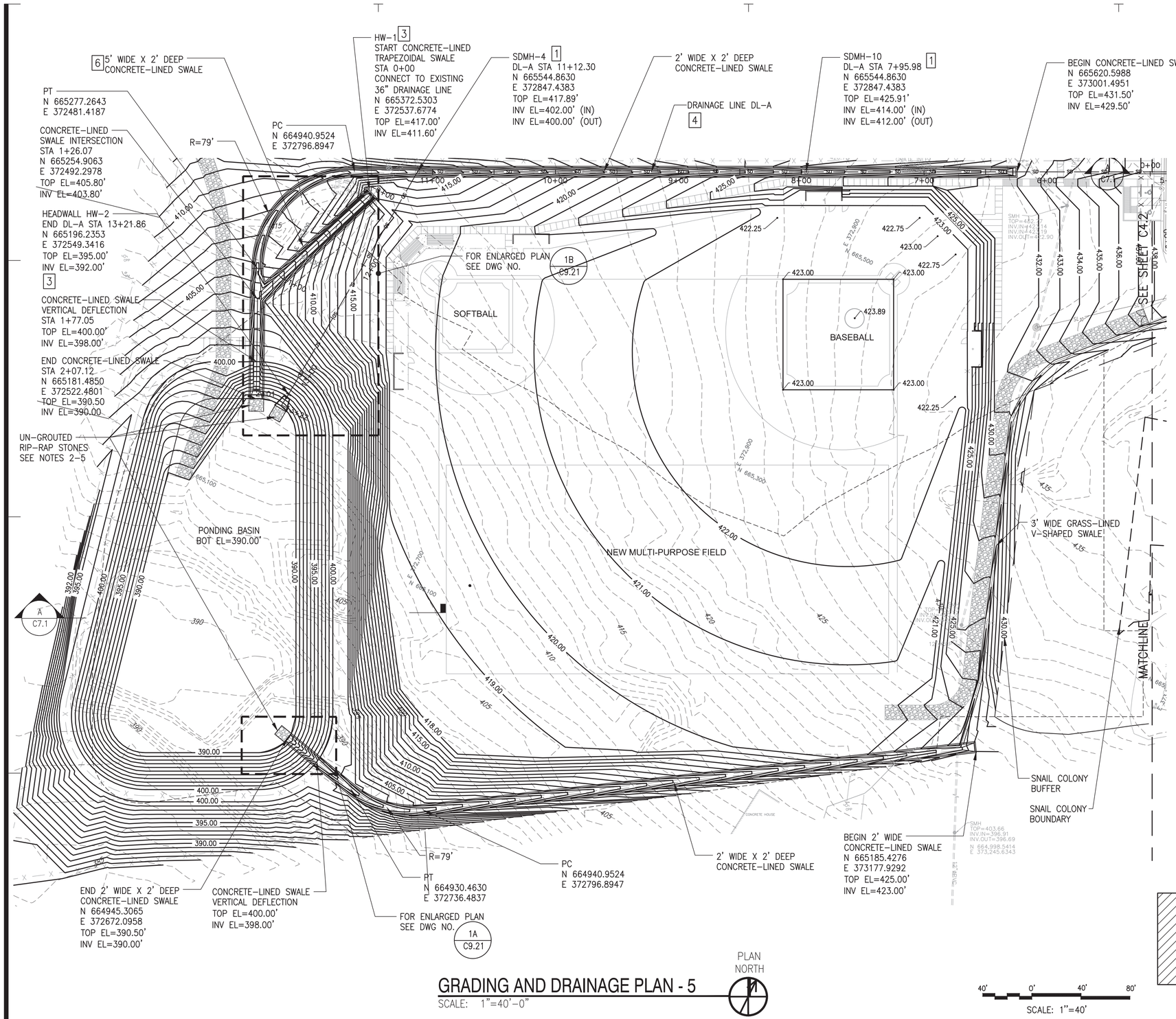


GRADING AND DRAINAGE PLAN - 5

SCALE: 1"=40'-0"

LEGEND:

- 438 — FINISHED GRADE
- 438 — EXISTING GRADE
- SD SD — DRAINAGE LINE
- STORM DRAINAGE MANHOLE
- FLOW LINE
- CATCH BASIN
- HEADWALL

KEYNOTES:

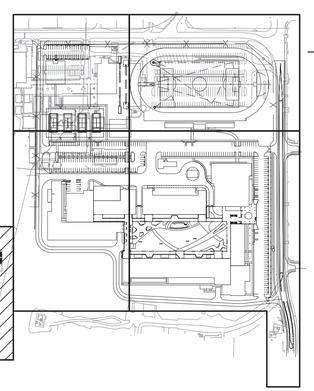
1. STORM DRAINAGE MANHOLE (SDMH) — 2 C9.6
2. CATCH BASIN (TYPE-1) — 1 C9.7
3. HEADWALL (HW) — 1 C9.6
4. DRAINAGE PIPE TRENCH — 3 C9.7
5. RETAINING WALL WITH CHAIN LINK FENCE — 4 C9.11
6. CONCRETE-LINED TRAPEZOIDAL SWALE — 3 C9.5

NOTE:

1. FOR DRAINAGE PROFILES, SEE SHEETS C8.1 – C8.5
2. PLACED RIPRAP IS ROCK PLACED ON A PREPARED SURFACE TO FORM A WELL-GRADED MASS. PLACE RIPRAP TO ITS FULL THICKNESS IN ONE OPERATION TO AVOID DISPLACING THE UNDERLYING MATERIAL. DO NOT PLACE RIPRAP MATERIAL BY METHOD THAT CAUSE SEGREGATION OR DAMAGE TO THE PREPARED SURFACE. PLACE OR REARRANGE INDIVIDUAL ROCKS BY MECHANICAL OR HAND METHODS TO OBTAIN A DENSE UNIFORM BLANKET WITH A REASONABLY SMOOTH SURFACE.
3. FURNISHED HARD, DURABLE, ANGULAR ROCK THAT IS RESISTANT TO WEATHERING AND WATER ACTION AND FREE OF ORGANIC OR OTHER UNSUITABLE MATERIAL. DO NOT USE SHALE, ROCK WITH SHALE SEAMS, OR OTHER FISSILE OR FISSURED ROCK THAT MAY BREAK INTO SMALLER PIECES IN THE PROCESS OF HANDLING AND PLACING. ROCK SIZE TO BE FROM 6 TO 14 INCHES WITH MASS OF ABOUT 40 TO 220 POUNDS.
4. PLACE RIPRAP TO ITS FULL THICKNESS IN ONE OPERATION TO AVOID DISPLACING THE UNDERLYING MATERIAL. DO NOT PLACE RIPRAP MATERIAL BY METHODS THAT CAUSE SEGREGATION OR DAMAGE TO THE PREPARED SURFACE. PLACE OR REARRANGE INDIVIDUAL ROCKS BY MECHANICAL OR HAND METHODS TO OBTAIN A DENSE UNIFORM BLANKET WITH A REASONABLY SMOOTH SURFACE.

NORTH

KEYPLAN



SCALE: 1"=40'

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REVISIONS

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P.O. Box 8900 Tamuning, Guam 96931

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GRADING AND DRAINAGE PLAN - 5
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C4.5

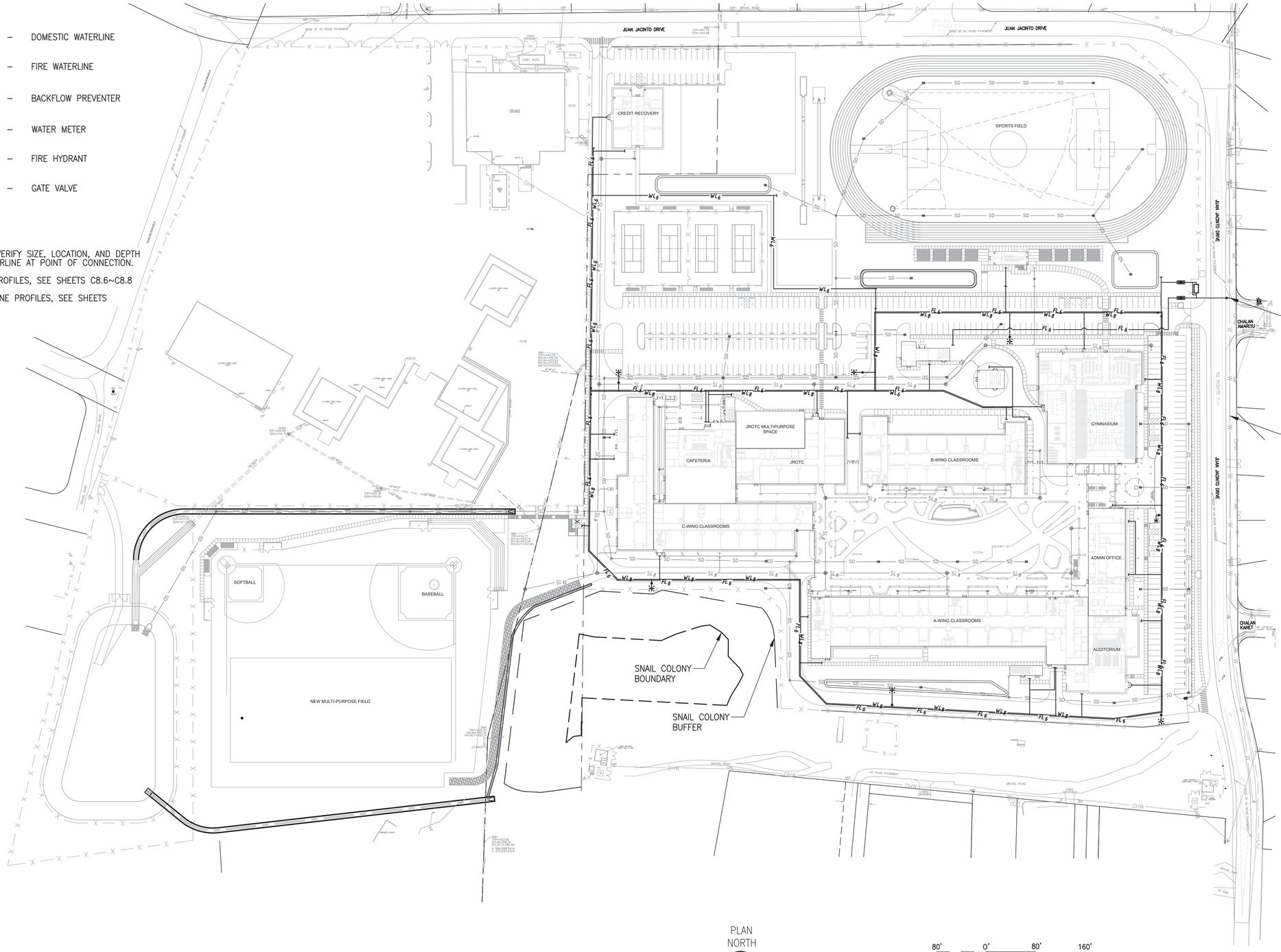
Sheet No. ____ of ____

LEGEND:

- WL6 — DOMESTIC WATERLINE
- FL6 — FIRE WATERLINE
- BACKFLOW PREVENTER
- WATER METER
- FIRE HYDRANT
- GATE VALVE

NOTES:

1. CONTRACTOR TO VERIFY SIZE, LOCATION, AND DEPTH OF EXISTING WATERLINE AT POINT OF CONNECTION.
2. FOR WATERLINE PROFILES, SEE SHEETS C8.6~C8.8
3. FOR FIRE WATERLINE PROFILES, SEE SHEETS C8.9~C8.11.



OVERALL WATER PLAN

SCALE: 1"=80'-0"

PLAN NORTH

80' 0' 80' 160'

SCALE: 1"=80'

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL WATER PLAN
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C5.0
Sheet No. _____ of _____

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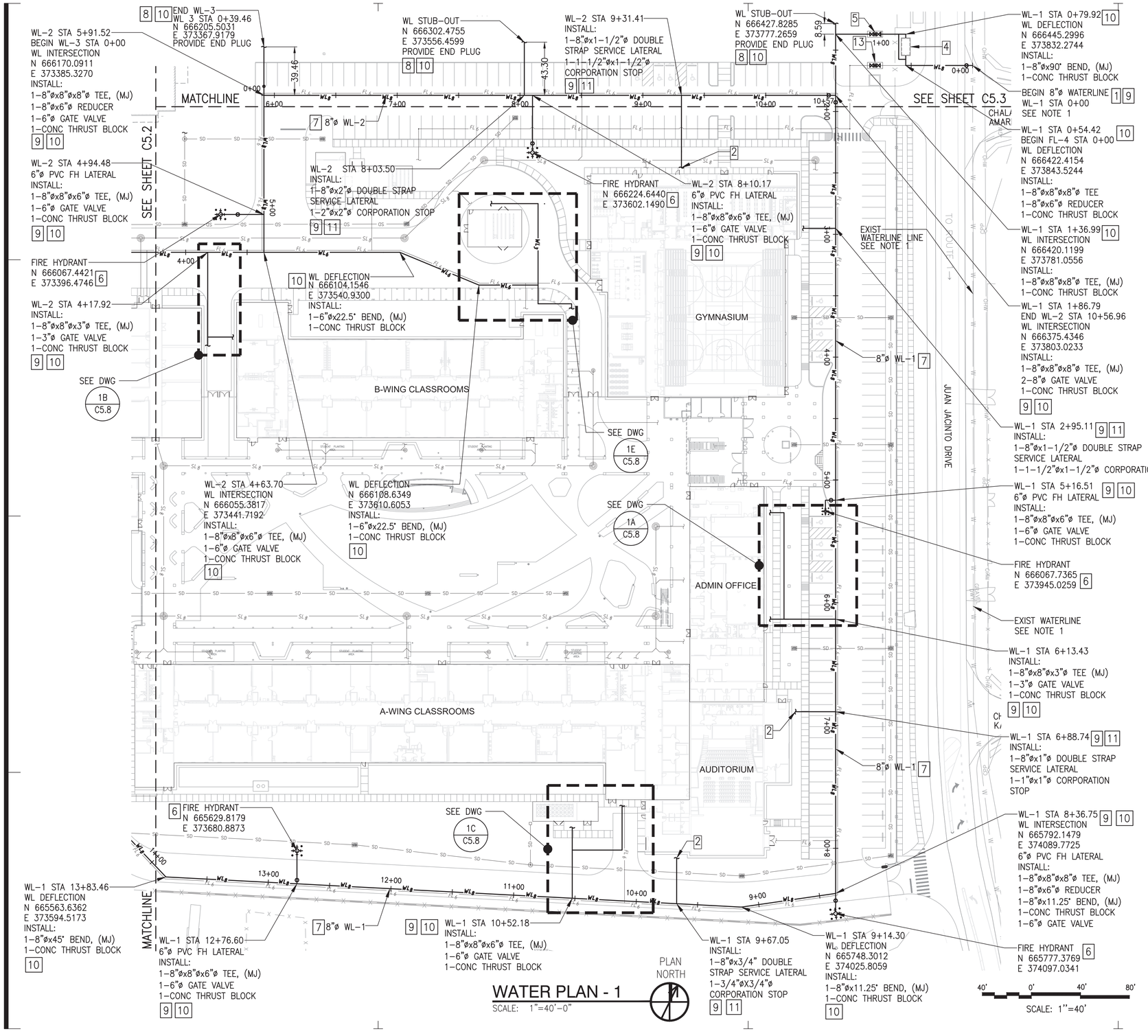


WATER PLAN - 1

SCALE: 1"=40'-0"

LEGEND:

- WL — DOMESTIC WATERLINE
- FL — FIRE WATERLINE
- BACKFLOW PREVENTER
- WATER METER
- FIRE HYDRANT
- GATE VALVE

KEYNOTES:

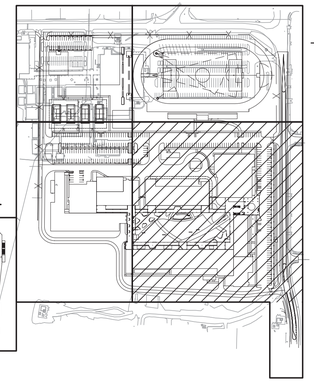
1. CONNECT TO EXISTING WATER MAIN — 3 C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 C9.1
5. 8"ø BACKFLOW PREVENTER ASSEMBLY — 4 C9.1
6. FIRE HYDRANT ASSEMBLY — 2 C9.1
7. WATERLINE TRENCH DETAIL — 3 C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 C9.3
9. GATE VALVE — 1 C9.3
10. FITTING AND THRUST BLOCK — 1 C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 C9.2
12. CONNECT TO EXIST STUB-OUT — 7 C9.3
13. 6"ø BACKFLOW PREVENTER ASSEMBLY — 4 C9.2

NOTES:

1. CONTRACTOR TO VERIFY SIZE, LOCATION, AND DEPTH OF EXISTING PIPE AT POINT OF CONNECTION.
2. FOR WATERLINE PROFILES, SEE SHEETS C8.6~C8.8.

NORTH

KEYPLAN



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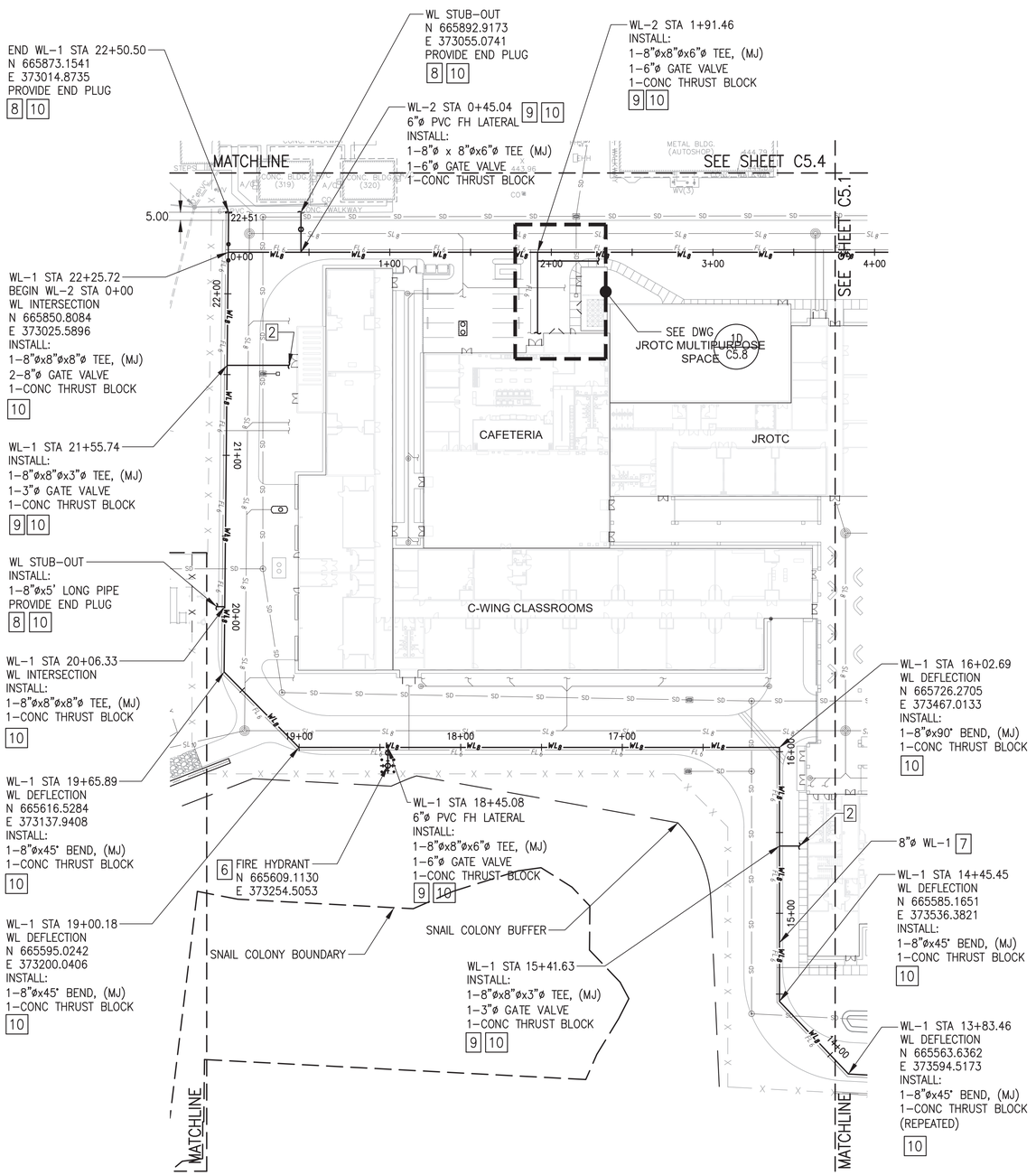
Project:	GDOE SIMON SANCHEZ HIGH SCHOOL
Title:	WATER PLAN - 1 PROGRAMMING DOCUMENT
Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File
Drawing	C5.1

Sheet No. _____ of _____



WATER PLAN - 2

SCALE: 1"=40'-0"

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

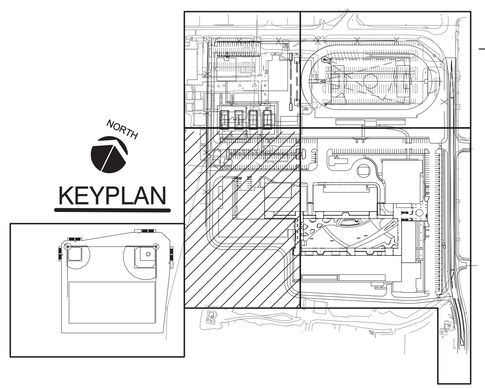
- WL-8 — DOMESTIC WATERLINE
- FL-6 — FIRE WATERLINE
- FIRE HYDRANT
- GATE VALVE

KEYNOTES:

1. CONNECT TO EXISTING WATER MAIN — 3 C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 C9.1
5. 8"ø BACKFLOW PREVENTER ASSEMBLY — 4 C9.1
6. FIRE HYDRANT ASSEMBLY — 2 C9.1
7. WATERLINE TRENCH DETAIL — 3 C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 C9.3
9. GATE VALVE — 1 C9.3
10. FITTING AND THRUST BLOCK — 1 C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 C9.2
12. CONNECT TO EXIST STUB-OUT — 7 C9.3
13. 6"ø BACKFLOW PREVENTER ASSEMBLY — 4 C9.2

NOTE:

1. FOR WATERLINE PROFILES, SEE SHEETS C8.6~C8.8.



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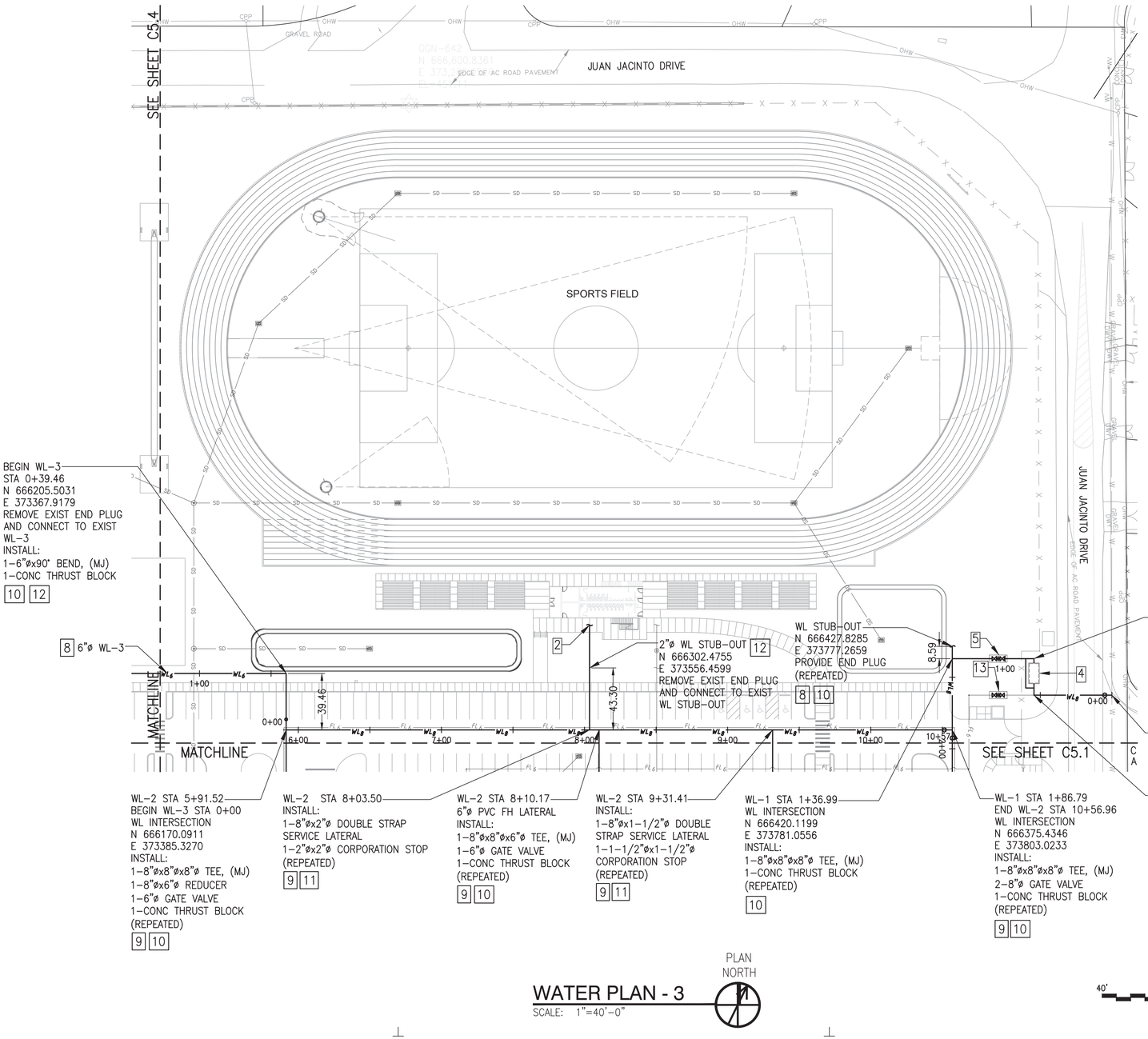
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WATER PLAN - 2
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C5.2

Sheet No. _____ of _____



WATER PLAN - 3

SCALE: 1"=40'-0"

LEGEND:

- WL6 — DOMESTIC WATERLINE
- FL6 — FIRE WATERLINE
- FIRE HYDRANT
- GATE VALVE

KEYNOTES:

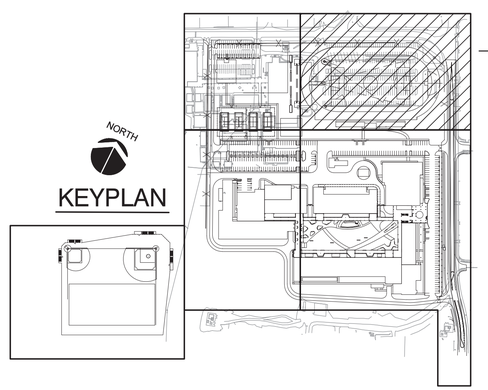
1. CONNECT TO EXISTING WATER MAIN — 3 / C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 / C9.1
5. 8"ø BACKFLOW PREVENTER ASSEMBLY — 4 / C9.1
6. FIRE HYDRANT ASSEMBLY — 2 / C9.1
7. WATERLINE TRENCH DETAIL — 3 / C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
9. GATE VALVE — 1 / C9.3
10. FITTING AND THRUST BLOCK — 1 / C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 / C9.2
12. CONNECT TO EXIST STUB-OUT — 7 / C9.3
13. 6"ø BACKFLOW PREVENTER ASSEMBLY — 4 / C9.2

NOTES:

1. CONTRACTOR TO VERIFY SIZE, LOCATION, AND DEPTH OF EXISTING PIPE AT POINT OF CONNECTION.
2. FOR WATERLINE PROFILES, SEE SHEETS C8.6~C8.8.

NORTH

KEYPLAN



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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

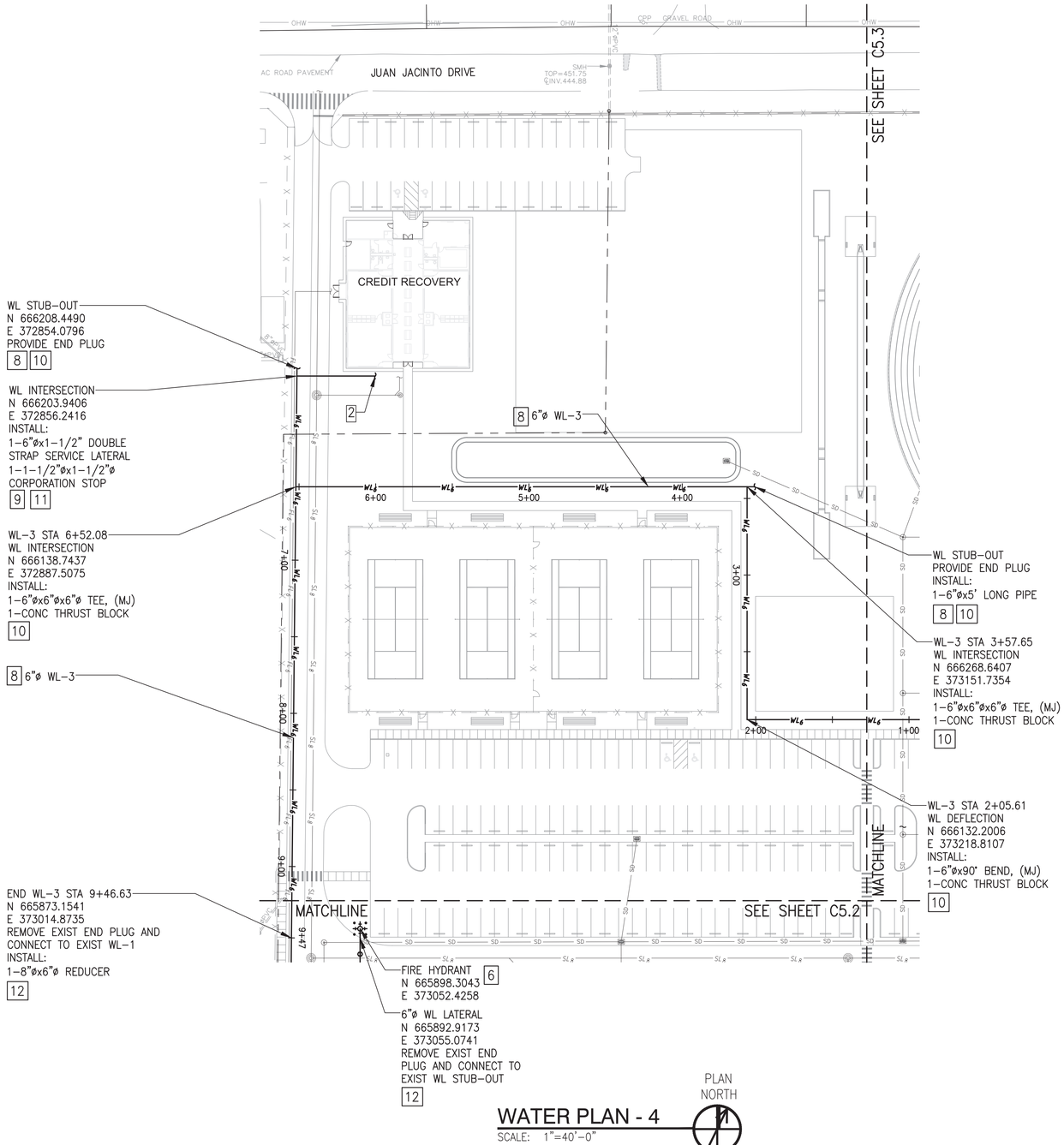
Title: WATER PLAN - 3

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing: C5.3

Sheet No. ____ of ____



PLAN NORTH

WATER PLAN - 4

SCALE: 1"=40'-0"

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- WL — DOMESTIC WATERLINE
- FL — FIRE WATERLINE
- FIRE HYDRANT
- GATE VALVE

KEYNOTES:

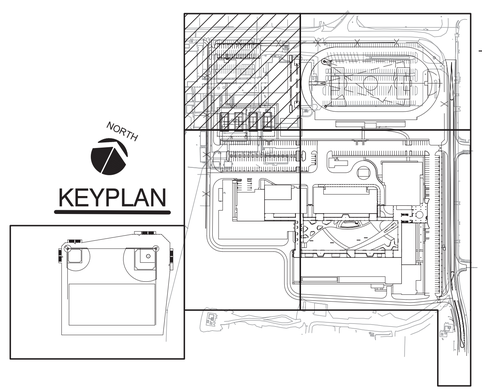
1. CONNECT TO EXISTING WATER MAIN — 3 / C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 / C9.1
5. 8" BACKFLOW PREVENTER ASSEMBLY — 4 / C9.1
6. FIRE HYDRANT ASSEMBLY — 2 / C9.1
7. WATERLINE TRENCH DETAIL — 3 / C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
9. GATE VALVE — 1 / C9.3
10. FITTING AND THRUST BLOCK — 1 / C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 / C9.2
12. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTE:

1. FOR WATERLINE PROFILES, SEE SHEETS C8.6~C8.8.

NORTH

KEYPLAN



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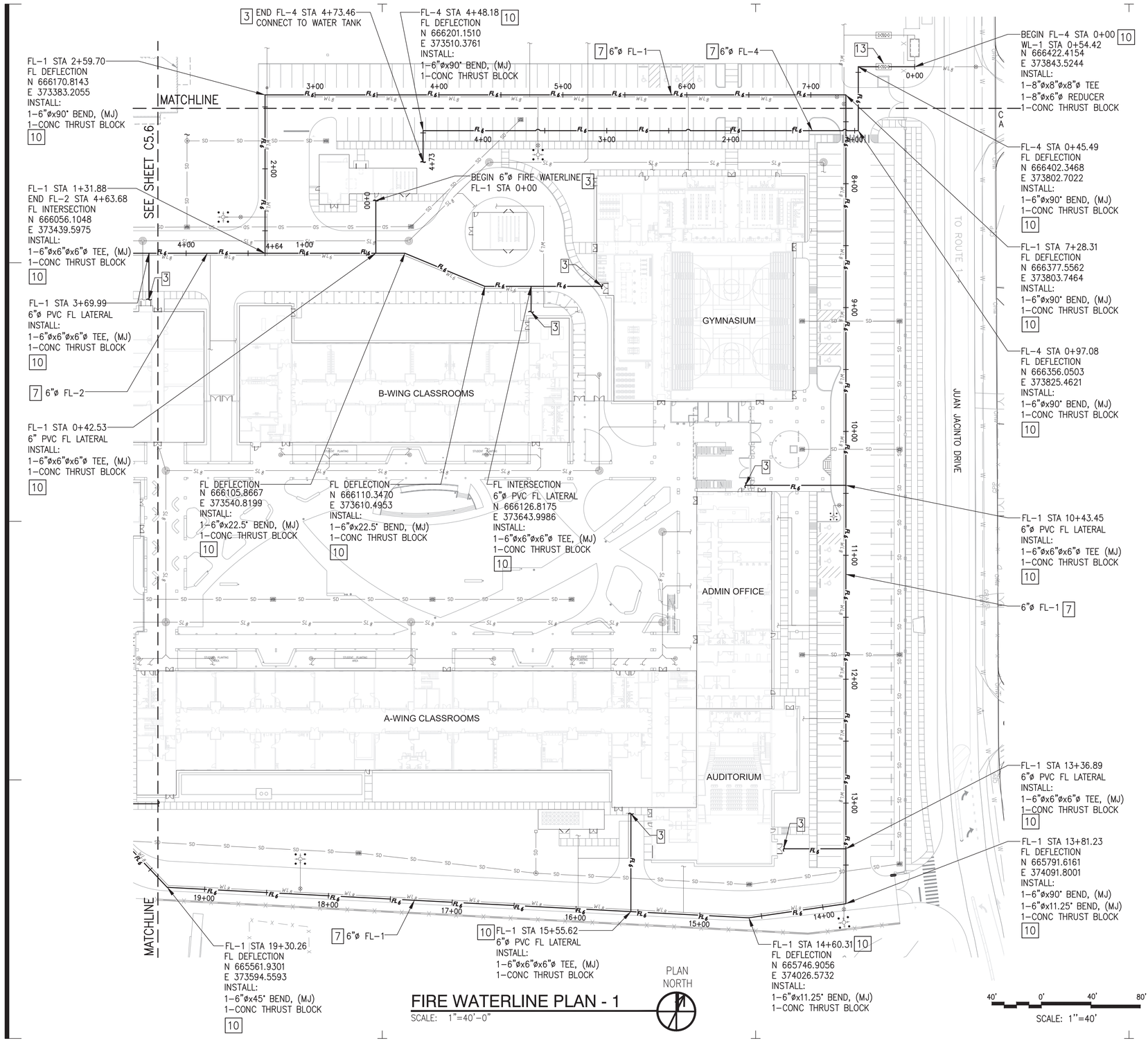
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WATER PLAN - 4
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C5.4

Sheet No. _____ of _____



FIRE WATERLINE PLAN - 1

SCALE: 1"=40'-0"

LEGEND:

- WL-8 – DOMESTIC WATERLINE
- FL-6 – FIRE WATERLINE
- – BACKFLOW PREVENTER
- – WATER METER
- – FIRE HYDRANT
- – GATE VALVE

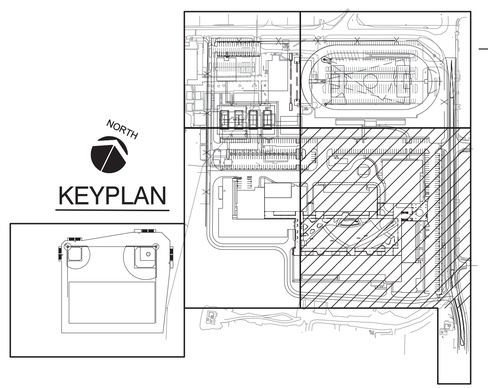
KEYNOTES:

1. CONNECT TO EXISTING WATER MAIN — 3 / C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 / C9.1
5. 8"ø BACKFLOW PREVENTER ASSEMBLY — 4 / C9.1
6. FIRE HYDRANT ASSEMBLY — 2 / C9.1
7. WATERLINE TRENCH DETAIL — 3 / C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 1 / C9.3; 6 / C9.3
9. GATE VALVE — 1 / C9.3
10. FITTING AND THRUST BLOCK — 1 / C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 / C9.2
12. CONNECT TO EXIST STUB-OUT — 7 / C9.3
13. 6"ø BACKFLOW PREVENTER ASSEMBLY — 4 / C9.2

NOTES:

1. CONTRACTOR TO VERIFY SIZE, LOCATION, AND DEPTH OF EXISTING PIPE AT POINT OF CONNECTION.
2. FOR FIRE WATERLINE PROFILES, SEE SHEETS C8.9~C8.11.

KEYPLAN



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

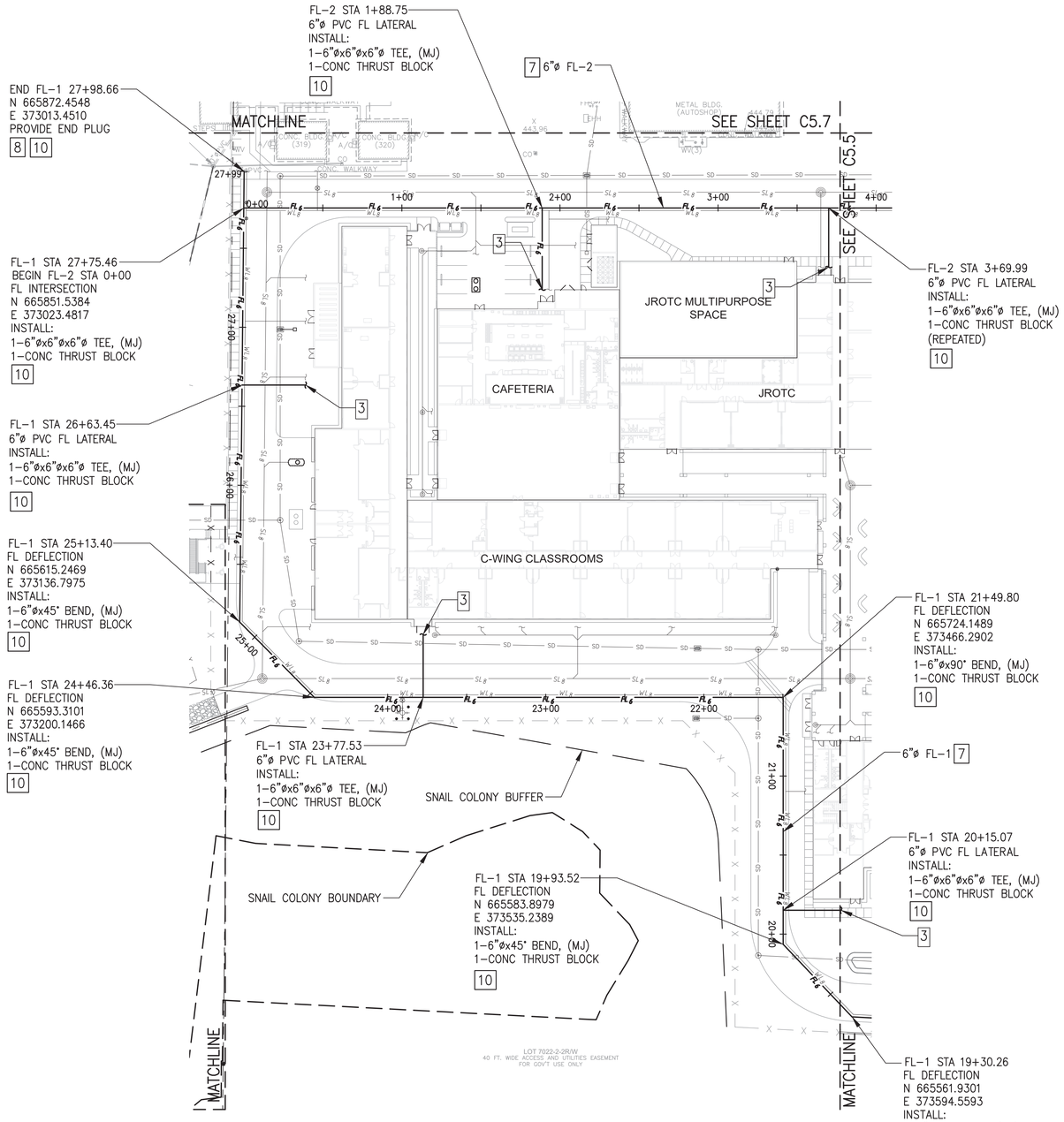
Title:
FIRE WATERLINE PLAN - 1

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C5.5

Sheet No. _____ of _____



FIRE WATERLINE PLAN - 2

SCALE: 1"=40'-0"

PLAN NORTH

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- DOMESTIC WATERLINE
- FIRE WATERLINE
- FIRE HYDRANT
- GATE VALVE

KEYNOTES:

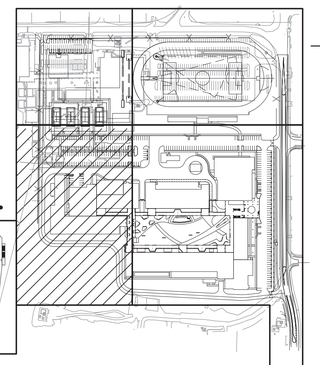
1. CONNECT TO EXISTING WATER MAIN — 3 / C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 / C9.1
5. 8" BACKFLOW PREVENTER ASSEMBLY — 4 / C9.1
6. FIRE HYDRANT ASSEMBLY — 2 / C9.1
7. WATERLINE TRENCH DETAIL — 3 / C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
9. GATE VALVE — 1 / C9.3
10. FITTING AND THRUST BLOCK — 1 / C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 / C9.2
12. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTE:

1. FOR FIRE WATERLINE PROFILES, SEE SHEETS C8.9~C8.11.

NORTH

KEYPLAN



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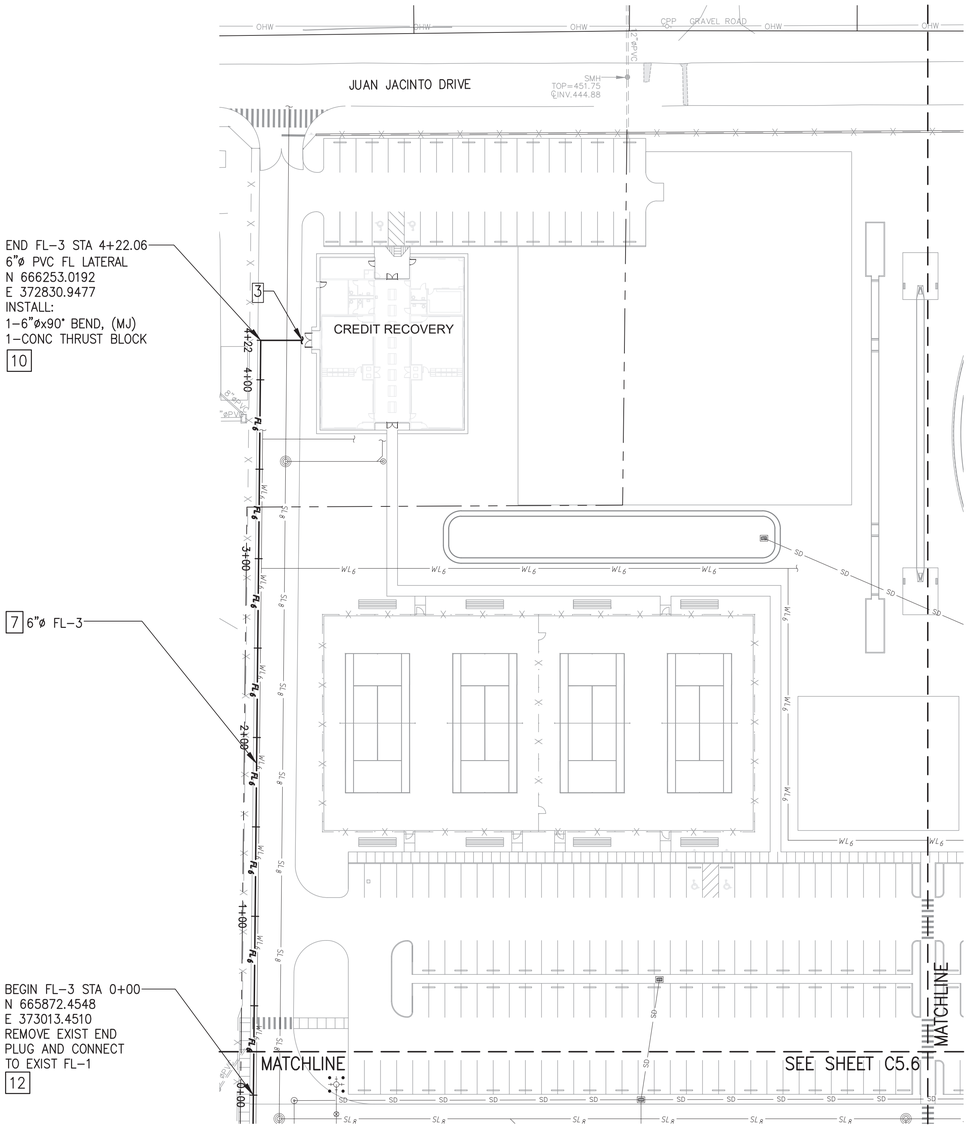
Project:	GDOE SIMON SANCHEZ HIGH SCHOOL
Title:	FIRE WATERLINE PLAN - 2 PROGRAMMING DOCUMENT
Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File
Drawing	C5.6
Sheet No.	of



PLAN NORTH

FIRE WATERLINE PLAN - 3

SCALE: 1"=40'-0"

LEGEND:

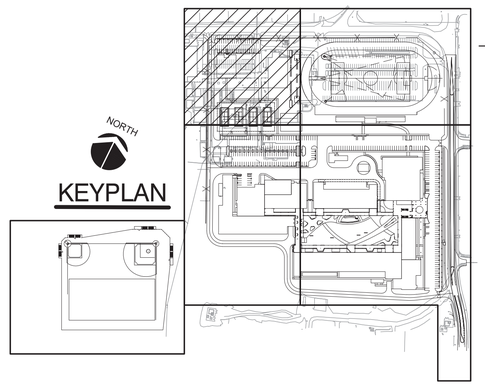
- WL_8 – DOMESTIC WATERLINE
- FL_6 – FIRE WATERLINE
- – FIRE HYDRANT
- – GATE VALVE

KEYNOTES:

1. CONNECT TO EXISTING WATER MAIN — 3 / C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 / C9.1
5. 8" BACKFLOW PREVENTER ASSEMBLY — 4 / C9.1
6. FIRE HYDRANT ASSEMBLY — 2 / C9.1
7. WATERLINE TRENCH DETAIL — 3 / C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
9. GATE VALVE — 1 / C9.3
10. FITTING AND THRUST BLOCK — 1 / C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 / C9.2
12. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTE:

1. FOR FIRE WATERLINE PROFILES, SEE SHEETS C8.9~C8.11.



40' 0' 40' 80'

SCALE: 1"=40'

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REVISIONS		
No.	Description	Date

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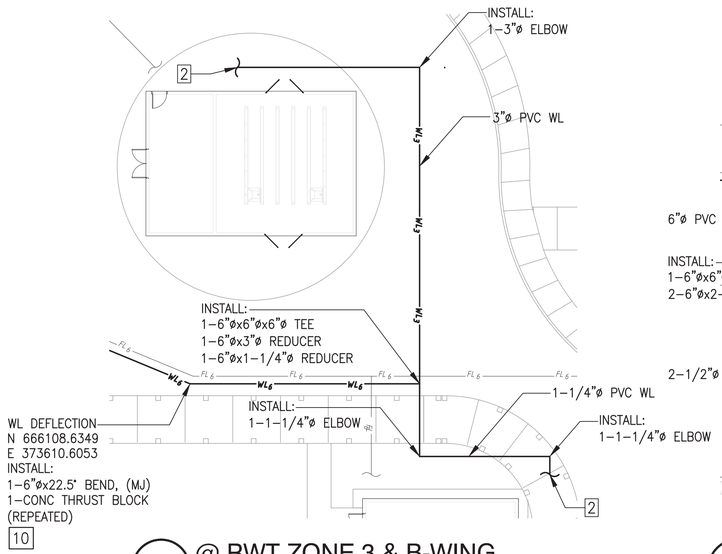
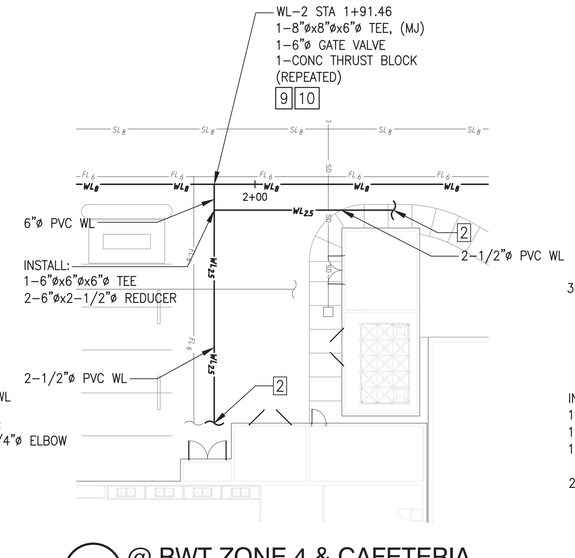
Project:	GDOE SIMON SANCHEZ HIGH SCHOOL
Title:	FIRE WATERLINE PLAN - 3
	PROGRAMMING DOCUMENT
Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File
Drawing	C5.7
Sheet No.	of



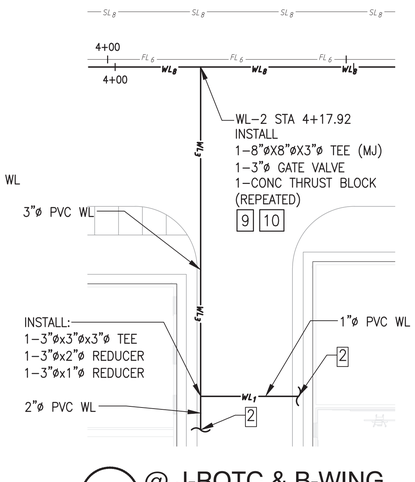
1E @ RWT ZONE 3 & B-WING

SCALE: 1"=15'-0"



1D @ RWT ZONE 4 & CAFETERIA

SCALE: 1"=15'-0"



1B @ J-ROTC & B-WING

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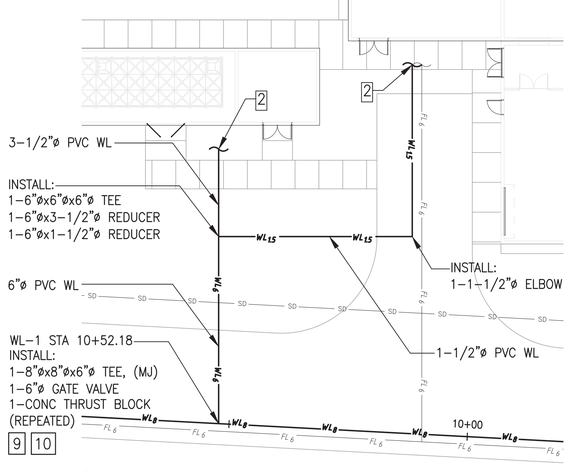
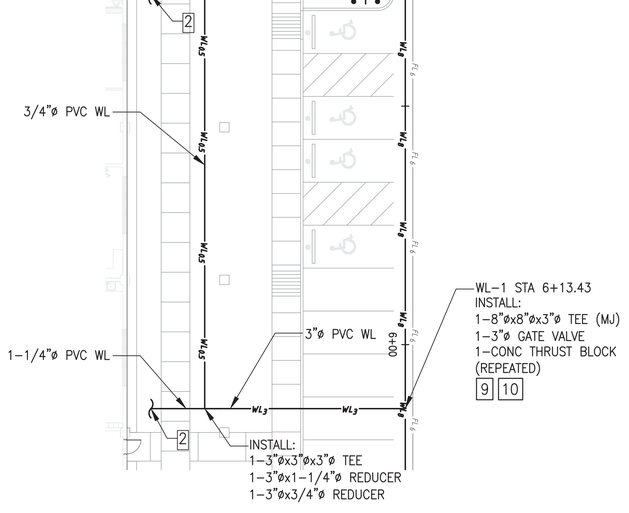


1C @ RWT ZONE 1 & A-WING

SCALE: 1"=15'-0"



1A @ ADMIN BUILDING

SCALE: 1"=15'-0"

1 BUILDING LATERAL ENLARGED PLAN

SCALE: 1"=15'-0"

LEGEND:

- WL-8 — DOMESTIC WATERLINE
- FL-6 — FIRE WATERLINE
- FIRE HYDRANT
- GATE VALVE

KEYNOTES:

1. CONNECT TO EXISTING WATER MAIN — 3 / C9.1
2. CONNECT TO BLDG DOMESTIC WATERLINE POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS
3. CONNECT TO BLDG FIRE WATERLINE POINT OF CONNECTION (POC), SEE FIRE PROTECTION DRAWINGS
4. 6" WATER METER — 1 / C9.1
5. 8" BACKFLOW PREVENTER ASSEMBLY — 4 / C9.1
6. FIRE HYDRANT ASSEMBLY — 2 / C9.1
7. WATERLINE TRENCH DETAIL — 3 / C9.2
8. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
9. GATE VALVE — 1 / C9.3
10. FITTING AND THRUST BLOCK — 1 / C9.2
11. BLDG SERVICE LATERAL DETAIL — 2 / C9.2
12. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTE:

1. FOR WATERLINE PROFILES, SEE SHEETS C8.6~C8.8.

15' 0' 15' 30'

SCALE: 1"=15'

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BLDG LATERAL ENLARGED PLAN
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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Project No.	File

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Sheet No. _____ of _____

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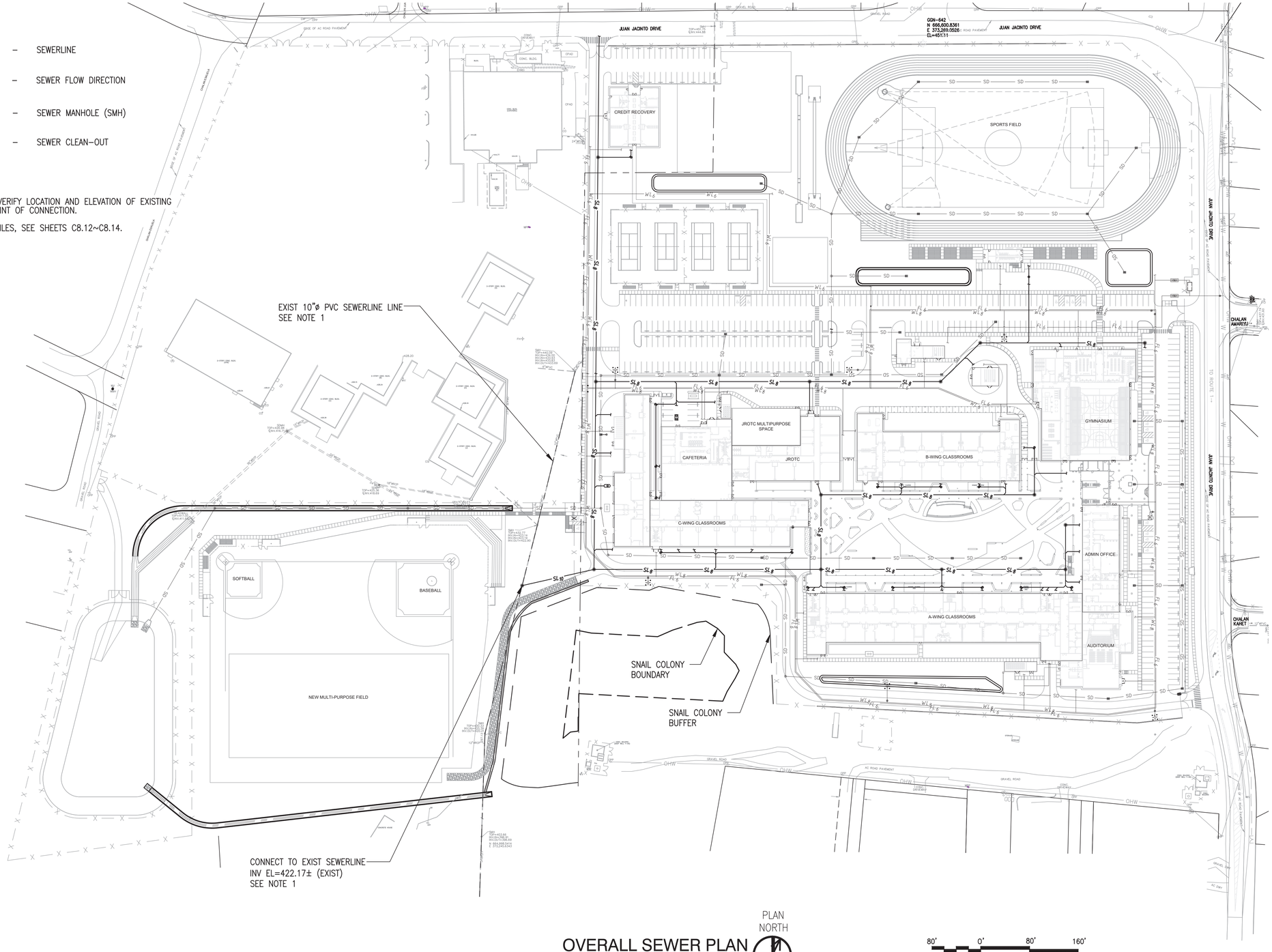
LEGEND:

- SL ø — SEWERLINE
- SEWER FLOW DIRECTION
- SEWER MANHOLE (SMH)
- SEWER CLEAN-OUT

NOTES:

1. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING SEWERLINE AT POINT OF CONNECTION.
2. FOR SEWER PROFILES, SEE SHEETS C8.12~C8.14.



PLAN NORTH

OVERALL SEWER PLAN

SCALE: 1"=80'-0"

80' 0' 80' 160'

SCALE: 1"=80'

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL SEWER PLAN
PROGRAMMING DOCUMENT

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Scale:	AS SHOWN
Date:	3/31/25
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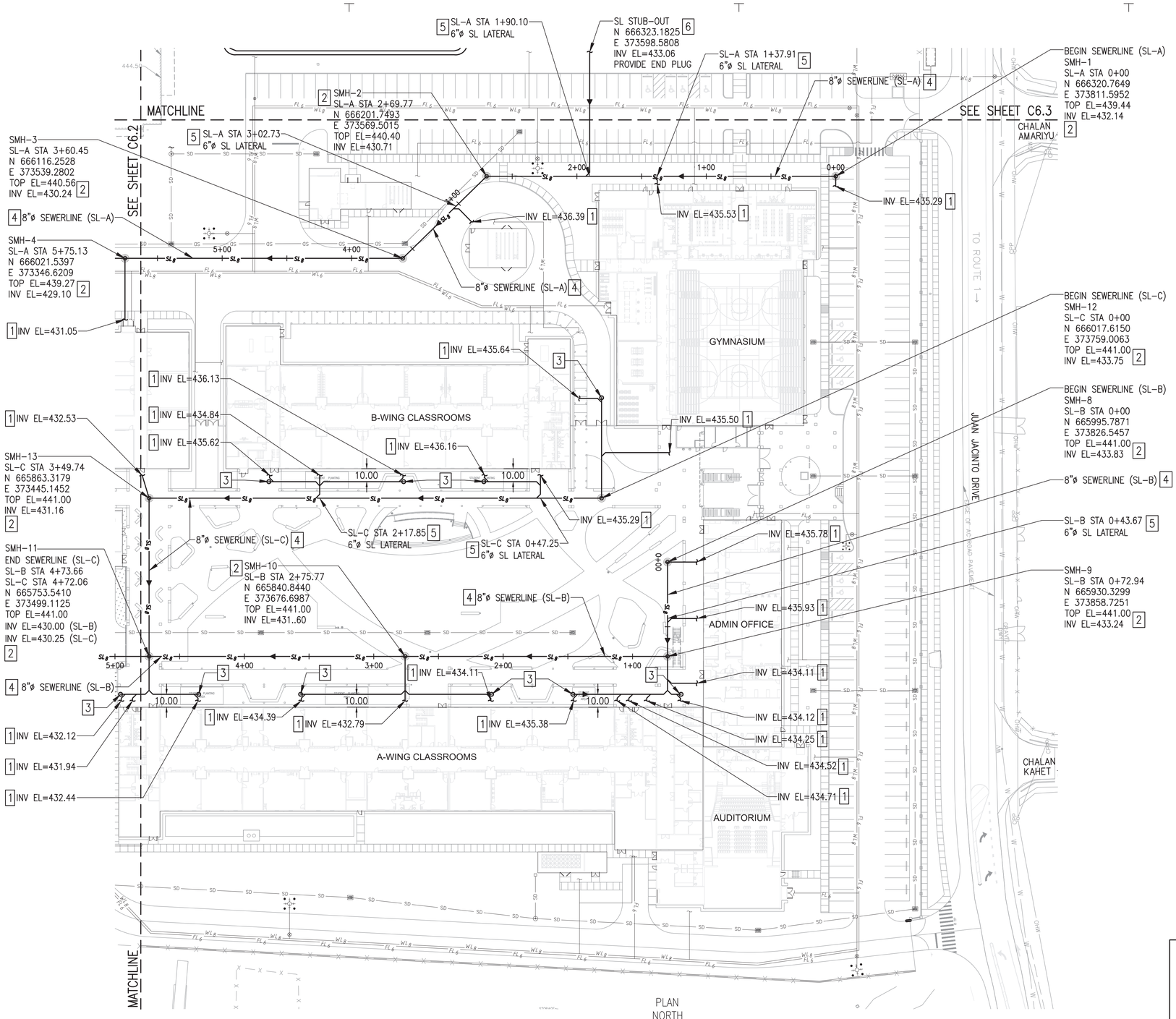
Drawing
C6.0

Sheet No. _____ of _____



SEWER PLAN - 1

SCALE: 1"=40'-0"

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- SL — SEWERLINE
- SEWER FLOW DIRECTION
- SEWER MANHOLE (SMH)
- SEWER CLEAN-OUT

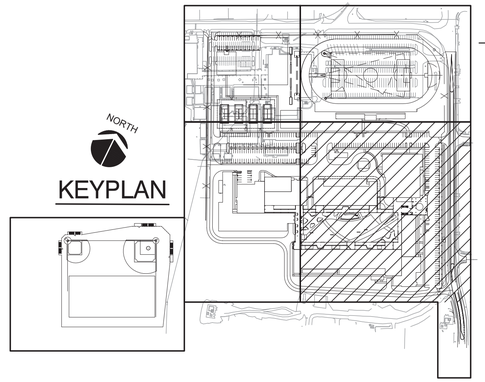
KEYNOTES:

1. CONNECT TO BLDG SEWER POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS FOR CONTINUATION
2. SANITARY SEWER MANHOLE (SMH) — 5 / C9.4
3. SANITARY SEWER CLEAN-OUT TO GRADE — 1 / C9.4
4. SEWERLINE TRENCH — 2 / C9.4
5. SEWER LATERAL CONNECTION — 3 / C9.4
6. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
7. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTES:

1. PROVIDE CLEANOUT ON EACH BLDG LATERAL CONNECTION FIVE (5) FEET AWAY FROM BLDG POC OR AS INDICATED ON PLAN.
2. FOR SEWER PROFILES, SEE SHEETS C8.12~C8.14.

KEYPLAN



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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: SEWER PLAN - 1

PROGRAMMING DOCUMENT

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Drawing: C6.1

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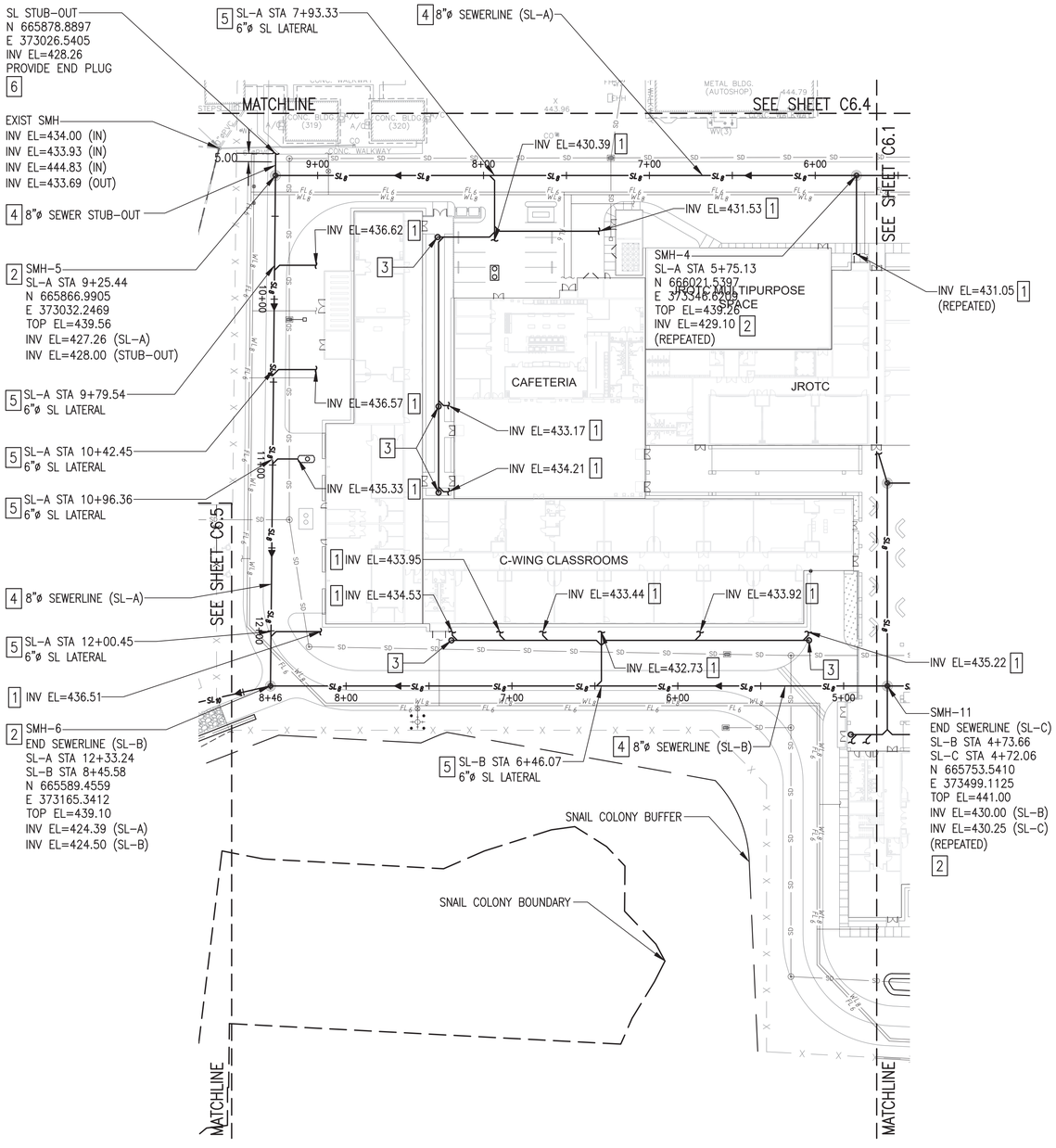

PLAN NORTH

SEWER PLAN - 2

SCALE: 1"=40'-0"

40' 0' 40' 80'

SCALE: 1"=40'

LEGEND:

- SL — SEWERLINE
- SEWER FLOW DIRECTION
- SEWER MANHOLE (SMH)
- SEWER CLEAN-OUT

KEYNOTES:

1. CONNECT TO BLDG SEWER POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS FOR CONTINUATION
2. SANITARY SEWER MANHOLE (SMH) — 5 / C9.4
3. SANITARY SEWER CLEAN-OUT TO GRADE — 1 / C9.4
4. SEWERLINE TRENCH — 2 / C9.4
5. SEWER LATERAL CONNECTION — 3 / C9.4
6. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
7. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTES:

1. PROVIDE CLEANOUT ON EACH BLDG LATERAL CONNECTION FIVE (5) FEET AWAY FROM BLDG POC OR AS INDICATED ON PLAN.
2. FOR SEWER PROFILES, SEE SHEETS C8.12~C8.14.

NORTH

KEYPLAN

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SIMON SANCHEZ HIGH SCHOOL

Title:
SEWER PLAN - 2
PROGRAMMING DOCUMENT

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Supv:	EMS
Scale:	AS SHOWN
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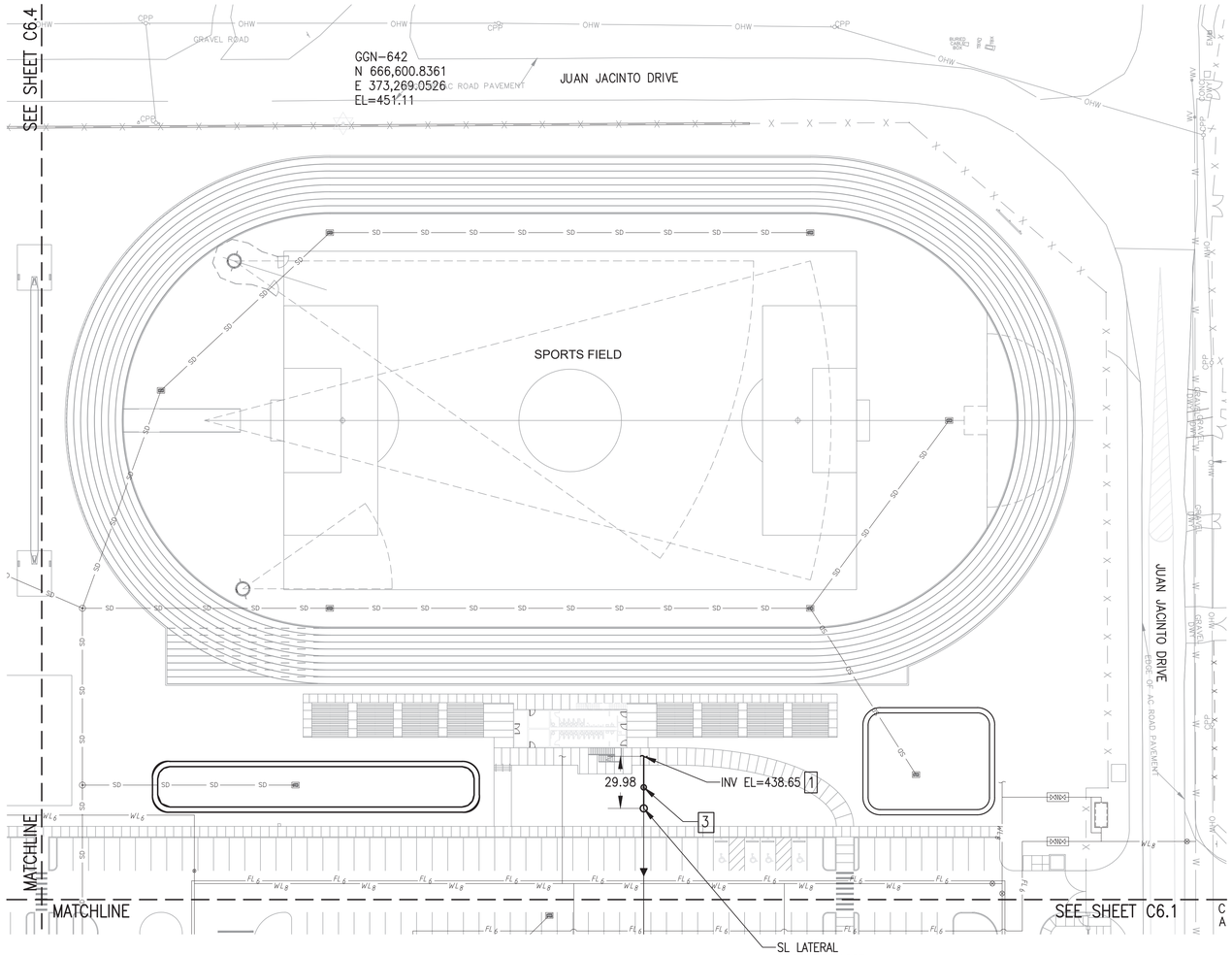
Project No.	Title

Drawing
C6.2

Sheet No. _____ of _____



SEWER PLAN - 3

SCALE: 1"=40'-0"

PLAN NORTH

40' 0' 40' 80'

SCALE: 1''=40'

LEGEND:

- SL – SEWERLINE
- – SEWER FLOW DIRECTION
- – SEWER MANHOLE (SMH)
- – SEWER CLEAN-OUT

KEYNOTES:

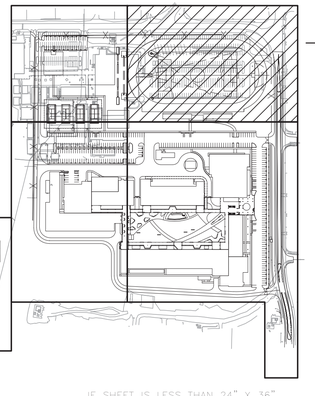
1. CONNECT TO BLDG SEWER POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS FOR CONTINUATION
2. SANITARY SEWER MANHOLE (SMH) — 5 / C9.4
3. SANITARY SEWER CLEAN-OUT TO GRADE — 1 / C9.4
4. SEWERLINE TRENCH — 2 / C9.4
5. SEWER LATERAL CONNECTION — 3 / C9.4
6. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
7. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTES:

1. PROVIDE CLEANOUT ON EACH BLDG LATERAL CONNECTION FIVE (5) FEET AWAY FROM BLDG POC OR AS INDICATED ON PLAN.
2. FOR SEWER PROFILES, SEE SHEETS C8.12~C8.14.

NORTH

KEYPLAN



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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: SEWER PLAN - 3

PROGRAMMING DOCUMENT

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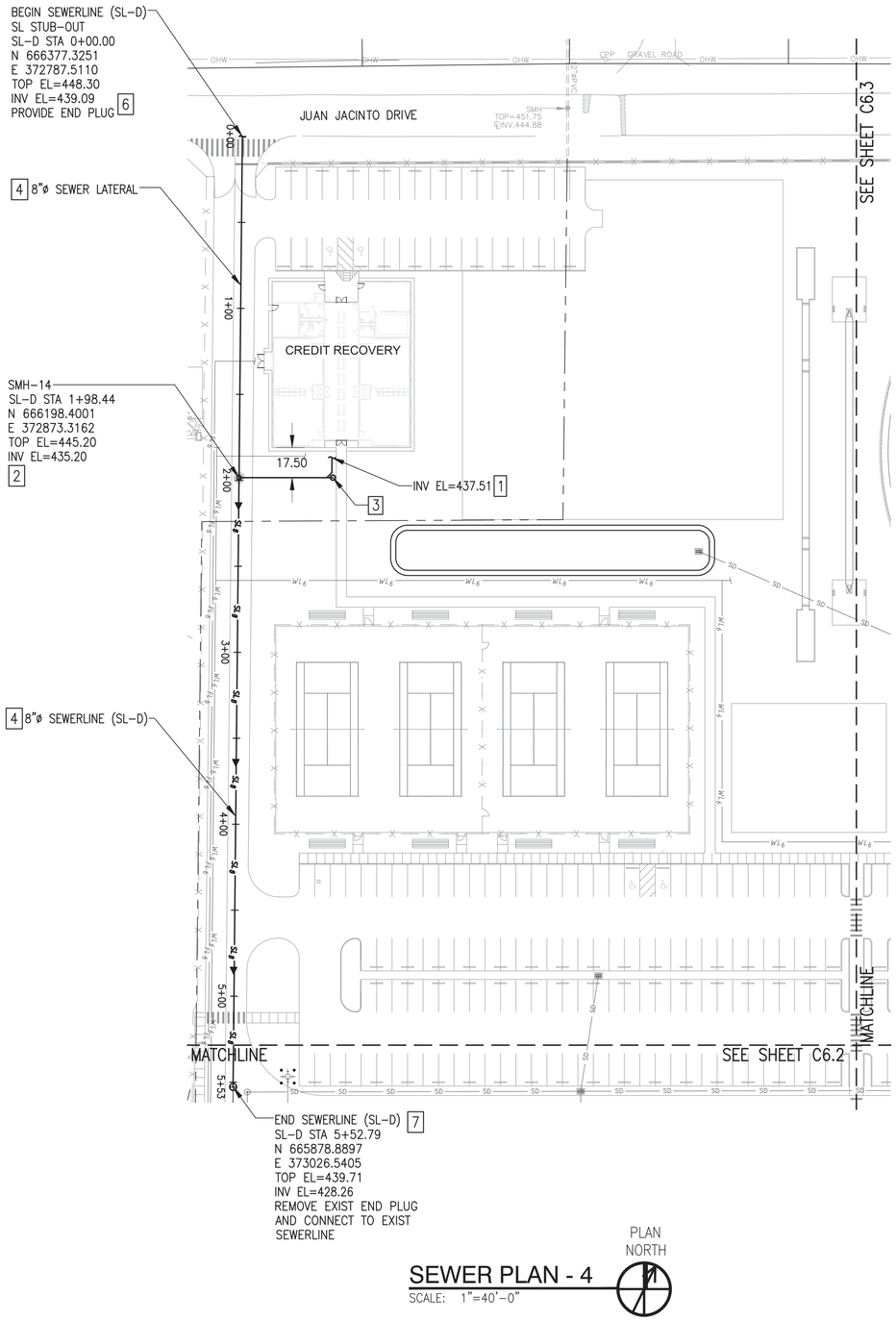


SEWER PLAN - 4

SCALE: 1"=40'-0"

LEGEND:

- SL ø — SEWERLINE
- SEWER FLOW DIRECTION
- SEWER MANHOLE (SMH)
- SEWER CLEAN-OUT

KEYNOTES:

1. CONNECT TO BLDG SEWER POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS FOR CONTINUATION
2. SANITARY SEWER MANHOLE (SMH) — 5 / C9.4
3. SANITARY SEWER CLEAN-OUT TO GRADE — 1 / C9.4
4. SEWERLINE TRENCH — 2 / C9.4
5. SEWER LATERAL CONNECTION — 3 / C9.4
6. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
7. CONNECT TO EXIST STUB-OUT — 7 / C9.3

NOTES:

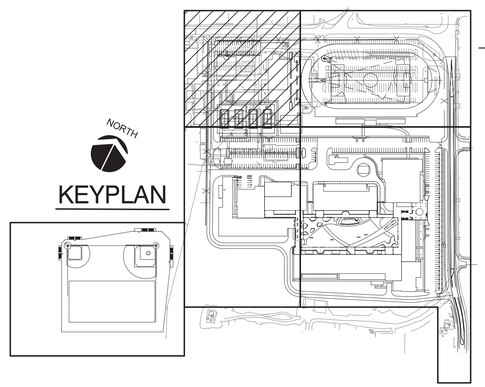
1. PROVIDE CLEANOUT ON EACH BLDG LATERAL CONNECTION FIVE (5) FEET AWAY FROM BLDG POC OR AS INDICATED ON PLAN.
2. FOR SEWER PROFILES, SEE SHEETS C8.12~C8.14.

40' 0' 40' 80'

SCALE: 1"=40'

NORTH

KEYPLAN



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SEWER PLAN - 4

PROGRAMMING DOCUMENT

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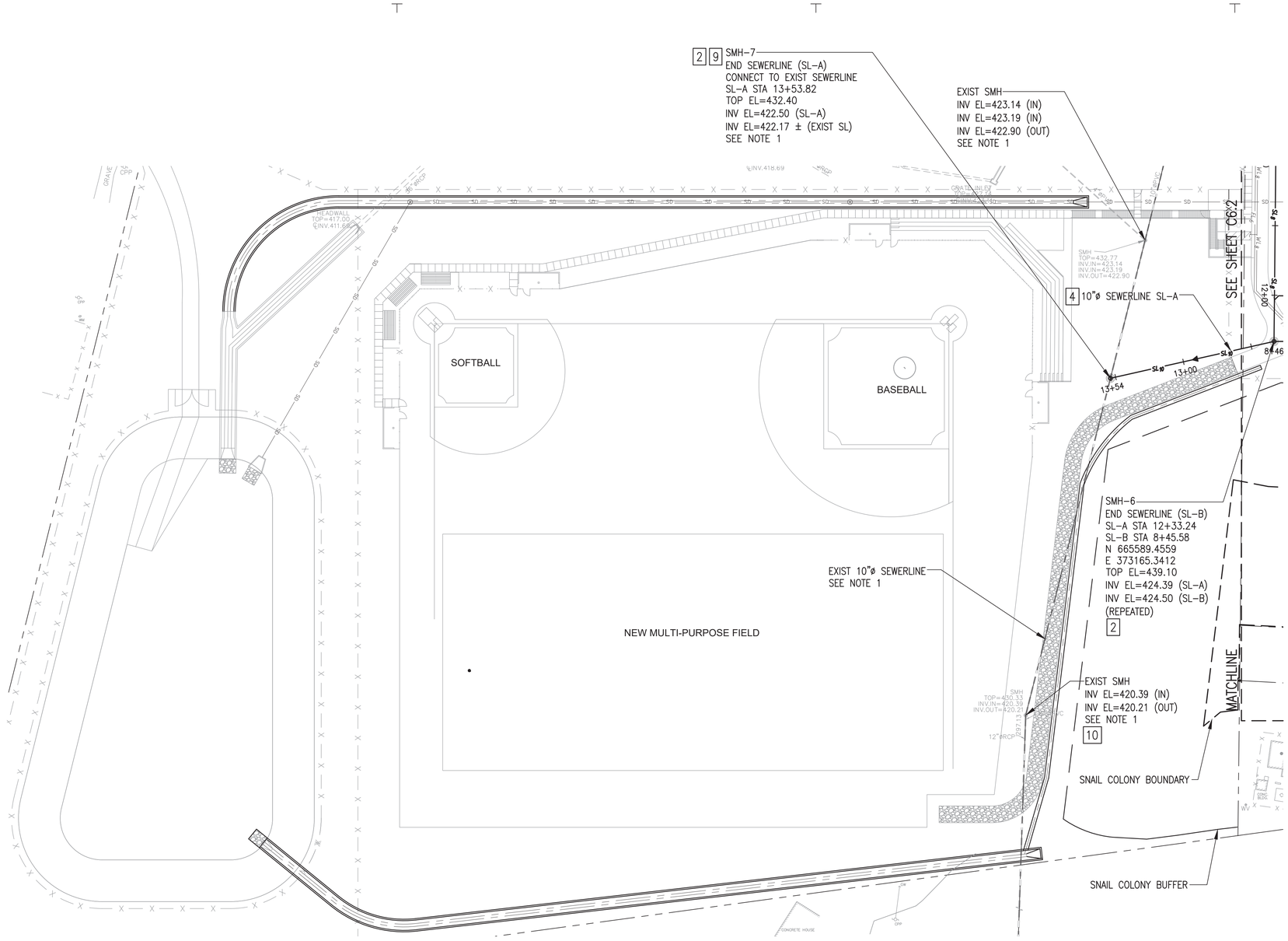
Drawing
C6.4

Sheet No. _____ of _____



LEGEND:

- SL – SEWERLINE
- – SEWER FLOW DIRECTION
- – SEWER MANHOLE (SMH)
- – SEWER CLEAN-OUT

KEYNOTES:

1. CONNECT TO BLDG SEWER POINT OF CONNECTION (POC), SEE PLUMBING DRAWINGS FOR CONTINUATION
2. SANITARY SEWER MANHOLE (SMH) — 5 / C9.4
3. SANITARY SEWER CLEAN-OUT TO GRADE — 1 / C9.4
4. SEWERLINE TRENCH — 2 / C9.4
5. SEWER LATERAL CONNECTION — 3 / C9.4
6. STUB-OUT FOR FUTURE CONNECTION — 6 / C9.3
7. CONNECT TO EXIST STUB-OUT — 7 / C9.3
8. SHALLOW SANITARY SEWER MANHOLE (SMH) — 6 / C9.4
9. CONNECT TO EXIST SEWERLINE — 9 / C9.3
10. SEWER MANHOLE ADJUSTMENT DETAIL — 8 / C9.3

NOTES:

1. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING SEWERLINE AT POINT OF CONNECTION.
2. PROVIDE CLEANOUT ON EACH BLDG LATERAL CONNECTION FIVE (5) FEET AWAY FROM BLDG POC OR AS INDICATED ON PLAN.
3. FOR SEWER PROFILES, SEE SHEETS C8.12~C8.14.

SEWER PLAN - 5

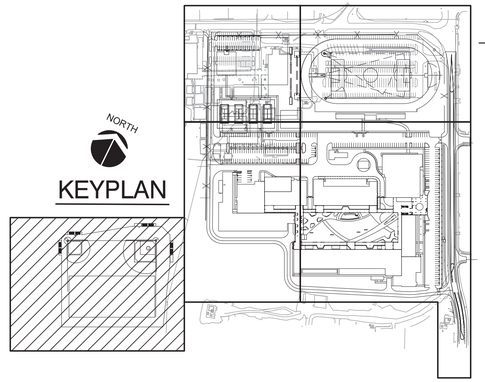
SCALE: 1"=40'-0"

PLAN NORTH

40' 0' 40' 80'

SCALE: 1"=40'

KEYPLAN



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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: SEWER PLAN - 5
PROGRAMMING DOCUMENT

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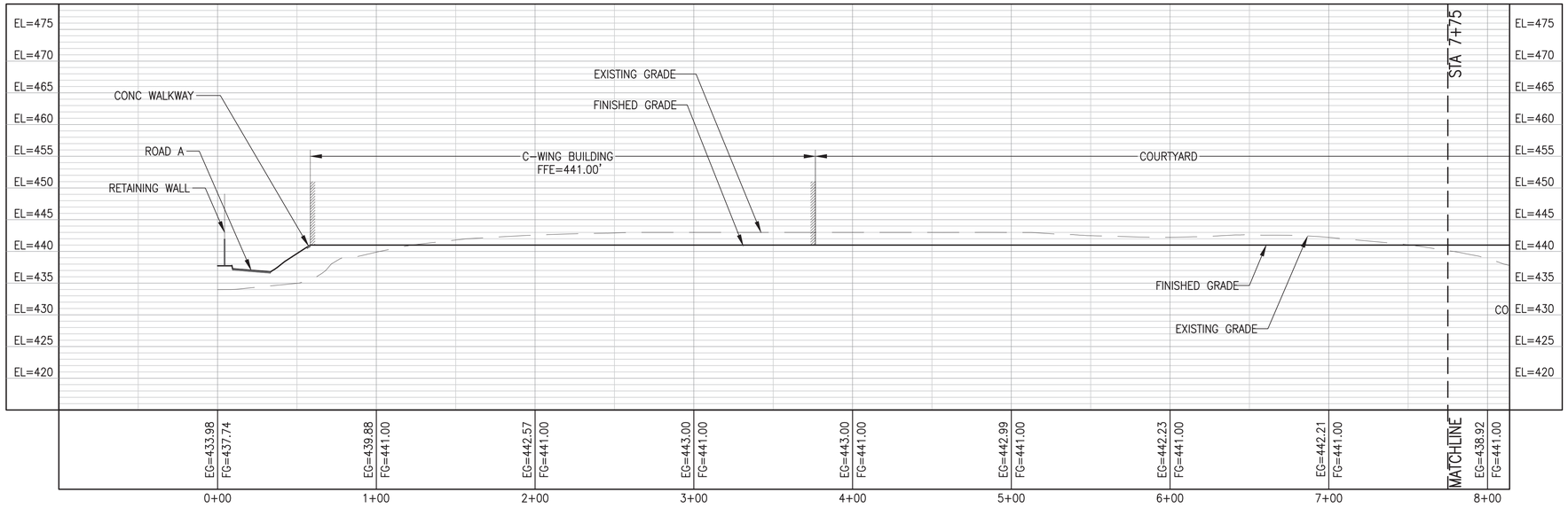
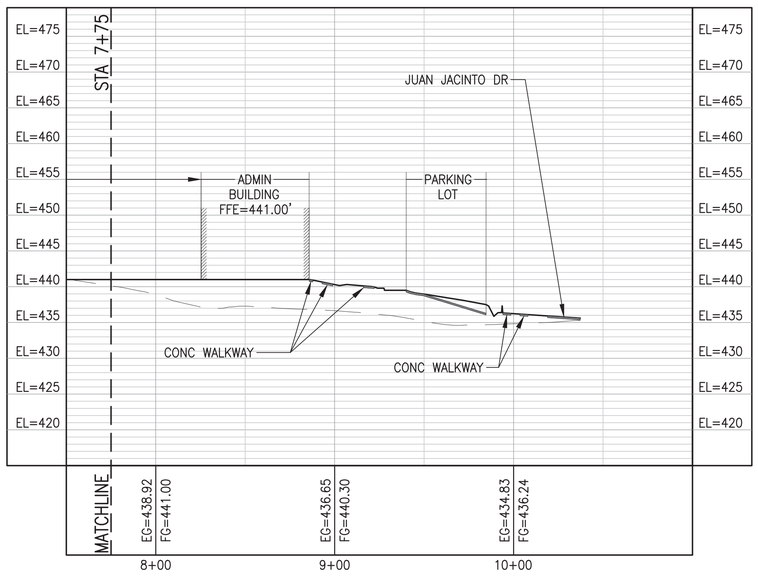


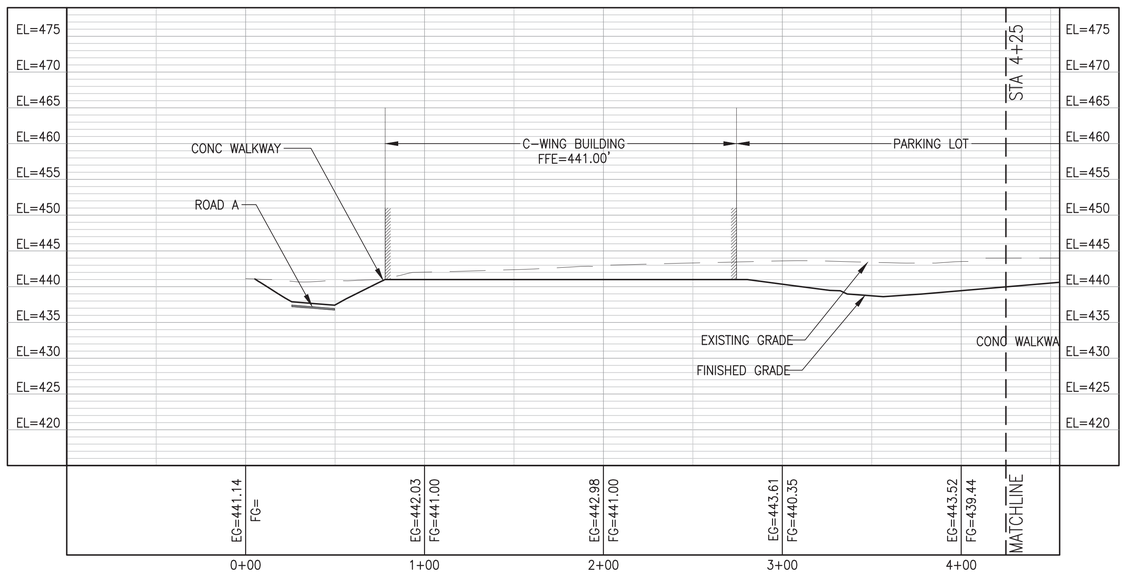
1 SITE SECTION A (STA. 0+00 TO STA. 7+75)

SCALE: HORIZONTAL 1"=40'- 0"
VERTICAL 1"=10'- 0"



2 SITE SECTION A (STA. 7+75 TO STA. 10+37)

SCALE: HORIZONTAL 1"=40'- 0"
VERTICAL 1"=10'- 0"



3 SITE SECTION B (STA. 0+00 TO STA. 4+25)

SCALE: HORIZONTAL 1"=40'- 0"
VERTICAL 1"=10'- 0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

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SIMON SANCHEZ HIGH SCHOOL

Title:
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Project No.	File

Drawing:
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Sheet No. _____ of _____

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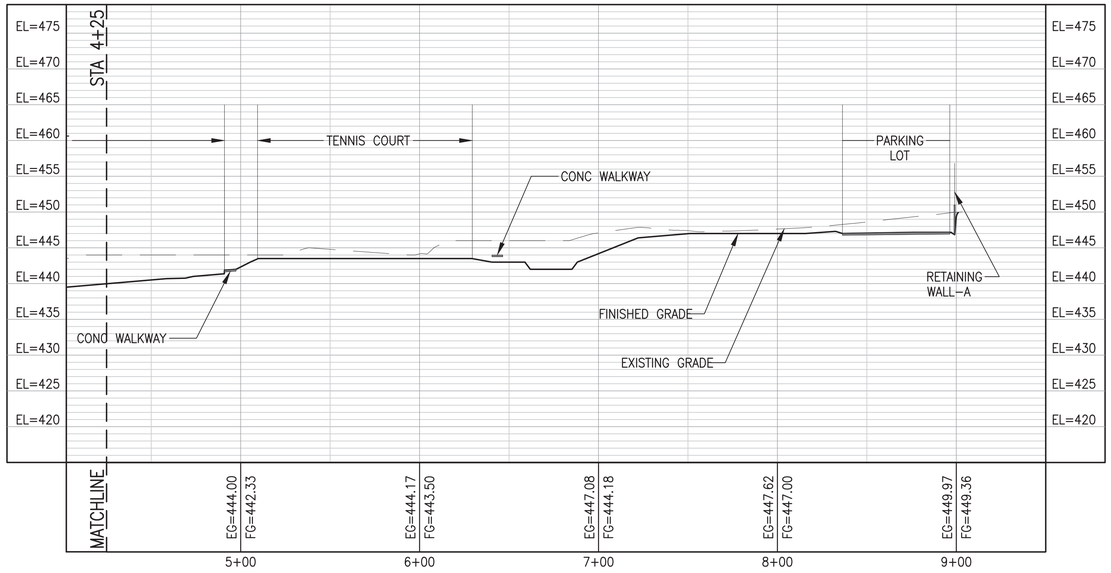
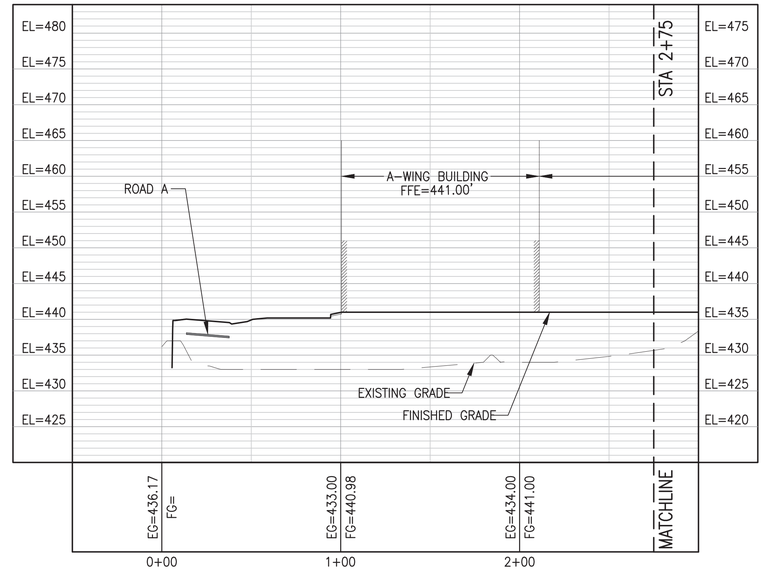


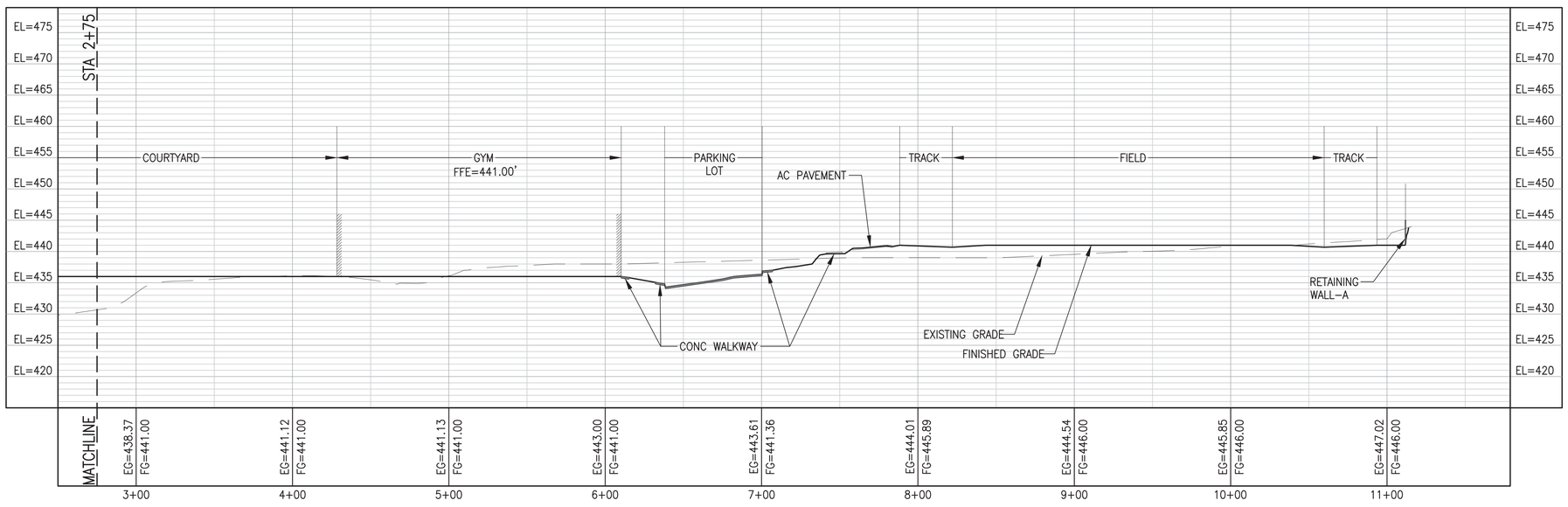
1 SITE SECTION B (STA. 4+25 TO STA. 9+04)

SCALE: HORIZONTAL 1"=40'– 0"
VERTICAL 1"=10'– 0"



1 SITE SECTION C (STA. 0+00 TO STA. 2+75)

SCALE: HORIZONTAL 1"=40'– 0"
VERTICAL 1"=10'– 0"



2 SITE SECTION C (STA. 2+75 TO STA. 11+16)

SCALE: HORIZONTAL 1"=40'– 0"
VERTICAL 1"=10'– 0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EL Agana, GU 96910
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

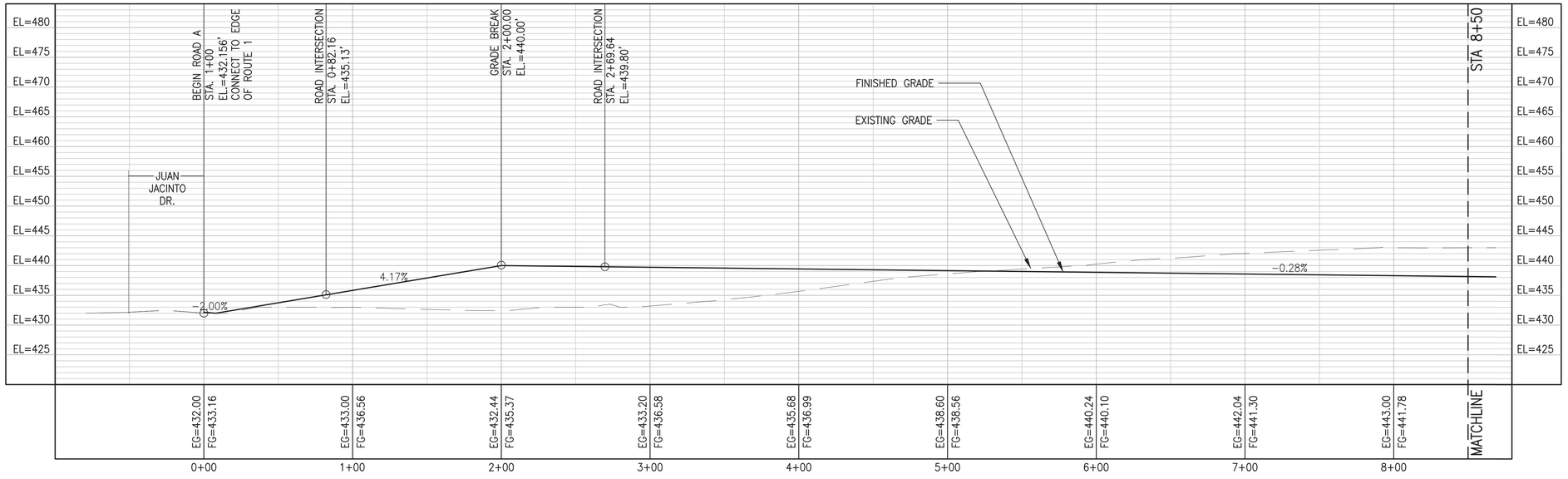
Title:
SITE SECTIONS - 2

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

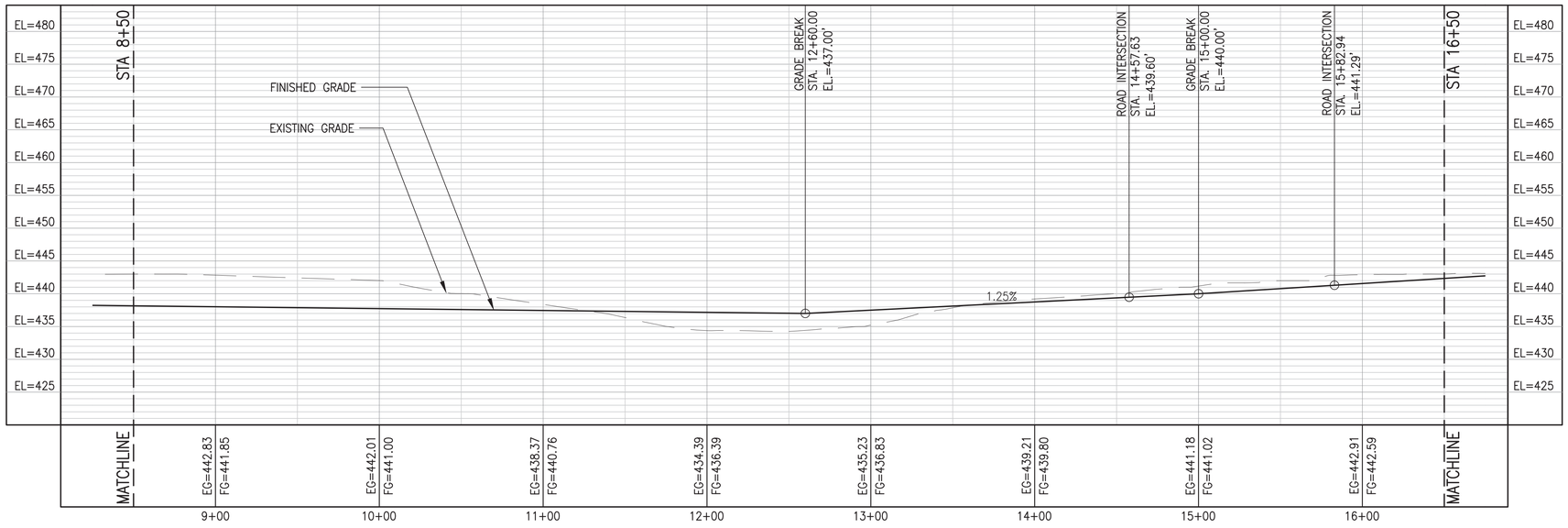
Drawing:
C7.2

Sheet No. _____ of _____



1 ROAD A CENTERLINE PROFILE (STA. 0+00 TO STA. 8+50)

SCALE: HORIZONTAL 1"=40'– 0"
VERTICAL 1"=10'– 0"



2 ROAD A CENTERLINE PROFILE (STA. 8+50 TO STA. 16+50)

SCALE: HORIZONTAL 1"=40'–0"
VERTICAL 1"=10'–0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

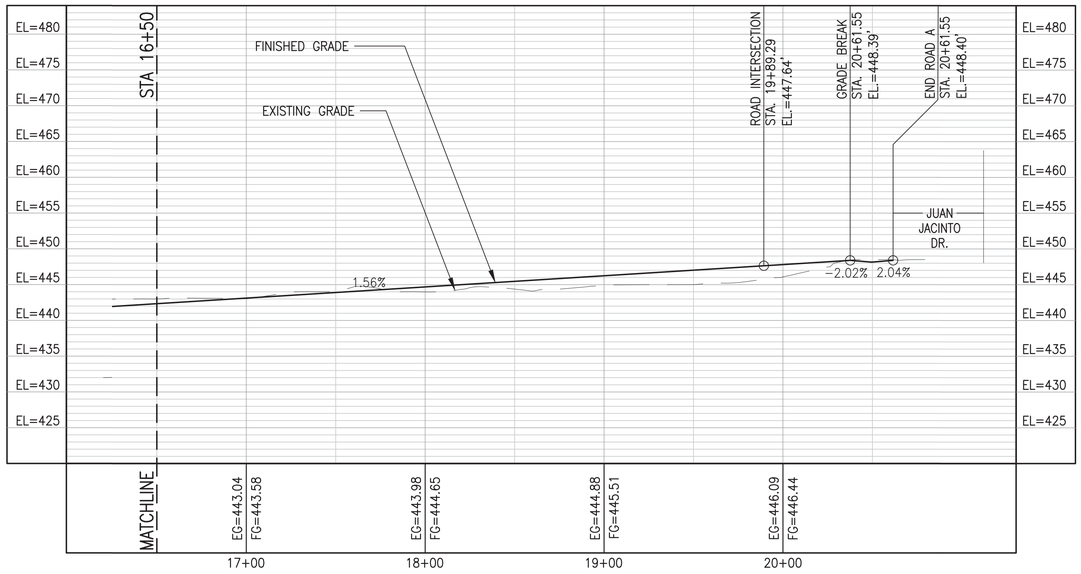
Title:
ROAD A CENTERLINE PROFILE - 1

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing:
C7.3

Sheet No. _____ of _____



1 ROAD A CENTERLINE PROFILE (STA. 16+50 TO STA. 20+61.55)

SCALE: HORIZONTAL 1"=40'- 0"
VERTICAL 1"=10'- 0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ROAD A CENTERLINE PROFILE - 2

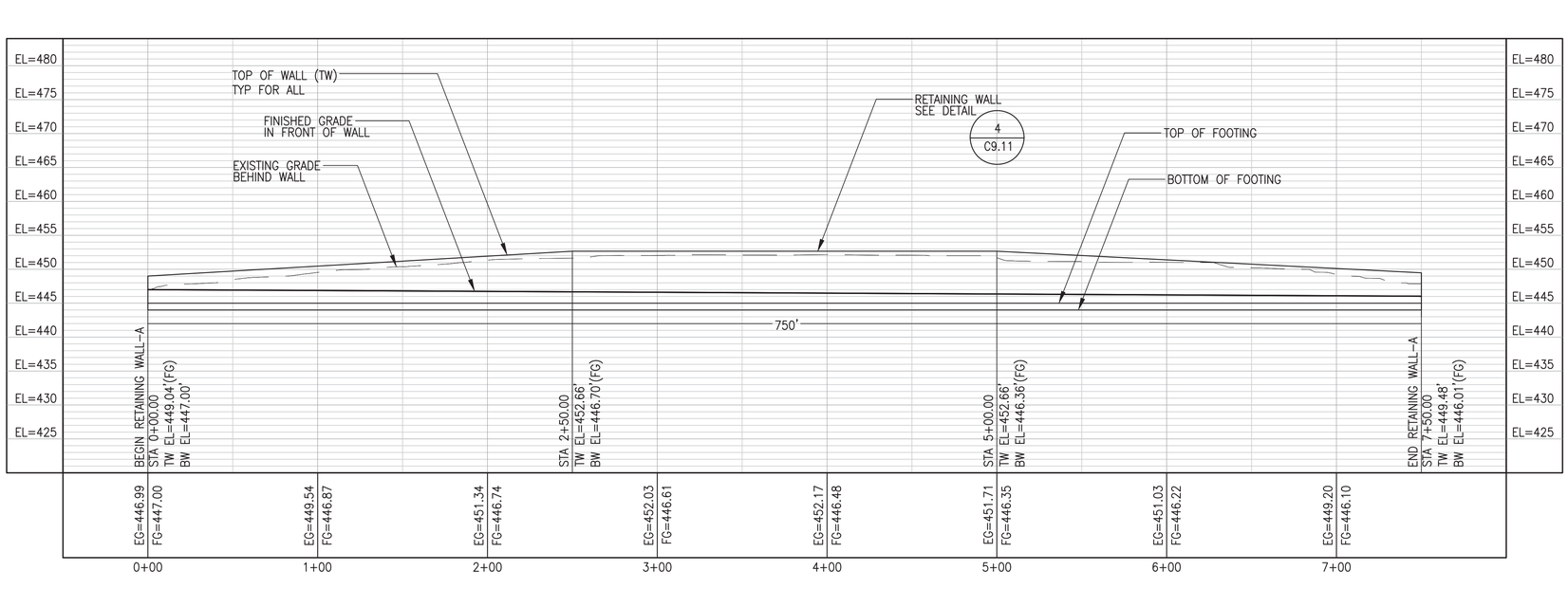
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C7.4

Sheet No: _____ of _____

NOT FOR CONSTRUCTION



1 RETAINING WALL A (STA. 0+00 TO STA. 7+50.00)

SCALE: HORIZONTAL 1"=40'- 0"
VERTICAL 1"=10'- 0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
RETAINING WALL PROFILE - 1

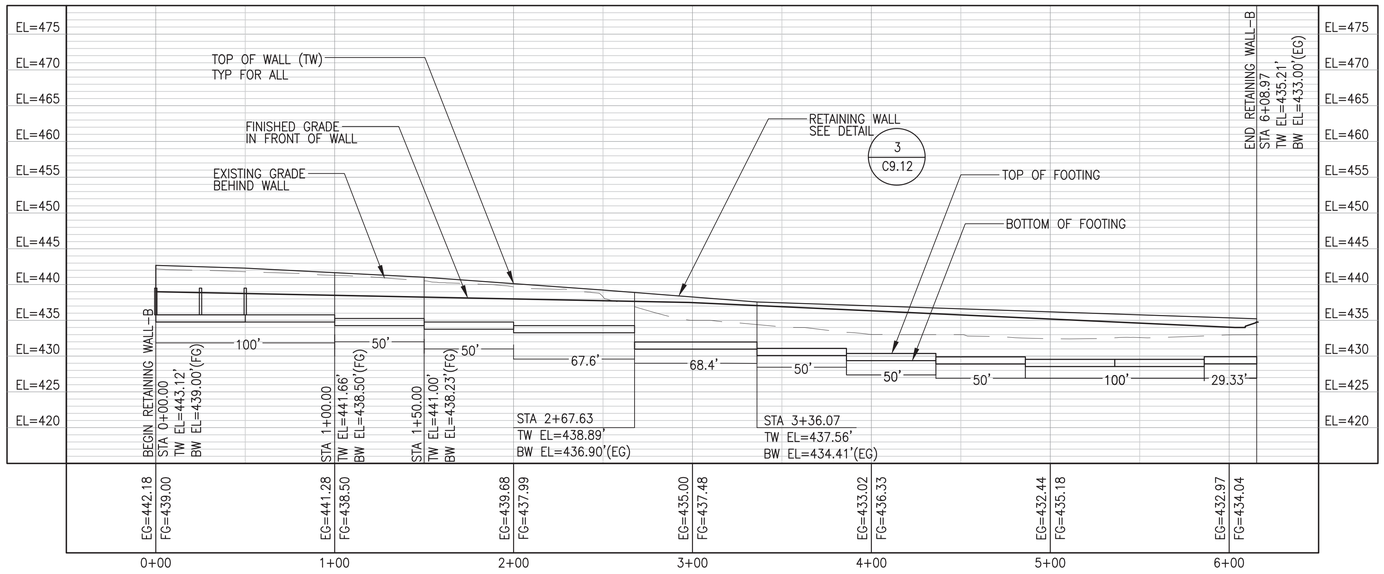
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C7.5

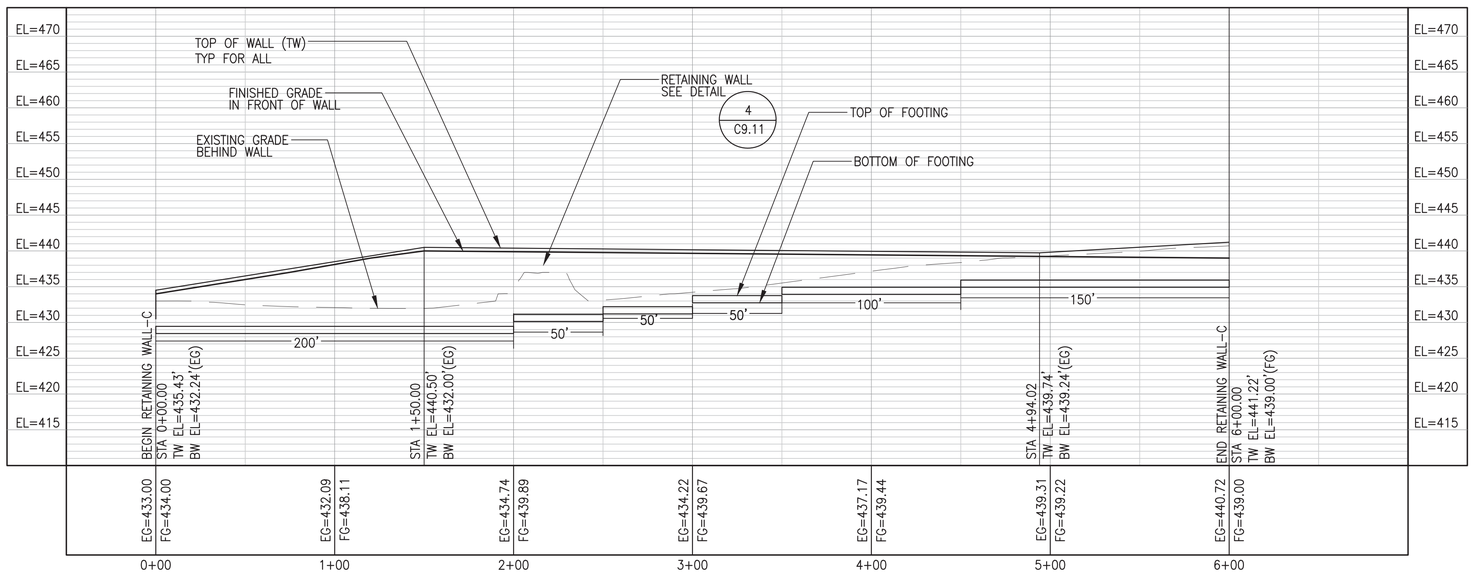
Sheet No: _____ of _____

NOT FOR CONSTRUCTION



1 RETAINING WALL B (STA. 0+00 TO STA. 6+08.97)

SCALE: HORIZONTAL 1"=40'– 0"
VERTICAL 1"=10'– 0"



2 RETAINING WALL C (STA. 0+00 TO STA. 5+41.50)

SCALE: HORIZONTAL 1"=40'– 0"
VERTICAL 1"=10'– 0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

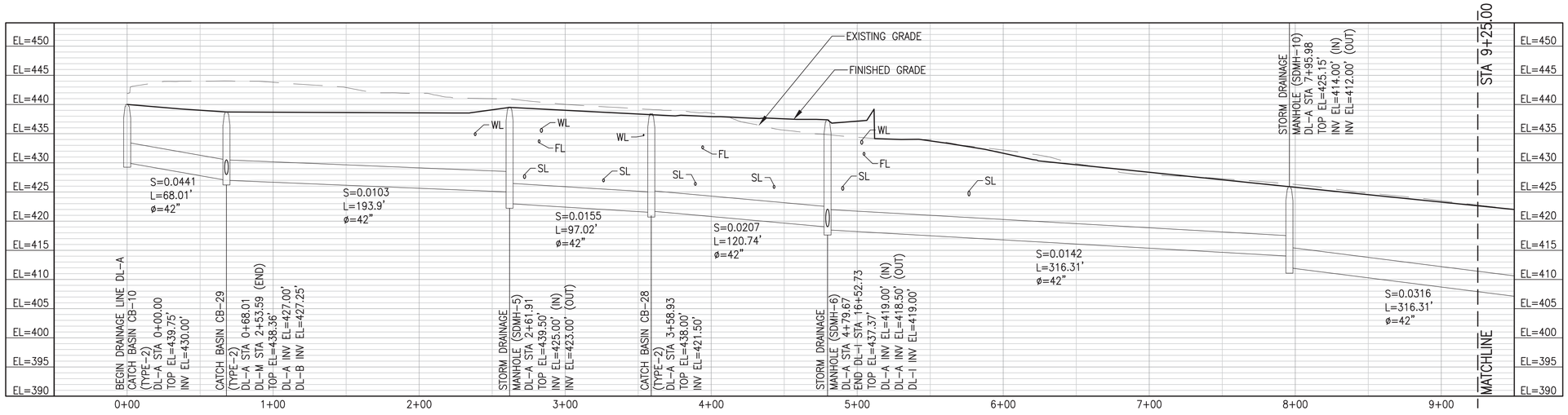
Title:
RETAINING WALL PROFILE - 2

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C7.6

Sheet No: _____ of _____

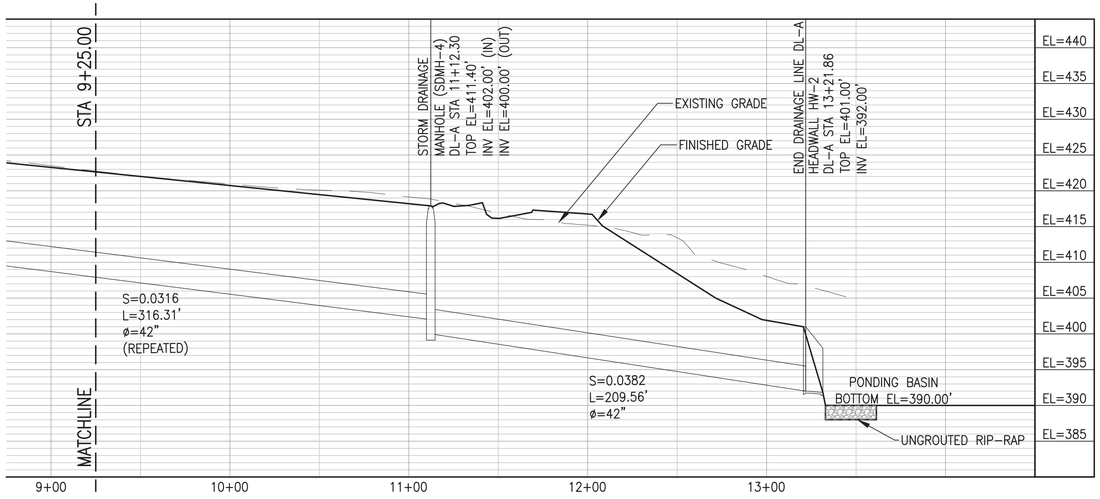


1 DRAINAGE LINE DL-A PROFILE (STA 0+00.00 TO STA 9+25.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

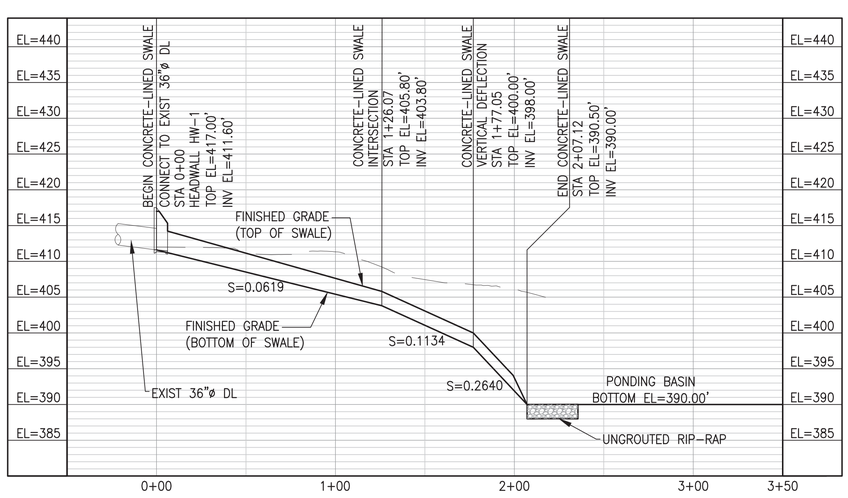
40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'



2 DRAINAGE LINE DL-A PROFILE (STA 9+25.00 TO STA 13+21.86)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



3 CONCRETE LINED SWALE PROFILE (STA 0+00 TO STA 2+07.12)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE LINE PROFILES - 1

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.1

Sheet No: _____ of _____

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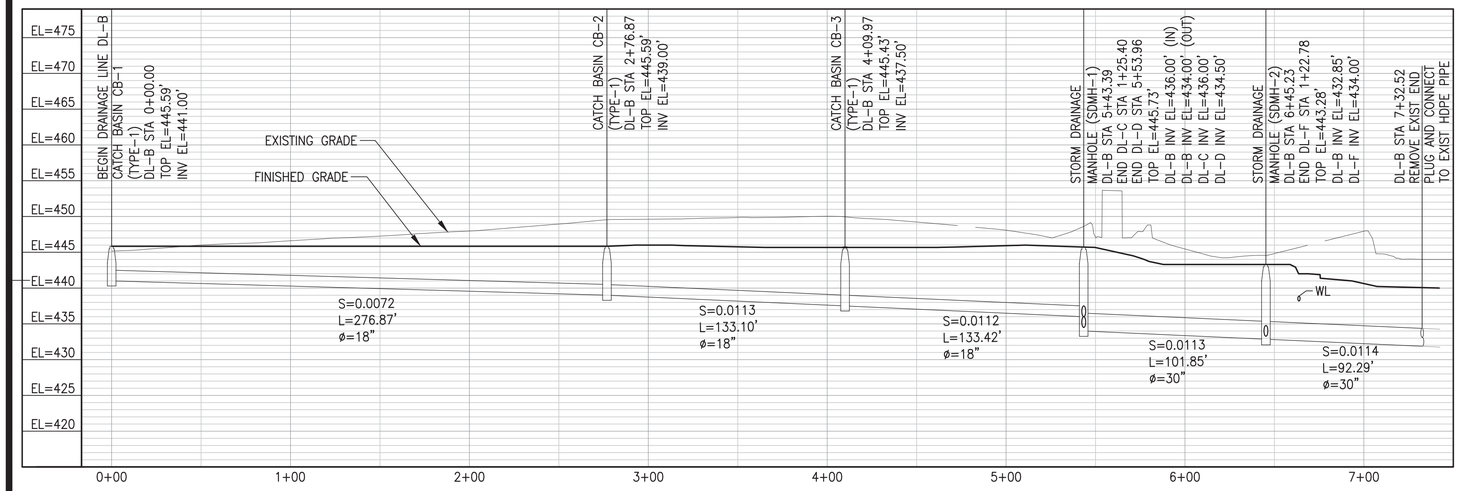

1 DRAINAGE LINE DL-B PROFILE (STA 0+00.00 TO STA 7+32.52)

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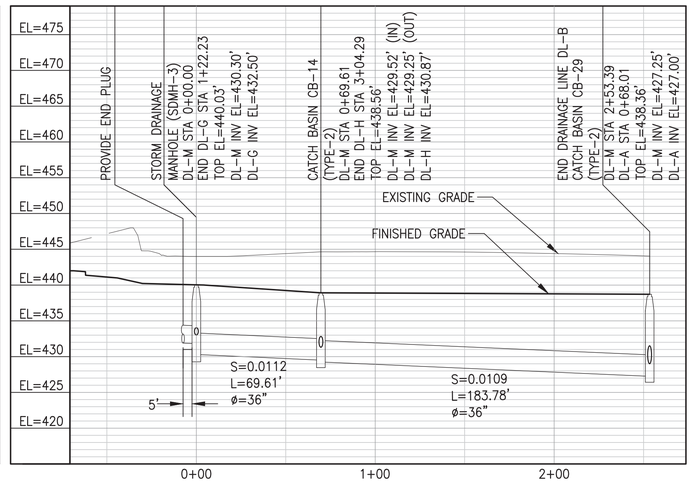
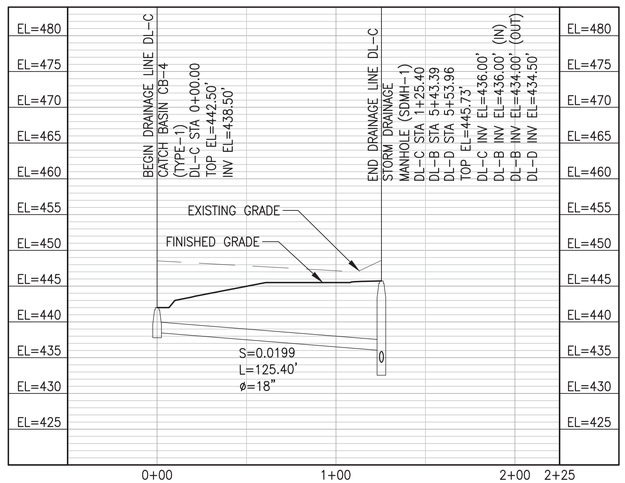
VERTICAL 1"=10'-0"



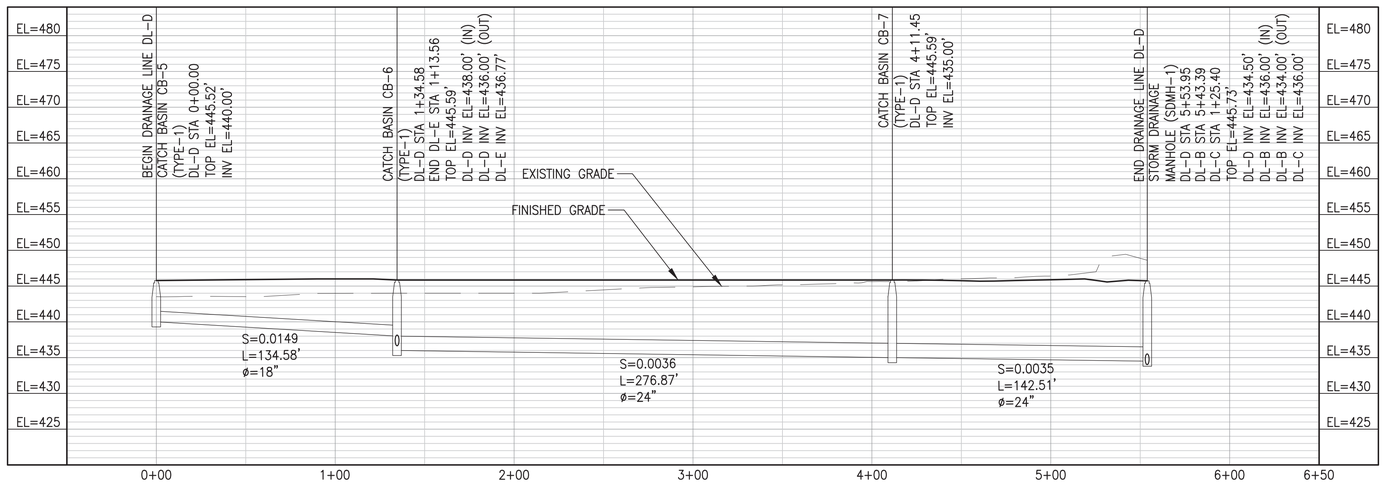
1B DRAINAGE LINE DL-M PROFILE (STA 0+00.00 TO STA 2+53.39)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 DRAINAGE LINE DL-C PROFILE (STA 0+00.00 TO STA 1+25.40)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



3 DRAINAGE LINE DL-D PROFILE (STA 0+00.00 TO STA 5+53.95)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE LINE PROFILES - 2

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
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Date:	3/31/25
Project No.	Title

Drawing
C8.2

Sheet No: _____ of _____

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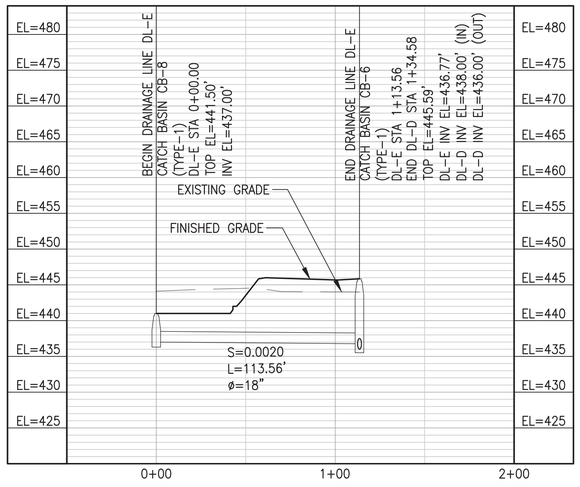
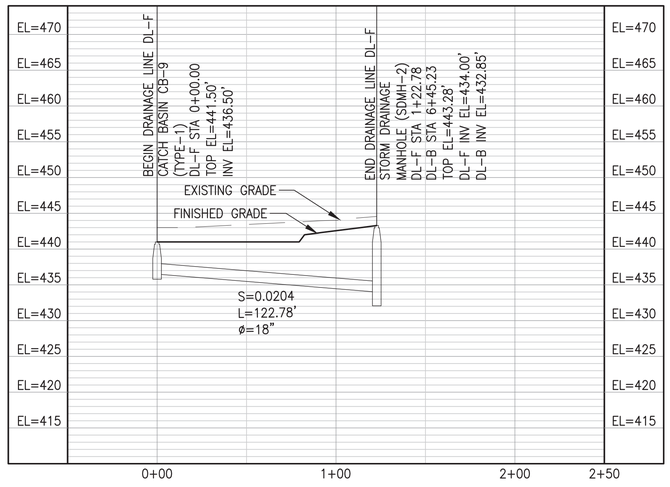


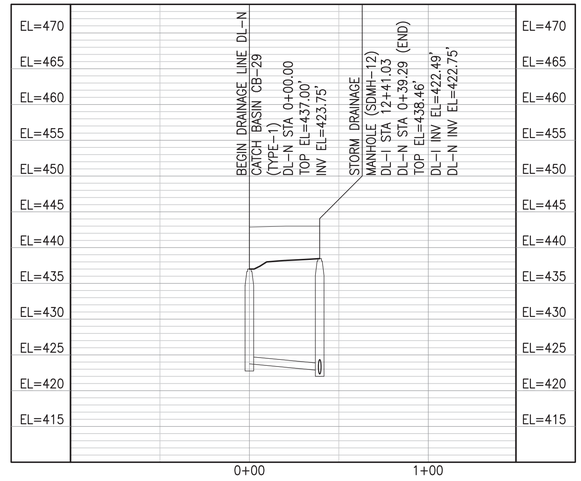
1 DRAINAGE LINE DL-E PROFILE (STA 0+00.00 TO STA 1+13.56)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



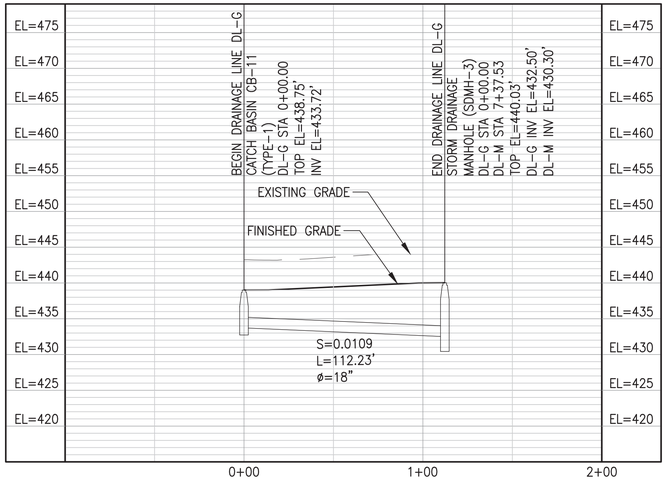
2 DRAINAGE LINE DL-F PROFILE (STA 0+00.00 TO STA 1+22.78)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



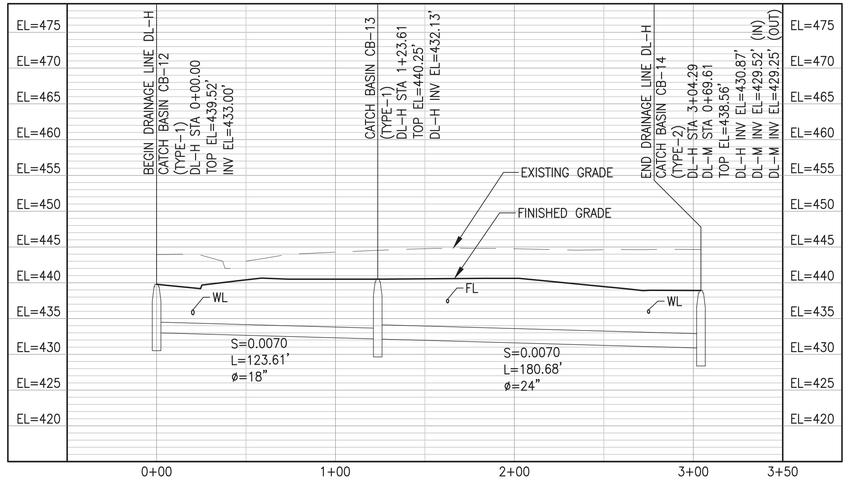
3 DRAINAGE LINE DL-N PROFILE (STA 0+00.00 TO STA 0+39.29)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



4 DRAINAGE LINE DL-G PROFILE (STA 0+00.00 TO STA 1+22.23)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



5 DRAINAGE LINE DL-H PROFILE (STA 0+00.00 TO STA 3+04.29)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

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REVISIONS

No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE LINE PROFILES - 3

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.3

Sheet No: _____ of _____

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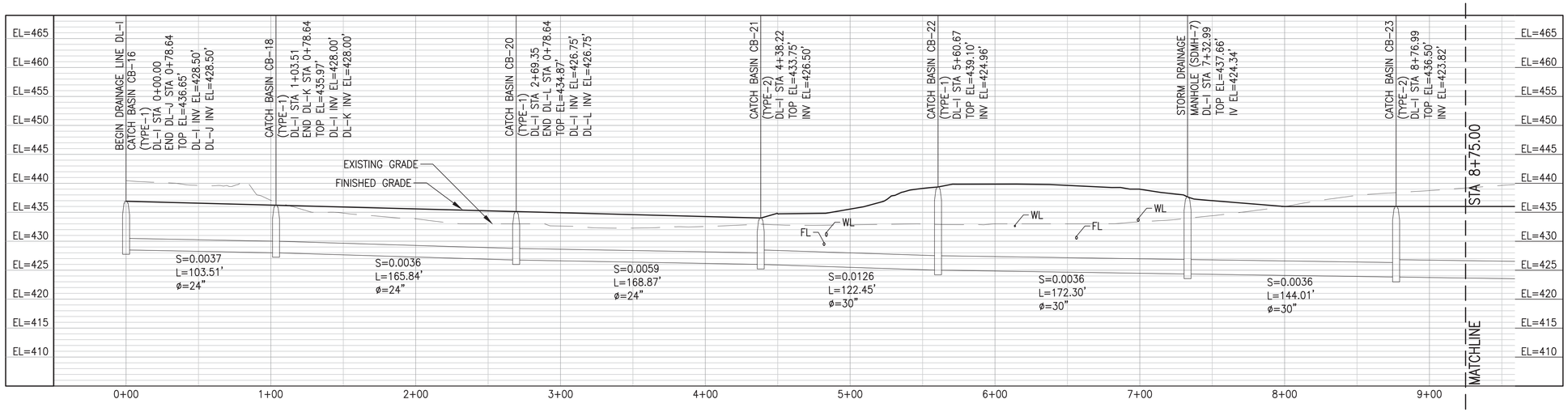
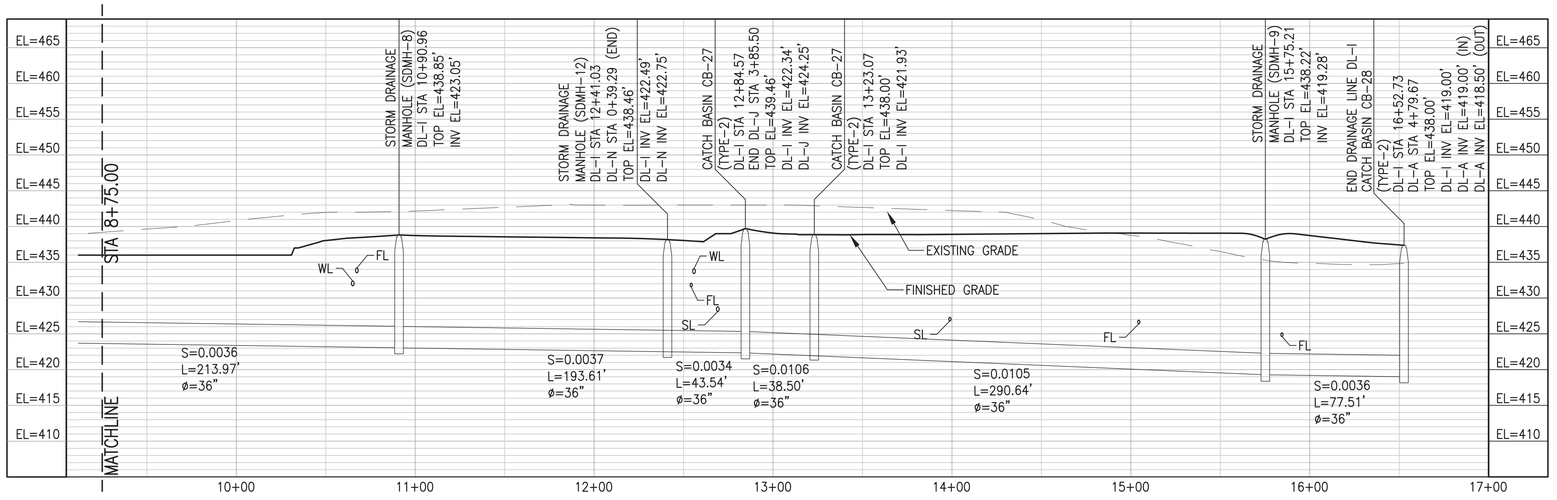


1 DRAINAGE LINE DL-I PROFILE (STA 0+00.00 TO STA 9+25.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 DRAINAGE LINE DL-I PROFILE (STA 9+25.00 TO STA 16+52.73)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

REVISIONS		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE LINE PROFILES - 4

PROGRAMMING DOCUMENT

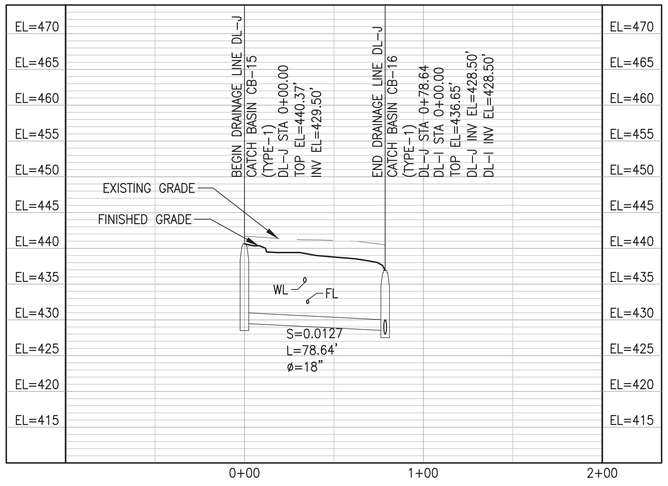
Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.4
Sheet No: ____ of ____

40' 0' 40' 80'
SCALE: 1"=40'
10' 0' 10' 20'
SCALE: 1"=10'

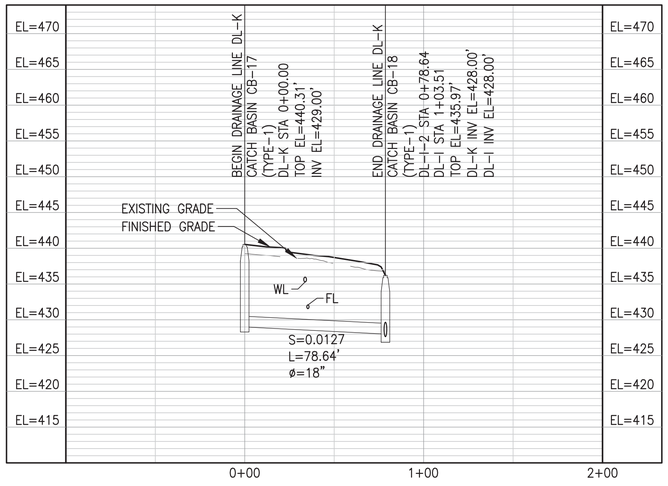
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

NOT FOR CONSTRUCTION



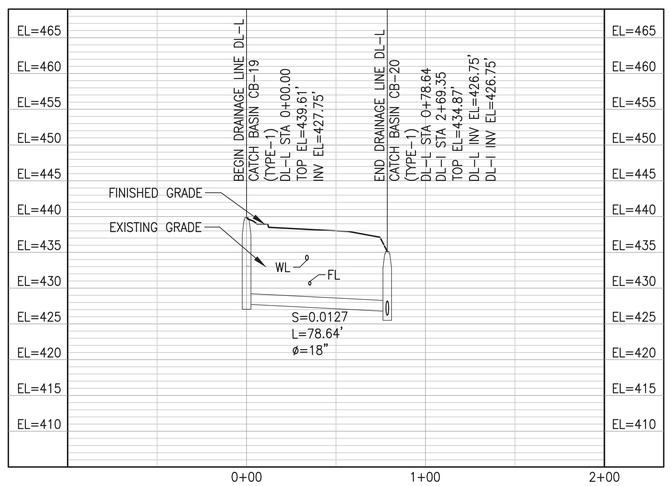
1 DRAINAGE LINE DL-J PROFILE (STA 0+00.00 TO STA 0+78.64)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



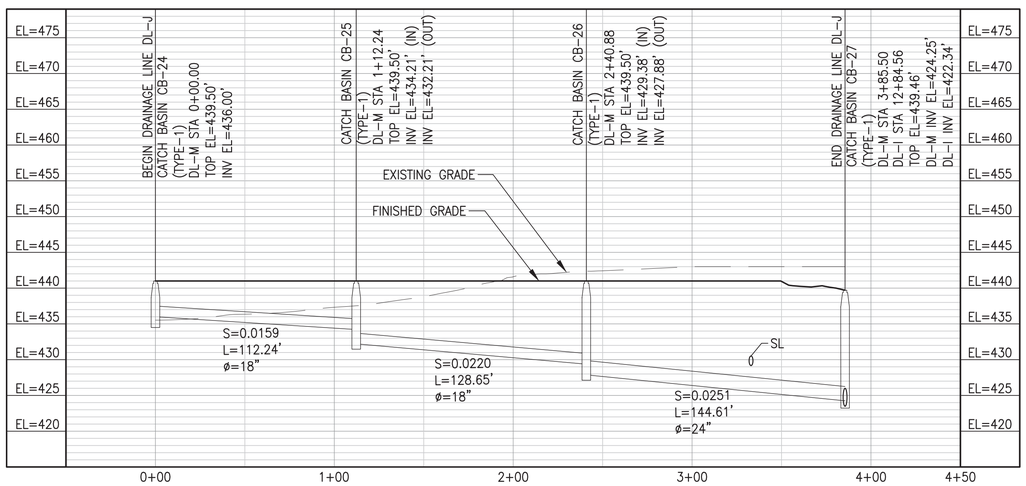
2 DRAINAGE LINE DL-K PROFILE (STA 0+00.00 TO STA 0+78.64)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



3 DRAINAGE LINE DL-L PROFILE (STA 0+00.00 TO STA 0+78.64)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



4 DRAINAGE LINE DL-M PROFILE (STA 0+00.00 TO STA 3+85.50)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
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■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

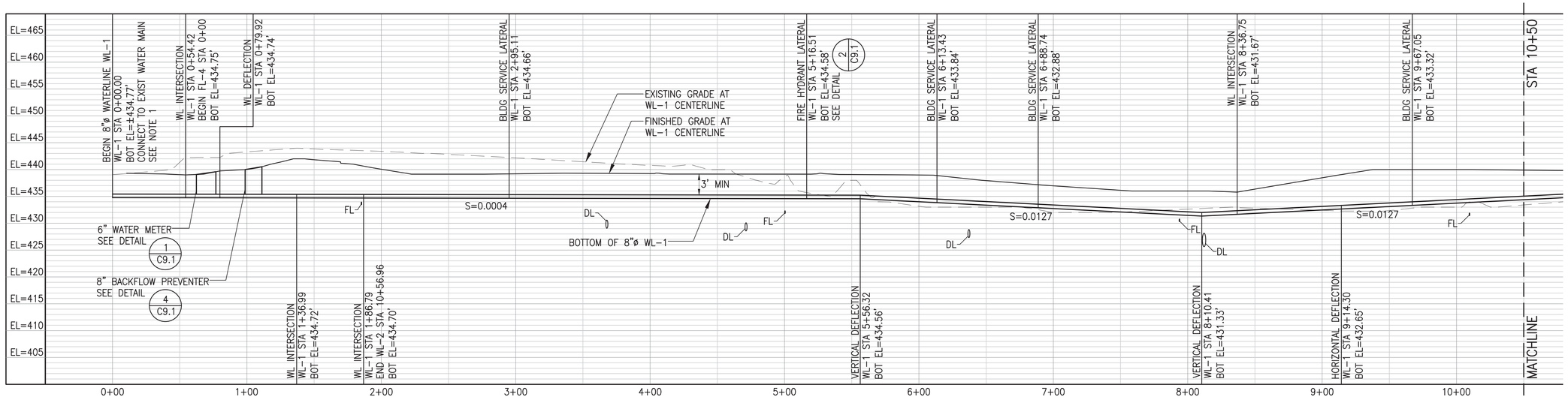
Title:
DRAINAGE LINE PROFILES - 5

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.5

Sheet No: _____ of _____

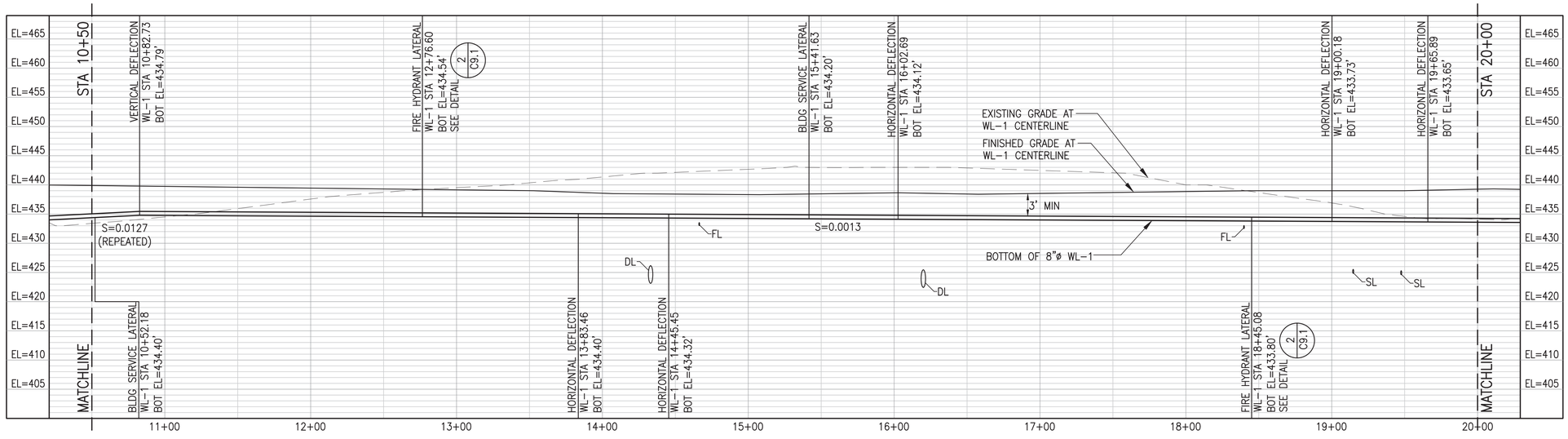


1 WATERLINE WL-1 PROFILE (STA 0+00.00 TO STA 10+50.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. CONTRACTOR TO FIELD VERIFY ACTUAL SIZE, LOCATION, AND DEPTH AT POINT OF CONNECTION.
2. ALL VERTICAL DEFLECTION FITTING SHALL BE RESTRAINED JOINT.



2 WATERLINE WL-1 PROFILE (STA 10+50.00 TO STA 20+00.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

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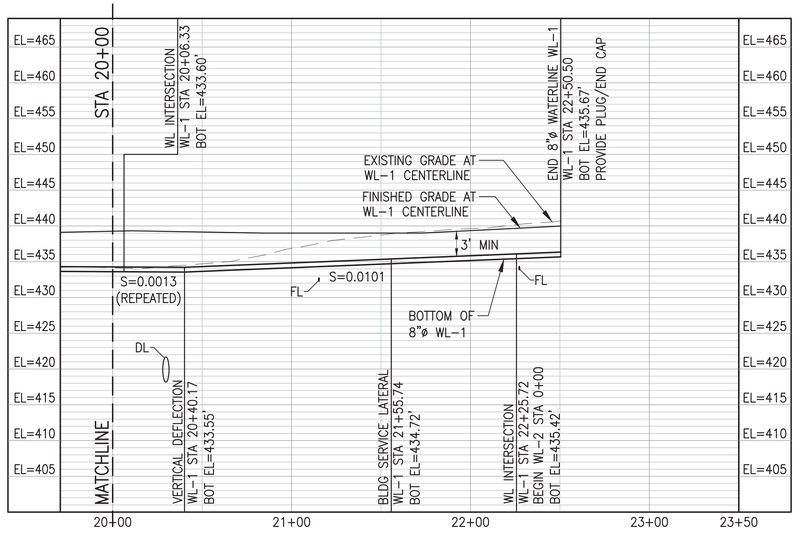
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WATERLINE PROFILE - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

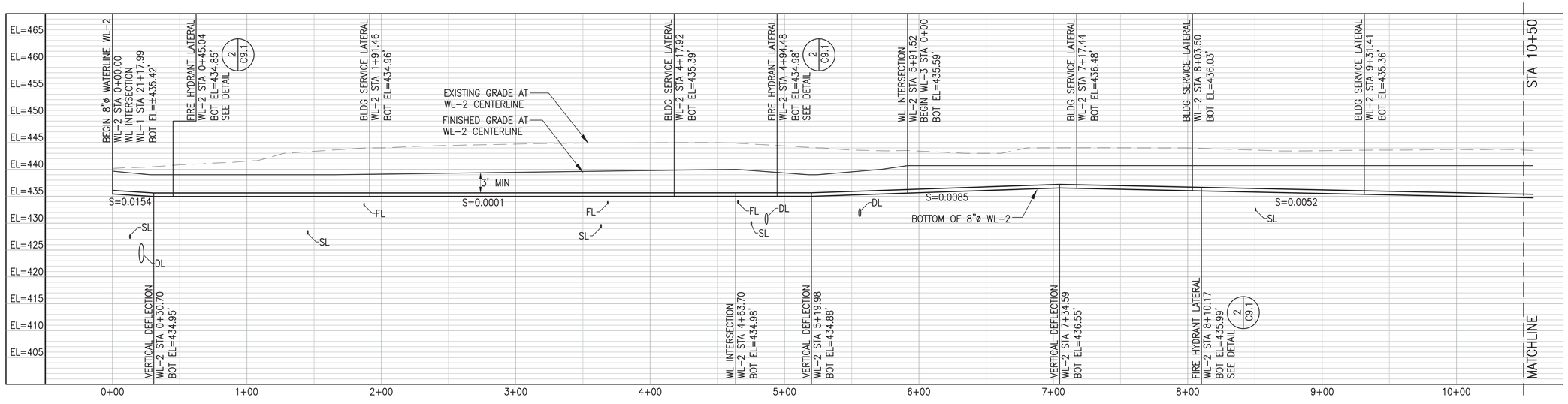
Drawing
C8.6

Sheet No: _____ of _____



1 WATERLINE WL-1 PROFILE (STA 20+00.00 TO STA 21+42.77)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 WATERLINE WL-2 PROFILE (STA 0+00.00 TO STA 10+56.48)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. ALL VERTICAL DEFLECTION FITTING SHALL BE RESTRAINED JOINT.

SCALE: 1"=40'

SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

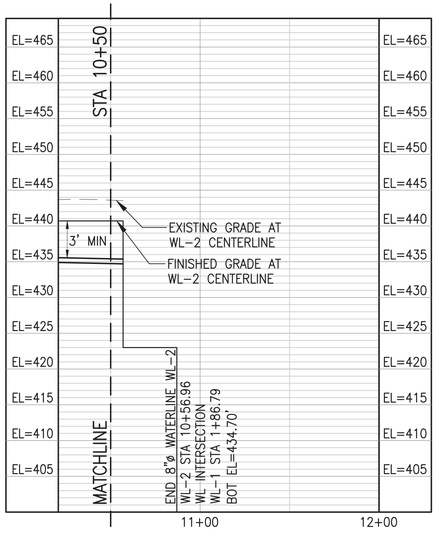
Title:
WATERLINE PROFILE - 2

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C8.7

Sheet No. _____ of _____

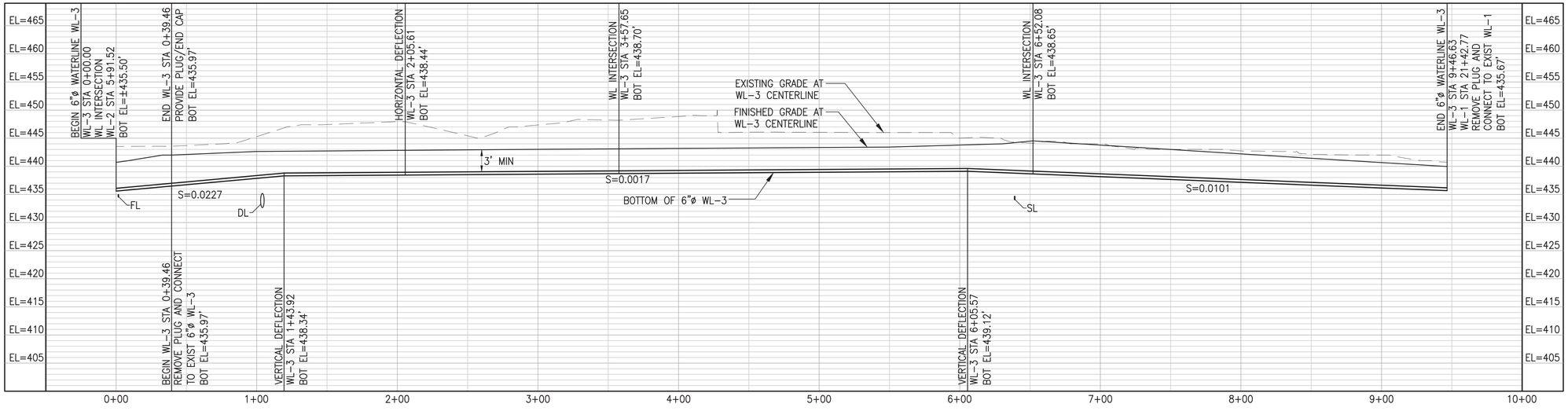


1 WATERLINE WL-2 PROFILE (STA 10+50.00 TO STA 10+89.47)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. ALL VERTICAL DEFLECTION FITTING SHALL BE RESTRAINED JOINT.



2 WATERLINE WL-3 PROFILE (STA 0+00.00 TO STA 9+46.63)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

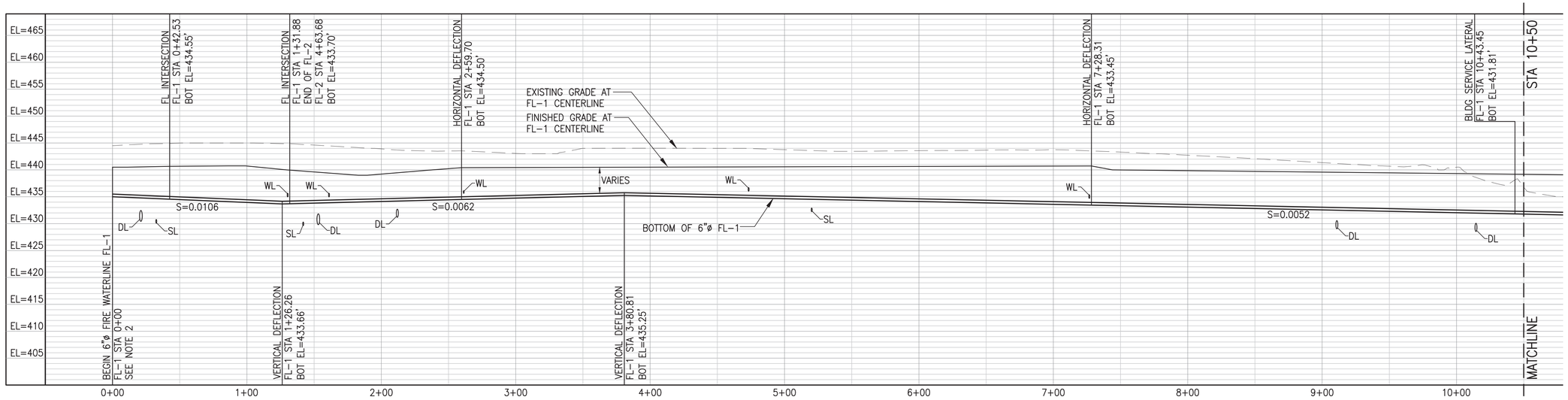
Title:
WATERLINE PROFILE - 3

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.8

Sheet No: _____ of _____

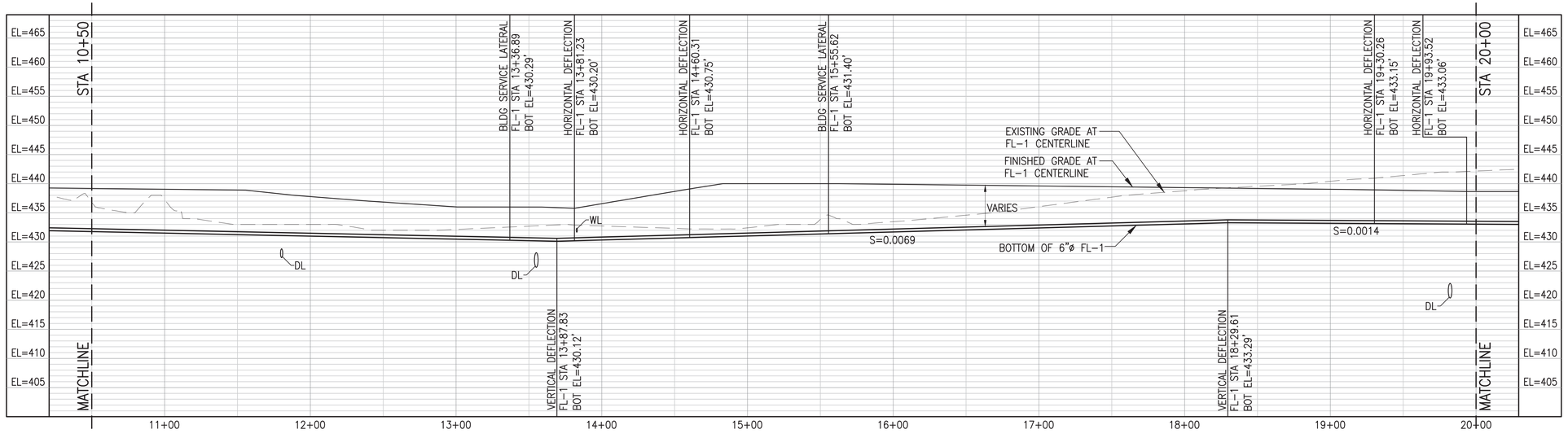


1 FIRE WATERLINE FL-1 PROFILE (STA 0+00.00 TO STA 10+50.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. ALL VERTICAL DEFLECTION FITTING SHALL BE RESTRAINED JOINT.
2. REFER TO FIRE PROTECTION PLAN FOR STUB-OUT ELEVATION.



2 FIRE WATERLINE FL-1 PROFILE (STA 10+50.00 TO STA 20+00.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

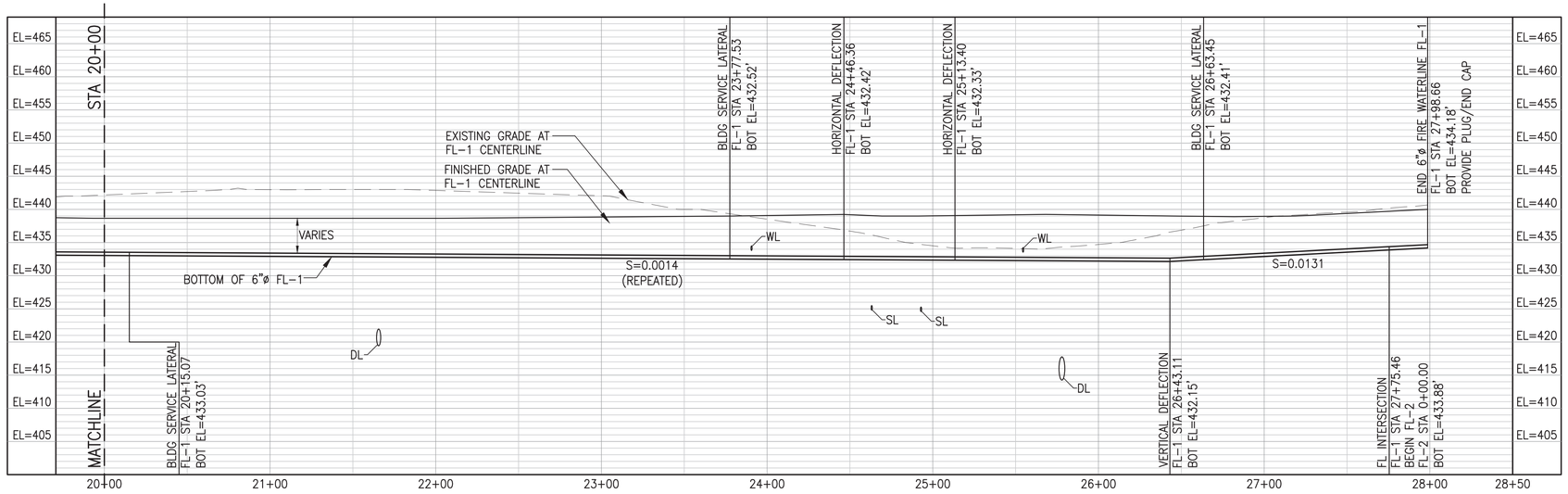
Title:
FIRE LINES
PROFILE - 1

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

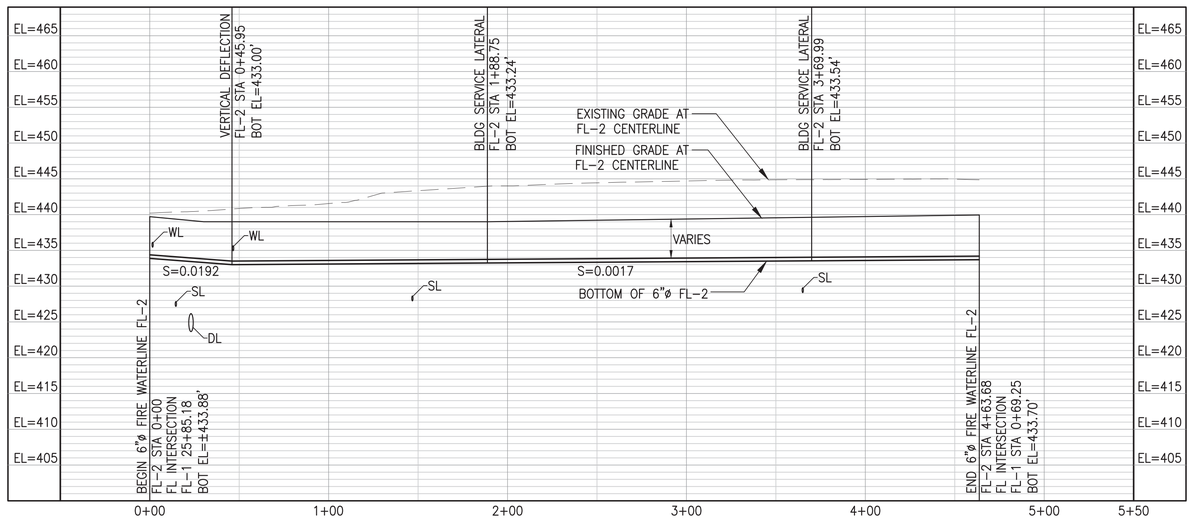
Drawing:
C8.9

Sheet No. _____ of _____



1 FIRE WATERLINE FL-1 PROFILE (STA 20+00.00 TO STA 27+98.66)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 FIRE WATERLINE FL-2 PROFILE (STA 0+0.00 TO STA 4+63.68)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. ALL VERTICAL DEFLECTION FITTING SHALL BE RESTRAINED JOINT.

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE LINE PROFILE - 2

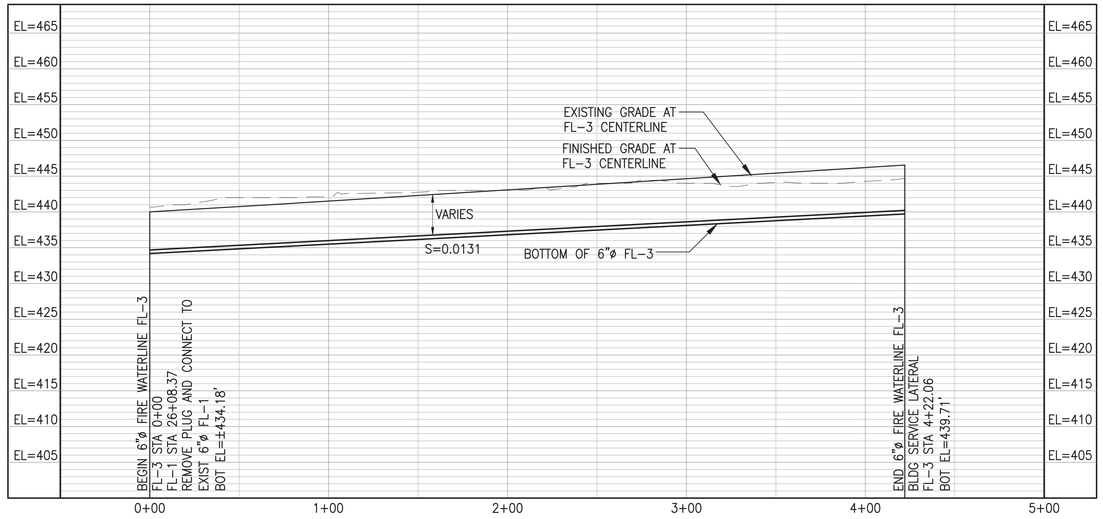
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.10

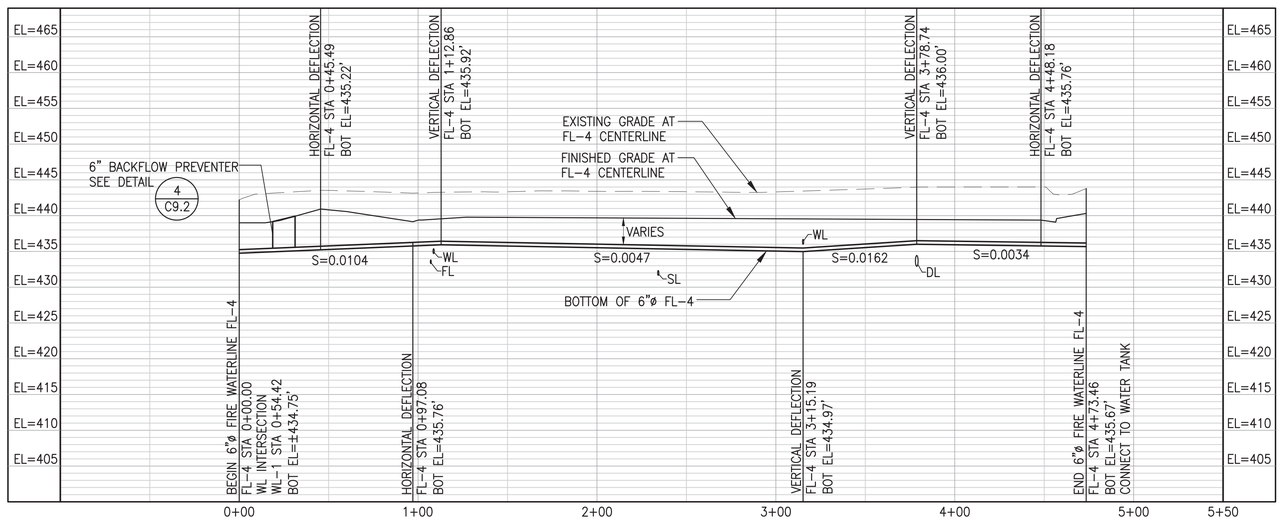
Sheet No: _____ of _____

NOT FOR CONSTRUCTION



1 FIRE WATERLINE FL-3 PROFILE (STA 0+00.00 TO STA 4+22.06)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 FIRE WATERLINE FL-4 PROFILE (STA 0+00.00 TO STA 4+73.46)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. ALL VERTICAL DEFLECTION FITTING SHALL BE RESTRAINED JOINT.

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

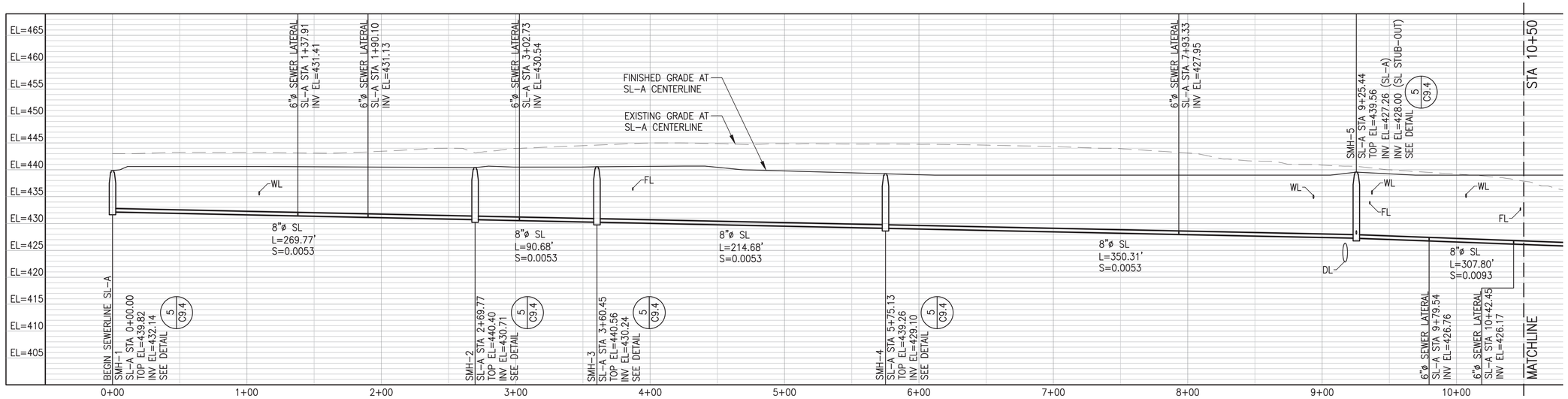
Title:
FIRE LINE PROFILE - 3

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

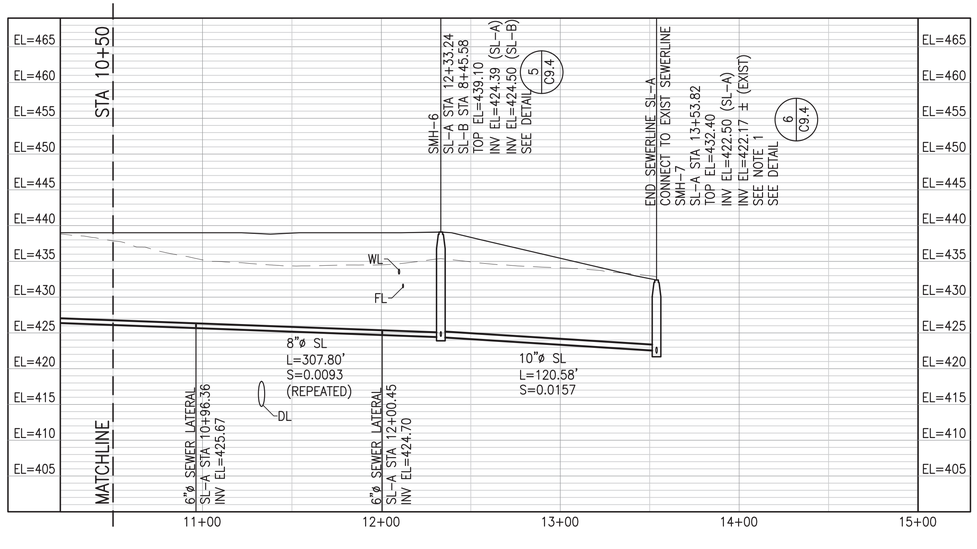
Drawing
C8.11

Sheet No: _____ of _____



1 SEWERLINE SL-A PROFILE (STA 0+00.00 TO STA 10+50.00)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 SEWERLINE SL-A PROFILE (STA 10+50.00 TO STA 13+81.74)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

NOTES:

1. CONTRACTOR TO FIELD VERIFY ACTUAL LOCATION AND DEPTH AT POINT OF CONNECTION.

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

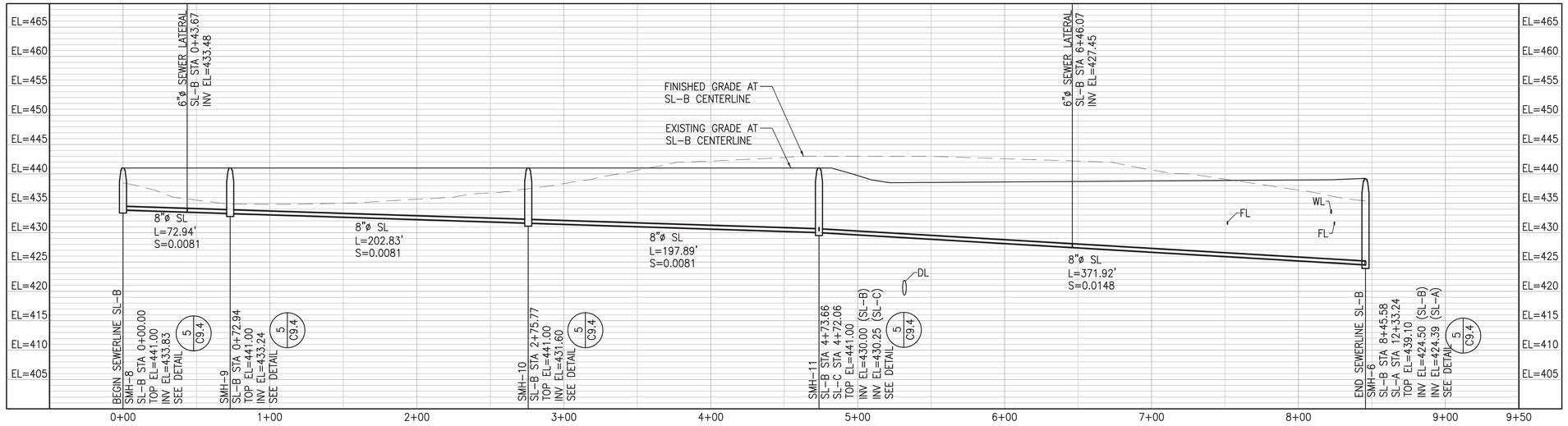
Title:
SEWERLINE PROFILE - 1

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

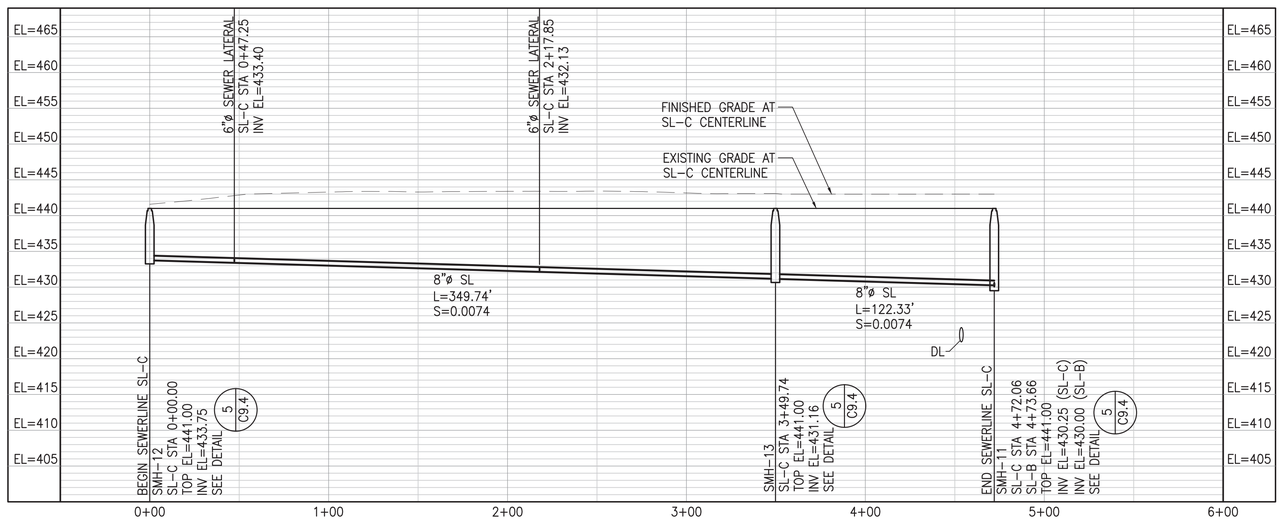
Drawing:
C8.12

Sheet No. _____ of _____



1 SEWERLINE SL-B PROFILE (STA 0+00.00 TO STA 8+45.58)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"



2 SEWERLINE SL-C PROFILE (STA 0+00.00 TO STA 4+72.06)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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REVISIONS

No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

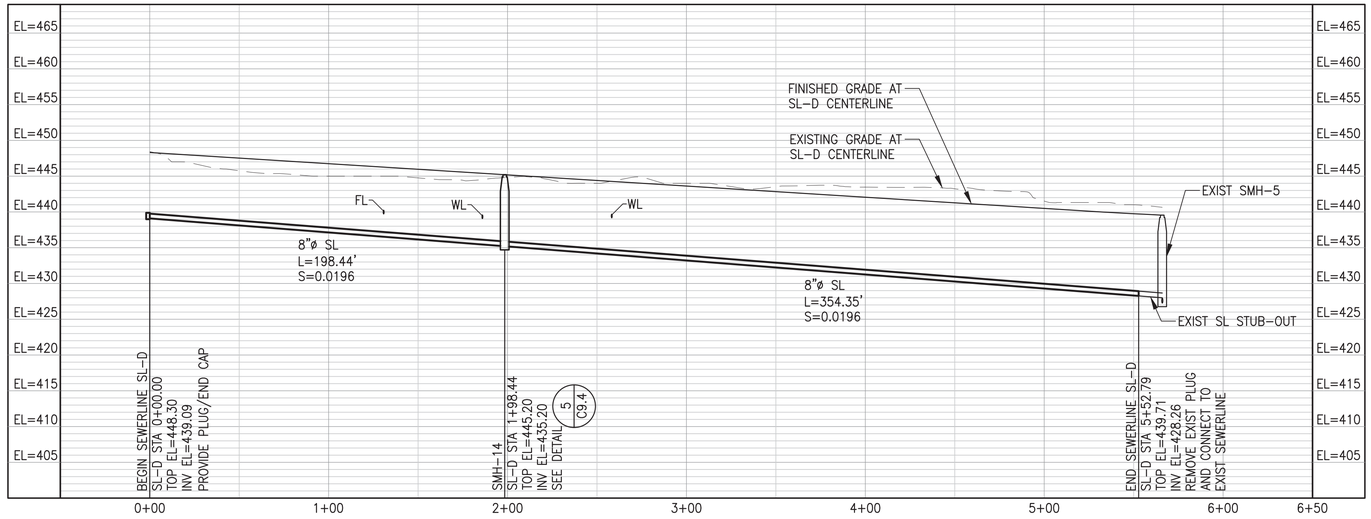
Title:
SEWERLINE PROFILE - 2

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C8.13

Sheet No: _____ of _____



1 SEWERLINE SL-D PROFILE (STA 0+00.00 TO STA 5+52.79)

SCALE: HORIZONTAL 1"=40'-0"
VERTICAL 1"=10'-0"

40' 0' 40' 80'
SCALE: 1"=40'

10' 0' 10' 20'
SCALE: 1"=10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SEWERLINE PROFILE - 3

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

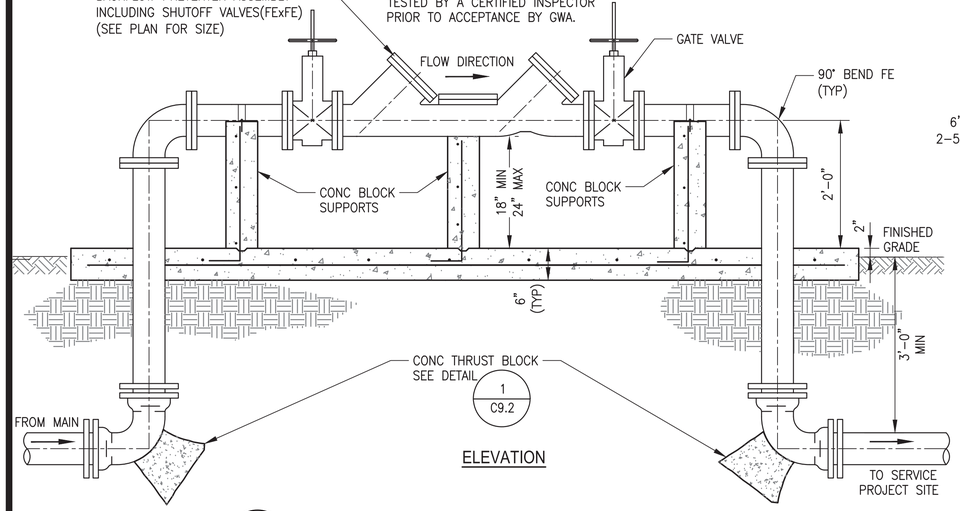
Drawing
C8.14

Sheet No: _____ of _____

NOT FOR CONSTRUCTION

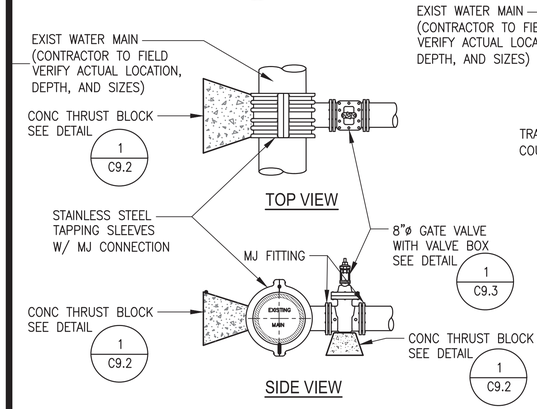
NOTES:

1. BACKFLOW PREVENTER SHALL BE CENTERED ON CONCRETE PAD.
2. BACKFLOW PREVENTER SHALL BE TESTED BY A CERTIFIED INSPECTOR PRIOR TO ACCEPTANCE BY GWA.

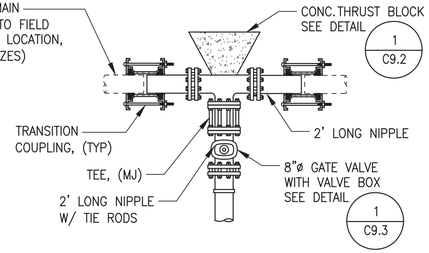


ELEVATION

4 8"Ø BACKFLOW PREVENTER DETAIL
NOT TO SCALE



3A WET TAPPING CONNNECTION
NOT TO SCALE

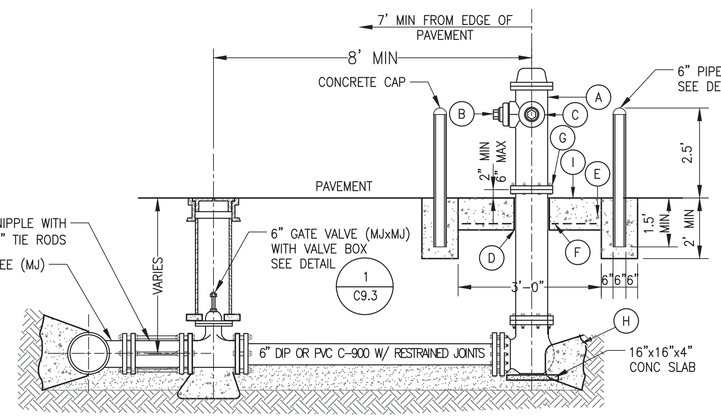


3B CUT-IN CONNNECTION
NOT TO SCALE

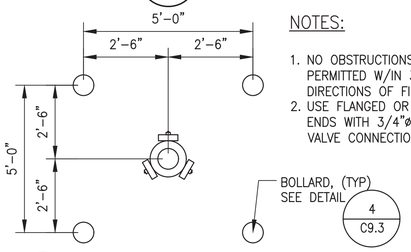
WET TAPPING CONNECTION NOTES:

1. TAPPING SLEEVE MUST BE 316 STAINLESS STEEL WITH MECHANICAL JOINT CONNECTION AND VALVE SHALL BE MJxMJ VALVE. TAPPING SLEEVE WITH FLANGED CONNECTION AND FExMJ VALVE MAY BE ACCEPTED WITH THE APPROVAL OF GWA ENGINEER.
2. CONTRACTOR SHALL VERIFY THE LOCATION, SIZE, MATERIAL AND DEPTH OF THE EXISTING WATER MAIN BEFORE TAPPING. TAPPING SHALL BE PERFORMED WITH THE PRESENCE OF A GWA INSPECTOR.
3. TAPPING SLEEVE SHALL BE 24" MINIMUM SEPARATION FROM ANY BELL, COUPLING, VALVE, FITTING, OR ANOTHER TAPPING LOCATED ALONG EXISTING WATER MAIN TO BE TAPPED.
4. ALL CONNECTIONS TO THE EXISTING MAINS SHALL BE MADE AFTER THE NEW WATER MAIN PASSES THE REQUIRED TESTS AND APPROVED BY GWA IN THE PRESENCE OF AN AUTHORIZED GWA REPRESENTATIVE.
5. ALL FITTINGS SHALL BE SWABBED WITH CHLORINE SOLUTION OF 50 PPM (MG/L) MINIMUM CONCENTRATION.
6. NUTS AND BOLTS MUST BE STAINLESS STEEL TYPE 304 OR 316.
7. CONCRETE SHALL NOT CONTACT BOLTS, NUTS OR END OF MECHANICAL JOINT FITTINGS.

3 CONNECTION TO EXIST MAIN
NOT TO SCALE



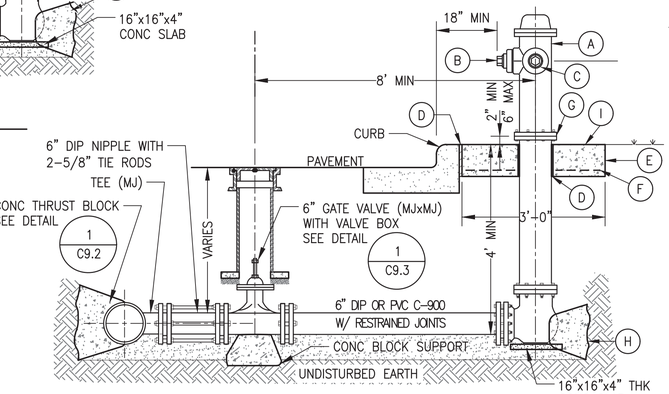
2C W/O CURB AND GUTTER
NOT TO SCALE



NOTES:

1. NO OBSTRUCTIONS WILL BE PERMITTED W/IN 3 FT IN ALL DIRECTIONS OF FIRE HYDRANT.
2. USE FLANGED OR MECHANICAL ENDS WITH 3/4"ø TIE RODS ON VALVE CONNECTION.

2B BOLLARD ASSEMBLY
NOT TO SCALE

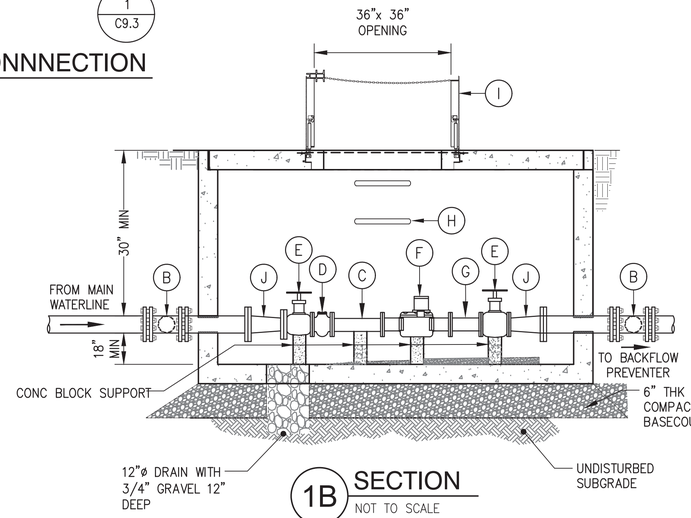


2A W/ CURB AND GUTTER
NOT TO SCALE

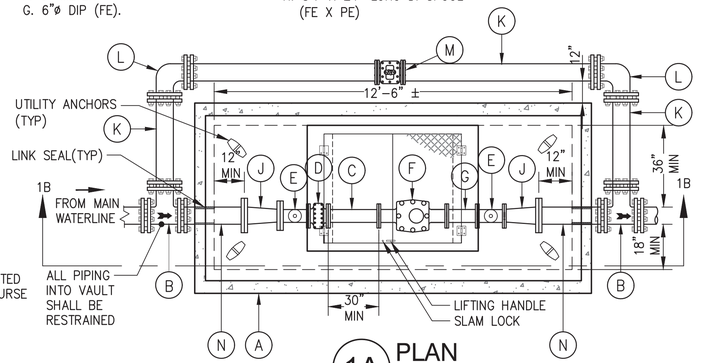
2 FIRE HYDRANT ASSEMBLY DETAIL
NOT TO SCALE

FIRE HYDRANT KEY NOTES:

A. WET BARREL HYDRANTS APPROVED BY GWA.
B. PUMPER NOZZLE 4-1/2" TO BE FACING TRAVELED WAY, UON.
C. HOSE NOZZLE 2-1/2".
D. 1/2" PRE-MOLDED EXPANSION JOINT W/ 1" TOP FILLER.
E. 3'x3'x6' SQ CONC PAD, TO BE CONSTRUCTED AROUND FH'S C/L WHEN NOT LOCATED W/IN SIDEWALK OR CONC AREA.
F. #10-6/6 WWF.
G. BREAKAWAY FLANGE
H. CONC THRUST BLOCK, APPROXIMATELY 2'x2'x3' TO BE POURED AGAINST UNDISTURBED EARTH.
I. TOP OF SLAB SHALL BE AT CURB LEVEL 4" TO 6" BELOW THE BREAK LINE OF THE HYDRANT..



1B SECTION
NOT TO SCALE



1A PLAN
NOT TO SCALE

WATER METER KEY NOTES:

A. METER VAULT SIZE SHALL BE BASED ON FITTINGS USED.
B. 8"ø X 8"ø X 8"ø TEE (MJ).
C. 6"ø DIP
D. STRAINER.
E. 6" GATE VALVE (RISING STEM).
F. 6" METER
G. 6"ø DIP (FE).
H. ALUMINUM LADDER PER OSHA STANDARD
I. ALUMINUM ROOF HATCH COVER
J. 8"ø X 6"ø REDUCER (FE)
K. 8"ø BY PASS PIPE
L. 8"ø X 90° BEND (MJ)
M. 8"ø GATE VALVE WITH VALVE BOX
N. 8"ø X 24" LONG DI SPOOL (FE X PE)

1 6"Ø WATER METER DETAIL
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

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NOT FOR CONSTRUCTION

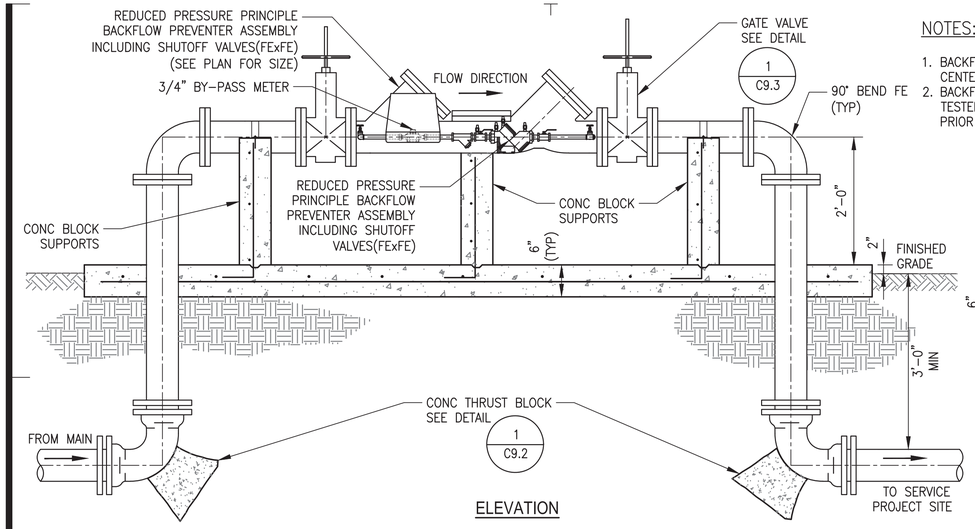
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WATER DETAILS - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C9.1

Sheet No. _____ of _____



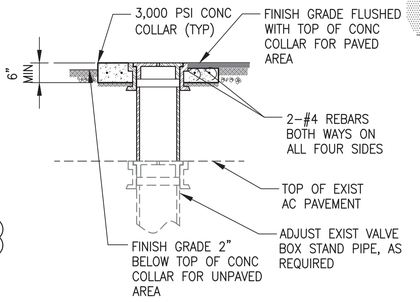
ELEVATION

4 6"Ø BACKFLOW PREVENTER DETAIL

NOT TO SCALE

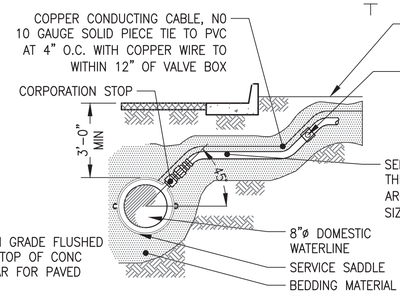
NOTES:

1. BACKFLOW PREVENTER SHALL BE CENTERED ON CONCRETE PAD.
2. BACKFLOW PREVENTER SHALL BE TESTED BY A CERTIFIED INSPECTOR PRIOR TO ACCEPTANCE BY GWA.



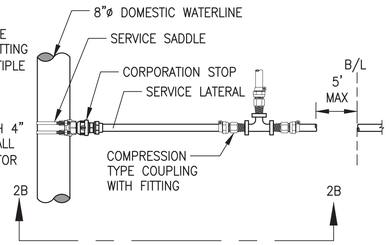
4 GATE VALVE BOX ADJUSTMENT DETAIL

NOT TO SCALE



2B SECTION

NOT TO SCALE

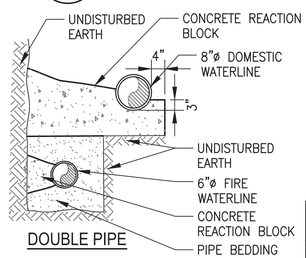


2A PLAN

NOT TO SCALE

2 WATER SERVICE LATERAL DETAIL

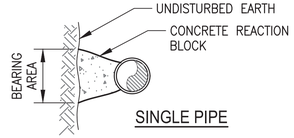
NOT TO SCALE



DOUBLE PIPE

1D SECTION

NOT TO SCALE

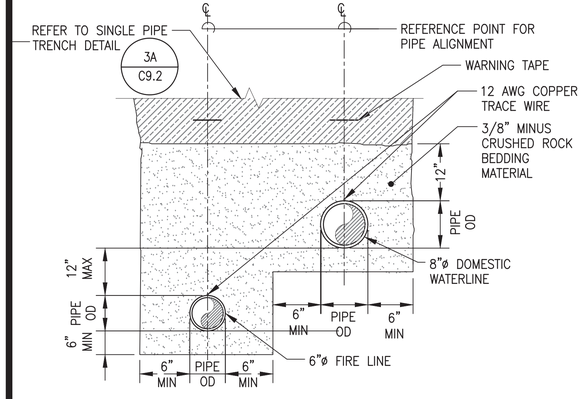


SINGLE PIPE

1C SECTION

NOT TO SCALE

FITTINGS	BEARING AREA (SQ FT)			
	6" PIPE	8" PIPE	10" PIPE	12" PIPE
1/4 (90°) BEND	3.17	5.46	8.21	11.61
1/8 (45°) BEND	1.75	2.95	4.45	6.28
1/16 (22.50°) BEND	1.50	2.00	4.00	6.00
1/32 (11.25°) BEND	N/A	N/A	N/A	N/A
TEE/ GATE VALVE/PLUG	3.0	3.86	5.81	8.21



3B DOUBLE PIPE TRENCH

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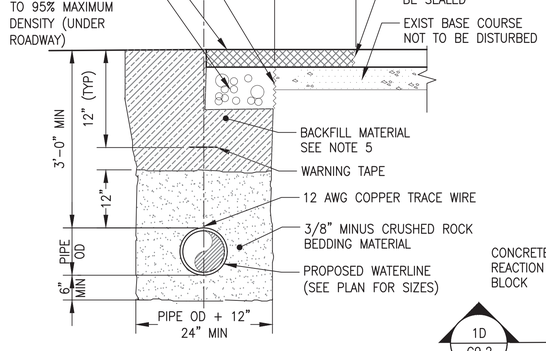
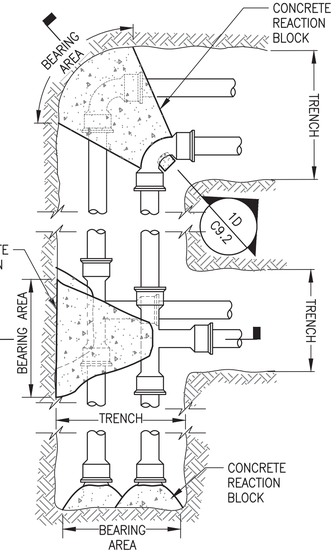


3A SINGLE PIPE TRENCH

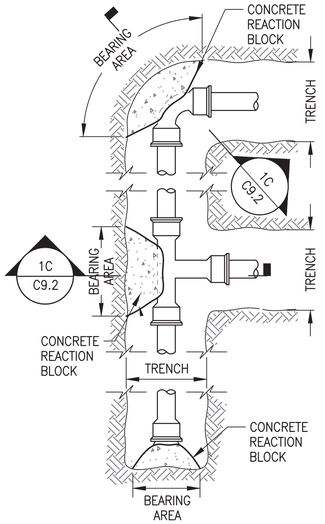
NOT TO SCALE



DOUBLE PIPE

1B PLAN

NOT TO SCALE



SINGLE PIPE

1A PLAN

NOT TO SCALE

NOTES:

1. THE SCHEDULE AND DETAILS AS SHOWN ARE PROVIDED AS A GUIDE ONLY. CALCULATIONS ARE BASED ON PRESSURE OF 250 PSI, AND IS APPLICABLE TO PRESSURE OF A LESSER AMOUNT.
2. ACTUAL FIELD CONDITIONS AND SOIL TYPE SHALL BE VERIFIED IN THE FIELD. THE CONTRACTOR OR ENGINEER WHO PREPARED THE PLANS SHALL SUBMIT THE FINAL DESIGN AND DETAILS TO THE MANAGER FOR REVIEW AND APPROVAL AFTER FIELD VERIFICATION PRIOR TO INSTALLATION.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSION STRENGTH OF 2500 PSI AND SHALL BE POURED AGAINST UNDISTURBED EARTH.
4. THRUST BLOCK IS TO EXTEND TO UNDISTURBED SOIL.
5. KEEP CONCRETE CLEAR OF MJ OR BELL AND SPIGOT JOINTS.
6. BLOCK IN A SIMILAR MANNER AT TEES, HYDRANTS, PLUG OR OTHER LOCATIONS AS REQUIRED.
7. SIZE MAY BE DECREASED FOR LESSER DEGREE BENDS AS DETERMINED BY ENGINEER.
8. WHEN NECESSARY ADDITIONAL THRUST RESTRAINT METHODS MAY BE USED, SUCH AS MECHANICAL JOINT RESTRAINTS, TIE-RODS RECOMMENDATIONS) OR OTHER APPROVED METHODS.
9. ALL VERTICAL FITTINGS AND JOINTS SHALL BE RESTRAINED. NO VERTICAL THRUST BLOCKS.

NOTES:

1. CONTRACTOR SHALL APPLY AND OBTAIN ENCROACHMENT PERMITS PRIOR TO THE START OF ANY WORK IN RIGHT OF WAY.
2. CONTRACTOR SHALL NOTIFY DPW'S HIGHWAY PROJECT DEVELOPMENT AND CONSTRUCTION (HPDC) SECTION 48 HOURS PRIOR TO START OF WORK.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SHORING OF TRENCH TO ENSURE SAFE ACCESS FOR WORKERS.
4. DPW RECOMMENDS 7 DAYS CURE TIME FOR THE FLOWABLE FILL PRIOR TO PAVEMENT RESTORATION. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADEQUATE PROTECTION FOR THE FLOWABLE FILL FROM VEHICULAR LOADING DURING THIS CURING PERIOD. LANE CLOSURE SHALL NOT BE USED AS AN OPTION DURING THIS CURING PERIOD.
5. APPROVED SELECT FILL MATERIAL BETWEEN FLOWABLE FILL AND BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AT EVERY 8" LIFTS.
6. ALL RIGHT OF WAY RESTORATION WORK SHALL BE PER DEPARTMENT OF (DPW) APPROVAL.
7. NON-DETECTABLE UNDERGROUND UTILITY WARNING TAPE (6" WIDE) IS REQUIRED FOR ALL WATER PIPE (METAL AND NON-METAL) IN THE RIGHT WAY OF OR EASEMENTS.

3 WATER PIPE TRENCH DETAILS

NOT TO SCALE

1 HORIZONTAL CONCRETE THRUST BLOCK SCHEDULE

NOT TO SCALE

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REVISIONS

No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WATER DETAILS - 2
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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C9.2

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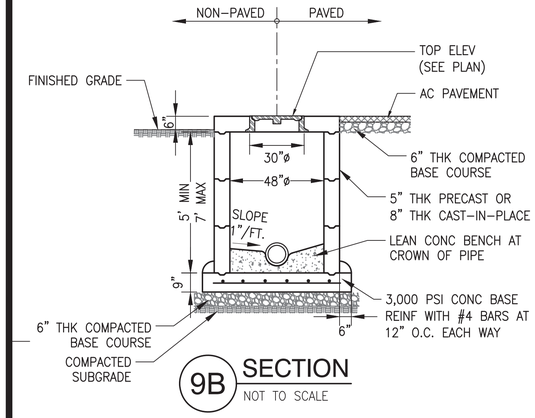
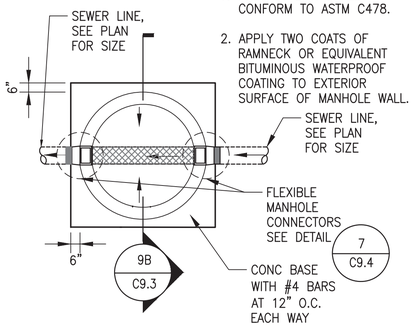


9B SECTION
NOT TO SCALE

NOTES:

1. PRECAST SMH SHALL CONFORM TO ASTM C478.
2. APPLY TWO COATS OF RAMNECK OR EQUIVALENT BITUMINOUS WATERPROOF COATING TO EXTERIOR SURFACE OF MANHOLE WALL.

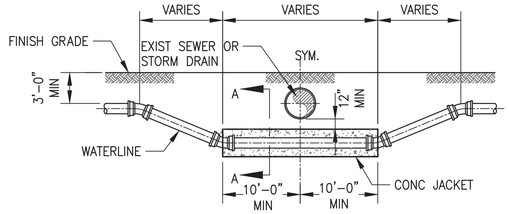


9A PLAN
NOT TO SCALE

9 SHALLOW SEWER MANHOLE
NOT TO SCALE

NOTE:

1. ALL VERTICAL DEFLECTION FITTINGS SHALL BE RESTRAINED JOINT. NO CONCRETE THRUST BLOCK REQUIRED.



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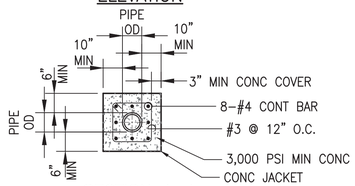
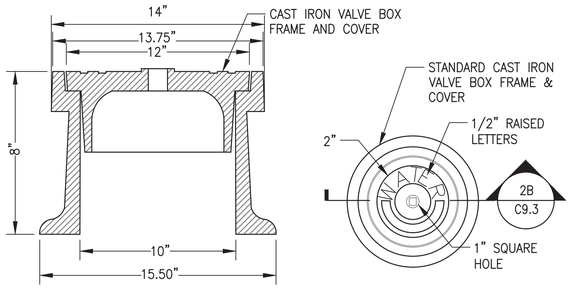


SECTION A–A

5 WATERLINE CROSSING UNDER SEWER OR STORM DRAIN
NOT TO SCALE



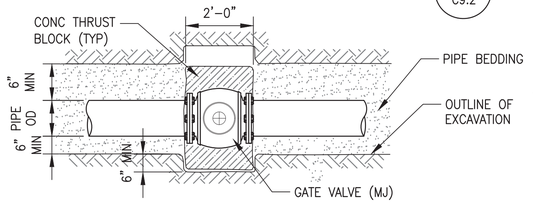
2B SECTION
NOT TO SCALE

2A PLAN
NOT TO SCALE

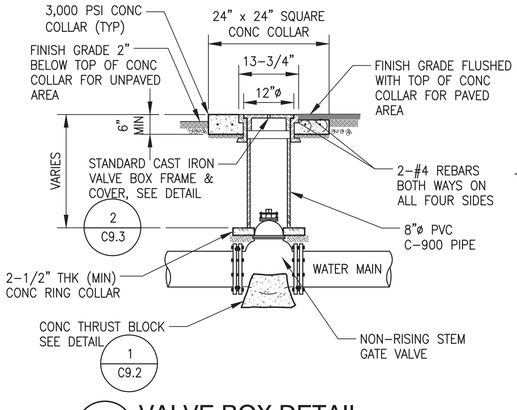
2 VALVE BOX FRAME & COVER DETAIL
SCALE: NOT TO SCALE

NOTES:

1. A BURIED VALVE 5' AND DEEPER SHALL BE PROVIDED WITH A SOLID STEEL EXTENSION STEM OPERATOR WITH A 2" SQUARE AWWA NUT WITHIN 36" OF VALVE BOX COVER. NUT IS TO INDICATE DIRECTION OF ROTATION TO OPEN VALVE.
2. CONTRACTOR SHALL REMOVE ALL DEBRIS AND SOIL FROM VALVE BOX BEFORE ACCEPTANCE.
3. CONCRETE COLLAR FLUSH WITH FINISHED GRADE FOR PAVED AREA AND 2" ABOVE FINISHED GRADE FOR UNPAVED AREA.
4. JOINTS, BOLTS AND NUTS SHALL BE CLEAR OF CONCRETE.
5. TRACE WIRE IS REQUIRED FOR PVC WATER MAINS. SEE DETAIL 3 C9.2

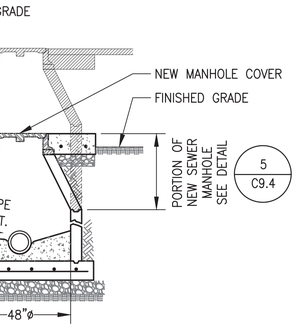


1B TRENCH PLAN @ GATE VALVE
NOT TO SCALE

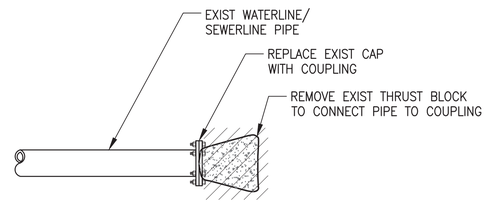


1A VALVE BOX DETAIL
NOT TO SCALE

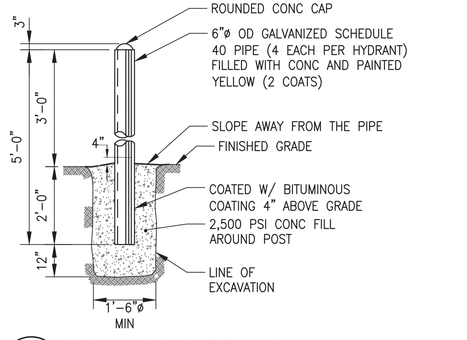
1 VALVE BOX
NOT TO SCALE



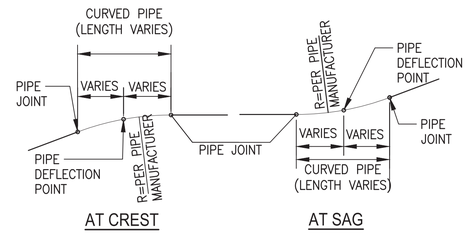
8 SEWER MANHOLE ADJUSTMENT DETAIL
NOT TO SCALE



7 CONNECT TO EXIST STUB-OUT
NOT TO SCALE



4 BOLLARD DETAILS
NOT TO SCALE



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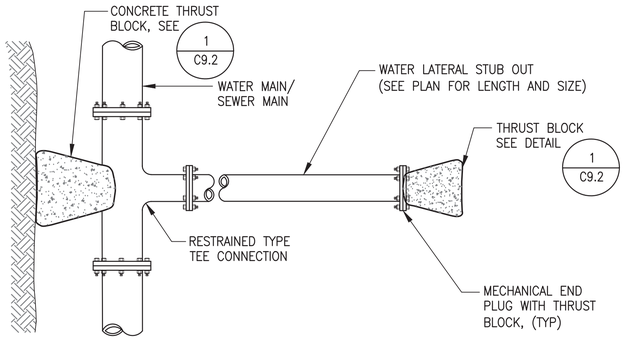
3 PIPE DEFLECTION DETAIL
NOT TO SCALE



6 STUB-OUT DETAIL FOR FUTURE CONNECTION
NOT TO SCALE

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P.O. Box 8900 Tamuning, Guam 96931

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
WATER AND SEWER DETAILS - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
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Sheet No: _____ of _____

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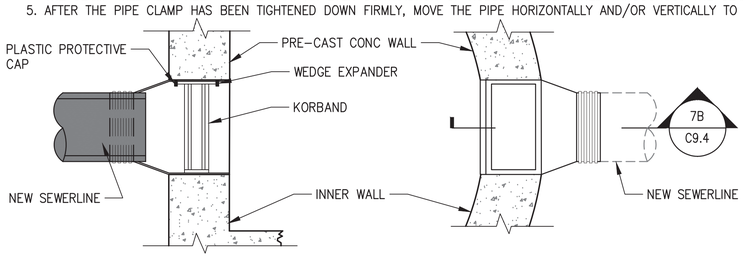
PIPE INSTALLATION NOTES:

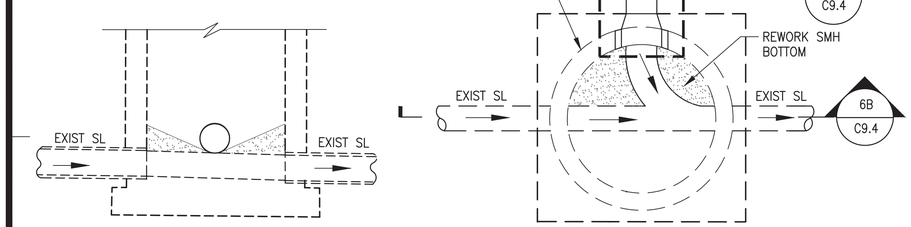
1. CENTER PIPE IN CONNECTOR OPENING.
2. POSITION CLAMP TAKE-UPS 90° APART. USING T-HANDLE TORQUE WRENCH (P/N 80090), TIGHTEN THE TWO SETS OF CLAMPS ALTERNATELY TO 60 IN LBS.
3. INSPECT CONNECTOR TO ENSURE THAT TAKE-UP IS UNIFORM AND RUBBER IS EVENLY COMPRESSED AROUND PIPE.
4. ON MINIMUM PIPE OD INSTALLATIONS, LIFT THE RUBBER UP UNDERNEATH THE PIPE CLAMP SCREW SO THAT THE CONNECTOR CONTACTS THE BOTTOM SURFACE OF THE PIPE WHILE THE PIPE CLAMP SCREW IS BEING TIGHTENED. APPLICATION OF PIPE LUBRICATION ON UNDERSIDE OF THE CLAMP WILL ALSO HELP ASSURE THAT AN EVEN CONTRACTION OF RUBBER IS MAINTAINED THROUGHOUT THE CLAMPING AREA.
5. AFTER THE PIPE CLAMP HAS BEEN TIGHTENED DOWN FIRMLY, MOVE THE PIPE HORIZONTALLY AND/OR VERTICALLY TO BRING IT TO GRADE.



7B SIDE VIEW
NOT TO SCALE

7A TOP VIEW
NOT TO SCALE

7 FLEXIBLE SMH CONNECTION DETAIL
NOT TO SCALE

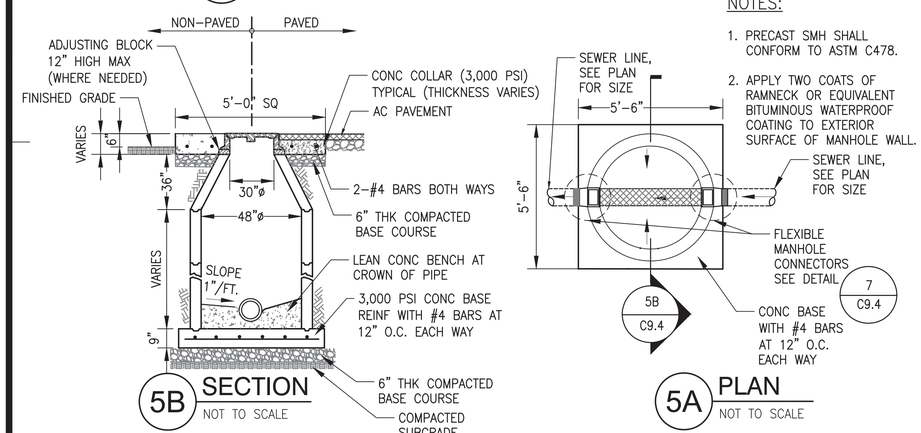


6B SECTION
NOT TO SCALE

NOTE:
1. INVERT ELEV OF NEW PIPE SHALL BE AS SHOWN ON PLAN OR PROFILE.

6A PLAN
NOT TO SCALE

6 CONNECTION TO EXIST SEWERLINE
NOT TO SCALE

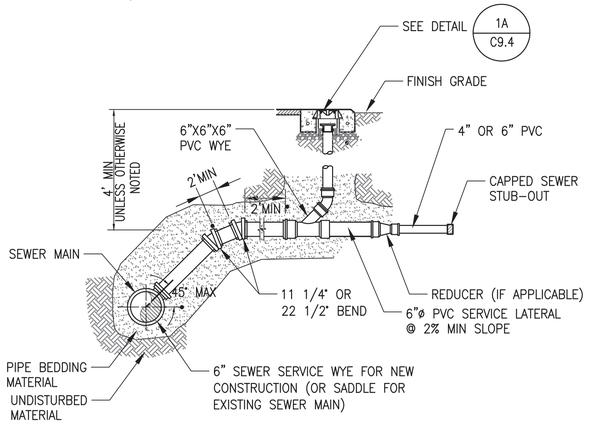


5B SECTION
NOT TO SCALE

NOTES:
1. PRECAST SMH SHALL CONFORM TO ASTM C478.
2. APPLY TWO COATS OF RAMNECK OR EQUIVALENT BITUMINOUS WATERPROOF COATING TO EXTERIOR SURFACE OF MANHOLE WALL.

5A PLAN
NOT TO SCALE

5 SEWER MANHOLE
NOT TO SCALE

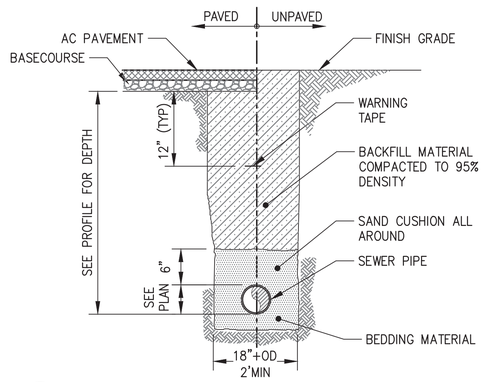


3C SECTION - DEEP CONNECTION
NOT TO SCALE

3B SECTION - STANDARD CONNECTION
NOT TO SCALE

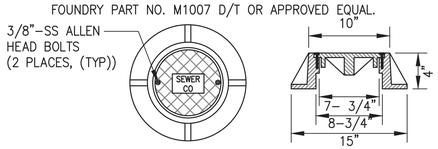
3A PLAN
NOT TO SCALE

3 SEWER LATERAL CONNECTION
NOT TO SCALE

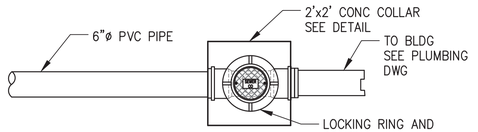


2 TYPICAL SEWER PIPE TRENCH DETAIL
NOT TO SCALE

NOTES:
1. CLEAN-OUT PIPE AND FITTINGS SHALL BE THE SAME MATERIAL AS THE SEWER MAIN.
1. A SANITARY TEE, SWEEP, OR STRAIGHT TEE IS NOT ACCEPTABLE.
2. SEWER STUB WILL BE EXTENDED 5' BEYOND BUILDING LINE TO PREVENT DAMAGE TO CLEAN-OUT AND MINIMIZE CONFLICTS WITH OTHER UTILITIES WHEN SERVICE TO BUILDING IS ACCOMPLISHED.
3. RING AND COVER SHALL BE 8"X4" LOCKING TYPE, OLYMPIC FOUNDRY PART NO. M1007 D/T OR APPROVED EQUAL.



8"x 4" CAST IRON LOCKING RING AND COVER



1B PLAN
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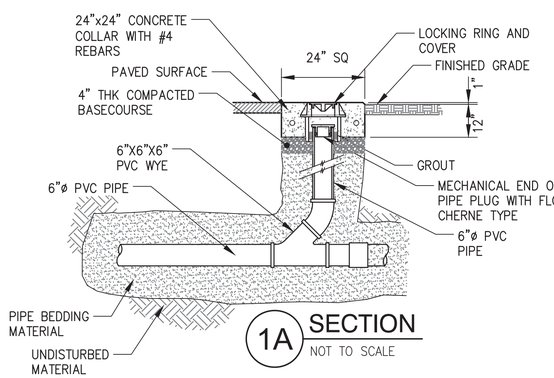

1A SECTION
NOT TO SCALE

1 CLEAN OUT TO GRADE DETAIL
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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100 Cliff Business Center, P.O. Box EL Agana, GU 96910
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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

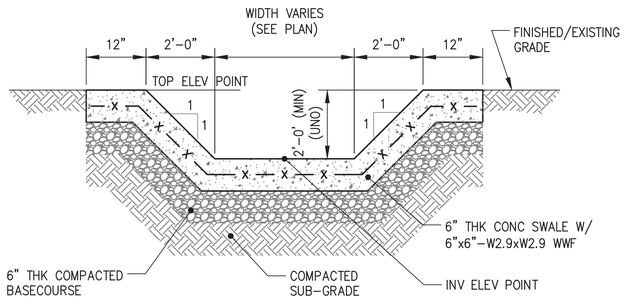
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SEWER DETAILS - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C9.4

Sheet No. _____ of _____



4 CONCRETE LINED SWALE
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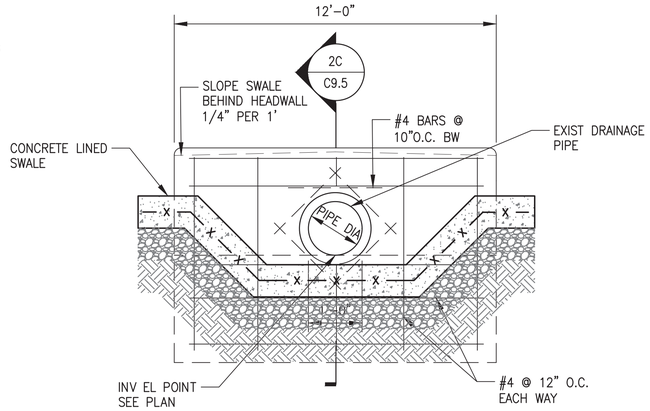
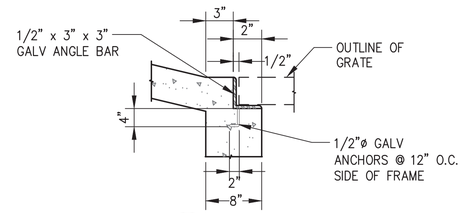


2B ELEVATION
NOT TO SCALE

METAL GRATES SPECIFICATIONS & NOTES:

1. METAL GRATINGS, FRAMES, BOLTS, & MISC INSERTS SHALL BE HOT DIPPED GALV AFTER FABRICATION. ALL DIMENSIONS ARE FINISHED INCLUDING GALVANIZING.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36.
3. ALL WELDING REQ'D FABRICATED GRATES SHALL BE ACCOMPLISHED BY A CERTIFIED WELDER & WORK SHALL BE IN ACCORDANCE W/ THE REQUIREMENTS OF AWS STANDARDS & AISC SPECS.
4. METAL GRATE ASSEMBLY SHALL HAVE A NET AREA OPENING OF NOT LESS THAN 2.80 SQUARE FEET.
5. ONLY CATCH BASINS AND DRAINAGE MANHOLE 4 FEET OR DEEPER SHALL BE PROVIDED WITH LADDER RUNGS.



1D SECTION
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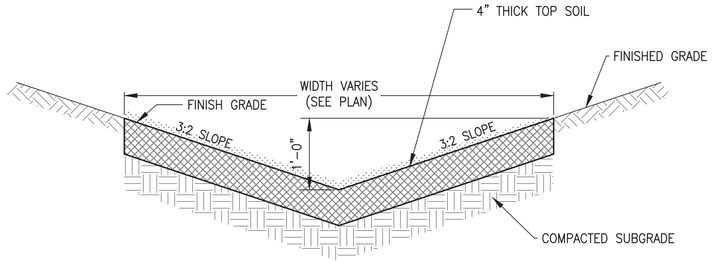

3 GRASS-LINED V-SHAPED SWALE
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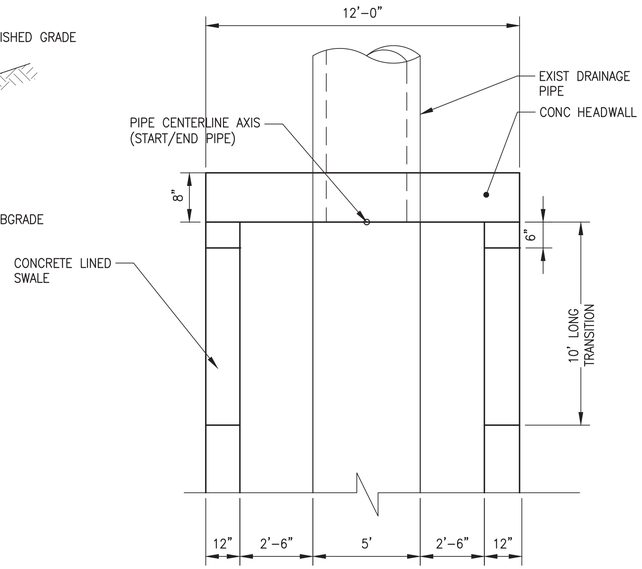

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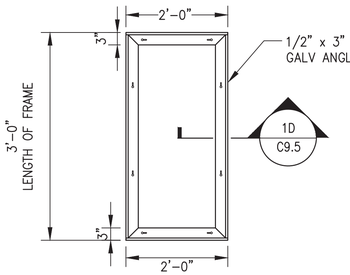

1C SECTION
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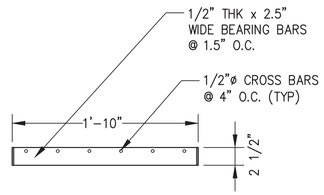

1B SECTION
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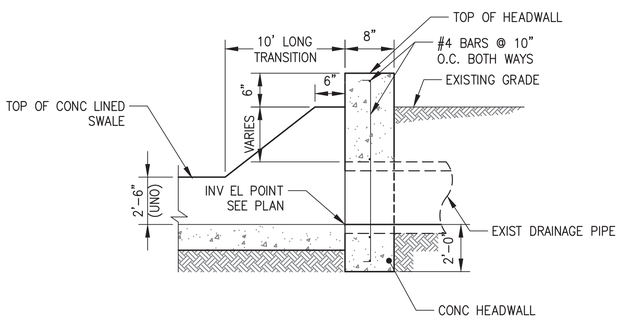
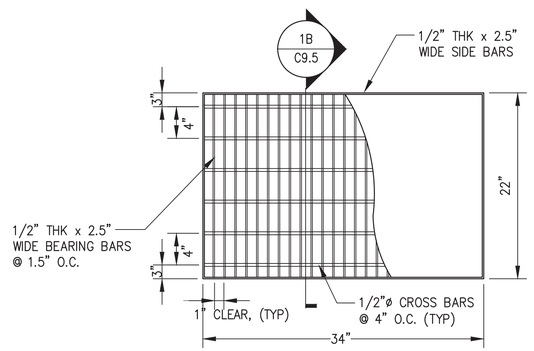


2C SECTION
NOT TO SCALE

2 CONCRETE HEADWALL/
END WALL DETAILS
NOT TO SCALE



1A PLAN
NOT TO SCALE

1 METAL GRATING DETAILS
NOT TO SCALE

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REVISIONS

No.	Description	Date

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P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE DETAILS - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C9.5

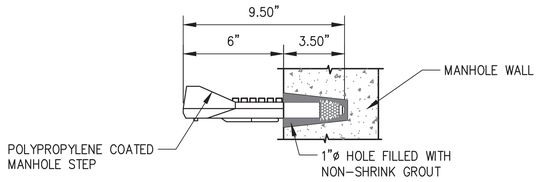
Sheet No. _____ of _____

PLACED RIPRAP NOTES:

1. PLACED RIPRAP IS ROCK PLACED ON A PREPARED SURFACE TO FORM A WELL-GRADED MASS. PLACE RIPRAP TO ITS FULL THICKNESS IN ONE OPERATION TO AVOID DISPLACING THE UNDERLYING MATERIAL. DO NOT PLACE RIPRAP MATERIAL BY METHOD THAT CAUSE SEGREGATION OR DAMAGE TO THE PREPARED SURFACE. PLACE OR REARRANGE INDIVIDUAL ROCKS BY MECHANICAL OR HAND METHODS TO OBTAIN A DENSE UNIFORM BLANKET WITH A REASONABLY SMOOTH SURFACE.

2. FURNISHED HARD, DURABLE, ANGULAR ROCK THAT IS RESISTANT TO WEATHERING AND WATER ACTION AND FREE OF ORGANIC OR OTHER UNSUITABLE MATERIAL. DO NOT USE SHALE, ROCK WITH SHALE SEAMS, OR OTHER FISSILE OR FISSURED ROCK THAT MAY BREAK INTO SMALLER PIECES IN THE PROCESS OF HANDLING AND PLACING. ROCK SIZE TO BE FROM 6 TO 14 INCHES WITH MASS OF ABOUT 40 TO 220 POUNDS.

3. PLACE RIPRAP TO ITS FULL THICKNESS IN ONE OPERATION TO AVOID DISPLACING THE UNDERLYING MATERIAL. DO NOT PLACE RIPRAP MATERIAL BY METHODS THAT CAUSE SEGREGATION OR DAMAGE TO THE PREPARED SURFACE. PLACE OR REARRANGE INDIVIDUAL ROCKS BY MECHANICAL OR HAND METHODS TO OBTAIN A DENSE UNIFORM BLANKET WITH A REASONABLY SMOOTH SURFACE.



3C SECTION "A-A"
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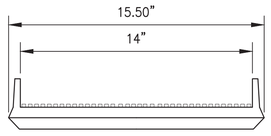

3B ELEVATION
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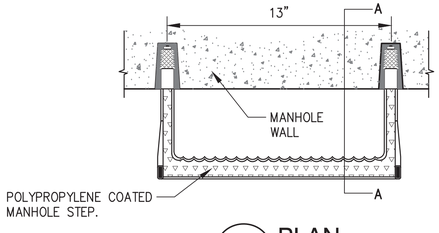
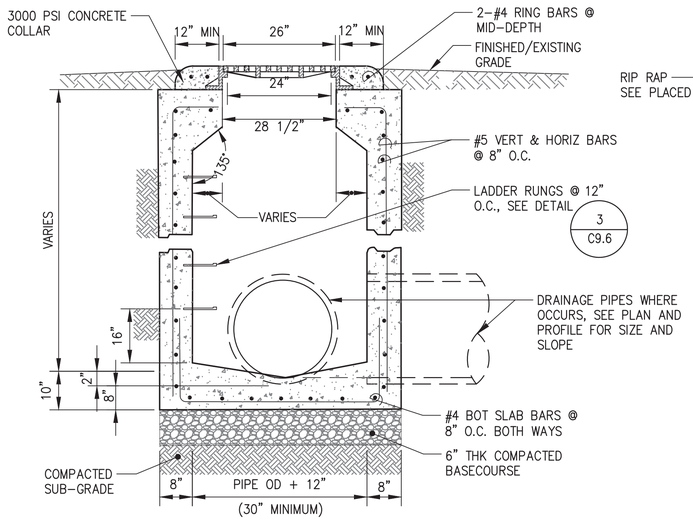


3A PLAN
NOT TO SCALE

3 LADDER RUNGS DETAIL
NOT TO SCALE



2B SECTION
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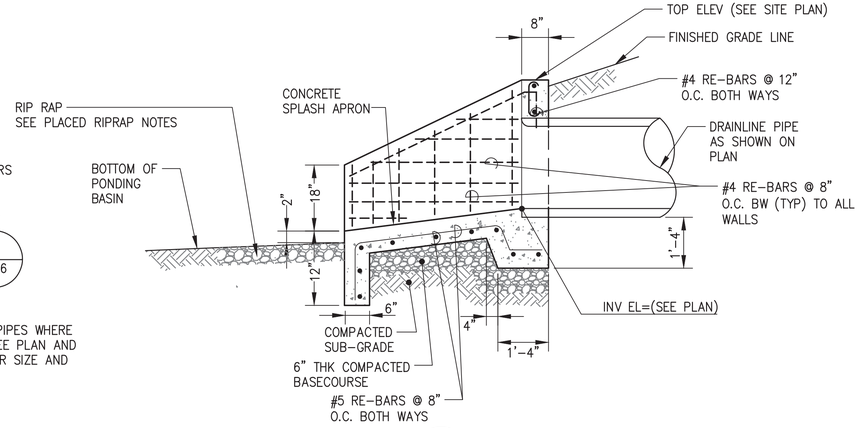

1C SECTION
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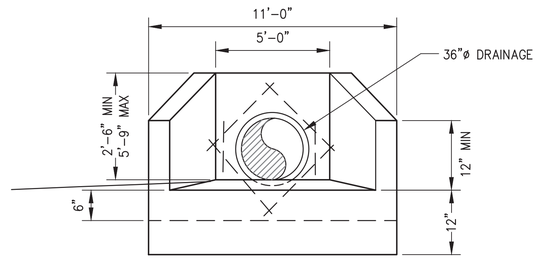

1B ELEVATION
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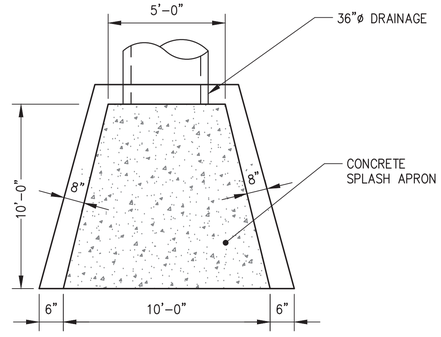
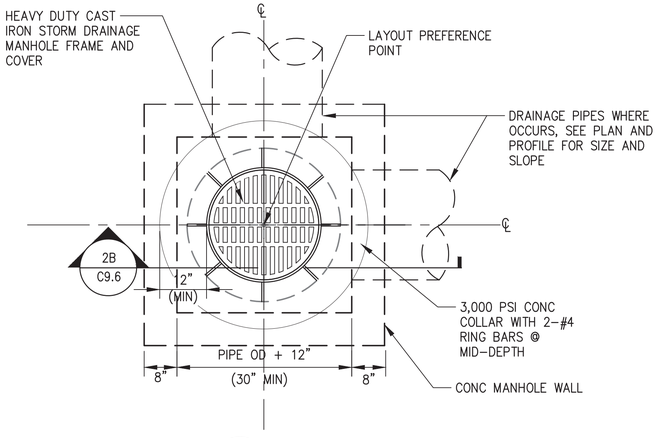


1A PLAN
NOT TO SCALE

1 END WALL W/ SPLASH APRON (TYPE 1) DETAIL
NOT TO SCALE



2A SECTION
NOT TO SCALE

2 SQUARE STORM DRAINAGE MANHOLE (SDMH) PLAN
NOT TO SCALE

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REVISIONS		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE DETAILS - 2
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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Date:	3/31/25
Project No.	File

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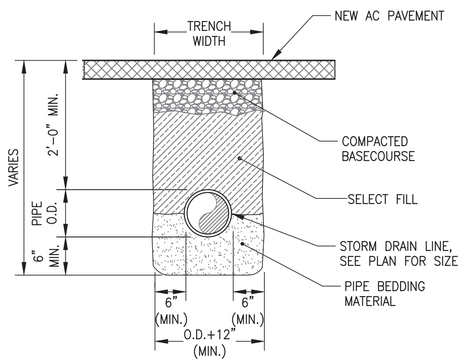

2B AT PAVEMENT
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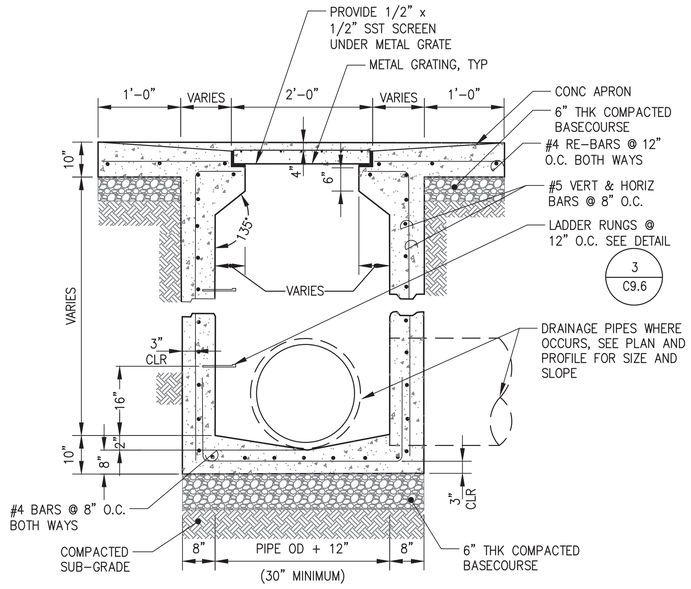

2B SECTION
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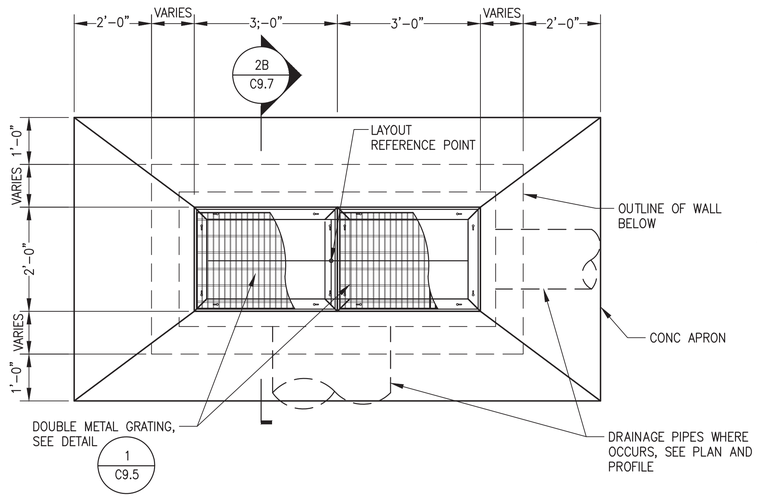

2A PLAN
NOT TO SCALE

2 CATCH BASIN DETAILS - TYPE 2
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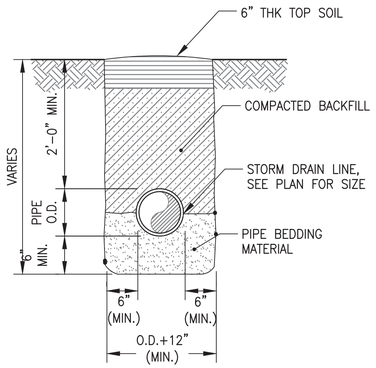

2A AT LANDSCAPE
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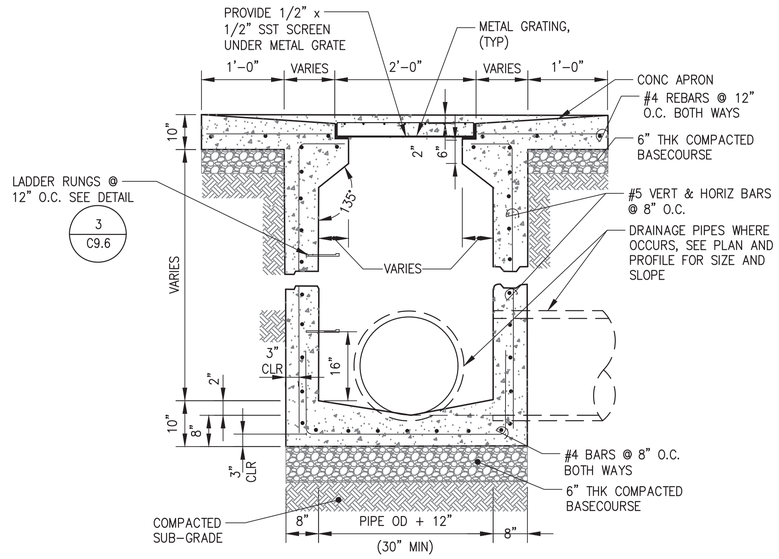

1B SECTION
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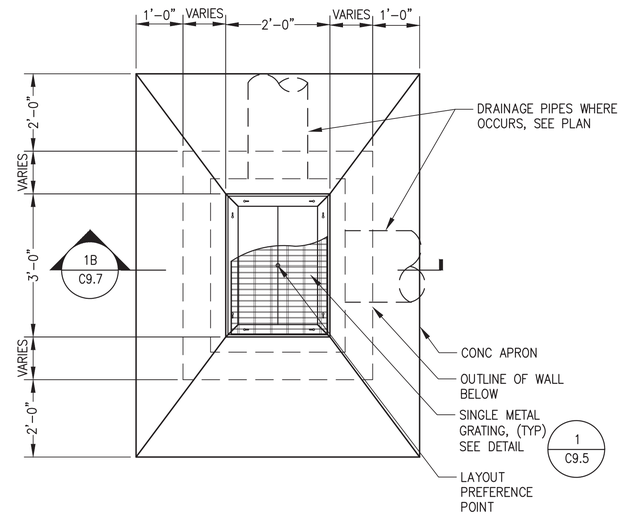

1A PLAN
NOT TO SCALE

1 CATCH BASIN DETAILS - TYPE 1
NOT TO SCALE

3 DRAINAGE PIPE TRENCH DETAILS
NOT TO SCALE

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REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DRAINAGE DETAILS - 3

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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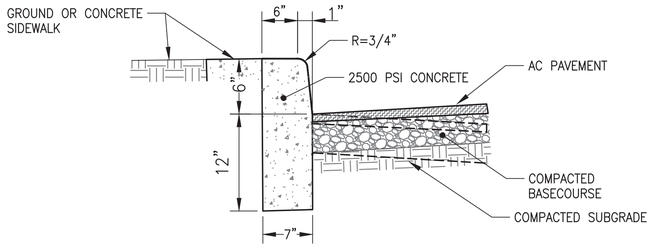

4 CONCRETE CURB
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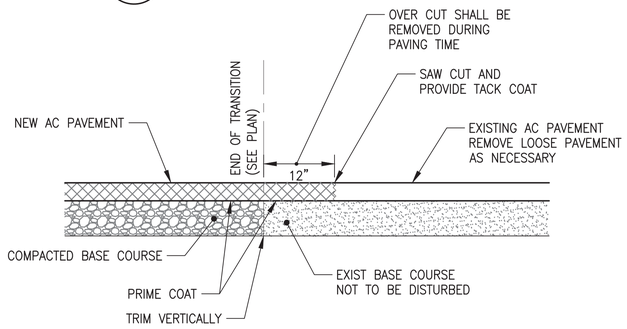

3 CONN TO EXIST AC PAVEMENT DETAIL
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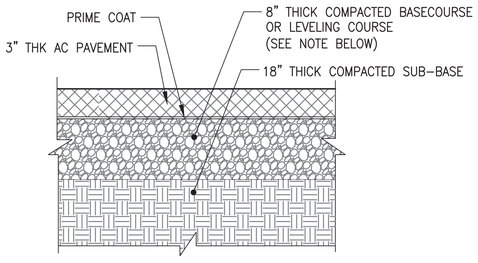

2C AT ACCESS ROAD
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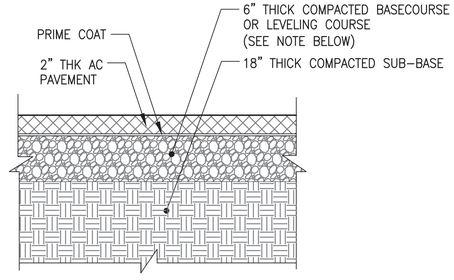

2B AT PARKING AREA
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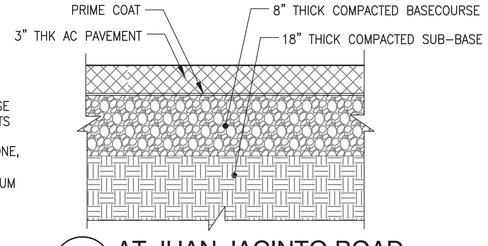
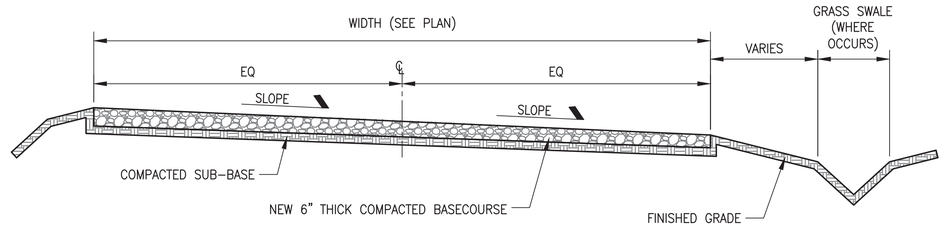


2A AT JUAN JACINTO ROAD
NOT TO SCALE

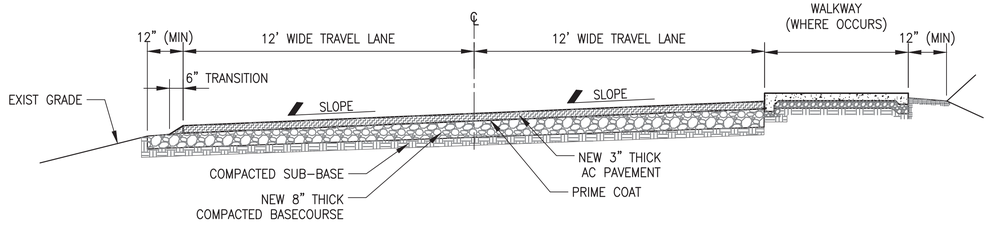
NOTES:

1. ON FILL AREAS, USE 6" THICK BASE COURSE COMPACTED TO 95% OF ITS MAXIMUM DRY DENSITY.
2. CUT AREAS ON CORALLINE LIMESTONE, USE 4" THICK LEVELING COURSE COMPACTED TO 95% OF ITS MAXIMUM DRY DENSITY.

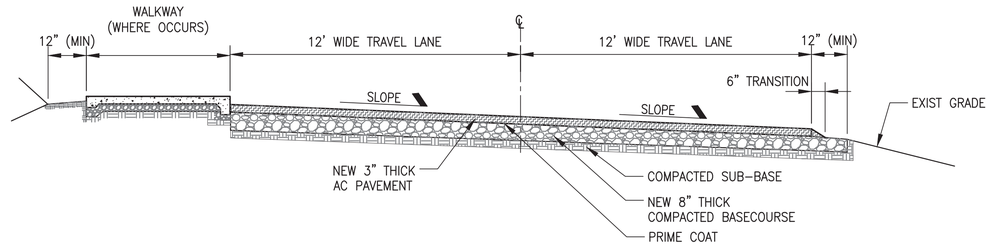
2 TYPICAL AC PAVEMENT SECTION
NOT TO SCALE



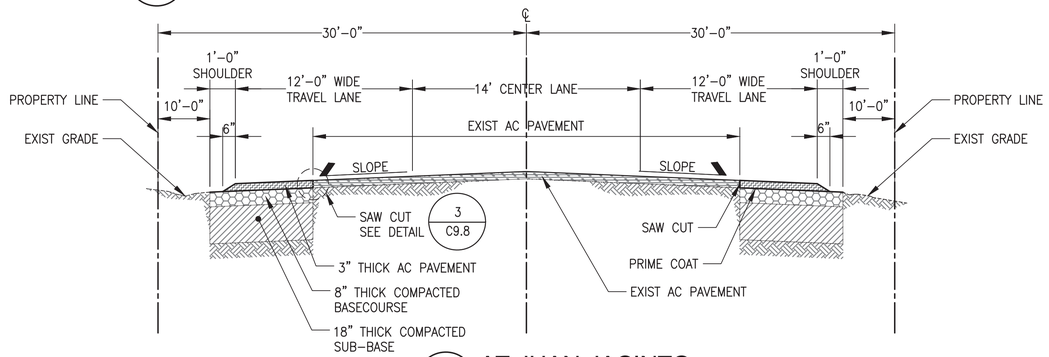
1D GRAVEL ACCESS ROAD
NOT TO SCALE



1C ROAD A SECTION 2 (STA 8+15 TO 9+10)
NOT TO SCALE



1B ROAD A SECTION 1 (STA 0+00 TO 8+00 & 9+25 TO 20+60.99)
NOT TO SCALE



1A AT JUAN JACINTO
NOT TO SCALE

1 TYPICAL ROAD SECTIONS
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax : (671) 472-3381
Architecture
Planning
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DCA
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■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

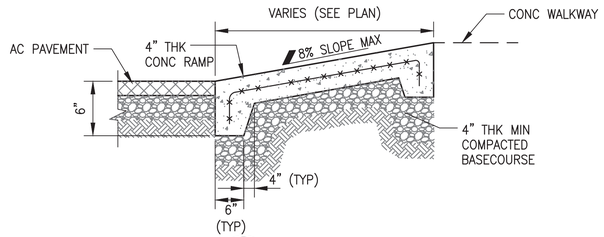
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE DETAILS - 1
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C9.8

Sheet No. _____ of _____



5D DETAIL
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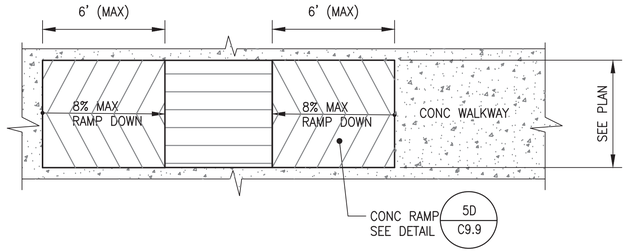
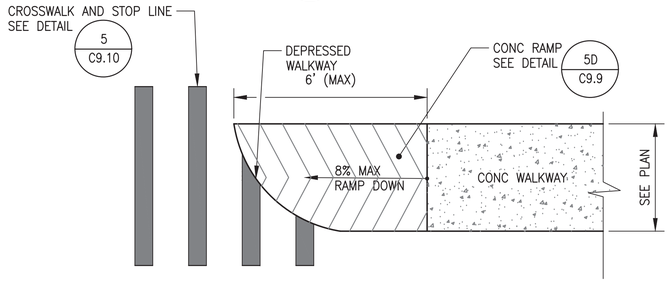


5C DETAIL
NOT TO SCALE



5B DETAIL
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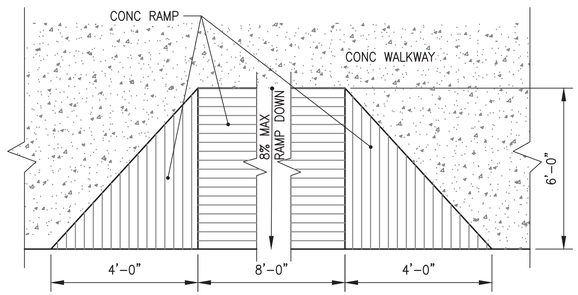
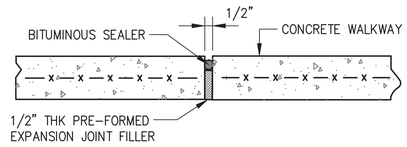


5A DETAIL
NOT TO SCALE

5 CONC WALKWAY RAMP DETAIL
NOT TO SCALE



4 EXPANSION JOINT DETAIL
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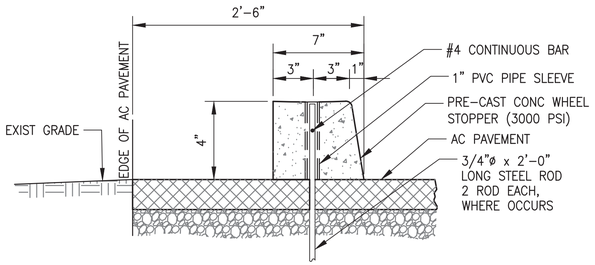
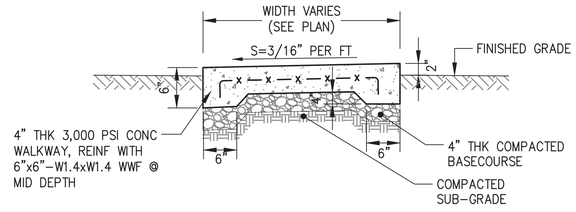


3 CONC WHEEL STOP DETAIL
NOT TO SCALE



2D TYPE-3 SECTION
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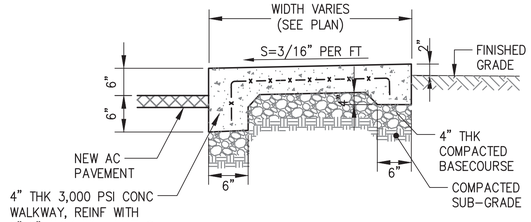

2C TYPE-2 SECTION
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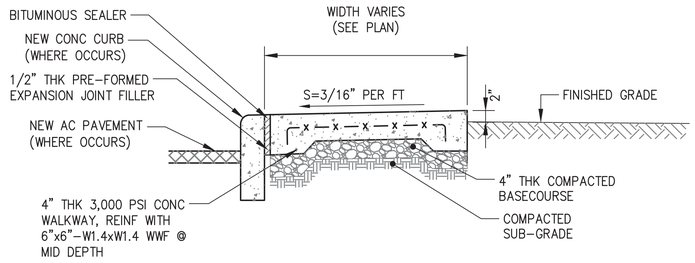
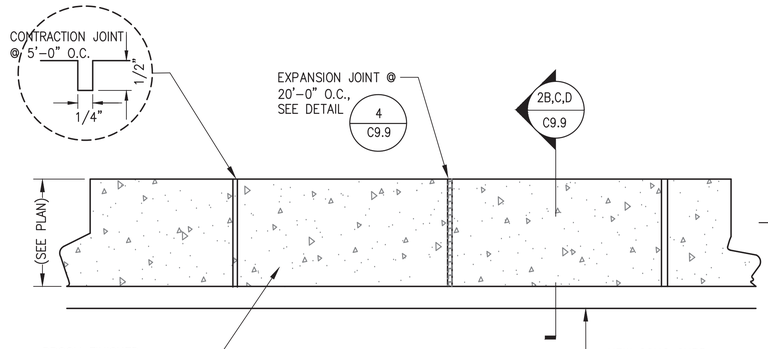
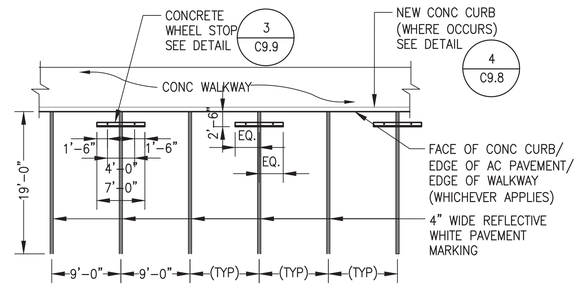


2B TYPE-1 SECTION
NOT TO SCALE



2A PLAN
NOT TO SCALE

2 CONCRETE WALKWAY DETAILS
NOT TO SCALE



1 TYPICAL PARKING STALL DETAIL
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISIONS

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TRMA
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■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

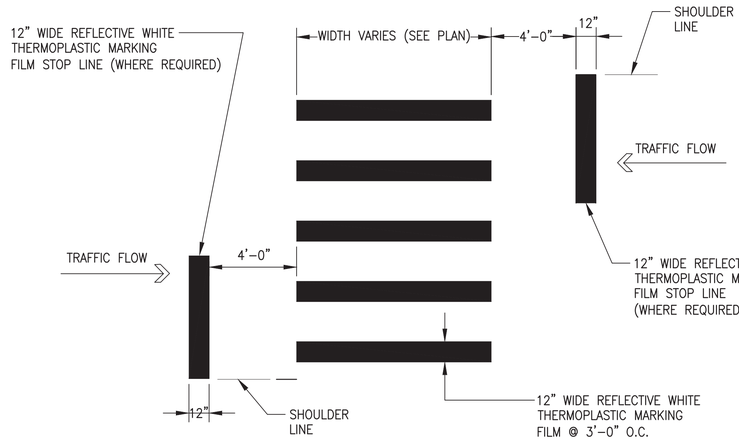
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE DETAILS - 2
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing
C9.9

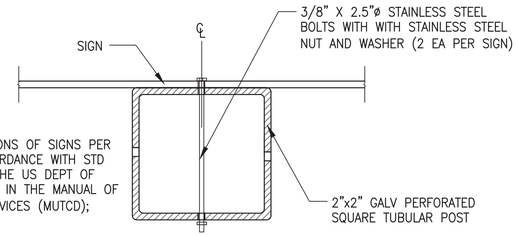
Sheet No. _____ of _____



5 CROSSWALK AND STOP LINE DETAIL
NOT TO SCALE

NOTES:

1. SIZE PAINT COLOR & DIMENSIONS OF SIGNS PER DPW STANDARDS AND IN ACCORDANCE WITH STD HIGHWAY SIGNS ADOPTED BY THE US DEPT OF TRANSPORTATION AS SPECIFIED IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD); (LATEST EDITION)



3 SIGN MOUNTING DETAIL
NOT TO SCALE



R2-5
24" X 30"

SPEED LIMIT SIGN



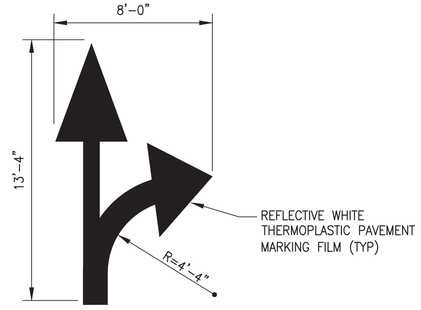
S2-1
36" X 36"

SCHOOL CROSSING



R1-1
30" X 30"

STOP SIGN



6C STRAIGHT/RIGHT
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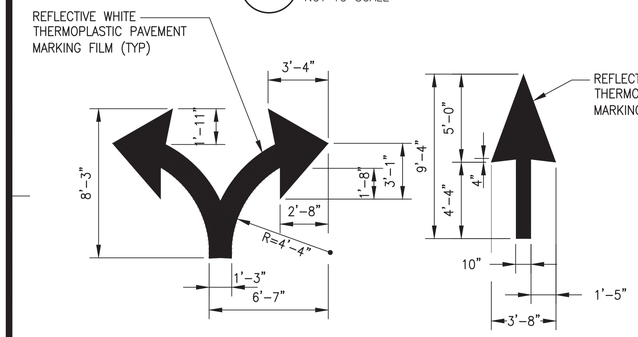
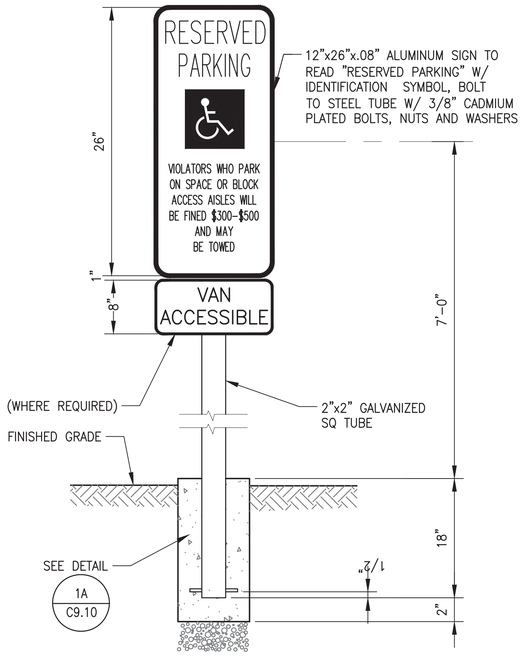


6B LEFT/RIGHT
NOT TO SCALE

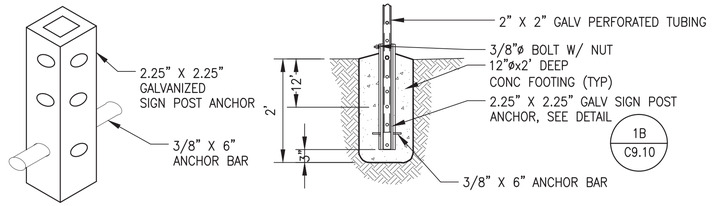
6A STRAIGHT
NOT TO SCALE

6 DIRECTIONAL ARROWS DETAILS
NOT TO SCALE



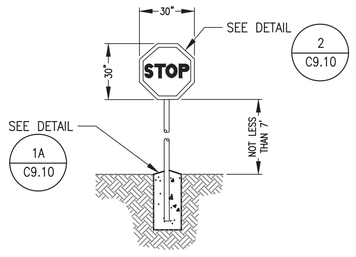
4 RESERVED PARKING SIGN POST DETAIL
NOT TO SCALE

2 SIGN DETAIL
NOT TO SCALE



1B DETAIL
NOT TO SCALE

1A DETAIL
NOT TO SCALE



NOTES:

1. GALV TUBE EMBEDDED IN CONC SHALL BE DIPPED IN BITUMINOUS MATERIAL.
2. CROWN TOP OF CONCRETE FOOTING TO DRAIN WATER AWAY FROM POST.

1 SIGNS AND FOOTING DETAIL
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

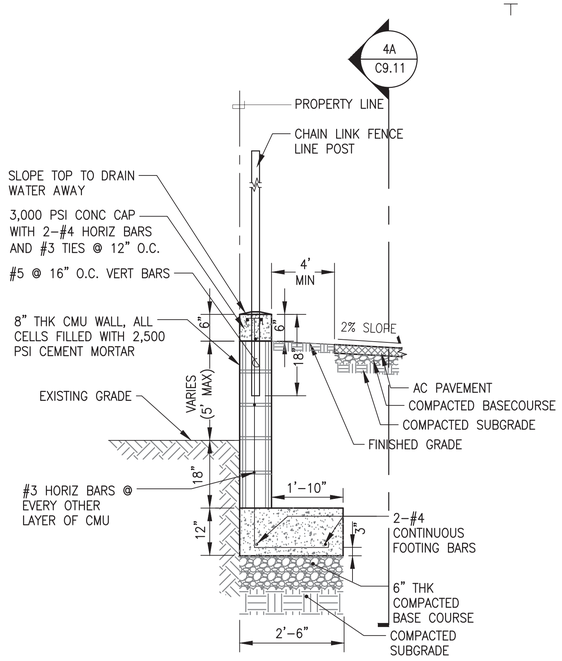
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE DETAILS - 3
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C9.10

Sheet No: _____ of _____



4B SECTION
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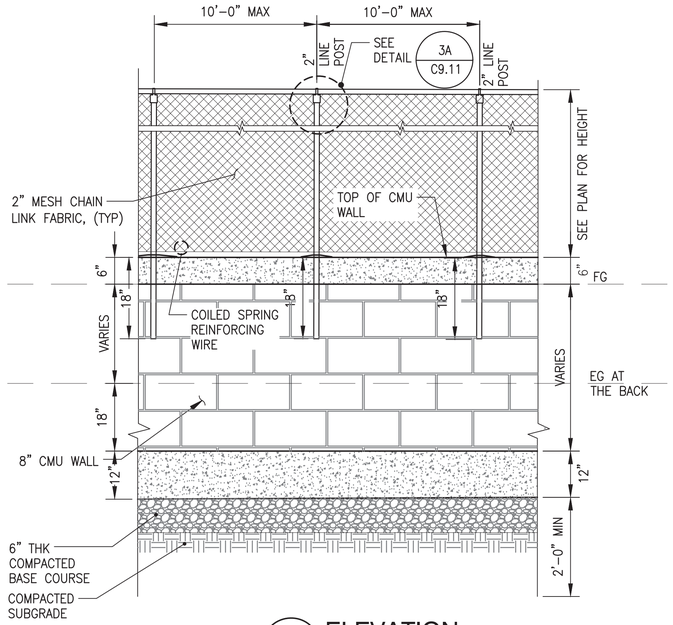
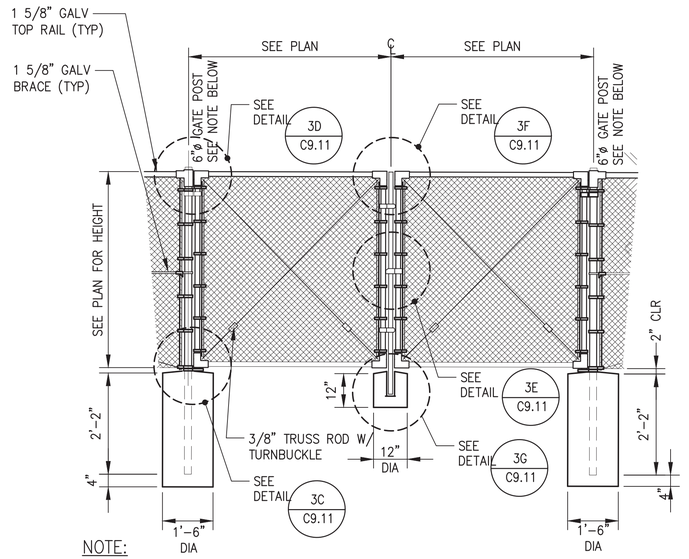


4A ELEVATION
NOT TO SCALE



NOTE:

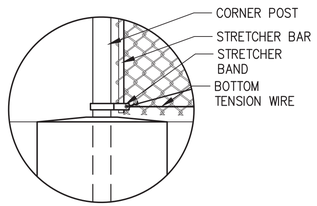
1. FOR PEDESTRIAN GATES, USE 4"ø POSTS.

2 VEHICULAR GATE DETAIL
NOT TO SCALE

NOTES:

1. FOR 4' HIGH FENCE, USE 12"ø X 18" DEEP FOOTING.
2. FOR 4' HIGH GATES, USE 2"ø GATE POSTS.
3. UNLESS SPECIFIED, POSTS DIAMETER SHOWN IN THE DRAWINGS ARE NOMINAL DIMENSION.

4 RETAINING WALL WITH CHAIN LINK FENCE
NOT TO SCALE



3H DETAIL
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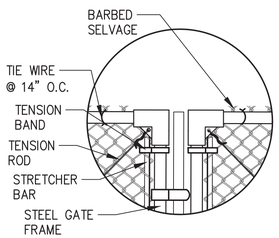

3F DETAIL
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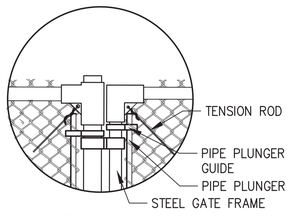
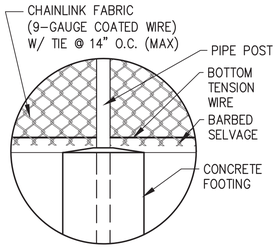
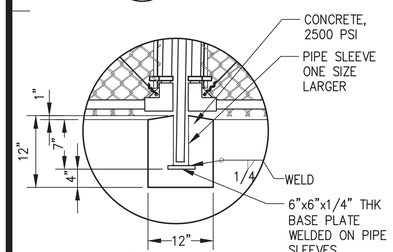


3D DETAIL
NOT TO SCALE



3B DETAIL
NOT TO SCALE



3G DETAIL
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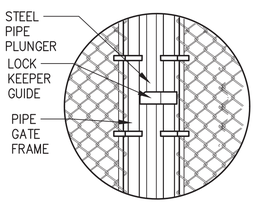

3E DETAIL
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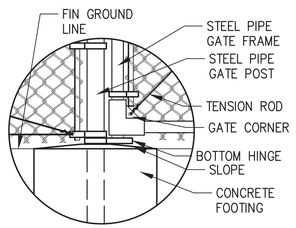

3C DETAIL
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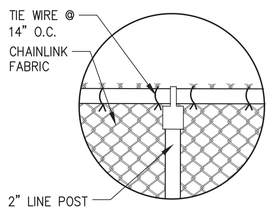
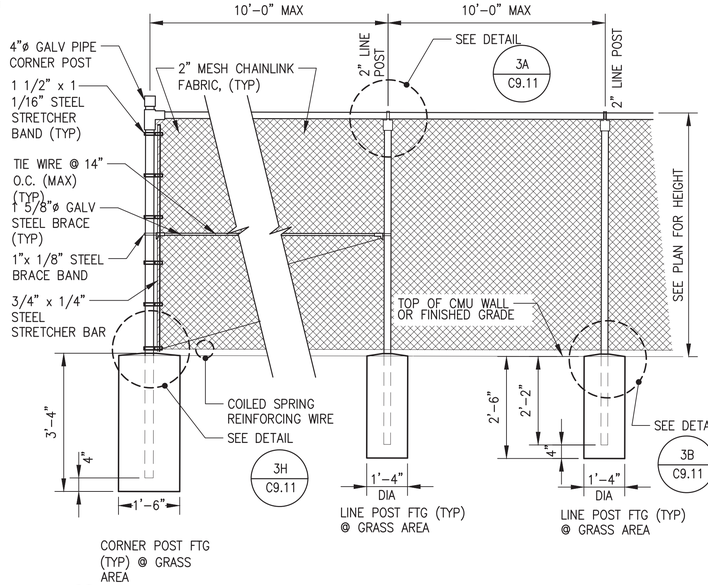


3A DETAIL
NOT TO SCALE

3 FENCING DETAILS
NOT TO SCALE



1 TYPICAL CHAIN LINK FENCE ELEVATION
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

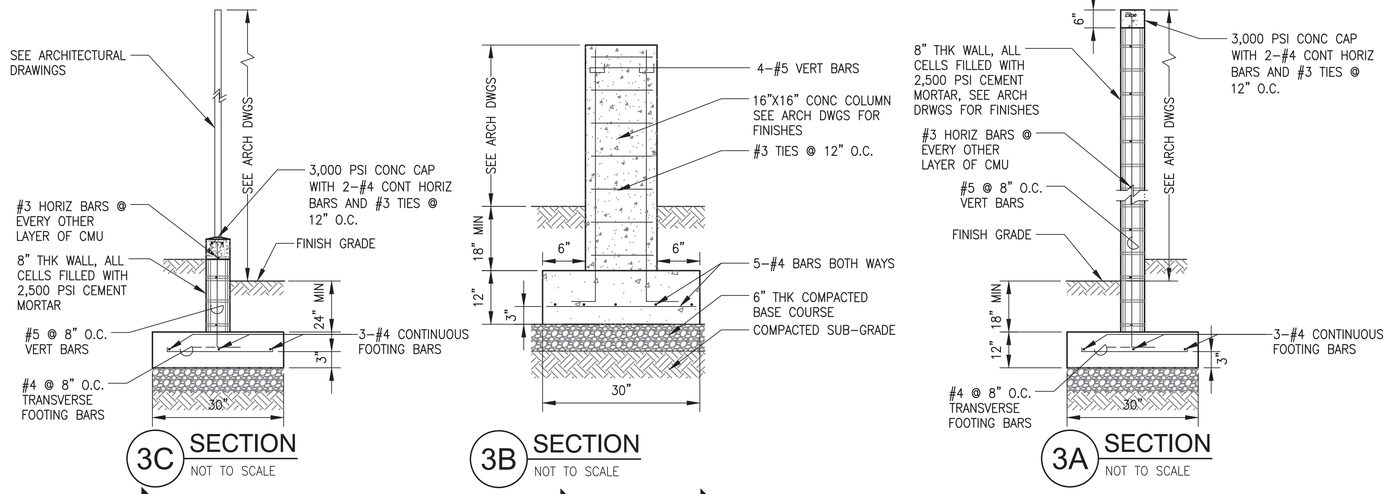
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE DETAILS - 4
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing:
C9.11

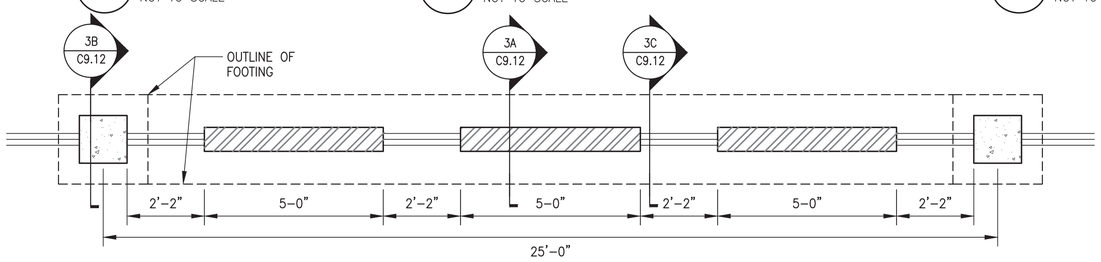
Sheet No. _____ of _____



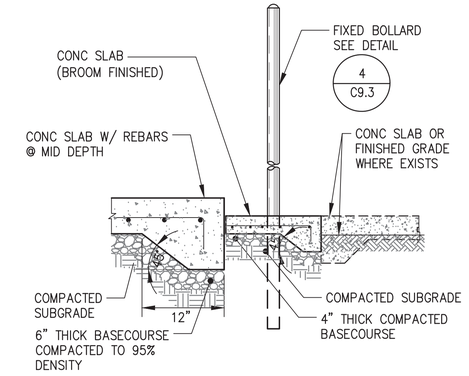
3C SECTION
NOT TO SCALE

3B SECTION
NOT TO SCALE

3A SECTION
NOT TO SCALE



3 CONCRETE/CMU FENCE DETAIL
NOT TO SCALE



1D SECTION
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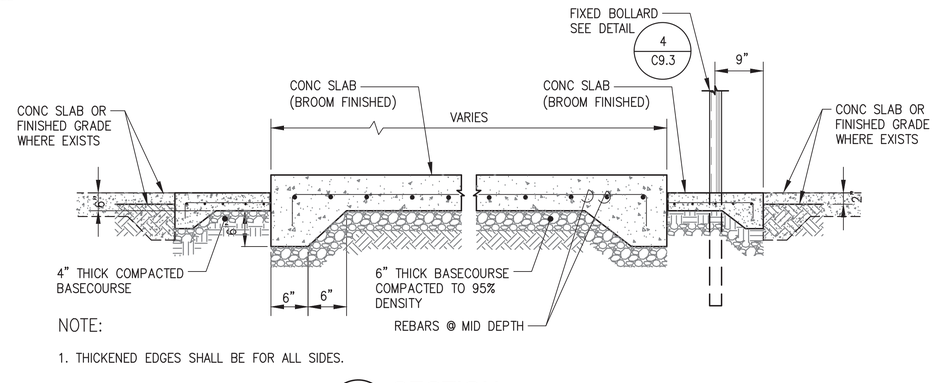
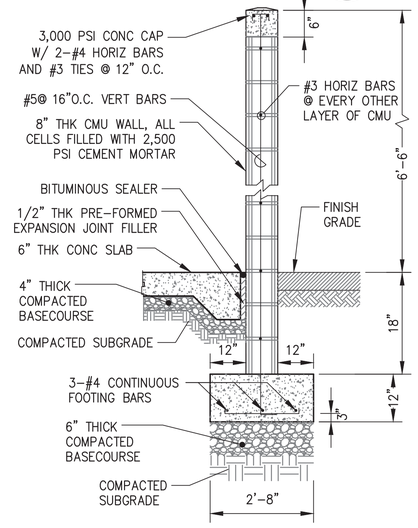


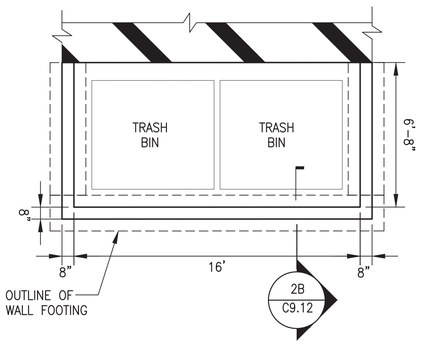
NOTE:

1. THICKENED EDGES SHALL BE FOR ALL SIDES.

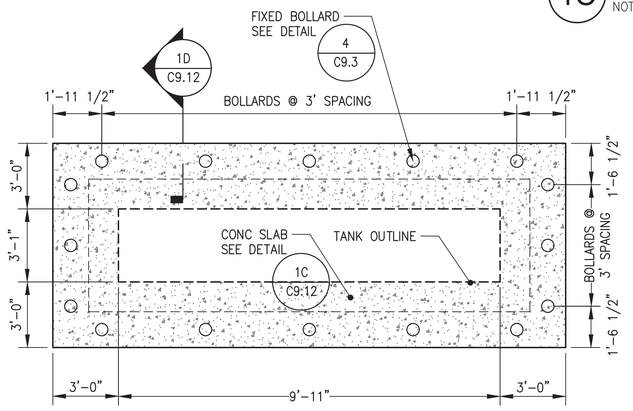
1C SECTION
NOT TO SCALE



2B CMU WALL & FOOTING
NOT TO SCALE



2A PLAN
NOT TO SCALE



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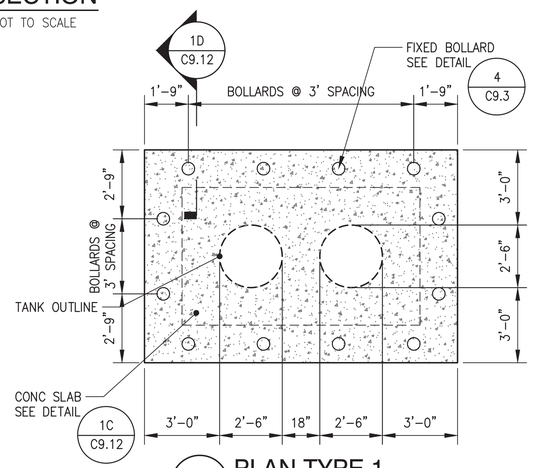

1A PLAN TYPE 1
NOT TO SCALE

2 TRASH ENCLOSURE DETAIL
NOT TO SCALE

1 LPG TANK PAD DETAIL
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISIONS		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax : (671) 472-3381
Architecture
Planning
Interior Design

DCA
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■ ENGINEERING (CIVIL/STRUCTURAL) ■ CONSTRUCTION MANAGEMENT ■ PLANNING
■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

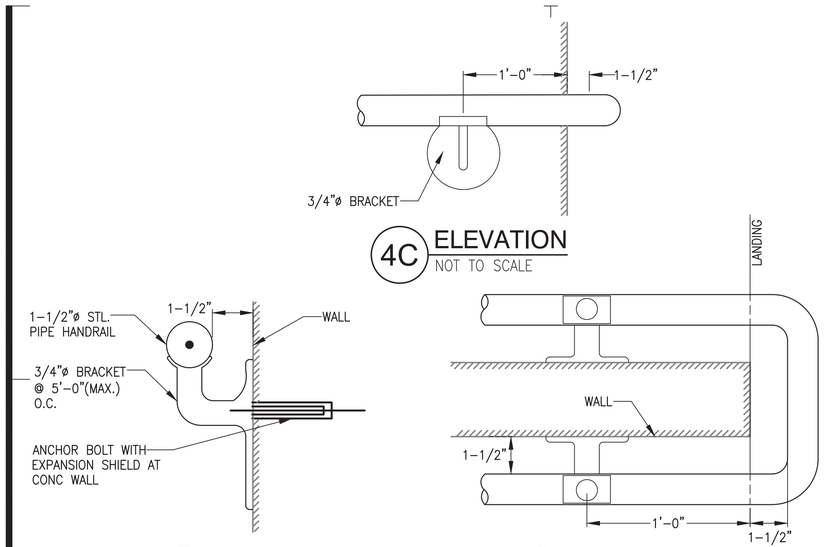
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
SITE DETAILS - 5
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

Drawing:
C9.12

Sheet No. _____ of _____

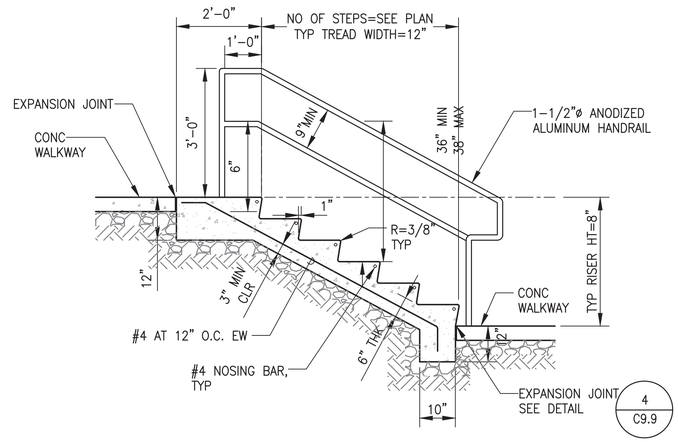


4C ELEVATION — NOT TO SCALE

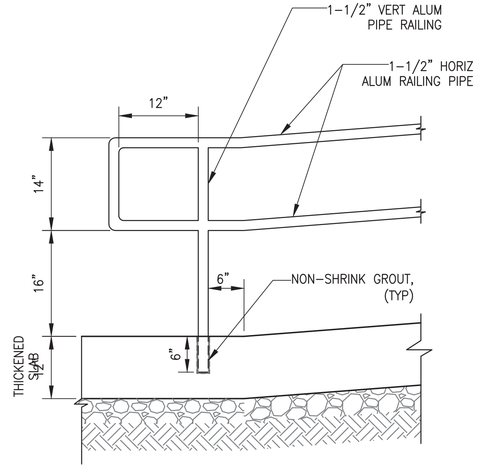
4B SECTION — NOT TO SCALE

4A PLAN — NOT TO SCALE

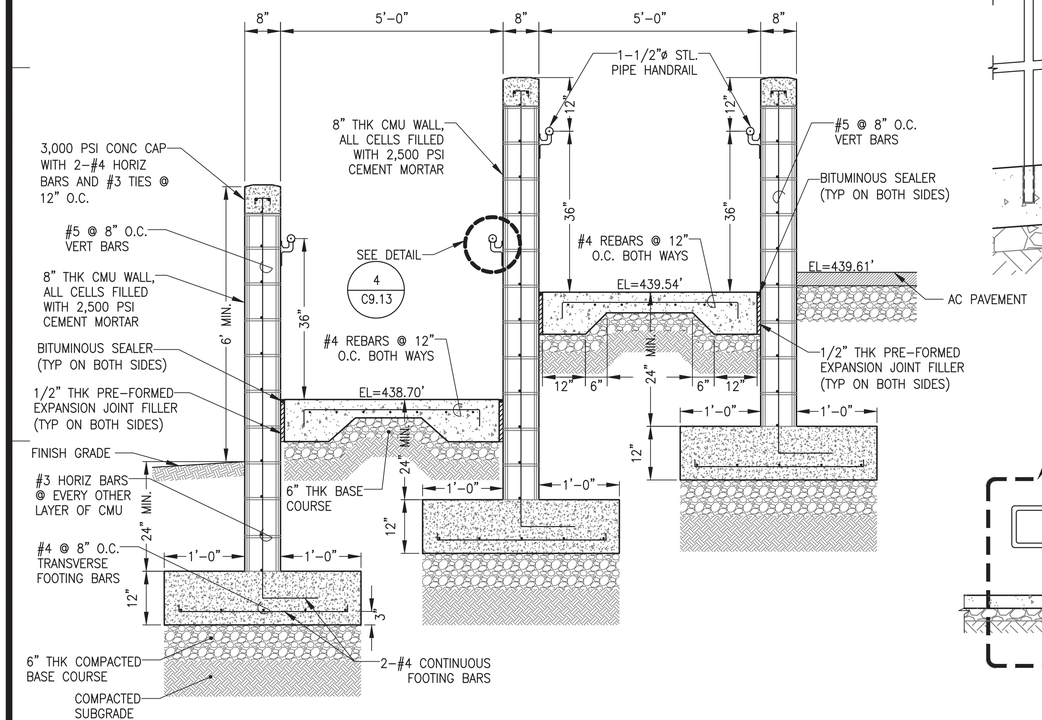
4 WALL MOUNT RAILING DETAIL
NOT TO SCALE



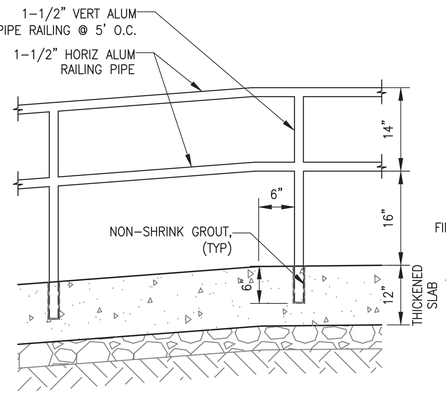
2 CONCRETE STEPS DETAIL — NOT TO SCALE



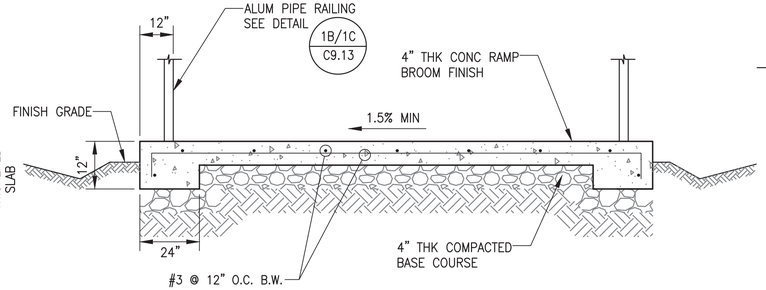
1C RAILING DETAIL — NOT TO SCALE



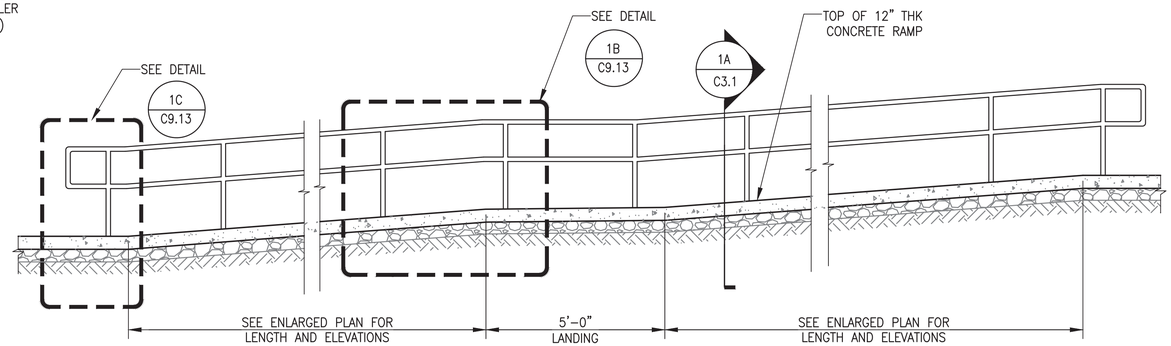
3 ACCESSIBLE RAMP SECTION — NOT TO SCALE



1B RAILING DETAIL — NOT TO SCALE



1A SECTION — NOT TO SCALE



1 ACCESSIBLE RAMP DETAIL — NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

TRMA
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■ ENVIRONMENTAL SERVICES ■ SURVEYING
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■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

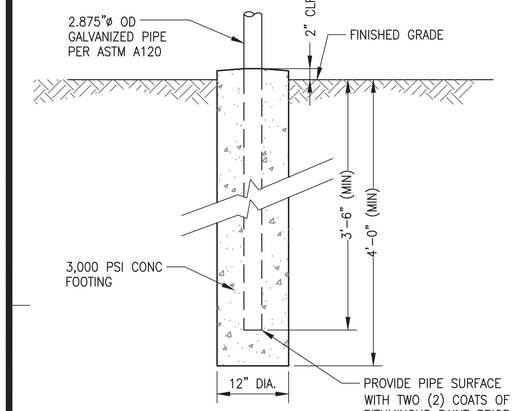
Title: CONCRETE STEPS AND RAMP DETAIL
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

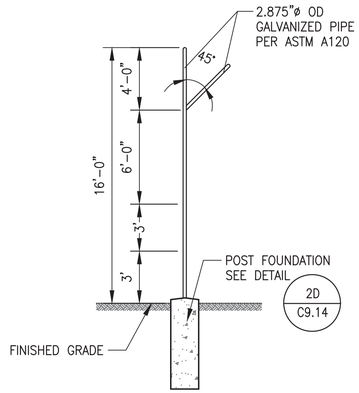
Drawing: C9.13

Sheet No: _____ of _____

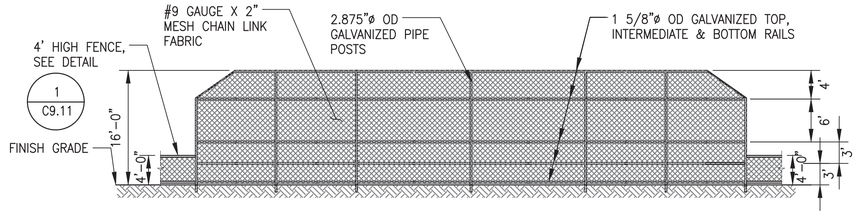
NOT FOR CONSTRUCTION



2D SECTION
NOT TO SCALE



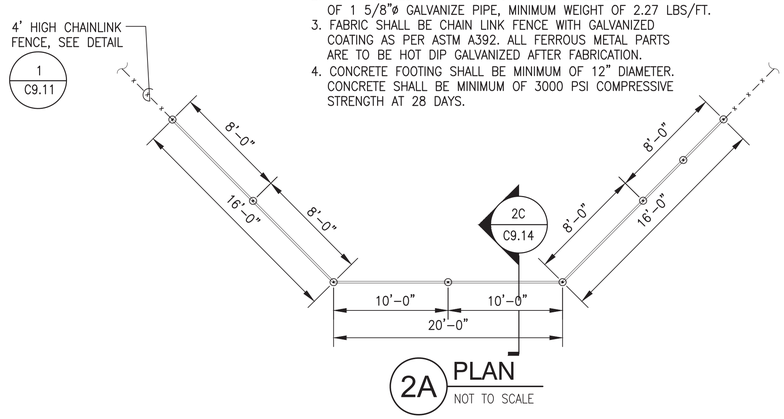
2C SECTION
NOT TO SCALE



2B ELEVATION
NOT TO SCALE

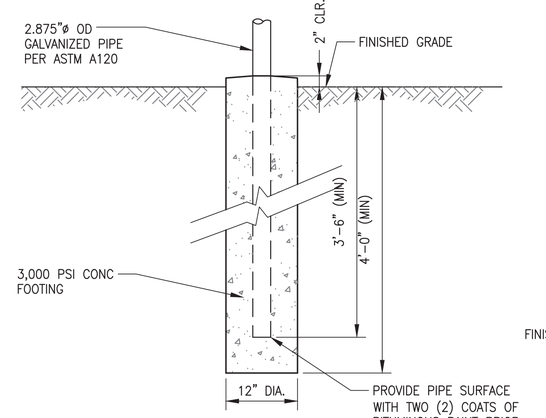
NOTES:

1. POSTS SHALL BE MINIMUM OF 2.875"ø OD GALVANIZE PIPE, MINIMUM WEIGHT OF 5.79 LBS/FT.
2. TOP INTERMEDIATE AND BOTTOM RAILS SHALL BE MINIMUM OF 1 5/8"ø GALVANIZE PIPE, MINIMUM WEIGHT OF 2.27 LBS/FT.
3. FABRIC SHALL BE CHAIN LINK FENCE WITH GALVANIZED COATING AS PER ASTM A392. ALL FERROUS METAL PARTS ARE TO BE HOT DIP GALVANIZED AFTER FABRICATION.
4. CONCRETE FOOTING SHALL BE MINIMUM OF 12" DIAMETER. CONCRETE SHALL BE MINIMUM OF 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

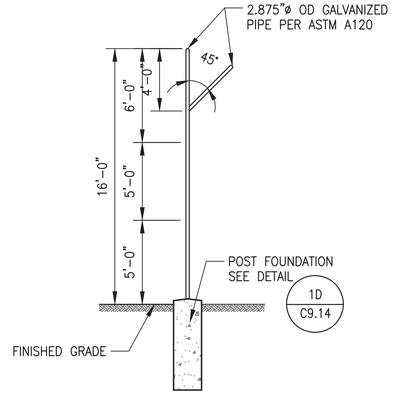


2A PLAN
NOT TO SCALE

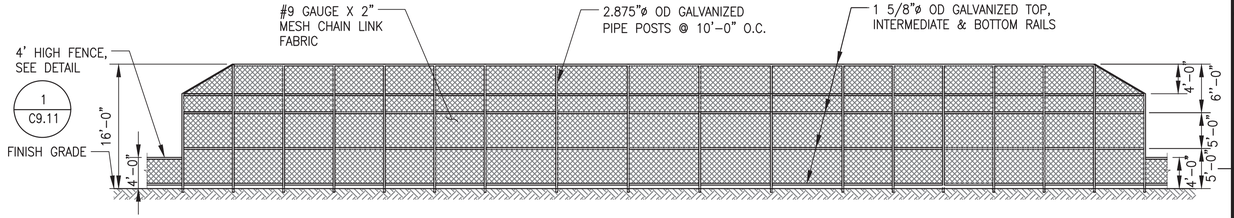
2 SOFTBALL BACKSTOP DETAIL
NOT TO SCALE



1D SECTION
NOT TO SCALE



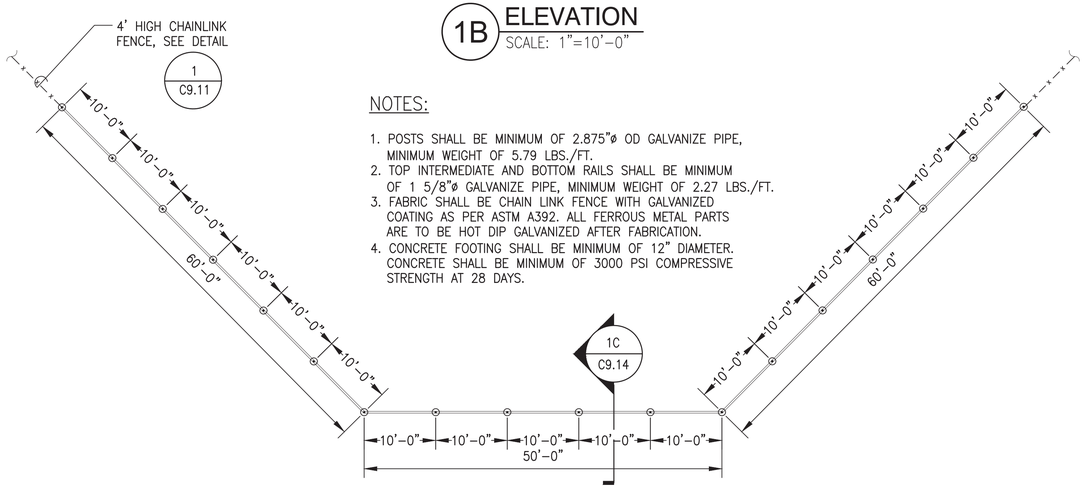
1C SECTION
NOT TO SCALE



1B ELEVATION
SCALE: 1"=10'-0"

NOTES:

1. POSTS SHALL BE MINIMUM OF 2.875"ø OD GALVANIZE PIPE, MINIMUM WEIGHT OF 5.79 LBS./FT.
2. TOP INTERMEDIATE AND BOTTOM RAILS SHALL BE MINIMUM OF 1 5/8"ø GALVANIZE PIPE, MINIMUM WEIGHT OF 2.27 LBS./FT.
3. FABRIC SHALL BE CHAIN LINK FENCE WITH GALVANIZED COATING AS PER ASTM A392. ALL FERROUS METAL PARTS ARE TO BE HOT DIP GALVANIZED AFTER FABRICATION.
4. CONCRETE FOOTING SHALL BE MINIMUM OF 12" DIAMETER. CONCRETE SHALL BE MINIMUM OF 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.



1A PLAN
SCALE: 1"=10'-0"

1 BASEBALL BACKSTOP DETAIL
SCALE: 1"=10'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

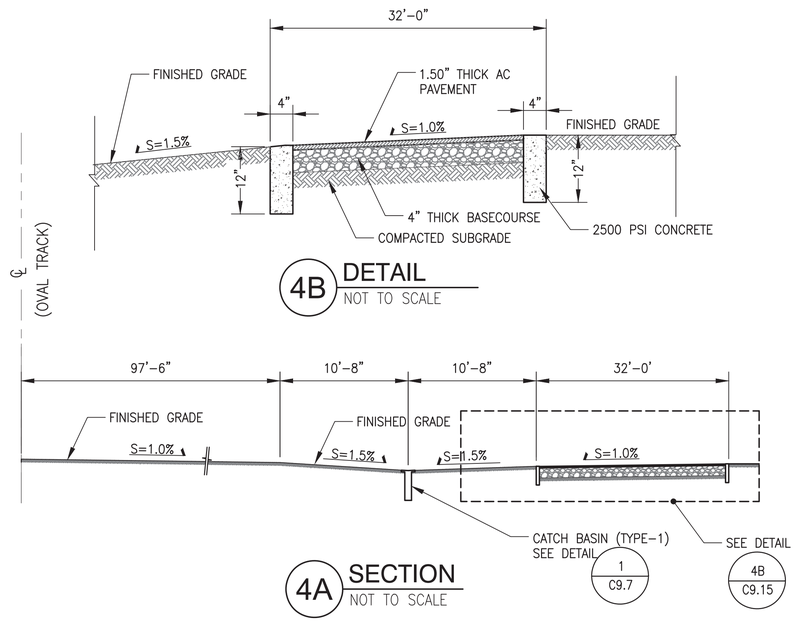
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
BASEBALL AND SOFTBALL BACKSTOP DETAIL
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C9.14
Sheet No: _____ of _____

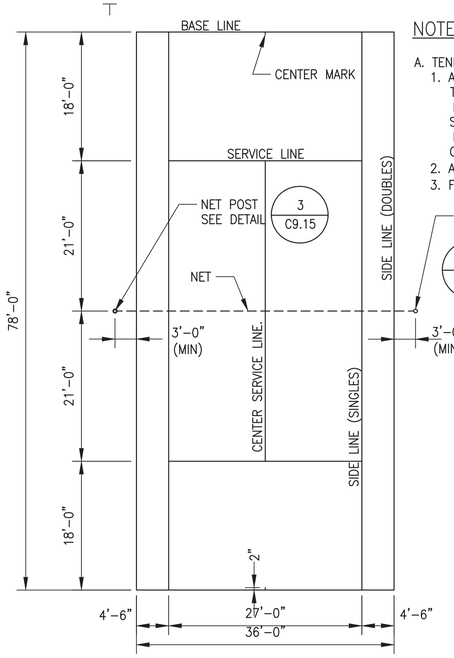
NOT FOR CONSTRUCTION



4B DETAIL
NOT TO SCALE

4A SECTION
NOT TO SCALE

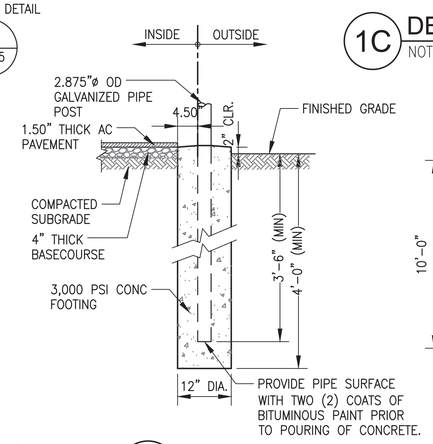
4 OVAL TRACK SECTION
NOT TO SCALE



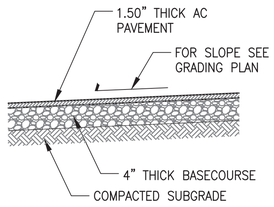
NOTES:

A. TENNIS COURTS
1. ALL MEASUREMENTS FOR COURT MARKINGS ARE TO BE OUTSIDE OF LINES EXCEPT FOR THOSE INVOLVING THE CENTER SERVICE LINE WHICH IS EQUALLY DIVIDED BETWEEN THE RIGHT AND LEFT SERVICE COURTS.
2. ALL COURT MARKINGS TO BE 2" WIDE.
3. FENCE ENCLOSURE TO BE 10'-0" WIDE.

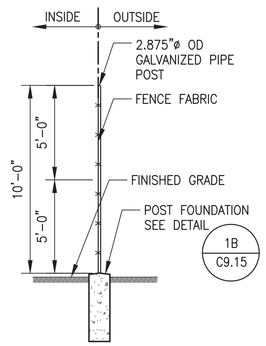
2 TENNIS COURT PAVEMENT MARKING DETAIL
NOT TO SCALE



1B DETAIL
NOT TO SCALE



1C DETAIL
NOT TO SCALE



1A DETAIL
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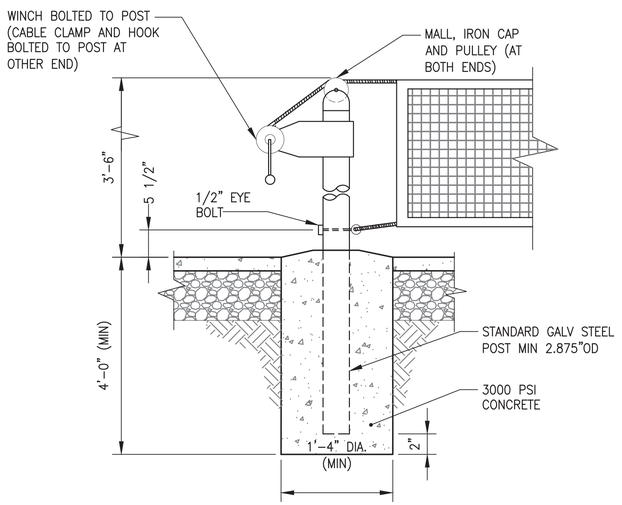
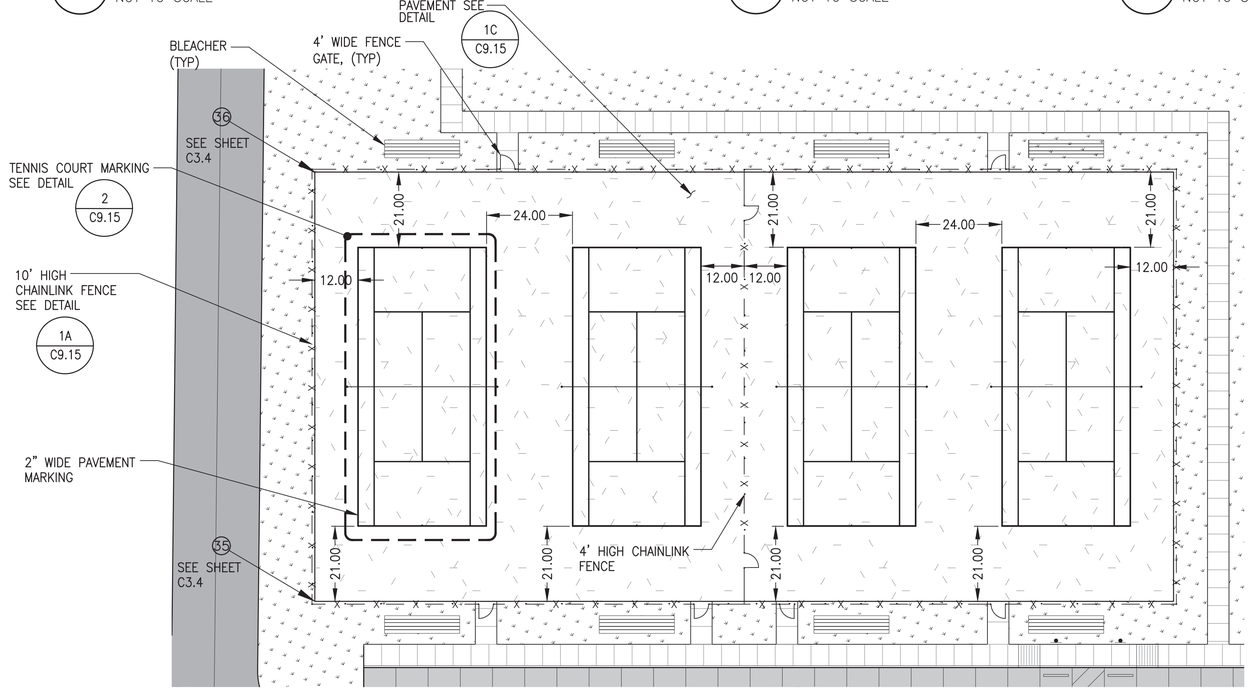


3 TYPICAL TENNIS NET & POST DETAILS
NOT TO SCALE



1 TYPICAL TENNIS COURT DETAIL
1"=20'-0"

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REVISIONS

No.	Description	Date

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■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
TRACK AND FIELD AND TENNIS COURT DETAILS
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

Drawing
C9.15
Sheet No: _____ of _____

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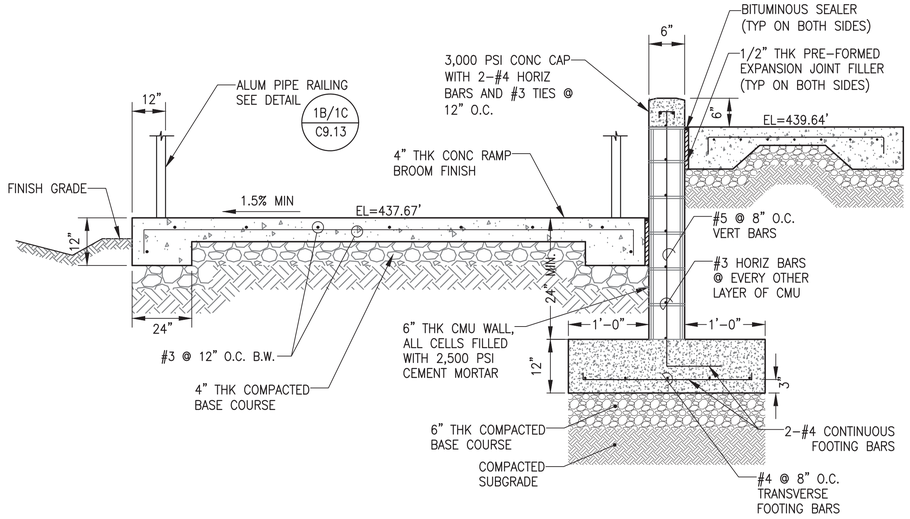

4 ACCESSIBLE RAMP & WALKWAY SECTION
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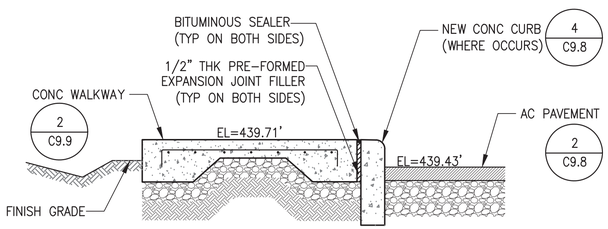

3 WALKWAY SECTION
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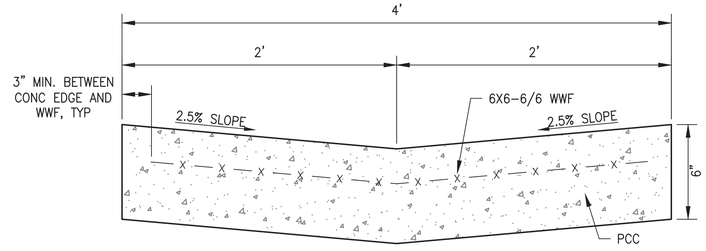

2 CONCRETE THRU GUTTER SECTION
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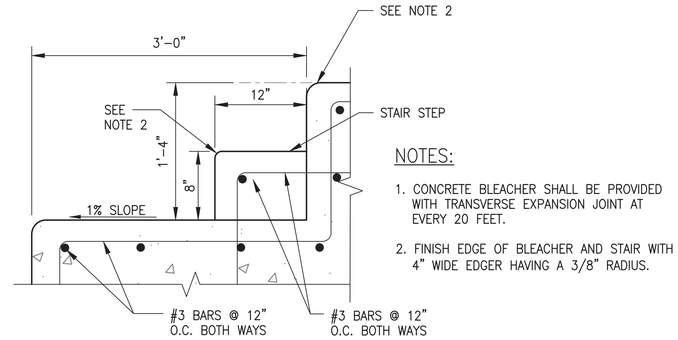
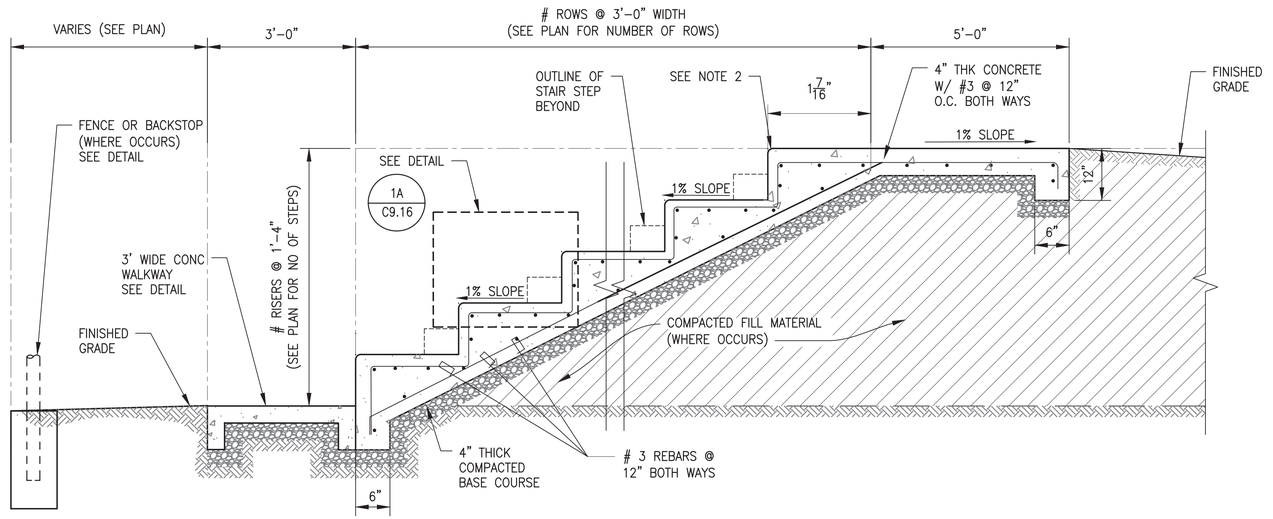


NOTES:

1. CONCRETE BLEACHER SHALL BE PROVIDED WITH TRANSVERSE EXPANSION JOINT AT EVERY 20 FEET.
2. FINISH EDGE OF BLEACHER AND STAIR WITH 4" WIDE EDGER HAVING A 3/8" RADIUS.

1A CONCRETE STEP SECTION
NOT TO SCALE



1 CONCRETE BLEACHER SECTION
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS

No.	Description	Date

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P.O. Box 8900 Tamuning, Guam 96931

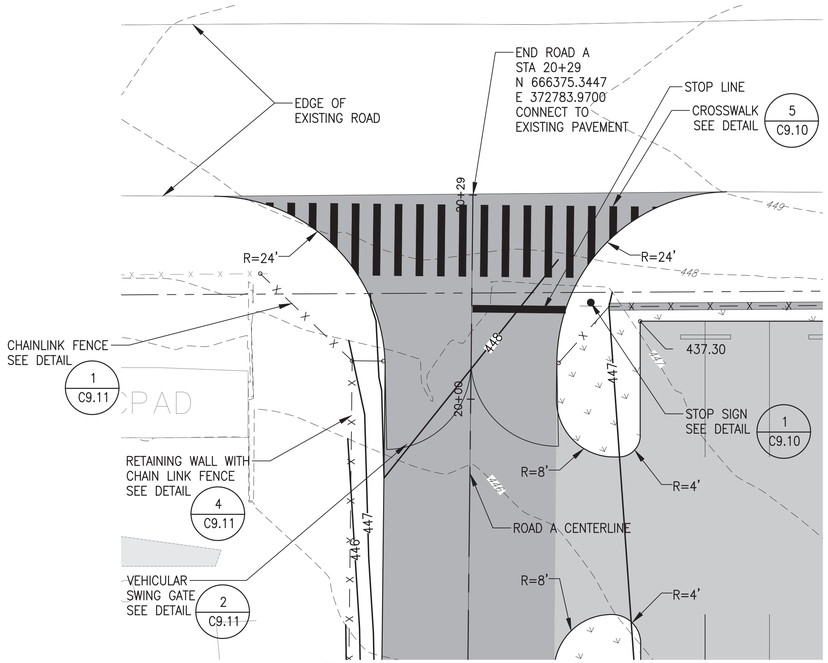
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

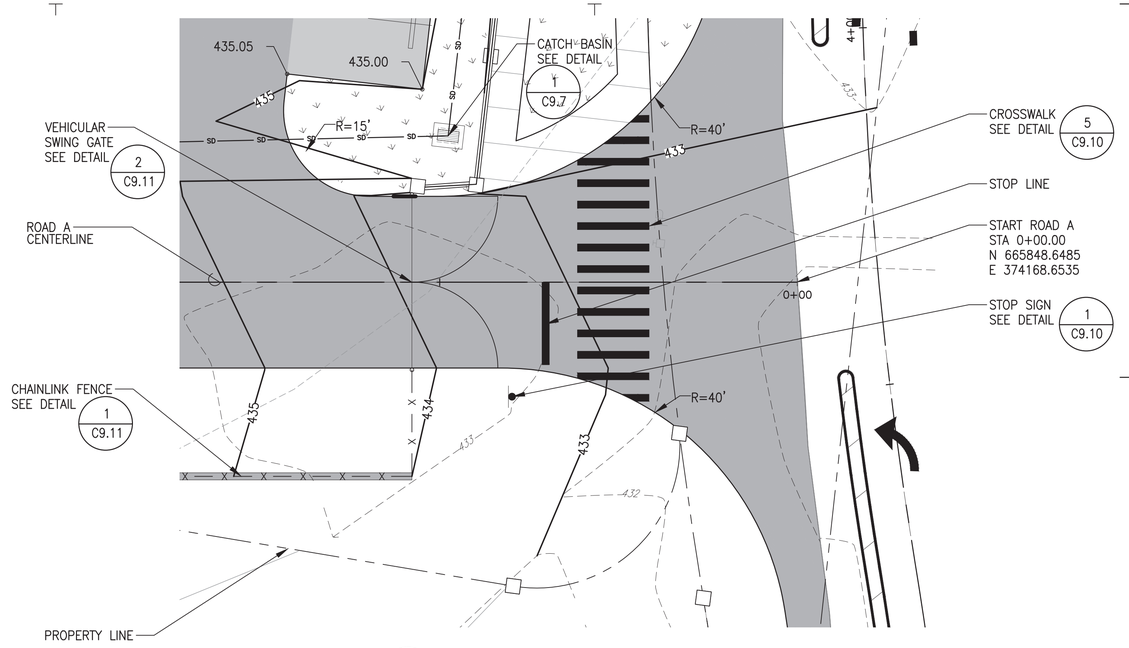
Title:
CONCRETE BLEACHER DETAILS
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	Title

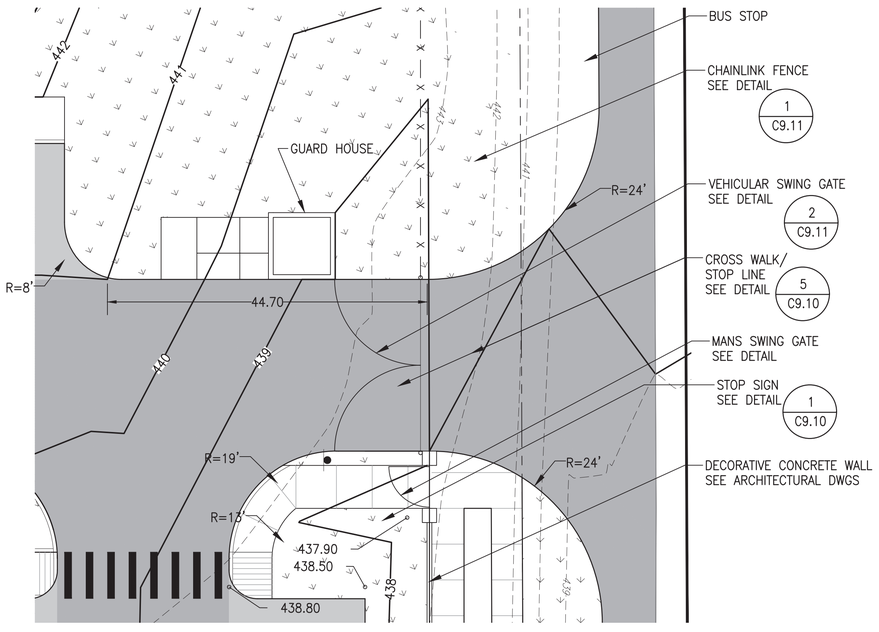
Drawing
C9.16
Sheet No: _____ of _____



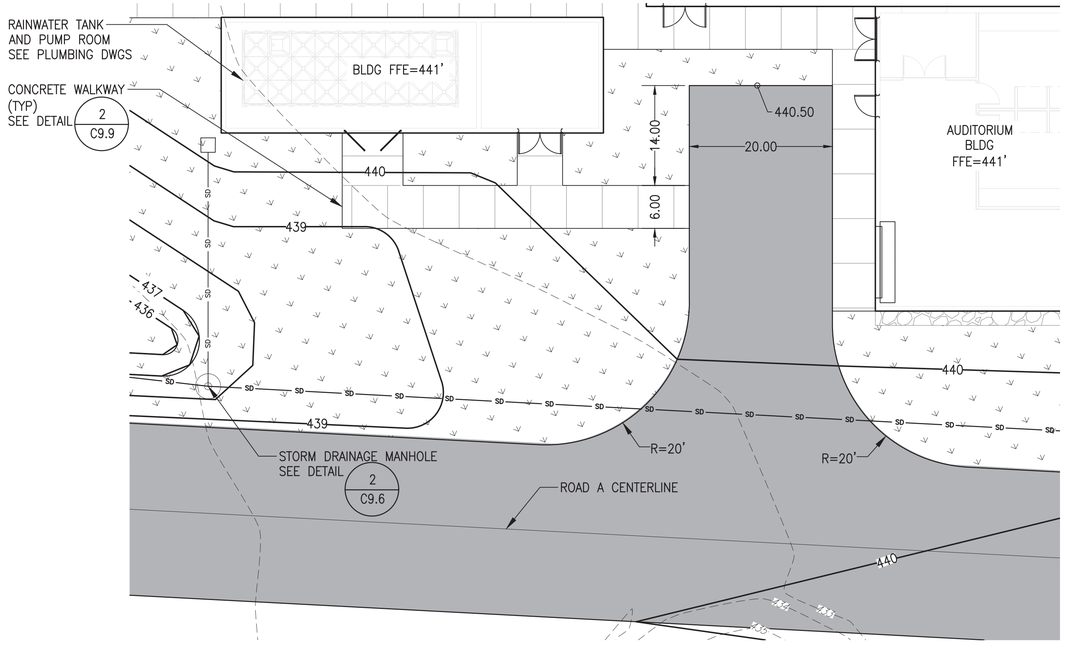
4 ENLARGED PLAN - 4
SCALE: 1"=10-0"



2 ENLARGED PLAN - 2
SCALE: 1"=10-0"



3 ENLARGED PLAN - 3
SCALE: 1"=10-0"



1 ENLARGED PLAN - 1
SCALE: 1"=10-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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P.O. Box 8900 Tamuning, Guam 96931

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

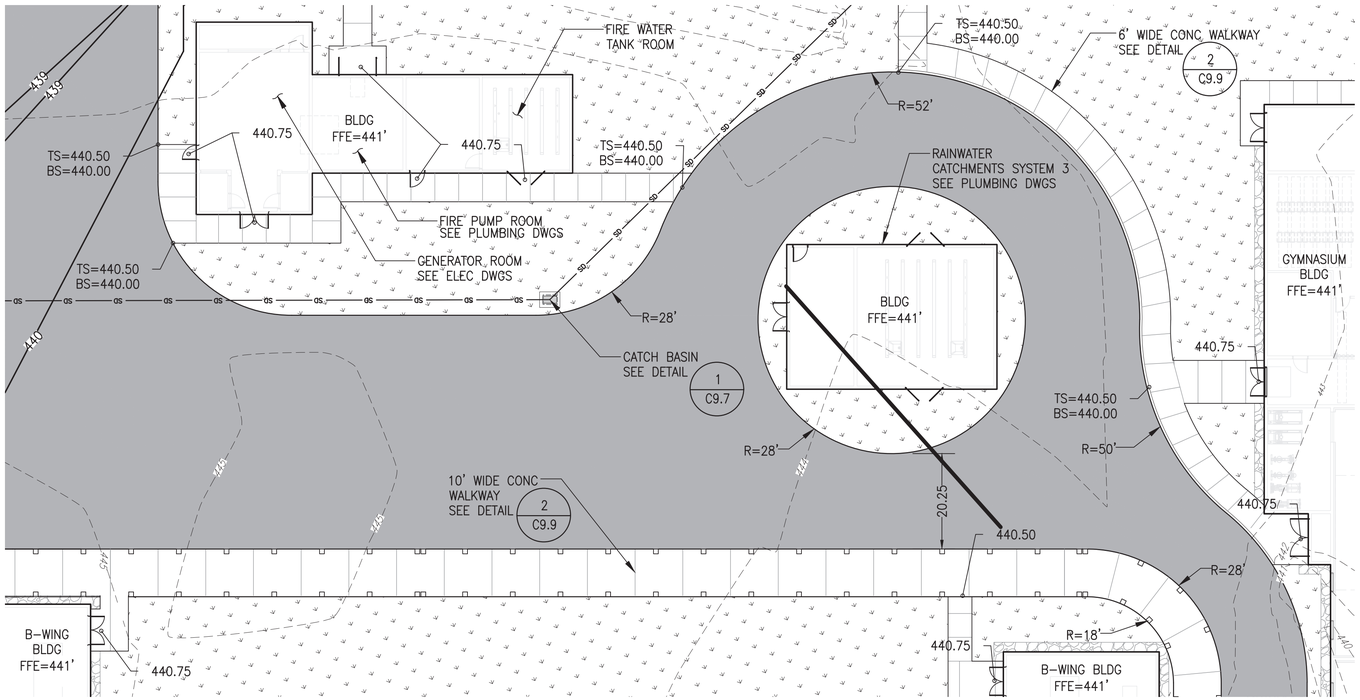
Title:
ENLARGED PLAN VIEWS - 1

PROGRAMMING DOCUMENT

Designed:	ELP/JCS
Drawn:	CDC/ADC/MMD
Checked:	EMS
Supv:	EMS
Scale:	AS SHOWN
Date:	3/31/25
Project No.	File

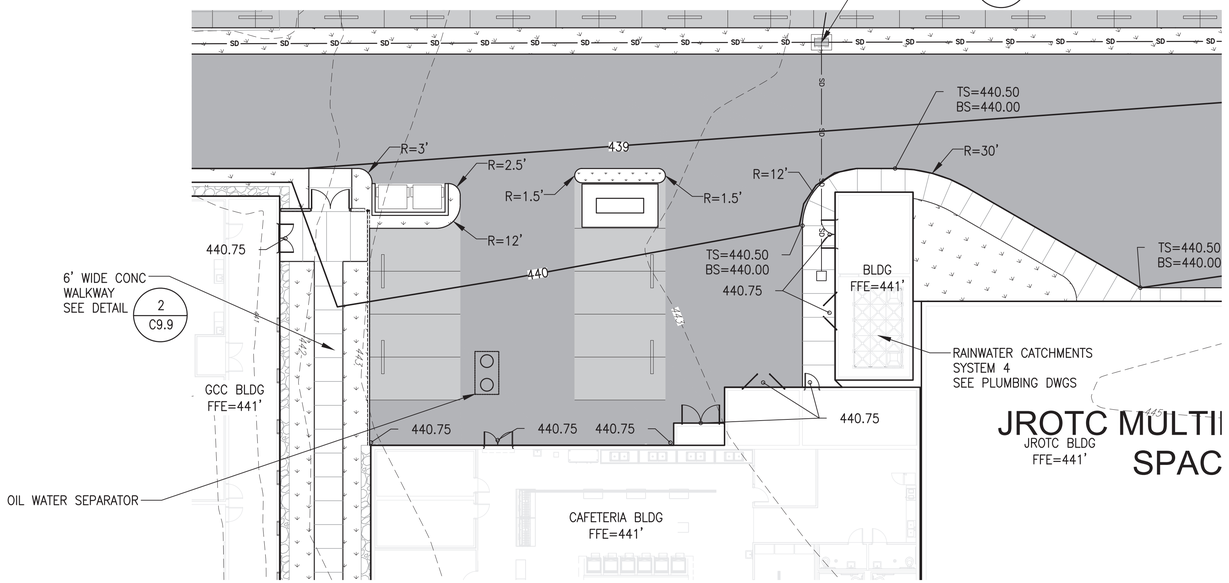
Drawing
C9.17

Sheet No: _____ of _____



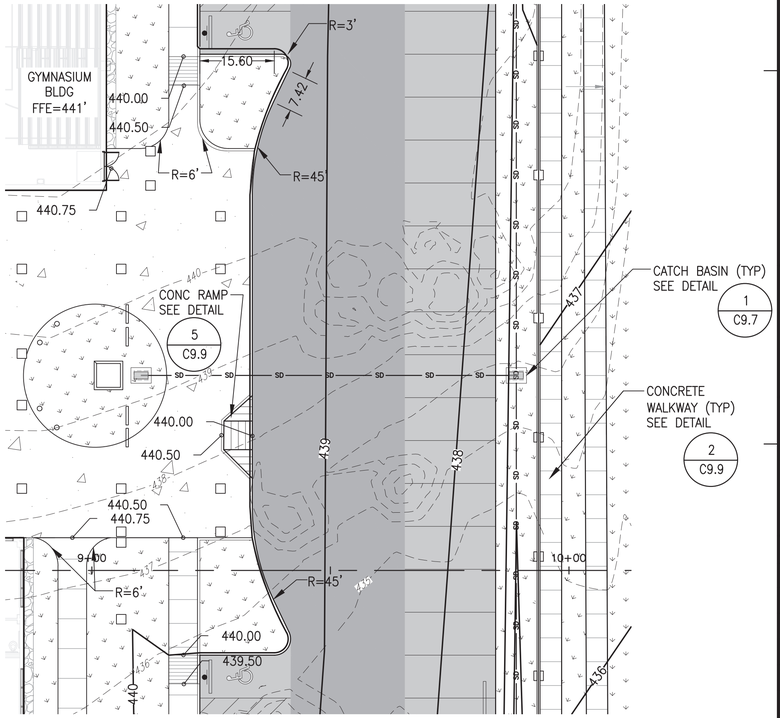
3 ENLARGED PLAN - 7

SCALE: 1"=15-0"



2 ENLARGED PLAN - 6

SCALE: 1"=15-0"



1 ENLARGED PLAN - 5

SCALE: 1"=15-0"

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P.O. Box 8900 Tamuning, Guam 96931

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN VIEWS - 2
PROGRAMMING DOCUMENT

Designed:	ELP/JCS
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Drawing
C9.18

Sheet No. _____ of _____

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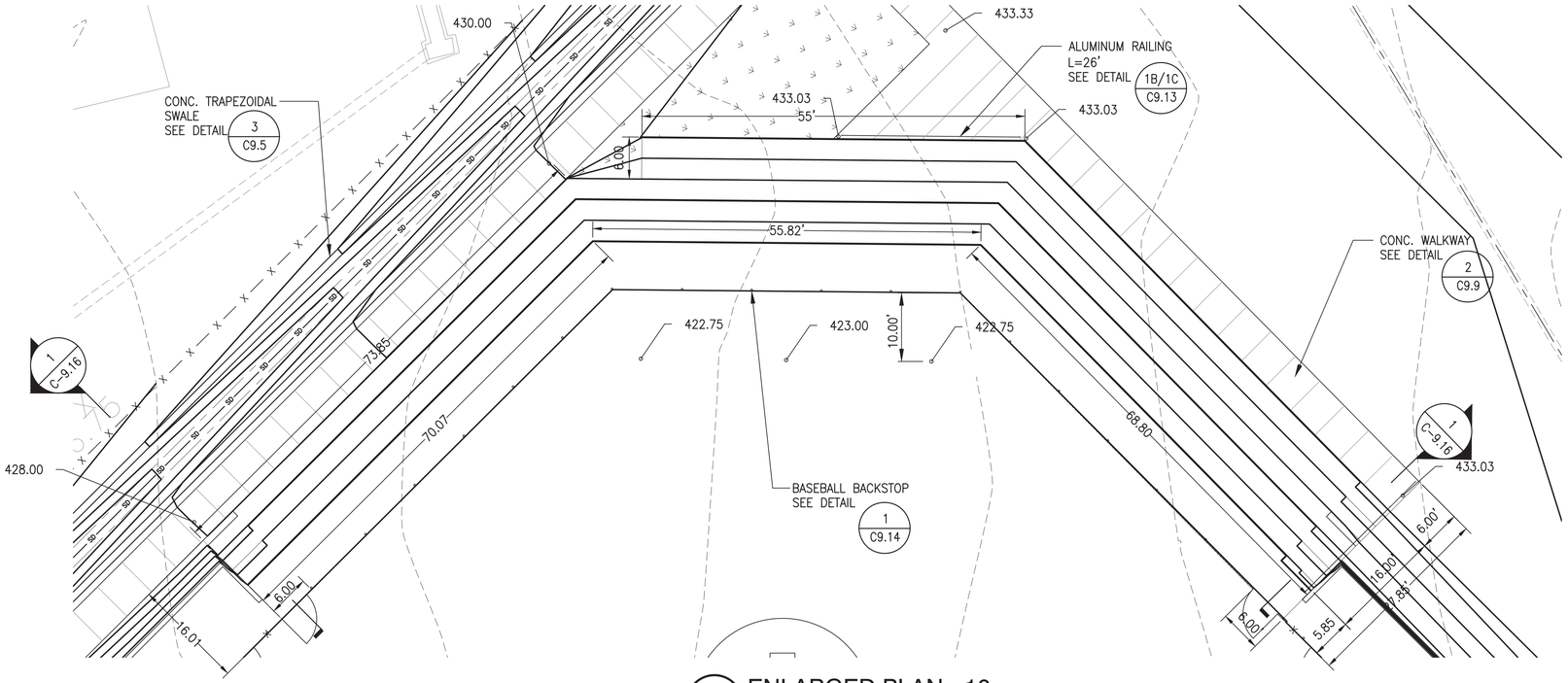

3 ENLARGED PLAN - 10

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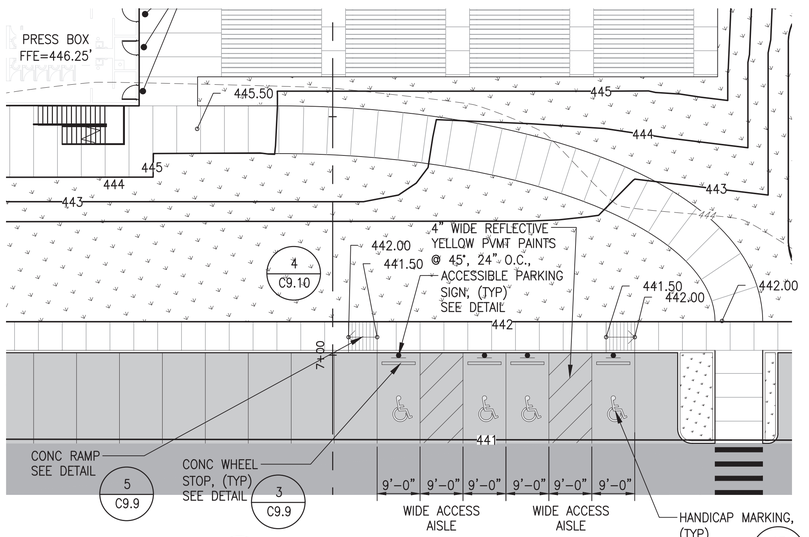

2 ENLARGED PLAN - 8

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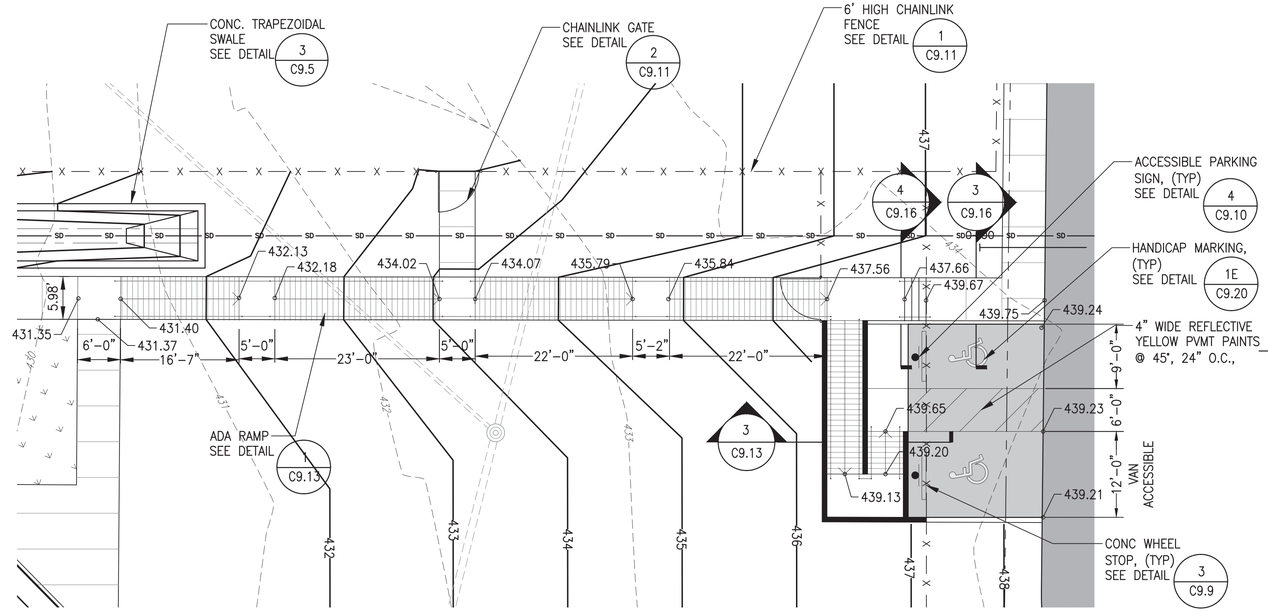

1 ENLARGED PLAN - 9

SCALE: 1"=10-0"

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Project:
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Title:
ENLARGED PLAN VIEWS - 3

PROGRAMMING DOCUMENT

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Supv:	EMS
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Date:	3/31/25
Project No.	File

Drawing:
C9.19

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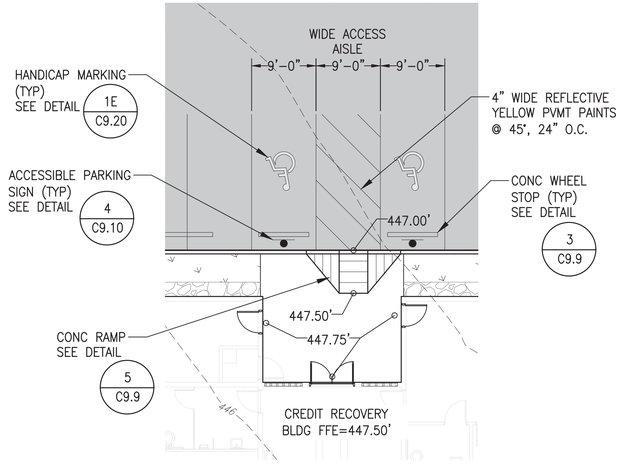
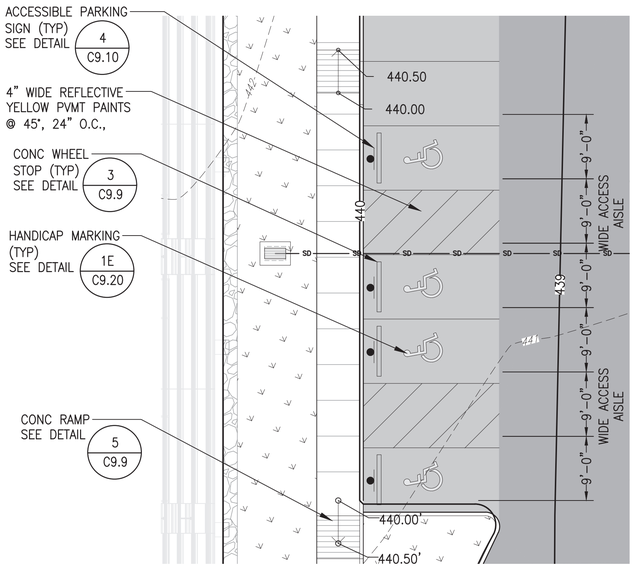
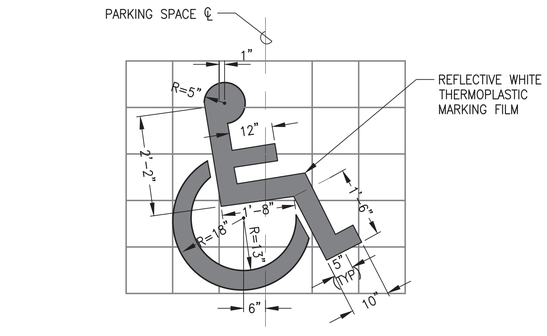


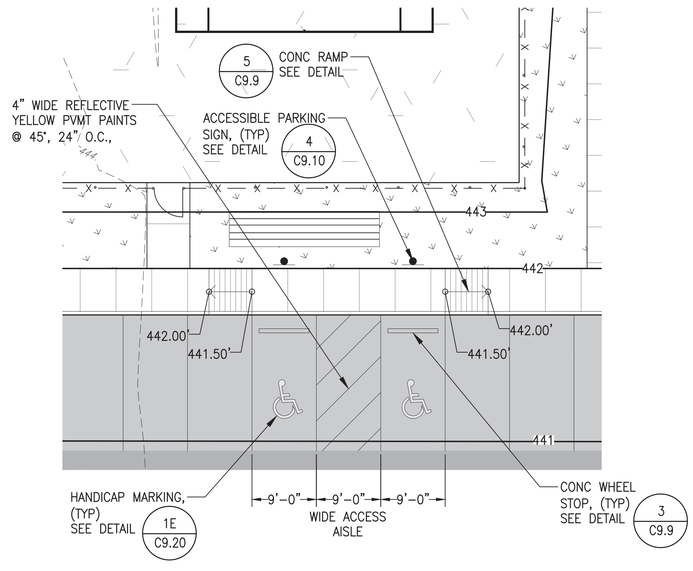
1D ACCESSIBLE PARKING - 4
SCALE: 1"=10-0"



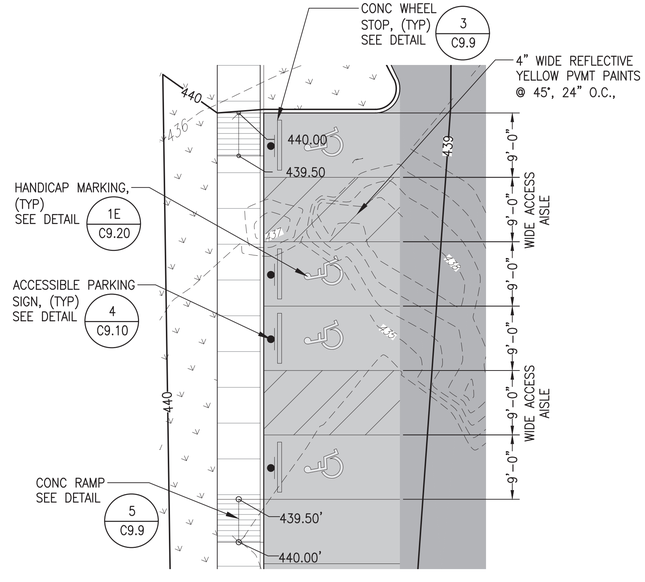
1B ACCESSIBLE PARKING - 2
SCALE: 1"=10-0"



1E HANDICAP PAVEMENT MARKING DETAIL
NOT TO SCALE



1C ACCESSIBLE PARKING - 3
SCALE: 1"=10-0"



1A ACCESSIBLE PARKING - 1
SCALE: 1"=10-0"

1 ACCESSIBLE PARKING DETAILS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN VIEWS - 4

PROGRAMMING DOCUMENT

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Date:	3/31/25
Project No.	Title

Drawing
C9.20
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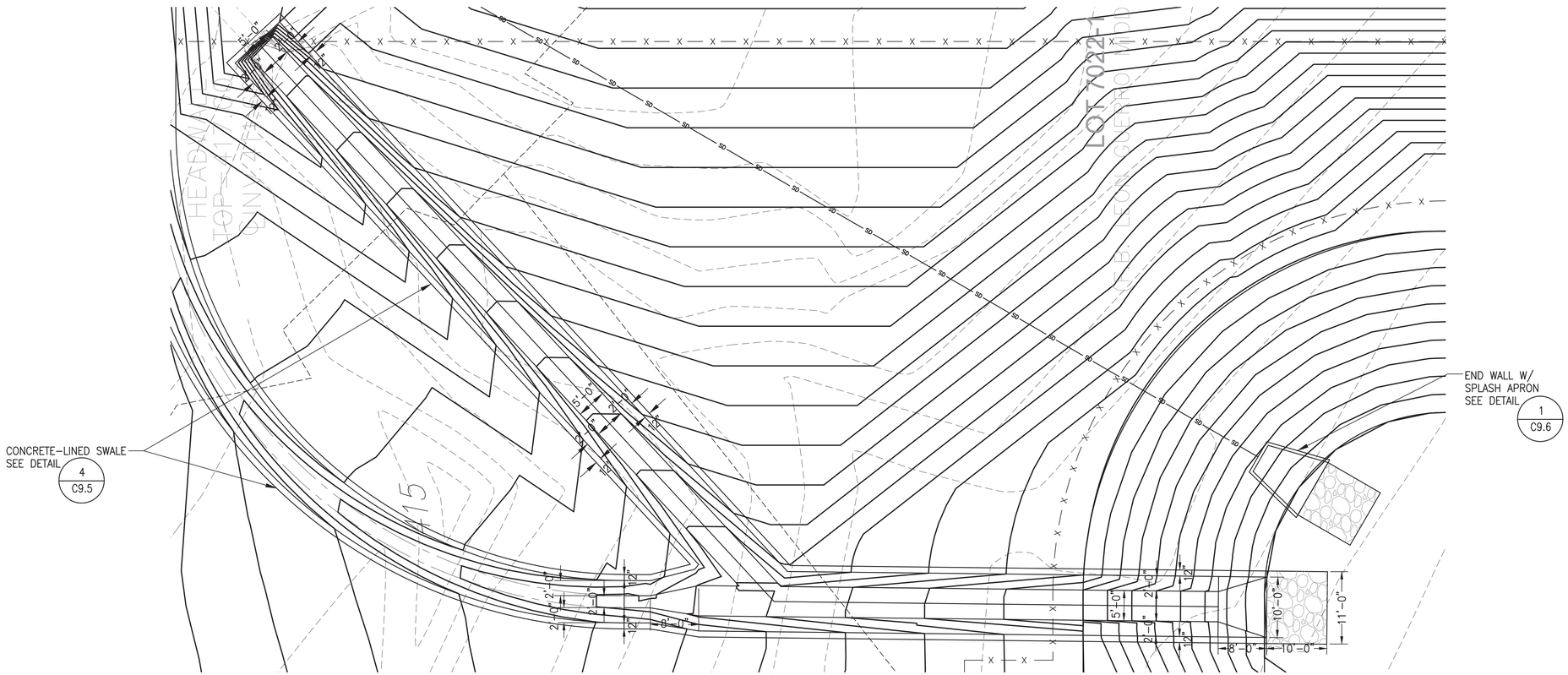
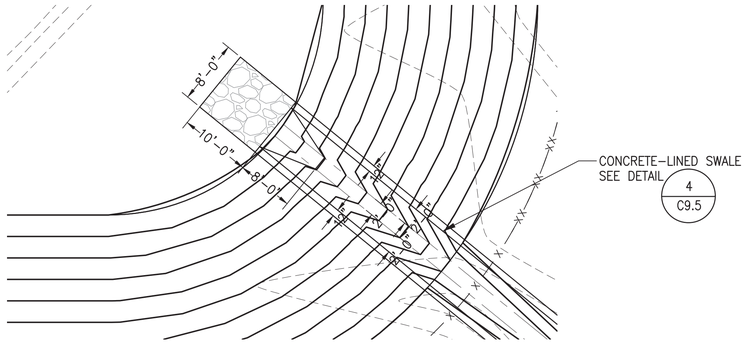


1B CONCRETE-LINED SWALE DETAIL
SCALE: 1"=10–0"



1A CONCRETE-LINED SWALE DETAIL
SCALE 1'=10–0"

1 CONCRETE-LINED SWALE DETAILS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED PLAN VIEWS - 5
PROGRAMMING DOCUMENT

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Supv:	EMS
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Project No.	File

Drawing:
C9.21

Sheet No. _____ of _____

GENERAL LANDSCAPE NOTES:

1. INSPECT THE SITE AND VERIFY CONDITIONS PRIOR TO COMMENCING WITH THE WORK. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OFFICER-IN-CHARGE. BY COMMENCING WITH THE WORK, THE CONTRACTOR ACCEPTS THE EXISTING CONDITIONS AND RESPONSIBILITY FOR MAINTAINING THOSE CONDITIONS.
2. PRIOR TO COMMENCEMENT OF CONSTRUCTION THE CONTRACTOR TOGETHER WITH THE OFFICER-IN-CHARGE MUST IDENTIFY THE LOCATION OF EXISTING UTILITIES, SITE FURNISHINGS, PAVING, AND OTHER EXISTING FEATURES TO REMAIN. PHOTO DOCUMENT CURRENT CONDITIONS AND PROTECT FROM ANY DAMAGE, DIRT, DUST, AND DEBRIS CAUSED BY CONSTRUCTION.
3. NOTIFY ALL NECESSARY UTILITY COMPANIES 48 HOURS MINIMUM PRIOR TO DIGGING FOR VERIFICATION OF ALL UNDERGROUND UTILITIES, AND OTHER OBSTRUCTIONS AND COORDINATE WITH THE OFFICER-IN-CHARGE PRIOR TO INITIATING OPERATIONS.
4. COORDINATE ALL WORK WITH RELATED CONTRACTORS AND WITH THE GENERAL CONSTRUCTION OF THE PROJECT IN ORDER NOT TO IMPEDE THE PROGRESS OF THE WORK OF OTHERS OR THE CONTRACTOR'S OWN WORK.
3. FIELD LAYOUT AND MARK THE LOCATION, ALIGNMENT AND FINE GRADING ELEVATION PROFILE OF THE PROPOSED IMPROVEMENTS AND OBTAIN APPROVAL OF THE LAYOUT AND FINISH ELEVATIONS PRIOR TO START OF THE WORK. THE OFFICER-IN-CHARGE RESERVES THE RIGHT TO REVISE THE LAYOUT AND FINISH ELEVATIONS OF THE PROPOSED IMPROVEMENTS PRIOR TO START OF THE WORK. THE OWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE TO MAKE THE ADJUSTMENTS AT NO ADDITIONAL COST.
4. FIELD ADJUST LOCATIONS OF PLANT MATERIAL AS NECESSARY TO AVOID DAMAGE TO EXISTING UNDERGROUND UTILITIES AND / OR EXISTING ABOVE GROUND ELEMENTS. ALL CHANGES REQUIRED SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE AND SHALL BE COORDINATED WITH THE OFFICER-IN-CHARGE.
5. THE EXISTENCE AND LOCATION OF EXISTING STRUCTURES, UTILITIES AND APPURTENANCES SHOWN OR NOTED ON THESE PLANS ARE FROM THE LATEST AVAILABLE DRAWINGS AND FIELD OBSERVATIONS AND ARE NOT GUARANTEED AS TO THE LOCATION NOR TO THE EXISTENCE OF OTHER OBSTACLES WHICH MAY BE ENCOUNTERED. DISCREPANCIES SHALL BE REPORTED TO THE OFFICER-IN-CHARGE. REASONABLE MODIFICATIONS TO ACCOMMODATE SITE CONDITIONS SHALL NOT CONSTITUTE A RIGHT TO ADDITIONAL FUNDS.
6. EXISTING STRUCTURES, UTILITIES AND APPURTENANCES ADJACENT TO CONSTRUCTION LIMITS SHALL BE PROTECTED. EXISTING STRUCTURES, UTILITIES AND APPURTENANCES DAMAGED BY WORK UNDER THIS CONTRACT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OFFICER-IN-CHARGE.
7. DISCREPANCIES SHALL BE REPORTED TO THE OFFICER-IN-CHARGE REASONABLE MODIFICATIONS TO ACCOMMODATE SITE CONDITIONS SHALL NOT CONSTITUTE A RIGHT TO ADDITIONAL PROJECT COST.
8. THE CONTRACTOR SHALL NOT DEVIATE FROM THE DRAWINGS AND SPECIFICATIONS. IN THE EVENT OF ERRORS OR DISCREPANCIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OFFICER-IN-CHARGE.
9. PROVIDE SAFEGUARDS AND EXERCISE CAUTION AGAINST INJURY OR DAMAGE OF EXISTING MATERIALS AND FINISHES, AND NEW SITE IMPROVEMENTS. VEHICLES SHALL NOT PASS OVER WALKWAYS AND CURBS, UNLESS PROTECTION HAS BEEN PROVIDED PER THE SPECIFICATIONS.
10. DO NOT STORE MATERIALS OR EQUIPMENT, OR OPERATE OR PARK EQUIPMENT NEAR OR UNDER THE BRANCHES OF EXISTING PLANTS AND TREES THAT ARE TO REMAIN, EXCEPT AS REQUIRED FOR CONSTRUCTION IN THOSE AREAS. REFER TO TREE PROTECTION NOTES AND DETAILS.
11. FIELD LAYOUT THE LOCATION, ALIGNMENT AND ELEVATION PROFILE OF THE PROPOSED IMPROVEMENTS AND OBTAIN APPROVAL OF THE LAYOUT AND FINISH ELEVATIONS PRIOR TO START OF EXCAVATION. THE OFFICER-IN-CHARGE. RESERVES THE RIGHT TO REVISE THE LAYOUT AND FINISH ELEVATIONS OF THE PROPOSED IMPROVEMENTS PRIOR TO START OF EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE THE ADJUSTMENTS AT NO ADDITIONAL PROJECT COST.

HARDSCAPE SCHEDULE

LEGEND SYMBOL	LABEL CODE	APPROXIMATE QUANTITY	MATERIAL	COLOR / FINISH	SIZE / DIMENSIONS	DESCRIPTION	SUBMITTAL REQUIRED	MOCK UP REQUIRED	SHOP DRAWINGS REQUIRED
	H1	18,000 SF	REINFORCED FORMED PEDESTRIAN RATED CONCRETE	NATURAL MEDIUM GRAY COLOR LIGHT BROOM FINISH, BRUSH STROKE PERPENDICULAR TO PATH OF TRAVEL	PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER.	N	Y	N
	H2	23,000 SF	INTEGRAL COLOR REINFORCED FORMED CONCRETE WITH MEDIUM COLOR CONTRAST AGGREGATE	LIGHT BROOM FINISH, DAVIS COLOR 677 "MESQUITE"	PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER.	CONTRACTOR TO PROVIDE SAMPLE	Y	Y
	H3	15,000 SF	INTEGRAL COLOR REINFORCED FORMED CONCRETE (SANDBLASTED PATTERN OVER "H2" CONCRETE POUR)	TAPED AND SANDBLASTED TO EXPOSE MEDIUM CONTRAST AGGREGATE	PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER.	CONTRACTOR TO PROVIDE SAMPLE	Y	Y
	H4	355 SF	CAST IN PLACE CONCRETE STEPS WITH SLIP RESISTANT WETTED SURFACE	DAVIS COLOR 860 "COBBLESTONE", BROOM FINISH PERPENDICULAR TO PATH OF TRAVEL.	PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER.	CONTRACTOR TO PROVIDE SAMPLE FOR APPROVAL	Y	Y
	H5	220 SF	SLOPED WALKWAY TO ACCESS ELEVATED CENTRAL STAGE, SLIP RESISTANT WETTED SURFACE	DAVIS COLOR 860 "COBBLESTONE", HEAVY BROOM FINISH PERPENDICULAR TO PATH OF TRAVEL	PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER. PROVIDE HAND RAILINGS PER CODE REQUIREMENTS. FINISH TO MATCH ARCHITECTURE.	CONTRACTOR TO PROVIDE SAMPLE FOR APPROVAL	Y	Y
	H6	745 LF	INTEGRAL COLOR, REINFORCED CAST IN PLACE CONCRETE PLANTER RETAINING SEAT WALL	DAVIS COLOR 860 "COBBLESTONE" . SIDES: SMOOTH BOARD FORM FINISH, TOP: POLISHED	18" H X 24" D, LENGTH AND RADIUS PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER.	CONTRACTOR TO PROVIDE SAMPLE FOR APPROVAL	Y	Y
	H6A	475 LF	INTEGRAL COLOR, REINFORCED FREESTANDING CAST IN PLACE CONCRETE SEAT WALL	DAVIS COLOR 860 "COBBLESTONE" . SIDES: SMOOTH BOARD FORM FINISH, TOP: POLISHED	18" H X 24" D, LENGTH AND RADIUS PER PLANS	REINFORCED PEDESTRIAN CONCRETE DETAILS, BASE PREPARATION, AND TECHNICAL SPECIFICATIONS PER CIVIL AND OR STRUCTURAL ENGINEER.	Y	Y	Y
	H7	200 LF	CAST IN PLACE REINFORCED CONCRETE PLANTING EDGER	BOARD FORM FINISH	PER PLANS	REFER TO DETAIL ON SHEET L1.5	N	N	N
	F1	20 EA (4T) 10 EA (2T)	MOVABLE SEATING (FOUR TOP & TWO TOP)	BLUE BELL	(2) TOP = 24" ROUND BISTRO TABLE (4) TOP = 30" ROUND BISTRO TABLE	"BRAVO BISTRO" MANUFACTURED BY LANDSCAPE FORMS. CHAIRS (NO ARMS) PER PLAN, ONE TABLE PER SYMBOL. PROVIDE CUT-SHEET SUBMITTAL AND COLOR SAMPLE FOR FINAL APPROVAL BY THE OFFICER-IN-CHARGE.	CONTRACTOR TO PROVIDE CUT SHEET FOR APPROVAL	N	N
	E1	10 EA	PEDESTRIAN LIGHT POLE	BRONZE	14' MAX HT.	FOUNDATION PER STRUCTURAL ENGINEER, INCLUDE HAND HOLE AT EACH POLE. VALMONT POLE, TAPERED. BASIS OF DESIGN TO BE POST TOP OURO20 BY HUBBEL LIGHTING. REFER TO ELECTRICAL DRAWINGS FOR FIXTURE SCHEDULE, PLANS, CIRCUITRY	CONTRACTOR TO PROVIDE CUT SHEET FOR APPROVAL	N	Y
	E2	35 EA	120V GFCI CONVENIENCE OUTLET WITH LOCKABLE METAL WEATHER COVER. CAST BOX INTO FACE OF CONCRETE SEAT WALL	BRONZE	REFERENCE ELECTRICAL DRAWINGS	OUTDOOR WEATHER RATED FIXTURE WITH COVER AND HOUSING. SET INTO CONC. BENCH PEDESTAL. REFER TO ELECTRICAL DRAWINGS FOR FIXTURE SCHEDULE, PLANS, CIRCUITRY	CONTRACTOR TO PROVIDE CUT SHEET FOR APPROVAL	N	Y
	E3	2 EA	A/V EQUIPMENT EVENT POWER AS REQUIRED IN LOCKING/SECURED CABINET	-	REFERENCE ELECTRICAL DRAWINGS	REFER TO ELECTRICAL DRAWINGS FOR FIXTURE SCHEDULE, PLANS, CIRCUITRY	CONTRACTOR TO PROVIDE CUT SHEET FOR	N	Y

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BOWERS + KUBOTA
BOWERS + KUBOTA CONSULTING
2153 NORTH KING ST. STE 200
HONOLULU, HI 96819
WWW.BOWERSANDKUBOTA.COM

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
HARDSCAPE SCHEDULE
PROGRAMMING DOCUMENT

Designed: BCH/B+K
Drawn: CB
Checked: BT
Supv: MG
Scale: AS INDICATED
Date: 3/31/25
Project No.
File

Drawing No.
L1.0

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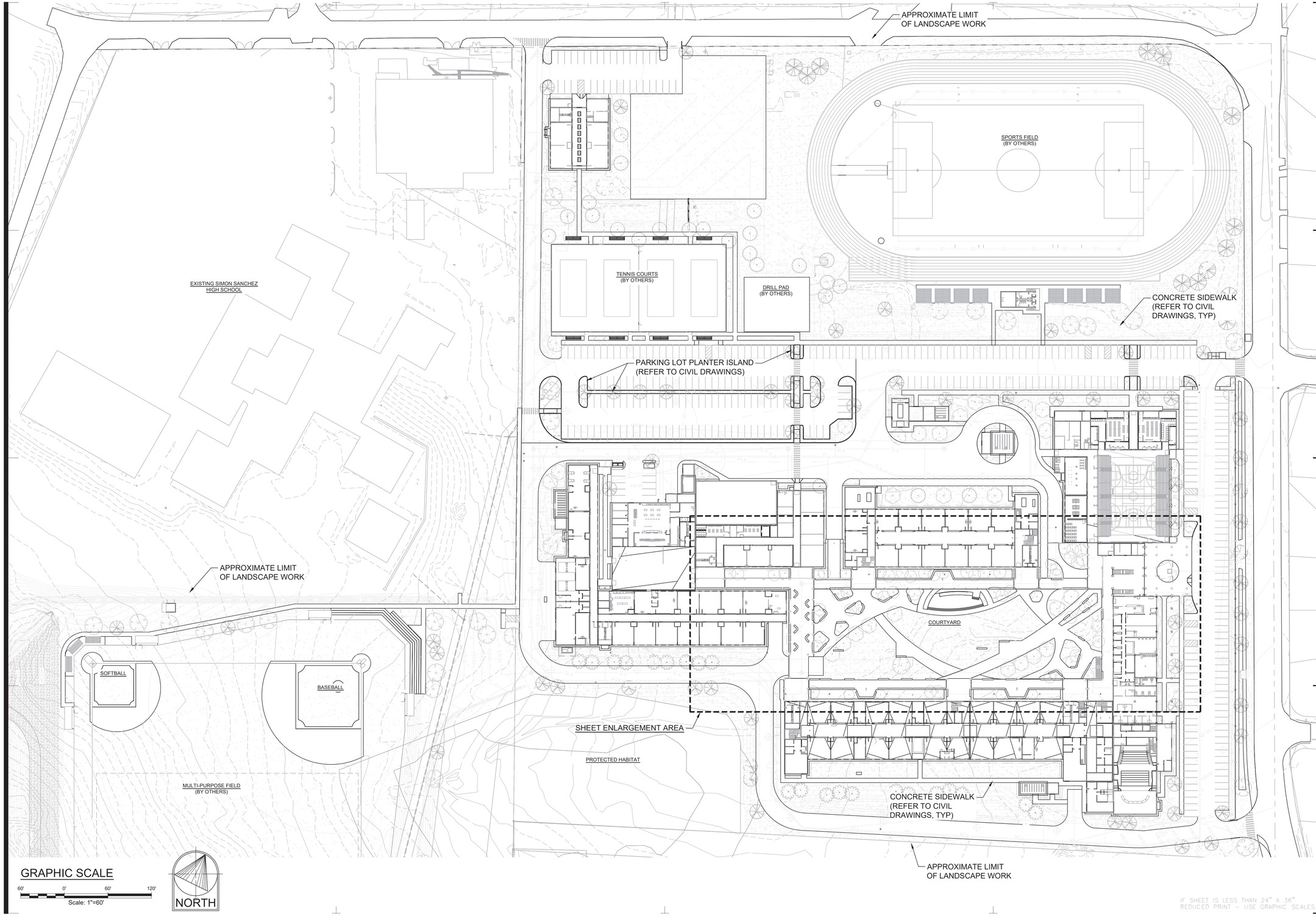

GRAPHIC SCALE

60' 0' 60' 120'

Scale: 1"=60'

NORTH

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL HARDSCAPE SITE PLAN
PROGRAMMING DOCUMENT

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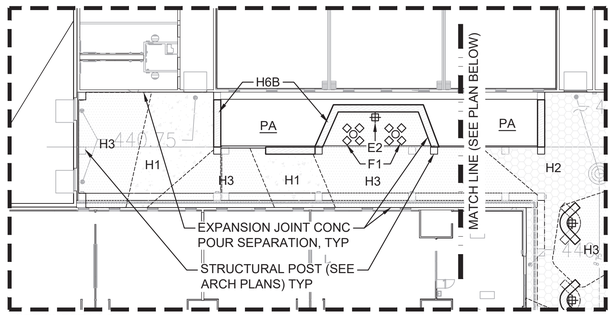
Date:	3/31/25
Project No.	Title

Drawing No.:
L1.1

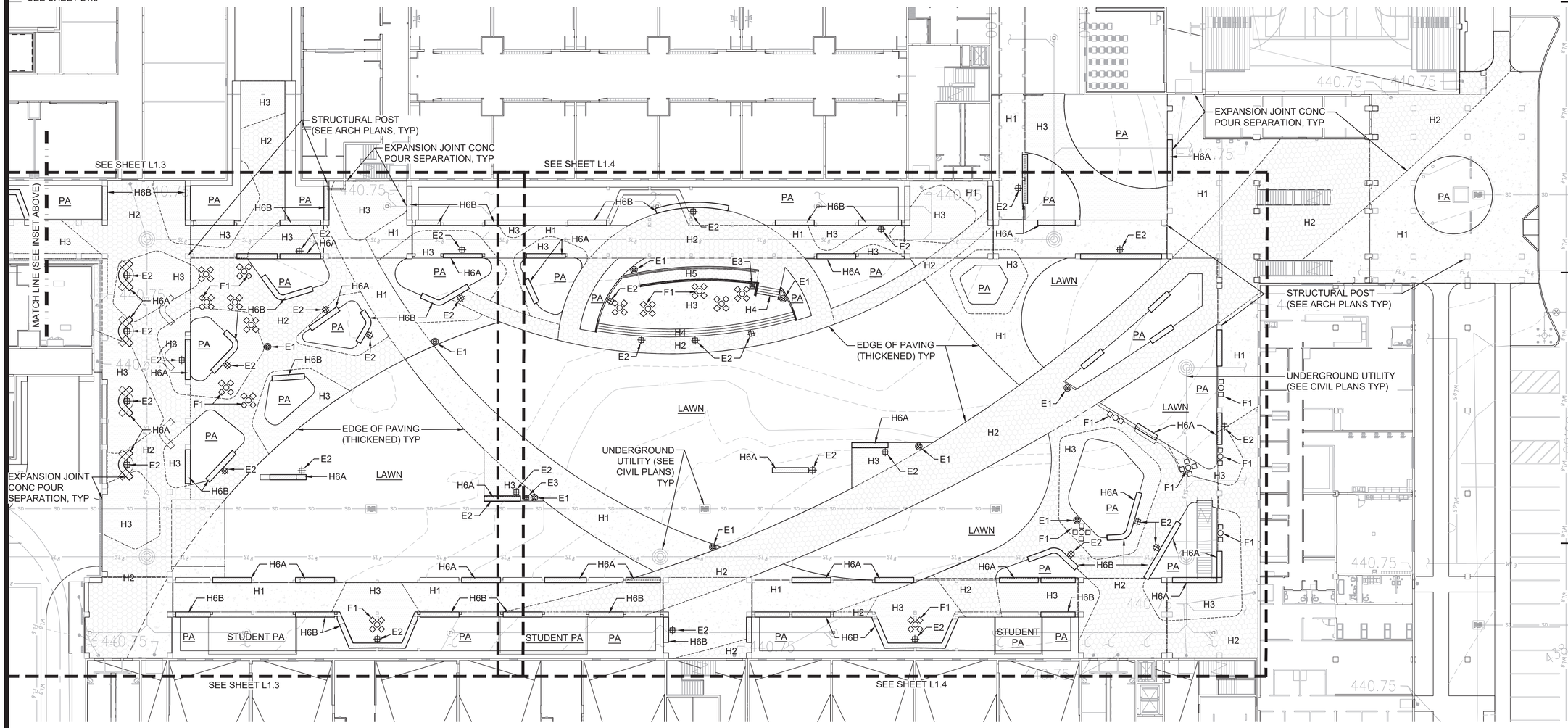
Sheet No. of



KEY LEGEND (REFER TO HARDSCAPE SCHEDULE)		
SYMBOL	CODE	DESCRIPTION
	H1	NATURAL MEDIUM GRAY CONCRETE TO MATCH ARCHITECTURAL, LIGHT BROOM FINISH
	H2	INTEGRAL COLOR FORMED CONCRETE, LIGHT BROOM FINISH
	H3	SANDBLASTED "H2" CONCRETE POUR SURFACE, EXPOSED AGGREGATE FINISH
	H4	CAST IN PLACE CONC. STEPS WITH SLIP RESISTANT WETTED MEDIUM BROOM FINISH
	H5	SLOPED WALKWAY AT CENTRAL STAGE WITH SLIP RESISTANT WETTED BROOM FINISH
	H6A	CAST IN PLACE CONC. PLANTER RETAINING SEAT WALL
	H6B	FREESTANDING CAST IN PLACE CONC. SEAT WALL

KEY LEGEND (REFER TO HARDSCAPE SCHEDULE)		
SYMBOL	CODE	DESCRIPTION
	F1	MOVABLE SEATING (FOUR TOP & TWO TOP) REFER SHEET L1.7
	E1	PEDESTRIAN LIGHT POLE (REFER TO ELECTRICAL PLANS)
	E2	GFCI OUTDOOR RATED CONVENIENCE OUTLET (REFER TO ELECTRICAL PLANS)
	E3	EVENT POWER (REFER TO ELECTRICAL PLANS)

NOTE:
SEE CIVIL PLANS FOR GRADING, DRAINAGE, PAVING TIE DOWNS, PAVING AND WALL SUB-GRADE PREPARATION, FOOTING AND STRUCTURAL REINFORCEMENT DETAILS, AND OTHER COORDINATION INFORMATION.



GRAPHIC SCALE
60' 0' 60' 120'
Scale: 1"=60'

NORTH

1 COURTYARD HARDSCAPE PLAN
SCALE: 1"=20'-0"

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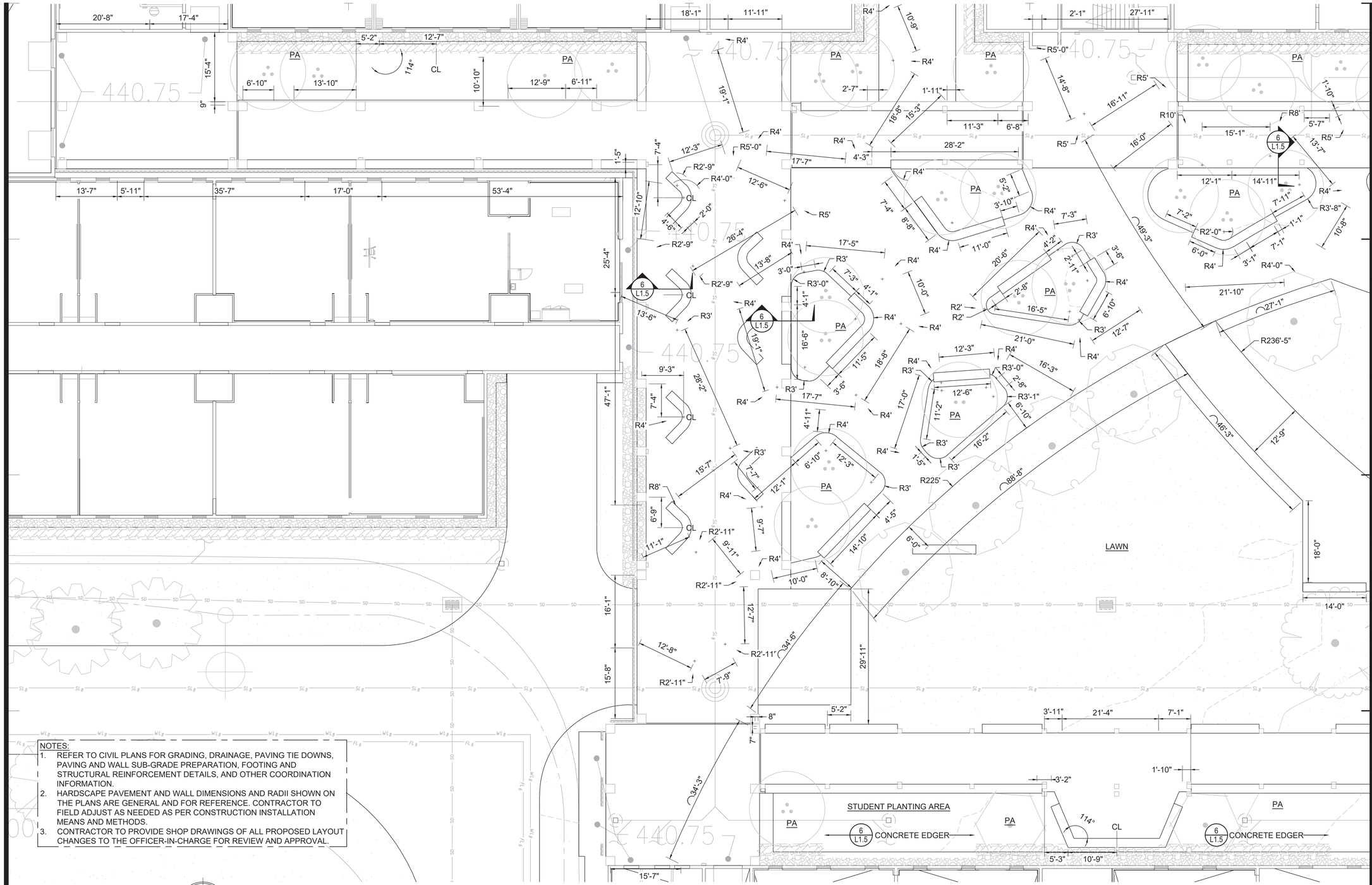
Drawing No.
L1.2
Sheet No. of



1 COURTYARD HARDSCAPE LAYOUT ENLARGEMENT PLAN - 1
SCALE: 1"=10'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: HARDSCAPE ENLARGEMENT PLAN - 1
PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
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Supv:	MG
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Project No.:	
Title:	

Drawing No.: L1.3
Sheet No. ____ of ____

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NOTES:
1. REFER TO CIVIL PLANS FOR GRADING, DRAINAGE, PAVING TIE DOWNS, PAVING AND WALL SUB-GRADE PREPARATION, FOOTING AND STRUCTURAL REINFORCEMENT DETAILS, AND OTHER COORDINATION INFORMATION.
2. HARDSCAPE PAVEMENT AND WALL DIMENSIONS AND RADII SHOWN ON THE PLANS ARE GENERAL AND FOR REFERENCE. CONTRACTOR TO FIELD ADJUST AS NEEDED AS PER CONSTRUCTION INSTALLATION MEANS AND METHODS.
3. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF ALL PROPOSED LAYOUT CHANGES TO THE OFFICER-IN-CHARGE FOR REVIEW AND APPROVAL.

GRAPHIC SCALE
10' 0' 10' 20'
Scale: 1"=10'

NORTH

1 COURTYARD HARDSCAPE LAYOUT ENLARGEMENT PLAN - 2
SCALE: 1"=10'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: COURTYARD HARDSCAPE ENLARGEMENT PLAN - 2
PROGRAMMING DOCUMENT

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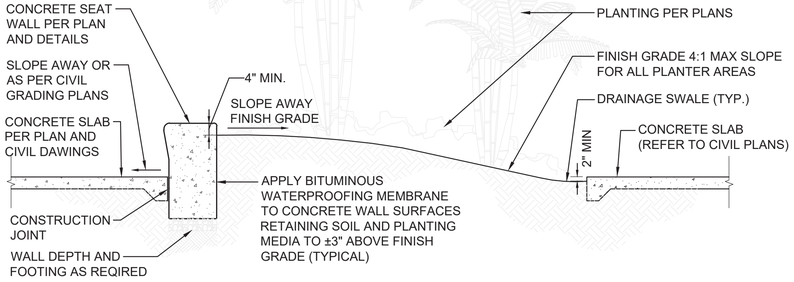
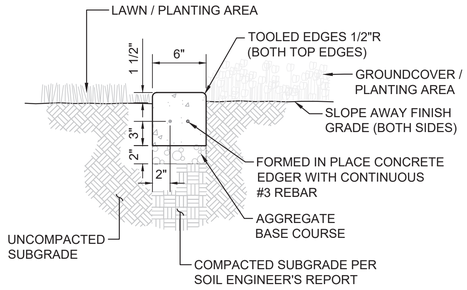
Scale:	AS INDICATED
Date:	3/31/25
Project No.	Title

Drawing No. L1.4
Sheet No. of



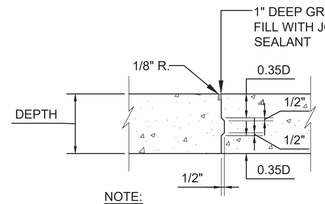
1 PLANTER SECTION
NOT TO SCALE



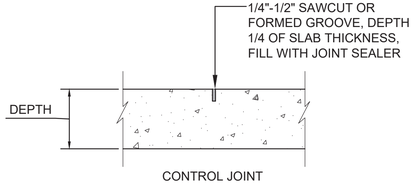
2 CONCRETE HEADER DETAIL
NOT TO SCALE

GENERAL HARDSCAPE NOTES:

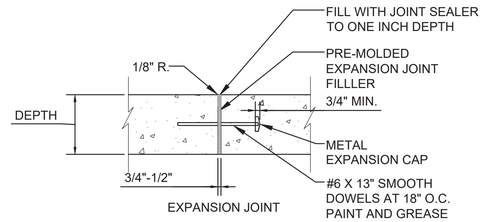
1. ALL CONCRETE SITE WORK TO BE REINFORCED AS NEEDED. COORDINATE AND REFER TO STRUCTURAL DRAWINGS FOR STAGE AND SEAT WALL DETAILS.
2. COORDINATE AND REFER TO CIVIL AND ELECTRICAL DRAWINGS FOR UNDERGROUND EQUIPMENT, PIPING, CONDUIT LOCATIONS AND CONNECTIONS.
3. COORDINATE AND REFER TO ELECTRICAL DRAWINGS FOR GFCI ELECTRICAL OUTLETS, PEDESTRIAN LIGHT POLES, AND A/V EQUIPMENT.
4. COORDINATE AND REFER TO CIVIL DRAWINGS FOR HARDSCAPE AND GRADING DETAILS.
5. SLOPE AWAY PLANTING BERMS ADJACENT OF CONCRETE SLABS, SIDEWALKS, WALKWAYS TO MINIMIZE WATER COLLECTION ALONG HARDSCAPE.



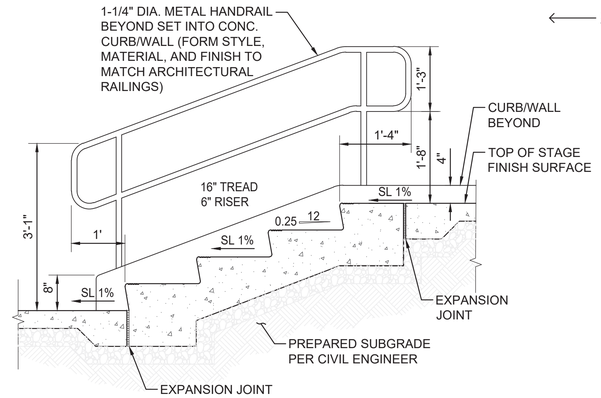
NOTE:
USE KEY JOINT FOR UNPLANNED CONSTRUCTION JOINTS



CONTROL JOINT



EXPANSION JOINT



TYPICAL HARDSCAPE AND STAIR NOTES:

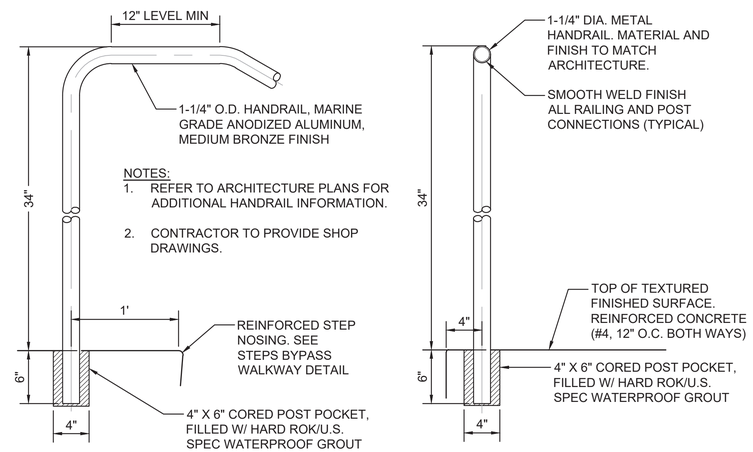
1. ALL CONCRETE SITE WORK TO BE REINFORCED AS REQUIRED AND AS PER CIVIL ENGINEER.
2. GUARD RAILS AND HAND RAILINGS MUST BE INSTALLED PER APPLICABLE CODES.
3. PROVIDE RADIUS NOSING AND RISER TRANSITIONS WITH COMPLIANT NON-SLIP TACTILE STEP EDGE STRIPS.
4. COORDINATE SET IN PLACE RAILING POSTS AND FOOTING INSTALLED AS REQUIRED.
5. PROVIDE EXPANSION AND CONTROL JOINTS AS PER PLAN AND AS PER PROPER AND REQUIRED SPACING AND LOCATIONS TO MINIMIZE CONCRETE CRACKING.
3. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR OFFICER-IN-CHARGE REVIEW AND APPROVAL.

3a STEPS AND HAND RAIL AT STAGE FRONT SECTION / ELEVATION
NOT TO SCALE

3

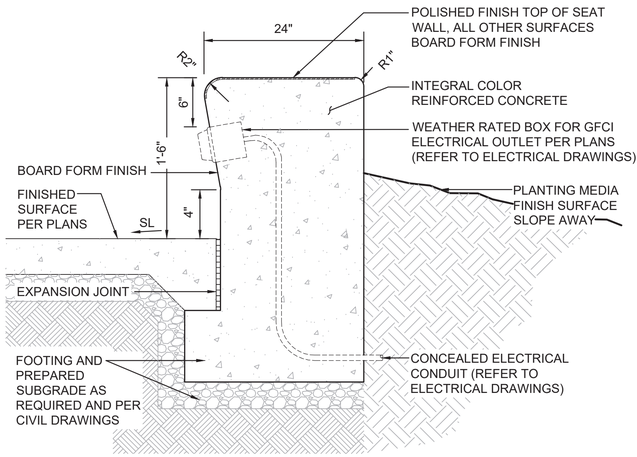


3b STEPS AND HAND RAIL AT STAGE REAR SECTION / ELEVATION
NOT TO SCALE



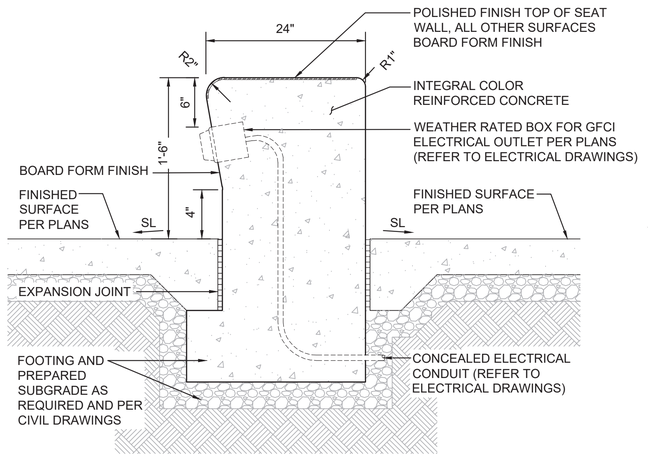
NOTES:
1. REFER TO ARCHITECTURE PLANS FOR ADDITIONAL HANDRAIL INFORMATION.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS.

4 HANDRAIL SECTION AND CONNECTION DETAIL
NOT TO SCALE



TYPICAL SECTION

5 CONCRETE SEAT WALL AT PLANTER
NOT TO SCALE



TYPICAL SECTION

6 FREESTANDING CONCRETE SEAT WALL
NOT TO SCALE

7 CONCRETE CONTROL AND EXPANSION JOINTS
NOT TO SCALE

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
HARDSCAPE DETAILS
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Drawing No.
L1.5
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

TEMPORARY IRRIGATION NOTES:

1. IRRIGATION SYSTEM IS SUBJECT TO FIELD ADJUSTMENTS DUE TO UNANTICIPATED SITE CONDITIONS. AVOID ANY CONFLICT BETWEEN UNDERGROUND UTILITIES, STRUCTURES AND PLANTINGS. THE CONTRACTOR MUST BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES.
2. UNLESS DIRECTED OTHERWISE, POTABLE WATER MUST BE READILY AVAILABLE TO THE CONTRACTOR AT NO EXPENSE TO THE CONTRACTOR.
3. CONTRACTOR MUST PROVIDE A TEMPORARY ABOVE-GRADE AUTOMATIC SYSTEM (TO BE APPROVED BY THE OFFICER IN CHARGE) FOR THE DURATION OF THE MAINTENANCE PERIOD AND NOT TO EXCEED ONE YEAR FROM ACCEPTANCE. THE TEMPORARY AUTOMATIC IRRIGATION SYSTEM MUST CONSIST OF, BUT IS NOT LIMITED TO, THE FOLLOWING:
   - A. AUTOMATIC IRRIGATION CONTROLLER INCLUDING A MINIMUM OF 3 INDEPENDENT PROGRAMS, 7 DAY PROGRAM CYCLE, AND 8 START TIMES PER PROGRAM PER DAY.
   - B. REDUCED PRESSURE BACKFLOW PREVENTER WITH STAINLESS STEEL ENCLOSURE
   - C. SHUT OFF AND ISOLATION VALVES.
   - D. PVC OR HDPE MAINLINE AND DISTRIBUTION LINES, INCLUSIVE OF JOINT RESTRAINT SYSTEMS IF NECESSARY TO PREVENT PIPE MOVEMENT DURING SYSTEM OPERATION.
   - E. SLOW CLOSING REMOTE CONTROL VALVES CONSTRUCTED OF GLASS FILLED NYLON AND INCLUDES: FABRIC-REINFORCED DIAPHRAGM, INTERNAL SCREEN SCRUBBER MECHANISM TO PREVENT DEBRIS CLOGGING, AND PRESSURE REGULATION.
   - F. GEAR DRIVEN ROTOR HEADS WITH ADJUSTABLE ARC, PRESSURE REGULATION, AND CHECK VALVES FOR LARGE RADIUS AREAS.
   - G. POP-UP SPRAY HEADS OR POP-UP STREAM ROTARY HEADS WITH PRESSURE REGULATION, CHECK VALVES, AND NOZZLES WITH MATCHED PRECIPITATION RATES FOR SMALL RADIUS AREAS.
   - H. ALL LABOR, MATERIALS AND APPURTENANCES REQUIRED TO INSTALL AND MAINTAIN THE TEMPORARY IRRIGATION SYSTEM.
4. CONTRACTOR MUST PROVIDE WATERING SCHEDULE. ALL IRRIGATION OPERATION MUST BE DURING "OFF PEAK" EVENING HOURS. OPERATION DURING OTHER TIMES MUST BE WITH THE APPROVAL OF THE OFFICER IN CHARGE.
5. PIPE SLEEVE MUST ALLOW FOR IRRIGATION PIPING AND THEIR RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVE MATERIAL.
6. EXTEND SLEEVE 18" BEYOND EDGES OF PAVING OR CONSTRUCTED HARDSCAPE
7. MARK SLEEVE LOCATIONS ON SIDES OF PAVING OR WITH IRRIGATION FLAGS IN PLANTING AREA.
8. VERIFY ALL SLEEVE LOCATIONS WITH CONTRACTING OFFICER PRIOR TO CONSTRUCTION OF PAVING.
9. CONTRACTOR MUST COORDINATE INSTALLATION OF ALL SLEEVES AND CONDUITS UNDER PAVEMENT AND THROUGH WALLS. CONTRACTOR MUST ASSURE THAT THESE ITEMS ARE LAID PRIOR TO PLACEMENT OF PAVEMENT OR WALL STRUCTURES.
10. THE LANDSCAPE CONTRACTOR MUST REMOVE THE TEMPORARY IRRIGATION SYSTEM IN ITS ENTIRETY UPON COMPLETION OF THE MAINTENANCE PERIOD AND MUST REPAIR ANY AREAS DAMAGED DURING THE REMOVAL OF THE TEMPORARY IRRIGATION SYSTEM AT NO ADDITIONAL COST TO THE OWNER.

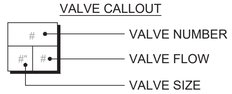
IDENTIFICATION REQUIREMENTS FOR NON-POTABLE,RECLAIMED WATER (R-1) IRRIGATION SYSTEM

1. HORIZONTAL AND VERTICAL CLEARANCES BETWEEN POTABLE WATER AND NON-POTABLE, RECLAIMED WATER LINES MUST CONFORM WITH THE "WATER RESOURCES MASTER PLAN" GUAM WATERWORKS AUTHORITY, VOL 3, CHAPTER 7 - WATER REUSE.
2. IDENTIFICATION TAPE MUST BE INSTALLED ON PRESSURE AND/OR NON-PRESSURE LATERALS. A PURPLE TAPE, SUGGESTED COLOR INDEX 77742 VIOLET #16, PANTONE 512 OR EQUAL, WITH WHITE OR BLACK LETTERING STATING "CAUTION: RECYCLED WATER - DO NOT DRINK," MUST BE FASTENED DIRECTLY TO THE TOP OF THE PIPE. THE TAPE MUST RUN CONTINUOUSLY THE ENTIRE LENGTH OF THE PIPE. THE OVERALL WIDTH OF THE TAPE MUST BE AT LEAST THREE (3) INCHES IN WIDTH. IT IS RECOMMENDED THAT THE IDENTIFICATION TAPE BE LOCATOR TYPE MARKING TAPE.
3. NEW ON-SITE PIPELINES MUST BE IDENTIFIED AS RECYCLED WATER PIPES BY USING A PURPLE COLOR CODE, SUGGESTED COLOR PANTONE 522 OR EQUAL FOR PIPE AND OTHER APPURTENANCES, SUGGESTED COLOR INDEX 77742 VIOLET #16, PANTONE 512 OR EQUAL FOR MARKING TAPES, LABELS AND SIGNS, AND MARKINGS, DIFFERENTIATING THEM FROM POTABLE WATER PIPING. THE WORDS "CAUTION: RECYCLED WATER - DO NOT DRINK," MUST BE PRINTED ON THE PIPE OR IDENTIFICATION TAPE. THIS STATEMENT MUST BE STAMPED ON OPPOSITE SIDES OF THE PIPE, REPEATED EVERY THREE FEET. ALL PIPING AND VALVES MUST ALSO BE APPROPRIATELY LABELED OR CONTINUOUSLY TAPED WITH APPROPRIATE IDENTIFICATION.
4. CONTROLLERS OF RECYCLED WATER MUST BE COLOR-CODED TO DIFFERENTIATE THE RECYCLED WATER FROM THE POTABLE WATER. CONTROLLERS MUST BE LABELED INSIDE AND OUTSIDE, WARNING THAT THE SYSTEM IS UTILIZING RECYCLED WATER. THE LABELS MUST ALSO ALERT THE SYSTEM'S OWNER/MAINTENANCE PERSONNEL OF ANY IMPORTANT CONSTRAINTS ON THE OPERATION OF THE SYSTEM.

IRRIGATION NOTES

1. IRRIGATION SYSTEMS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC AND ARE SUBJECT TO ADJUSTMENTS DUE TO UNANTICIPATED FIELD CONDITIONS. UNLESS OTHERWISE NOTED, LOCATE ALL SPRINKLER HEADS, VALVES, AND PIPES WITHIN PLANTING AREAS. AVOID ANY CONFLICT BETWEEN UNDERGROUND UTILITIES, STRUCTURES AND PLANTINGS. THE CONTRACTOR MUST BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES. BURY PRESSURE MAINLINES 24" DEEP MINIMUM FOR DECODER-BASED WIRING, AND LATERAL LINES 12" DEEP MINIMUM.
2. CONTRACTOR MUST INSTALL ALL IRRIGATION EQUIPMENT (IE. IRRIGATION LINES, CONTROL WIRES, VALVES, HEADS, ETC.) PER SPECIFICATIONS. EXISTING GATE VALVES, POINT OF CONNECTION, ETC. ARE DERIVED FROM THE BEST AVAILABLE INFORMATION AND ON-SITE INSPECTION. THE CONTRACTOR MUST VERIFY THOSE POINTS OF CONNECTION NOTED AND REPORT ANY DISCREPANCIES TO THE OFFICER IN CHARGE.
3. WITHIN 30 DAYS AFTER AWARD OF THE CONTRACT, SUBMIT FOR THE OFFICER-IN-CHARGE'S ACCEPTANCE SIX (6) COPIES OF DETAILED SCALED DRAWINGS AND WIRING DIAGRAMS FOR PERMANENT AND TEMPORARY IRRIGATION SYSTEMS. NOT PROPOSED DEVIATIONS FROM THE CONTRACT. INCLUDE SAMPLES OF MATERIALS, IF REQUIRED BY CONTRACT.
4. CONTRACTOR MUST SECURE ALL NECESSARY PERMITS AND OBSERVE ALL LOCAL CODES AND REGULATIONS. THE CONTRACTOR MUST CONFIRM ALL SITES DIMENSIONS AND CONDITIONS, AND REPORT ANY DISCREPANCIES TO THE OFFICER IN CHARGE.
5. THE IRRIGATION SYSTEM DESIGN IS BASED ON A MINIMUM STATIC WATER PRESSURE OF 65 PSI AT THE POINT OF CONNECTION. NOTIFY OFFICER IN CHARGE IF PRESSURE IS LESS THAN 65 PSI OR GREATER THAN 100 PSI.
6. CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF THE INSTALLATION OF ALL SLEEVES, CONDUITS, MAINS AND LATERALS UNDER PAVEMENT AND THROUGH WALLS AND MUST ASSURE THAT THESE ITEMS ARE LAID PRIOR TO THE PLACEMENT OF PAVEMENT/WALL. STUB-OUTS AND CONDUITS RUNNING THROUGH THE BUILDING STRUCTURE WILL BE DONE BY OTHERS. ALL IRRIGATION WIRES MUST BE BUNDLED AND INSTALLED UNDER THE IRRIGATION MAIN FOR IN-GRADE INSTALLATION. INSTALL IRRIGATION WIRES IN CONDUITS WHERE WIRES ARE NOT FOLLOWING THE IRRIGATION MAIN AND ALL ABOVE-GRADE INSTALLATIONS. VERIFY UTILITY LOCATIONS BEFORE TRENCHING. CONTRACTOR MUST BE RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND EXISTING PLANTING TO REMAIN.
7. INSTALL SPRINKLER HEADS 6" AWAY FROM WALKWAYS, DRIVEWAYS AND 24" FROM STRUCTURES. FLEX RISERS MUST BE USED ON ALL SHRUB HEADS ON RISERS INSTALLED ALONG WALKWAYS, DRIVEWAYS AND PARKING SPACES. ADJUST ALL SPRINKLER HEADS TO OBTAIN BEST COVERAGE. ADJUST FLOW CONTROL OF CONTROL VALVES TO MINIMIZE MISTING.
8. PERFORM HYDROSTATIC TEST BY APPLYING CONTINUOUS STATIC PRESSURE OF 100PSI FOR ONE (1) HOUR. NOTIFY THE OFFICER-IN-CHARGE AT LEAST THREE (3) DAYS IN ADVANCE OF TEST. REPAIR LEAKS THAT DEVELOP AND REPEAT TEST. DO NOT BACKFILL UNTIL THERE IS NO FURTHER SIGN OF LEAKAGE.
9. PERFORM OPERABILITY TEST BY OPENING REMOTE CONTROL VALVE AND TEST CIRCUITS FOR LEAKS AROUND BARBED AND THREADED PVC FITTINGS. REPAIR LEAKS AND REPEAT TESTS. NOTIFY THE OFFICER-IN-CHARGE AT LEAST THREE (3) DAYS IN ADVANCE OF TEST. DO NOT BACKFILL UNTIL THERE IS NO FURTHER SIGN OF LEAKAGE.
10. PERFORM COVERAGE TEST. BEFORE PLANTING PERIOD, RUN AUTOMATIC CONTROLLER THROUGH ALL IT'S CYCLES. CHECK WATERING FOR PROPER COVERAGE AND UNIFORMITY IN COMPANY OF THE OFFICER-IN-CHARGE. RUN SYSTEM UNTIL THERE ARE PUDDLES OR THERE IS SHEET FLOW TO DETERMINE INITIAL IRRIGATION TIME AND NUMBER OF CYCLES PER WEEK NEEDED TO WATER REQUIREMENTS OF PLANTS.
11. THE CONTRACTOR, TOGETHER WITH THE OWNER'S MAINTENANCE REPRESENTATIVE MUST PROGRAM THE IRRIGATION CONTROLLER TO ACCOMMODATE THE LANDSCAPE AND SITE REQUIREMENTS, AND MUST INSTRUCT THE REPRESENTATIVE ON THE OPERATION OF THE COMPLETE SYSTEM. ALL IRRIGATION OPERATION MUST BE DURING "OFF PEAK" HOURS. OPERATION DURING OTHER TIMES MUST BE WITH THE APPROVAL OF THE OWNER.
12. AFTER INSTALLATION OF IRRIGATION, LANDSCAPE CONTRACTOR TO PROVIDE MARK-UP INFORMATION OF ANY CHANGES MADE IN THE FIELD TO THE FINAL DESIGN PLANS. PROVIDE THREE (3) REPRODUCIBLE COPIES DOCUMENTING THESE 'AS-BUILT' CONDITIONS TO THE OFFICER-IN-CHARGE UPON COMPLETION OF IRRIGATION INSTALLATION WORK OR THIRTY (30) DAYS BEFORE FINAL INSPECTION, WHICHEVER IS SOONER.

VALVE CALLOUT



IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL	ARC	PSI	GPM	RADIUS
	RAIN BIRD R-VAN-STRIP RD-06-SAM-P45	LCS	45	0.24	5'x15'
	RAIN BIRD R-VAN-STRIP RD-06-SAM-P45	RCS	45	0.24	5'x15'
	RAIN BIRD R-VAN14 RD-06-SAM-P45	ADJ	45		14'
	RAIN BIRD R-VAN18 RD-06-SAM-P45	ADJ	45		17'
	RAIN BIRD R-VAN18 RD-06-SAM-P45	360	45	1.85	17'
	RAIN BIRD R-VAN24 RD-06-SAM-P45	ADJ	45		23'
	RAIN BIRD R-VAN24 RD-06-SAM-P45	360	45	3.48	23'
1.0	RAIN BIRD 5006-PL-PC-SAM-R-SS-LA		45	1.05	29'
2.0	RAIN BIRD 5006-PL-PC-SAM-R-SS-LA		45	2.02	32'
	RAIN BIRD XCZ-100-PRB-R WIDE FLOW DRIP CONTROL KIT WITH PURPLE CAP 1" PESBR VALVE AND 1" PRESSURE REGULATING 40PSI BASKET FILTER, INSTALL WITH IVM SOLENOID				
	PIPE TRANSITION POINT ABOVE GRADE PIPE TRANSITION POINT FROM PVC LATERAL TO DRIP TUBING WITH RISER TO ABOVE GRADE INSTALLATION.				
	RAIN BIRD XFS-CV-06-12-NP NON POTABLE ON-SURFACE LANDSCAPE DRIPLINE WITH CHECK VALVE. 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, W/ EMITTERS OFFSET FOR TRIANGULAR PATTERN. INSTALL WITH RAIN BIRD QF PREFABRICATED HEADERS AND SPECIFY XF INSERT FITTINGS, PLUMB WITH PVC FLUSH BALL VALVE AND OPERIND OPERATING INDICATOR AT OUTPUT HEADERS				
	RAIN BIRD PESBR-IVM PLASTIC REMOTE CONTROL VALVES WITH SCRUBBER AND IVM SOLENOID				
	RAIN BIRD 44-NP 1" BRASS QUICK-COUPLING VALVE, INSTALL WITH HARCO QUICK COUPLER ANCHOR				
	BUCKNER-SUPERIOR VBM BRASS MANUAL ANGLE VALVE, SAME SIZE AS MAINLINE				
	NIBCO T-113 CLASS 125 BRONZE GATE VALVE WITH WHEEL HANDLE, SAME SIZE AS MAINLINE				
M	BUCKNER-SUPERIOR 3300-RW 2" 2" NORMALLY OPEN BRASS MASTER VALVE WITH PURPLE CROSS HANDLE FOR RECLAIMED WATER USE. USE WITH 16333 DC LATCHING SOLENOID FOR RAIN BIRD IVM CONTROLLER				
A	A.R.I D-040 PN16 2" COMBINATION AIR RELIEF VALVE				
BF	ZURN 975XL 2" REDUCED PRESSURE BACKFLOW DEVICE				
C	RAIN BIRD ESPLXIVMP-LXMMSS 240 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET. GROUND SYSTEM W/ (X) LXIVMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES. INSTALL PER MANUFACTURERS RECOMMENDATIONS.				
R	RAIN BIRD RSD-BEX RAIN SENSOR				
S	RAIN BIRD SMRT-Y SOIL MOISTURE SENSOR KIT.				
FS	RAIN BIRD FS-200-P 2" FLOW SENSOR				
POC 1	POINT OF CONNECTION				
POC 2	POINT OF CONNECTION				
	IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21				
	IRRIGATION LATERAL LINE: TYPE K COPPER PIPE				
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21				
	IRRIGATION MAINLINE: SCHEDULE 40 STD. STEEL PIPE				
	PIPE SLEEVE: PVC SCHEDULE 40 TYPICAL PIPE SLEEVE FOR IRRIGATION PIPE. PIPE SLEEVE SIZE SHALL ALLOW FOR IRRIGATION PIPING AND THEIR RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVING MATERIAL. EXTEND SLEEVES 18 INCHES BEYOND EDGES OF PAVING OF CONSTRUCTION.				

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: IRRIGATION SCHEDULE AND NOTES
PROGRAMMING DOCUMENT

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Date:	3/31/25
Project No.	File

Drawing No.: L2.0

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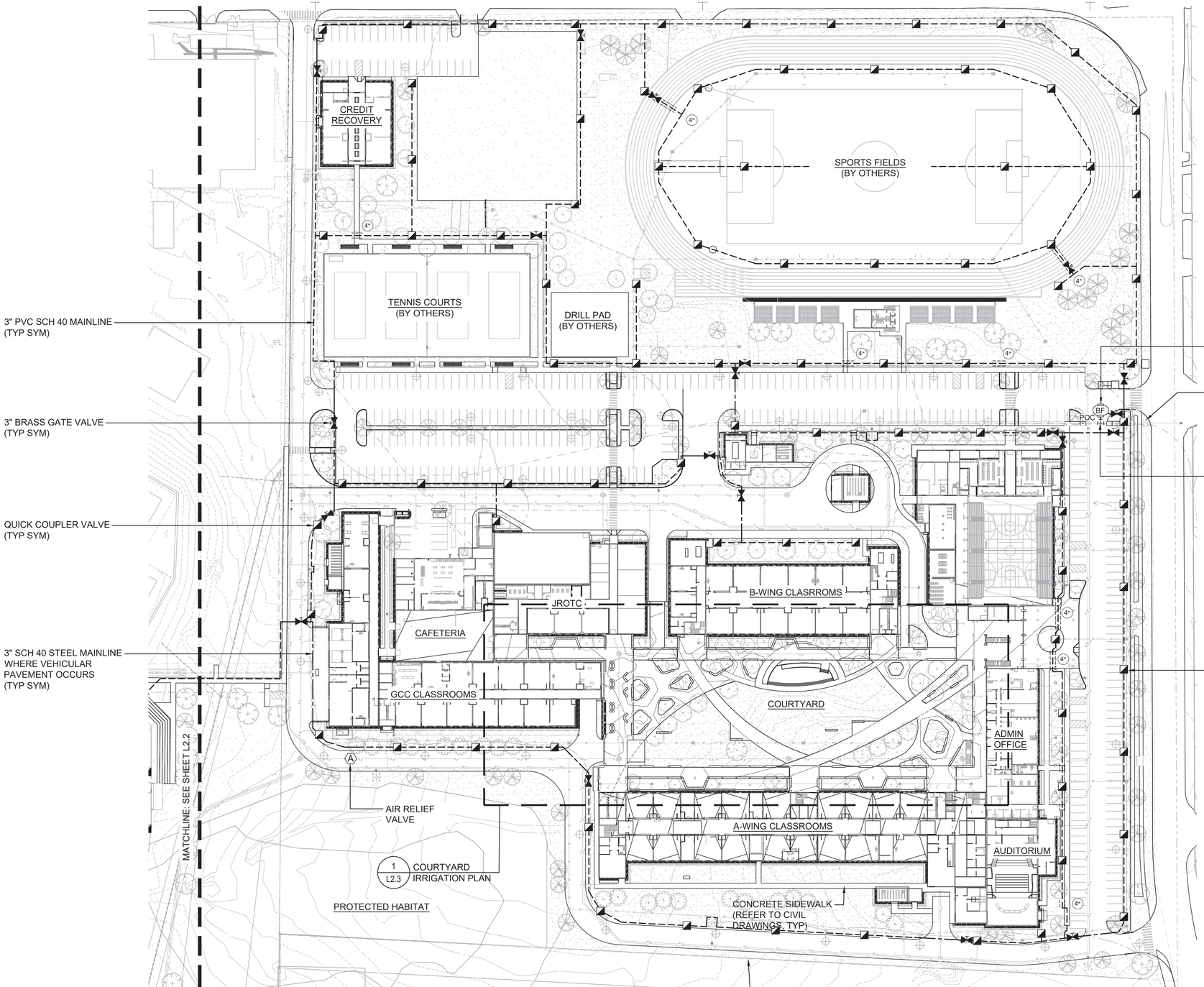

GRAPHIC SCALE

60' 0' 60' 120'

Scale: 1"=60'

NORTH

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISIONS

No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

BOWERS + KUBOTA
BOWERS + KUBOTA CONSULTING
2153 NORTH KING ST. STE 200
HONOLULU, HI 96819
WWW.BOWERSANDKUBOTA.COM

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

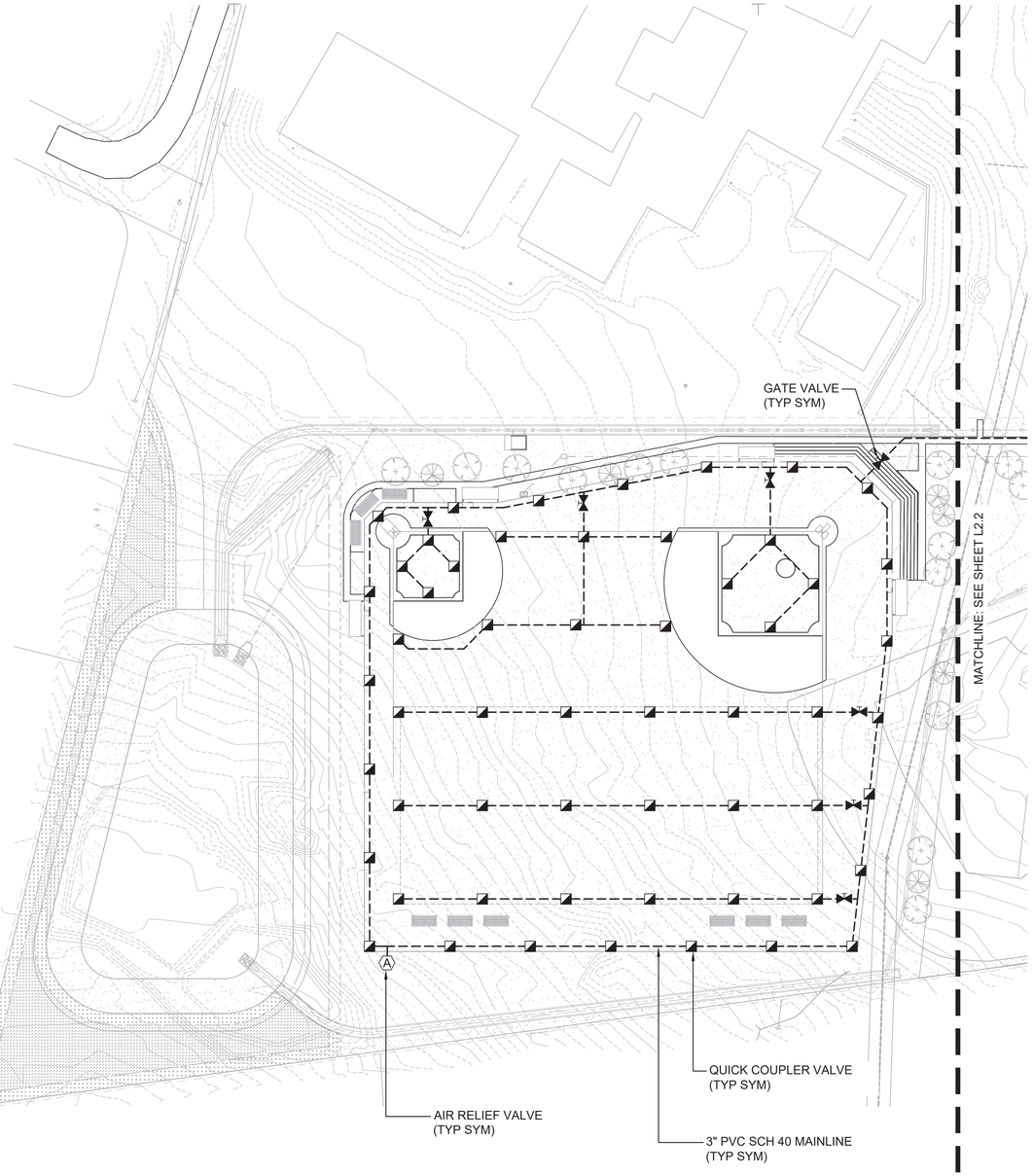
Title:
PARTIAL SITE IRRIGATION PLAN - 1

PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	Title

Drawing No.
L2.1

Sheet ____ of ____



GRAPHIC SCALE

60' 0' 60' 120'

Scale: 1"=60'

NORTH

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REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

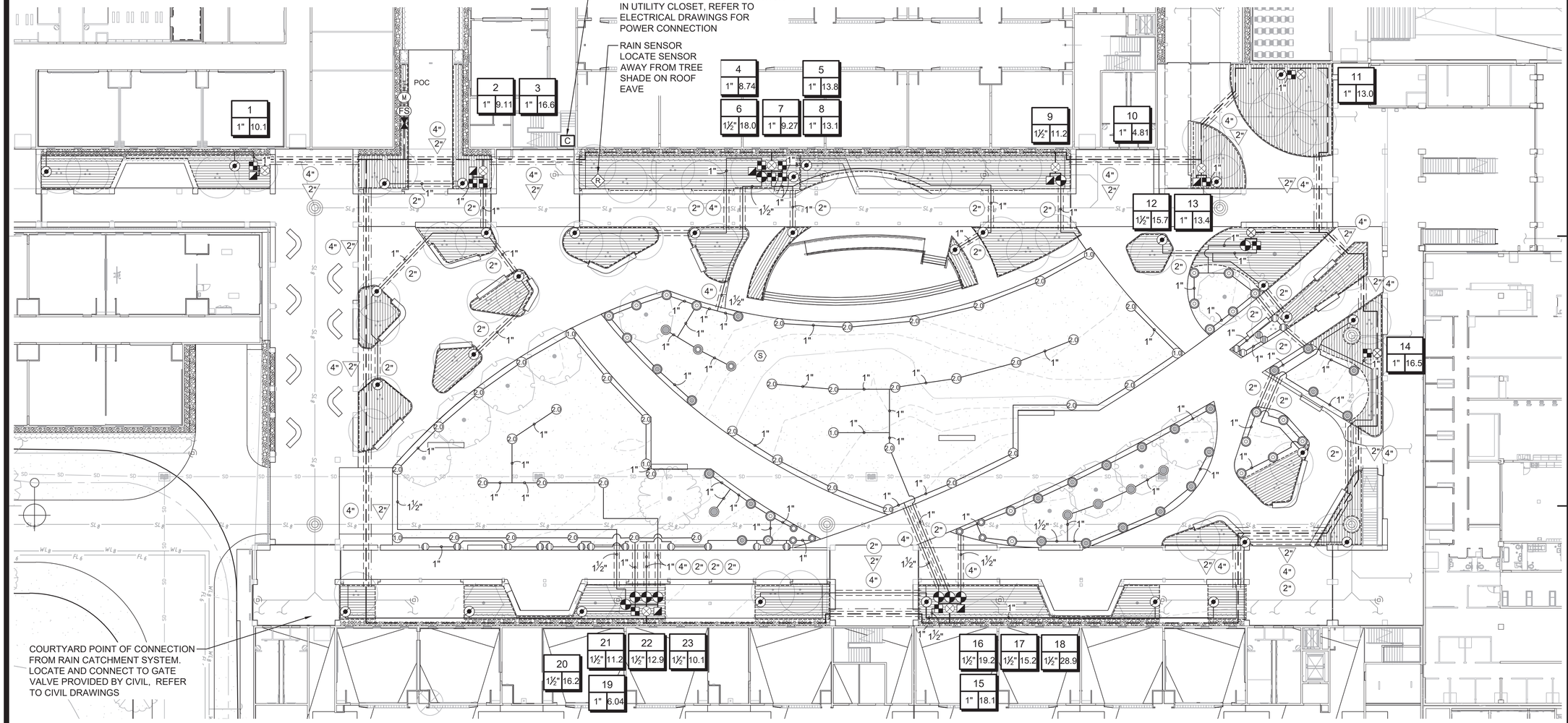
Title:
PARTIAL SITE IRRIGATION PLAN - 2

PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	File

Drawing No.
L2.2

Sheet No. ____ of ____



IRRIGATION PLAN NOTES

1. THIS PLAN IS DIAGRAMMATIC. LOCATE ALL MAINLINES, LATERALS, VALVES AND DISTRIBUTION EQUIPMENT WITHIN PLANTING AREAS UNLESS OTHERWISE NOTED. PLACE MAINLINE IN PLANTING AREAS WHERE NO SLEEVES ARE SHOWN. AVOID ALL CONFLICTS BETWEEN UNDERGROUND UTILITIES, STRUCTURES AND PLANTINGS. THE CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES.
2. PLACE ALL VALVES AND VALVE BOXES WITHIN GROUNDCOVER AREAS UNLESS OTHERWISE NOTED. CONTRACTOR MUST INSTALL VALVES IN SUCH A WAY AS TO BE AS INCONSPICUOUS AS POSSIBLE.
3. THE CONTRACTOR WILL BE RESPONSIBLE TO VERIFY THAT THE POINT-OF-CONNECTION (POC) HAS A STATIC PRESSURE OF 50 PSI AND WATER FLOW OF 50 GPM (MIN.). SEE ALSO IRRIGATION GENERAL NOTES REGARDING TESTING AND NOTIFICATION OF RESULTS. IF ANY OF THE POC INFORMATION SHOWN ON THESE DRAWINGS IS FOUND TO BE DIFFERENT THAN THE ACTUAL POC INFORMATION GATHERED ON THE FIELD, IMMEDIATELY NOTIFY THE OFFICER-IN-CHARGE AND IRRIGATION CONSULTANT.
4. SHOULD THE CONTRACTOR FAIL TO VERIFY THE POC INFORMATION, ANY CHANGES REQUIRED BY LOW PRESSURE OR VOLUME WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. FAILURE TO NOTIFY IRRIGATION CONSULTANT MUST PLACE ALL REQUIRED REPAIRS / EQUIPMENT AND OTHER RELATED COSTS AT THE FULL RESPONSIBILITY OF THE IRRIGATION CONTRACTOR.
5. CONTRACTOR MUST ENSURE RUNNING MULTIPLE STATION CAPACITY AT 50 GPM (MAX.)
6. FOR IRRIGATION DETAILS SEE SHEETS L2.3 AND L2.4.

GRAPHIC SCALE

20' 0' 20' 40'
Scale: 1"=20'

NORTH

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: COURTYARD IRRIGATION PLAN
PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	Title
Drawing No.	L2.3
Sheet No.	of

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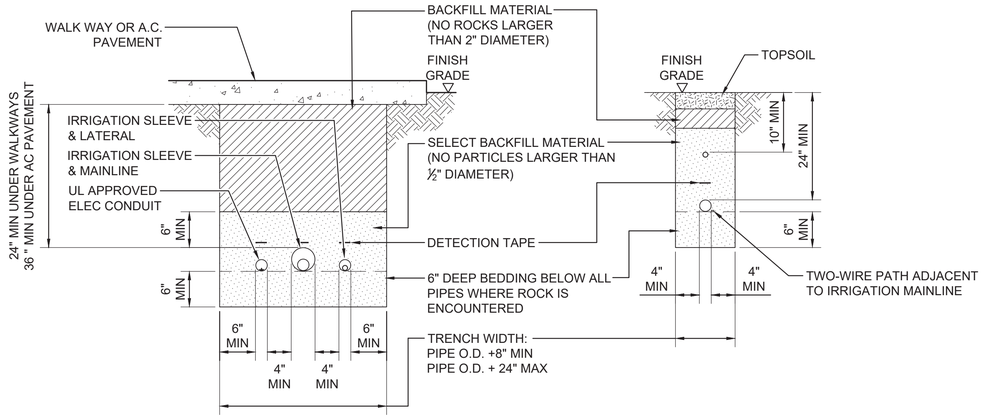
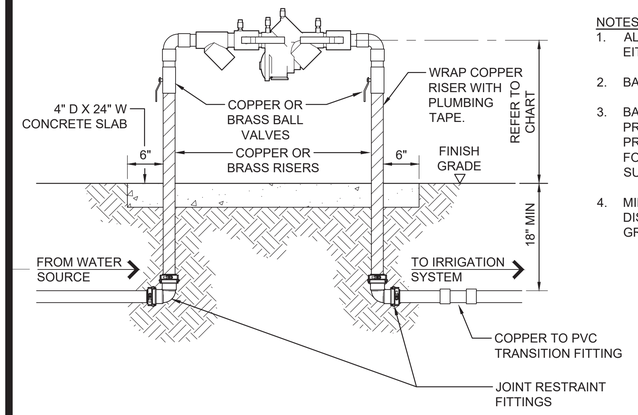


1 IRRIGATION TRENCHING DETAIL

NOT TO SCALE



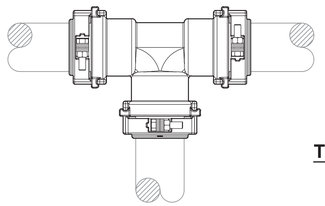
NOTES:

1. ALL PIPES AND FITTINGS INSTALLED ABOVE GRADE SHALL BE EITHER COPPER OR BRONZE ONLY.
2. BACK FLOW PREVENTER SHALL BE PLUMB.
3. BACK FLOW PREVENTER SHALL BE LOCATED IN AN AREA WELL PROTECTED FROM VEHICLES (CLEAR ZONE). IF THE BACK FLOW PREVENTER IS LOCATED IN AN UNPROTECTED AREA, THEN FOUR (4) 6" PIPE BOLLARDS FILLED WITH CONCRETE SHALL SURROUND THE BACK FLOW PREVENTER
4. MINIMUM HEIGHT SHALL BE 12" ABOVE HIGHEST POINT OF DISTRIBUTION, OR THAT SHOWN IN CHART, WHICHEVER IS GREATEST.

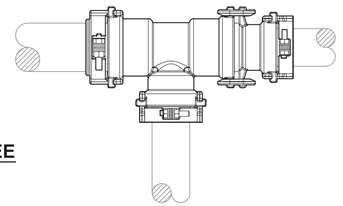
SIZE (INCHES)	H (INCHES)
3/4" TO 1-1/2"	18"
2" TO 3"	24"

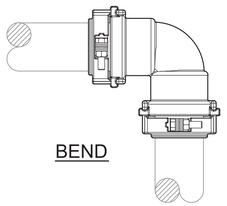
4 REDUCED PRESSURE BACKFLOW PREVENTER

NOT TO SCALE

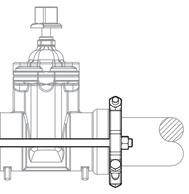


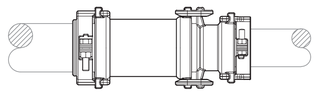
TEE



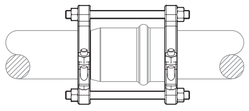


BEND



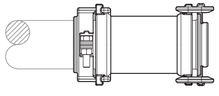


REDUCER



PIPE TO PIPE RESTRAINT

VALVE TO PIPE RESTRAINT



CAP/DEAD END

MINIMUM RESTRAINED LENGTH REQUIREMENTS FOR EACH FITTING/VALVE BELL							
	90° BEND	45°, 22 ½° , 11 ¼° BEND	TEE	REDUCER	CAP/DEAD END	VALVE	COUPLING/SERVICE TEE (SEE NOTE 3)
4" & SMALLER	20'	20'	20'	40'	60'	60'	NONE
6" & LARGER	40'	20'	20'	60'	80'	80'	NONE

1. EACH FITTING & VALVE BELL MUST BE RESTRAINED TO THE LENGTH OF PIPE NOTED IN THE TABLE USING FITTING TO PIPE RESTRAINT, VALVE TO PIPE RESTRAINT, AND PIPE TO PIPE RESTRAINT AS REQUIRED.
2. PIPE JOINTS WITHIN THE RESTRAINED LENGTH REQUIREMENT MUST BE RESTRAINED WITH PIPE TO PIPE RESTRAINTS.
3. SERVICE TEES AND COUPLINGS WITHIN THE RESTRAINED LENGTH REQUIREMENT MUST BE RESTRAINED WITH FITTING TO PIPE RESTRAINTS
4. THE RESTRAINT SCHEMES BELOW ARE FOR SYSTEM PRESSURES UP TO 125 PSI. CONTACT MANUFACTURER FOR HIGHER SYSTEM PRESSURES.

2 JOINT RESTRAINT FITTING DETAIL

NOT TO SCALE

REVISIONS

No.	Description	Date

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Architecture
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NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
IRRIGATION DETAILS - 1
PROGRAMMING DOCUMENT

Designed: BCH/B+K
Drawn: CB
Checked: BT
Supv: MG
Scale: AS INDICATED
Date: 3/31/25
Project No.:
File:
Drawing No.:
L2.4
Sheet No. ____ of ____

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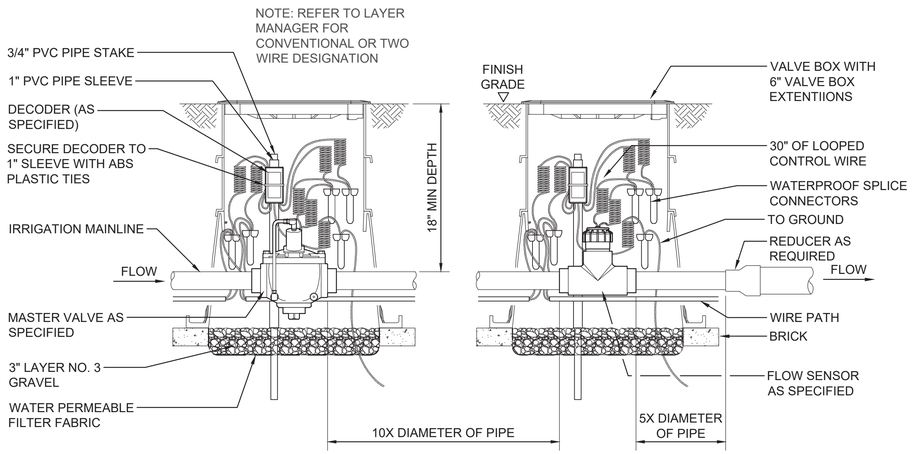
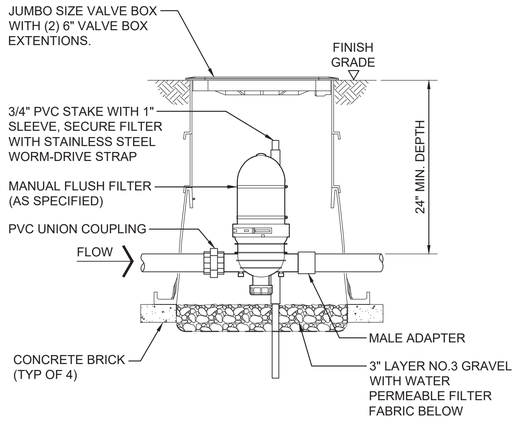
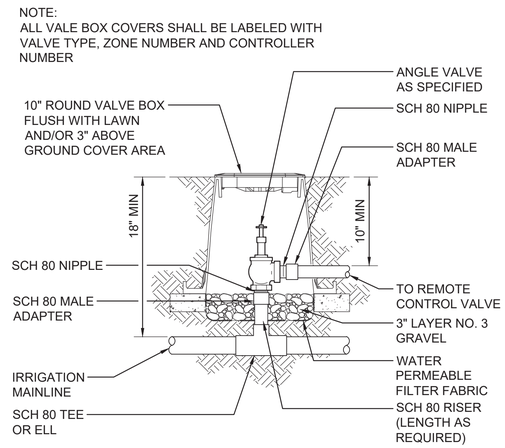


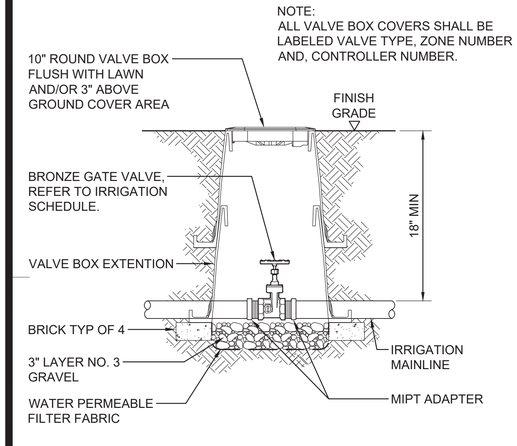
1 MASTER VALVE AND FLOW SENSOR DETAIL
NOT TO SCALE



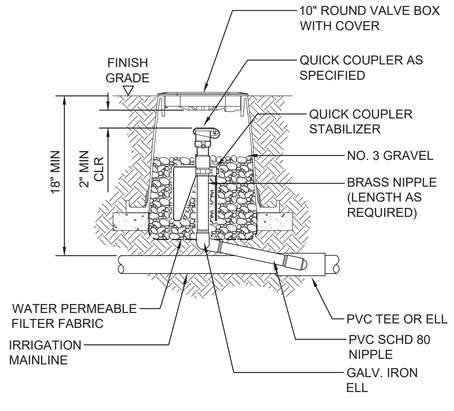
4 MANUAL FLUSH FILTER DETAIL
NOT TO SCALE



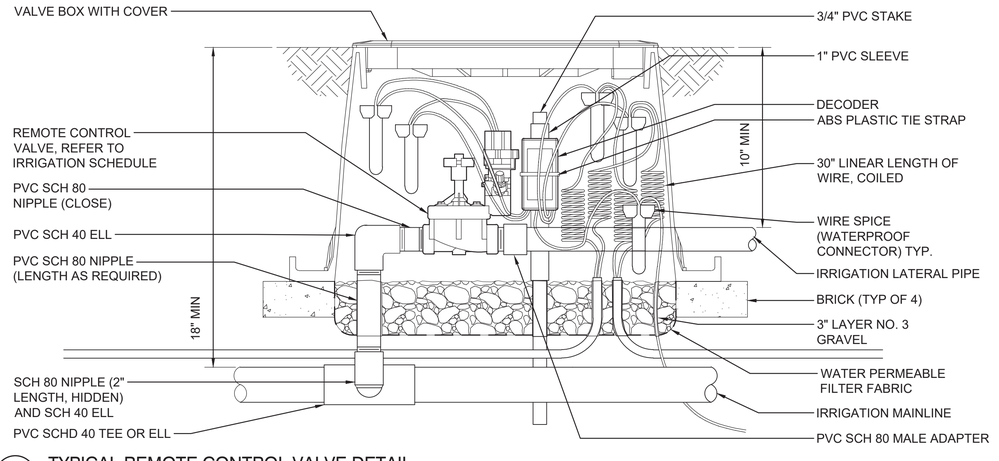
5 MANUAL ANGLE VALVE DETAIL
NOT TO SCALE



2 GATE VALVE DETAIL
NOT TO SCALE



3 QUICK COUPLER DETAIL
NOT TO SCALE



6 TYPICAL REMOTE CONTROL VALVE DETAIL
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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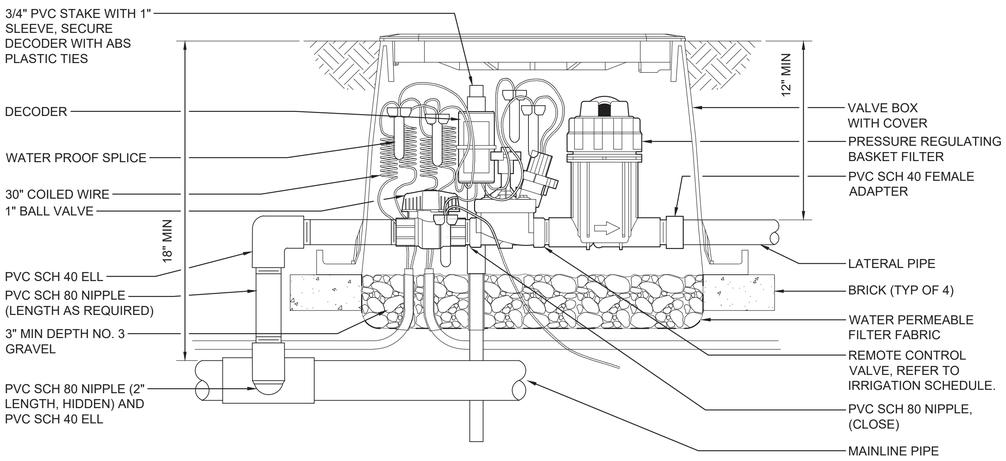
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

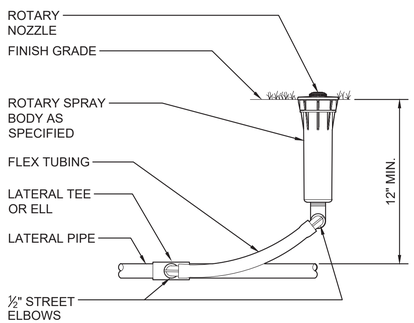
Title:
IRRIGATION DETAILS - 2
PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	
Title	

Drawing No.
L2.5
Sheet No. ____ of ____

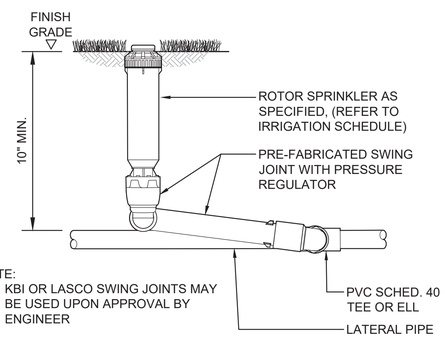


1 1" WIDE FLOW DRIP KIT DETAIL
NOT TO SCALE



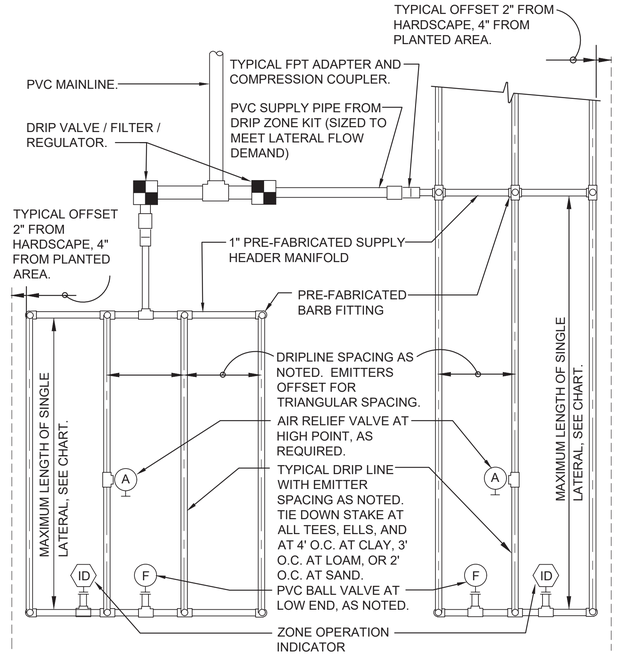
NOTES:
1. KBI OR LASCO SWING JOINTS MAY BE USED UPON APPROVAL BY LANDSCAPE ARCHITECT.
2. INSTALL PART-CIRCLE POP-UP HEADS 6" FROM EDGE OF PAVED AREAS.

2 6" ROTARY NOZZLE POP-UP DETAIL
NOT TO SCALE



NOTE:
1. KBI OR LASCO SWING JOINTS MAY BE USED UPON APPROVAL BY ENGINEER
2. INSTALL PART CIRCLE POP-UP HEADS 6" FROM EDGE OF PAVED AREAS.

3 LAWN POP-UP ROTOR DETAIL
NOT TO SCALE



END FEED EXAMPLE

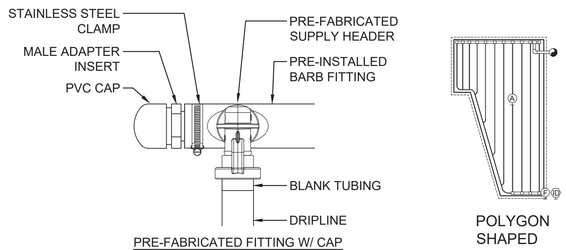
CENTER FEED EXAMPLE

MAXIMUM LATERAL LENGTH (FEET)						
PSI	EMITTER FLOW RATE (GPH)					
	12" SPACING		18" SPACING		24" SPACING	
	0.6	0.9	0.6	0.9	0.6	0.9
10	125	96	175	135	218	171
20	249	191	350	171	442	340
30	307	236	434	333	550	422
40	350	268	495	380	627	171
50	125	96	175	135	218	171
60	125	96	175	135	218	171

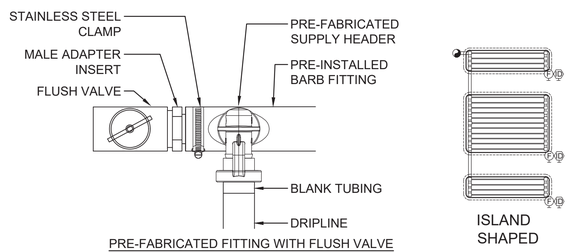
GRID PRECIPITATION RATES (IN/HR)			
EMITTER SPACING	LATERAL SPACING	EMITTER FLOW RATE	
		0.6	0.9
12	12	0.96	1.44
18	18	0.69	1.03
24	24	0.28	0.41

LATERAL FLOW PER 100FT (GPM)			
EMITTER FLOW	12" SPACING	18" SPACING	24" SPACING
0.6 GPH	1.0 GPM	0.67 GPM	0.50 GPM
0.9 GPH	1.5 GPM	1.00 GPM	0.75 GPM

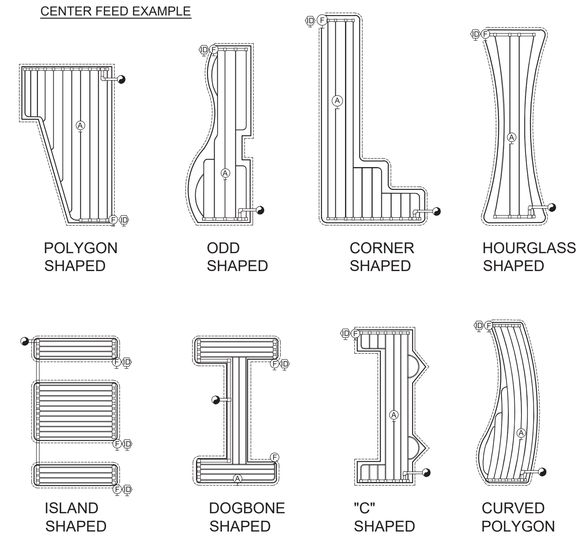
SLOPED CONDITION NOTES:
1. DRIPLINE LATERALS SHOULD FOLLOW THE CONTOURS OF THE SLOPE WHENEVER POSSIBLE
2. INSTALL AIR RELIEF VALVE AT HIGHEST POINT
3. NORMAL SPACING WITHIN ⅔ OF SLOPE
4. INSTALL DRIPLINE AT 25% GREATER SPACING AT THE BOTTOM ⅓ OF THE SLOPE
5. WHEN ELEVATION CHANGE IS 10 FT OR MORE, ZONE THE BOTTOM ⅓ ON A SEPARATE VALVE.



PRE-FABRICATED FITTING W/ CAP



PRE-FABRICATED FITTING WITH FLUSH VALVE



4 TYPICAL DRIPLINE EMITTER DETAIL
NOT TO SCALE

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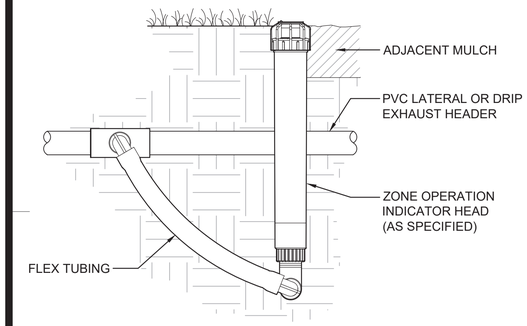
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
IRRIGATION DETAILS - 3
PROGRAMMING DOCUMENT

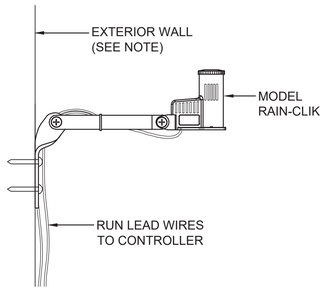
Designed: BCH/B+K
Drawn: CB
Checked: BT
Supv: MG
Scale: AS INDICATED
Date: 3/31/25
Project No.:
Title:

Drawing No.:
L2.6
Sheet No. of



1 DRIP ZONE INDICATOR DETAIL

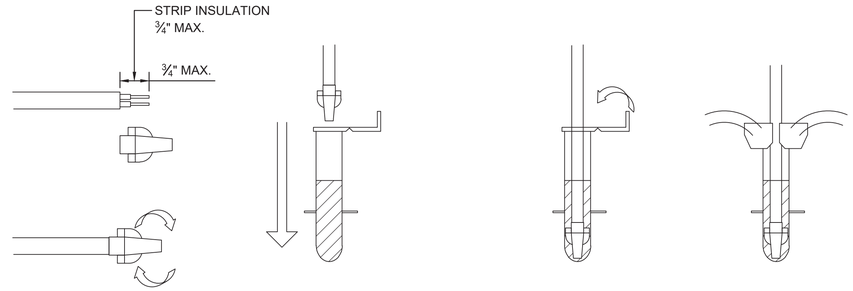
NOT TO SCALE



NOTE:
MOUNT ON ANY SURFACE WHERE IT WILL BE EXPOSED TO UNOBSTRUCTED RAINFALL, BUT NOT IN THE PATH OF SPRINKLER SPRAY.

3 RAIN SENSOR DETAIL

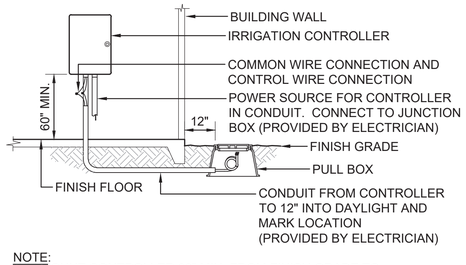
NOT TO SCALE



1. WITH WIRE ENDS EVEN, INSERT WIRES INTO THE CONNECTOR AND TIGHTEN UNTIL SECURE.
2. INSERT THE CONNECTOR ALL THE WAY INTO THE TUBE UNTIL THE CONNECTOR RESTS ON THE BOTTOM
3. FOLD WIRES INTO CHANNELS
4. CLOSE CAP

5 WIRE SPLICE DETAIL

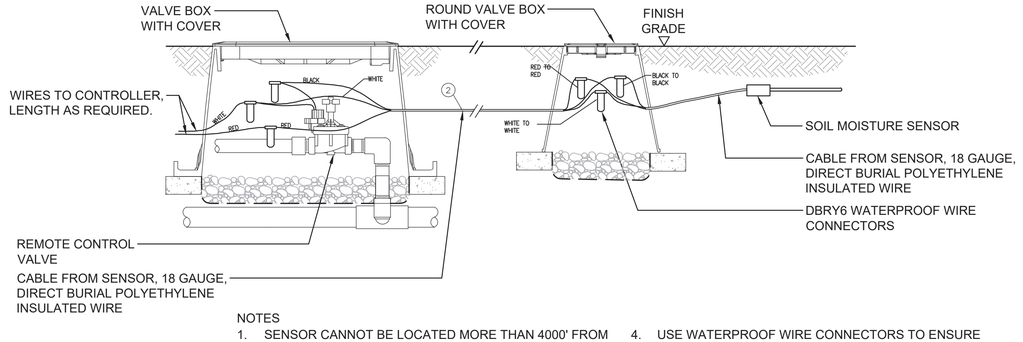
NOT TO SCALE



NOTE:
1. MOUNT CONTROLLER 60" MIN. FROM FINISH GRADE TO BOTTOM OF CONTROLLER.
2. ALL WIRING TO BE INSTALLED AS PER LOCAL CODE.
3. SEE MANUFACTURER'S RECOMMENDATIONS FOR MOUNTING.

2 WALL MOUNTED CONTROLLER DETAIL

NOT TO SCALE



NOTES
1. SENSOR CANNOT BE LOCATED MORE THAN 4000' FROM CONTROLLER.
2. FOR LOCATION PURPOSES KEEP THE SENSOR, SPLICE BOX, AND VALVE BOX IN A STRAIGHT LINE.
3. SCRIBE A LINE ACROSS THE LID OF THE SPLICE BOX TO SHOW THE DIRECTION OF THE SENSOR.
4. USE WATERPROOF WIRE CONNECTORS TO ENSURE ADEQUATE SENSOR FUNCTIONALITY.
5. SELECT A ZONE WIRE WHICH ACTIVATES A SINGLE VALVE.
6. INSTALL THE SENSOR IN A LOCATION WHICH IS THE MOST REPRESENTATIVE OF THE ENTIRE SITE BEING IRRIGATED.

4 SOIL MOISTURE SENSOR DETAIL

NOT TO SCALE

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
IRRIGATION DETAILS - 4
PROGRAMMING DOCUMENT

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L2.7
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PLANT SCHEDULE OVERALL PLANTING PLAN

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE		REMARKS
	21	AGLAIA MARIANNENSIS	MAPUNAO	25 GAL		1" CAL. SINGLE TRUNK, 10' HT. MIN., 5' TO LOWEST BRANCHES, UNIFORM BRANCHING
	14	BARRINGTONIA ASIATICA	FISH KILL TREE	25 GAL		1" CAL. SINGLE TRUNK, 10' HT. MIN., 5' TO LOWEST BRANCHES, UNIFORM BRANCHING
	66	CASSIA FISTULA	GOLDEN SHOWER TREE	25 GAL		3/4" CAL. SINGLE TRUNK, 8' HT.MIN., 4' TO LOWEST BRANCHES, UNIFORM BRANCHING
	24	CORDIA SUBCORDATA	NIYORON	25 GAL		1-1/2"-2" CAL MIN, 6`-8` OVERALL HT, 5`-6` SPD, 4`-5` CLEAR STRAIGHT TRUNK
	4	FILICIUM DECIPIENS	FERN TREE	25 GAL		1" CAL. SINGLE TRUNK, 10' HT. MIN., 5' TO LOWEST BRANCHES, UNIFORM BRANCHING
	25	FILICIUM DECIPIENS	FERN TREE	45 GAL		1" CAL. SINGLE TRUNK, 10' HT. MIN., 5' TO LOWEST BRANCHES, UNIFORM BRANCHING
	4	JATROPHA INTEGERRIMA	JATROPHA	15 GAL		MULTI-TRUNK, TREE FORM 6' HT. MIN. UNIFORM BRANCHING
	32	PLUMERIA OBTUSA	SINGAPORE PLUMERIA	15 GAL		3/4 CAL. SINGLE TRUNK, 8' HT. MIN., 4 TO LOWEST BRANCHES, UNIFORM BRANCHING
	1	PLUMERIA OBTUSA	SINGAPORE PLUMERIA	45 GAL		1" CAL. SINGLE TRUNK, 10' HT. MIN., 5' TO LOWEST BRANCHES, UNIFORM BRANCHING
PALM	QTY	BOTANICAL NAME	COMMON NAME	SIZE		REMARKS
	62	PTYCHOSPERMA MACARTHURII	MACARTHUR PALM	45 GAL		2" MIN. CANE, 6' MIN. CLEAR TRUNK HEIGHT
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE		REMARKS
	180	CORDYLINE FRUTICOSA 'EMERALD GREEN'	EMERALD GREEN TI PLANT	1 GAL		BUSHY, FULL, UNIFORM BRANCHING TO GROUND, TRIANGULAR SPACING
	200	CORDYLINE FRUTICOSA 'RED'	RED TI PLANT	1 GAL		BUSHY, FULL, UNIFORM BRANCHING TO GROUND, TRIANGULAR SPACING
	235	CRINUM ASIATICUM	CRINUM LILY	5 GAL		24" - 30" HT., NO RUST
	1,600	PSEUDERANTHEMUM RETICULATUM	GOLDEN ERANTHEMUM	5 GAL		30" O.C., HEDGE LAYOUT
GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	POT	SPACING	REMARKS
	270	CUPHEA HYSSOPIFOLIA	FALSE HEATHER	1 GAL	24" o.c.	24" O.C., TRIANGULAR SPACING
	830	DIANELLA TASMANICA 'VARIEGATA'	VARIEGATED FLAX LILY	1 GAL	24" o.c.	24" O.C., TRIANGULAR SPACING
	3,400	FICUS MICROCARPA 'GREEN ISLAND'	DWARF WAX FICUS	6" POT	12" o.c.	12" O.C., BUSHY, FULL, UNIFORM BRANCHING, TO GROUND, TRIANGULAR SPACING
	3,600	MICROSORUM SCOLOPENDRIA 'LAUA'E IKI'	LAUA'E IKI FERN	6" POT	12" o.c.	12" O.C., TRIANGULAR SPACING
	340	MONSTERA DELICIOSA	MONSTERA	1 GAL	24" o.c.	12" O.C., BUSHY, FULL, TRIANGULAR SPACING
	600	VITEX ROTUNDIFOLIA	POHINAHINA	6" POT	18" o.c.	18" O.C., BUSHY, FULL, UNIFORM BRANCHING TO GROUND, TRIANGULAR SPACING
TURF	QTY	BOTANICAL NAME	COMMON NAME	POT	SPACING	REMARKS
	566,400 SF	CYNODON DACTYLON	BERMUDA GRASS	HYDROMULCH		TOTAL COVERAGE WATER UNTIL ESTABLISHED

REFERENCE NOTES SCHEDULE

SYMBOL	QTY	DESCRIPTION
— — — —	3,500 LF	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
– – – – – – – –	7,200 LF	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	211 CY	RED CINDER, 4" LAYER
	1,600	SYNTHETIC TURF (UNIFORM COLOR WITH CHARACTERISTICS OF CYNODON DACTYLON)
	75 CY	NO. 3 GRAVEL MAINTENANCE STRIP (3" LAYER)
	8,100 SF	FILTER FABRIC, WOVEN, INSTALL UNDER ALL GRAVEL AREAS
	8,300 CY	IMPORTED SCREENED TOP SOIL (4" LAYER)
	693,000 SF	SOIL PREPARATION (1" LAYER ORGANIC SOIL CONDITIONER OR APPROVED SUBSTITUTE / COMPOST, ROTOR-TILL 4" DEEP INTO SOIL)

PLANTING NOTES:

1. VERIFY ALL PLANT QUANTITIES AND REPORT ANY DISCREPANCIES TO THE OFFICER-IN-CHARGE PRIOR TO CONSTRUCTION.
2. FIELD LAYOUT AND MARK TREE AND PALM LOCATIONS AND OBTAIN APPROVAL OF THE OFFICER-IN-CHARGE PRIOR TO EXCAVATING PLANTING PITS.
3. PROVIDE 4" OF PLANTING SOIL OVER ALL PLANTING AREAS.
4. BACKFILL MIX CONSISTS OF FOUR (4) PARTS OF AMENDED IMPORTED PLANTING SOIL TO ONE (1) PART ORGANIC SOIL CONDITIONER (SEE SPECIFICATIONS). ADD ONE (1) POUND OF 10-30-10 FERTILIZER TO ONE (1) CUBIC YARD OF BACKFILL MIX. MIX THOROUGHLY ON PROJECT SITE PRIOR TO ANY PLANTING OPERATIONS.
5. INDICATED BACKFILL MIX IS FOR BIDDING PURPOSES ONLY. A SOIL ANALYSIS WITH RECOMMENDATIONS WILL BE REQUIRED AND TAKE PRECEDENCE OVER THE INDICATED MIXTURE.
6. REFER TO PLANTING DETAILS FOR RECOMMENDED TABLET LOCATION IN PLANTING PIT.
7. SLOW RELEASE FERTILIZER PLANTING TABLETS 20-10-5, 21 GRAM SIZE FOR TREES, PALMS, AND SHRUBS MUST BE AS FOLLOWS:

FIELD SPECIMEN	12 TABLETS
45 GALLON	10 TABLETS
25 GALLON	8 TABLETS
15 GALLON	5 TABLETS
5 GALLON	3 TABLETS
3 GALLON	2 TABLETS
1 GALLON	1 TABLET

8. GROUNDCOVER MUST BE PLANTED UNDER ALL TREES, PALMS, AND SHRUBS (UNLESS OTHERWISE NOTED ON PLANS).
9. PROVIDE 2" MINIMUM DEPTH OF ORGANIC COVER MULCH OVER ALL PLANTED AREAS EXCLUDING TURF (UNLESS OTHERWISE NOTED ON PLANS).
10. THE CONTRACTOR MUST VERIFY THE PLANT QUANTITY ESTIMATES SHOWN ON THE MATERIAL SCHEDULE FOR THE PURPOSES OF BIDDING AND PROCUREMENT. THE CONTRACTOR MUST PROVIDE PLANTS AND OTHER MATERIALS IN THE QUANTITIES NECESSARY TO COMPLETE THE INSTALLATION AS SHOWN ON THE DRAWINGS.
11. UPON SUBSTANTIAL COMPLETION OF THE GENERAL PLANT QUANTITIES, THE CONTRACTOR MUST NOTIFY THE LANDSCAPE ARCHITECT AND SCHEDULE A SITE MEETING TO FIELD DIRECT LOCATIONS OF THE "PLANT MATERIAL FOR INFILL" TO BE INSTALLED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE FORMAL MAINTENANCE PERIOD.
12. CONTRACTOR MUST RESTORE ALL EXISTING AREAS DAMAGED BY CONSTRUCTION ACTIVITIES AND TO MATCH ADJACENT AREAS AT NO ADDITIONAL PROJECT COST.
13. AFTER THE COMPLETION OF PLANT INSTALLATION, PROVIDE 1" DEPTH BLACK CINDER TO 'FINISH' AND ACHIEVE A CLEAN PROJECT APPEARANCE OF PLANTER AREAS.

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: PLANTING SCHEDULE AND NOTES
PROGRAMMING DOCUMENT

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Sheet No. _____ of _____

SHEET L3.2

SHEET L3.3

SHEET L3.4

SHEET L3.5

SHEET L3.6

SHEET L3.7

SHEET L3.8

SHEET L3.9

SHEET L3.10

EXISTING SIMON SANCHEZ HIGH SCHOOL

TENNIS COURTS (BY OTHERS)

DRILL PAD (BY OTHERS)

SPORTS FIELD (BY OTHERS)

COURTYARD

SOFTBALL

BASEBALL

MULTI-PURPOSE FIELD (BY OTHERS)

PROTECTED HABITAT

GRAPHIC SCALE

60' 0' 60' 120'

Scale: 1"=60'

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Project:

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title:

OVERALL PLANTING PLAN

PROGRAMMING DOCUMENT

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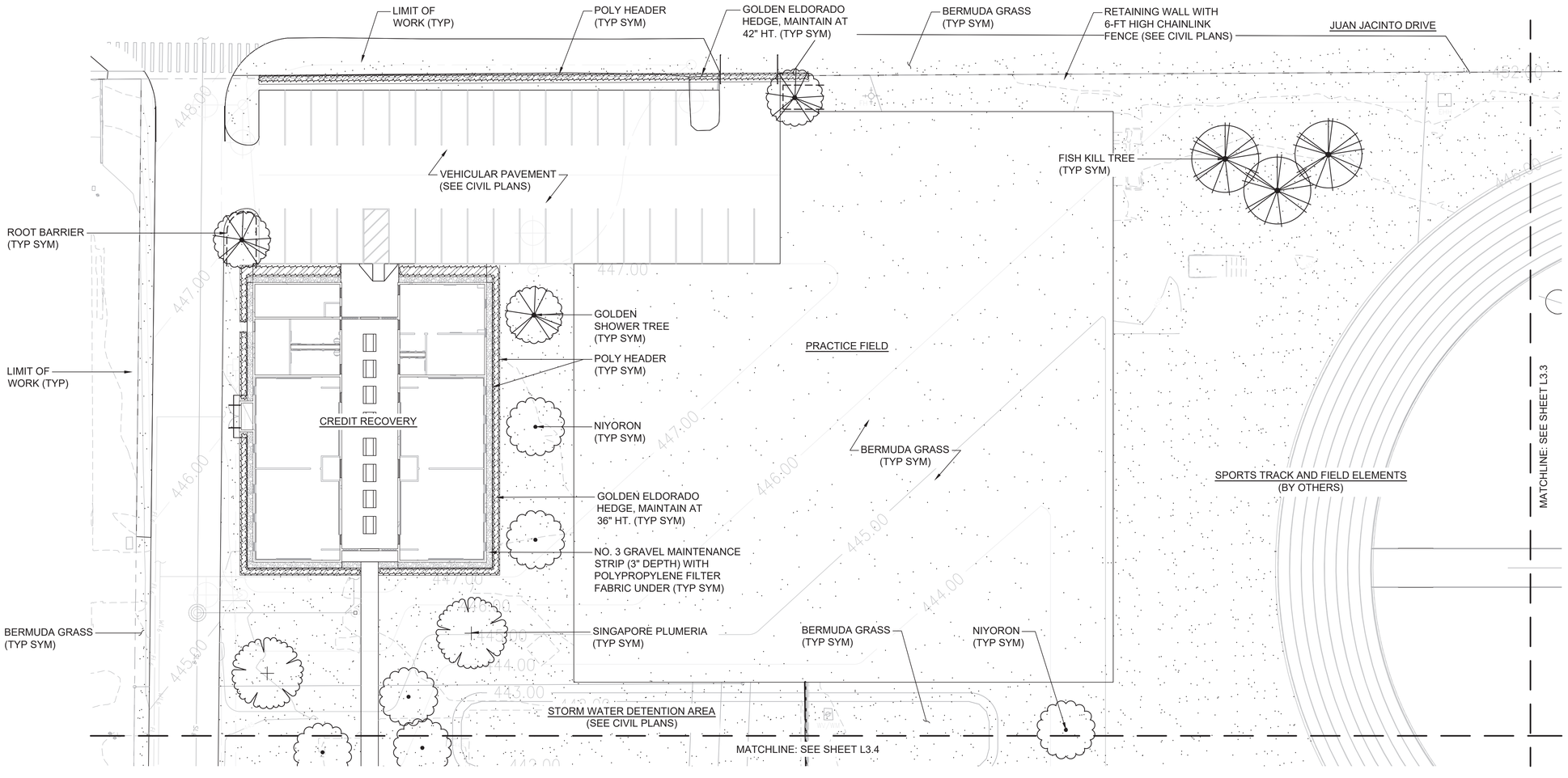
PLANT SCHEDULE 1

TREES	BOTANICAL NAME	COMMON NAME
	BARRINGTONIA ASIATICA	FISH KILL TREE
	CASSIA FISTULA	GOLDEN SHOWER TREE
	CORDIA SUBCORDATA	NIYORON
	PLUMERIA OBTUSA	SINGAPORE PLUMERIA

SHRUB AREAS		
	PSEUDERANTHEMUM RETICULATUM	GOLDEN ELDORADO
TURF		
	CYNODON DACTYLON	BERMUDA GRASS
MISCELLANEOUS		
SYMBOL	DESCRIPTION	
_ _ _ _ _ _ _	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS	
— — — —	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)	
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)	



GRAPHIC SCALE

20' 0' 20' 40'

Scale: 1"=20'

NORTH

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: PARTIAL PLANTING PLAN - 1

PROGRAMMING DOCUMENT

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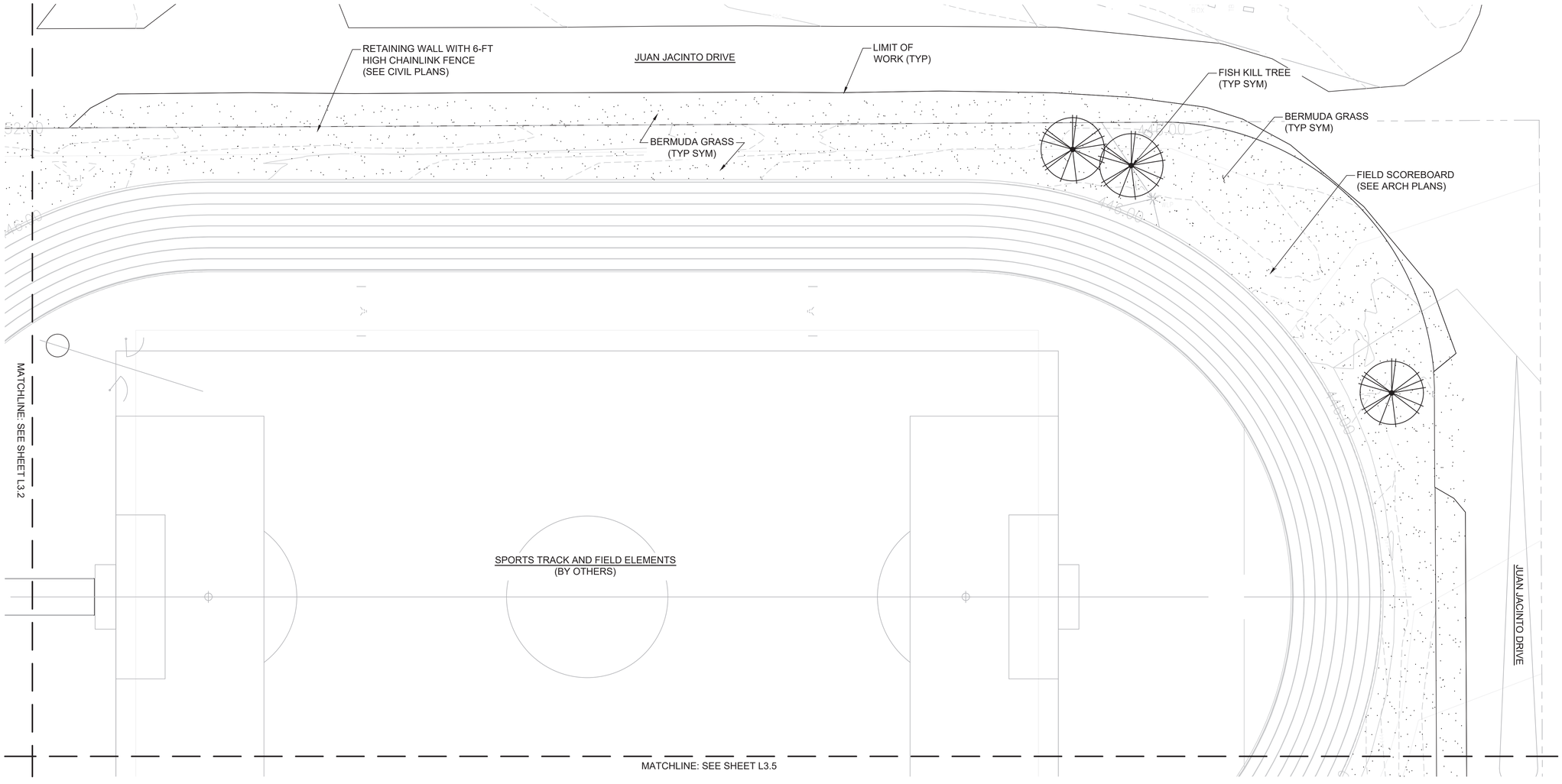
PLANT SCHEDULE 2		
TREES	BOTANICAL NAME	COMMON NAME
	BARRINGTONIA ASIATICA	FISH KILL TREE
TURF		
	CYNODON DACTYLON	BERMUDA GRASS



GRAPHIC SCALE

20' 0' 20' 40'

Scale: 1"=20'

NORTH

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

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PARTIAL PLANTING PLAN - 2

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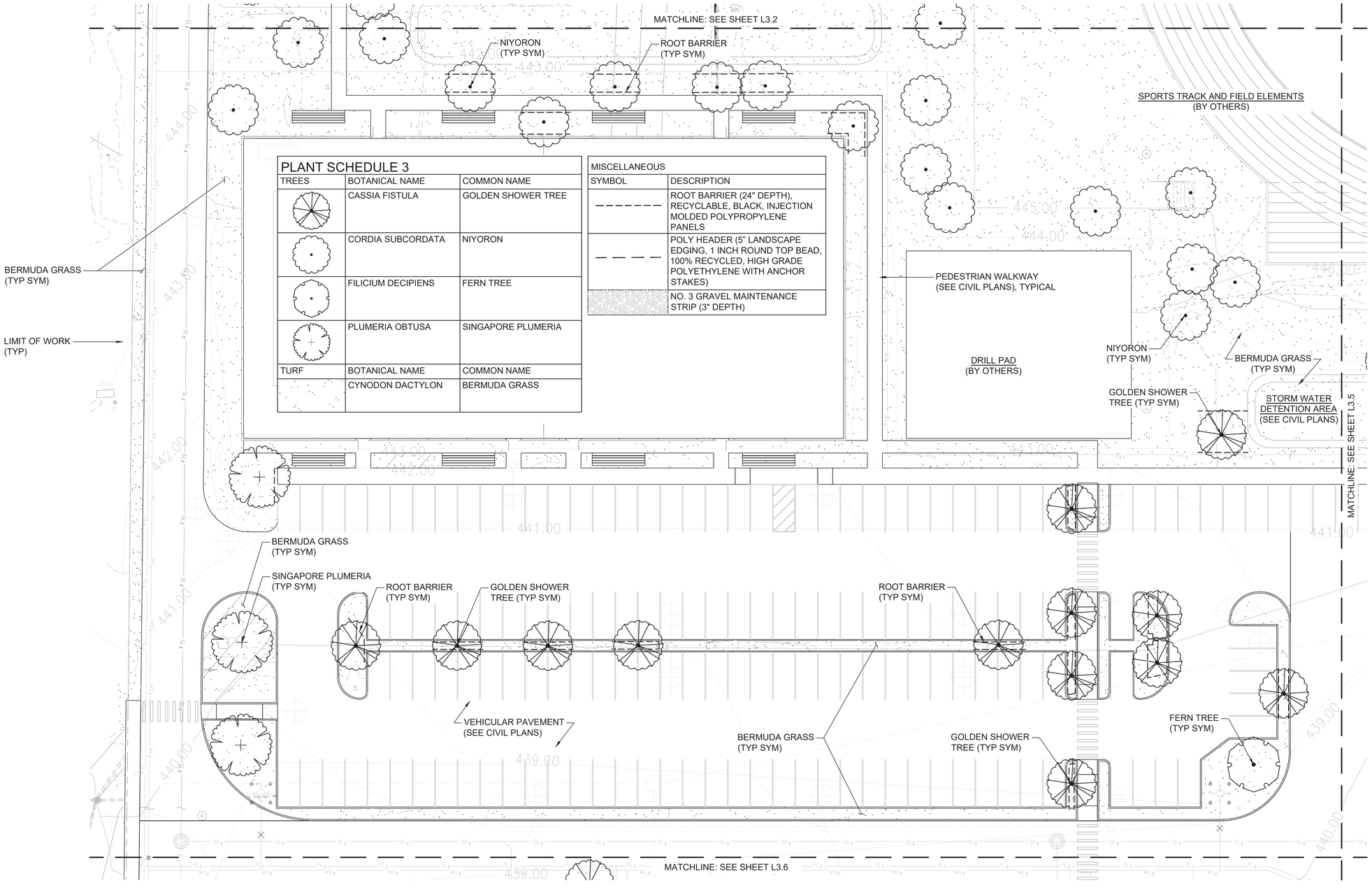

PLANT SCHEDULE 3

TREES	BOTANICAL NAME	COMMON NAME
	CASSIA FISTULA	GOLDEN SHOWER TREE
	CORDIA SUBCORDATA	NIYORON
	FILICIUM DECIPIENS	FERN TREE
	PLUMERIA OBTUSA	SINGAPORE PLUMERIA
TURF	BOTANICAL NAME	COMMON NAME
	CYNODON DACTYLON	BERMUDA GRASS

MISCELLANEOUS	
SYMBOL	DESCRIPTION
	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)

GRAPHIC SCALE

20' 0' 20' 40'

Scale: 1"=20'

NORTH

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

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Title
PARTIAL PLANTING PLAN - 3
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MATCHLINE: SEE SHEET L3.3

PLANT SCHEDULE 4

TREES	BOTANICAL NAME	COMMON NAME
	BARRINGTONIA ASIATICA	FISH KILL TREE
	CASSIA FISTULA	GOLDEN SHOWER TREE
	FILICIUM DECIPIENS	FERN TREE
	PLUMERIA OBTUSA	SINGAPORE PLUMERIA
SHRUB AREAS		
	PSEUDERANTHEMUM RETICULATUM	GOLDEN ELDORADO
TURF		
	CYNODON DACTYLON	BERMUDA GRASS

MISCELLANEOUS	
SYMBOL	DESCRIPTION
	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)

SPORTS TRACK AND FIELD ELEMENTS (BY OTHERS)

LIMIT OF WORK (TYP)

SYNTHETIC TURF (TYP SYM)

PRESS BOX

BERMUDA GRASS (TYP SYM)

STORM WATER DETENTION AREA (SEE CIVIL PLANS)

STORM WATER DETENTION AREA (SEE CIVIL PLANS)

FISH KILL TREE (TYP SYM)

SINGAPORE PLUMERIA (TYP SYM)

MATCHLINE: SEE SHEET L3.4

PEDESTRIAN WALKWAYS (SEE CIVIL PLANS), TYPICAL

GOLDEN SHOWER TREE (TYP SYM)

SINGAPORE PLUMERIA (TYP SYM)

ROOT BARRIER (TYP SYM)

NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH) WITH POLYPROPYLENE FILTER FABRIC UNDER (TYP SYM)

VEHICULAR PAVEMENT (SEE CIVIL PLANS)

GOLDEN SHOWER TREE (TYP SYM)

POLY HEADER (TYP SYM)

FERN TREE (TYP SYM)

GOLDEN SHOWER TREE (TYP SYM)

ROOT BARRIER (TYP SYM)

POLY HEADER (TYP SYM)

MECHANICAL EQUIPMENT

GOLDEN ELDORADO HEDGE, MAINTAIN AT 36" HT. (TYP SYM)

GYMNASIUM

NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH) WITH POLYPROPYLENE FILTER FABRIC UNDER (TYP SYM)

RAIN HARVESTING EQUIPMENT (SEE CIVIL PLANS)

BOUNDARY WALL (SEE ARCH PLANS)

JUAN JACINTO DRIVE

MATCHLINE: SEE SHEET L3.7

GRAPHIC SCALE

20' 0' 20' 40'

Scale: 1"=20'

NORTH

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

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Title
PARTIAL PLANTING PLAN - 4

PROGRAMMING DOCUMENT

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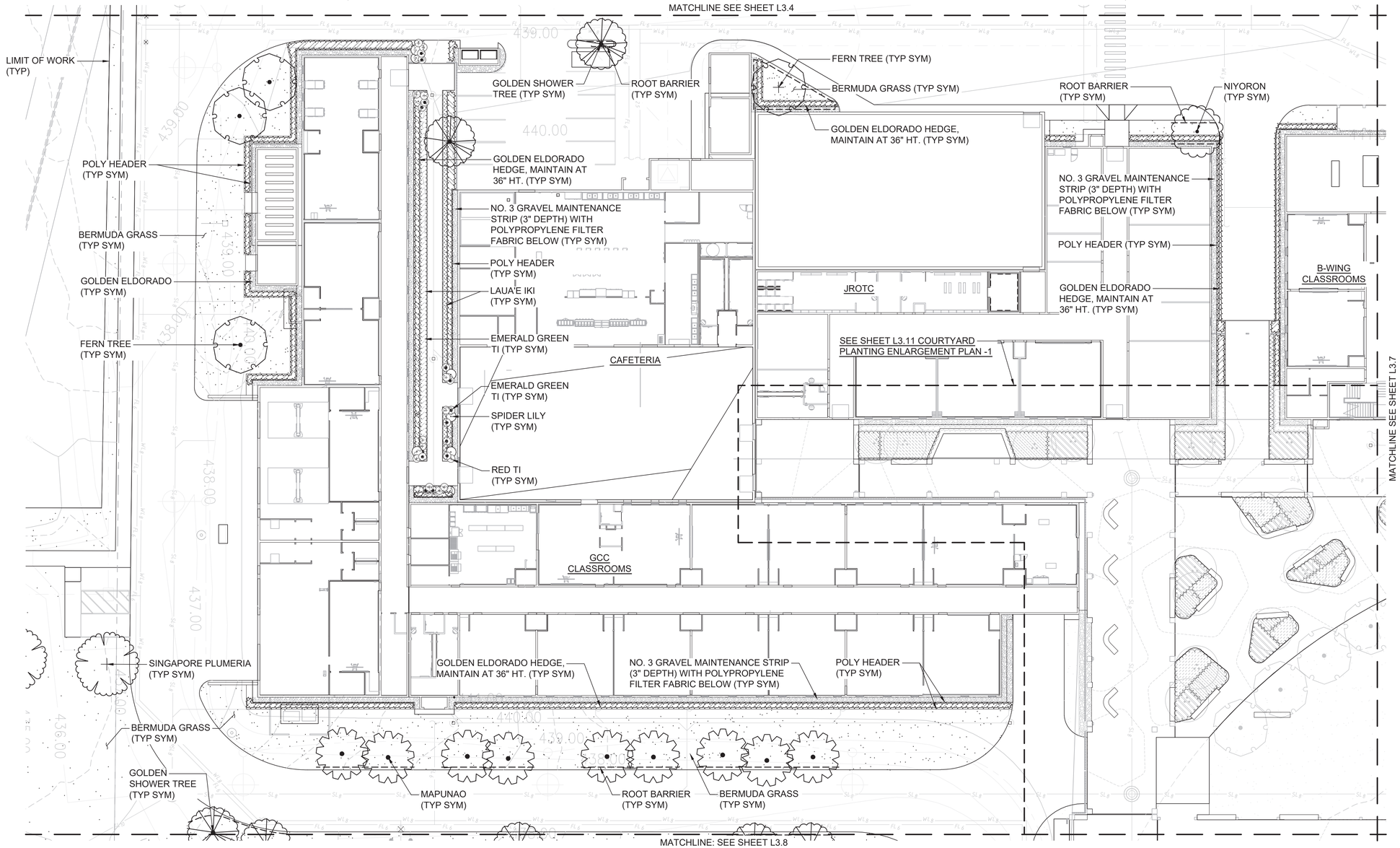

PLANT SCHEDULE 5

TREES	BOTANICAL NAME	COMMON NAME
	AGLAIA MARIANNENSIS	MAPUNAO
	CASSIA FISTULA	GOLDEN SHOWER TREE
	CORDIA SUBCORDATA	NIYORON
	FILICIUM DECIPIENS	FERN TREE
	FILICIUM DECIPIENS	FERN TREE
	PLUMERIA OBTUSA	SINGAPORE PLUMERIA

SHRUB AREAS		
	PSEUDERANTHEMUM RETICULATUM	GOLDEN ELDORADO
TURF		
	CYNODON DACTYLON	BERMUDA GRASS

MISCELLANEOUS	
SYMBOL	DESCRIPTION
	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

GRAPHIC SCALE
20' 0' 20' 40'
Scale: 1"=20'

NORTH

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: PARTIAL PLANTING PLAN - 5

PROGRAMMING DOCUMENT

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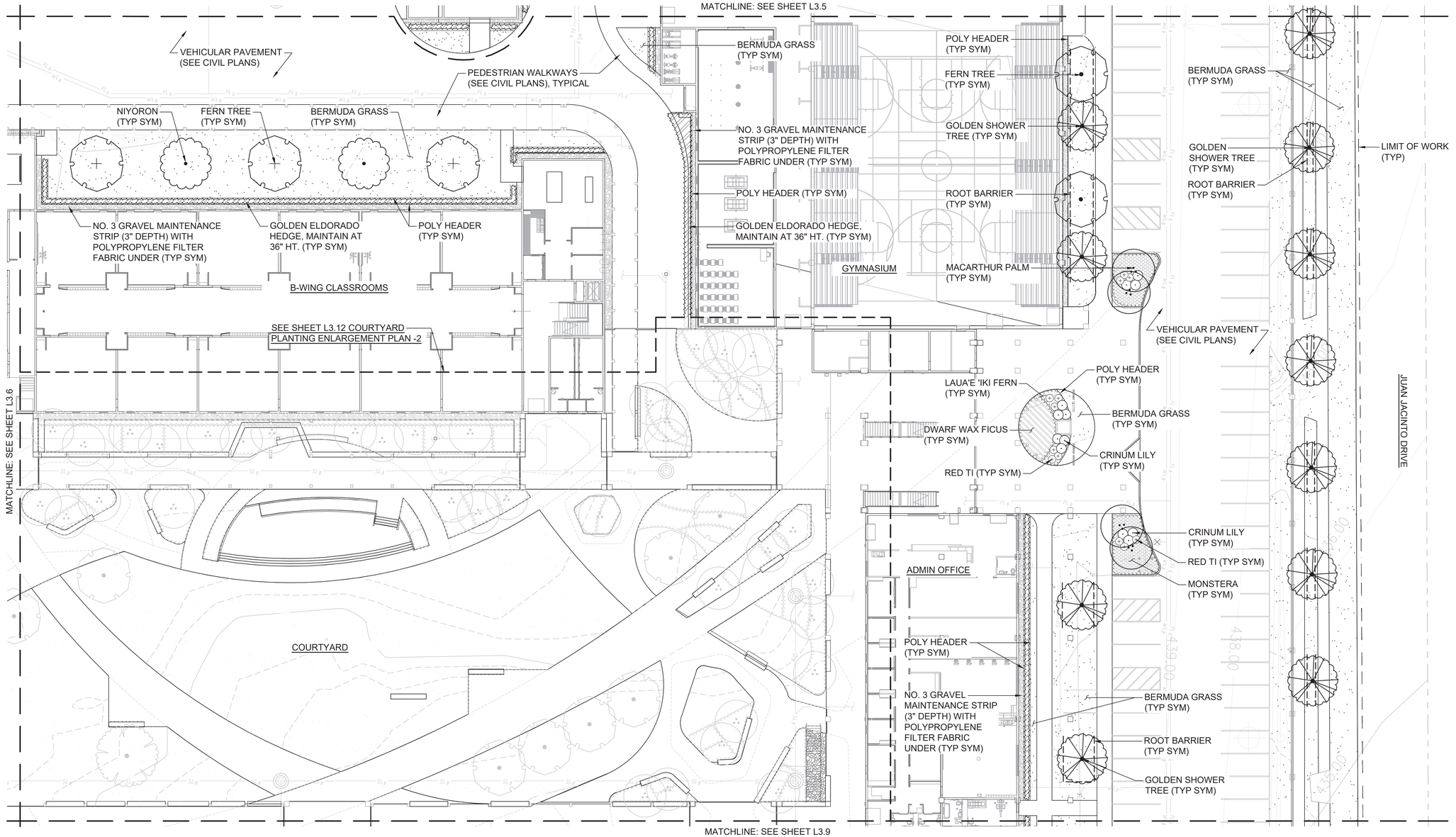

PLANT SCHEDULE 6

TREES	BOTANICAL NAME	COMMON NAME
	CASSIA FISTULA	GOLDEN SHOWER TREE
	CORDIA SUBCORDATA	NIYORON
	FILICIUM DECIPIENS	FERN TREE
	FILICIUM DECIPIENS	FERN TREE

PALM		
	PTYCHOSPERMA MACARTHURII	MACARTHUR PALM

SHRUBS		
	CORDYLINE FRUTICOSA 'RED'	RED TI PLANT
	CRINUM ASIATICUM	CRINUM LILY

SHRUB AREAS		
	PSEUDERANTHEMUM RETICULATUM	GOLDEN ELDORADO

GROUND COVERS		
	FICUS MICROCARPA 'GREEN ISLAND'	DWARF WAX FICUS
	MICROSORUM SCOLOPENDRIA 'LAUA'E IKI'	LAUA'E IKI FERN
	MONSTERA DELICIOSA	MONSTERA

MISCELLANEOUS	
SYMBOL	DESCRIPTION
– – – – – – –	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
— — — —	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

GRAPHIC SCALE
20' 0' 20' 40'
Scale: 1"=20'

NORTH

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISIONS

No.	Description	Date

TRMA
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Interior Design

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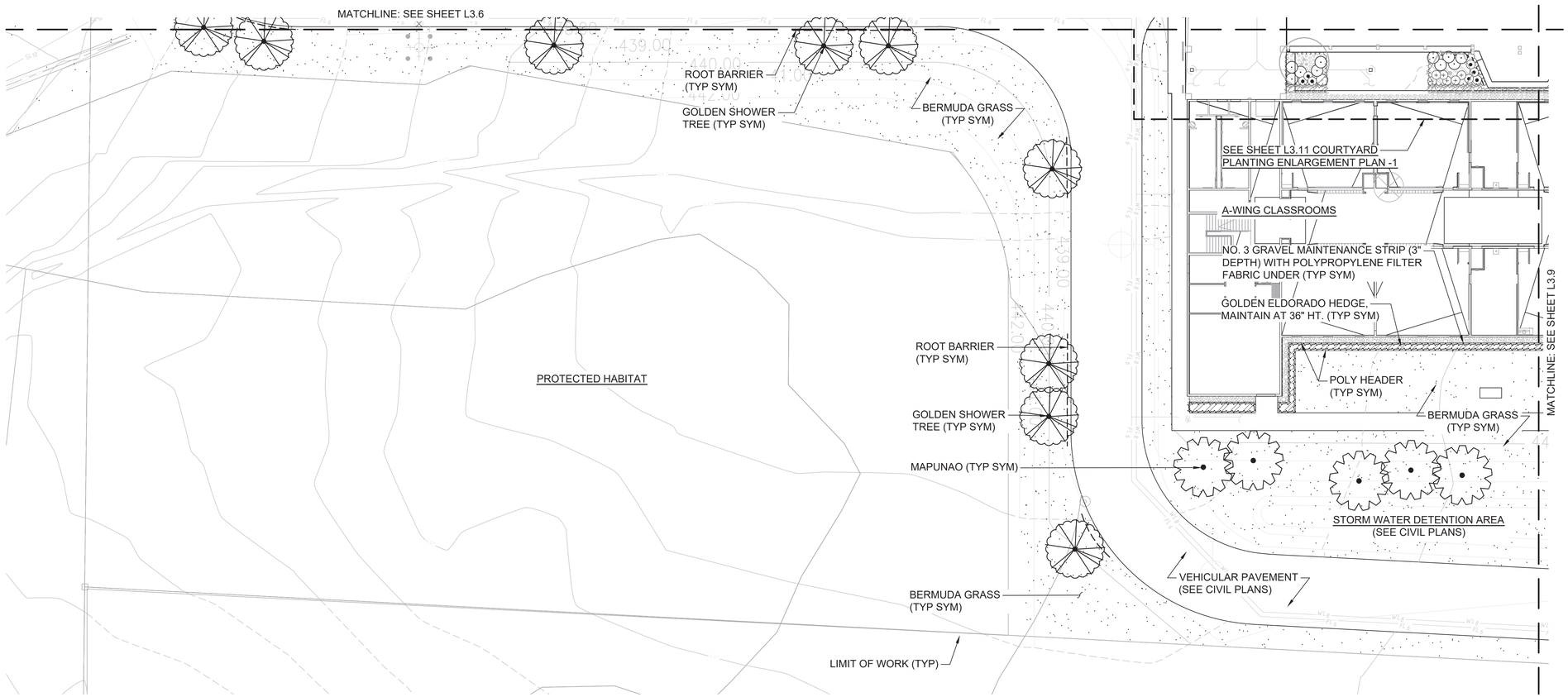
HONOLULU, HI 96819
WWW.BOWERSANDKUBOTA.COM

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PARTIAL PLANTING PLAN - 6
PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	File

Drawing No.
L3.7
Sheet No. ____ of ____



PLANT SCHEDULE 7

TREES	BOTANICAL NAME	COMMON NAME
	AGLAIA MARIANNENSIS	MAPUNAO
	CASSIA FISTULA	GOLDEN SHOWER TREE
SHRUB AREAS		
	PSEUDERANTHEMUM RETICULATUM	GOLDEN ELDORADO
TURF		
	CYNODON DACTYLON	BERMUDA GRASS

MISCELLANEOUS	
SYMBOL	DESCRIPTION
	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)

GRAPHIC SCALE

20' 0' 20' 40'

Scale: 1"=20'

NORTH

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

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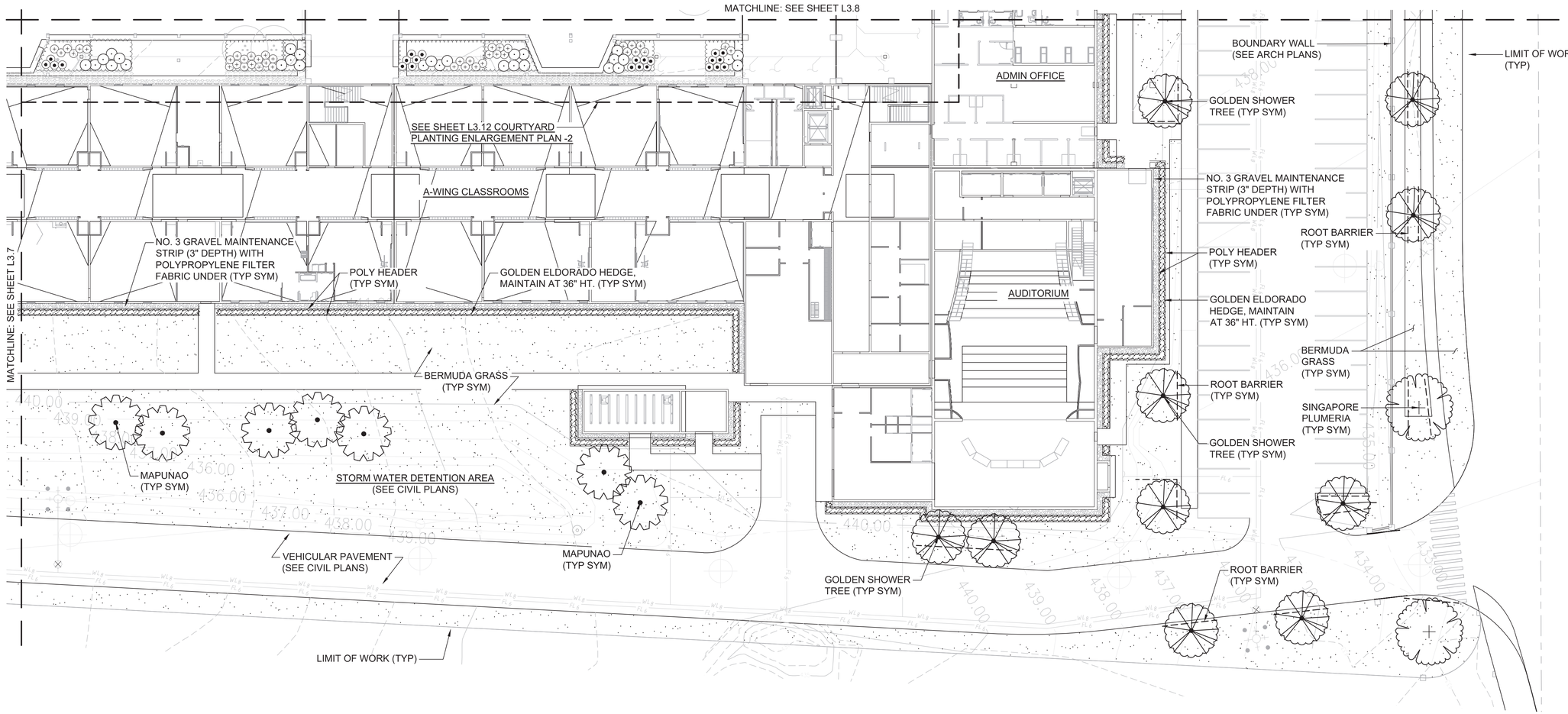
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PARTIAL PLANTING PLAN - 7
PROGRAMMING DOCUMENT

Designed: BCH/B+K
Drawn: CB
Checked: BT
Supv: MG
Scale: AS INDICATED
Date: 3/31/25
Project No.
Title

Drawing No.
L3.8

Sheet No. _____ of _____



PLANT SCHEDULE 8

TREES	BOTANICAL NAME	COMMON NAME
	AGLAIA MARIANNENSIS	MAPUNAO
	CASSIA FISTULA	GOLDEN SHOWER TREE
	JATROPHA INTEGERRIMA	JATROPHA
	PLUMERIA OBTUSA	SINGAPORE PLUMERIA

SHRUB AREAS		
	PSEUDERANTHEMUM RETICULATUM	GOLDEN ELDORADO
TURF		
	CYNODON DACTYLON	BERMUDA GRASS

MISCELLANEOUS	
SYMBOL	DESCRIPTION
	ROOT BARRIER (24" DEPTH), RECYCLABLE, BLACK, INJECTION MOLDED POLYPROPYLENE PANELS
	POLY HEADER (5" LANDSCAPE EDGING, 1 INCH ROUND TOP BEAD, 100% RECYCLED, HIGH GRADE POLYETHYLENE WITH ANCHOR STAKES)
	NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH)

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

GRAPHIC SCALE
20' 0' 20' 40'
Scale: 1"=20'

NORTH

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PARTIAL PLANTING PLAN - 8
PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	
File	

Drawing No.
L3.9
Sheet No. ____ of ____

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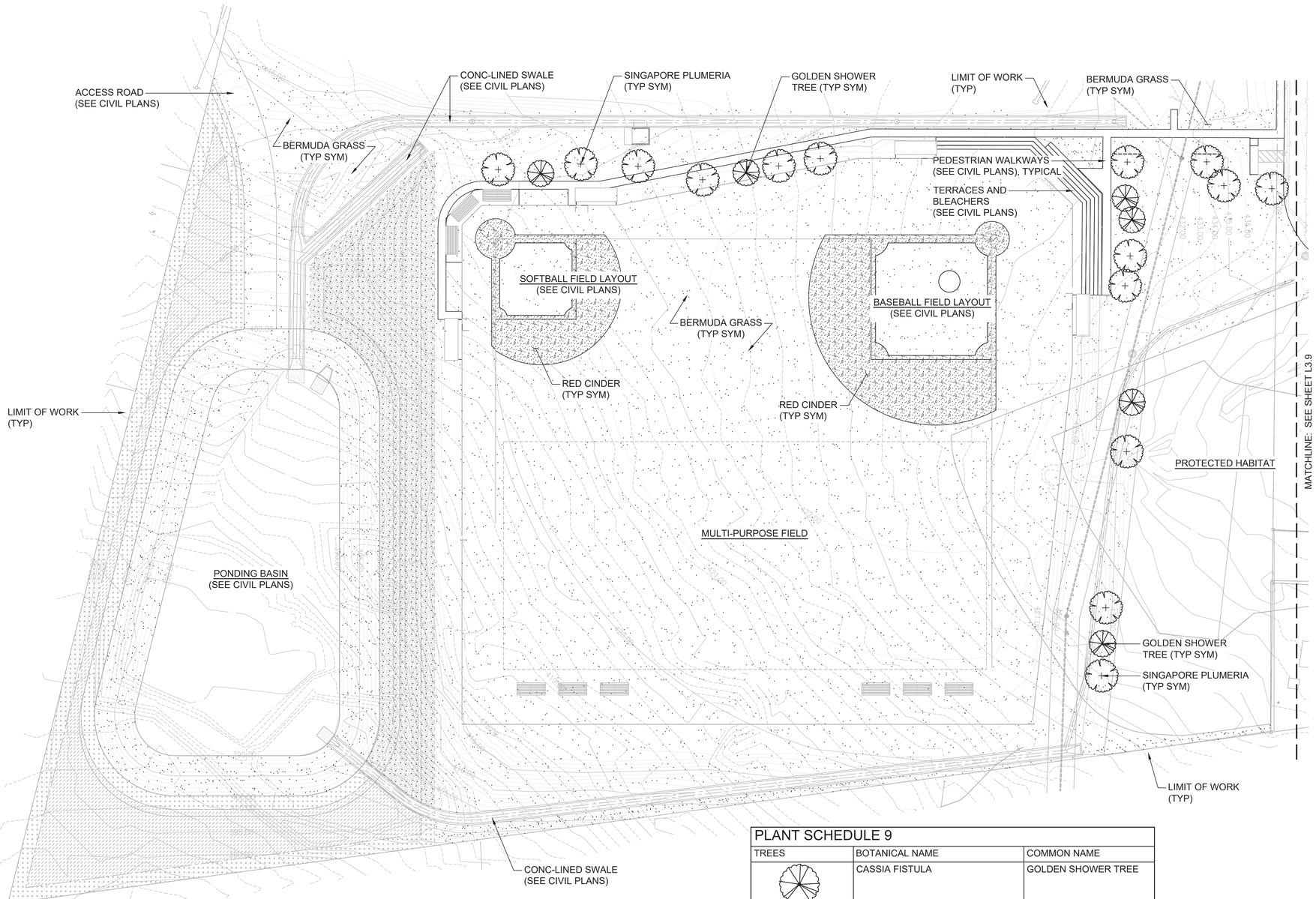

PLANT SCHEDULE 9

TREES	BOTANICAL NAME	COMMON NAME
	CASSIA FISTULA	GOLDEN SHOWER TREE
	PLUMERIA OBTUSA	SINGAPORE PLUMERIA
TURF		
	CYNODON DACTYLON	BERMUDA GRASS
MISCELLANEOUS		
SYMBOL	DESCRIPTION	
	RED CINDER FOR BASEBALL AND SOFTBALL FIELDS	

NOTE:
REFERENCE CIVIL DRAWINGS FOR ALL GRADING, DRAINAGE, PARKING, SIDEWALKS, AND VEHICULAR PAVEMENTS (TYPICAL).

GRAPHIC SCALE

20' 0' 20' 40'

Scale: 1"=20'

NORTH

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PARTIAL PLANTING PLAN - 9
PROGRAMMING DOCUMENT

Designed: BCH/B+K
Drawn: CB
Checked: BT
Supv: MG
Scale: AS INDICATED
Date: 3/31/25
Project No.
File
Drawing No.
L3.10
Sheet No. of

GOLDEN ELDORADO (TYP SYM)
MACARTHUR PALM (TYP SYM)
RED TI (TYP SYM)
EMERALD GREEN TI (TYP SYM)
SPIDER LILY (TYP SYM)
FALSE HEATHER (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH) WITH POLYPROPYLENE FILTER FABRIC UNDER (TYP SYM)
DWARF WAX FICUS (TYP SYM)
SPIDER LILY (TYP SYM)
RED TI (TYP SYM)
DWARF WAX FICUS (TYP SYM)
POLY HEADER (TYP SYM)
FALSE HEATHER (TYP SYM)
SPIDER LILY (TYP SYM)
MACARTHUR PALM (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
LAUA'E IKI (TYP SYM)
SPIDER LILY (TYP SYM)
EMERALD GREEN TI (TYP SYM)
RED TI (TYP SYM)
LAUA'E IKI (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
DWARF WAX FICUS (TYP SYM)
LAUA'E IKI (TYP SYM)
GCC CLASSROOMS
DWARF WAX FICUS (TYP SYM)
MACARTHUR PALM (TYP SYM)
SPIDER LILY (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
RED TI (TYP SYM)
LAUA'E IKI (TYP SYM)
EMERALD GREEN TI (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
SPIDER LILY (TYP SYM)
BERMUDA GRASS (TYP SYM)
MACARTHUR PALM (TYP SYM)
DWARF WAX FICUS (TYP SYM)
EMERALD GREEN TI (TYP SYM)
FERN TREE, 45 GAL (TYP SYM)
ROOT BARRIER (TYP SYM)
BERMUDA GRASS (TYP SYM)
MATCHLINE: SEE SHEET L3.12
SINGAPORE PLUMERIA, 45 GAL (TYP SYM)
ROOT BARRIER (TYP SYM)
MACARTHUR PALM (TYP SYM)
POHINAHINA (TYP SYM)
ROOT BARRIER (TYP SYM)
DWARF WAX FICUS (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
SPIDER LILY (TYP SYM)
FALSE HEATHER (TYP SYM)
EMERALD GREEN TI (TYP SYM)
RED TI (TYP SYM)
SPIDER LILY (TYP SYM)
EMERALD GREEN TI (TYP SYM)
JATROPHA (TYP SYM)
GOLDEN ELDORADO (TYP SYM)
POLY HEADER (TYP SYM)
NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH) WITH POLYPROPYLENE FILTER FABRIC UNDER (TYP SYM)

GRAPHIC SCALE
10' 0' 10' 20'
Scale: 1"=10'

NORTH

1 COURTYARD PLANTING ENLARGEMENT PLAN - 1
SCALE: 1"=10'-0"

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Planning
Interior Design

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: COURTYARD PLANTING ENLARGEMENT PLAN - 1
PROGRAMMING DOCUMENT

Designed:	BCH/B+K
Drawn:	CB
Checked:	BT
Supv:	MG
Scale:	AS INDICATED
Date:	3/31/25
Project No.	Title

Drawing No.: L3.11

Sheet No. _____ of _____

VARIEGATED FLAX LILY (TYP SYM)
GOLDEN ELDORADO (TYP SYM)
DWARF WAX FICUS (TYP SYM)
MACARTHUR PALM (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
RED TI (TYP SYM)
FALSE HEATHER (TYP SYM)
EMERALD GREEN TI (TYP SYM)
SPIDER LILY (TYP SYM)
MACARTHUR PALM (TYP SYM)
DWARF WAX FICUS (TYP SYM)
POHINAHINA (TYP SYM)
MONSTERA (TYP SYM)
RED TI (TYP SYM)
SPIDER LILY (TYP SYM)
POHINAHINA (TYP SYM)
RED TI (TYP SYM)
SPIDER LILY (TYP SYM)
EMERALD GREEN TI (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
DWARF WAX FICUS (TYP SYM)
MACARTHUR PALM (TYP SYM)
RED TI (TYP SYM)
MONSTERA (TYP SYM)
LAUA'E IKI (TYP SYM)
DWARF WAX FICUS (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
EMERALD GREEN TI (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
RED TI (TYP SYM)
EMERALD GREEN TI (TYP SYM)
LAUA'E IKI (TYP SYM)
MACARTHUR PALM (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
SPIDER LILY (TYP SYM)
LAUA'E IKI (TYP SYM)
FERN TREE, 45 GAL (TYP SYM)
MONSTERA (TYP SYM)
MACARTHUR PALM (TYP SYM)
EMERALD GREEN TI (TYP SYM)
SPIDER LILY (TYP SYM)
RED TI (TYP SYM)
MONSTERA (TYP SYM)
LAUA'E IKI (TYP SYM)
BERMUDA GRASS (TYP SYM)
BERMUDA GRASS (TYP SYM)
ROOT BARRIER (TYP SYM)
FERN TREE, 45 GAL (TYP SYM)
MACARTHUR PALM (TYP SYM)
LAUA'E IKI (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
DWARF WAX FICUS (TYP SYM)
BERMUDA GRASS (TYP SYM)
SPIDER LILY (TYP SYM)
RED TI (TYP SYM)
DWARF WAX FICUS (TYP SYM)
EMERALD GREEN TI (TYP SYM)
SPIDER LILY (TYP SYM)
LAUAE ' IKI (TYP SYM)
POHINAHINA (TYP SYM)
FALSE HEATHER (TYP SYM)
VARIEGATED FLAX LILY (TYP SYM)
RED TI (TYP SYM)
SPIDER LILY (TYP SYM)
EMERALD GREEN TI (TYP SYM)
JATROPHA (TYP SYM)
RED TI (TYP SYM)
SPIDER LILY (TYP SYM)
ROOT BARRIER (TYP SYM)
FALSE HEATHER (TYP SYM)
STUDENT PLANTING AREA
RED TI (TYP SYM)
SPIDER LILY (TYP SYM)
POLY HEADER (TYP SYM)
STUDENT PLANTING AREA
GOLDEN ELDORADO (TYP SYM)
EMERALD GREEN TI (TYP SYM)
NO. 3 GRAVEL MAINTENANCE STRIP (3" DEPTH) WITH POLYPROPYLENE FILTER FABRIC UNDER (TYP SYM)
MATCHLINE: SEE SHEET L3.11

GRAPHIC SCALE
10' 0' 10' 20'
Scale: 1"=10'

NORTH

1 COURTYARD PLANTING ENLARGEMENT PLAN - 2
SCALE: 1"=10'-0"

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REVISIONS

No.	Description	Date

TRMA
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
COURTYARD PLANTING ENLARGEMENT PLAN - 2

PROGRAMMING DOCUMENT

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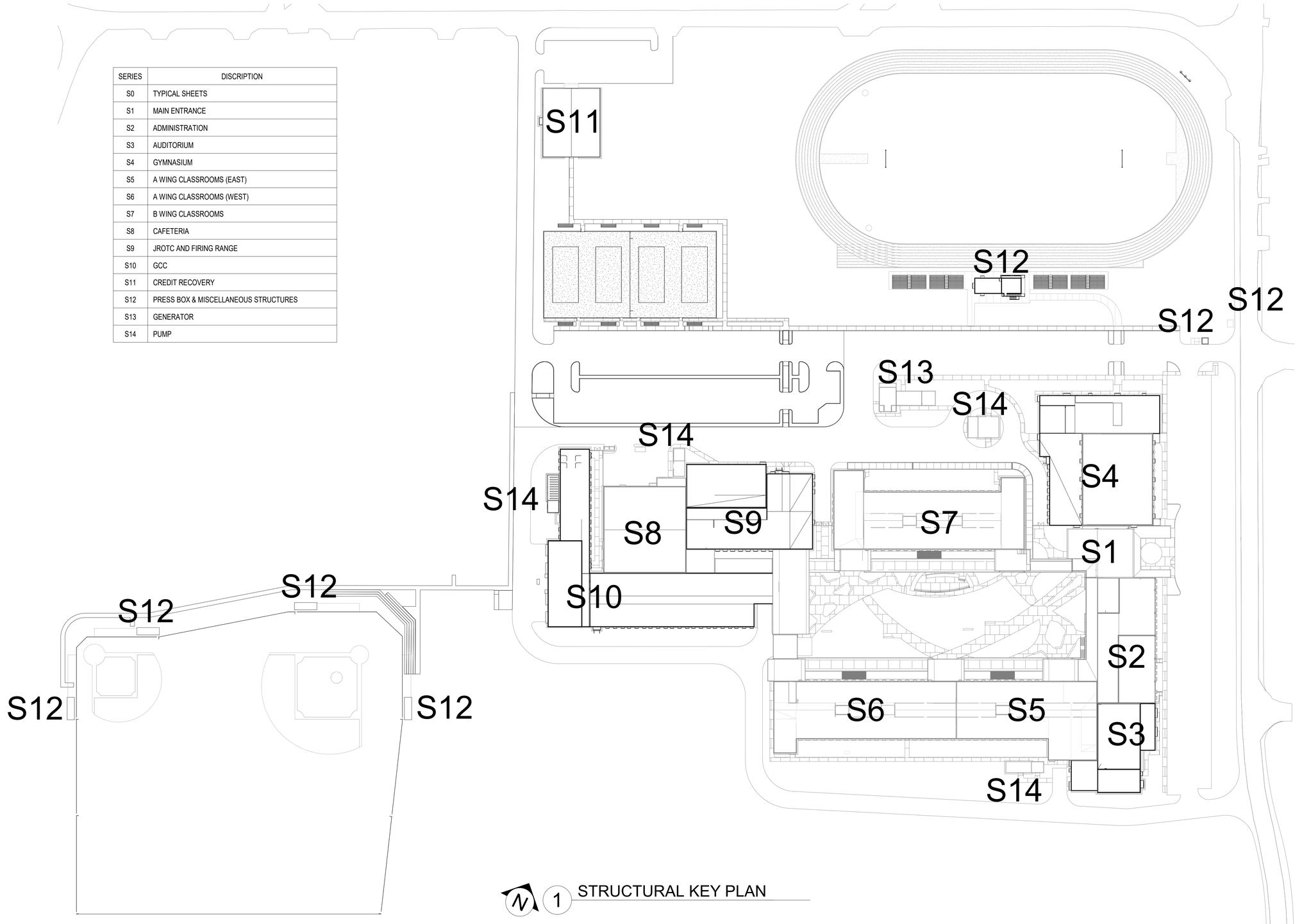
Scale:	AS INDICATED
Date:	3/31/25
Project No.	
File	

Drawing No.
L3.12

Sheet No. ____ of ____

SERIES	DISCRIPTION
S0	TYPICAL SHEETS
S1	MAIN ENTRANCE
S2	ADMINISTRATION
S3	AUDITORIUM
S4	GYMNASIUM
S5	A WING CLASSROOMS (EAST)
S6	A WING CLASSROOMS (WEST)
S7	B WING CLASSROOMS
S8	CAFETERIA
S9	JROTC AND FIRING RANGE
S10	GCC
S11	CREDIT RECOVERY
S12	PRESS BOX & MISCELLANEOUS STRUCTURES
S13	GENERATOR
S14	PUMP



1 STRUCTURAL KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Architecture
Planning
Interior Design

DCA
DUEÑAS · CAMACHO ASSOCIATES
■ ENGINEERING (CIVIL/STRUCTURAL) ■ CONSTRUCTION MANAGEMENT ■ PLANNING
■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
STRUCTURAL KEY PLAN
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S0.0.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

STRUCTURAL DESIGN CRITERIA

1. BASIS OF DESIGN: 2018 INTERNATIONAL BUILDING CODE, ASCE 7-16, ACI 318-14

2. LIVE LOAD:

   OFFICE = 50 PSF CLASSROOM = 40 PSF LIGHT STORAGE = 125 PSF
   CORRIDORS = 100 PSF ROOF = 20 PSF STAIRS & EXIT WAYS = 100 PSF LIBRARY = 150 PSF

3. DEAD LOAD: SECOND FLOOR AND ROOF (FOR JOIST DESIGN)

   METAL DECK = 2 PSF MEMBRANE = 1 PSF MECH & ELEC = 3 PSF MISC. = 10 PSF CONCRETE = 51 PSF
   INSULATION = 2 PSF FIRE PROTECTION = 2 PSF

4. WIND FORCE: (ASCE 7-16)

   BASIC WIND SPEED = SEE SCHEDULE THIS SHEET
   EXPOSURE CATEGORY: C
   RISK CATEGORY = SEE SCHEDULE THIS SHEET
   WIND PRESSURE, P = qz GCp - qh (GCpi)
   GUST FACTOR, G = 0.85
   Cp = EXTERNAL PRESSURE COEFFICIENT FROM ASCE 7-16 FIG. 27.3-1 OR 27.3-3
   (GCpi) = INTERNAL PRESSURE COEFFICIENT FROM ASCE 7-16 FIG. 26.13-1
   VELOCITY PRESSURE, qz = 0.00256 Kz Kzt Kd Ke V^2 PSF
   WHERE: TOPOGRAPHIC FACTOR, Kzt = 1.0
   WIND DIRECTIONALITY FACTOR, Kd = 0.85
   GROUND ELEVATION FACTOR, Ke = 1.0
   Kz = VELOCITY PRESSURE EXPOSURE COEFFICIENT FROM ASCE 7-16 TABLE 26.10-1
   qh = THE VELOCITY PRESSURE AT MEAN ROOF HEIGHT

4. SEISMIC FORCE (IBC 2018)

   ECCENTRICITY RATIO = 5%
   RESPONSE MODIFICATION FACTOR, SEE SCHEDULE THIS SHEET
   SEISMIC IMPORTANCE FACTOR = SEE SCHEDULE THIS SHEET
   0.2 SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), Ss = 2.82g
   1 SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), S1 = 0.698g
   LONG - PERIOD TRANSITION PERIOD = 12 s
   SITE CLASS: C
   RISK CATEGORY: SEE SCHEDULE THIS SHEET
   SEISMIC DESIGN CATEGORY: D
   Sds = 2.26 g
   Sd1 = 0.652 g

5. REINFORCING STEEL:

   UNCOATED DEFORMED BARS: - - - - - - - - - FY = 60,000 PSI

   DEFORMED REINFORCEMENT SHALL COMPLY WITH ASTM A706, GRADE 60, ASTM A615 GRADE 60 REINFORCEMENT SHALL BE PERMITTED IF:
   - THE ACTUAL YIELD STRENGTH BASED ON MILL TESTS DOES NOT EXCEED Fy BY MORE THAN 18,000 PSI; AND;
   - THE RATIO OF THE ACTUAL TENSILE STRENGTH TO THE ACTUAL YIELD STRENGTH IS NOT LESS THAN 1.25.

6. LOAD COMBINATIONS (IBC 2018)

DL = DEAD LOAD	COMBO 1:	1.4 (DL)
FL = FLOOR LOAD	COMBO 2:	1.2 (DL) + 1.6 (FL) + 0.5 (RL)
RL = ROOF LOAD	COMBO 3:	1.2 (DL) + 1.6 (RL) + 0.5 (FL)
WL = WIND LOAD	COMBO 4 THRU 7:	1.2 (DL) + 1.6 (WLX / WLY) + 0.5 (FL) +0.5 (RL)
EQ = EARTHQUAKE LOAD	COMBO 8 THRU 11:	1.2 (DL) + 1.0 (EQX / EQY) + 0.5 (FL)
WR = ROOF WIND LOAD	COMBO 12 THRU 15:	0.9 (DL) + 1.6 (WLX / WLY)
	COMBO 16 THRU 19:	0.9 (DL) + 1.0 (EQX / EQY)

7. CONCRETE COVER:

   TOP OF ROOF SLABS: - 1 1/2"
   BOTTOM OF INTERIOR ROOF SLABS: - 1"
   TOP & BOTTOM OF EXTERIOR ROOF SLABS: - 1 1/2"
   TOP & BOTTOM OF INTERIOR FLOOR SLABS: - 1"
   PRECAST WALL: - 3/4"
   WALLS (SMALLER THAN 10"): - 1 1/2"
   WALLS (10" AND GREATER): - 2"
   WALLS W/ REVEALS (AT REVEAL SIDE ONLY) - REVEAL DEPTH +WALL COVER
   BEAMS (SMALLER THAN 12"): - 1 1/2"
   BEAMS (12" AND GREATER): - 2"
   COLUMNS: - 2"
   FORMED FOOTINGS: - 2"
   WALLS, SLABS AND FOOTING CAST AGAINST EARTH: - - - - - - - - - - - - - - - - - - 3"
   WALLS, SLABS AND FOOTING IN CONTACT WITH FLUIDS: - - - - - - - - - - - - - - - - 2"

8. CONCRETE STRENGTH:

   FOOTING: - f 'c = 4,000 PSI
   SLAB ON GRADE: - f 'c = 4,000 PSI
   CONCRETE TOPPING: - f'c = 4,000 PSI
   COLUMNS, WALLS, BEAMS, SUSPENDED SLABS: - f 'c = 4,000 PSI
   OTHERS: - f 'c = 4,000 PSI

9. ALLOWABLE SOIL BEARING PRESSURES:

DL + LL	DL + LL + EQ or WL
4,000 PSF	5,330 PSF

10. STRUCTURAL STEEL:

    SHAPES and PLATES: - ASTM A36, Fy = 36 KSI
    TUBES and PIPES: - ASTM A 500B, Fy = 46 KSI
    BOLTS: - ASTM A325
    ANCHOR BOLTS: - ASTM A307
    WELDING ELECTRODE: - E70XX

WIND FORCE AND SEISMIC FORCE SCHEDULE

STRUCTURAL #	DISCRIPTION	RISK CATEGORY	IMPORTANCE FACTOR	RESPONCE MODIFICATION FACTOR	BASIC WIND SPEED (MPH)
S1	MAIN ENTRANCE	IV	1.5	8	220
S2	ADMINISTRATION	III	1.25	6	210
S3	AUDITORIUM	III	1.25	5	210
S4	GYMNASIUM	IV	1.5	5	220
S5	A-WING CLASSROOMS (EAST)	III	1.25	5	210
S6	A-WING CLASSROOMS (WEST)	III	1.25	5	210
S7	B-WING CLASSROOMS	III	1.25	5	210
S8	CAFETERIA	III	1.25	5	210
S9	JROTC	III	1.25	5	210
S10	GCC	III	1.25	5	210
S11	CREDIT RECOVERY	II	1	5	195
S12	PRESS BOX & MISCELLANEOUS STRUCTURES	II	1	5	195
S13	GENERATOR	II	1	5	195
S14	PUMP	II	1	5	195
MISC	WALKWAYS	IV	1.5	8	220
	LIGHTING / FOUNDATION	II	1	5	195

FOUNDATION SUBGRADE PREPARATION AND FOUNDATION NOTES

THE FOLLOWING "STRUCTURAL FOUNDATION SUPPORT AND SUBGRADE PREPARATION NOTES" WERE TAKEN FROM THE GEOTECHNICAL INVESTIGATION REPORT FOR THE "SUBSURFACE SOIL INVESTIGATION NEW SIMON SANCHEZ HIGH SCHOOL, YIGO, GUAM PREPARED BY: GEO-ENGINEERING & TESTING, INC..; DATED: 31 AUGUST 2022.

SUBGRADE IMPROVEMENTS: DURING CONSTRUCTION, THE FOLLOWING STRUCTURAL FOUNDATION SUBGRADE IMPROVEMENTS SHOULD BE MADE, WHICHEVER IS APPLICABLE:

1. WHERE FOUNDATION EXCAVATION EXPOSES MODERATELY HARD TO HARD CORALLINE LIMESTONE ROCK, IT MAY BE STOPPED AFTER REACHING THE DESIGNED FOOTING DEPTH; CLEAN THE ROCK SURFACE AS NEEDED. IF THE EXPOSED ROCK SURFACE IS HARD AND UNEVEN, LEVEL IT WITH LEAN CONCRETE OR SAND-CEMENT MIXTURE HAVING AT LEAST 1500 PSI (POUNDS PER SQUARE INCH) 28-DAY COMPRESSIVE STRENGTH, WITH MINIMUM 1 INCH ABOVE HIGHEST POINT OF THE ROCK SURFACE.

2. IF THE EXPOSED SURFACE IS NATIVE CORALLINE LIMESTONE AND/OR DENSE LIMESTONE SAND/GRAVEL SOIL AND IT CAN BE SCARIFIED, SCARIFY AND LEVEL THE UPPER 4 TO 6 INCHES, MOISTURE CONDITION AS NECESSARY AND COMPACT TO AT LEAST 95 PERCENT OF ITS MOD WITH A UNIFORM, DENSE AND UNYIELDING SURFACE.

3. IN THE EVENT THE EXPOSED FOUNDATION SUBGRADE SURFACE IS VERY WEAK (SOIL-LIKE) CORALLINE LIMESTONE OR CLAYEY SILTY SOIL, IT LOOSE TO MEDIUM DENSE SAND/GRAVEL SHOULD BE EXCAVATED ENTIRELY OR TO A MINIMUM DEPTH TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION. THEREAFTER, SCARIFY THE EXPOSED SURFACE TO APPROXIMATELY 6 INCHES DEEP, MOISTURE CONDITION AS NECESSARY AND COMPACT TO AT LEAST 95 PERCENT OF ITS MOD WITH A DENSE AND UNYIELDING SURFACE. APPROVED LIMESTONE SILTY SAND/GRAVEL BACKFILL SOIL SHOULD BE PLACED IN 8-INCH LOOSE LAYERS, MOISTURE CONDITIONED AS NECESSARY AND COMPACTED TO AT LEAST 95 PERCENT OF ITS MOD WITH A UNIFORM, DENSE AND UNYIELDING SURFACE. NOTE THAT PART OF THE EXCAVATED SOILS MAY BE REUSABLE.

4. HARD ROCK EXCAVATION - IN GENERAL, THE ON-SITE CORALLINE LIMESTONE ROCK WILL BE DIFFICULT TO EXCAVATE AND WILL REQUIRE AN EXCAVATOR WITH VIBRATORY ROCK BREAKER. THE CONTRACTOR SHOULD BE RESPONSIBLE FOR THE EXCAVATIONS AND THE SAFETY OF MEN AND EQUIPMENT WORKING WITH AND AROUND THE EXCAVATIONS.

GENERAL STRUCTURAL NOTES

1. ALL WORK SHALL COMPLY WITH ALL APPLICABLE PROVISIONS AND MINIMUM STANDARDS OF THE 2018 INTERNATIONAL BUILDING CODE (IBC) AND ANY OTHER REGULATING AGENCIES, CODES, AND STANDARDS HAVING AUTHORITY OVER ANY PORTION OF THE WORK.

2. "GENERAL STRUCTURAL NOTES" AND TYPICAL DETAILS SHOWN ON THESE "S0" SHEETS APPLY TO ALL STRUCTURAL DRAWINGS UNLESS NOTED OR SHOWN OTHERWISE.

3. FEATURES OF CONSTRUCTION SHOWN ON THE "S0" SHEETS ARE TYPICAL AND SHALL APPLY GENERALLY THROUGHOUT THE STRUCTURAL DRAWINGS FOR SIMILAR CONDITIONS.

4. REFER TO THE ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS AND LAYOUTS UNLESS NOTED OR SHOWN OTHERWISE ON THESE STRUCTURAL DRAWINGS.

5. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LAYOUTS BEFORE THE START OF ANY WORK AND SHALL IMMEDIATELY NOTIFY THE CONTRACTING OFFICER (CO) IN WRITING OF ANY DISCREPANCIES THAT MAY AFFECT THE DESIGN INTENT. RESOLUTION OF THE DISCREPANCY MUST BE RECEIVED IN WRITING FROM THE CONTRACTING OFFICER (ARCHITECT/ENGINEER) BEFORE PROCEEDING WITH THE WORK.

6. IF EQUIPMENT IS TO BE HOUSED IN A FACILITY, ROOM OR BUILDING, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM WITH THE EQUIPMENT MANUFACTURER AND DESIGNER ENGINEER OF RECORD (EOR) THAT THE INTENDED LAYOUT, ANCHORING, AND DIMENSIONS MEETS THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.

7. REFER TO THE CIVIL "C" DRAWINGS FOR EXTERIOR SLAB ON GRADE (WALKWAY) AND CONCRETE DRIVEWAY DIMENSIONS AND DETAILS.

8. THE CONTRACTOR SHALL COORDINATE AND CONFIRM ALL SLAB ELEVATIONS WITH THE CIVIL "C" DRAWINGS.

9. REFER TO THE ARCHITECTURAL "A" AND MECHANICAL "M" DRAWINGS FOR SLAB DEPRESSIONS AND SLOPES AS REQUIRED FOR VARIOUS FLOOR FINISHES, FLOOR DRAINS, ROOF DRAINS, AND ROOF SLOPES.

10. DO NOT REMOVE SHORING OF CONCRETE MEMBER(S) BEFORE THE CONCRETE HAS ATTAINED THE SPECIFIED CONCRETE COMPRESSIVE STRENGTH.

11. DO NOT IMPOSE LOADS ONTO UNSUPPORTED CONCRETE MEMBER(S) BEFORE THE CONCRETE IN THOSE MEMBER(S) HAS ATTAINED THE SPECIFIED CONCRETE COMPRESSIVE STRENGTH.

12. OPENINGS, NOTCHES, POCKETS, REVEALS AND/OR ETCHINGS, ETC. SHALL NOT BE PLACED IN STRUCTURAL MEMBERS UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS. NOTIFY THE CO IN WRITING WHEN WORK REQUIRES THESE ELEMENTS IN THE STRUCTURAL MEMBERS AND ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. RESOLUTION TO THE DISCREPANCY MUST BE RECEIVED IN WRITING FROM THE CONTRACTING OFFICER (ARCHITECT/ENGINEER)BEFORE PROCEEDING WITH THE WORK.

13. THE PROJECT SPECIFICATIONS FORM A PART OF THE CONTRACT DOCUMENTS.

14. DRAWINGS SHALL NOT BE SCALED.

15. PRIOR TO SUBMITTING SHOP DRAWINGS AND PRODUCT DATA, THE CONTRACTOR SHALL VERIFY THAT THE SUBMITTALS MEET THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL SPECIFICALLY NOTE ANY EXCEPTIONS TO THESE REQUIREMENTS WITHIN THE SUBMITTALS.

16. WHERE THE WEIGHT OF EQUIPMENT OR MATERIALS BEING STORED OR TRANSPORTED TO LOCATION EXCEEDS THE DESIGN LIVE LOAD OF THE AFFECTED AREAS, THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING OR OTHER LOAD SPREADING MEANS TO DISTRIBUTE THE STORED OR TRANSPORTED WEIGHT. THE DESIGN OF SUCH TEMPORARY SHORING IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

17. THE CONTRACTOR SHALL COORDINATE ALL PENETRATIONS BELOW AND ABOVE GRADE (I.E., PIPE PENETRATIONS, OPENINGS REQUIRED FOR EQUIPMENT, ETC.) THROUGH THE STRUCTURAL SUPPORTING ELEMENTS BETWEEN DISCIPLINES AND SHALL IMMEDIATELY NOTIFY THE CONTRACTING OFFICER (ARCHITECT/ENGINEER) IN WRITING OF ANY DISCREPANCIES AND/OR CONFLICTS THAT MAY AFFECT THE DESIGN INTENT. RESOLUTION TO THE DISCREPANCY MUST BE RECEIVED IN WRITING FROM THE CONTRACTING OFFICER (ARCHITECT/ENGINEER) BEFORE PROCEEDING WITH THE WORK.

    ALL PENETRATIONS, TO INCLUDE PENETRATIONS THROUGH CONCRETE FOUNDATIONS, FOUNDATION WALLS, WALLS AND BEAMS SHALL BE INCLUDED IN THE SHOP DRAWINGS AND SHALL BE SUBJECT FOR REVIEW AND APPROVAL.

    PENETRATIONS THROUGH THE OPEN WEB STEEL JOIST AND JOIST GIRDER SHALL BE PER THE APPROVAL OF THE JOIST OR JOIST GIRDER MANUFACTURER.

    IF A PENETRATION WAS MISSED IN THE SHOP DRAWING AND/OR CONCRETE POUR, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONTRACTING OFFICER (ARCHITECT/ENGINEER) IN WRITING. THE CONTRACTOR SHALL NOT CORE OR ATTEMPT TO CHIP THE STRUCTURE TO PROVIDE FOR THIS MISSED PENETRATION WITHOUT WRITTEN CONSENT AND APPROVAL FROM THE CONTRACTING OFFICER (ARCHITECT/ENGINEER).

    REFER TO THE RESPECTIVE DISCIPLINE REQUIRING THE PENETRATION FOR EXACT SIZE AND LOCATION OF THE PENETRATION.

    REFER TO "S0" SHEETS FOR TYPICAL PENETRATION DETAILS UNLESS NOTED OTHERWISE.

18. CONCRETE EQUIPMENT PADS (I.E., PADS FOR ELECTRICAL EQUIPMENT, GENERATOR, MECHANICAL EQUIPMENT, A/C EQUIPMENT, ETC.) SHOWN ON THE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY UNLESS NOTED OTHERWISE. REFER TO THE RESPECTIVE DISCIPLINE REQUIRING THE EQUIPMENT PAD FOR ITS EXACT SIZE AND LOCATION.

    REFER TO THE "S0" SHEETS FOR TYPICAL EQUIPMENT PAD ON GRADE OR ON SUSPENDED SLAB PAD DETAILS UNLESS NOTED OTHERWISE.

19. PIPE SUPPORTS (I.E. PIPE HANGERS, PIPE CONCRETE SUPPORTS/CRADLES, PIPE STEEL SUPPORT, PIPE RACK FRAME, PIPE CONCRETE ENCASEMENT, ETC.) IF SHOWN ON THESE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY UNLESS NOTED OTHERWISE. REFER TO THE RESPECTIVE DISCIPLINE REQUIRING THE PIPE SUPPORTS FOR ITS EXACT SIZE, LOCATION, AND DETAILS UNLESS NOTED OTHERWISE IN THESE STRUCTURAL PLANS.

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REVISION

No.	Description	Date

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P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: ____-____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
STRUCTURAL DESIGN CRITERIA AND NOTES
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S0.1.1
Sheet No. _____ of _____

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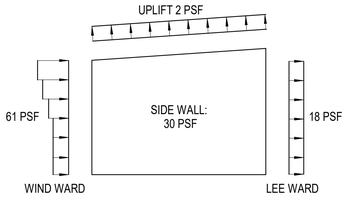
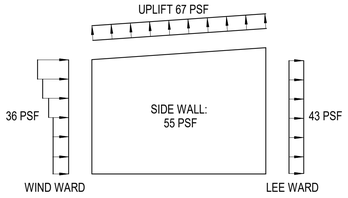
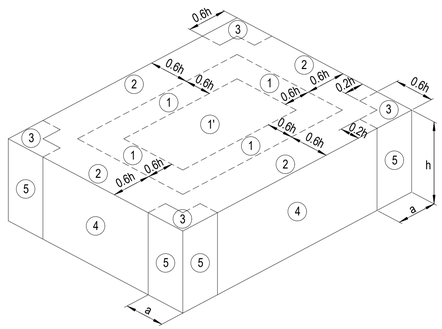


NEGATIVE INTERNAL PRESSURE



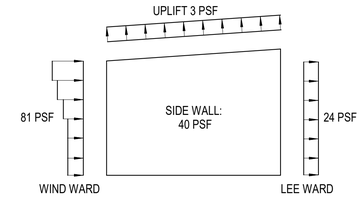
POSITIVE INTERNAL PRESSURE

	ZONE	EFFECTIVE WIND AREA (SF)	POSITIVE PRESSURE (INWARD) (PSF)	NEGATIVE PRESSURE (OUTWARD) (PSF)
ROOF	1'	10	34	76
		20	31	76
		50	28	76
		100	27	76
	1	10	34	133
		20	31	122
		50	28	112
		100	27	104
	2	10	34	175
		20	31	164
		50	28	148
		100	27	138
	3	10	34	238
		20	31	216
		50	28	188
		100	27	164
WALLS	4	10	83	90
		20	80	87
		50	73	83
		100	69	76
	5	10	83	112
		20	80	104
		50	73	94
		100	69	87



COMPONENTS AND CLADDING
(CREDIT RECOVERY)

1 DESIGN WIND PRESSURE



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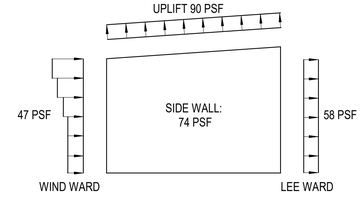
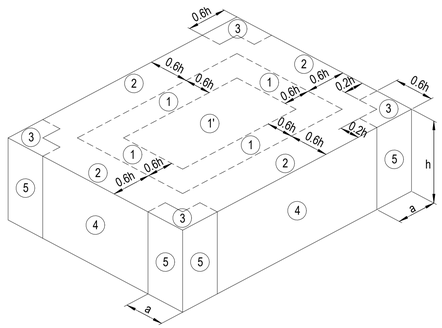


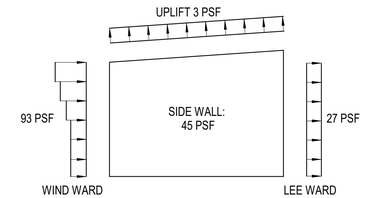
POSITIVE INTERNAL PRESSURE

	ZONE	EFFECTIVE WIND AREA (SF)	POSITIVE PRESSURE (INWARD) (PSF)	NEGATIVE PRESSURE (OUTWARD) (PSF)
ROOF	1'	10	46	103
		20	41	103
		50	37	103
		100	36	103
	1	10	46	178
		20	41	164
		50	37	150
		100	36	140
	2	10	46	235
		20	41	221
		50	37	199
		100	36	186
	3	10	46	320
		20	41	290
		50	37	252
		100	36	221
WALLS	4	10	112	122
		20	107	117
		50	98	112
		100	93	103
	5	10	112	150
		20	107	140
		50	98	126
		100	93	117

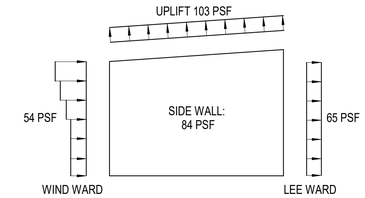


COMPONENTS AND CLADDING
(ADMINISTRATION, AUDITORIUM, A WING, B WING,
CAFETERIA, JROTC AND FIRING RANGE, GCC)

2 DESIGN WIND PRESSURE

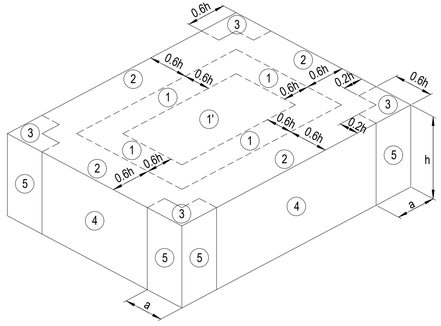


NEGATIVE INTERNAL PRESSURE



POSITIVE INTERNAL PRESSURE

	ZONE	EFFECTIVE WIND AREA (SF)	POSITIVE PRESSURE (INWARD) (PSF)	NEGATIVE PRESSURE (OUTWARD) (PSF)
ROOF	1'	10	52	117
		20	47	117
		50	43	117
		100	42	117
	1	10	52	204
		20	47	188
		50	43	171
		100	42	160
	2	10	52	269
		20	47	253
		50	43	228
		100	42	213
	3	10	52	366
		20	47	332
		50	43	288
		100	42	253
WALLS	4	10	128	139
		20	123	134
		50	112	128
		100	107	117
	5	10	128	171
		20	123	161
		50	112	144
		100	107	134



COMPONENTS AND CLADDING
(GYMNASIUM)

3 DESIGN WIND PRESSURE

NOTATION

a = 10% LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 3 FEET.

EXCEPTION: FOR BUILDING WITH 0 = 0 DEGREE TO 7 DEGREE AND A LEAST HORIZONTAL DIMENSION GREATER THAN 300 FEET, DIMENSION A SHALL BE LIMITED TO A MAXIMUM OF 0.8h.

h = MEAN ROOF HEIGHT, IN FEET, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR 0 ≤ 10 DEGREE.
0 = ANGLE OF PLANE OF ROOF FROM HORIZONTAL, IN DEGREES.

REVISION

No.	Description	Date

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Project

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title

DESIGN WIND PRESSURE
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

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Sheet No._____ of _____

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TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE		CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCED
1	INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS AND PLACEMENT.	-	X	ACI 3 1 8: CH 20, 25.2, 25.3, 26.6.1 - 26.6.3	1908.4
2	REINFORCING BAR WELDING:	-	-	AWS D1.4 ACI 318: 26.6.4	1904.1, 1904.2, 1908.2, 1908.3 1908.1 0
	A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706;	-	X		
	B. INSPECT SINGLE - PASS FILLET WELDS, MAXIMUM 5/16"; AND	-	X		
	C. INSPECT ALL OTHER WELDS.	X	-		
3	INSPECT ANCHOR CAST IN CONCRETE.	-	X	ACI 318: 17.8.2	-
4	INSPECT ANCHORS POST INSTALLED IN HARDENED CONCRETE MEMBER.	-	-	ACI 318: 17.8.2.4 ACI 318: 17.8.2	-
	A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATION TO RESIST SUSTAINED TENSION LOADS.	X	-		
	B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.a.	-	X		
5	VERIFY USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: CH 19, 26.4.3, 26.4.4	
6	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TEST, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C172 ASTM C3 1 ACI 318: 26.5, 26.12	
7	INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8	VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	ACI 318: 26.5.3 - 26.5.5	1908.9
9	INSPECT PRESTRESSED CONCRETE FOR:	-	-	ACI 318: 26.10	-
	A. APPLICATION OF PRESTRESSING FORCES; AND	X	-		
	B. GROUTING OF BONDED PRESTRESSING TENDONS.	X	-		
10	INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	ACI 318: 26.9	-
11	VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	X	ACI 318: 26.1 1.2	-
12	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 26.1 1.1.2(b)	-

SPECIAL STRUCTURAL INSPECTIONS AS PER THE 2018 INTERNATIONAL BUILDING CODE (IBC)

1. SPECIAL INSPECTION AND TESTING SHALL BE PER IBC 2018 CHAPTER 17 TITLE "SPECIAL INSPECTIONS AND TESTING" REQUIREMENTS UNLESS NOTED OTHERWISE.
2. REFER TO SECTION 1704 FOR THE OWNER'S AND CONTRACTOR'S RESPONSIBILITY AND TESTS FOR SPECIAL INSPECTIONS AND FOR ALL WORK NOTED IN THE SPECIAL INSPECTION TABLES (SHOWN ON THIS SHEET).
3. REFER TO SECTION 1704.2.1 FOR SPECIAL INSPECTOR QUALIFICATIONS. PRIOR TO THE START OF THE CONSTRUCTION, THE APPROVED AGENCIES SHALL PROVIDE WRITTEN DOCUMENTATION TO THE BUILDING OFFICIAL DEMONSTRATING THE COMPETENCE AND RELEVANT EXPERIENCE OR TRAINING OF THE SPECIAL INSPECTORS WHO WILL PERFORM THE SPECIAL INSPECTIONS AND TESTS DURING CONSTRUCTION.
4. DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:
   - A. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED FOR THE CONFORMANCE WITH THE APPROVED DESIGN DRAWING AND SPECIFICATION. THE INSPECTOR MAY NOT ALTER, MODIFY OR WAVE ANY OF THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
   - B. THE SPECIAL INSPECTOR SHALL KEEP RECORDS OF INSPECTIONS AND FURNISH INSPECTOR REPORTS TO THE GOVERNMENT/OWNER, THE CONTRACTING OFFICER, THE BUILDING OFFICIAL, THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND THE CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE GOVERNMENT/OWNER, THE CONTRACTING OFFICER AND THE CONTRACTOR FOR CORRECTIVE ACTION. IF CORRECTIVE ACTION HAS NOT BEEN TAKEN, THE SPECIAL INSPECTOR SHALL COMPILE AND SUBMIT A LIST OF ALL OUTSTANDING DISCREPANCIES TO THE GOVERNMENT/OWNER, THE CONTRACTING OFFICER, BUILDING OFFICIAL AND THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. THIS SHALL BE DONE ON A WEEKLY BASIS UNTIL ALL CORRECTIVE ACTIONS HAVE BEEN COMPLETED.
   - C. SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT TO THE GOVERNMENT/OWNER STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.
5. OBSERVATION INSPECTIONS BY REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE / ENGINEER OF RECORD WILL BE REQUIRED FOR ALL PLACEMENT OF STEEL REINFORCEMENT PRIOR TO CONCRETE POURING FOR THE FOLLOWING:
   - A. CAST-IN-PLACE CONCRETE FOUNDATIONS, GRADE BEAMS, SLAB ON GRADES, WALLS, COLUMNS, BEAMS, HEADER BEAMS, ELEVATED SLABS, CONCRETE TOPPING, ETC.
   - B. PRECAST CONCRETE PANELS (IF REQUIRED).
   - C. PLACEMENT OF PRECAST CONCRETE PANELS AND GROUTING OF WALL PANEL DOWEL CONNECTIONS TO FOUNDATIONS AND PANEL TO PANEL CONNECTIONS. THIS IS TO INCLUDE PANEL TO PANEL ERECTION WELD CONNECTIONS.
   - D. PLACEMENT OF JOIST GIRDERS AND JOIST SEATS.
6. WHERE SPECIAL INSPECTION REQUIREMENTS DUPLICATE THE REQUIREMENTS OF SPECIFIED QUALITY ASSURANCE TESTING, DUPLICATE INSPECTIONS SHALL NOT BE REQUIRED.
7. INSPECTION OF FABRICATORS:
   - A. SPECIAL INSPECTIONS ARE NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF THE FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION IN ACCORDANCE WITH SECTION 1704.2.5.
   - B. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.
8. SPECIAL INSPECTIONS SHALL BE REQUIRED FOR ALL CONCRETE CONSTRUCTION WORK LISTED IN THE TABLES (SHOWN ON THIS SHEET) WITH CORRESPONDING FREQUENCY OF INSPECTIONS, THAT APPLY TO THIS PROJECT INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   - A. SPECIAL INSPECTION FOR WIND RESISTANCE SHALL BE IN ACCORDANCE WITH IBC 2018 SECTION 1705.11.
   - B. SPECIAL INSPECTION FOR SEISMIC RESISTANCE SHALL BE IN ACCORDANCE WITH IBC 2018 SECTION 1705.12.
9. SPECIAL INSPECTION FOR INSPECTION AND TESTING OF STEEL CONSTRUCTION SHALL BE IN ACCORDANCE WITH IBC 2018 SECTION 1705.2 IN CONJUNCTION WITH TABLE 1704.3 (SHOWN ON THIS SHEET) FROM IBC 2009.

TABLE 1705.6 REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE		CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHEVE THE DESIGN BEARING CAPACITY.	-	X
2	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X
3	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X
4	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X	-
5	PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X

TABLE 1704.3 (PER IBC 2009) REQUIREDVERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

TYPE		CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCED
1	MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:				
	A. IDENTIFICATION MARKINGS TO CONFIRM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X	AISC 360, SECTION A3 .3 AND APPLICABLE ASTM MATERIAL STANDARDS	-
	B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	-	X	-	-
2	INSPECTION OF HIGH-STRENGTH BOLTS:	-	-	-	-
	A. SNUG-TIGHT JOINTS.	-	X	AISC 360, SECTION SECTION M2.5	1704.3.3
	B. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCH MARKING, TWIST-OFF BOLT OR DIRECT TENSION INDICATOR METHOD OF INSTALLATION.	-	X		
	C. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCH MARKING OR CALIBRATED WRENCH METHOD OF INSTALLATION.	X	-		
3	MATERIAL VERIFICATION OF STRUCTURAL STEEL AND COLD-FORMED STEEL DECK:	-	-	-	-
	A. FOR STRUCTURAL STEEL, IDENTIFICATION MARKING TO CONFIRM TO AISC 360.	-	X	AISC 360, SECTION SECTION M5.5	-
	B. FOR OTHER STEEL, IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARD SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	-	X	APPLICABLE ASTM MATERIAL STANDARDS	-
	C. MANUFACTURER'S CERTIFIED TEST REPORTS.	-	X	-	-
4	MATERIAL VERIFICATION OF FILLER MATERIALS:	-	-	-	-
	A. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X	AISC 360, SECTION A3.5 AND APPLICABLE AWS AS DOCUMENTS	-
	B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	-	X	-	-
5	INSPECTION OF WELDING:	-	-	-	-
	A. STRUCTURAL STEEL AND COLD-FORMED STEEL DECK:	-	-	-	-
	1) COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS.	X	-	AWS D1.1	1704.3.1
	2) MULTIPASS FILLET WELDS.	X	-		
	3) SINGLE-PASS FILLETS WELDS > 5/16"	X	-		
	4) PLUG AND SLOT WELDS.	X	-		
	5) SINGLE-PASS FILLET WELDS ≤ 5/16"	-	X		
	6) FLOOR AND ROOF DECK WELDS.	-	X	AWS D1.3	-
	B. REINFORCING STEEL:	-	-	-	-
	1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.	-	X	AWS D1.4 ACI 318: SECTION 3.5.2	-
	2) REINFORCING STEEL RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL STRUCTURAL WALLS OF CONCRETE AND SHEAR REINFORCEMENT.	X	-		
	3) SHEAR REINFORCEMENT.	X	-		
	4) OTHER REINFORCING STEEL.	-	X		
6	INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE:	-	-	-	-
	A. DETAILS SUCH AS BRACING STIFFENING.	-	X	-	-
	B. MEMBER LOCATIONS.	-	X		
	C. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.	-	X		

TABLE 1705.2.3 REQUIRED SPECIAL INSPECTIONS OPEN-WEB STEEL JOISTS AND JOIST GIRDERS

TYPE		CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD
1	INSTALLATION OF OPEN WEB STEEL JOISTS AND JOIST GIRDER:	-	-	
	A. END CONNECTION - WELDING OR BOLTED.	-	X	SJI SPECIFICATION LISTED IN SECTION 2207.1.
	B. BRIDGING - HORIZONTAL OR DIAGONAL.	-	-	
	1) STANDARD BRIDGING.	-	X	SJI SPECIFICATION LISTED IN SECTION 2207.1.
	2) BRIDGING THAT DIFFERS FROM SJI SPECIFICATIONS LISTED IN SECTION 2207.1.	-	X	

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
SPECIAL INSPECTION NOTES AND SCHEDULE
PROGRAMMING DOCUMENT

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ACI 318-14 MINIMUM DEVELOPMENT (EMBEDMENT AND LAP REQUIREMENTS)
(Fy = 60,000 psi FOR UNCOATED OR GALVANIZED COATED DEFORMED BARS)

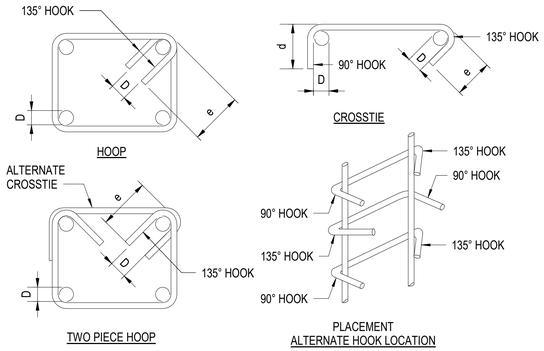
BAR SIZE	MINIMUM EMBEDMENT REQUIREMENTS (INCHES)				MINIMUM LAP REQUIREMENTS (INCHES)								BAR SIZE
					CLASS "A" SPLICE				CLASS "B" SPLICE				
	f'c = 3000psi		f'c = 4000psi		f'c = 3000psi		f'c = 4000psi		f'c = 3000psi		f'c = 4000psi		
	TOP[2]	OTHERS	TOP[2]	OTHERS	TOP[2]	OTHERS	TOP[2]	OTHERS	TOP[2]	OTHERS	TOP[2]	OTHERS	
#3	22	17	19	15	22	17	19	15	28	22	25	19	#3
#4	29	22	25	19	29	22	25	19	38	29	33	25	#4
#5	36	28	31	24	36	28	31	24	47	36	41	31	#5
#6	43	33	37	29	43	33	37	29	56	43	49	37	#6
#7	63	48	54	42	63	48	54	42	81	63	71	54	#7
#8	72	55	62	48	72	55	62	48	93	72	81	62	#8
#9	81	62	70	54	81	62	70	54	105	81	91	70	#9
#10	91	70	79	61	91	70	79	61	118	91	102	79	#10

EMBEDMENT AND LAP NOTES

1. PROVIDE STANDARD ACI 90 DEGREE BEND OR HOOK IF EMBEDMENT LENGTH IS LESS THAN REQUIRED MINIMUM AS SHOWN IN THIS TABLE. REINFORCEMENT IN WALLS, SLAB, BEAMS, ETC. SHALL BE EMBEDDED INTO SUPPORTING OR INTERSECTION STRUCTURAL ELEMENTS.
2. " TOP " ARE DEFINED WHERE HORIZONTAL REINFORCEMENT IS PLACED SUCH THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST BELOW THE DEVELOPMENT LAP OR SPLICE.
3. FOR SLABS, LOCATE LAPS WITHIN THE MIDDLE THIRD OF THE SPANS FOR TOP BARS AND AT SUPPORTS FOR BOTTOM BARS. USE "CLASS A" SPLICE IF LAPS ARE STAGGERED. OTHERWISE USE "CLASS B" SPLICE.
4. FOR WALLS, LOCATE LAPS AS SHOWN ON DETAILS AND USE "CLASS B" SPLICE FOR DOUBLE CURTAIN REINFORCEMENT, STAGGER LOCATION OF LAP FROM ONE CURTAIN TO ANOTHER.
5. FOR BEAMS AND COLUMNS, LOCATE LAPS AS SHOWN IN DETAILS USE "CLASS B" SPLICES UNLESS NOTED OTHERWISE.
6. FOR DEVELOPMENT LENGTH OF INDIVIDUAL BARS WITHIN A BUNDLE, THE DEVELOPMENT LENGTH SHALL BE THAT OF THE INDIVIDUAL BAR, INCREASE 20 PERCENT FOR THE THREE-BAR BUNDLE AND 33 PERCENT FOR THE FOUR BAR BUNDLE.
7. WHEN BARS OF DIFFERENT SIZES ARE USED IN A LAP SPLICE, THE LAP SPLICE LENGTH OF THE BIGGER BAR SHALL BE USED.

ACI 318-14 (SECTION 7.1.3) MINIMUM DEVELOPMENT REQUIREMENTS OF HOOPS AND CROSS TIES
(Fy = 60,000 psi FOR UNCOATED OR GALVANIZED COATED DEFORMED BARS)

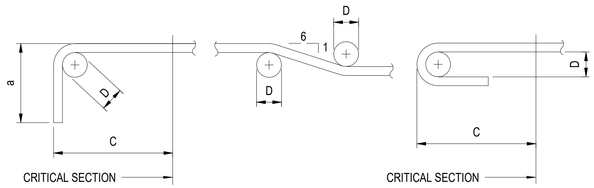
BAR SIZE	MINIMUM HOOK LENGTH (HL) REQUIREMENTS (INCHES)		MINIMUM BEND DIAMETER (D) (INCHES)
	90° (a)	135° (e)	
#3	4 1/4	4 1/4	1 1/2
#4	4 1/2	4 1/2	2
#5	5 3/4	5 3/4	2 1/2
#6	12	7 1/2	4 1/2
#7	14	8 3/4	5 1/4
#8	16	10	6



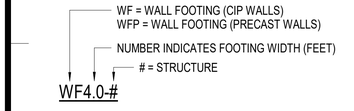
TYP. HOOPS AND CROSS-TIES DETAIL

ACI 318-14 MINIMUM DEVELOPMENT REQUIREMENTS OF STANDARD HOOKS IN TENSION
(Fy = 60,000 psi FOR UNCOATED OR GALVANIZED COATED DEFORMED BARS)

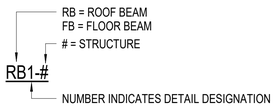
BAR SIZE	MINIMUM HOOK LENGTH (HL) REQUIREMENTS (INCHES)		l_{dh} = "C" (DEVELOPMENT LENGTH REQUIREMENT FROM CRITICAL SECTION) (INCHES)		MINIMUM BEND DIAMETER (D) (INCHES)
	90° (a)	180° (b)	3000 psi(c)	4000 psi(c)	
#3	6	4	9	8	2 1/4
#4	8	4 1/2	11	10	3
#5	10	5	14	12	3 3/4
#6	12	6	17	15	4 1/2
#7	14	7	20	17	5 1/4
#8	16	8	22	19	6
#9	19 1/2	10 1/2	25	22	9 1/4
#10	21 3/4	11 1/2	28	25	10 1/4



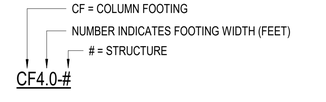
PRIMARY REINFORCING TYPICAL BENDS



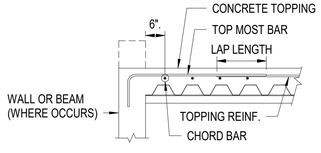
WALL FOOTING DESIGNATION

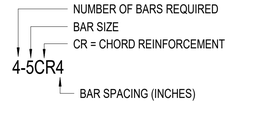


BEAM DESIGNATION

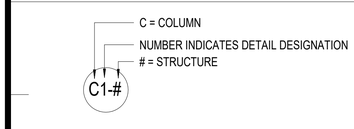


COLUMN FOOTING DESIGNATION





CHORD REINF. DESIGNATION



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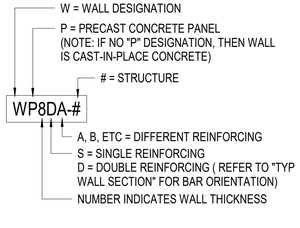

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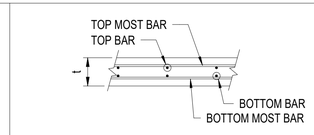
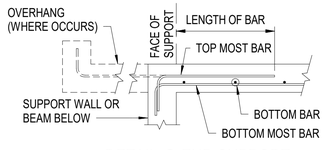
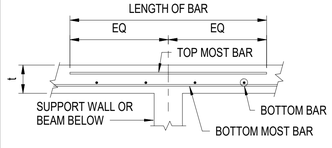


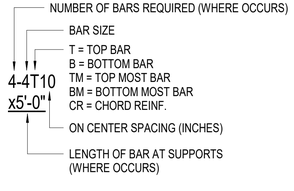
DETAIL @ SUSPENDED SLAB



DETAIL @ END SUPPORT



DETAIL @ MID. SUPPORT



SLAB REINF. DESIGNATION

ABBREVIATIONS

AB	ANCHOR BOLT
ADD'L	ADDITIONAL
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
BAL	BALANCE
BD	BOARD
BLDG	BUILDING
BOT	BOTTOM
BRG	BEARING
BTWN	BETWEEN
CC	CENTER TO CENTER
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUE OR CONTINUOUS
CONTR	CONTRACTOR
COOR	COORDINATE
CSJ	CONSTRUCTION JOINT
CTR	CENTER(ed)
DBL	DOUBLE
DIA OR Ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DN	DOWN
DP	DRILLED PIER OR DEEP
DT	DOBLE TEE
DTL(s)	DETAIL(s)
DWG(s)	DRAWING(s)
DWL(s)	DOWEL(s)
(E)	EXISTING
EA	EACH
EC	EPOXY COATED
EE	EACH END
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
EMBED	EMBEDDED
ENGR	ENGINEER
EOR	ENGINEER OF RECORD
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EW	EACH WAY
EXP	EXPANSION
FF	FINISH FLOOR
FIN	FINISH(ed)
FLG	FLANGE
FLR	FLOOR
FND	FOUNDATION
FT	FOOT OR FEET
FTG	FOOTING
FV	FIELD VERIFY
GA	GAGE OR GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
HK	HOOK
HORIZ	HORIZONTAL
HT	HEIGHT
ID	INSIDE DIAMETER
I.F.	INSIDE FACE
IN	INCH
INT	INTERIOR
IT	PRECAST INVERTED TEE
JST	JOIST
JT	JOINT
L OR LG	LENGTH
LB(s)	POUND(s)
LOC(s)	LOCATION(s)
MAS	MASONRY
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
NS	NON-SHRINK
NO OR #	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
OPNG	OPENING
QTY	QUANTITY
RAD or R	RADIUS
RC	REINFORCE CONCRETE
REF	REFER TO (REFERENCE)
REINF	REINFORCE (ING) (D) (MENT)
REQD	REQUIRED
R.O.	ROUGH OPENING
SCHED	SCHEDULE
SECT	SECTION
SIM	SIMILAR
SOG	SLAB ON GRADE
SP	SPACE(s)
SPECS	SPECIFICATION
SPRT	SUPPORT
SS	STAINLESS STEEL
STR	STRUCTURAL
STD	STANDARD
STL	STEEL
THK OR t	THICKNESS
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOW	TOP OF WALL
TOS	TO OF SLAB
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
V/F	VERIFY IN FIELD
W/O	WITHOUT
W/	WITH

REVISION

No.	Description	Date

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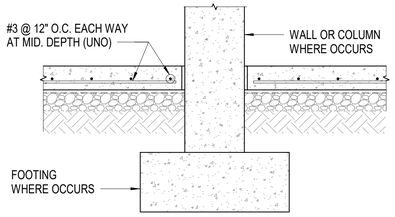
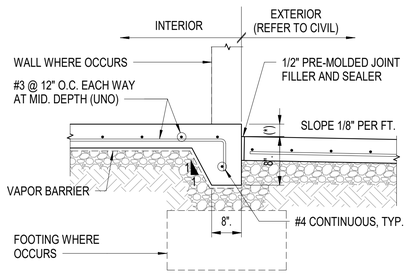
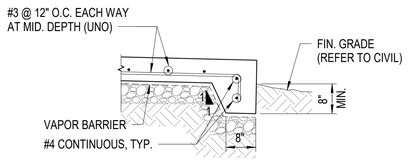


@ WALL / COLUMN

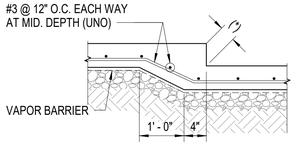


(*) NOTE: REFER TO ARCHITECTURAL / CIVIL DRAWING
FOR EXTERIOR SLAB STEP-UP IF REQUIRED

@ INTERIOR/EXTERIOR SLAB JOINT

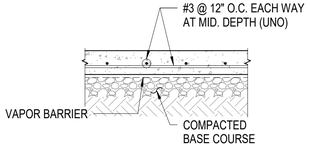


@ EXTERIOR SLAB



(*) NOTE: REFER TO ARCHITECTURAL DRAWING
FOR SLAB DEPRESSION REQUIREMENTS

@ DEPRESSION

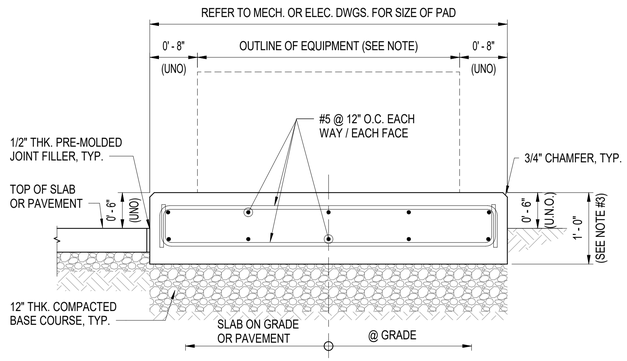


@ INTERIOR SLAB

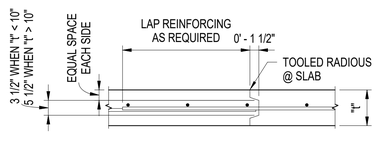
1 TYP. SLAB ON GRADE DETAILS

NOTE:

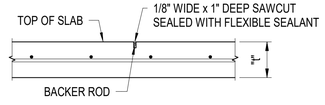
1. REFER TO THE EQUIPMENT DWGS. FOR EXACT SIZE AND LOCATION OF CONCRETE EQUIPMENT PAD. CONCRETE PAD TO EXTEND 8" AROUND EQUIPMENT TYPICAL, UNLESS NOTED OTHERWISE.
2. EQUIPMENT ANCHOR SHALL BE PER EQUIPMENT MANUFACTURER'S RECOMMENDATION.
3. WHEN EQUIPMENT ANCHOR REQUIRES EQUIPMENT PAD THICKER THAN SHOWN IN DETAIL, USE EQUIPMENT PSD THICKNESS REQUIRED BY EQUIPMENT MANUFACTURER OR ANCHOR DEVELOPMENT PLUS TWO INCHES, WHICH EVER IS THICKER.



2 TYP. EQUIP. PAD ON GRADE DETAIL

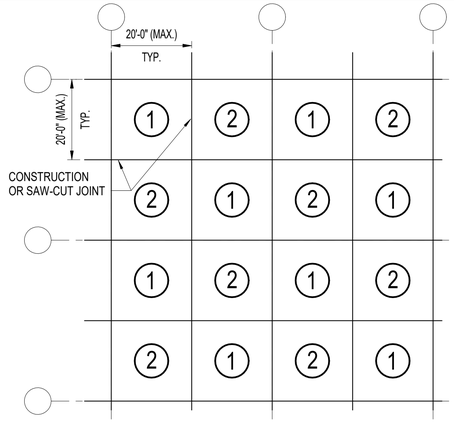


CONSTRUCTION JOINT



SAW CUT JOINT

3 TYP. CONTROL JOINT DETAIL



NOTE:

1. ALLOW 3 DAYS INTERVAL BETWEEN POURS 1 & 2.
2. CONTRACTOR HAS THE OPTION TO SUBMIT AN ALTERNATIVE POUR PATTERN FOR REVIEW AND APPROVAL BY THE EOR.

4 TYPICAL POUR SEQUENCE

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

DCA
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■ ENGINEERING (CIVIL/STRUCTURAL)
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■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
TYPICAL DETAILS
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

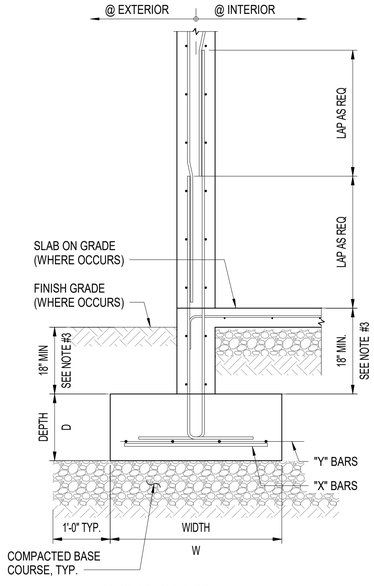
Drawing
S0.2.1
Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

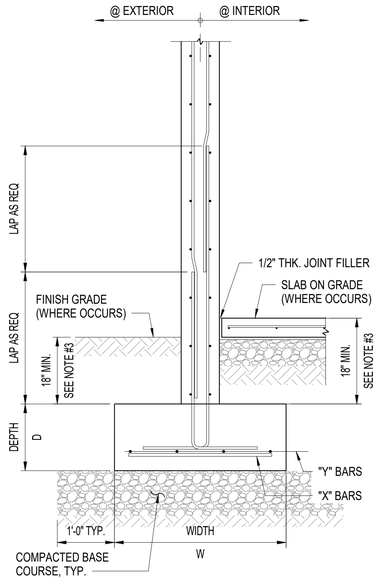
NOT FOR CONSTRUCTION

" WF " WALL FOOTING SCHEDULE

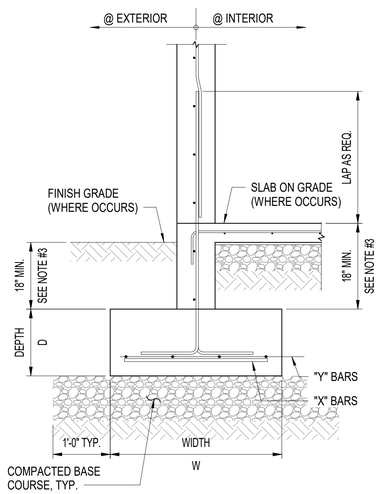
FOOTING MARK	WIDTH "W"	DEPTH (D)	FOOTING TYPE	REINFORCEMENT		REMARKS
				"X" BARS	"Y" BARS	
MAIN ENTRANCE						
WF2.0-1	2'-0"	1'-2"	1B	#5 @ 12" O.C.	3-#5	
WF8.0-1/4	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
ADMINISTRATION						
WF2.0-2	2'-0"	1'-2"	1B	#5 @ 12" O.C.	3-#5	
WF3.5-2	3'-6"	1'-2"	1B	#5 @ 12" O.C.	4-#5	
WF5.0-2	5'-0"	1'-2"	1B	#5 @ 10" O.C.	5-#5	
WF8.0-2/3	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
WF8.0-2/5	8'-0"	1'-4"	1C	#5 @ 8" O.C.	7-#6	
AUDITORIUM						
WF2.5-3	2'-6"	1'-2"	1B	#5 @ 12" O.C.	3-#5	
WF4.5-3	4'-6"	1'-4"	1B	#5 @ 10" O.C.	6-#5	
WF8.0-3/5	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
WF8.0-3/2	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
GYMNASIUM						
WF3.0-4	3'-0"	1'-2"	1B	#5 @ 12" O.C.	4-#5	
WF4.5-4	4'-6"	1'-4"	1B	#5 @ 10" O.C.	5-#5	
WF8.0-4/1	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
A-WING CLASSROOMS (EAST)						
WF4.5-5	4'-6"	1'-4"	-	#5 @ 10" O.C.	6-#5	
WF5.5-5	5'-6"	1'-4"	-	#5 @ 8" O.C.	8-#5	
WF8.0-5/2	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
WF8.0-5/3	8'-0"	1'-4"	1C	#5 @ 8" O.C.	9-#5	
WF9.0-5/6	9'-0"	1'-6"	1C	#6 @ 8" O.C.	8-#6	
A-WING CLASSROOMS (WEST)						
WF4.5-5	4'-6"	1'-4"	-	#5 @ 10" O.C.	6-#5	
WF5.5-5	5'-6"	1'-4"	-	#5 @ 8" O.C.	8-#5	
WF6.5-5	6'-6"	1'-4"	-	#5 @ 7" O.C.	10-#5	
WF9.0-6/5	9'-0"	1'-6"	1C	#6 @ 8" O.C.	8-#6	
B-WING CLASSROOMS						
WF4.5-7	4'-6"	1'-4"	-	#5 @ 10" O.C.	6-#5	
CAFETERIA						
WF2.0-8	2'-0"	1'-0"	-	#5 @ 12" O.C.	3-#5	
WF3.0-8	3'-0"	1'-4"	-	#5 @ 10" O.C.	4-#5	
WF5.0-8	5'-0"	2'-0"	-	#6 @ 10" O.C.	6-#6	
WF10.5-8	10'-6"	1'-1"	-	-	-	SEE SECTION 3 SHEET S8.2.2 FOR REINFORCING SIZE AND SPACING
WF8.5-8/9	8'-6"	1'-4"	1C	#5 @ 6" O.C.	10-#5	
WF6.5-8/10	6'-6"	1'-4"	1C	#5 @ 10" O.C.	8-#5	
JROTC & FIRING RANGE						
WF7.0-9	7'-0"	1'-4"	-	#5 @ 8" O.C.	8-#5	
WF8.5-9/8	8'-6"	1'-4"	1C	#5 @ 6" O.C.	10-#5	
GCC						
WF3.5-10	3'-6"	1'-4"	-	#5 @ 10" O.C.	5-#5	
WF5.0-10	5'-0"	1'-4"	-	#5 @ 10" O.C.	6-#5	
WF6.5-10/8	6'-6"	1'-4"	1C	#5 @ 10" O.C.	8-#5	
CREDIT RECOVERY						
WF2.5-11	2'-6"	1'-2"	-	#5 @ 12" O.C.	3-#5	
PRESS BOX & MISCELLANEOUS STRUCTURES						
WF2.0-12	2'-0"	1'-0"	1A	#5 @ 12" O.C.	3-#5	
WF3.0-12	3'-0"	1'-2"	1A	#5 @ 12" O.C.	4-#5	
WF5.5-12	5'-6"	1'-4"	1A	#6 @ 10" O.C.	6-#5	
GENERATOR						
WF2.5-13	2'-6"	1'-2"	1B	#5 @ 12" O.C.	3-#5	
PUMP						
WF2.0-14	2'-0"	1'-0"	1B	#5 @ 12" O.C.	3-#5	



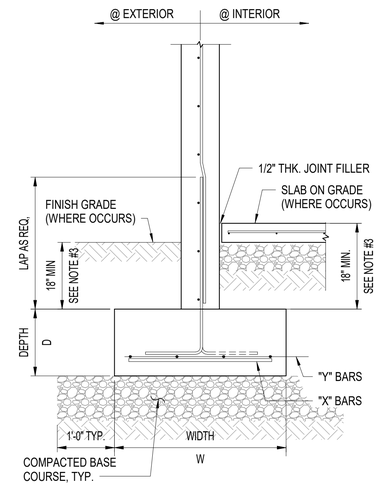
@ CIP DOUBLE CURTAIN WALL



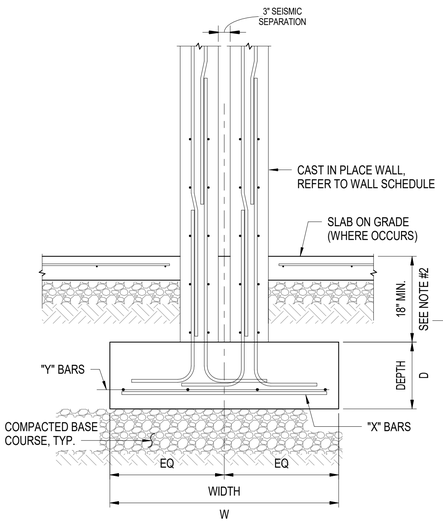
@ CIP DOUBLE CURTAIN WALL



@ CIP SINGLE CURTAIN WALL



@ CIP SINGLE CURTAIN WALL



1A SECTION @ CONNECTED SLAB ON GRADE

1B SECTION @ DISCONNECTED SLAB ON GRADE

1C SECTION @ SEISMIC SEPARATION

1 TYP. WALL FOOTING "WF" DETAILS

NOTE:

1. REFER TO SHEET S0.1.1 FOR "GENERAL STRUCTURAL NOTES" AND FOUNDATION SUBGRADE REQUIREMENTS BELOW FOOTINGS AND SLAB ON GRADE.
2. REFER TO STRUCTURAL PLANS FOR SLAB ON GRADE THICKNESS AND REINFORCING REQUIREMENTS.
3. MINIMUM FOOTING EMBEDMENT DEPTH TO BE MEASURED FROM FINISH GRADE OR TOP OF SLAB WHICH EVER IS LOWER, UNLESS SHOWN OTHERWISE ON STRUCTURAL DRAWINGS.

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
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Architecture
Planning
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P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
WALL FOOTING SCHEDULE AND DETAILS
PROGRAMMING DOCUMENT

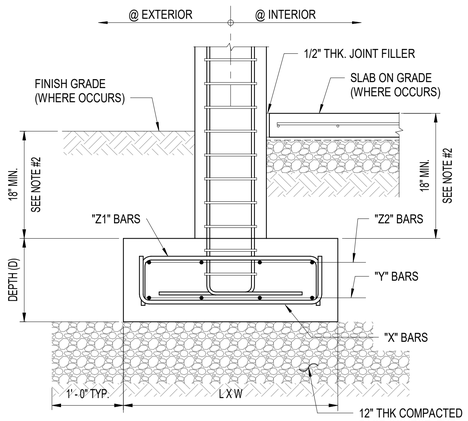
Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S0.2.2
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

" CF " COLUMN FOOTING SCHEDULE

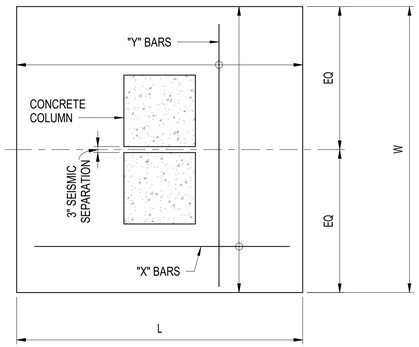
FOOTING MARK	SIZE (L X W)	DEPTH (D)	TYPE	REINFORCEMENT				REMARKS
				"X" BARS	"Y" BARS	"Z" BARS	"ZZ" BARS	
MAIN ENTRANCE								
CF4.5-1	4'-6"	1'-6"	1A	4 - #6	4 - #6	4 - #6	4 - #6	
CF9.0-1	9'-0"	1'-6"	1A	9 - #7	9 - #7	9 - #7	9 - #7	
CF12A-1	12'-0"	1'-6"	1A	14- #7	14- #7	14- #7	14- #7	
CF12.0-1	12'-0"	1'-10"	1A	18- #7	18- #7	18- #7	18- #7	
CF13.5-1	13'-6"	1'-10"	1A / 1B	19- #9	19- #9	19- #9	19- #9	
CF9.0-1/2	9'-0"	1'-6"	1B	9 - #7	9 - #7	9 - #7	9 - #7	
CF10.0-1/7	10'-0"	1'-6"	1B	10- #7	10- #7	10- #7	10- #7	
ADMINISTRATION								
CF4.0-2	4' -0"	1'-6"	1A	5 - #5	5 - #5	5 - #5	5 - #5	
CF6.0-2	6' -0"	1'-6"	1A	6 - #6	6 - #6	6 - #6	6 - #6	
CF7.5-2	7'-6"	1'-6"	1A	9 - #6	9 - #6	9 - #6	9 - #6	
CF8.5-2	8'-6"	1'-6"	1A	9 - #6	9 - #6	9 - #6	9 - #6	
CF9.0-2/1	9'-0"	1'-6"	1B	9 - #7	9 - #7	9 - #7	9 - #7	
CF10.0-2/5	10'-0"	1'-6"	1B	10- #7	10- #7	10- #7	10- #7	
CF10.0-2	10'-0"	1'-8"	1A	12 - #7	12 - #7	12 - #7	12 - #7	
GYMNASIUM								
CF3.0-4	3'-0"	1'-0"	1A	3-#5	3-#5	3-#5	3-#5	
CF4.0-4	4' -0"	1'-0"	1A	4 - #5	4 - #5	4 - #5	4 - #5	
CF5.5-4	5' -6"	1'-6"	1A	6 - #6	6 - #6	6 - #6	6 - #6	
A-WING CLASSROOMS (EAST)								
CF6.5-5	6'-6"	1'-6"	1A/1B	6 - #6	6 - #6	6 - #6	6 - #6	
CF6.5-5/6	6'-6"	1'-6"	1B	6 - #6	6 - #6	6 - #6	6 - #6	
CF10.0-5/2	10'-0"	1'-6"	1B	10- #7	10- #7	10- #7	10- #7	
A-WING CLASSROOMS (WEST)								
CF6.5-6	6'-6"	1'-6"	1A/1B	8-#5	8-#5	8-#5	8-#5	
CF6.5-6/5	6'-6"	1'-6"	1B	6 - #6	6 - #6	6 - #6	6 - #6	
CF11.5-6/10	11'-6"	1'-8"	1B	13 - #7	13 - #7	13 - #7	13 - #7	
B-WING CLASSROOMS								
CF2.0-7	2'-0"	1'-4"	1A	3-#5	3-#5	3-#5	3-#5	
CF2.5-7	2'-6"	1'-4"	1A	3-#5	3-#5	3-#5	3-#5	
CF6.5-7	6'-6"	1'-6"	1A/1B	6-#6	6-#6	6-#6	6-#6	
CF6.0x3.0-7	6'-0" x 3'-0"	1'-4"	1B	6 - #5	3 - #5	6 - #5	3 - #5	
CF6.5-7/10	6'-6"	1'-6"	1B	6 - #6	6 - #6	6 - #6	6 - #6	
CF10.0-7/1	10'-0"	1'-6"	1B	10- #7	10- #7	10- #7	10- #7	
CAFETERIA								
CF8.0-8	8'-0"	1'-6"	1A	8 - #6	8 - #6	8 - #6	8 - #6	
CF8.0x8.25-8/10	8'-0" x 8'-3"	1'-6"	1B	8 - #6	8 - #6	8 - #6	8 - #6	
GCC								
CF7.5-10	7'-6"	1'-6"	1A	7-#6	7-#6	7-#6	7-#6	
CF11.5-10	11'-6"	1'-8"	1A	13-#7	13-#7	13-#7	13-#7	
CF6.5-10	6'-6"	1'-6"	1A	6 - #6	6 - #6	6 - #6	6 - #6	
CF6.5-10/7	6'-6"	1'-6"	1B	6 - #6	6 - #6	6 - #6	6 - #6	
CF8.0x8.25-10/8	8'-0" x 8'-3"	1'-6"	1B	8 - #6	8 - #6	8 - #6	8 - #6	
CF11.5-10/6	11'-6"	1'-8"	1B	13 - #7	13 - #7	13 - #7	13 - #7	
PRESS BOX & MISCELLANEOUS STRUCTURES								
CF2.0-12	2'-0"	1'-0"	1A	5 - #5	5 - #5	5 - #5	5 - #5	
CF2.5-12	2'-6"	1'-2"	1A	5 - #5	5 - #5	5 - #5	5 - #5	
CF6.0x9.0-12	6'-0" x 9'-0"	1'-6"	1A	9 - #7	9 - #7	9 - #7	9 - #7	



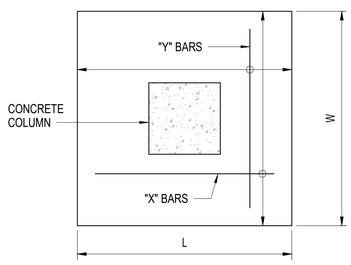
TYP. SECTION

NOTE:

1. REFER TO "GENERAL STRUCTURAL NOTES" FOR SUBGRADE REQUIREMENTS BELOW FOOTINGS AND SLAB ON GRADE.
2. MINIMUM FOOTING EMBEDMENT DEPTH TO BE MEASURED FROM FINISH GRADE OR TOP OF SLAB WHICH EVER IS LOWER, UNLESS SHOWN OTHERWISE ON STRUCTURAL DRAWINGS.

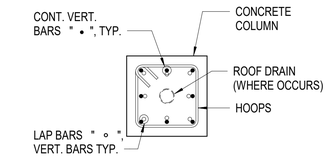


1B PLAN @ SEISMIC SEPARATION



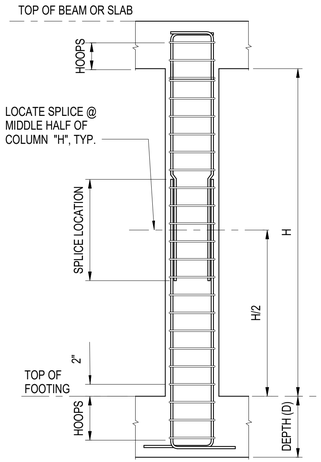
1A PLAN

1 TYP. COLUMN FOOTING DETAIL

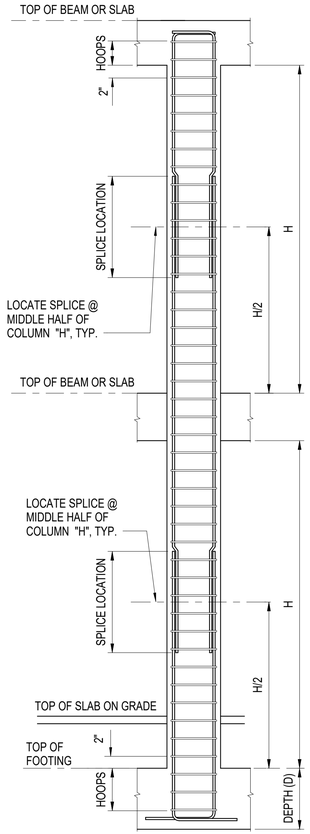


ROOF DRAIN:
- ≥ 12" x 12" COLUMNS: 2" DIA. MAX.
- < 12" x 12" COLUMNS: 4" DIA. MAX

TYP. SECTION @ LAP LOCATIONS



ELEVATION



ELEVATION

2 TYP. COLUMN SECTION

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

DCA
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■ CONSTRUCTION MANAGEMENT ■ PLANNING
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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: ____-____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
COL. FOOTING SCH. & DETAIL AND TYPICAL COLUMN SECTION
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

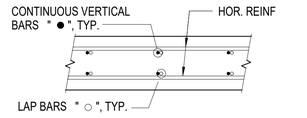
Drawing
S0.2.3
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

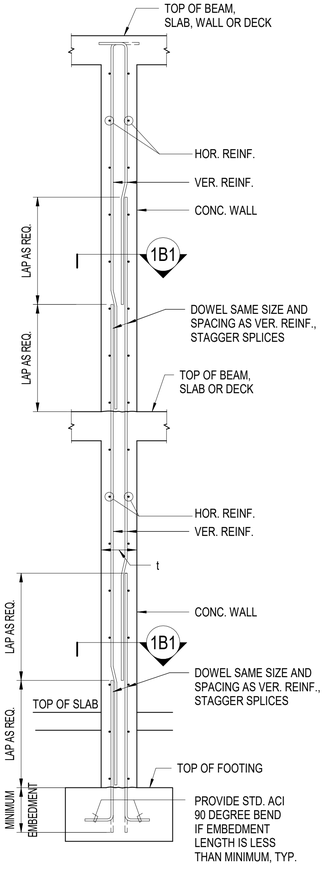
CAST-IN-PLACE WALL " W " SCHEDULE

WALL MARK	THICKNESS "t"	TYPE	REINFORCEMENT		REMARKS
			VERT. BARS	HOR. BARS	
MAIN ENTRANCE					
W8S-1	8"	S	#5 @ 12" O.C.	#4 @ 10"O.C.	
W8SA-1	8"	S	#5 @ 12" O.C.	#5 @ 6"O.C.	
ADMINISTRATION					
W8S-2	8"	S	#5 @ 12" O.C.	#4 @ 10"O.C.	
W10D-2	10"	D	#5 @ 12" O.C.	#4 @ 12" O.C.	
AUDITORIUM					
W6S-3	6"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	
W8S-3	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	
W8D-3	8"	D	#5 @ 12" O.C.	#4 @ 12" O.C.	
W12D-3	1'-0"	D	#7 @ 9" O.C.	#4 @ 12" O.C.	
W12DA-3	1'-0"	D	#5 @ 12" O.C.	#4 @ 12" O.C.	
GYMNASIUM					
W8D-4	8"	D	#5 @ 10" O.C.	#4 @ 12" O.C.	
W8DA-4	8"	D	#5 @ 10" O.C.	#3 HOOPS @ 3" O.C.	HOOPS TO EXTEND 1'-0" BEYOND OPENING
W14D-4	1'-2"	D	#7 @ 10" O.C.	#4 @ 10" O.C.	
W14DA-4	1'-2"	D	#7 @ 6" O.C.	#4 @ 10" O.C.	
W14DB-4	1'-2"	D	#7 @ 8" O.C.	#4 @ 10" O.C.	
A-WING CLASSROOMS (EAST)					
W8S-5	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	
A-WING CLASSROOMS (WEST)					
W8S-6	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	
B-WING CLASSROOMS					
W8S-7	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	
CAFETERIA					
W8S-8	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	
W8D-8	8"	D1	#5 @ 12" O.C.	#5 @ 12" O.C.	SEE SECTION 3 SHEET S8.2.2 FOR WALL BAR ORIENTATION
W10D-8	10"	D	#6 @ 12" O.C.	#4 @ 12" O.C.	
W10DA-8	10"	D	#6 @ 10" O.C.	#4HOOPS @ 4" O.C.	HOOPS TO EXTEND 1'-0" BEYOND OPENING
JROTC & FIRING RANGE					
W8S-9	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	
W10D-9	10"	D	#6 @ 7" O.C.	#4 @ 10" O.C.	
GCC					
W8S-10	8"	S	#5 @ 10" O.C.	#4 @ 10" O.C.	
W10D-10	10"	D	#5 @ 8" O.C.	#4 @ 10" O.C.	
CREDIT RECOVERY					
W8S-11	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	
PRESS BOX & MISCELLANEOUS STRUCTURES					
W8S-12	8"	S	#5 @ 12" O.C.	#5 @ 12" O.C.	
W8SA-12	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	
W8D-12	8"	D	#5 @ 12" O.C.	#4 @ 10" O.C.	
W8DA-12	8"	D	#5 @ 8" O.C.	#4 @ 10" O.C.	
GENERATOR					
W8S-13	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	
PUMP					
W8S-14	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	

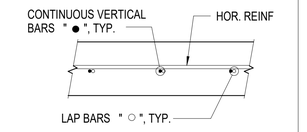
NOTE: ALL TYPE "D" WALL SHALL HAVE BOTH HORIZONTAL AND VERTICAL BARS STAGGER SPLICED.



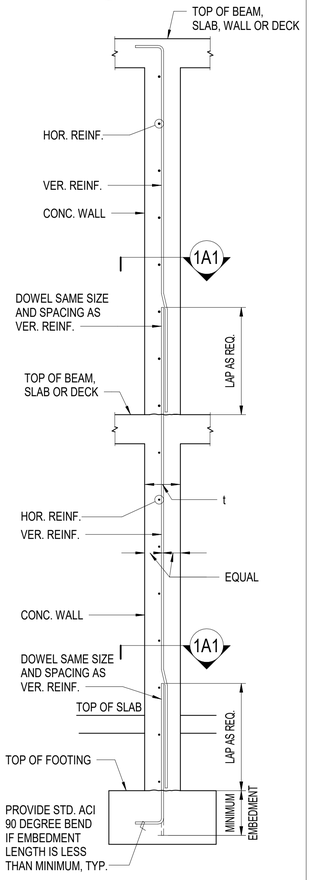
1B1 TYPE "D" PLAN



1B TYPE "D" SECTION



1A1 TYPE "S" PLAN



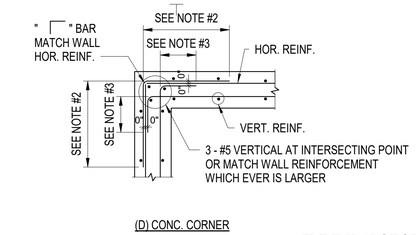
1A TYPE "S" SECTION

NOTE: REFER TO SHEET S0.3.1A FOR TYPICAL WALL SECTIONS

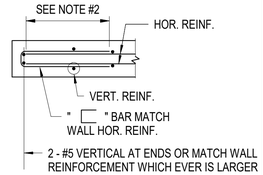
1 TYP. WALL BAR SPLICE DETAIL

WALL CONNECTION NOTES

1. PROVIDE CHAMFERED WALL CORNERS WHERE REQUIRED. SEE ARCHITECTURAL DWGS.
2. SEE REINFORCING SCHEDULE FOR CLASS "B" MINIMUM REQUIREMENTS FOR LAP LENGTH
3. SEE REINFORCING SCHEDULE FOR MINIMUM REQUIREMENTS FOR HOOK LENGTH
4. ALL HORIZONTAL BAR SPLICE SHALL BE ALONG THE SAME VERTICAL PLANE WITH ZERO GAP BETWEEN SPLICE BAR. BAR SPLICES SHOWN ON DETAILS ABOVE ARE OFF-SET HORIZONTALLY FOR DETAIL SPLICE ONLY.

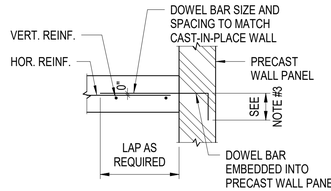


(D) CONC. CORNER

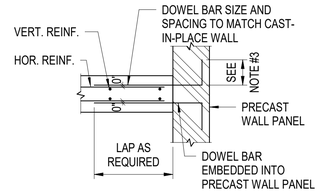


(D) CONC. END

TYPE "D1" SECTION



(S) CONC. TO PRECAST WALL FACE



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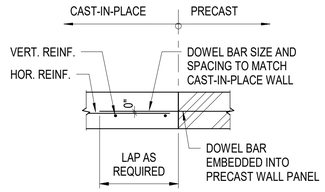
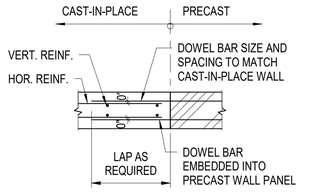
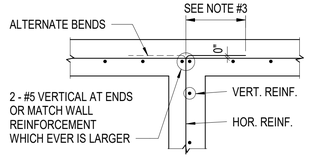


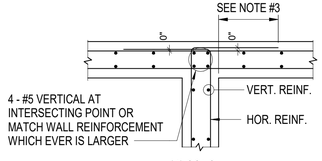
(S) CONC. TO PRECAST WALL END



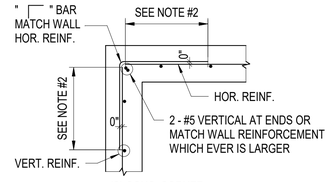
(D) CONC. TO PRECAST WALL END



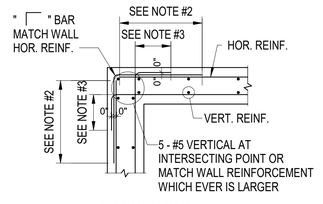
(S) CONC. TEE



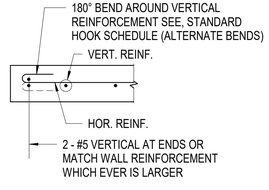
(D) CONC. TEE



(S) CONC. CORNER

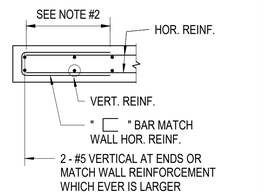


(D) CONC. CORNER



(S) CONC. END

TYPE "S" DETAILS



(D) CONC. END

TYPE "D" SECTION

2 TYP. WALL CONNECTION DETAIL

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CAST-IN-PLACE WALL SCHEDULE AND TYP. DETAILS
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S0.3.1
Sheet No. _____ of _____

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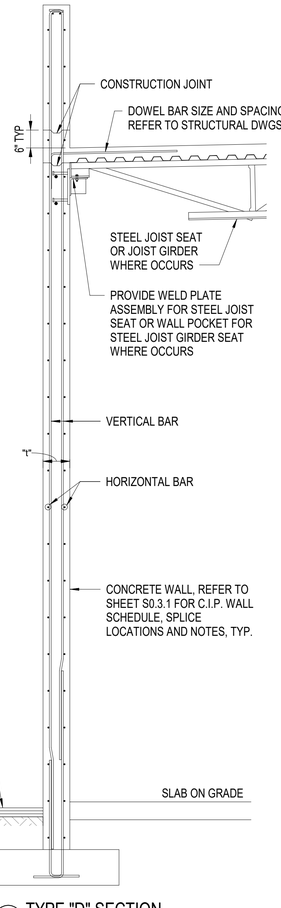
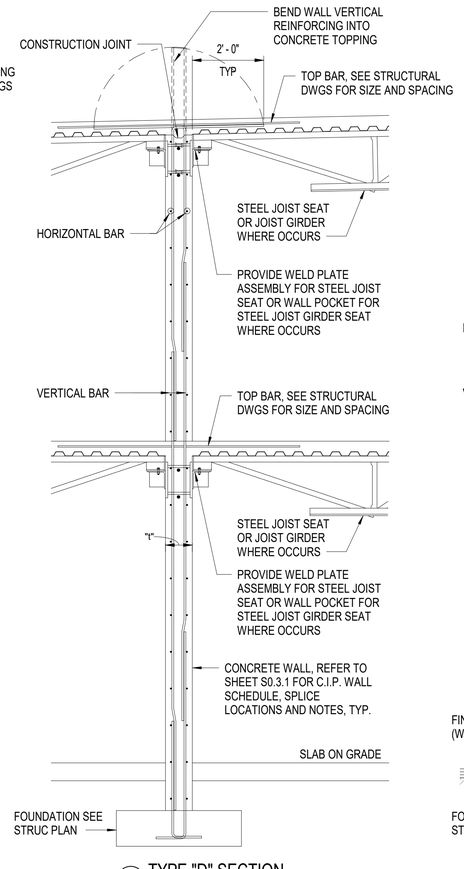
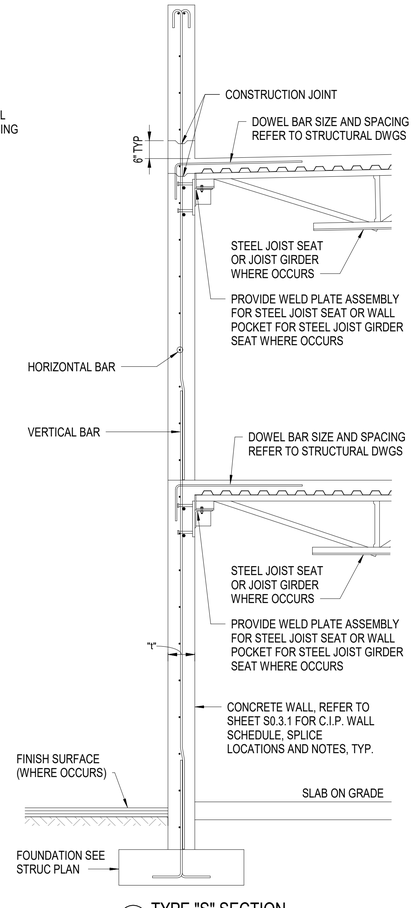


1A TYPE "D" SECTION (@ EXTERIOR)

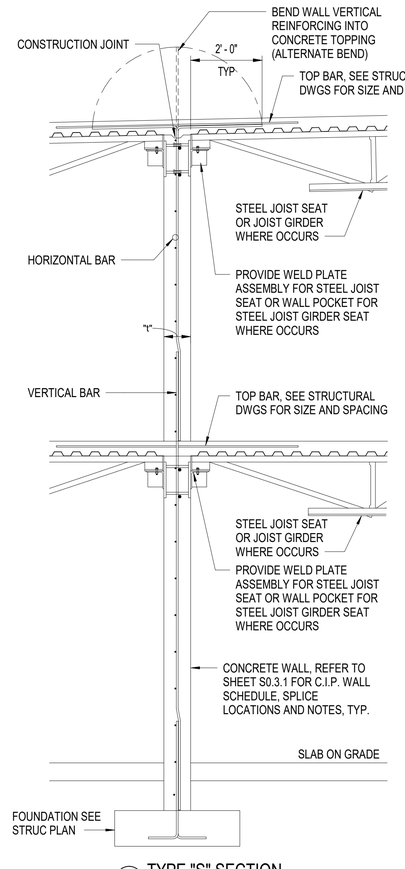


1B TYPE "D" SECTION (@ INTERIOR)

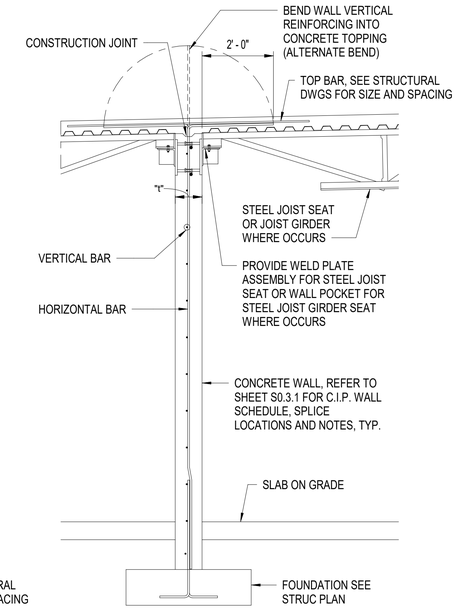


1C TYPE "S" SECTION (@ EXTERIOR)

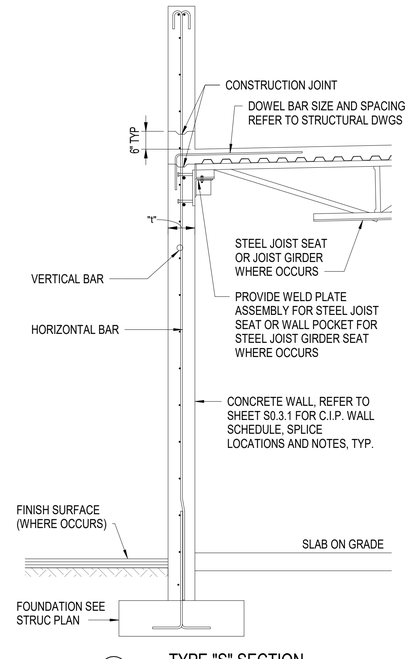
1 TYP. WALL SECTION



1D TYPE "S" SECTION (@ INTERIOR)



1F TYPE "S" SECTION (SINGLE FLOOR @ INTERIOR)



1E TYPE "S" SECTION (SINGLE FLOOR @ EXTERIOR)

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: -

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
TYPICAL CAST-IN-PLACE WALL SECTIONS
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S0.3.1A
Sheet No. of

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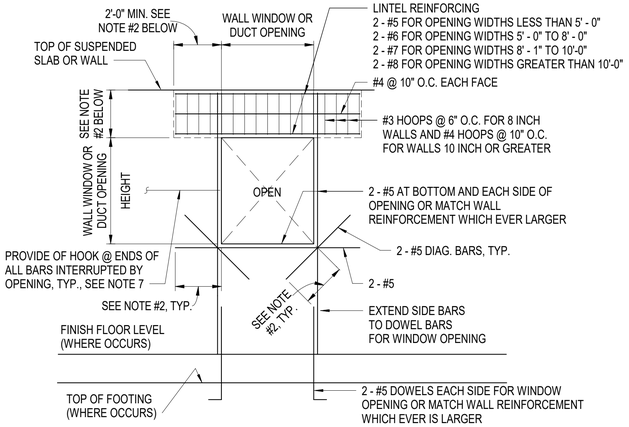
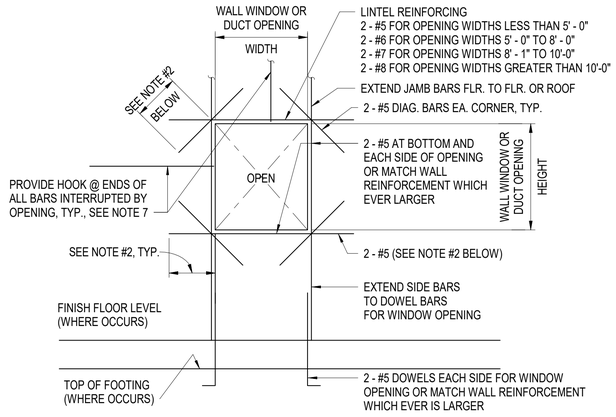
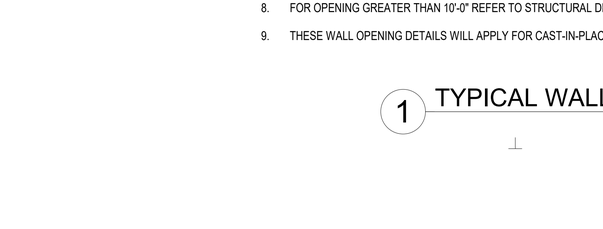


ELEVATION (CONC. WINDOW/DUCT OPENING)



ELEVATION (CONC. WINDOW/DUCT OPENING)



ELEVATION (CONC. WALL DOOR OPENING)

1B OPENING W/ LINTEL HEADER



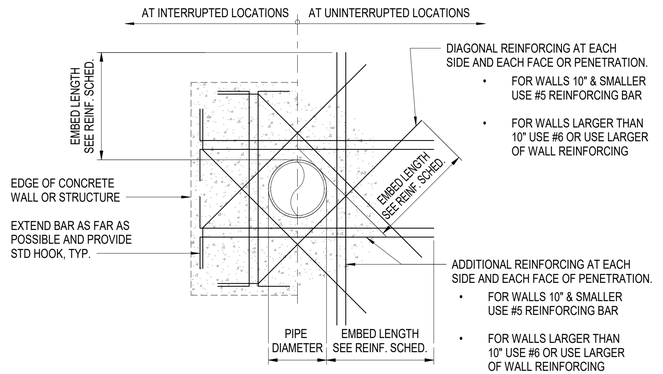
ELEVATION (CONC. WALL DOOR OPENING)

1A OPENING W/O LINTEL HEADER

WALL OPENING NOTES

1. FOR HEADER DEPTH GREATER THAN 4'-0" USE DETAIL "1A"; OTHERWISE USE DETAIL "1B".
2. SEE REINFORCING SCHEDULE FOR CLASS "B" MINIMUM EMBEDMENT REQUIREMENTS FOR LENGTH OF ADDITIONAL REINFORCING.
3. PROVIDE STANDARD HOOKS AT ENDS OF ALL BARS INTERRUPTED BY OPENING.
4. WHERE EXTENSION EQUAL TO DEVELOPMENT LENGTH IS NOT POSSIBLE, EXTEND BAR AS FAR AS POSSIBLE AND PROVIDE STANDARD HOOK.
5. WHERE REINFORCING BARS ARE INTERRUPTED BY OPENING SMALLER THAN 6-INCHES, ADDITION DIAGONAL REINFORCING SHALL BE PROVIDED.
6. WHERE PENETRATION IS THROUGH A DOUBLE REINFORCED STRUCTURE, PROVIDE ADDITIONAL REINFORCING AT EACH FACE.
7. FOR SINGLE AND DOUBLE REINFORCED WALLS, PROVIDE 180 DEGREE HOOKS AND 90 DEGRESS HOOKS RESPECTIVELY, AT ENDS OF ALL VERTICAL BARS ALONG OPENING. FOR HORIZONTAL BARS, REFER TO CONCRETE END DETAILS THIS SHEET.
8. FOR OPENING GREATER THAN 10'-0" REFER TO STRUCTURAL DRAWINGS FOR HEADER DETAIL.
9. THESE WALL OPENING DETAILS WILL APPLY FOR CAST-IN-PLACE CONCRETE WALLS OR PRECAST WALL PANELS.

1 TYPICAL WALL OPENING DETAILS



2 TYPICAL PIPE PENETRATION (12" & LARGER) DETAIL

3 TYPICAL PIPE PENETRATION (SMALLER THAN 12") DETAIL

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SIMON SANCHEZ HIGH SCHOOL

Title
TYPICAL OPENING AND CONNECTION DETAILS
PROGRAMMING DOCUMENT

Designed:	DCA
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Date:	03/31/25
Project	File

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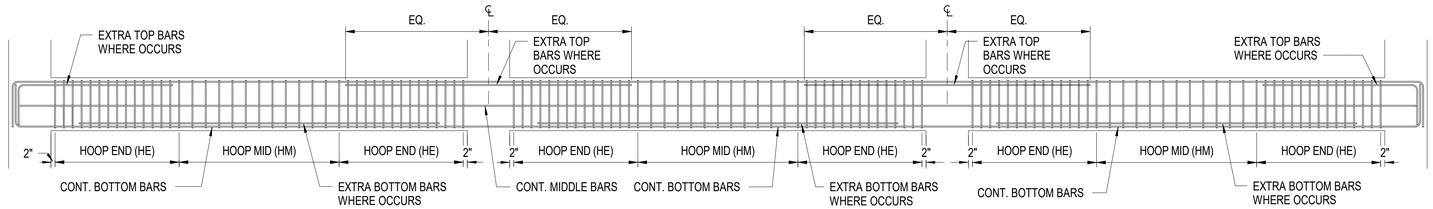
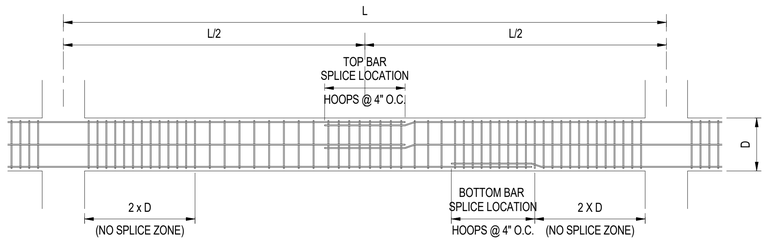


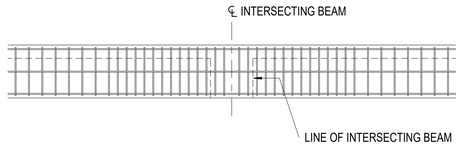
1 TYP. BEAM ELEVATION

NOTES

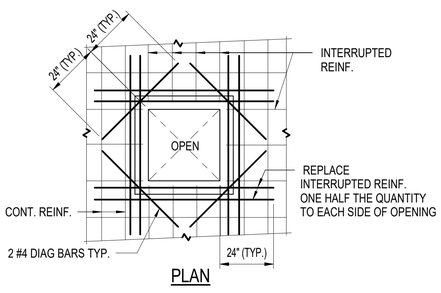
1. LOCATE TOP BAR SPLICE @ MID SPAN
2. LOCATE BOTTOM BAR SPLICE @ DISTANCE OUTSIDE THE NO. SPLICE ZONE AREA.
3. ALL SPLICES SHALL HAVE A MINIMUM HOOPS SPACING OF 4" O.C.
4. USE CLASS B SPLICE LENGTH FOR ALL LAP SPLICES.



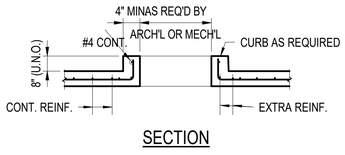
2 TYP. BEAM SPLICE LOCATION



3 TYP. BEAM HOOPS @ INTERSECTION

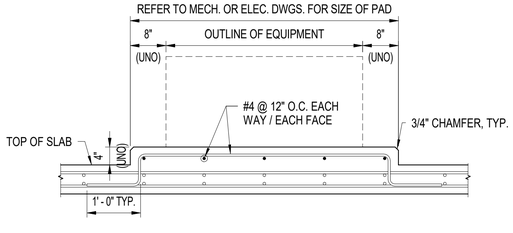


PLAN

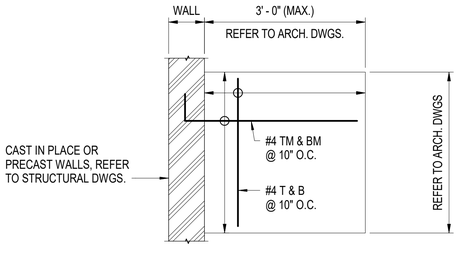


SECTION

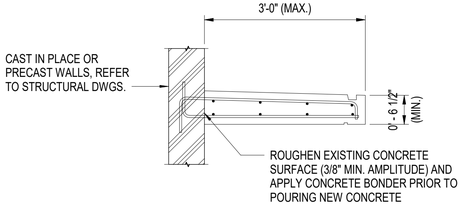
4 SUSPENDED SLAB PENETRATION DETAIL



5 TYP. EQUIPMENT PAD ON SUSPENDED SLAB DETAIL



PLAN



SECTION

6 TYP. CONCRETE EYEBROW DETAIL

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
TYPICAL BEAM ELEVATIONS AND TYPICAL DETAILS
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

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S0.3.3
Sheet No. _____ of _____

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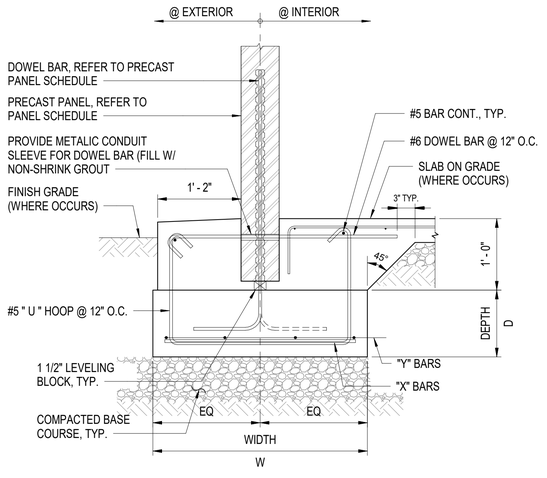
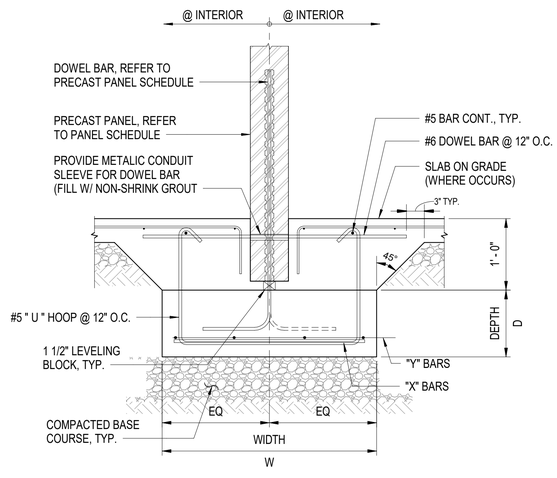
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

" WFP " WALL FOOTING SCHEDULE

FOOTING MARK	WIDTH "W"	DEPTH (D)	REINFORCEMENT		REMARKS
			"X" BARS	"Y" BARS	
A-WING CLASSROOMS (EAST)					
WFP4.5-5	4'-6"	1'-4"	#5 @ 10" O.C.	6-#5	
WFP5.5-5	5'-6"	1'-4"	#5 @ 8" O.C.	8-#5	
WFP6.5-5	6'-6"	1'-4"	#5 @ 7" O.C.	10-#5	
A-WING CLASSROOMS (WEST)					
WFP4.5-6	4'-6"	1'-4"	#5 @ 10" O.C.	6-#5	
WFP5.5-6	5'-6"	1'-4"	#5 @ 8" O.C.	8-#5	
WFP6.5-6	6'-6"	1'-4"	#5 @ 7" O.C.	10-#5	
B-WING CLASSROOMS					
WFP4.5-7	4'-6"	1'-4"	#5 @ 10" O.C.	6-#5	
WFP5.5-7	5'-6"	1'-4"	#5 @ 8" O.C.	8-#5	
WFP6.5-7	6'-6"	1'-4"	#5 @ 7" O.C.	10-#5	
JROTC					
WFP3.0-9	3'-0"	1'-4"	#5 @ 10" O.C.	4-#5	
WFP4.0-9	4'-0"	1'-4"	#5 @ 10" O.C.	5-#5	
WFP4.5-9	4'-6"	1'-4"	#5 @ 10" O.C.	6-#5	
GCC					
WFP2.5-10	2'-6"	1'-4"	#5 @ 10" O.C.	3-#5	
WFP3.5-10	3'-6"	1'-4"	#5 @ 10" O.C.	5-#5	
CREDIT RECOVERY					
WFP2.5-11	2'-6"	1'-2"	#5 @ 12" O.C.	3-#5	



@ EXTERIOR PRECAST WALL PANEL



@ INTERIOR PRECAST WALL PANEL

NOTE:

1. REFER TO SHEET S0.1.1 FOR "GENERAL STRUCTURAL NOTES" AND FOUNDATION SUBGRADE REQUIREMENTS BELOW FOOTINGS AND SLAB ON GRADE.
2. REFER TO STRUCTURAL PLANS FOR SLAB ON GRADE THICKNESS AND REINFORCING REQUIREMENTS.

1 TYP. WALL FOOTING " WFP " DETAILS

REVISION

No.	Description	Date

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P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
TYP. PRECAST WALL FOOTING SCH. AND DETAILS
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S0.4.1
Sheet No. _____ of _____

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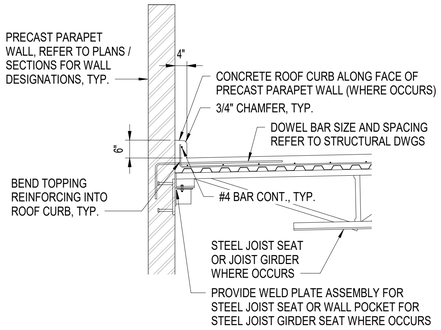
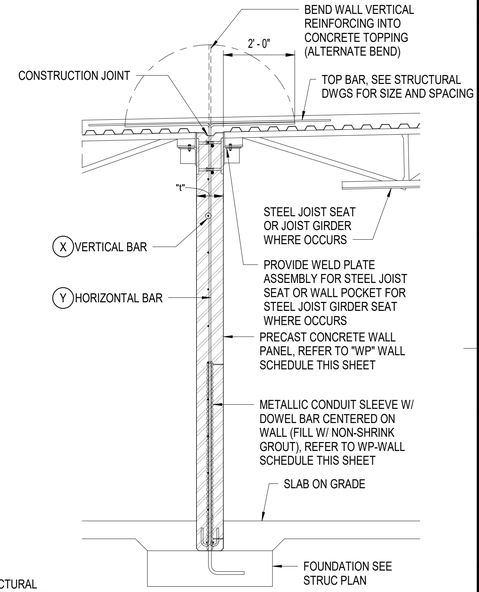
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

PRECAST WALL PANEL " WP " SCHEDULE

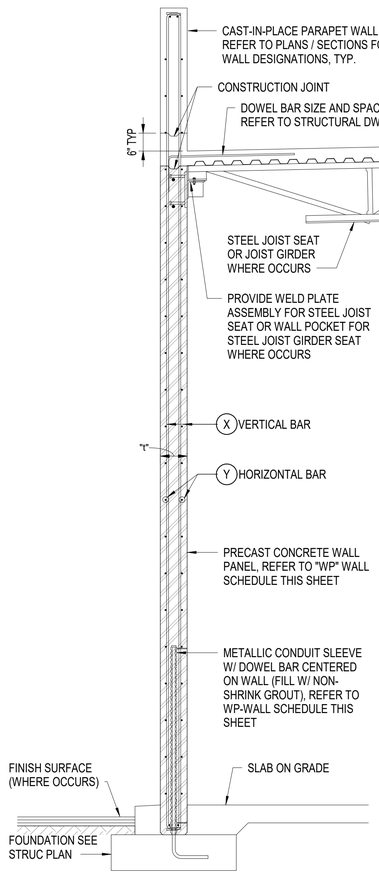
WALL MARK	THICKNESS "t"	TYPE	REINFORCEMENT			REMARKS
			(X) VERT. BARS	(Y) HOR. BARS	DOWEL BARS (DB)	
A-WING CLASSROOMS (EAST)						
WP8S-5	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
A-WING CLASSROOMS (WEST)						
WP8S-6	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
B-WING CLASSROOMS						
WP8S-7	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
JROTC & FIRING RANGE						
WP8S-9	8"	S	#5 @ 8" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
WP10D-9	10"	D	#6 @ 7" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
GCC						
WP8S-10	8"	S	#5 @ 10" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
WP10D-10	10"	D	#5 @ 8" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	
CREDIT RECOVERY						
WP8S-11	8"	S	#5 @ 12" O.C.	#4 @ 10" O.C.	#8 @ 4'-0" (MAX) O.C.	



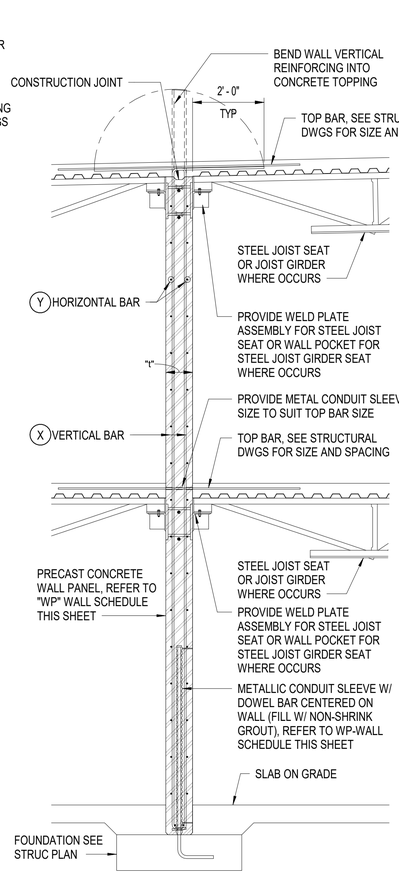
1G TYP. ROOF CURB (@ PRECAST PARAPET WALL)



1F TYPE "S" SECTION (SINGLE FLOOR @ INTERIOR)



1A TYPE "D" SECTION (@ EXTERIOR)



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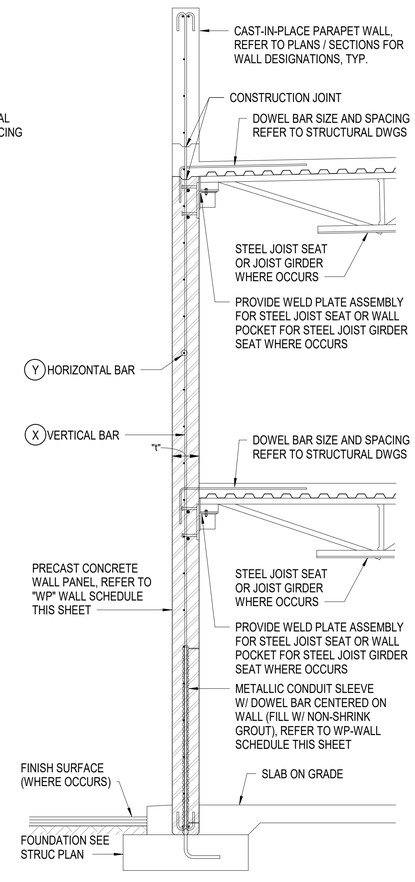

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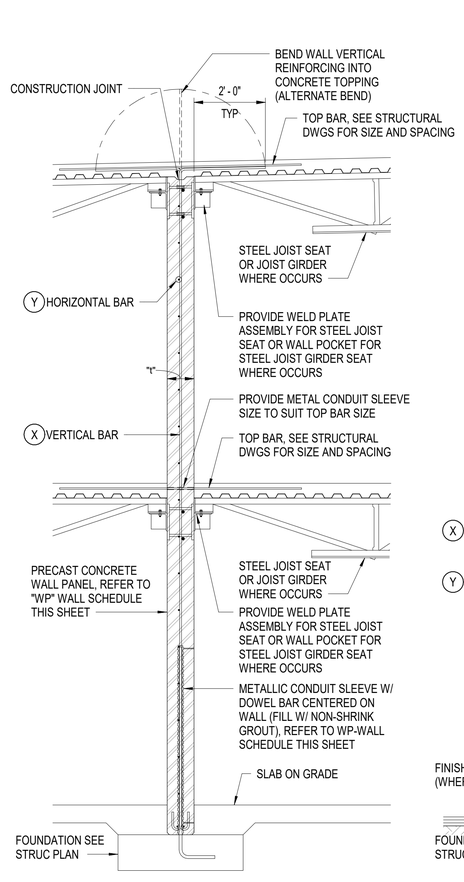
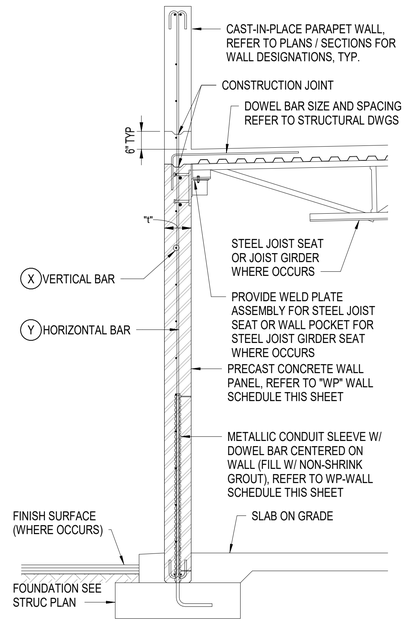


1D TYPE "S" SECTION (@ INTERIOR)



1E TYPE "S" SECTION (SINGLE FLOOR @ EXTERIOR)

1 TYP. PRECAST WALL PANEL SECTION AND SCHEDULE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRECAST WALL PANEL SCH. & TYP. WALL PANEL SECT.
PROGRAMMING DOCUMENT

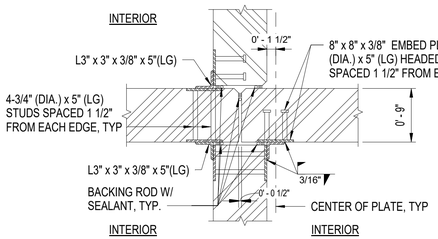
Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S0.4.2
Sheet No. ____ of ____

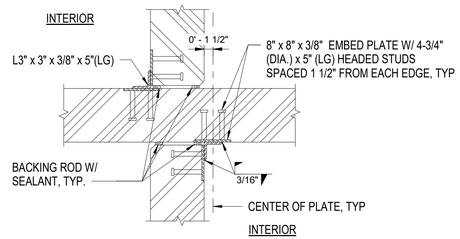
NOT FOR CONSTRUCTION

WALL PANEL NOTES

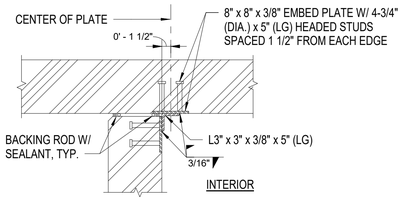
1. REFER TO SHEETS SHOWING PRECAST WALL PANEL ELEVATIONS.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, IN THE PREPARATION OF THE SHOP DRAWINGS, TO VERIFY WITH THE STEEL JOIST MANUFACTURER THE EXACT LOCATIONS OF EACH STEEL JOIST WALL SEAT OR STEEL JOIST GIRDER WALL POCKET ALONG EACH INDIVIDUAL PANEL.
3. THE PANELS AS SHOWN ON THIS SHEET IS A REPRESENTATION OF A TYPICAL PANEL MODEL. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, IN THE PREPARATION OF THE SHOP DRAWINGS, TO MAKE THE NECESSARY ADJUSTMENTS TO EACH PANEL TO ENSURE PROPER FIT BETWEEN PANELS. THE ADJUSTMENTS SHALL ACCOUNT FOR THE OFF-SET AND CONNECTION TO THE ADJACENT PANELS AT BOTH ENDS OF THE PANEL. THIS WILL ESTABLISH THE EXACT OVERALL WIDTH FOR EACH INDIVIDUAL PANEL. PANEL HEIGHTS SHALL ACCOUNT FOR THE OFF-SET FROM THE REFERENCED FLOOR AND/OR ROOF TOP ELEVATIONS. THIS WILL ESTABLISH THE EXACT OVERALL HEIGHTS FOR EACH INDIVIDUAL PANEL.
4. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD, FOR THE REVIEW AND APPROVAL, IT'S METHODOLOGY FOR THE PANEL ERECTION SEQUENCE, PANEL ERECTION CONNECTION SUPPORTS AND PANEL BRACING. SUBMITTAL SHALL INCLUDE CALCULATIONS PREPARED AND SIGNED BY A GUAM REGISTERED PROFESSIONAL ENGINEER. WRITTEN APPROVAL FROM THE ENGINEER OF RECORD MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO THE FABRICATION AND ERECTION OF THE PANELS.
5. PENETRATIONS SHALL BE AVOIDED DIRECTLY BELOW JOIST / JOIST GIRDER FRAMES. FOR PIPE PENETRATIONS WITHIN 3'-0" BELOW CONCRETE ROOF/METAL DECK, LOCATE PENETRATIONS BETWEEN JOIST / JOIST GIRDER FRAMES AT A MINIMUM DISTANCE OF 1'-0" FROM ADJACENT JOIST FRAME. NO RESTRICTIONS SHALL APPLY FOR PENETRATIONS GREATER THAN 3'-0" BELOW CONCRETE ROOF/METAL DECKING. PENETRATIONS SHALL BE 2'-0" (MIN.) FROM PANEL VERTICAL WALL JOINTS. SEE SHEET S0.-.- FOR WALL PENETRATION DETAILS.
6. ALL ERECTION CONNECTION SHALL BE PLACE AT THE INTERIOR WALL FACE, UNLESS NOTED OTHERWISE.



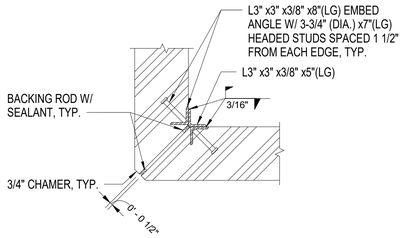
CROSS CONNECTION @ PANEL ENDS



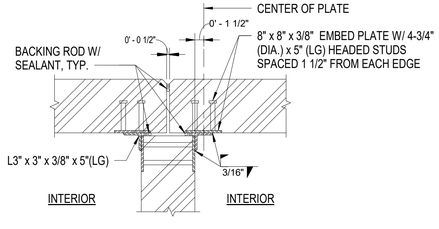
CROSS CONNECTION @ CONTINUOUS PANEL



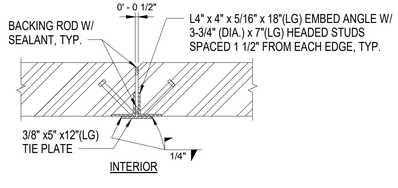
TEE CONNECTION @ CONTINUOUS PANEL



@ CORNER

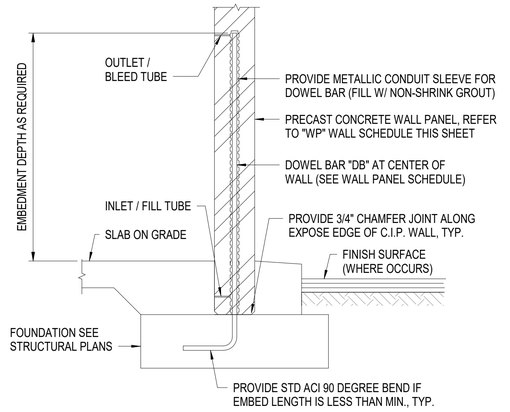


TEE CONNECTION @ PANEL ENDS

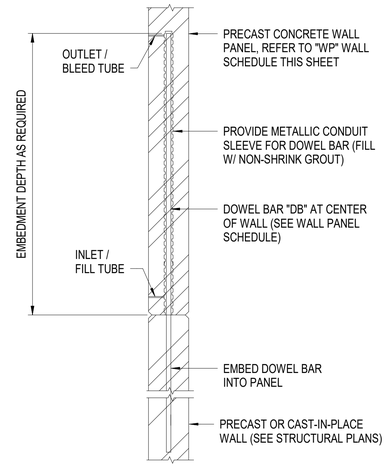


@ CONTINUOUS TIE-IN

1 TYP. PRECAST WALL PANEL CONNECTION DETAIL



@ PANEL TO FOUNDATION



@ PANEL TO PANEL

2 TYP. PANEL VERTICAL CONNECTION DETAIL

REVISION

No.	Description	Date

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: -

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

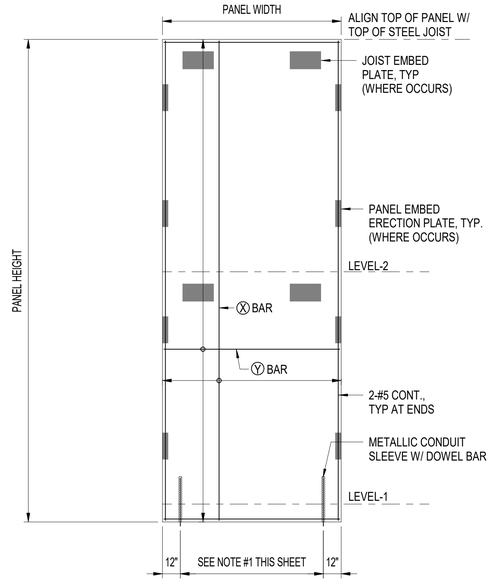
Title
TYPICAL WALL PANEL CONNECTION DETAILS
PROGRAMMING DOCUMENT

Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

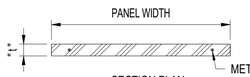
Drawing
S0.4.3
Sheet No. ____ of ____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

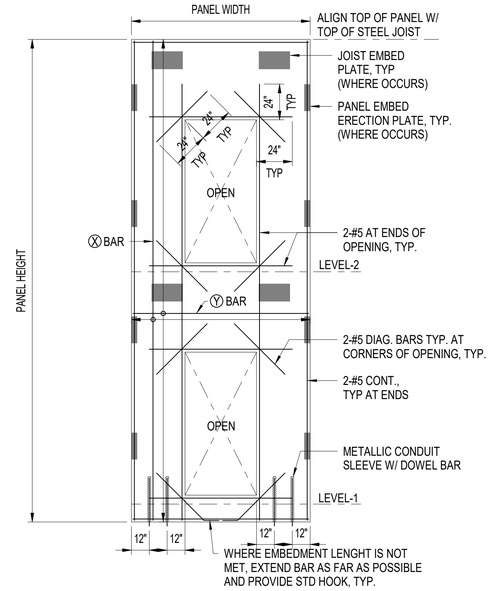
NOT FOR CONSTRUCTION



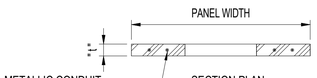
SECTIONAL ELEVATION



SECTION PLAN
TYPE-1



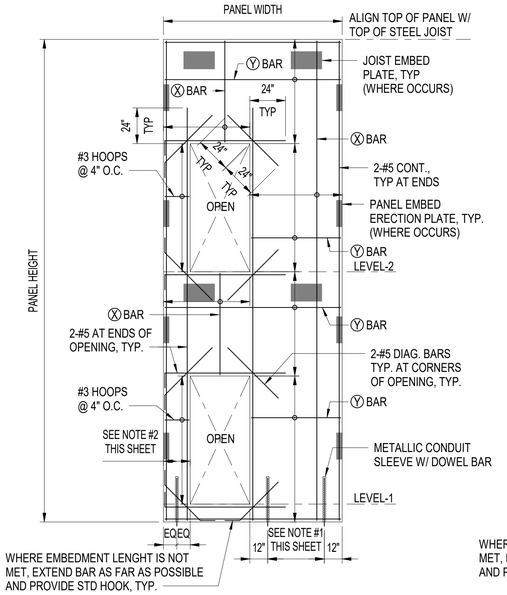
SECTIONAL ELEVATION



SECTION PLAN
TYPE-2

NOTE:

1. SEE PRECAST WALL PANEL SCHEDULE SHEET S0.4.2 FOR MAXIMUM DOWEL SPACING.
2. WHERE WALL WIDTH IS LESS THAN 3'-0" PROVIDE PROVIDE DOUBLE REINFORCING WITH #3 HOOPS @ 4" O.C. FOR 8" WALL OR #4 HOOPS @ 4" O.C. FOR 10" WALL. HOOPS TO EXTEND 1'-0" PASS EDGE OF OPENING



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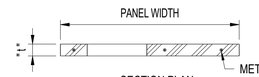
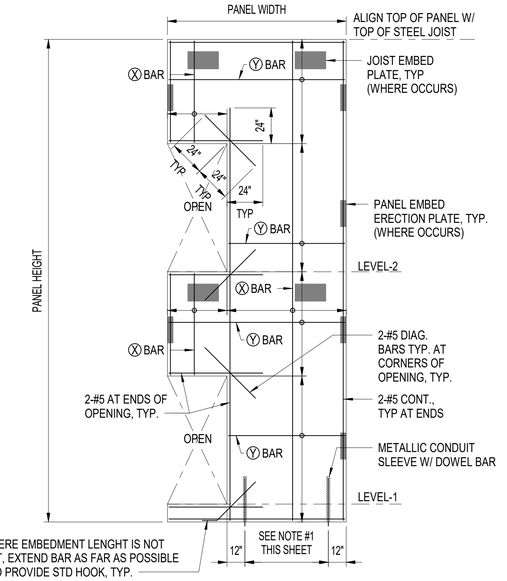


SECTION PLAN
TYPE-3



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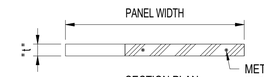

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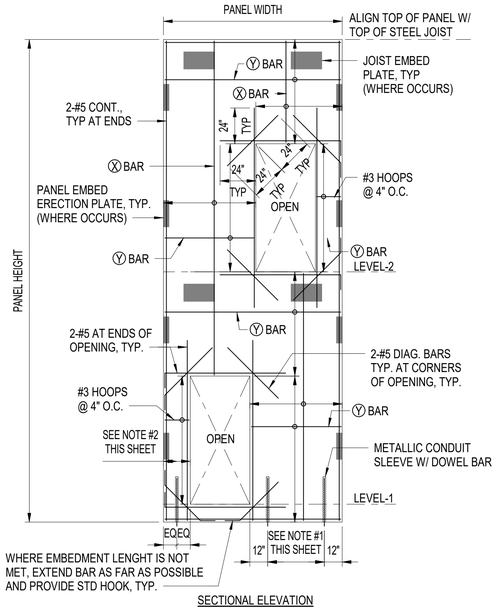
TYPE-4



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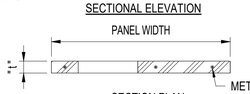

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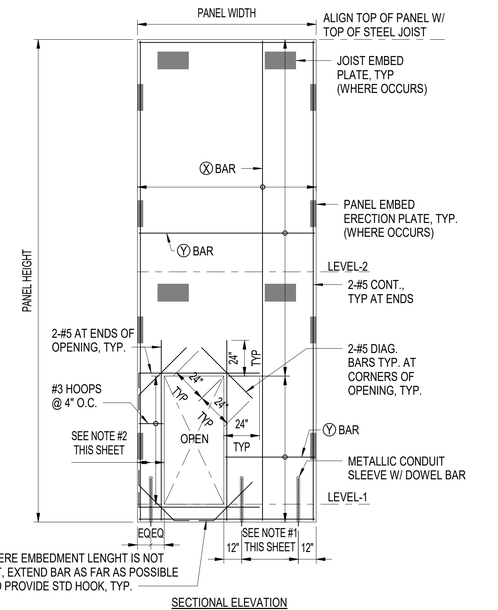
TYPE-5



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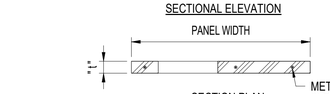
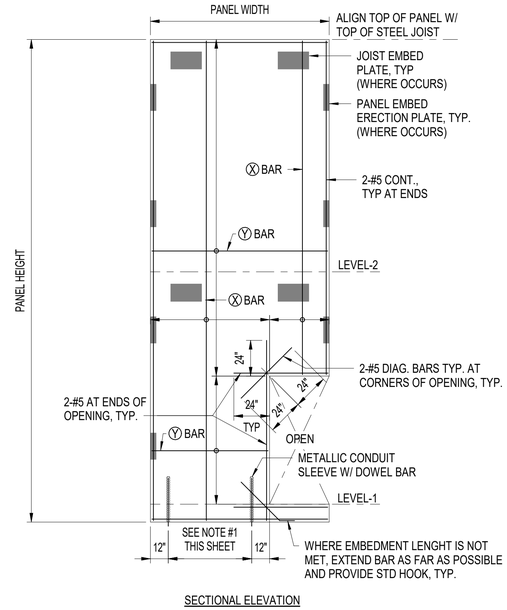


SECTION PLAN
TYPE-6



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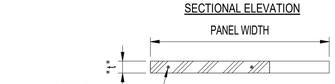

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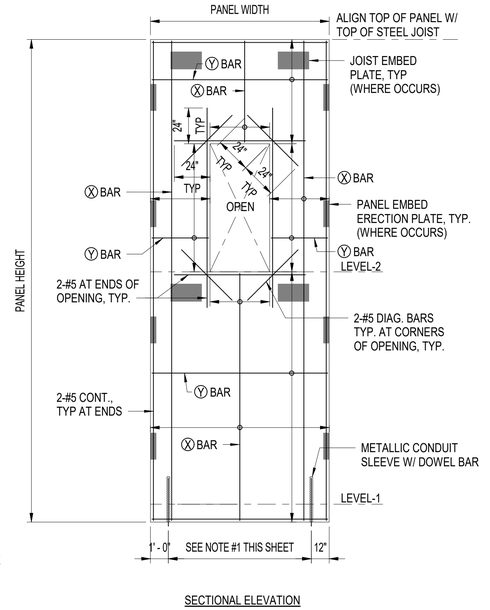

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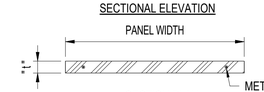

SECTION PLAN
TYPE-8

IF SHEET IS NOT 24"x36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
Planning
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■ CONSTRUCTION MANAGEMENT ■ PLANNING
■ ENVIRONMENTAL SERVICES ■ SURVEYING
■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96921

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: -

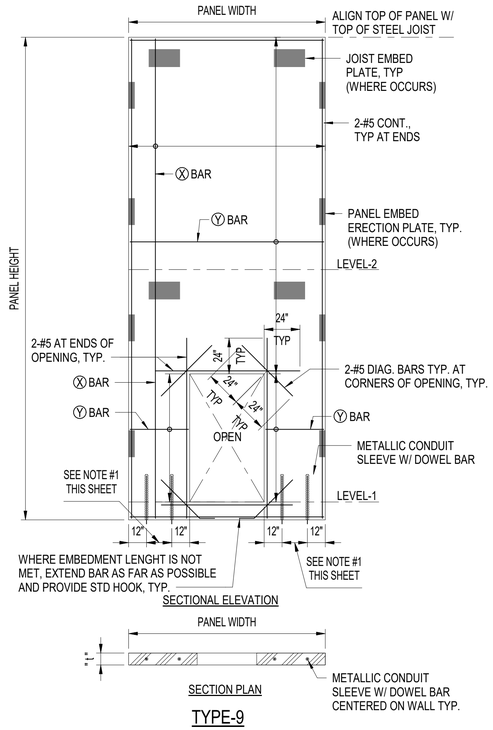
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

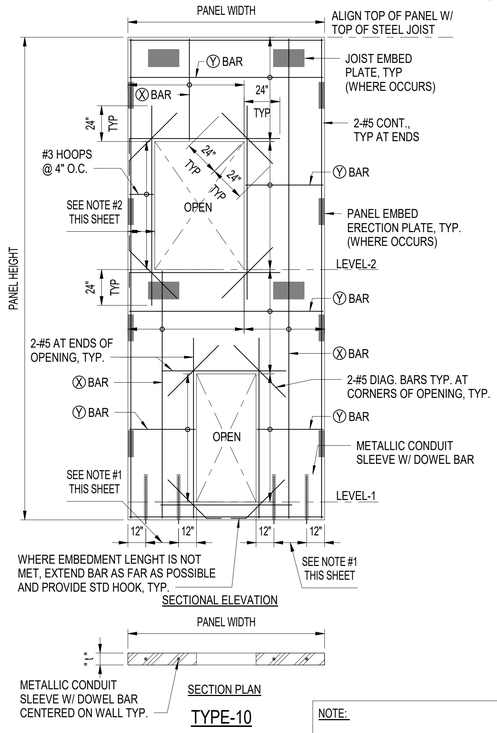
Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S0.4.4
Sheet No. of

NOT FOR CONSTRUCTION



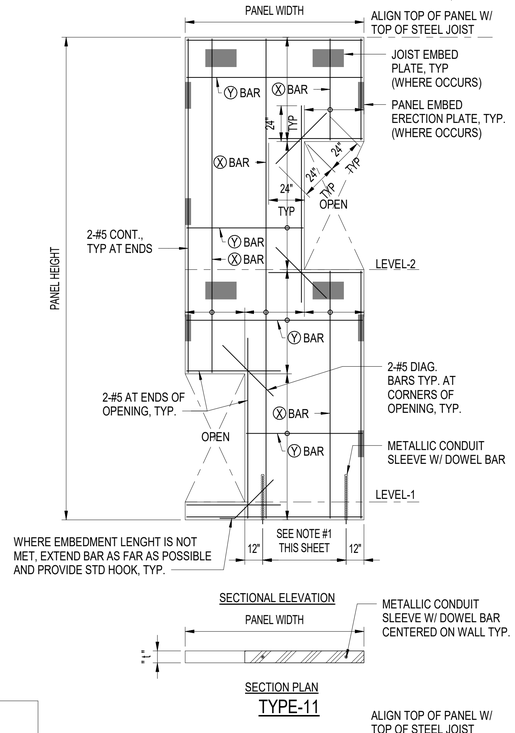
TYPE-9



TYPE-10

NOTE:

1. SEE PRECAST WALL PANEL SCHEDULE SHEET S0.4.2 FOR MAXIMUM DOWEL SPACING.
2. WHERE WALL WIDTH IS LESS THAN 3'-0" PROVIDE DOUBLE REINFORCING WITH #3 HOOPS @ 4" O.C. FOR 8" WALL OR #4 HOOPS @ 4" O.C. FOR 10" WALL. HOOPS TO EXTEND 1'-0" PASS EDGE OF OPENING



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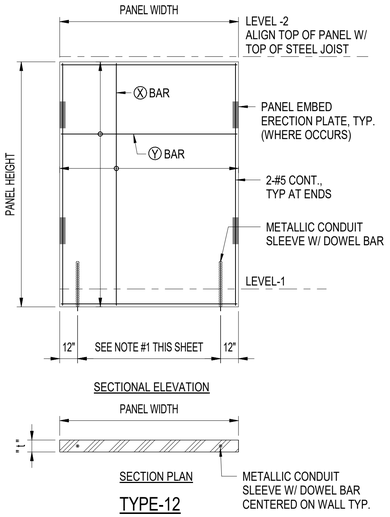

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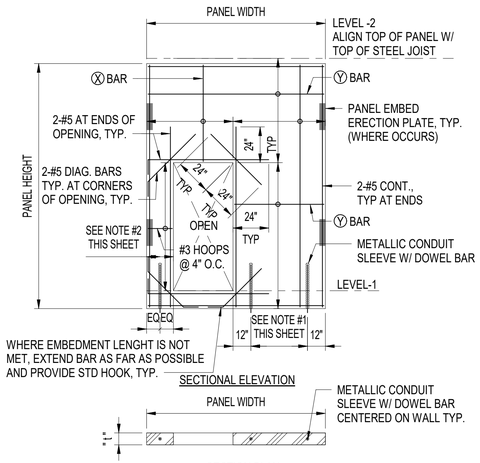

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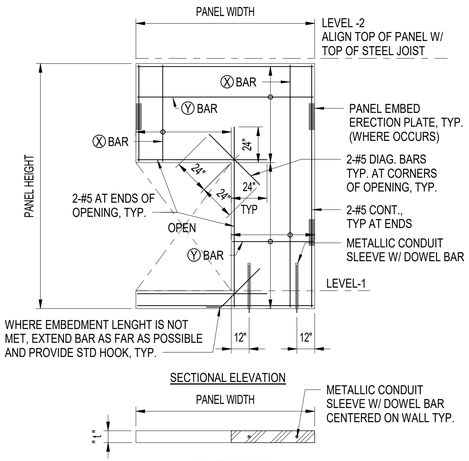
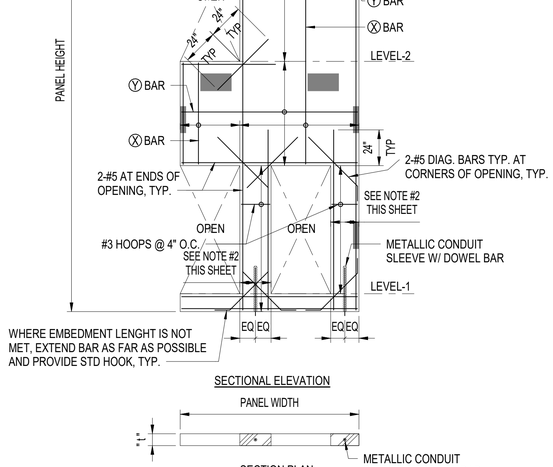


TYPE-14



TYPE-14A

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Taniguchi Ruth Makio Architects
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Architecture
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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: -

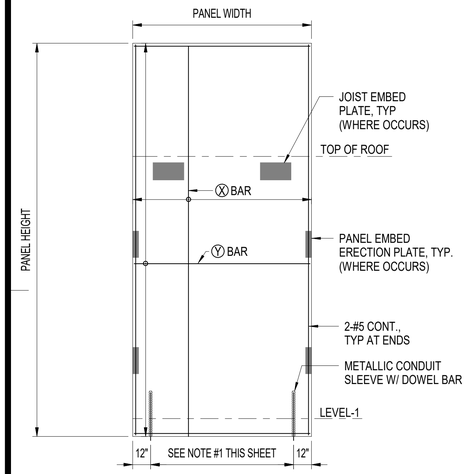
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

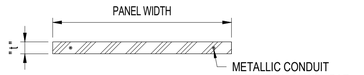
Designed:	DCA
Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S0.4.5
Sheet No. of

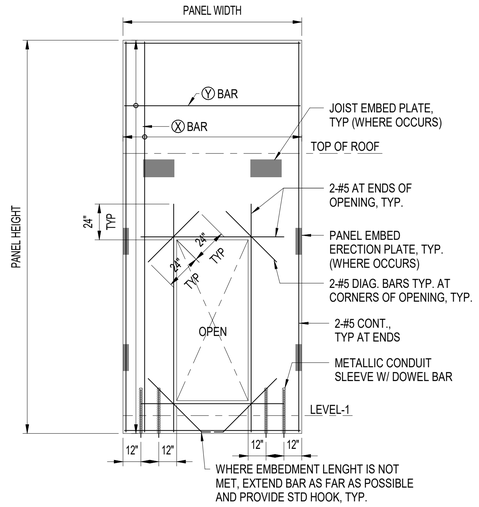
NOT FOR CONSTRUCTION



SECTIONAL ELEVATION



SECTION PLAN
TYPE-15



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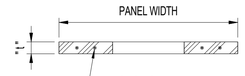
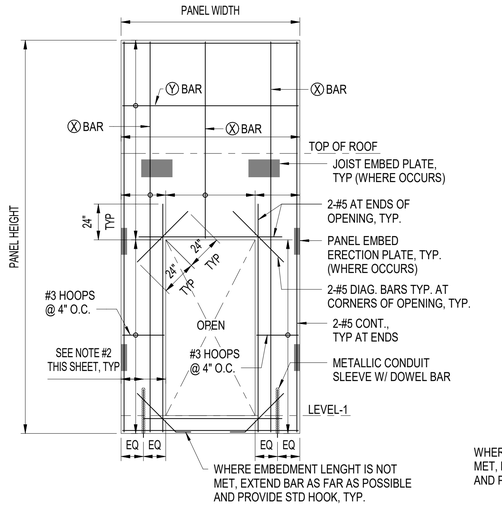


SECTION PLAN
TYPE-16

NOTE:

1. SEE PRECAST WALL PANEL SCHEDULE SHEET S0.4.2 FOR MAXIMUM DOWEL SPACING.
2. WHERE WALL WIDTH IS LESS THAN 3'-0" PROVIDE DOUBLE REINFORCING WITH #3 HOOPS @ 4" O.C. FOR 8" WALL OR #4 HOOPS @ 4" O.C. FOR 10" WALL. HOOPS TO EXTEND 1'-0" PASS EDGE OF OPENING



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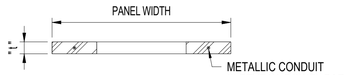

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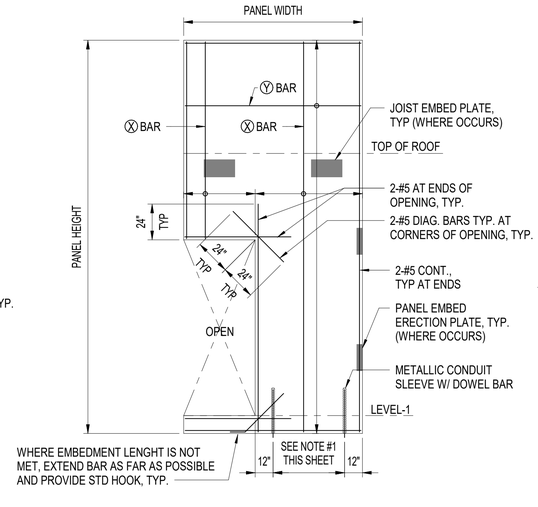

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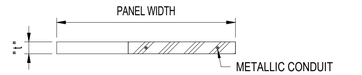

SECTION PLAN
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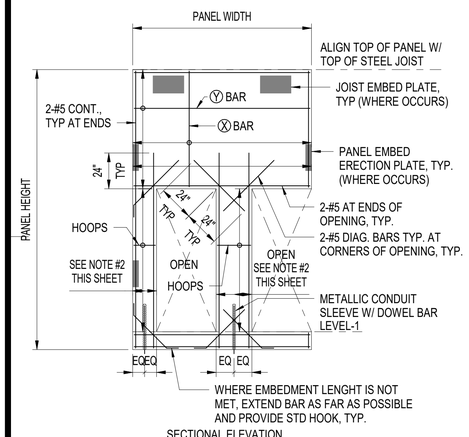

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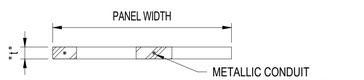

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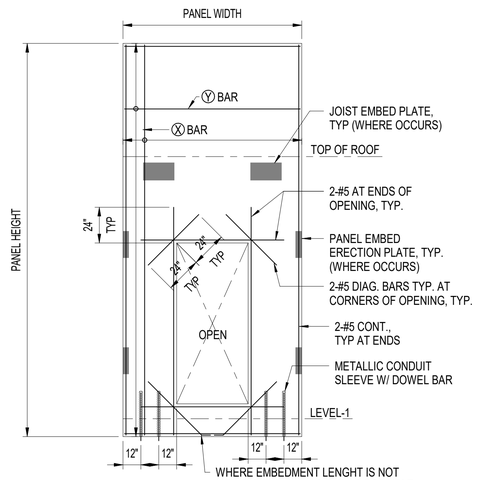

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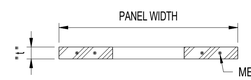

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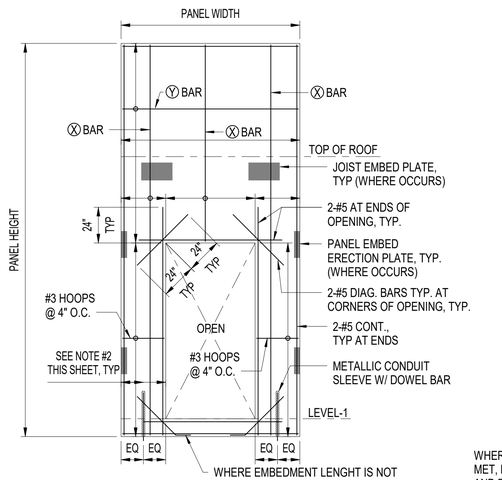

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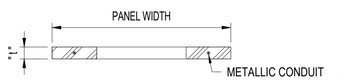
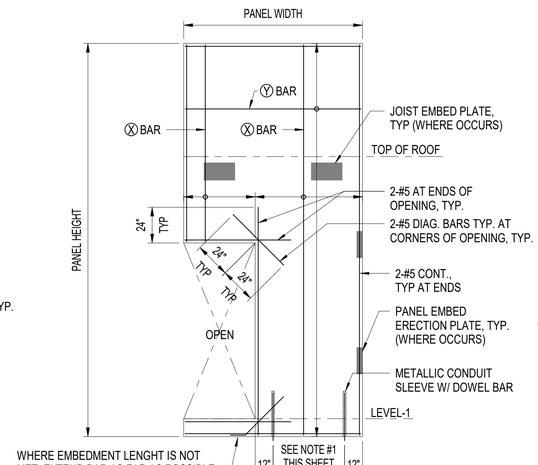


SECTION PLAN
TYPE-15



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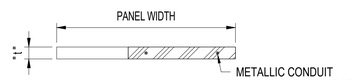

SECTION PLAN
TYPE-16

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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P.O. Box 8900 Tamuning, Guam 96931

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	DCA
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Checked	DCA
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Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S0.4.6
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

STEEL JOIST GIRDER NOTES

1. JOIST GIRDERS SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST STANDARD SPECIFICATIONS FOR JOIST GIRDERS OF THE STEEL JOIST INSTITUTE (SJI) 45TH EDITION.
2. STEEL JOISTS GIRDERS SHALL BE DESIGNED BY THE MANUFACTURER. THE MANUFACTURER'S ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN, ADEQUACY AND SAFETY OF ALL STEEL JOIST GIRDERS.
3. EXCEPT WHERE ADDITIONAL DESIGN LOADS ARE SHOWN ON THE STRUCTURAL DRAWINGS, STEEL JOIST GIRDERS SHALL BE DESIGNED AS SIMPLY SUPPORTED PRIMARY MEMBERS WITH ALL LOADS EQUAL IN MAGNITUDE AND EVENLY SPACED ALONG JOIST GIRDER TOP CHORD.
4. ADDITIONAL DESIGN LOADS SHOWN ON THE DRAWINGS SHALL BE CONSIDERED IN THE DESIGN OF THE JOIST GIRDER. WHERE SUCH LOADS DO NOT OCCUR AT THE PANEL POINTS OF THE JOIST GIRDER, AUXILIARY FRAMING SHALL BE ADDED TO THE JOIST GIRDER OR THE TOP CHORD SHALL BE DESIGNED FOR THE EFFECTS OF THE LOAD. WEIGHTS OF MECHANICAL EQUIPMENT ARE NOT INCLUDED IN THE UNIFORM DEAD LOAD. IT IS NECESSARY TO DESIGN THE JOIST GIRDERS FOR ADDITIONAL CONCENTRATED LOAD DUE TO THE WEIGHT OF MECHANICAL EQUIPMENT (ROOF TOP AIR CONDITIONING UNITS, CONCRETE PAD AND SCREEN WALLS).
5. WHEN NET UPLIFT FORCES DUE TO WIND ARE SHOWN ON THE DRAWINGS, THE MANUFACTURER SHALL DESIGN THE JOIST GIRDERS FOR THE NET UPLIFT.
6. JOIST GIRDERS SHALL BE PROPORTIONED SUCH THAT THEY CAN BE ERECTED WITHOUT BRIDGING.
7. MINIMUM BEARING REQUIREMENT, UNLESS NOTED OTHERWISE:
   4" ON STRUCTURAL STEEL, INCLUDING STEEL BEARING SEATS PROJECTING FROM WALLS
   6" ON STEEL BEARING PLATES DIRECTLY OVER CONCRETE WALLS
8. UNLESS NOTED OTHERWISE, JOIST GIRDERS SHALL BE ATTACHED TO SUPPORTING STEEL WORK OR STEEL BEARING PLATES WITH TWO (2) 1/4" FILLET WELDS (ONE EACH SIDE), 3" LONG, OR TWO (2) 3/4" DIAMETER BOLTS.
9. JOIST GIRDERS AT COLUMN CENTERLINES SHALL BE BOLTED TO STRUCTURAL STEEL WITH TWO (2) 3/4" DIAMETER A307 ERECTION BOLTS AND THEN WELDED TO THE COLUMN CAP PLATE UNLESS NOTED OTHERWISE. IF ERECTION BOLTS ARE REMOVED AFTER THE WELDED CONNECTION IS COMPLETE, ADDITIONAL WELDS SHALL BE MADE ALONG THE INSIDE EDGE OF THE SEAT SLOTS. IF A WELDED CONNECTION IS NOT PROVIDED IN THE DETAILS, THEN THE BOLTS SHALL BE A325 AND SHALL REMAIN IN PLACE.
10. NO OTHER LOADS SHALL BE PLACED ON THE JOIST GIRDER UNTIL THE STEEL JOISTS BEARING ON THIS GIRDER ARE IN PLACE AND ATTACHED THERETO.
11. ALL STEEL JOIST GIRDERS SHALL BE CAMBERED IN CONFORMANCE TO THE SJI SPECIFICATIONS. JOISTS LESS THAN 3'-0" FROM WALL SHALL HAVE ZERO CAMBER AND JOISTS BETWEEN 3' AND 6' FROM WALL SHALL HAVE HALF CAMBER OR LESS.
12. ALL ITEMS SUCH AS BUT NOT LIMITED TO, MECHANICAL, ARCHITECTURAL, ELECTRICAL, ETC. THAT REQUIRES EQUIPMENTS THAT ARE TO BE SUPPORTED OR HUNG FROM THE STEEL JOIST GIRDER SHALL BE FRAMED WITH AUXILIARY FRAMING TO THE PANEL POINTS OF THE STEEL JOIST GIRDER. METHODS OF FRAMING THAT INDUCE BENDING TO THE STEEL JOIST GIRDER CHORDS OR WEB MEMBERS MUST BE DESIGNED WITH THE RESPECTIVE LOADS COORDINATED BY THE CONTRACTOR AND JOIST MANUFACTURER.

STEEL JOIST NOTES

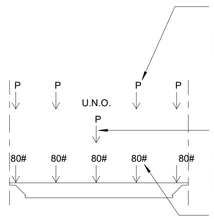
1. STEEL JOISTS SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST " STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS, " LH-SERIES " OF THE STEEL JOIST INSTITUTE (SJI) 45TH EDITION.
2. ALL STEEL JOISTS SHALL BE SPACED AT 4'-0" (MAX.) O.C. UNLESS NOTED OTHERWISE. ALL JOIST SEATS SHALL BE 5" DEEP UNLESS NOTED OTHERWISE.
3. STEEL JOIST DESIGNATIONS GIVE THE TOTAL DEPTH AND SERIES FOLLOWED BY THE TOTAL UNIFORM LOAD (PLF)/UNIFORM LIVE LOAD (PLF). THESE UNIFORM LOADS DO NOT INCLUDE THE EFFECTS OF WIND PRESSURES. BOTH UPLIFT AND DOWN WIND PRESSURES SHALL BE COMBINED AS REQUIRED WITH THESE UNIFORM LOADS. THE JOIST MANUFACTURER SHALL DESIGN THE JOISTS FOR THESE UNIFORM LOADS, AND FOR THE NON-UNIFORM, CONCENTRATED, AND/OR AXIAL LOADS PROVIDED ON THE DRAWINGS. SEE "STRUCTURAL DESIGN CRITERIA" SHEET S0.1.1 AND S0.1.2 FOR DESIGN WIND PRESSURES AND LOAD COMBINATIONS.
4. STEEL JOISTS SHALL BE DESIGNED BY THE MANUFACTURER. THE MANUFACTURER'S ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN, ADEQUACY AND SAFETY OF ALL STEEL JOISTS.
5. UNLESS OTHERWISE NOTED, STEEL JOISTS SHALL BE DESIGNED AS SIMPLY SUPPORTED, UNIFORMLY LOADED TRUSSES WITH THE TOP CHORD BRACED AGAINST LATERAL BUCKLING. THE UNIFORM DESIGN LOAD SHALL BE THE TOTAL SAFE UNIFORMLY DISTRIBUTED LOAD AS SHOWN IN THE SJI STANDARD LOAD TABLE.
6. WHEN NET UPLIFT FORCES DUE TO WIND ARE SHOWN ON THE DRAWINGS, THE MANUFACTURER SHALL DESIGN THE JOISTS AND BRIDGING FOR THE NET UPLIFT. A SINGLE LINE OF BOTTOM CHORD BRIDGING MUST BE PROVIDED NEAR THE FIRST BOTTOM CHORD PANEL POINTS WHENEVER UPLIFT DUE TO WIND FORCES IS SHOWN ON THE DESIGN DRAWINGS.
7. WHEN NON-UNIFORM OR CONCENTRATED LOADS ARE SHOWN ON THE DRAWINGS, THE MANUFACTURER SHALL DESIGN THE JOISTS IN ACCORDANCE WITH PARAGRAPH 103.1 OF THE "STANDARD SPECIFICATION FOR OPEN WEB STEEL JOIST, 'LH-SERIES"
8. STEEL JOIST BRIDGING SHALL BE PROVIDED IN ACCORDANCE WITH THE SJI SPECIFICATION. ALL BRIDGING AND BRIDGING ANCHORS SHALL BE PLACED AND STEEL JOIST ENDS FIXED PRIOR TO THE APPLICATION OF ANY LOADS. BRIDGING THAT TERMINATES AT, OR IS INTERRUPTED BY, STRUCTURAL STEEL BEAMS, MASONRY WALLS OR CONCRETE WALLS SHALL BE ATTACHED THERETO. COORDINATE BRIDGING LOCATIONS TO AVOID INTERFERENCE WITH ALL MECHANICAL, ELECTRICAL AND FIRE PROTECTION EQUIPMENT.
9. MINIMUM BEARING REQUIREMENTS FOR LH-SERIES STEEL JOISTS, UNLESS NOTED OTHERWISE.
   4" ON STRUCTURAL STEEL, INCLUDING STEEL BEARING SEATS PROJECTING FROM WALLS
   6" ON STEEL BEARING PLATES DIRECTLY OVER MASONRY OR CONCRETE WALLS
10. UNLESS NOTED OTHERWISE, LH-SERIES JOISTS SHALL BE ATTACHED TO SUPPORTING STEEL WORK OR STEEL BEARING PLATES WITH (2) 1/4" FILLET WELDS (ONE EACH SIDE) 2" LONG, OR WITH (2) 3/4" DIAMETER BOLTS (ONE EACH SIDE). WHERE THE DRAWINGS INDICATE THAT THE JOIST SEAT IS TO BE WELDED TO THE SUPPORTING STEEL OR JOIST GIRDER, THE BOLTS PROVIDED ARE FOR ERECTION ONLY. ERECTION BOLTS MAY BE REMOVED AFTER THE WELDS ARE COMPLETED BUT AN ADDITIONAL WELD SHALL BE MADE ALONG THE INSIDE EDGE OF THE SEAT SLOTS.
11. UNLESS NOTED OTHERWISE, STEEL JOISTS AT COLUMN CENTER LINES SHALL BE BOLTED TO STRUCTURAL STEEL WITH (2) 1/2" DIAMETER BOLTS OR (2) 3/4" DIAMETER BOLTS FOR LH-SERIES. WHERE STEEL JOISTS DO NOT SPACE TO COLUMN CENTER LINES, USE BOLTED CONNECTIONS FOR THE STEEL JOIST CLOSEST TO THE CENTER LINE. WHERE THE DRAWINGS INDICATE THAT THE JOIST SEAT IS TO BE WELDED TO THE SUPPORTING STEEL OR JOIST GIRDER, THE BOLTS PROVIDED ARE FOR ERECTION ONLY. ERECTION BOLTS MAY BE REMOVED AFTER THE WELDS ARE COMPLETED BUT AN ADDITIONAL WELD SHALL BE MADE ALONG THE INSIDE EDGE OF THE SEAT SLOTS.
12. HOLES IN STEEL JOIST CHORDS WILL NOT BE PERMITTED, EXCEPT FOR BOLTED CONNECTIONS AT THE BEARING END OF THE STEEL JOIST.
13. ALL ITEMS SUCH AS BUT NOT LIMITED TO, MECHANICAL, ARCHITECTURAL, ELECTRICAL, ETC. THAT REQUIRES EQUIPMENTS THAT ARE TO BE SUPPORTED OR HUNG FROM THE STEEL JOIST SHALL BE FRAMED WITH AUXILIARY FRAMING TO THE PANEL POINTS OF THE STEEL JOIST. METHODS OF FRAMING THAT INDUCE BENDING TO THE STEEL JOIST CHORDS OR WEB MEMBERS MUST BE DESIGNED WITH THE RESPECTIVE LOADS COORDINATED BY THE CONTRACTOR AND JOIST MANUFACTURER.
14. ALL STEEL JOISTS SHALL BE CAMBERED IN CONFORMANCE TO THE SJI SPECIFICATIONS. JOISTS LESS THAN 3'-0" FROM WALL SHALL HAVE ZERO CAMBER AND JOISTS BETWEEN 3' AND 6' FROM WALL SHALL HAVE HALF CAMBER OR LESS.
15. PLACEMENT OF SPRINKLER CONTRACTOR'S PIPING AND STEEL CONTRACTOR'S JOIST BRIDGING SHALL BE COORDINATED BY THE GENERAL CONTRACTOR. THE CONTRACTOR SHALL MAKE PROVISIONS FOR THE STEEL ERECTOR TO ADJUST/RELOCATE BRIDGING OR SPRINKLER CONTRACTOR TO ADJUST OR RELOCATE PIPING WHERE CONFLICTS OCCUR. ALL CHANGES REQUIRED OF THE JOIST BRIDGING SHALL BE DESIGNED BY JOIST MANUFACTURER.

STEEL DECK NOTES

1. STEEL DECK SHALL COMPLY WITH THE REQUIREMENTS OF THE STEEL DECK INSTITUTE "SPECIFICATIONS AND COMMENTARY FOR STEEL ROOF DECK" (2013).
2. STEEL DECK SHALL BE CONFIGURATION, DEPTH AND MINIMUM GAUGE AS SHOWN ON THE DRAWINGS. ATTACHMENT TO THE SUPPORTING STRUCTURE SHALL BE AS SHOWN ON THE DRAWINGS.
3. DO NOT HANG OR SUPPORT ANY LOADS FROM STEEL DECK.
4. STEEL DECK SHALL BE CONTINUOUS OVER A MINIMUM OF THREE SPANS. DECK WITH A THICKNESS OF 18G OR LESS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO SPANS ADJACENT TO JOIST BAYS WITH OPENINGS.
5. DECK ENDS SHALL BE LAPPED A MINIMUM OF 2". BUTTED ENDS ARE NOT PERMITTED.
6. SECURE DECK WITH HILTI X-EDN19 (OR APPROVED EQUAL) DECK PIN FASTENERS @ EACH RIB TO FRAME.
7. GALVANIZED G90.

FIRE SPRINKLER NOTES

1. SPRINKLER PIPING 4" AND SMALLER IN SIZE IS SUSPENDED FROM JOIST TOP CHORDS WITH TOP CHORD HANGERS OFF ONE SIDE OF THE JOIST. PROPORTION JOIST TOP CHORDS FOR THE ECCENTRIC LOADING. THE JOIST UNIFORM DEAD LOADS INCLUDE 9 PLF. FOR SPRINKLER PIPING 2 1/2" AND SMALLER. DEAD LOAD OF SPRINKLER PIPING 3" AND LARGER MUST BE ADDED AS SHOWN IN THE DIAGRAM BELOW IN COORDINATION WITH THE SPRINKLER DRAWINGS. HANGERS FOR ALL SPRINKLER PIPE 3" AND LARGER MUST BE LOCATED WITHIN 6 INCHES OF A JOIST PANEL POINT. CONTRACTOR TO PROVIDE ADDITIONAL WEB STRUT MEMBER(S) IN THE FIELD IF THIS CRITERIA IS NOT MET PER THE JOIST MANUFACTURER'S RECOMMENDATION.).
2. A TEMPORARY LIVE LOAD OF 250# SHALL BE CONSIDERED AT EACH HANGER LOCATION. THIS TEMPORARY LIVE LOAD OCCURS ONLY AT ONE HANGER AT A TIME AND DOES NOT NEED TO BE CONSIDERED IN COMBINATION WITH ANY OTHER LIVE OR SHORT TERM LOADS.
3. ADDITIONAL LOADINGS SHALL BE CONSIDERED IN THE JOIST AND GIRDER DESIGN TO ACCOUNT FOR ROOF MOUNTED AIR CONDITIONING SYSTEM, AND CONCRETE CURB/PAD OR RUNNERS, SEE SHEET S005. SEE MECHANICAL DRAWINGS FOR LOCATION OF AC UNITS AND WEIGHTS. CONTRACTOR TO PROVIDE LOAD STRUTS AS REQUIRED PER THE JOIST MANUFACTURER'S RECOMMENDATION.
4. ADDITIONALLY, THE JOIST MANUFACTURER SHALL ACCOUNT FOR LATERAL & VERTICAL SEISMIC FORCES FROM THE FIRE SPRINKLER SWAY BRACES (WHEN USED). SEE SPRINKLER DRAWINGS FOR LOCATIONS & INTENSITIES.



CONCENTRATED DEAD LOAD FOR MAINS 3" AND LARGER THAT ARE PARALLEL TO JOIST. SEE SPRINKLER DRAWINGS FOR LAYOUT OF MAINS. SEE TABLE BELOW FOR THE UNIFORM DEAD LOAD TO BE ADDED TO THE JOIST DESIGNATION. MAINS 6" AND LARGER ARE SUPPORTED BY TRAPEZE WITH THE TRAPEZE ENDS HUNG CONCENTRICALLY FROM THE ADJACENT JOISTS. BOTH JOISTS SHALL RECEIVE THE ADDED LOADING.

CONCENTRATED DEAD LOAD FOR MAINS 3" AND LARGER THAT ARE TRANSVERSE TO JOIST. APPLY TO JOISTS WHERE THEY CROSS THE MAINS, SEE SPRINKLER DRAWINGS FOR LAYOUT. SEE TABLE BELOW FOR CONCENTRATED DEAD LOAD. MAINS 3" AND LARGER SHALL BE HUNG FROM JOISTS AT A SPACING NOT TO EXCEED 7'-0" O.C.

CONCENTRATED DEAD LOAD FROM SPRINKLER PIPE 2 1/2" AND SMALLER. COLLECTIVE WEIGHT INCLUDED IN JOIST UNIFORM DEAD LOAD. LOCATE HANGERS A MINIMUM OF 2' AWAY FROM HANGERS SUPPORTING MAINS.

STANDARD JOIST LOADS FROM SPRINKLER HANGERS
(BASE ON DYNAFLOW PIPE FOR 4" AND SMALLER, SCH. 10 PIPE FOR 6" AND LARGER - PER SPRINKLER DESIGNER)

MAIN UNIT		MAIN - TRANSVERSE	MAIN - PARALLEL	
SIZE	WEIGHT	CONCENTRATED DEAD LOAD, P	CONCENTRATED DEAD LOAD, P	UNIFORM DEAD LOAD
3"	8 PLF	60#	80# (10'-0" O.C.)	13 PLF
4"	11 PLF	80#	80# (7'-3" O.C. MAX)	15 PLF
6"	23 PLF	165# (CONCENTRIC)	345# (TRAPEZE 15' O.C. MAX)	35 PLF
8"	37 PLF	260# (CONCENTRIC)	555# (TRAPEZE 15' O.C. MAX)	55 PLF
10"	56 PLF	390# (CONCENTRIC)	560# (TRAPEZE 10' O.C. MAX)	80 PLF

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
STEEL JOIST GIRDER, JOIST AND DECK NOTES
PROGRAMMING DOCUMENT

Designed:	DCA
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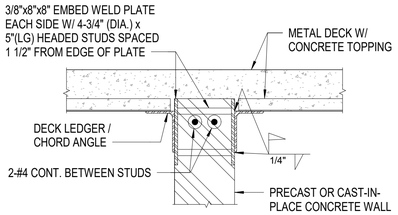
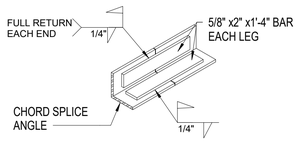
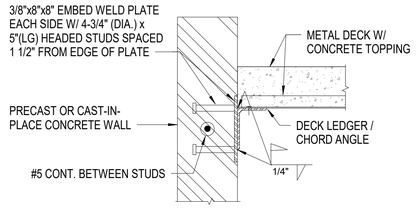


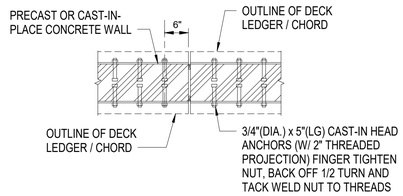
DECK LEDGER / CHORD WITH
BACK TO BACK EMBED WELD PLATE



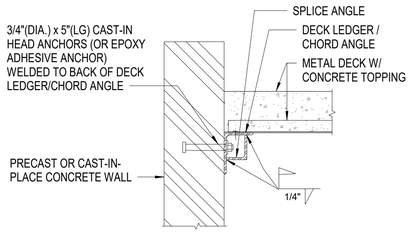
CHORD ANGLE SPLICE (ISOMETRIC)



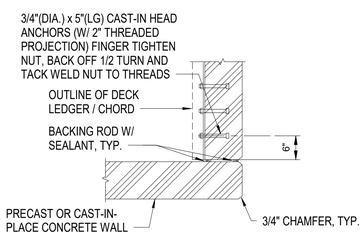
DECK LEDGER / CHORD
@ EMBED WELD PLATE



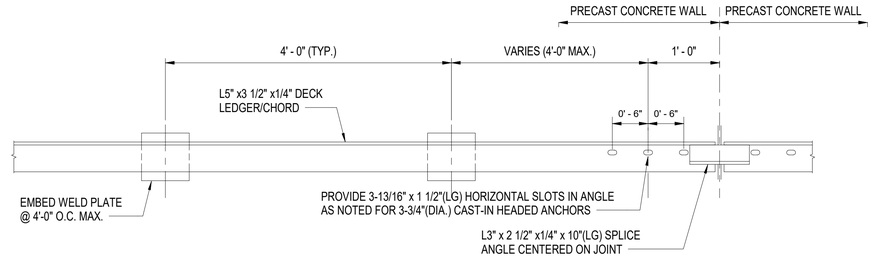
PLAN @ BACK TO BACK CONNECTION



DECK LEDGER /
CHORD @ SPLICE

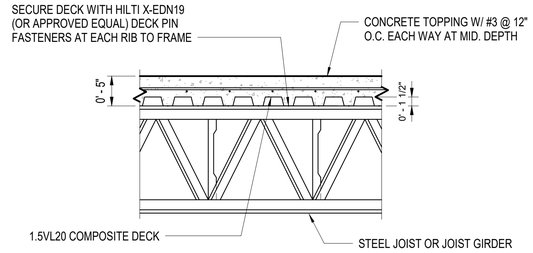


PLAN @ CORNER CONNECTION



DECK LEDGER / CHORD PARTIAL ELEVATION

1 TYP. DECK LEDGER / CHORD ANGLE DETAIL



2 TYP. METAL DECK W/ CONC. TOPPING DETAIL

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Project
GDOE
SIMON SANCHEZ HIGH
SCHOOL

Title
TYPICAL JOIST
MISCELLANIOUS
DETAILS
PROGRAMMING
DOCUMENT

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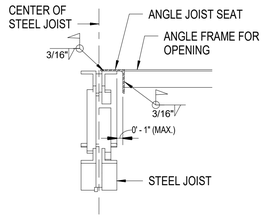

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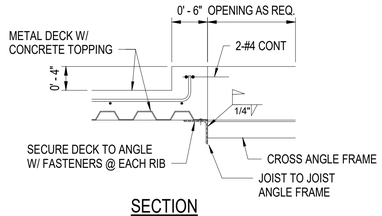

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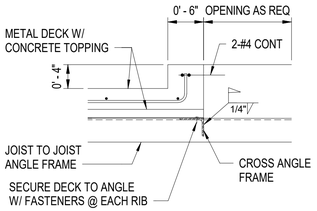

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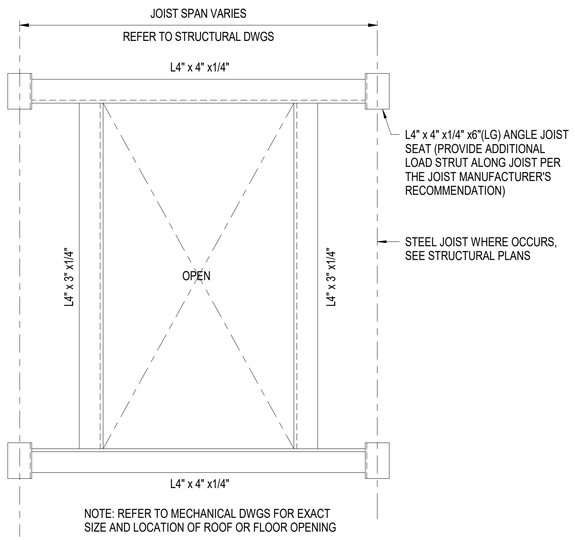
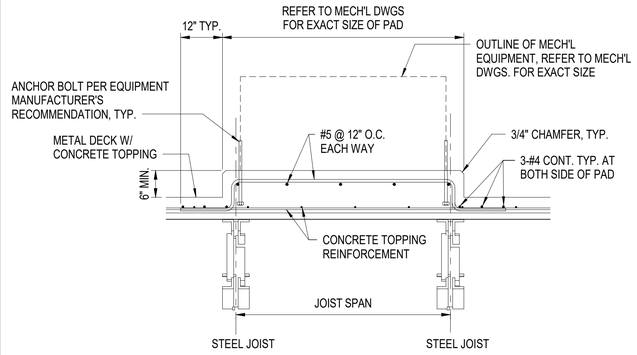


PLAN

1 TYP. STEEL DECK FRAMED OPENING DETAIL



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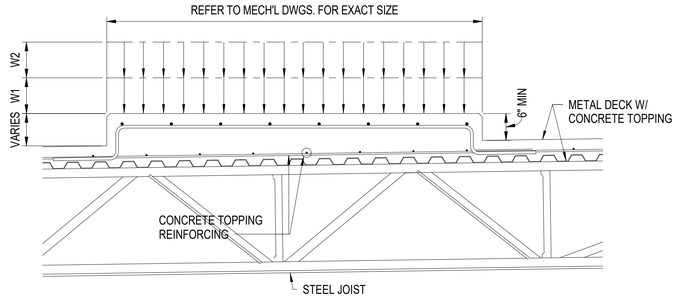

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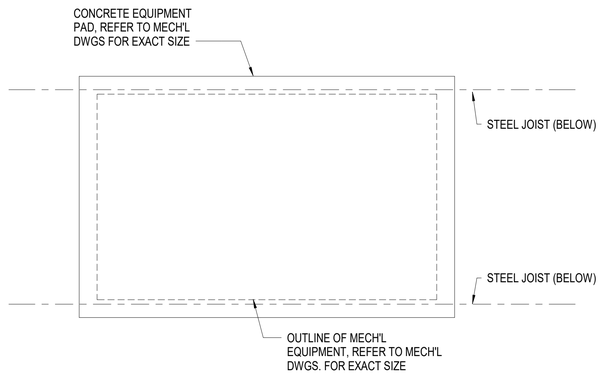

PLAN

JOIST ADDITIONAL LOAD DIAGRAM:

- W1 = 424 LBS/FT - UNIFORM LOAD (CONCRETE PAD)
- W2 = HVAC UNIT, REFER TO MECHANICAL DRAWINGS FOR EQUIPMENT SPECS
- W3 = SEE NOTES #12 AND #13 ON SHEET S0.5.1

2 TYP. EQUIPMENT PAD ON STEEL DECK DETAIL

REVISION

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SIMON SANCHEZ HIGH SCHOOL

Title
TYPICAL JOIST MISCELLANIOUS DETAILS
PROGRAMMING DOCUMENT

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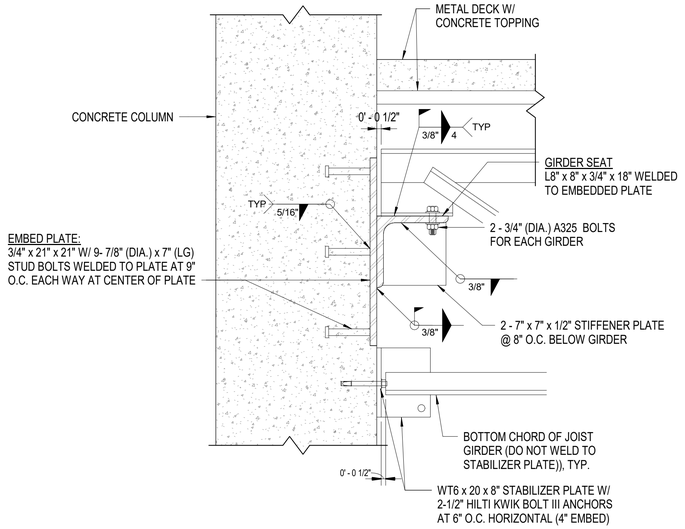
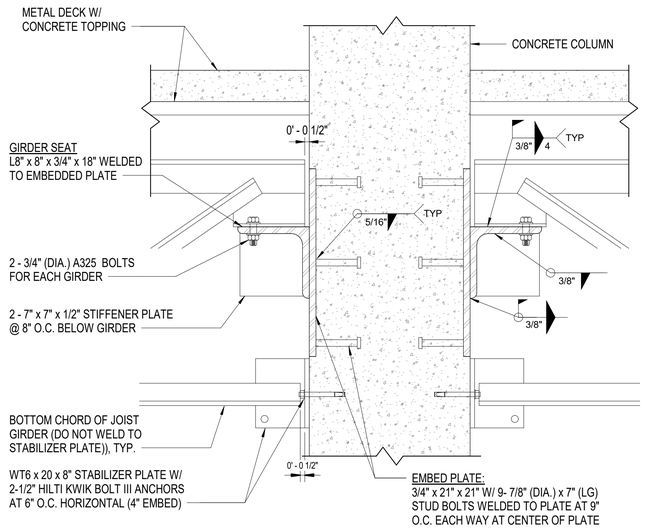
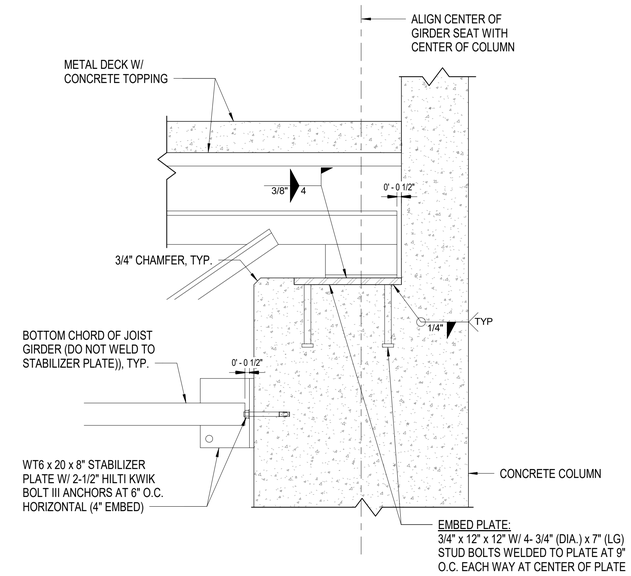


1 TYP. JOIST GIRDER END SEAT AT CONCRETE COLUMN DETAIL



2 TYP. JOIST GIRDER INTERMEDIATE AT CONCRETE COLUMN DETAIL



3 TYP. JOIST GIRDER AT TOP OF CONCRETE COLUMN DETAIL

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TYPICAL JOIST GIRDER CONNECTION DETAILS
PROGRAMMING DOCUMENT

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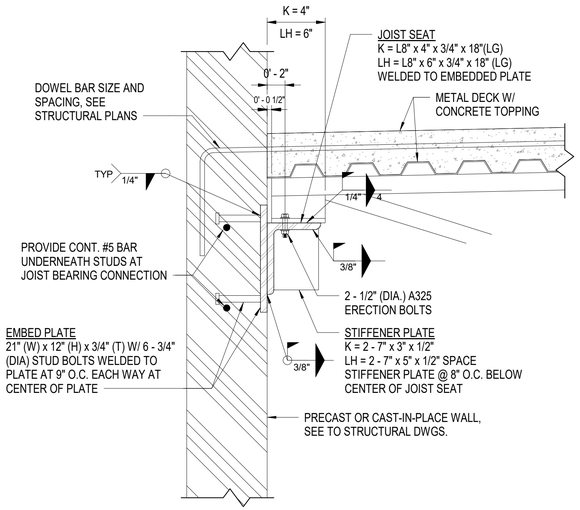
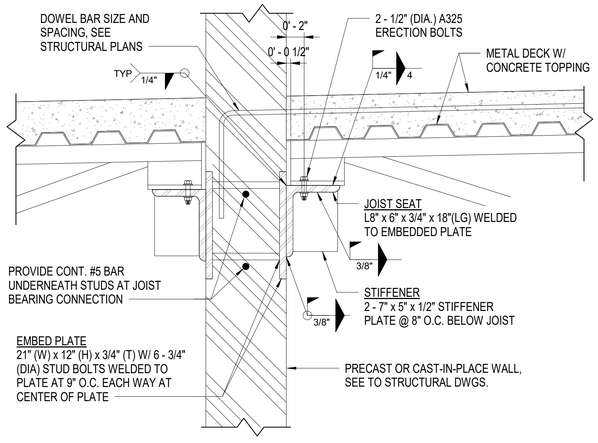


TYP. " K " & " LH " JOIST TO WALL SEAT CONNECTION DETAIL

1



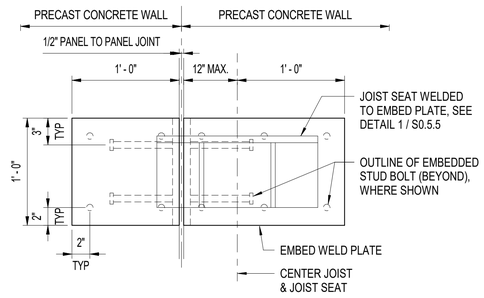
NOTE:
FOR " K " AND " LH " JOIST TO WALL SEAT ALONG SHARED WALL, USE SEPARATE JOIST SEAT, SEE DETAIL 1 THIS SHEET.

TYP. " LH " JOIST TO WALL SEAT CONNECTION DETAIL (@ SHARED WALL)

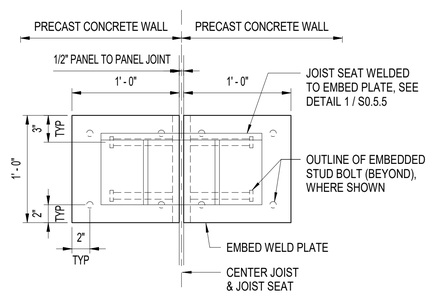
2

WELDED STUD SCHEDULE	
WALL / COLUMN THICKNESSES	STUD LENGTH (LG)
8"	6" (MIN.)
< 8"	7"

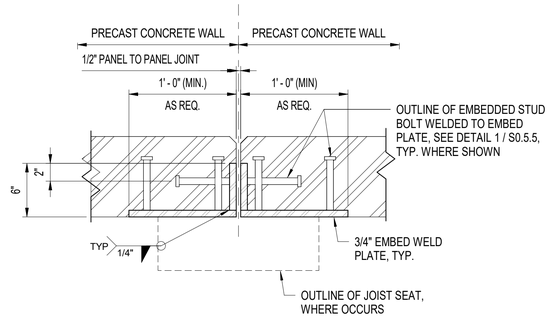
NOTE: REFER TO THIS SCHEDULE IF WELDED STUD LENGTHS (LG) ARE NOT SPECIFIED ON THE JOIST GIRDER OR JOIST WALL SEATS / EMBED PLATES UNLESS NOTED OTHERWISE ON THE DETAIL



SECTIONAL ELEVATION



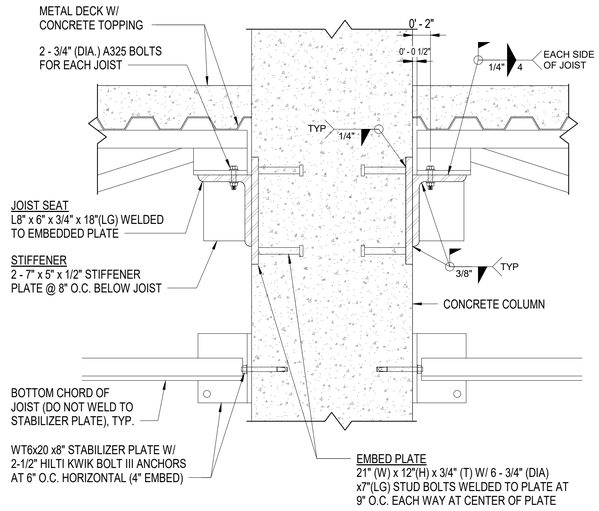
SECTIONAL ELEVATION



TYP. SECTIONAL PLAN

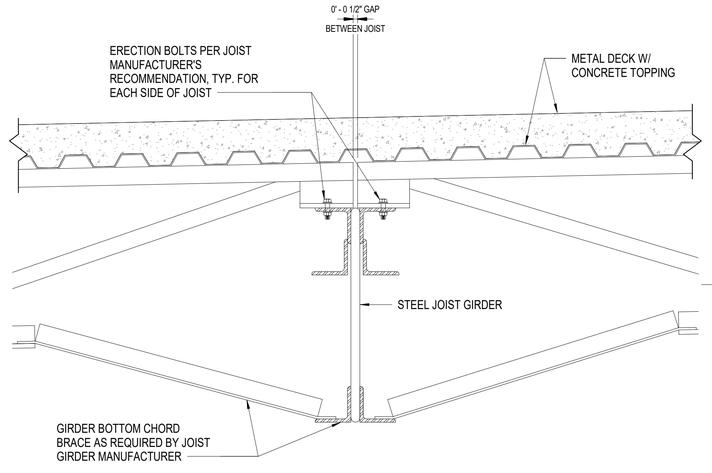
JOIST TO WALL SEAT PLATE CONNECTION DETAIL @ WALL PANEL JOINT

3



TYP. JOIST TO CONCRETE COLUMN CONNECTION DETAIL

4



TYP. JOIST TO JOIST GIRDER CONNECTION DETAIL

5

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
TYPICAL JOIST CONNECTION DETAILS
PROGRAMMING DOCUMENT

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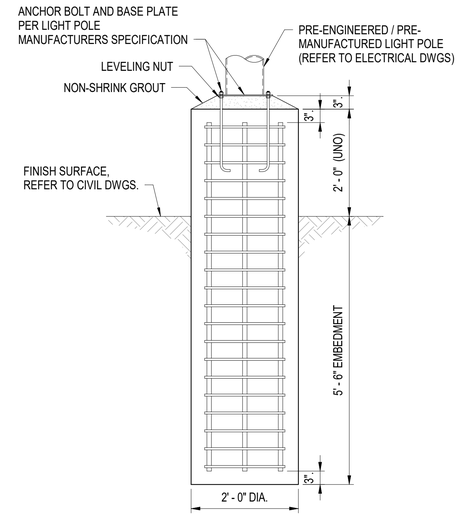

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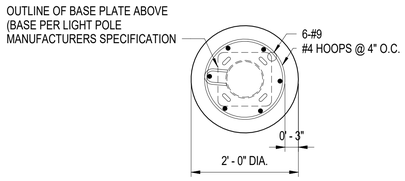
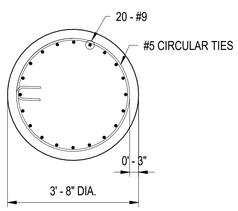


PLAN

1 TYP. LIGHT POLE FOUNDATION DETAIL

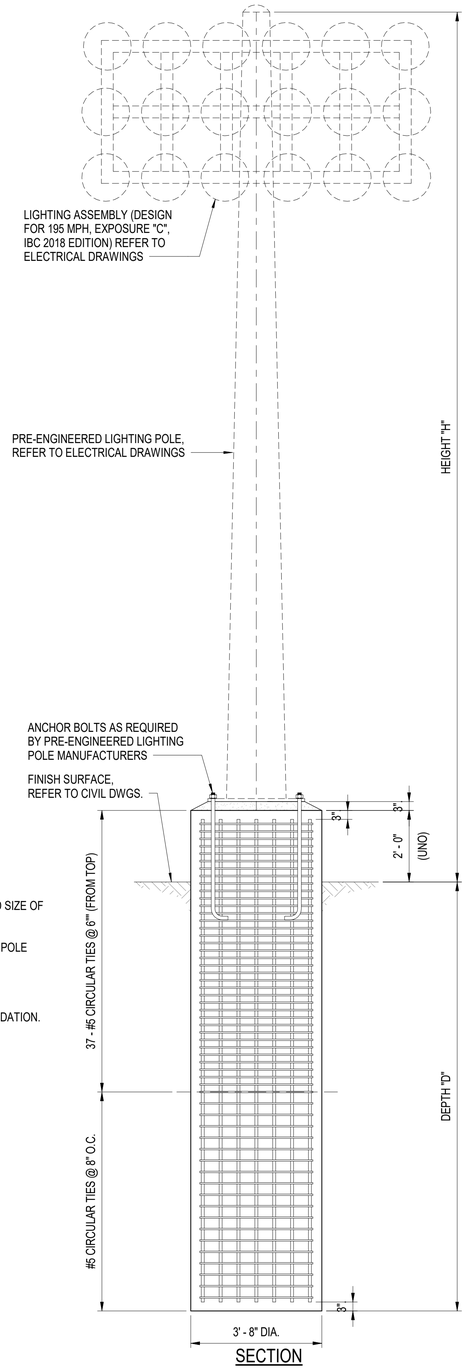
NOTE:

1. THE LIGHT POLE FOUNDATION SHALL BE DESIGN TO RESIST TYPHOON WIND LOADS WITH THE DEPTH AND SIZE OF THE FOUNDATION TO MEET THE POLE MANUFACTURER'S REQUIREMENTS.
2. THE LIGHT POLE MANUFACTURER SHALL BE RESPONSIBLE FOR THE DESIGN OF THE ANCHOR BOLTS AND POLE EMBEDMENT REQUIREMENTS BASE ON THE SPECIFIED DESIGN CRITERIA.
3. POLE FOUNDATION IS BASED ON ASSUMED DIMENSION OF POLE AND LIGHTS.
4. SUBMIT MANUFACTURER'S POLE CALCULATIONS FOR VERIFICATION AND FINAL APPROVAL OF POLE FOUNDATION.



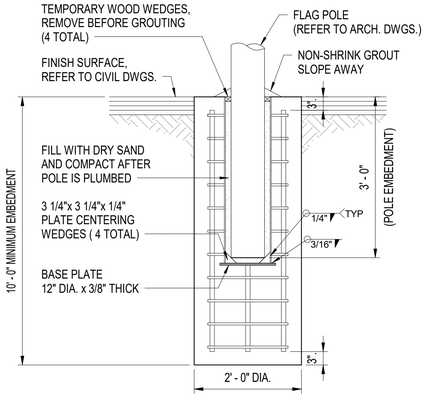
PLAN

LIGHT POLE AND FOUNDATION SCHEDULE	
HEIGHT "H"	DEPTH "D"
90'	23'-0"
80'	17'-0"
70'	15'-6"
60'	12'-0"
50'	10'-6"

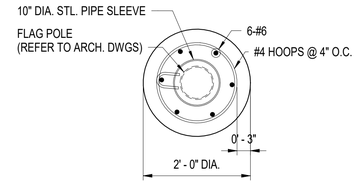


SECTION

2 TYP. SPORTS FIELD LIGHT POLE FOUNDATION DETAIL

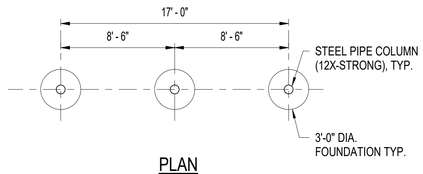


SECTION

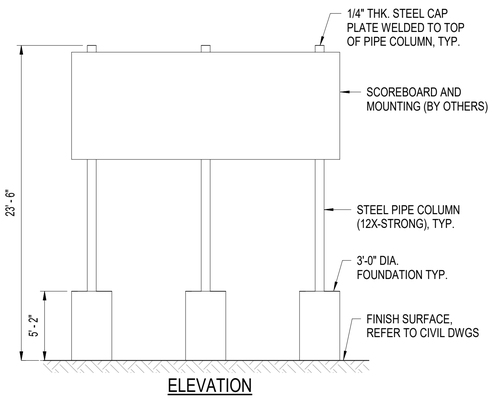


PLAN

3 TYP. FLAG POLE FOUNDATION DETAIL

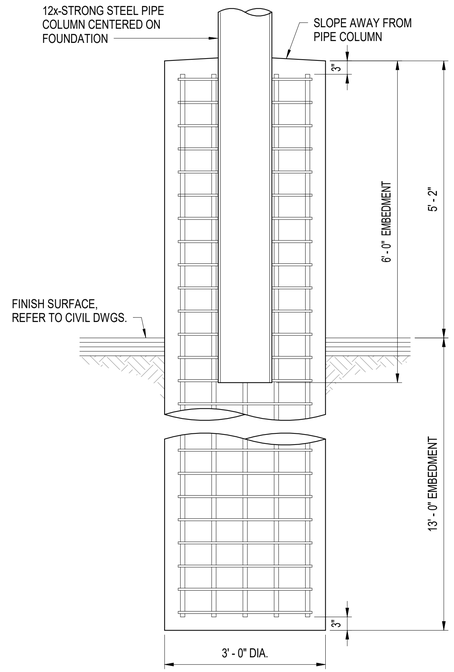


PLAN

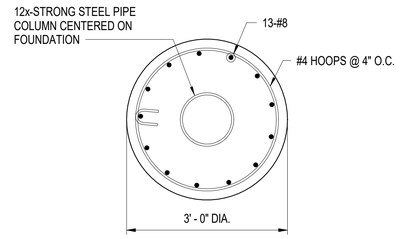


ELEVATION

4 SCOREBOARD PLAN AND ELEVATION



SECTION



PLAN

5 TYP. SCOREBOARD FOUNDATION DETAIL

REVISION

No.	Description	Date

TRMA
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SIMON SANCHEZ HIGH SCHOOL

Title
MISCELLANEOUS DETAILS
PROGRAMMING DOCUMENT

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Drawn	PCP
Checked	DCA
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

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S0.6.1
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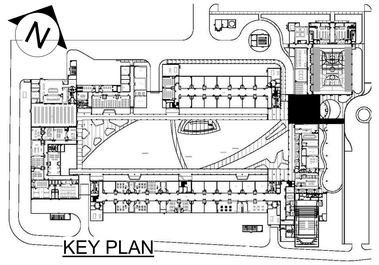
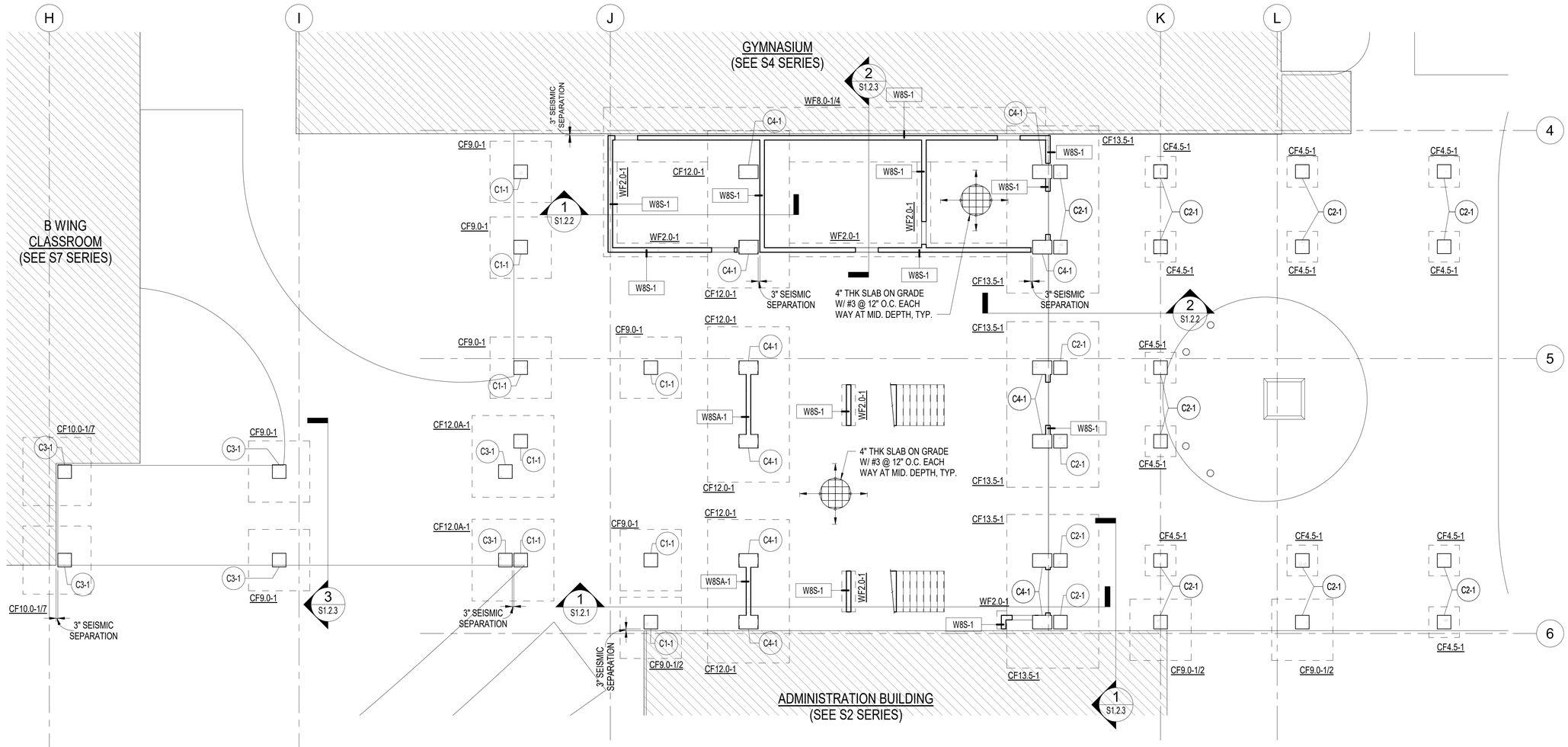
LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
CF#-#	COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
C#-#	COLUMN DESIGNATION, SEE SHEET S0.2.3 & S1.3.1
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1



KEY PLAN



1 FOUNDATION PLAN
1/8" = 1'-0"
0' 2' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Title
MAIN ENTRANCE
FOUNDATION PLAN
PROGRAMMING DOCUMENT

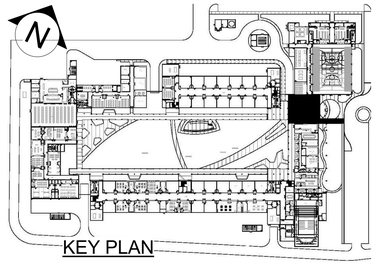
Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

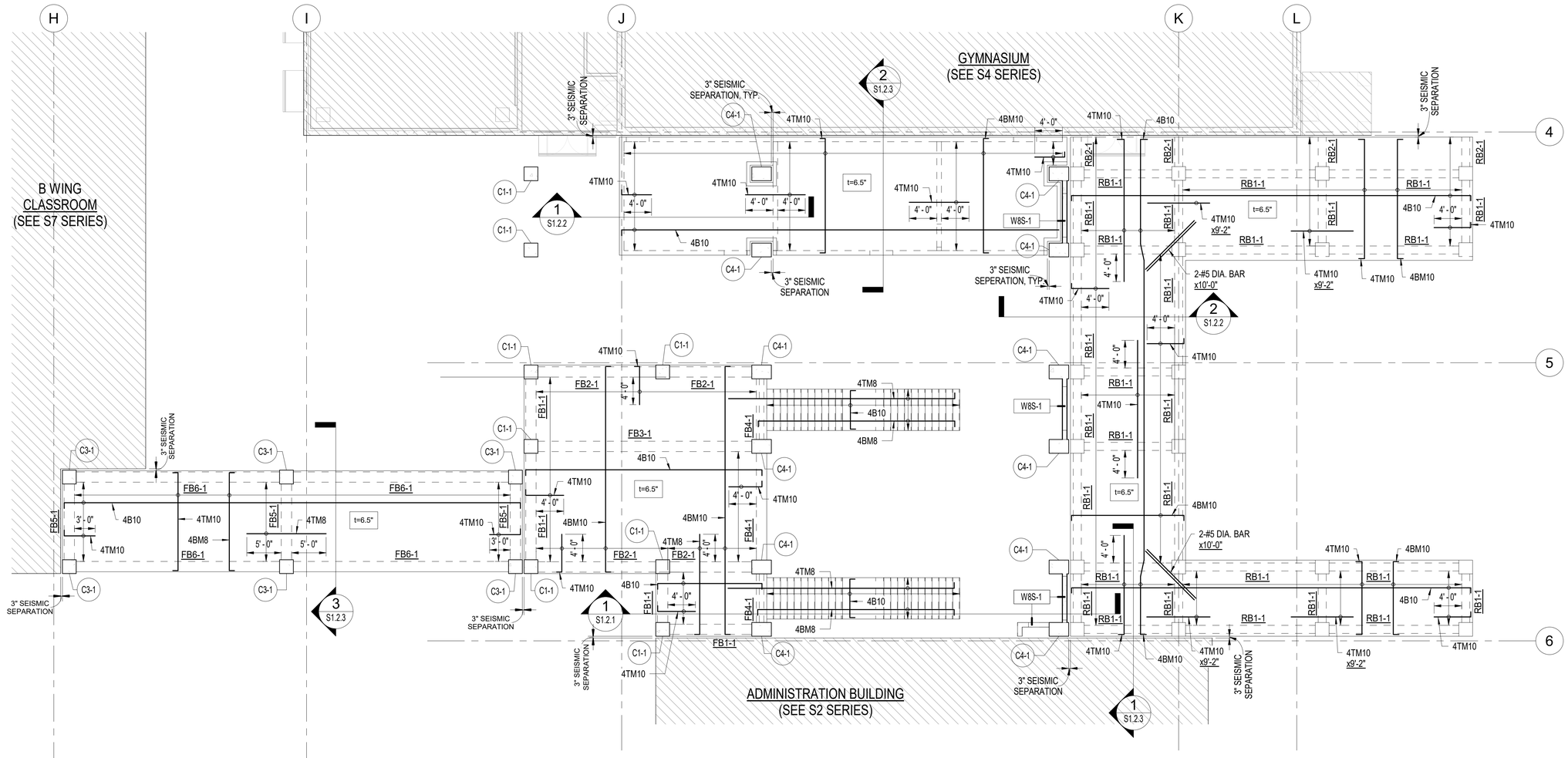
Drawing
S1.1.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

LEGEND AND TAGS

C#-#	COLUMN DESIGNATION, SEE SHEET S0.2.3 & S1.3.1
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
t=#	SLAB THICKNESS DESIGNATION (INCHES)
FB#-#	FLOOR BEAM (FB) DESIGNATION, SEE SHEET S0.3.4 & S1.3.1
RB#-#	ROOF BEAM (RB) DESIGNATION, SEE SHEET S0.3.4 & S1.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4





1 SECOND FLOOR AND LOWER ROOF FRAMING PLAN

1/8" = 1'-0"

0' 2' 4' 8' 16'

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Title
MAIN ENTRANCE
SECOND FLOOR AND LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

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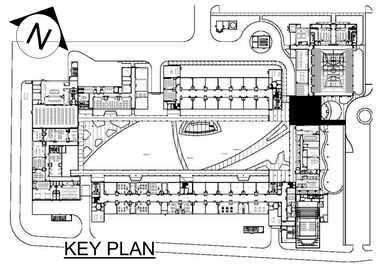
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S1.1.2
Sheet No. _____ of _____

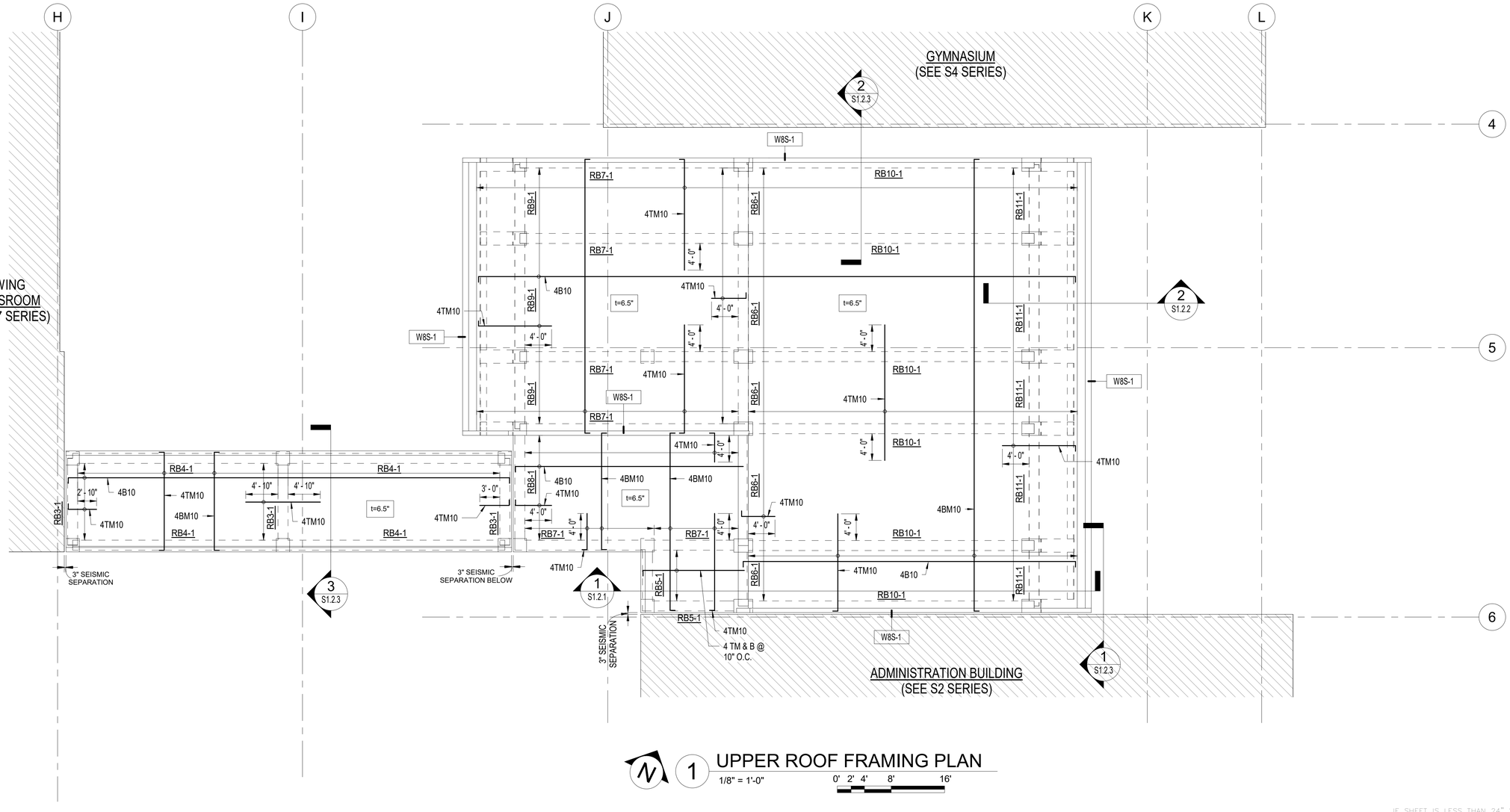
NOT FOR CONSTRUCTION

LEGEND AND TAGS

- t=# — SLAB THICKNESS DESIGNATION (INCHES)
- W#-# — WALL DESIGNATION, SEE SHEET S0.3.1
- RB#-# — ROOF BEAM (RB) DESIGNATION, SEE SHEET S0.3.4 & S1.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4



KEY PLAN



N 1 UPPER ROOF FRAMING PLAN

1/8" = 1'-0"

0' 2' 4' 8' 16'

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REDUCED PRINT – USE GRAPHIC SCALES

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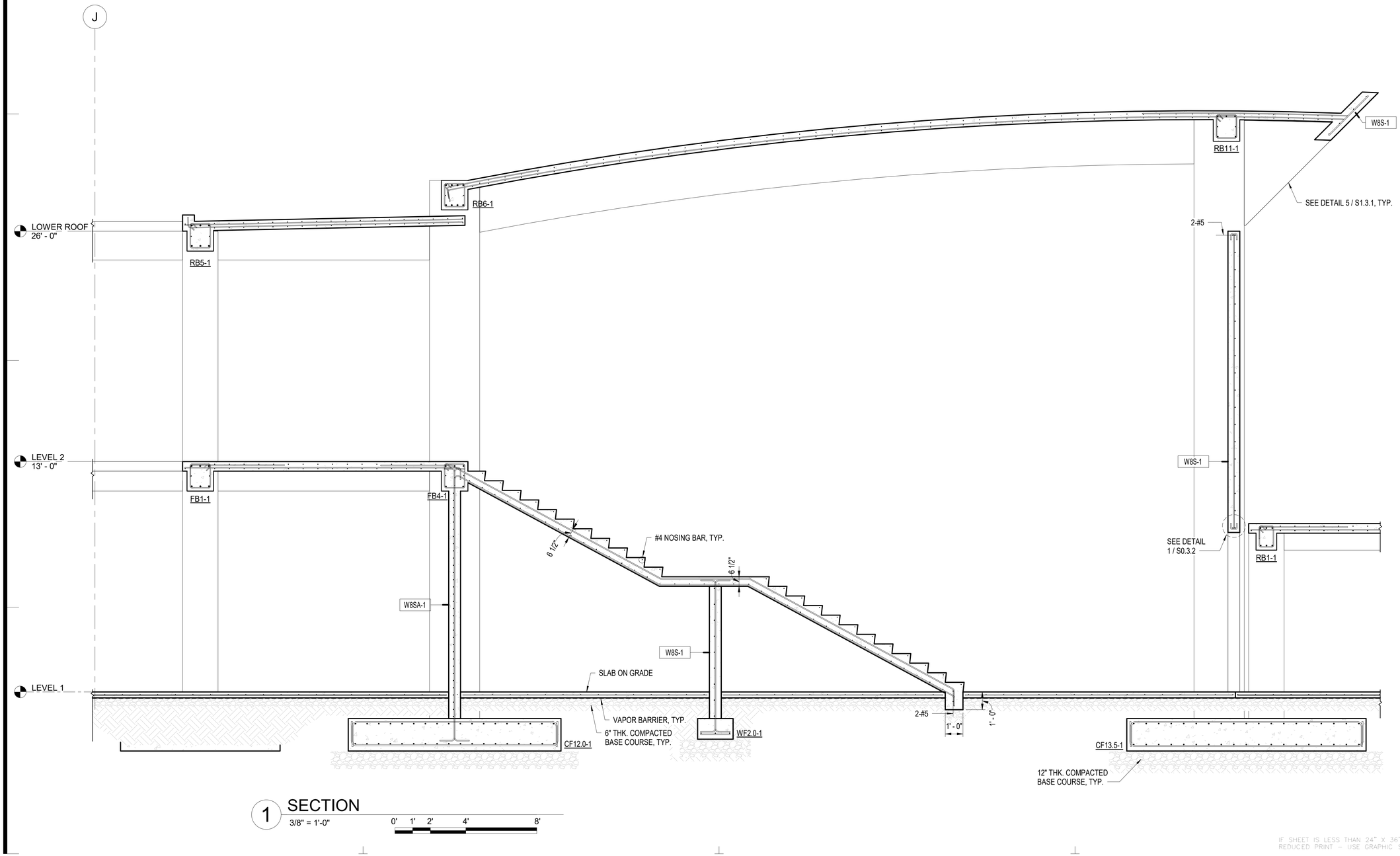
Title
MAIN ENTRANCE
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S1.1.3

Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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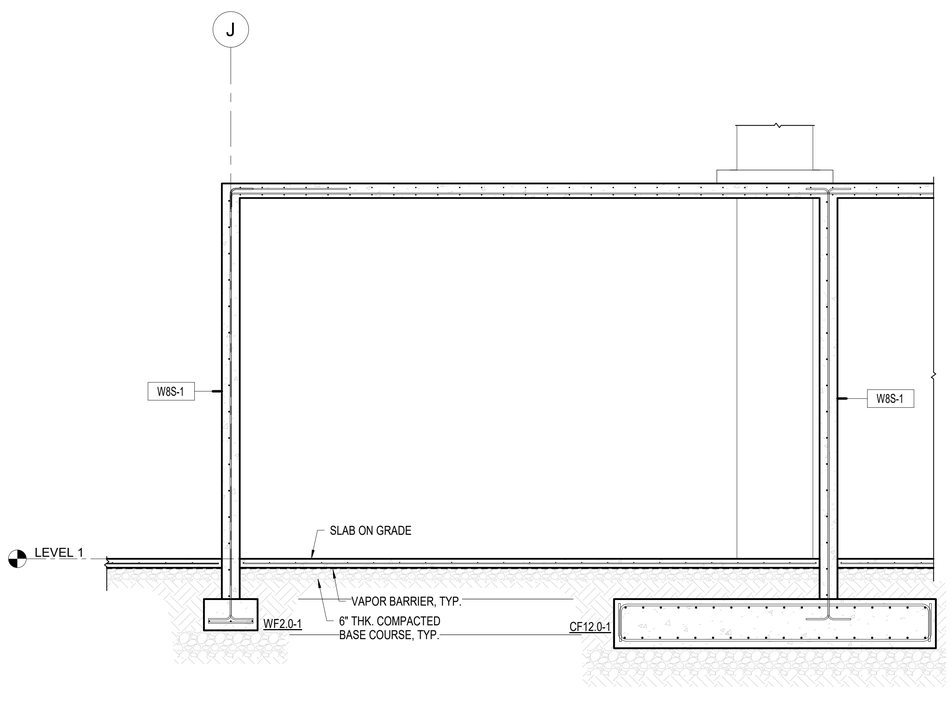
Title
MAIN ENTRANCE
SECTION
PROGRAMMING DOCUMENT

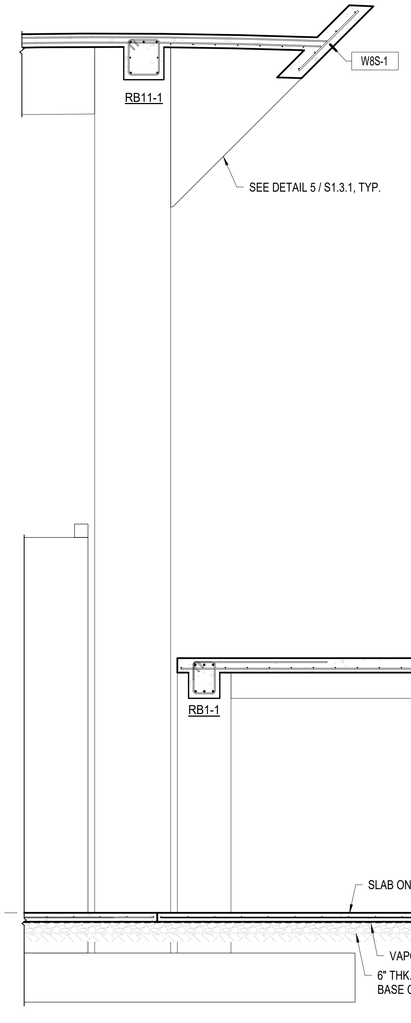
Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S1.2.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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Title
MAIN ENTRANCE
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S1.2.2
Sheet No. ____ of ____

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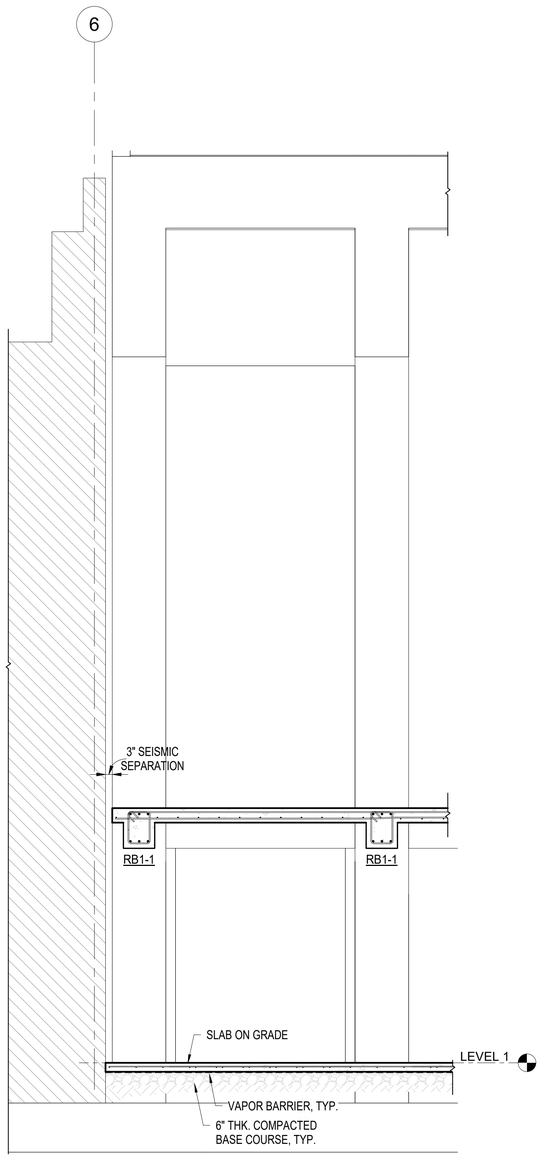
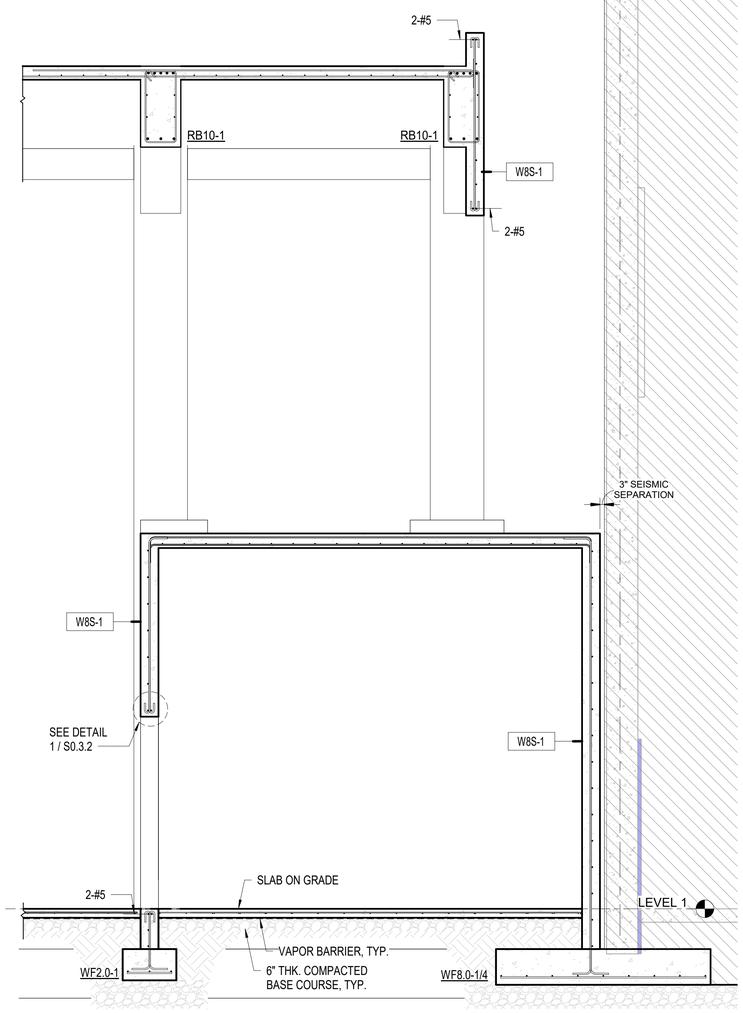
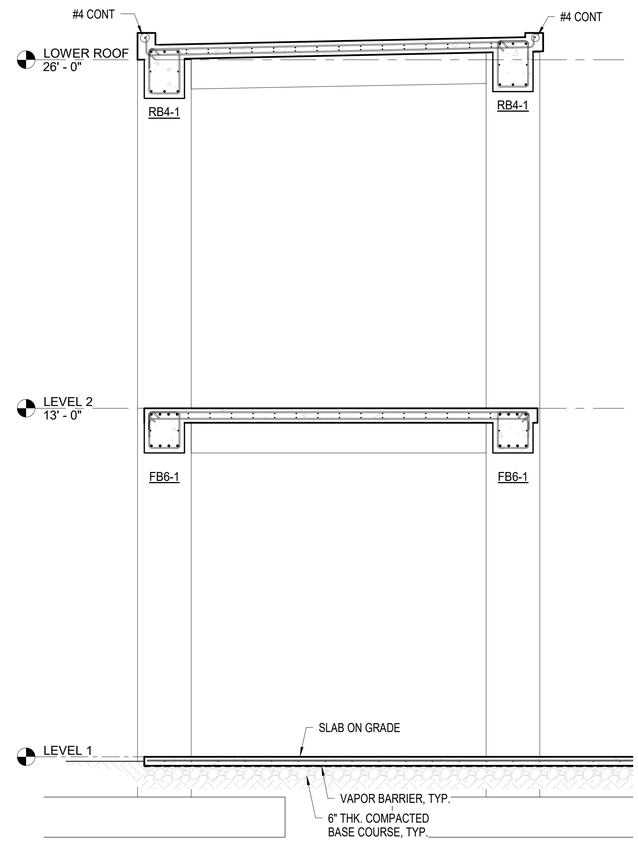


1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



3 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S1.2.3
Sheet No. _____ of _____

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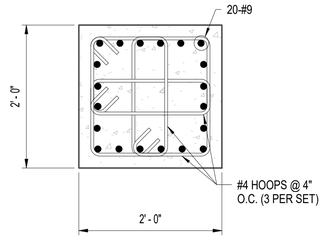
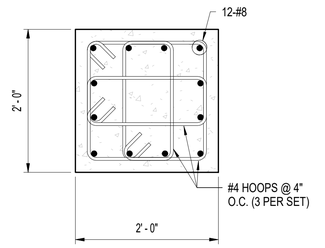


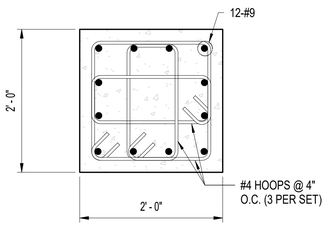
1 DETAIL C1-1

1" = 1'-0" 0' 3" 6" 1' 2'



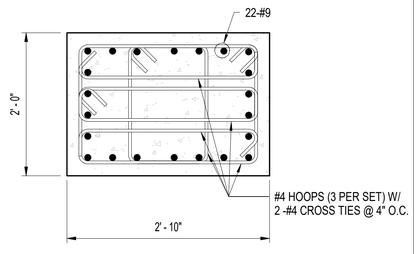
2 DETAIL C2-1

1" = 1'-0" 0' 3" 6" 1' 2'



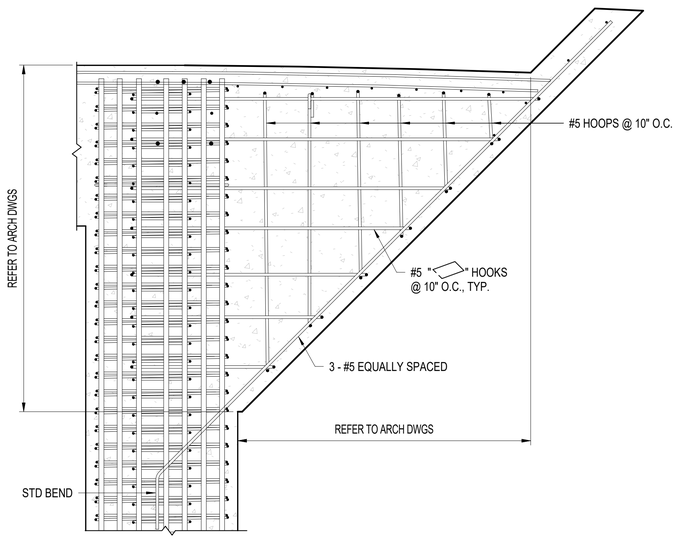
3 DETAIL C3-1

1" = 1'-0" 0' 3" 6" 1' 2'

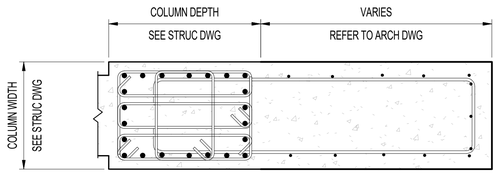


4 DETAIL C4-1

1" = 1'-0" 0' 3" 6" 1' 2'



SECTIONAL ELEVATION

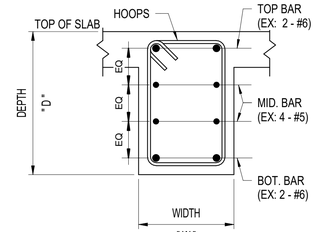


SECTIONAL PLAN

5 TYP. FIN WALL DETAIL

3/4" = 1'-0" 0' 6" 1' 2' 4'

BEAM SCHEDULE							
BEAM MARK	SIZE W X D (INCHES)	REINFORCEMENT					REMARKS
		TOP BARS	MID. BARS	BOT. BARS	HOOPS		
					HE	HM	
FB1-1	18" x 20"	3 - #9	2 - #5	3 - #9	#4 @ 4" OC	#4 @ 4" OC	
FB2-1	18" x 30"	4 - #9	4 - #5	4 - #9	#4 @ 4" OC	#4 @ 4" OC	
FB3-1	18" x 30"	5 - #9	4 - #5	3 - #9	11-#4 @ 6" OC	#4 @ 10" OC	
FB4-1	18" x 20"	3 - #6	2 - #5	3 - #6	11-#4 @ 4" OC	#4 @ 8" OC	
FB5-1	18" x 20"	3 - #9	2 - #5	3 - #9	#4 @ 4" OC	#4 @ 4" OC	
FB6-1	18" x 30"	3 - #9	2 - #5	2 - #9	11-#4 @ 6" OC	#4 @ 12" OC	
RB1-1	18" x 18"	3 - #8	-	3 - #8	13-#4 @ 3" OC	#4 @ 6" OC	
RB2-1	18" x 18"	2 - #8	-	2 - #8	13-#4 @ 3" OC	#4 @ 6" OC	
RB3-1	18" x 20"	3 - #8	2 - #5	3 - #8	11-#4 @ 4" OC	#4 @ 6" OC	
RB4-1	18" x 24"	3 - #8	2 - #5	2 - #8	11-#4 @ 5" OC	#4 @ 10" OC	
RB5-1	18" x 20"	3 - #9	2 - #5	3 - #9	#4 @ 3" OC	#4 @ 3" OC	
RB6-1	18" x 20"	4 - #9	2 - #5	4 - #9	#4 @ 3" OC	#4 @ 3" OC	
RB7-1	18" x 26"	4 - #9	2 - #5	2 - #9	#4 @ 5" OC	#4 @ 5" OC	
RB8-1	18" x 20"	3 - #9	2 - #5	3 - #9	11-#4 @ 4" OC	#4 @ 8" OC	
RB9-1	18" x 20"	4 - #8	4 - #5	3 - #8	11-#4 @ 4" OC	#4 @ 6" OC	
RB10-1	18" x 36"	5 - #9	4 - #5	3 - #9	10-#4 @ 8" OC	#4 @ 12" OC	
RB11-1	18" x 20"	3 - #7	2 - #5	2 - #7	11-#4 @ 4" OC	#4 @ 8" OC	



TYP. BEAM SECTION

6 BEAM SCHEDULE & TYP. SECTION

REVISION		
No.	Description	Date

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
MAIN ENTRANCE
MISCELLANEOUS DETAILS
PROGRAMMING DOCUMENT

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Checked	TPC/EEE
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Date:	03/31/25
Project	File

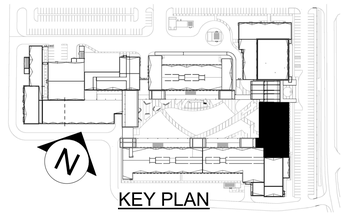
Drawing
S1.3.1
Sheet No. of

NOT FOR CONSTRUCTION

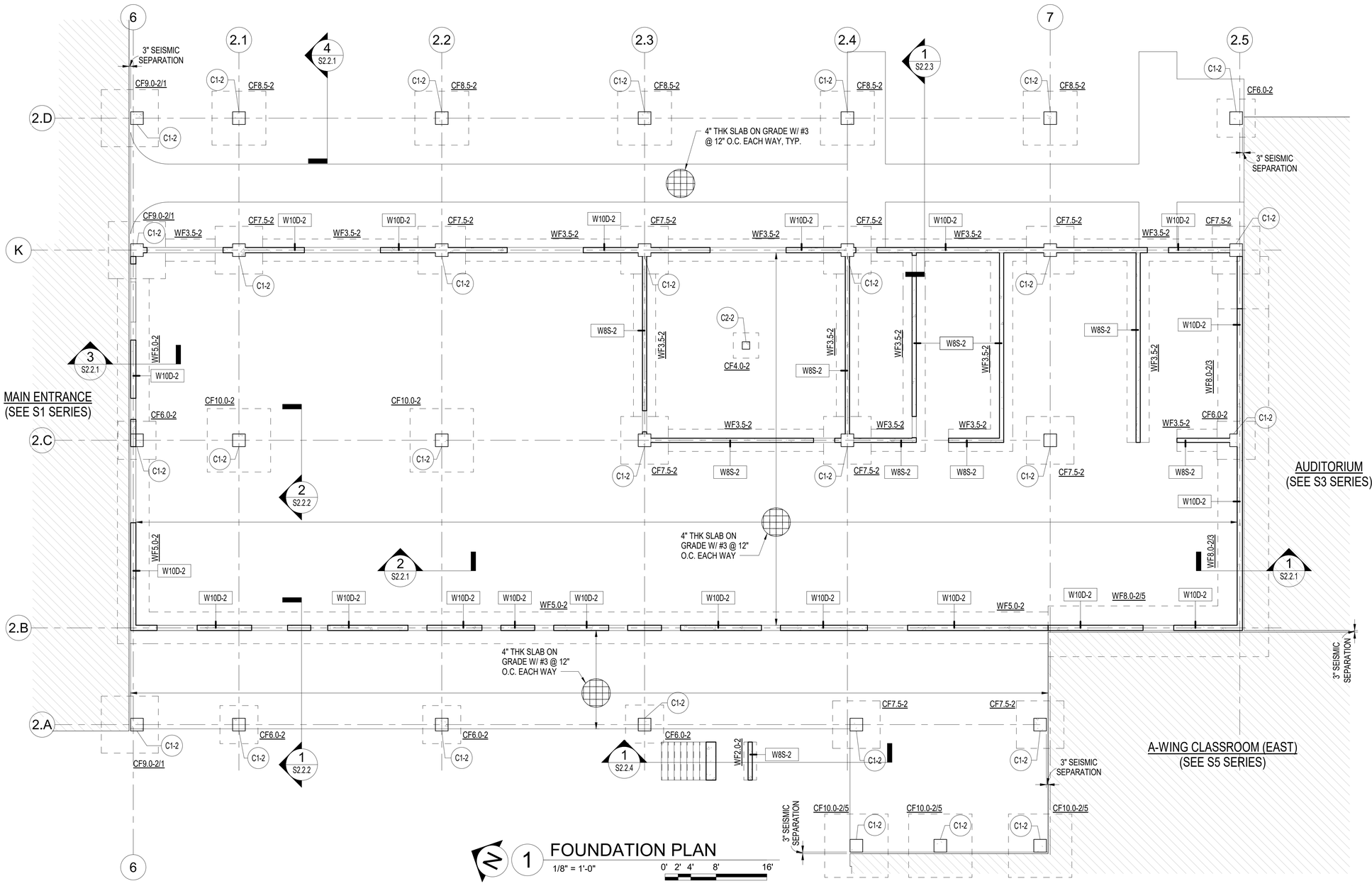
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
CF#-#	COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
C#-#	COLUMN DESIGNATION, SEE SHEET S0.2.3 & S2.3.1
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1



KEY PLAN



1 FOUNDATION PLAN
1/8" = 1'-0"
0' 2' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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■ GEOGRAPHIC INFORMATION SYSTEMS
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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
ADMINISTRATION
FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

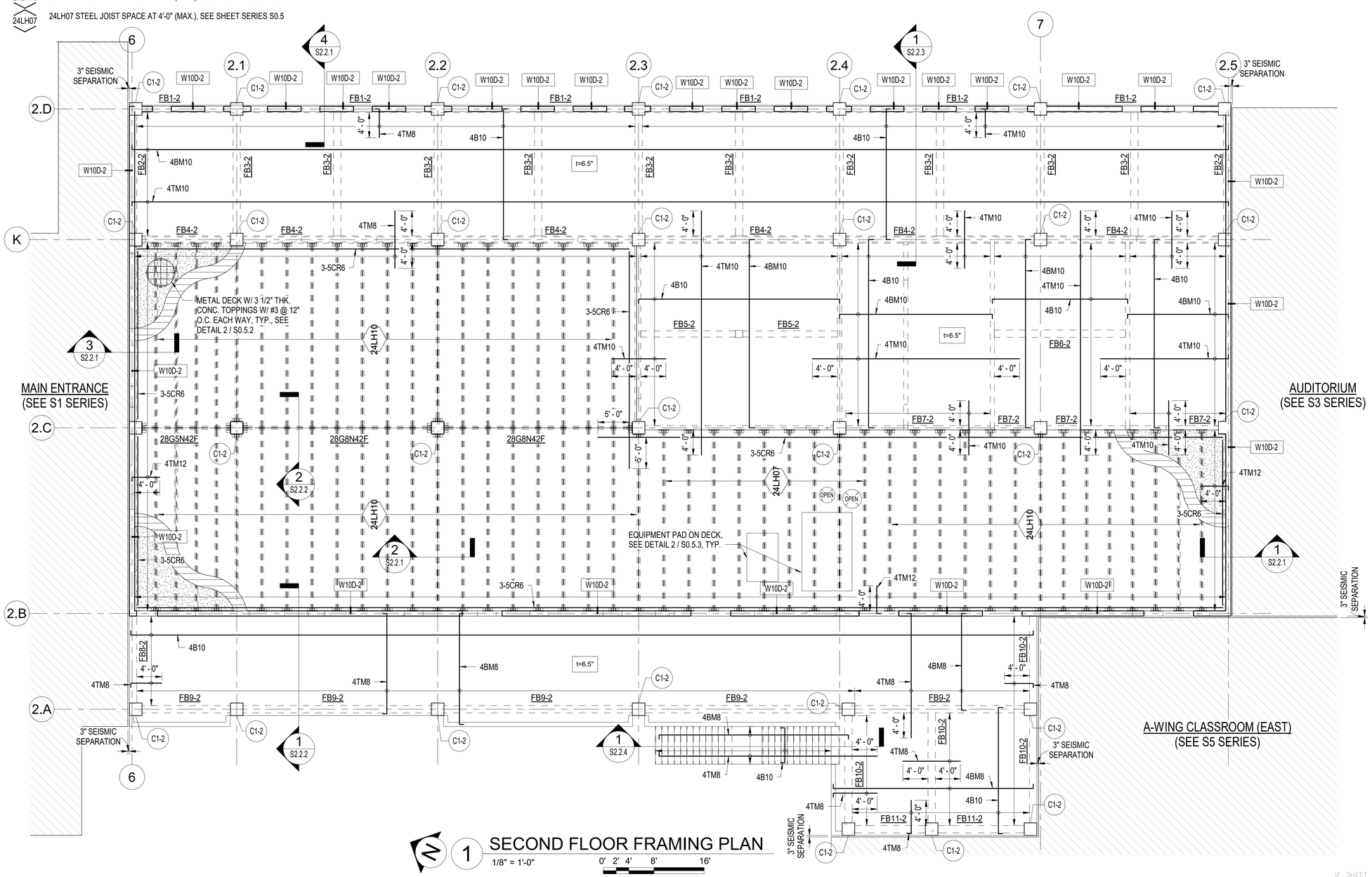
Drawing
S2.1.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

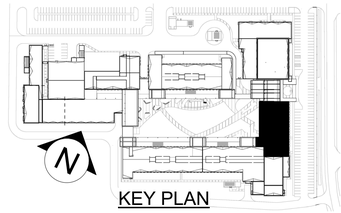
LEGEND AND TAGS

- C#-# — COLUMN DESIGNATION, SEE SHEET S0.2.3 & S2.3.1
- W#-# — WALL DESIGNATION, SEE SHEET S0.3.1
- t=# — SLAB THICKNESS DESIGNATION (INCHES)
- FB#-# — FLOOR BEAM (FB) DESIGNATION, SEE SHEET S0.3.4 & S2.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 3-5CR6 — CHORD STEEL REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 24LH10 — 24LH10 STEEL JOIST SPACE AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
- 24LH07 — 24LH07 STEEL JOIST SPACE AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.



1 SECOND FLOOR FRAMING PLAN
1/8" = 1'-0"
0' 2' 4' 8' 16'



KEY PLAN

REVISION		
No.	Description	Date

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SIMON SANCHEZ HIGH SCHOOL

Title
ADMINISTRATION
SECOND FLOOR FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S2.1.2
Sheet No. _____ of _____

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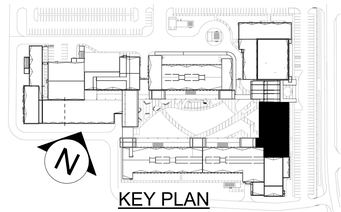
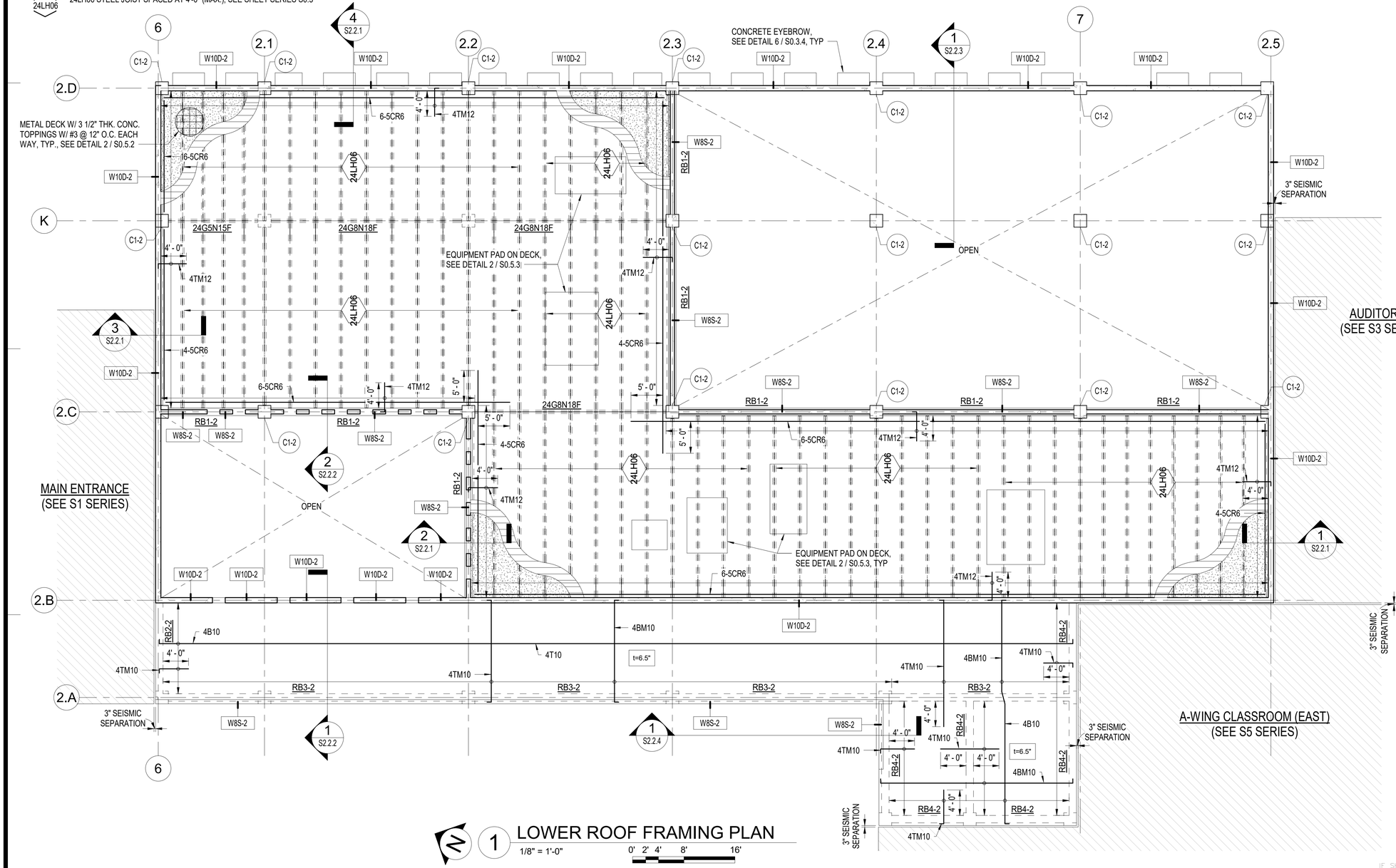
LEGEND AND TAGS

- C#-# — COLUMN DESIGNATION, SEE SHEET S0.2.3 & S2.3.1
- W#-# — WALL DESIGNATION, SEE SHEET S0.3.1
- t=# — SLAB THICKNESS DESIGNATION (INCHES)
- RB#-# — ROOF BEAM (RB) DESIGNATION, SEE SHEET S0.3.4 & S2.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 6-5CR6 — CHORD STEEL REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 24LH03 / 24LH06 — 24LH03 / 24LH06 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.



KEY PLAN



1 LOWER ROOF FRAMING PLAN

1/8" = 1'-0"

0' 2' 4' 8' 16'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
ADMINISTRATION
LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

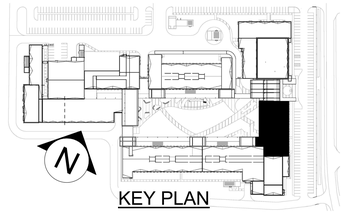
Drawing
S2.1.3
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

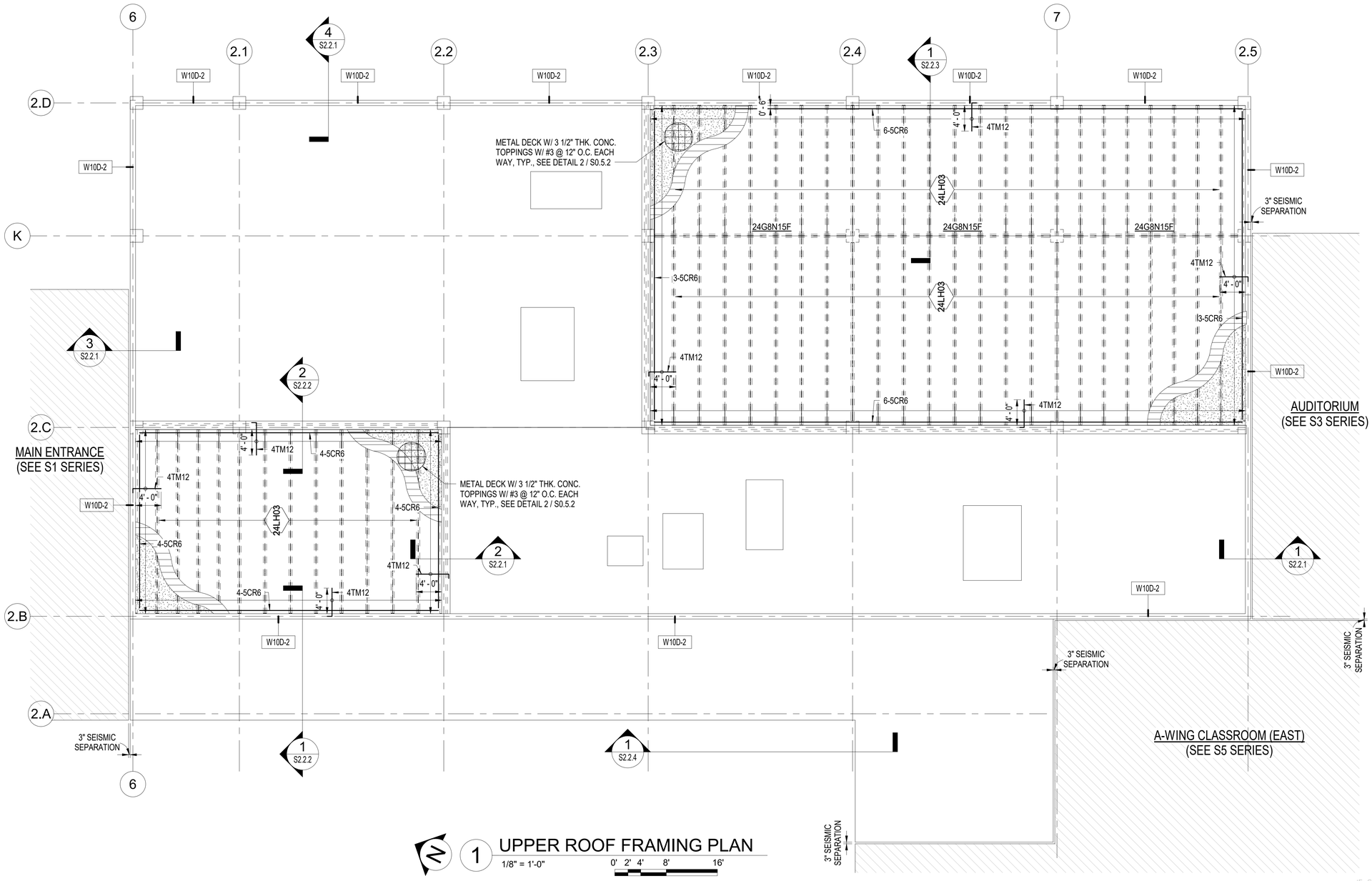
LEGEND AND TAGS

W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
RB#-#	ROOF BEAM (RB) DESIGNATION, SEE SHEET S2.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
3-5CR6	CHORD STEEL REINFORCING DESIGNATION, SEE SHEET S0.1.4
24LH03	24LH03 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.



KEY PLAN



1 UPPER ROOF FRAMING PLAN

1/8" = 1'-0"

0' 2' 4' 8' 16'

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GDOE
SIMON SANCHEZ HIGH SCHOOL

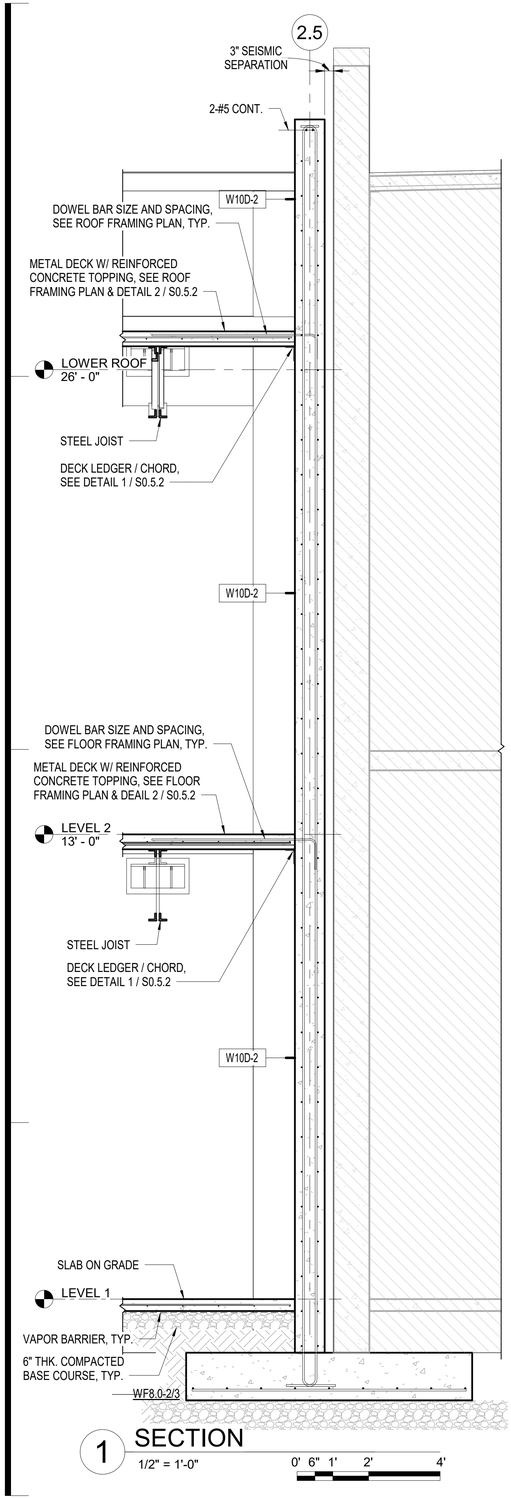
Title
ADMINISTRATION
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

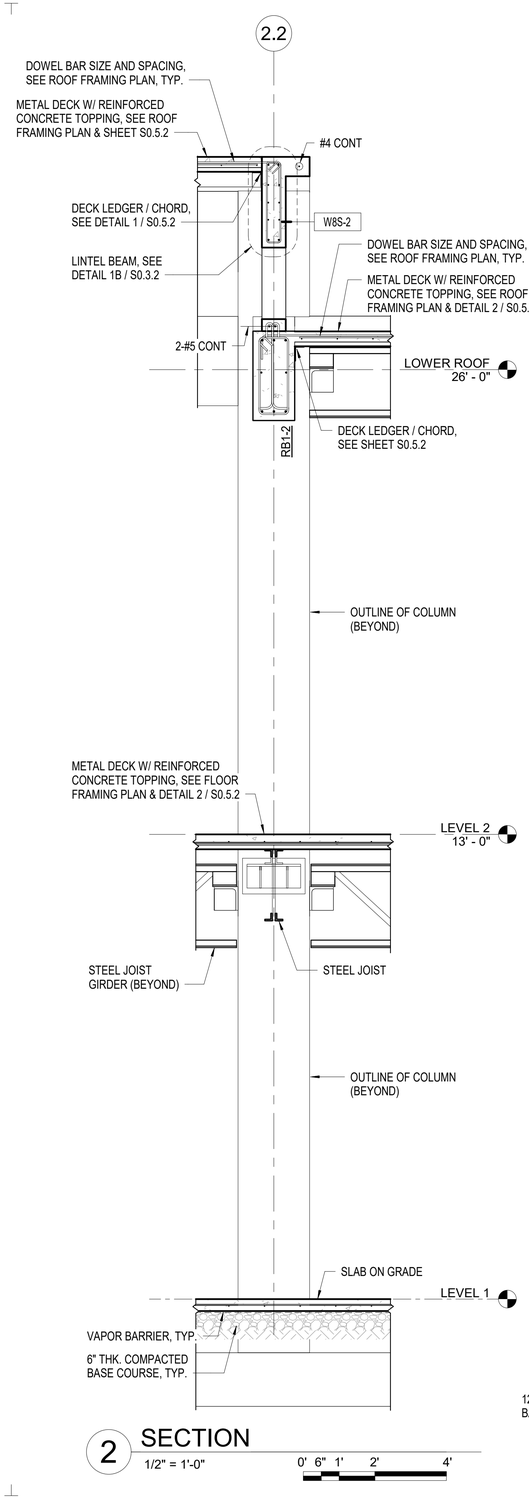
Drawing
S2.1.4

Sheet No. ____ of ____

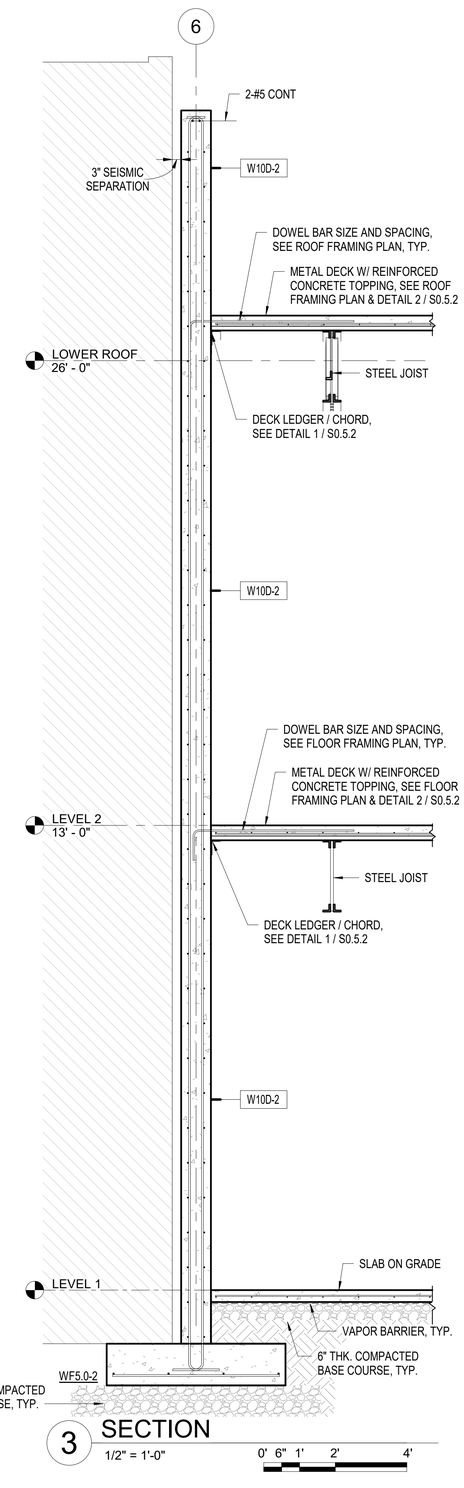
NOT FOR CONSTRUCTION



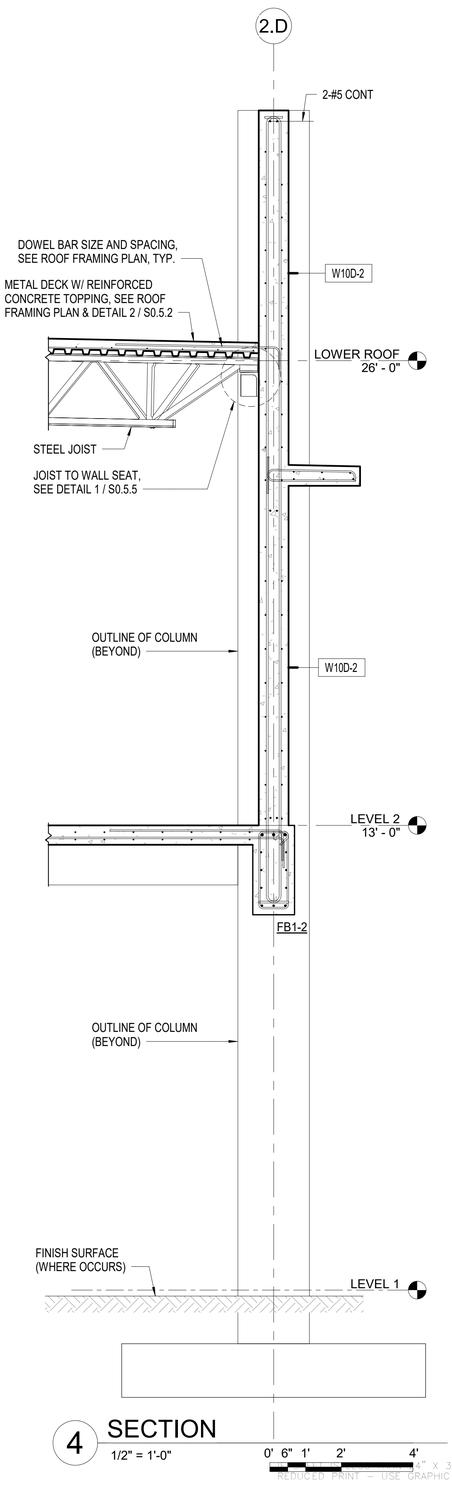
1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



4 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

REVISION

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

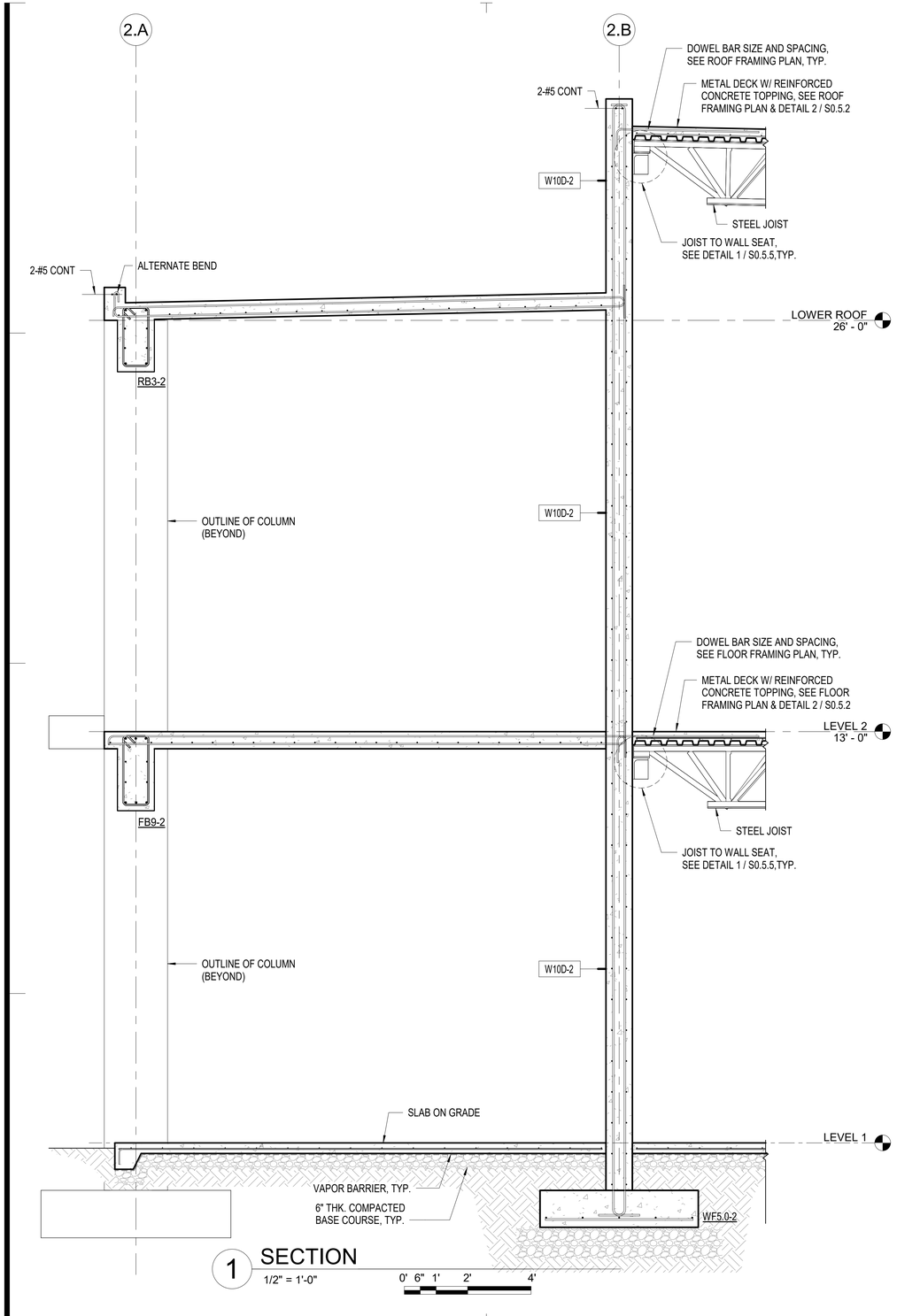
Title
ADMINISTRATION
SECTIONS
PROGRAMMING DOCUMENT

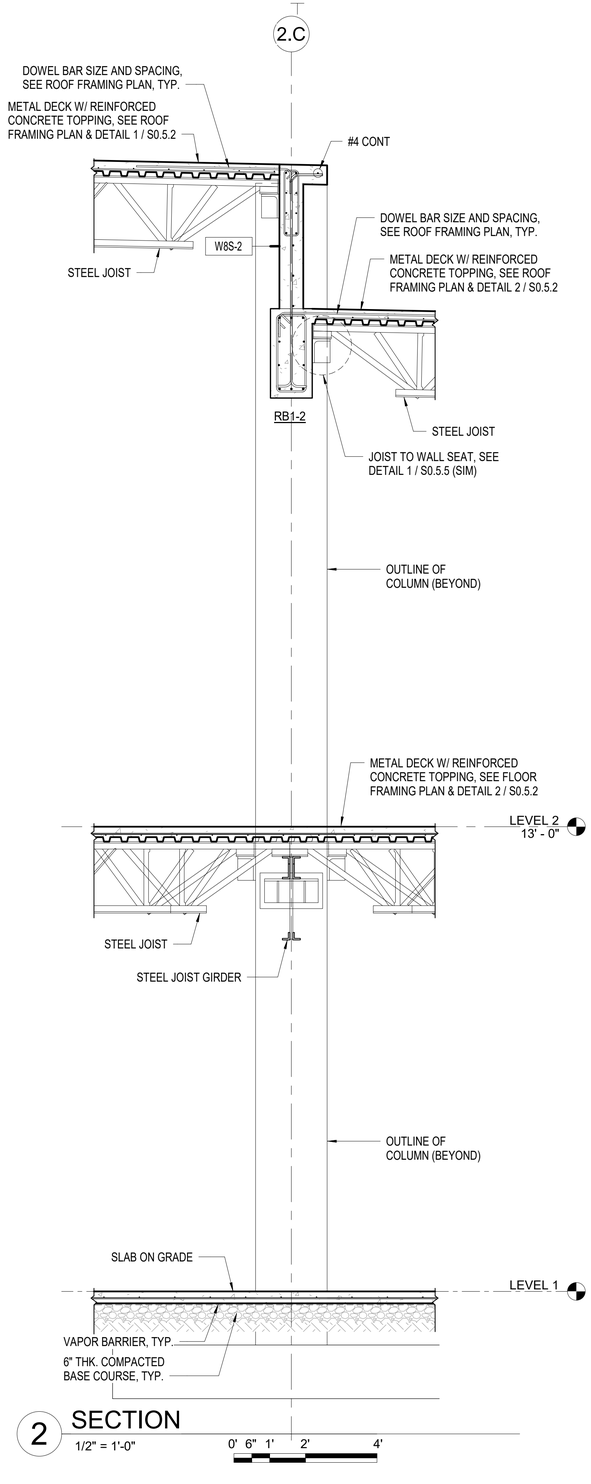
Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S2.2.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

ORIGINAL SHEET SIZE: 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES





IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISION		
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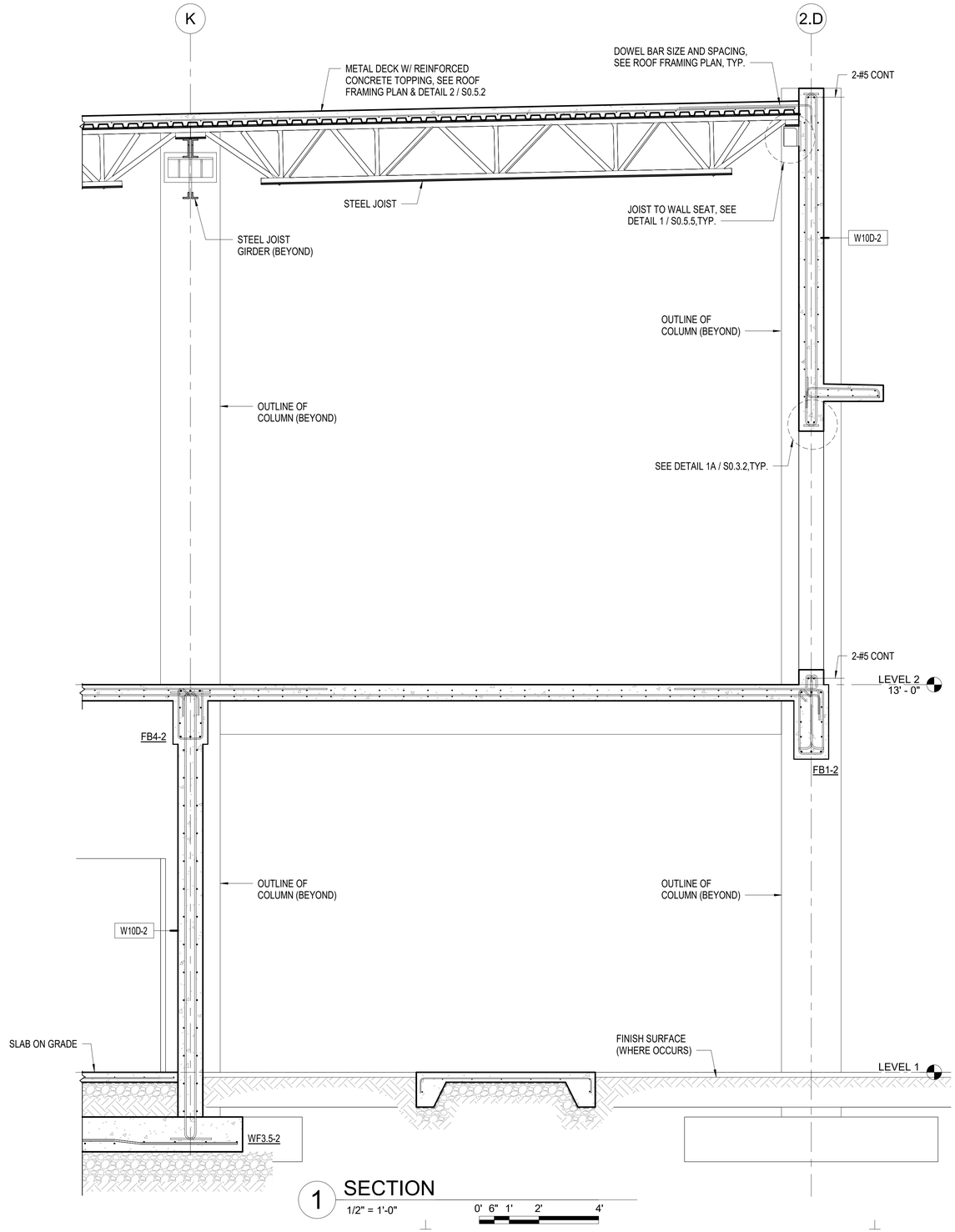
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
ADMINISTRATION
SECTIONS
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S2.2.2
Sheet No. _____ of _____



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

REVISION

No.	Description	Date

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Project

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SIMON SANCHEZ HIGH SCHOOL

Title

ADMINISTRATION

SECTION

PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

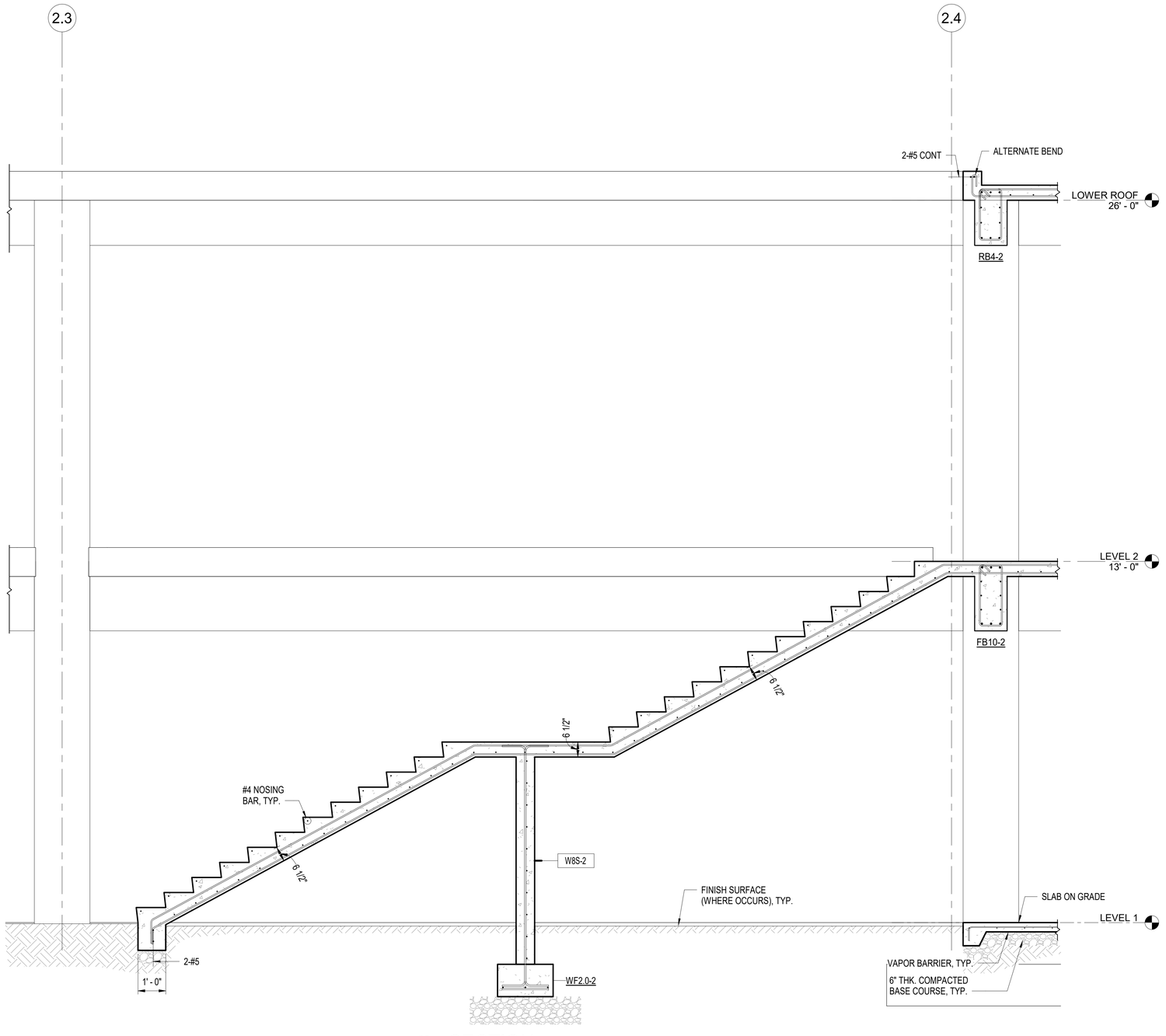
Drawing

S2.2.3

Sheet No. ____ of ____

NOT FOR CONSTRUCTION

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

REVISION		
No.	Description	Date

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
ADMINISTRATION
SECTION
PROGRAMMING DOCUMENT

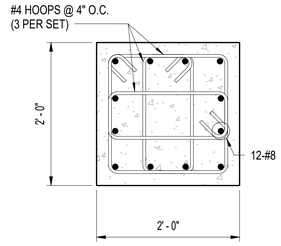
Designed:	KVB
Drawn	PCP
Checked	TPC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S2.2.4

Sheet No. _____ of _____

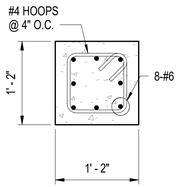
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION



1 DETAIL COLUMN "C1-2"

1" = 1'-0" 0' 3" 6" 1' 2'

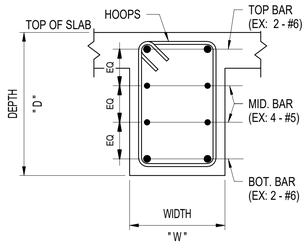


2 DETAIL COLUMN "C2-2"

1" = 1'-0" 0' 3" 6" 1' 2'

BEAM SCHEDULE

BEAM MARK	SIZE W X D (INCHES)	REINFORCEMENT					REMARKS
		TOP BARS	MID. BARS	BOT. BARS	HOOPS		
					HE	HM	
FB1-2	14" x 30"	3 - #6	6 - #5	3 - #6	11-#4 @ 6" OC	#4 @ 8" OC	
FB2-2	14" x 20"	2 - #6	2 - #5	2 - #6	11-#4 @ 4" OC	#4 @ 8" OC	
FB3-2	14" x 20"	2 - #8	2 - #5	3 - #8	11-#4 @ 4" OC	#4 @ 8" OC	
FB4-2	14" x 24"	3 - #6	4 - #5	3 - #6	11-#4 @ 5" OC	#4 @ 8" OC	
FB5-2	12" x 16"	3 - #5	-	2 - #5	12-#4 @ 3" OC	#4 @ 6" OC	
FB6-2	14" x 20"	3 - #5	2 - #5	3 - #5	12-#4 @ 5" OC	#4 @ 6" OC	
FB7-2	8" x 24"	2 - #5	4 - #5	2 - #5	11-#4 @ 4" OC	#4 @ 8" OC	
FB8-2	14" x 20"	2 - #6	4 - #5	2 - #6	11-#4 @ 4" OC	#4 @ 6" OC	
FB9-2	14" x 30"	3 - #8	4 - #5	3 - #8	11-#4 @ 6" OC	#4 @ 12" OC	
FB10-2	14" x 30"	3 - #7	6 - #5	3 - #7	11-#4 @ 6" OC	#4 @ 12" OC	
FB11-2	14" x 20"	2 - #6	4 - #5	2 - #6	11-#4 @ 4" OC	#4 @ 8" OC	
RB1-2	14" x 30"	3 - #6	2 - #5	3 - #6	11-#4 @ 6" OC	#4 @ 12" OC	
RB2-2	14" x 20"	2 - #6	4 - #5	2 - #6	11-#4 @ 4" OC	#4 @ 8" OC	
RB3-2	14" x 26"	2 - #8	4 - #5	2 - #8	12-#4 @ 5" OC	#4 @ 10" OC	
RB4-2	14" x 26"	2 - #7	4 - #5	2 - #7	12-#4 @ 5" OC	#4 @ 10" OC	



TYP. BEAM SECTION

REVISION		
No.	Description	Date

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

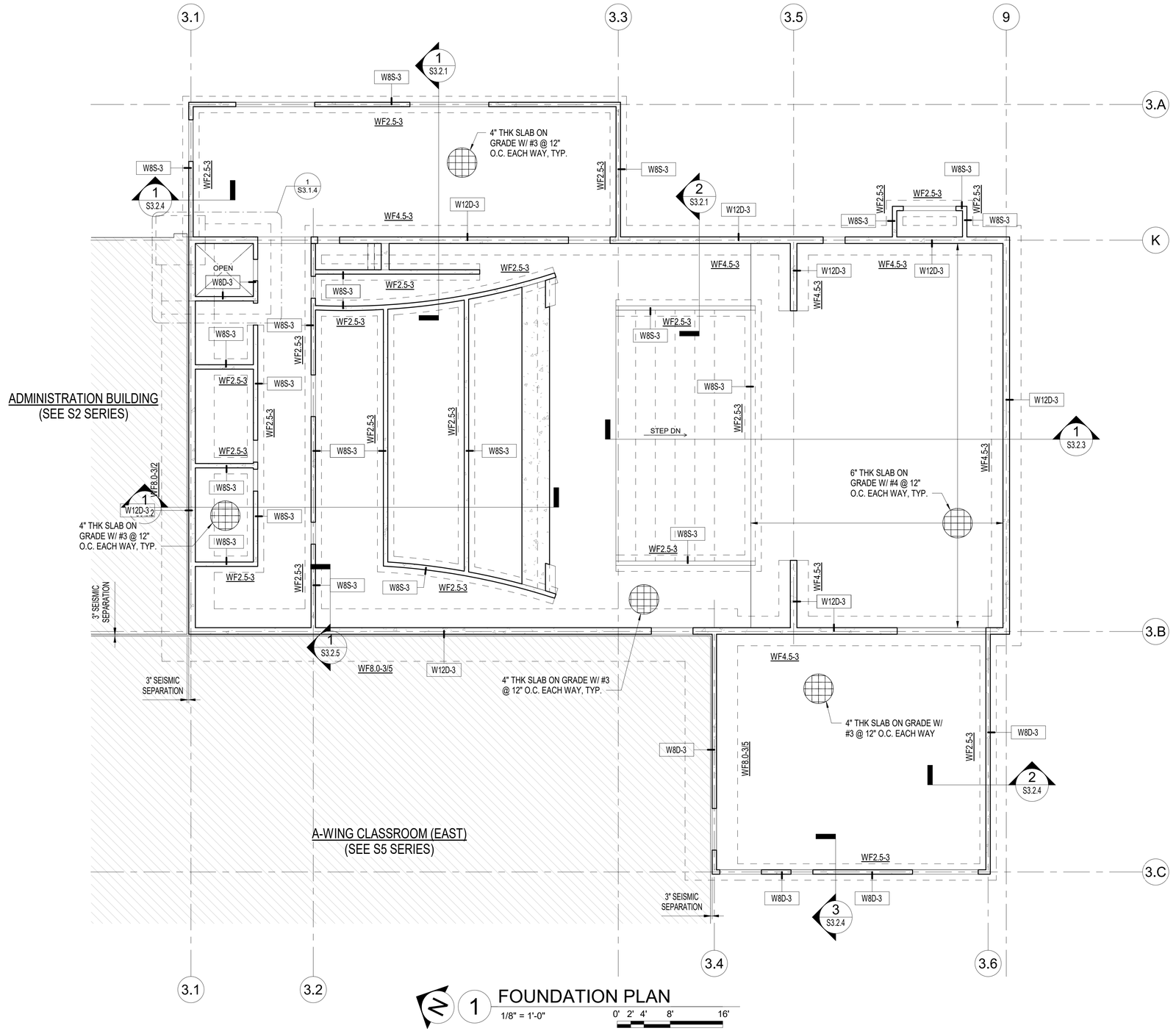
Title
ADMINISTRATION
MISCELLANEOUS DETAILS
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project File	

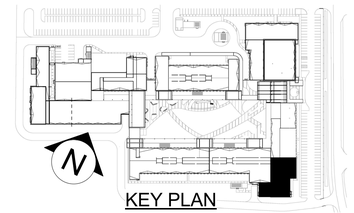
Drawing
S2.3.1
Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION



1 FOUNDATION PLAN
1/8" = 1'-0"
0' 2' 4' 8' 16'



KEY PLAN

LEGEND AND TAGS

WF#-# WALL FOOTING DESIGNATION, SEE SHEET S0.2.2

W#-# WALL DESIGNATION, SEE SHEET S0.3.1

REVISION		
No.	Description	Date

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

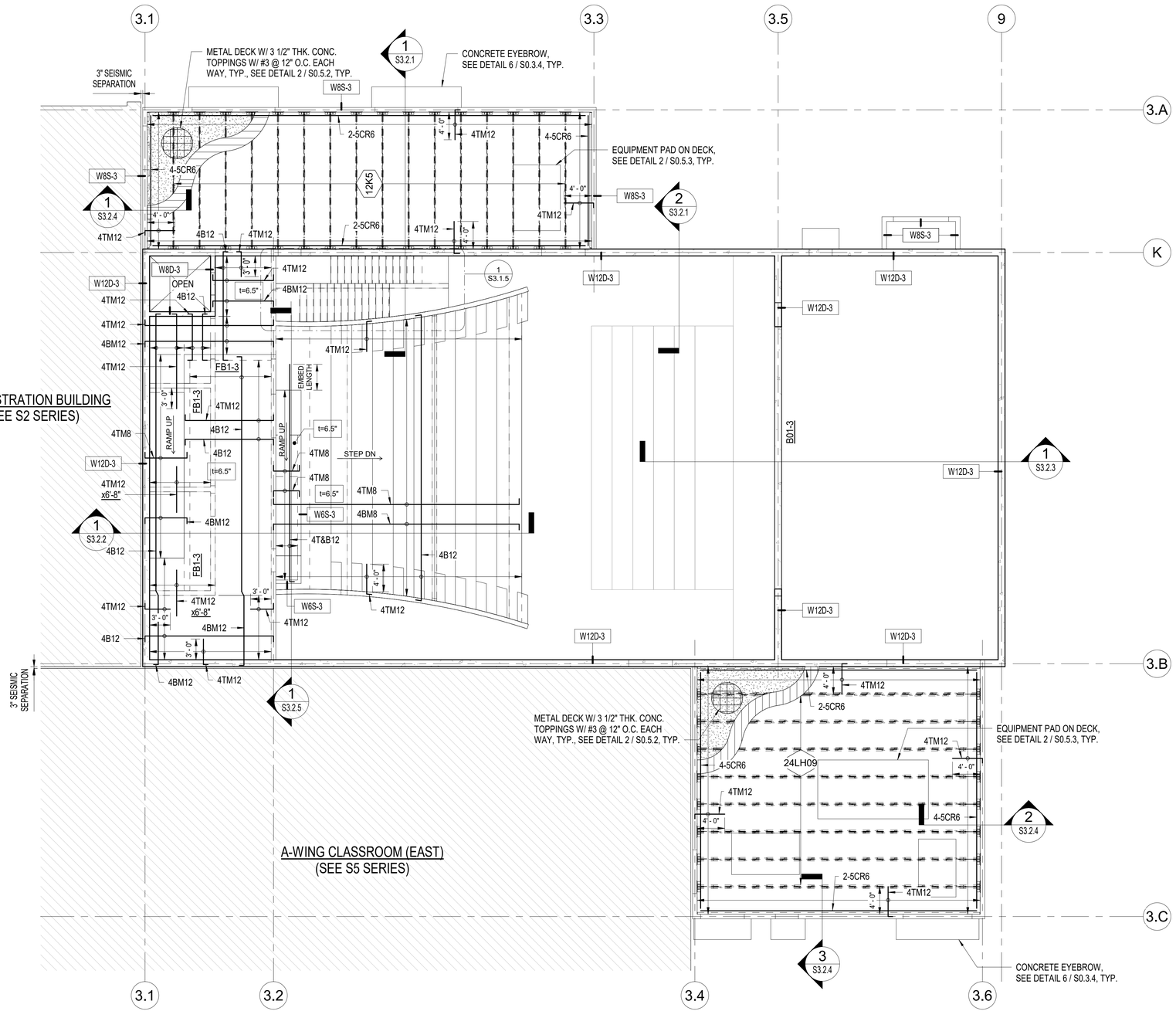
Title
AUDITORIUM
FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S3.1.1
Sheet No. of

NOT FOR CONSTRUCTION

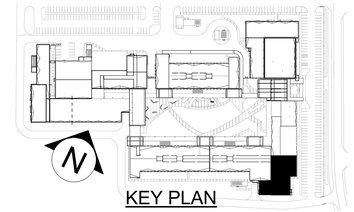
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 LEVEL 2 AND LOWER ROOF FRAMING PLAN

1/8" = 1'-0"

0' 2' 4' 8' 16'



KEY PLAN

LEGEND AND TAGS

W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
t=#	SLAB THICKNESS DESIGNATION (INCHES)
FB#-#	FLOOR BEAM (FB) DESIGNATION, SEE SHEET S0.3.4 &S3.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
2-5CR6	CHORD STEEL REINFORCING DESIGNATION, SEE SHEET S0.1.4
24LH09	24LH09 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
12K5	12K5 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.

REVISION

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
AUDITORIUM
LEVEL 2 AND LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S3.1.2
Sheet No. _____ of _____

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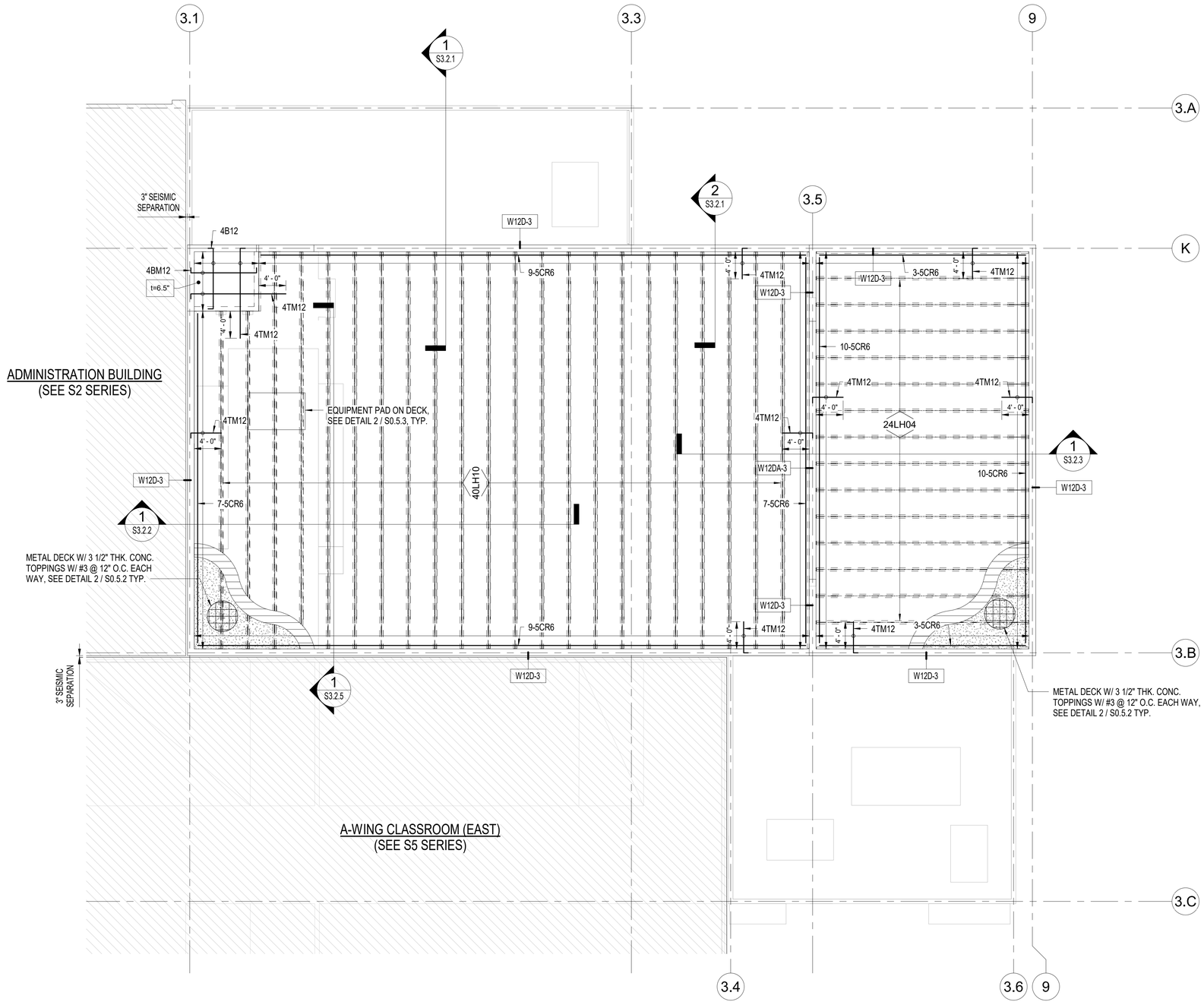
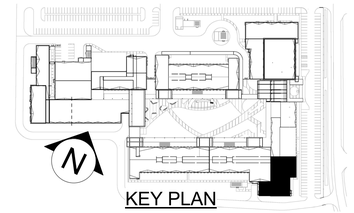


1 UPPER ROOF FRAMING PLAN

1/8" = 1'-0"

0' 2' 4' 8' 16'



KEY PLAN

LEGEND AND TAGS

W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
3-5CR6	CHORD STEEL REINFORCING DESIGNATION, SEE SHEET S0.1.4
24LH04	24LH04 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
40LH10	40LH10 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.

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SIMON SANCHEZ HIGH SCHOOL

Title
AUDITORIUM
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S3.1.3
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

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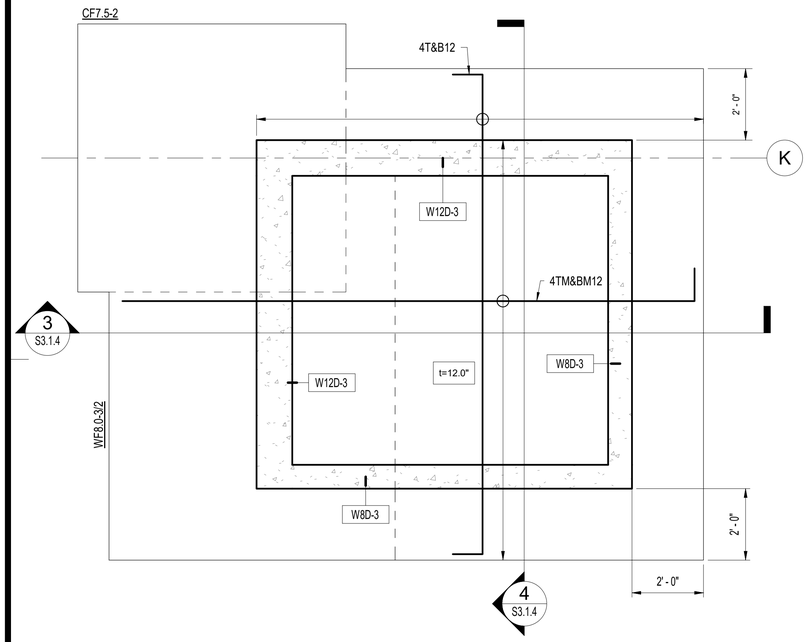
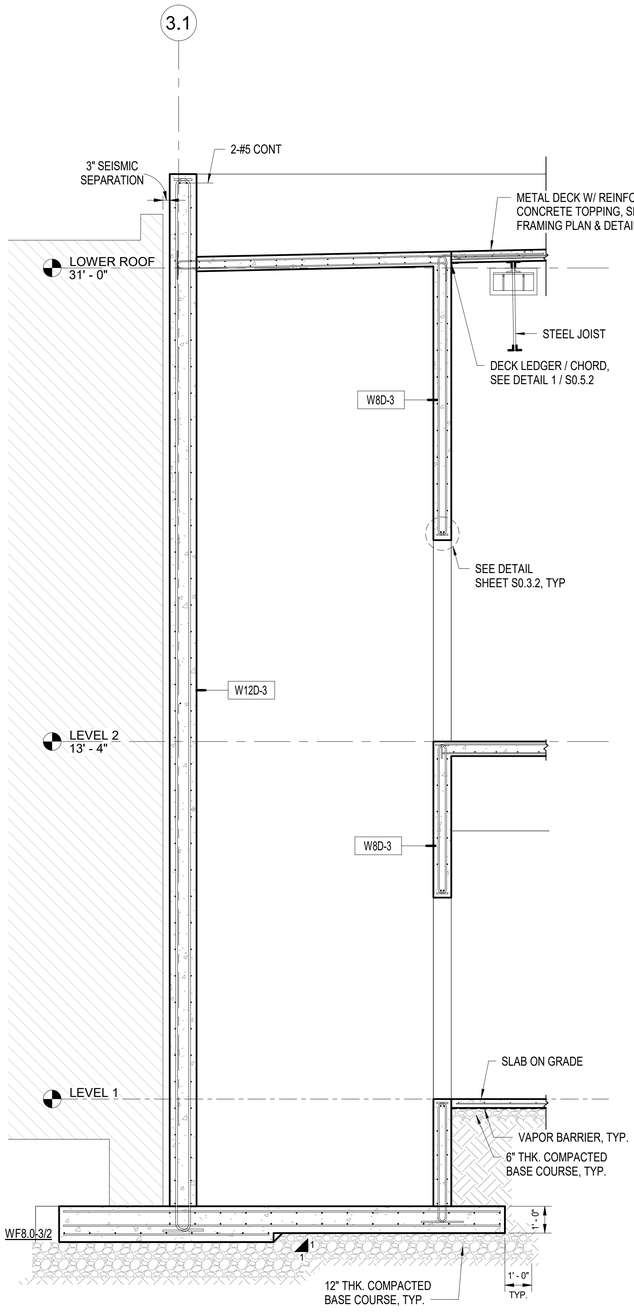


1 ELEVATOR SHAFT FOUNDATION PLAN

1/2" = 1'-0"

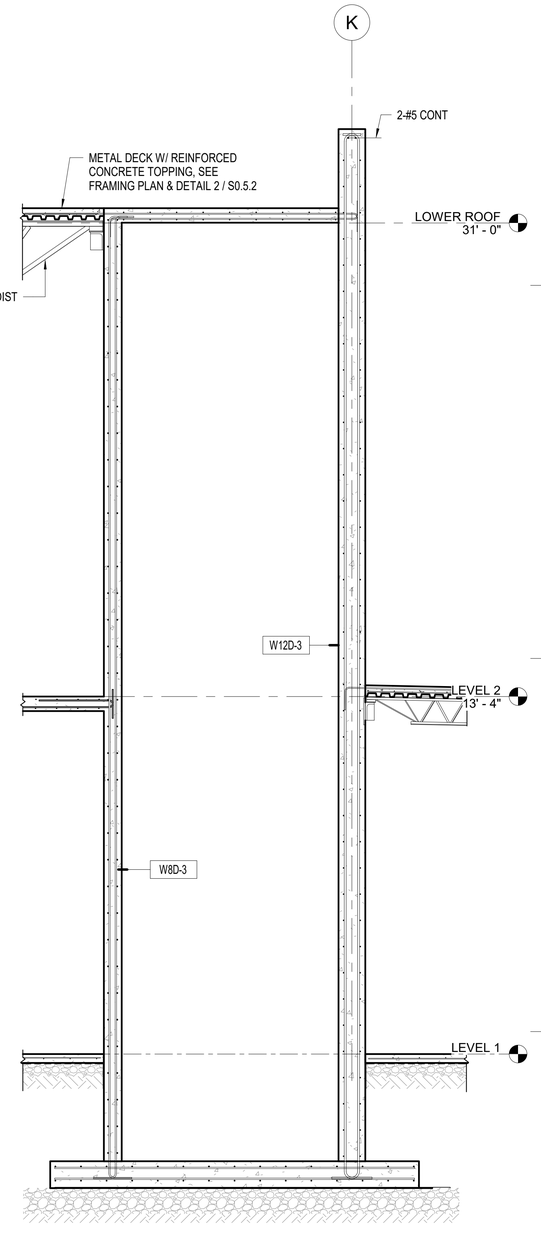
0' 6" 1' 2' 4'



3 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'



4 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

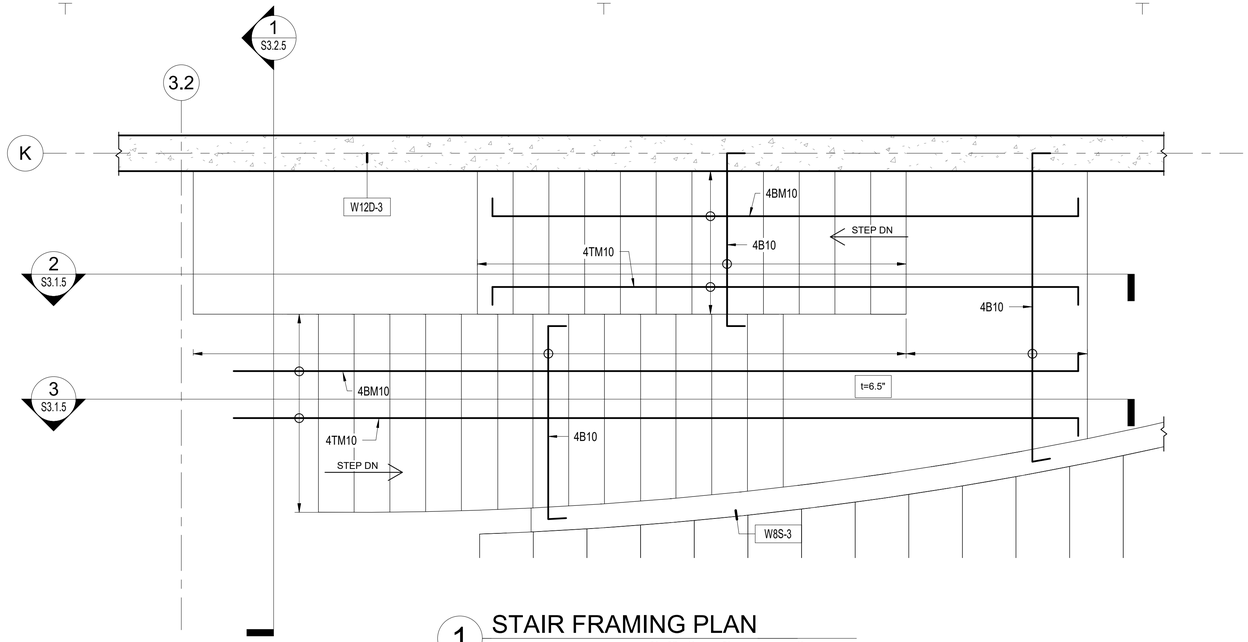
Title
AUDITORIUM
ELEVATOR SHAFT FOUNDATION PLAN, ROOF FRAMING PLAN AND SECTIONS
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S3.1.4

Sheet No. _____ of _____

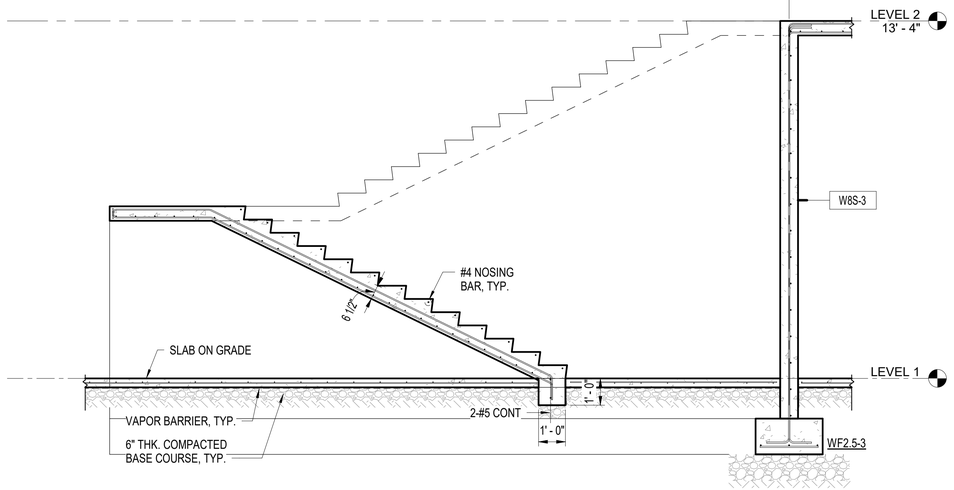
NOT FOR CONSTRUCTION



1 STAIR FRAMING PLAN

1/2" = 1'-0"

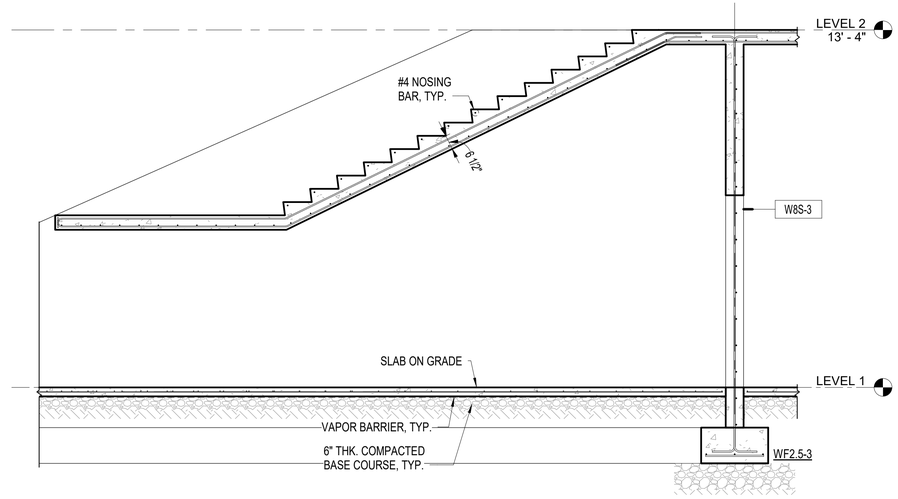
0' 6" 1' 2' 4'



2 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'



3 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

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Project

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title

AUDITORIUM

STAIR FRAMING PLAN AND SECTIONS

PROGRAMMING DOCUMENT

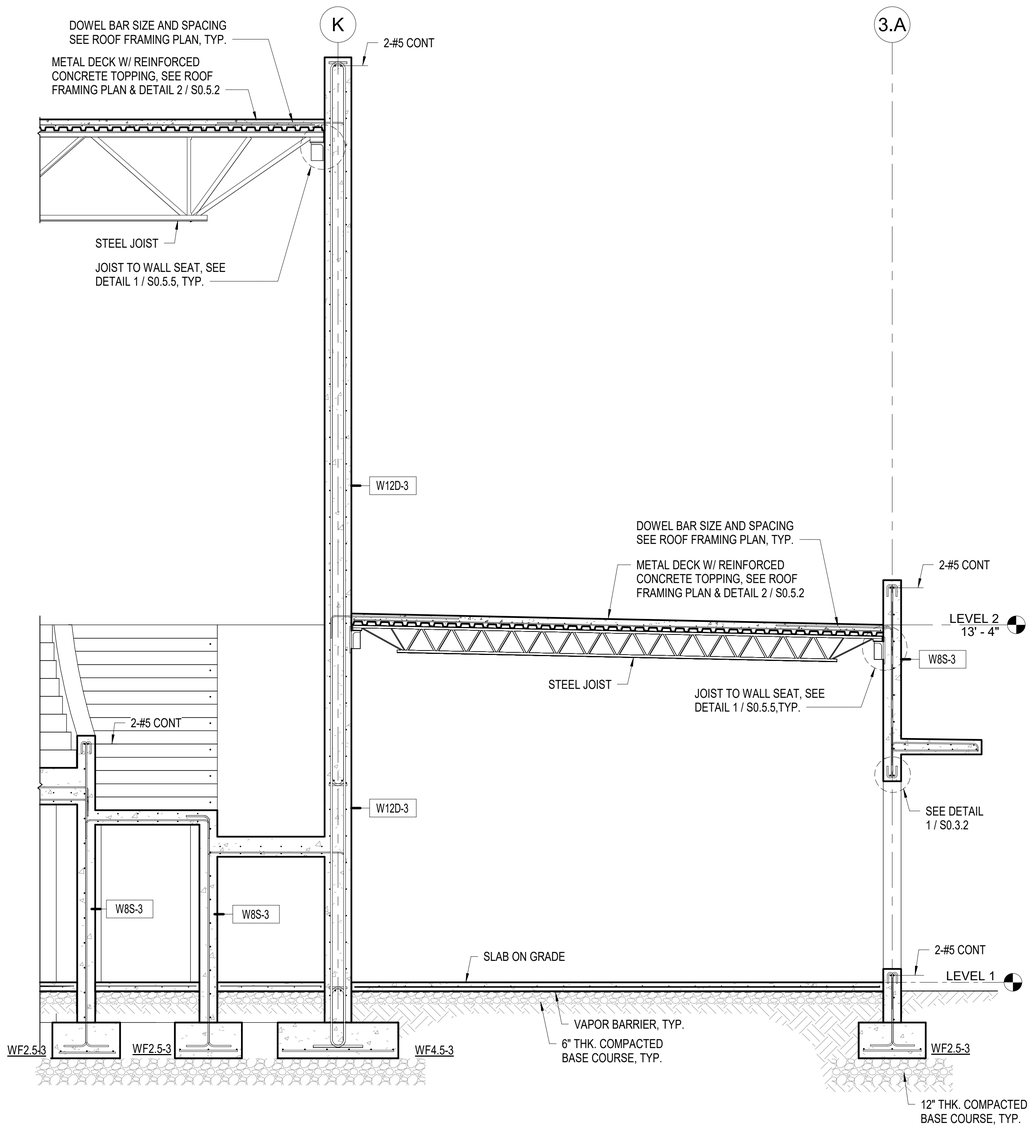
Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing

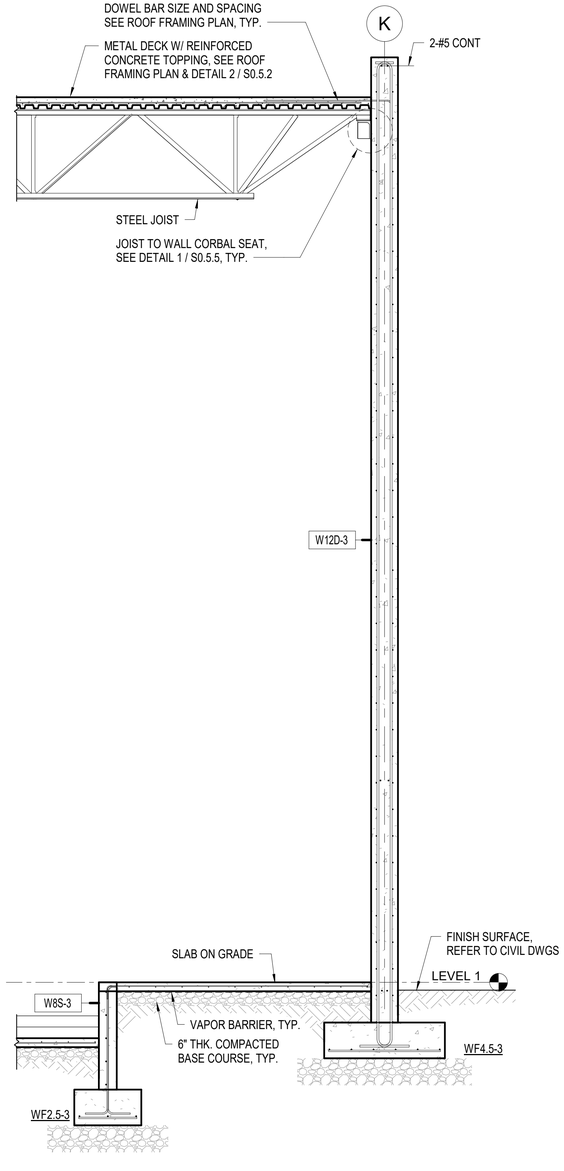
S3.1.5

Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: _____

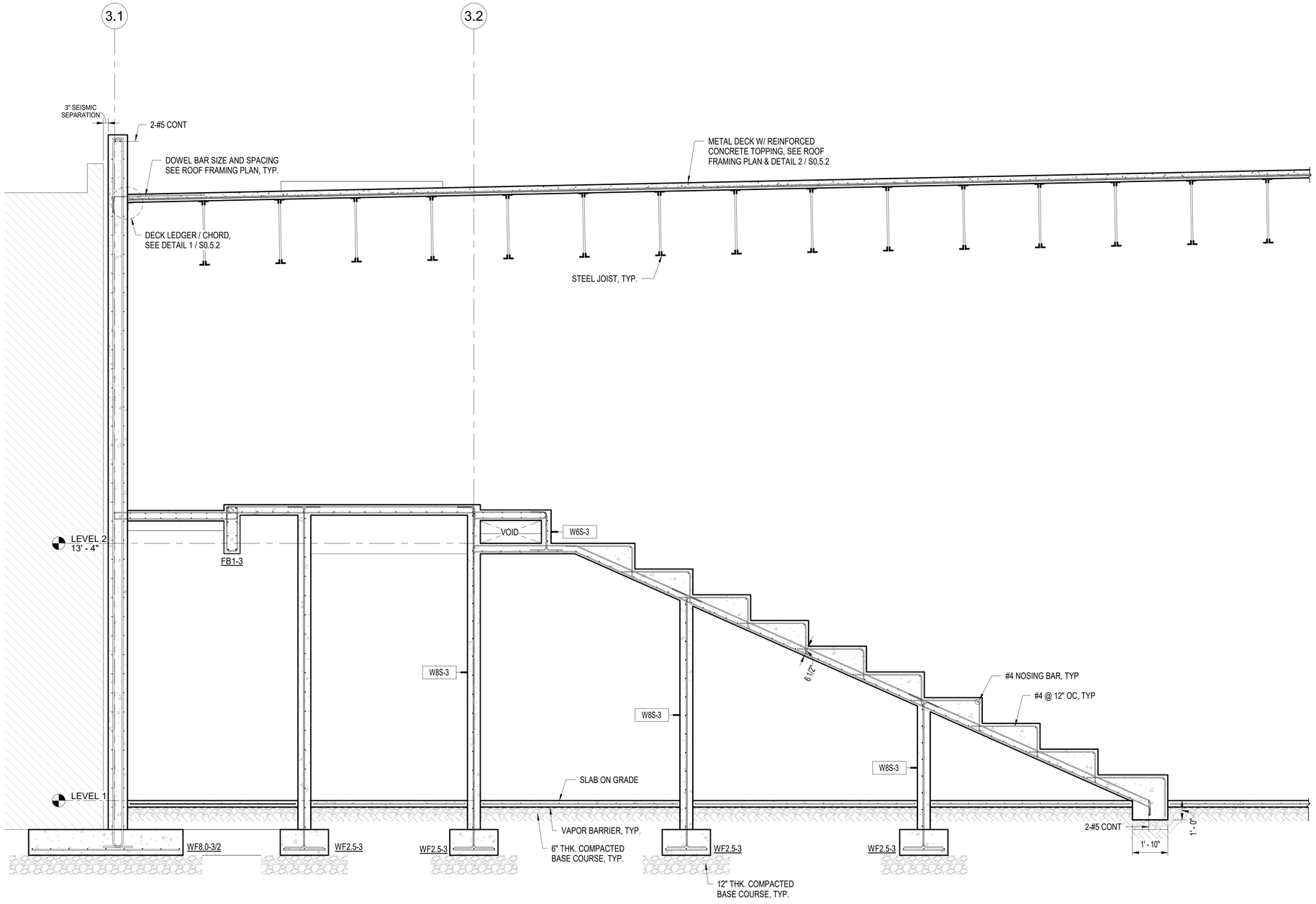
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
AUDITORIUM
SECTIONS
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S3.2.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Project
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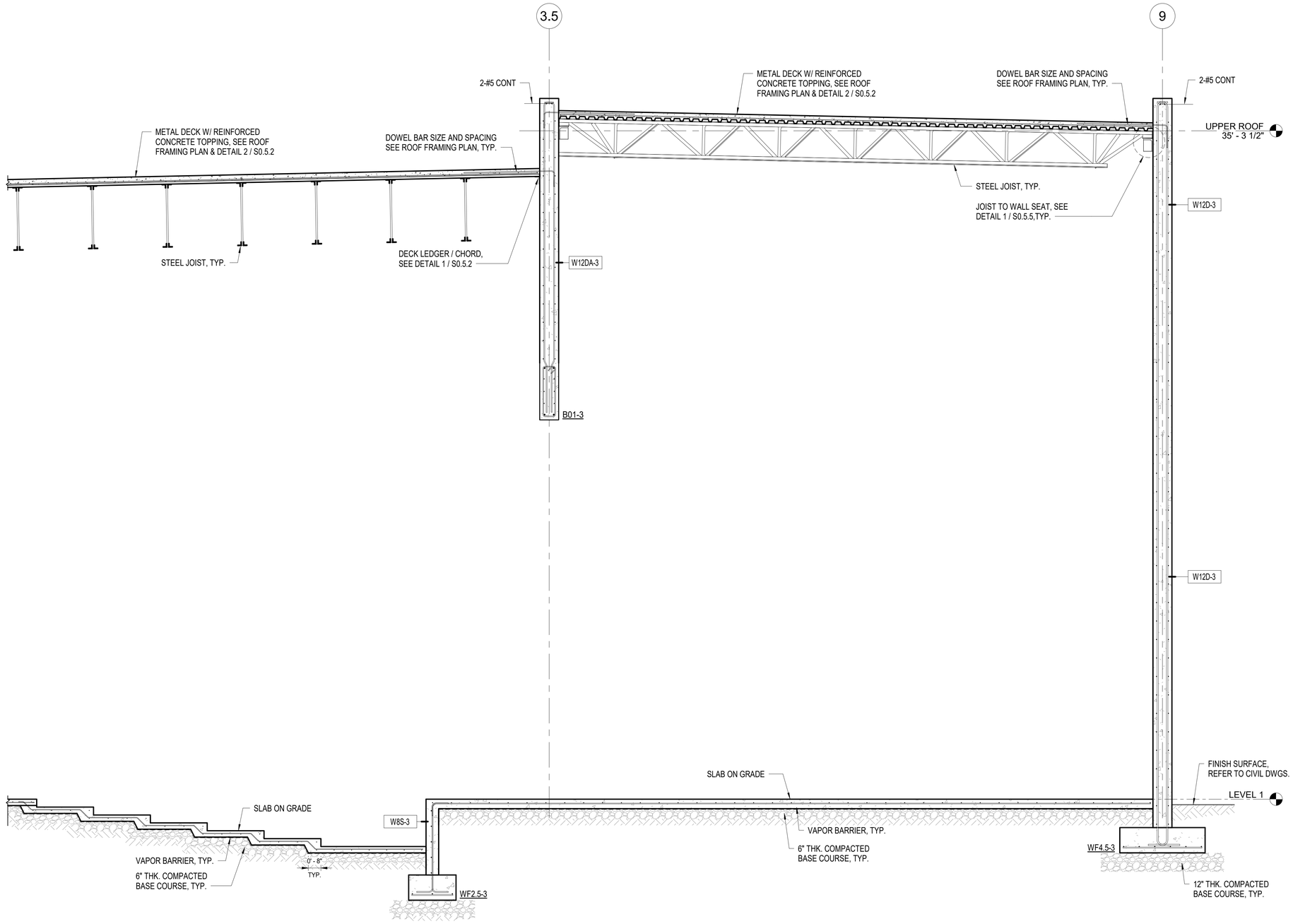
Title
AUDITORIUM
SECTION
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S3.2.2
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project
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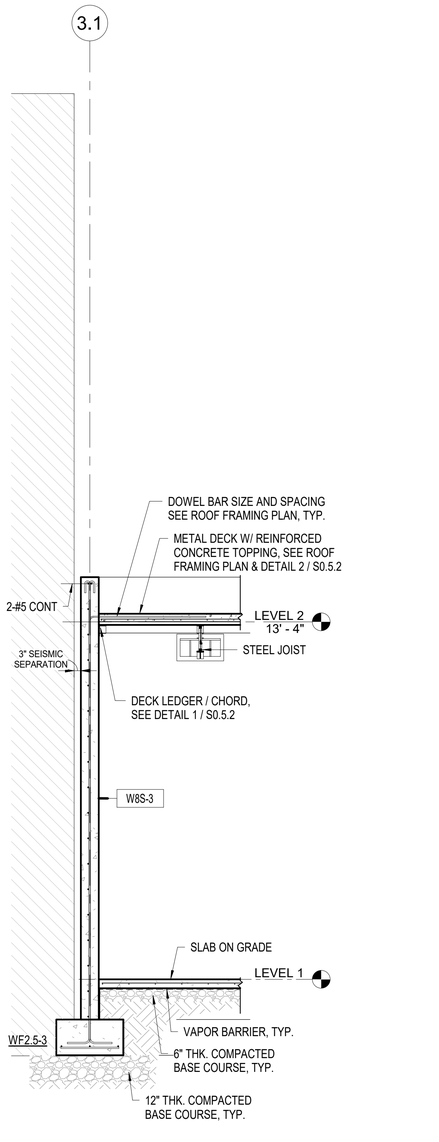
Title
AUDITORIUM
SECTION
PROGRAMMING DOCUMENT

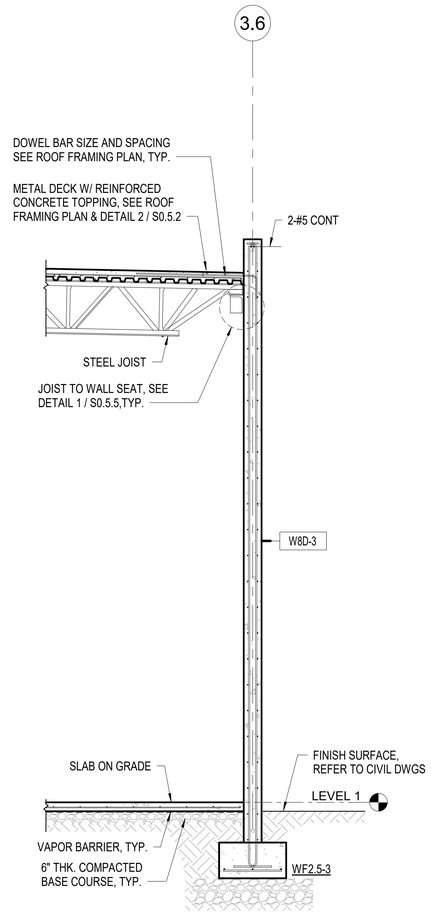
Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S3.2.3
Sheet No._____ of _____

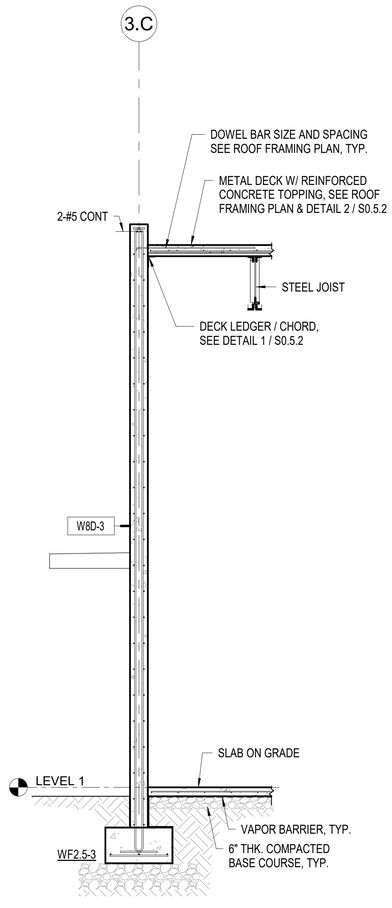
NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



3 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
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DIRECT SUPERVISION. DATE: _____

Project
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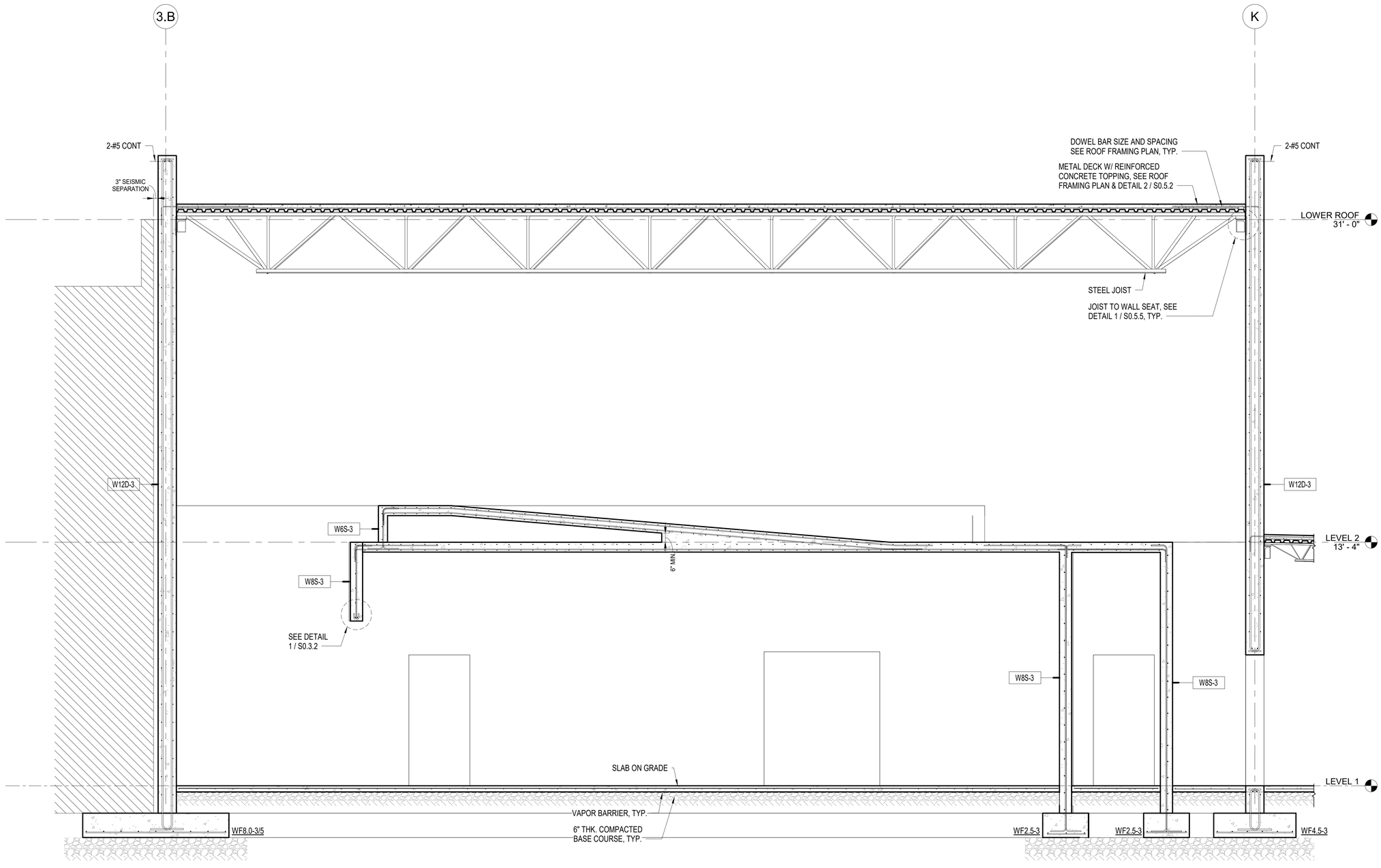
Title
AUDITORIUM
SECTIONS
PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S3.2.4
Sheet No. _____ of _____



1 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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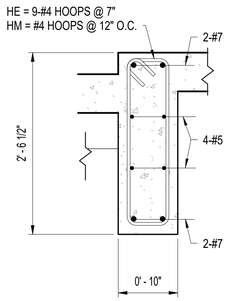
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
AUDITORIUM
SECTION
PROGRAMMING DOCUMENT

Designed:	ABR
Drawn	PCP
Checked	TPC/ABR
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S3.2.5
Sheet No. _____ of _____

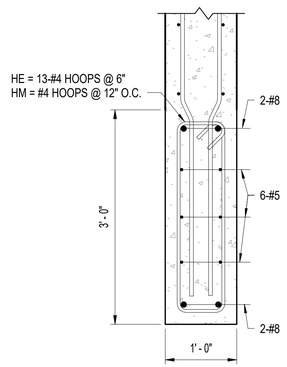
NOT FOR CONSTRUCTION



1 DETAIL FB1-3

1" = 1'-0"

0' 3" 6" 1' 2'



2 DETAIL B01-3

1" = 1'-0"

0' 3" 6" 1' 2'

REVISION

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381

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Project

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title

AUDITORIUM

MISCELLANEOUS DETAILS

PROGRAMMING DOCUMENT

Designed:	EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

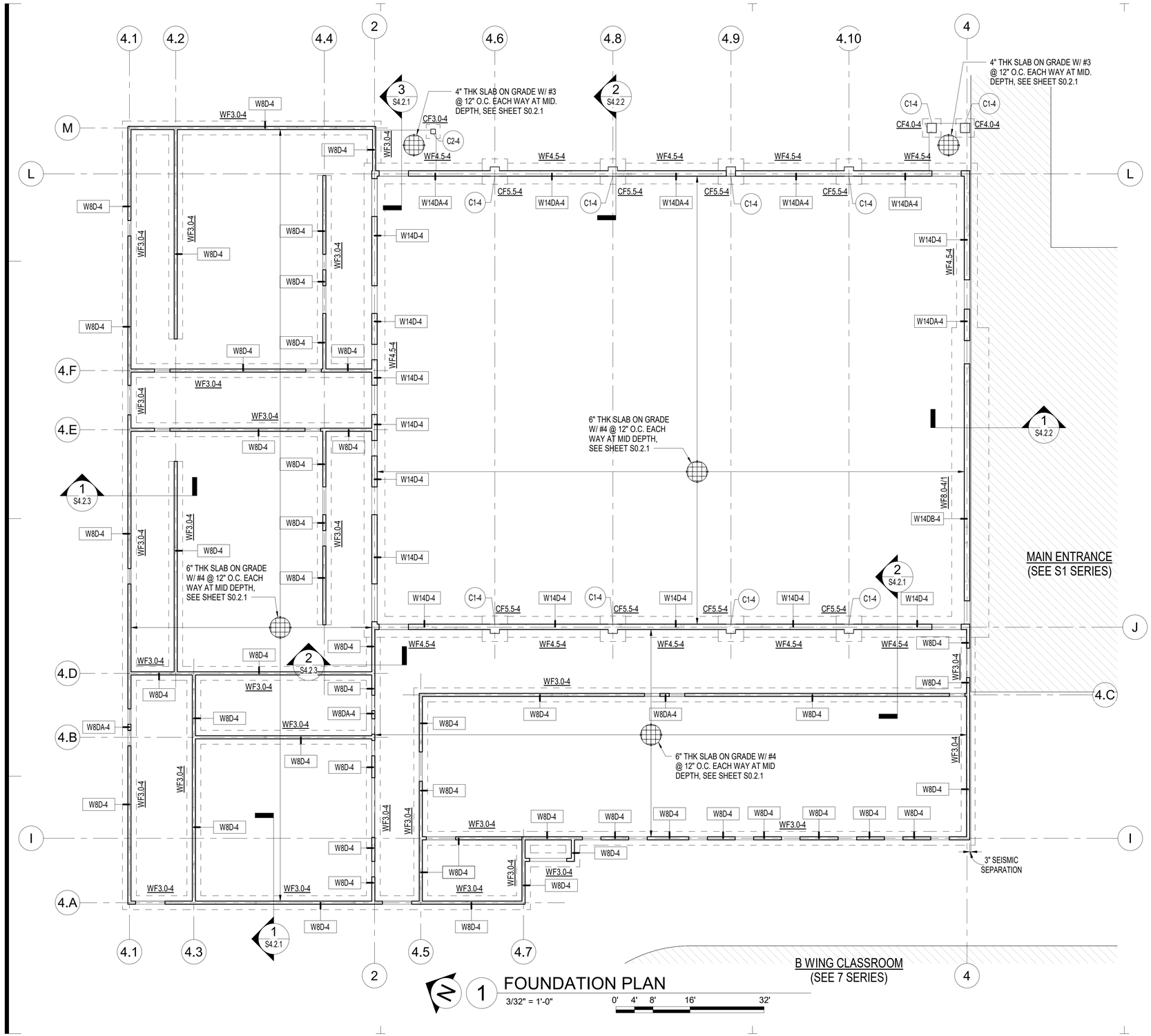
Drawing

S3.3.1

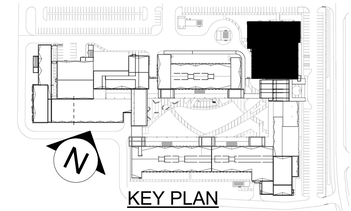
Sheet No. ____ of ____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION



1 FOUNDATION PLAN
3/32" = 1'-0"
0' 4' 8' 16' 32'



KEY PLAN

LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
CF#-#	COUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
C#-#	COLUMN DESIGNATION, SEE SHEET A0.3.2 & S4.3.1

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Off Business Center, P.O. Box EA, Agana, GU 96910
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Planning
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■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GYMNASIUM

FOUNDATION PLAN

PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S4.1.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

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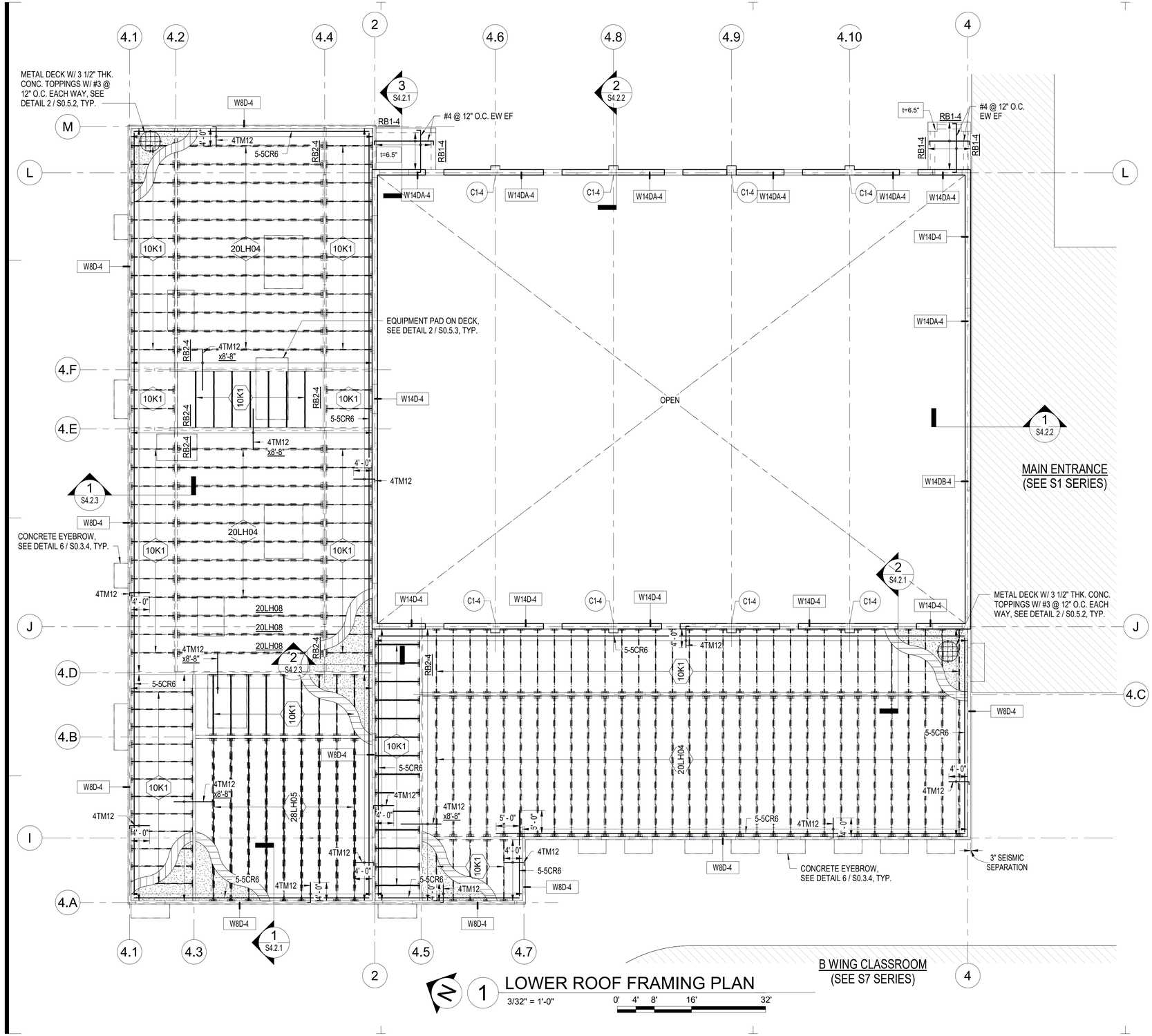
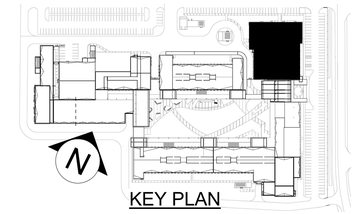


1 LOWER ROOF FRAMING PLAN
3/32" = 1'-0"
0' 4' 8' 16' 32'



KEY PLAN

LEGEND AND TAGS

W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
C#-#	COLUMN DESIGNATION, SEE SHEET S0.2.3 & S4.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
5-5CR6	CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4
10K1	10K1 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
12K1	12K1 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
20LH04	20LH04 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
20LH08	20LH08 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
28LH06	28LH06 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.

REVISION

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

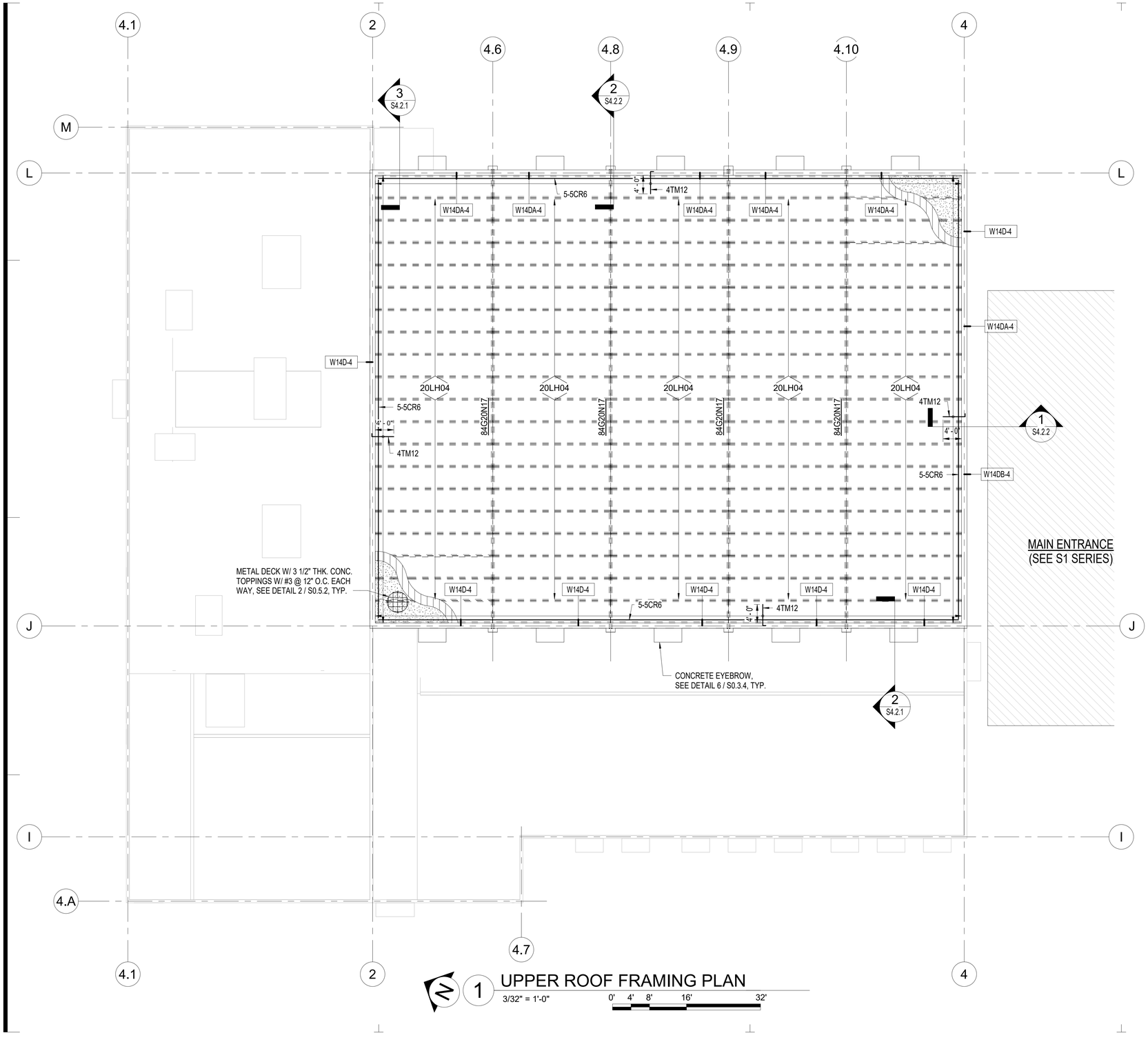
Title
GYMNASIUM
LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S4.1.2
Sheet No. of

NOT FOR CONSTRUCTION

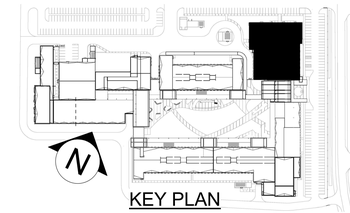
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 UPPER ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'



KEY PLAN

LEGEND AND TAGS

- W#-# — WALL DESIGNATION, SEE SHEET S0.3.1
- C#-# — COLUMN DESIGNATION, SEE SHEET S4.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 5-5CR6 — CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 20LH04 — 20LH04 STEEL JOIST SPACED AT 5'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.

REVISION		
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

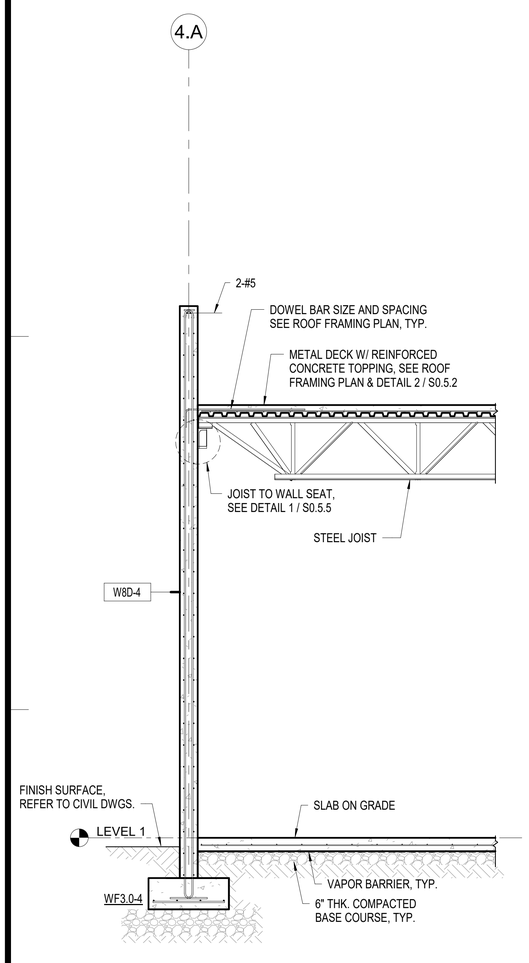
Title
GYMNASIUM
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

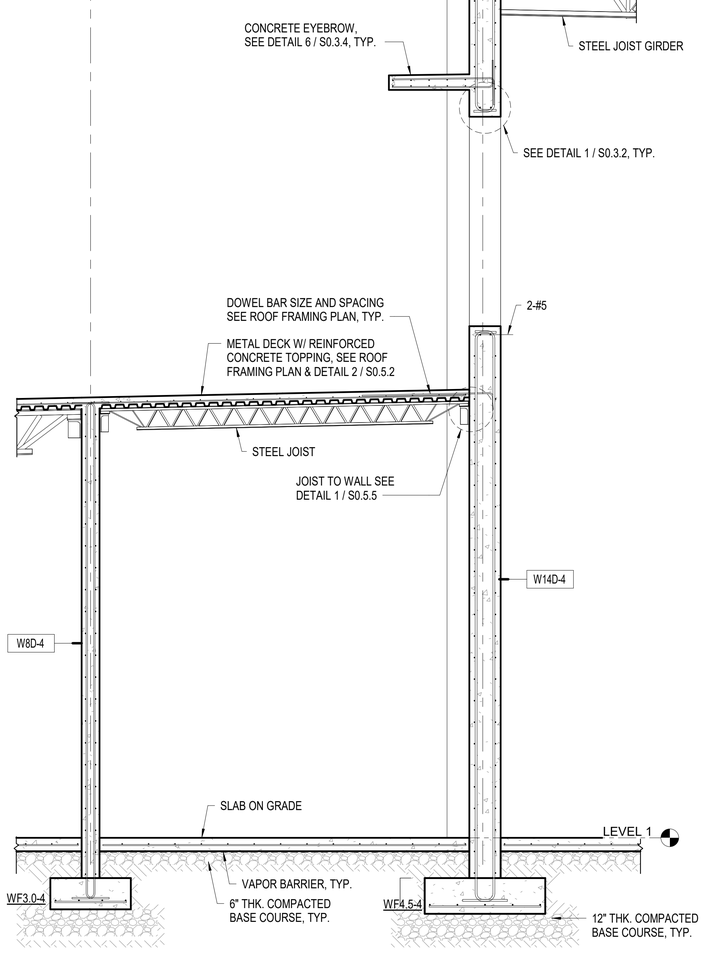
Drawing
S4.1.3
Sheet No. ____ of ____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

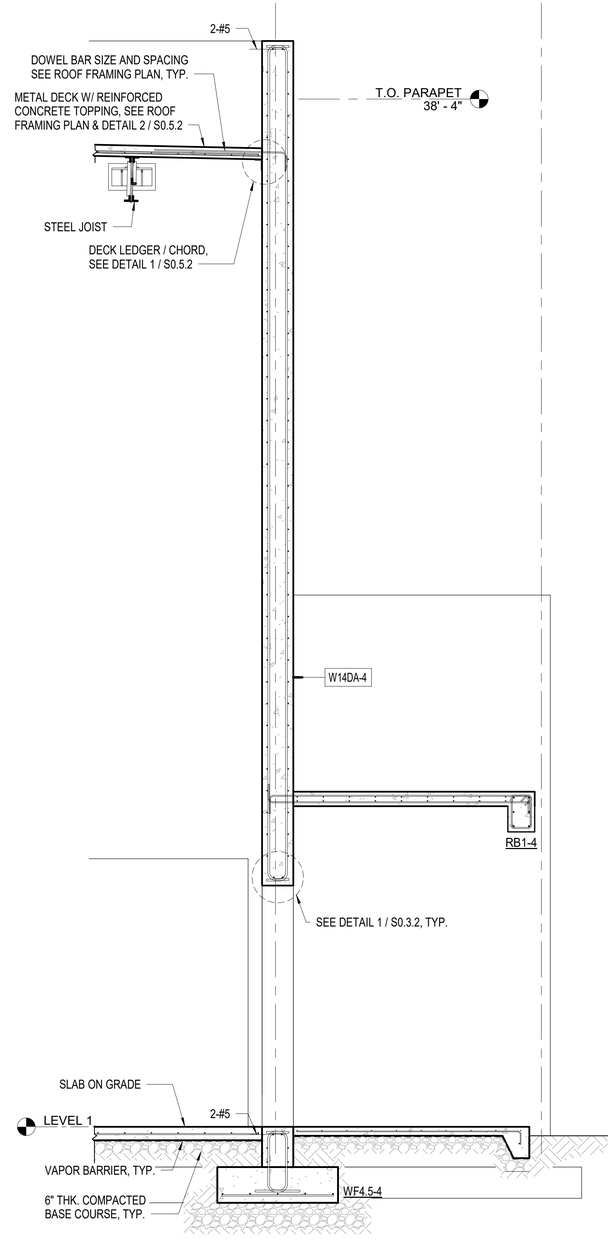
NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



3 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
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REVISION		
No.	Description	Date

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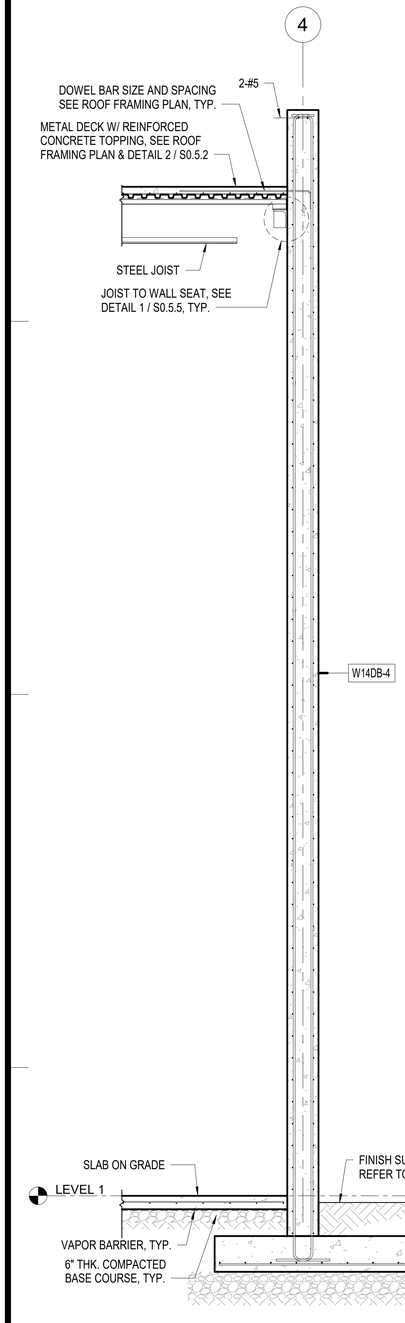
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GYMNASIUM
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S4.2.1
Sheet No. _____ of _____

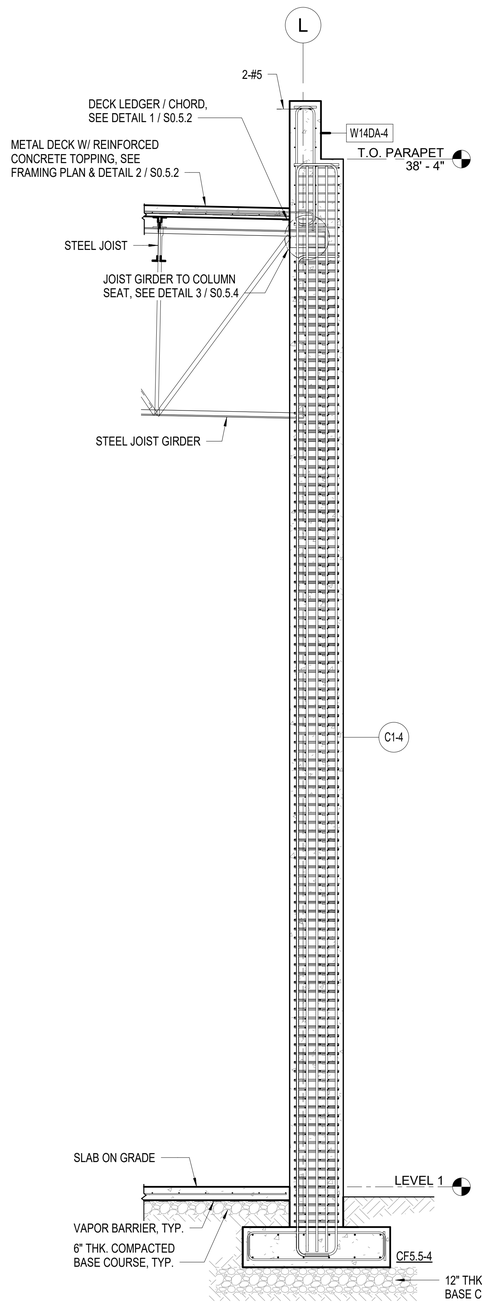
NOT FOR CONSTRUCTION



1 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'



2 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

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DIRECT SUPERVISION. DATE: _____

Project

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title

GYMNASIUM

SECTIONS

PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

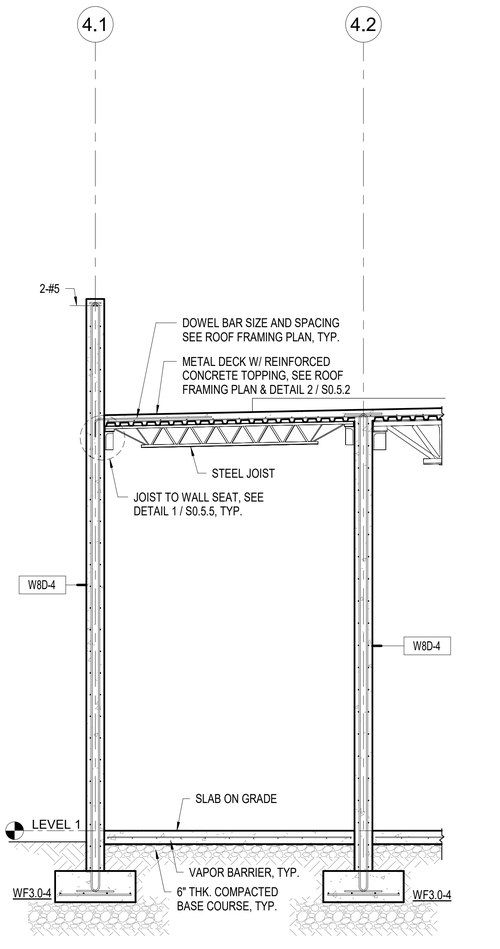
Drawing

S4.2.2

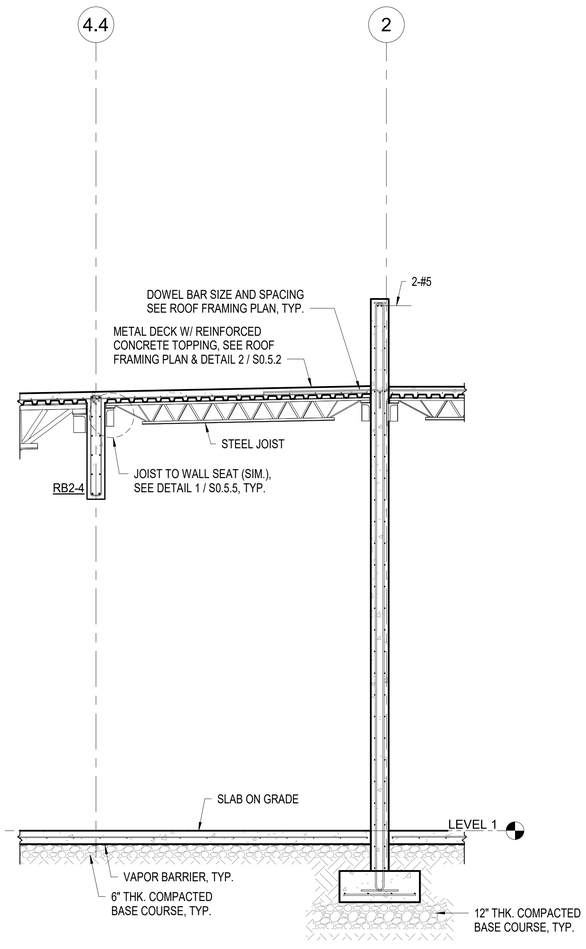
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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DIRECT SUPERVISION. DATE: -

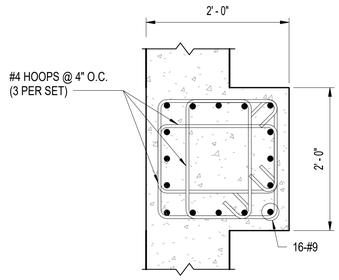
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GYMNASIUM
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S4.2.3
Sheet No. of

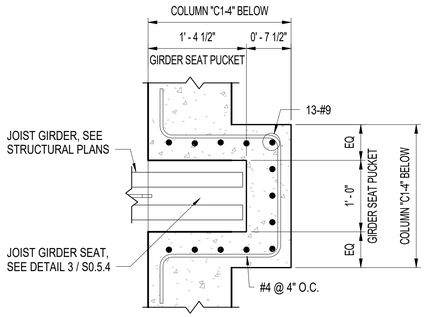
NOT FOR CONSTRUCTION



1 DETAIL C1-4

1" = 1'-0"

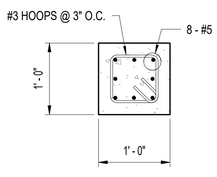
0' 3" 6" 1' 2'



2 DETAIL @ GIRDER SEAT

1" = 1'-0"

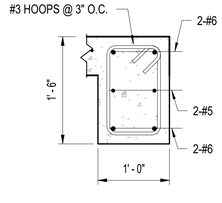
0' 3" 6" 1' 2'



3 DETAIL C2-4

1" = 1'-0"

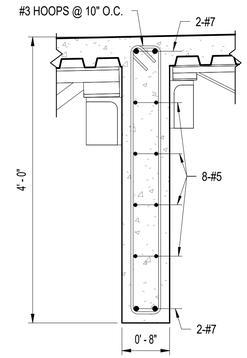
0' 3" 6" 1' 2'



4 DETAIL RB1-4

1" = 1'-0"

0' 3" 6" 1' 2'



5 DETAIL RB2-4

1" = 1'-0"

0' 3" 6" 1' 2'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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DIRECT SUPERVISION. DATE: -

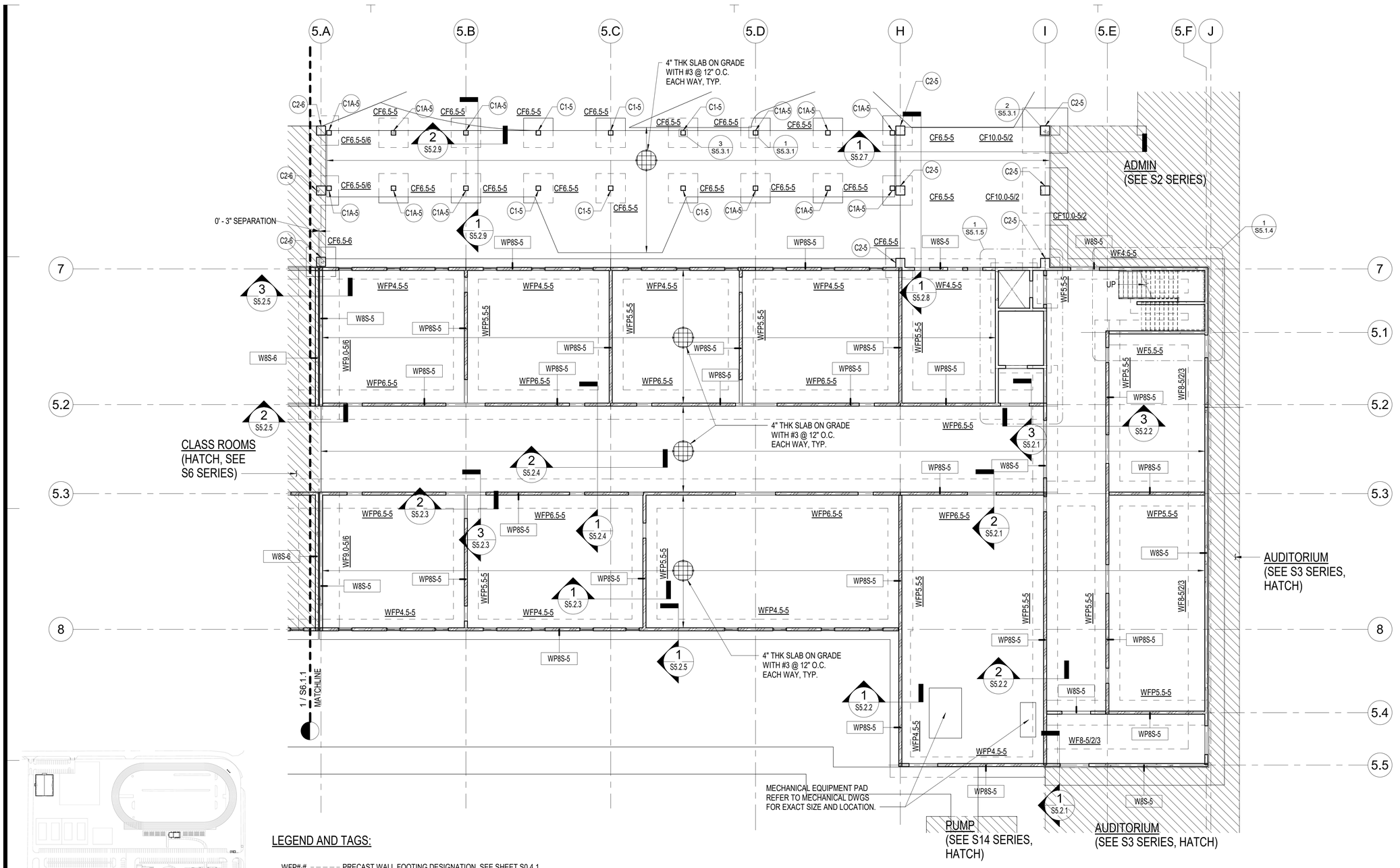
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

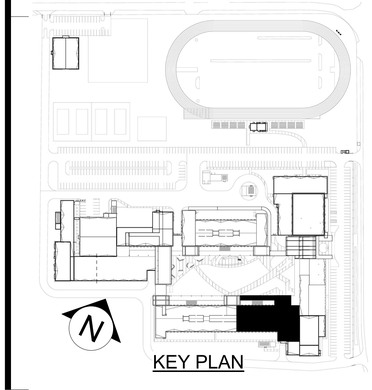
Title
GYMNASIUM
MISCELLANEOUS DETAILS
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S4.3.1
Sheet No. of

NOT FOR CONSTRUCTION





LEGEND AND TAGS:

- WFP#-# ------ PRECAST WALL FOOTING DESIGNATION, SEE SHEET S0.4.1
- WF#-# ------ WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
- CF#-# ------ COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
- C#-# ------ CONCRETE COLUMN DESIGNATION, SEE SHEET S5.3.1
- WP#-# ------ WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# ------ WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1

1 FOUNDATION PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISION

No.	Description	Date

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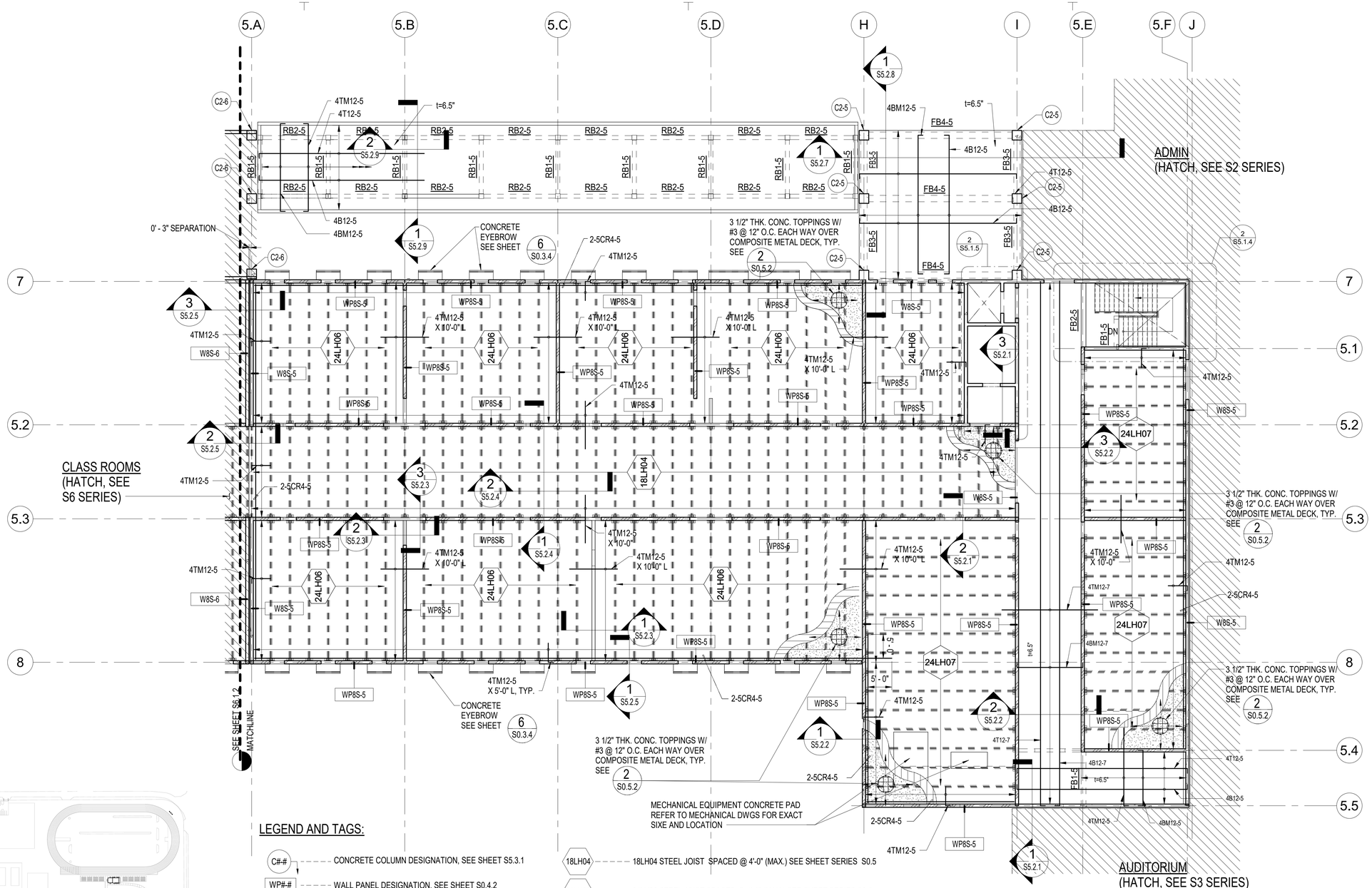
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S5.1.1

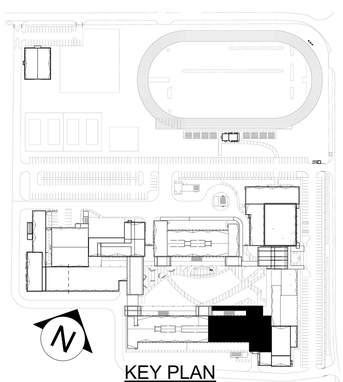
Sheet No. ____ of ____



LEGEND AND TAGS:

- C#-# — CONCRETE COLUMN DESIGNATION, SEE SHEET S5.3.1
- WP#-# — WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# — WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- FB#-# — CONCRETE FLOOR BEAM DESIGNATION, SEE SHEET S5.3.1
- RB#-# — CONCRETE ROOF BEAM DESIGNATION SEE SHEET S5.3.1
- 4T10 — SLAB REINFORCEMENT SEE SHEET S0.1.4
- 2-5CR4 — CHORD REINFORCEMENT SEE SHEET S0.1.4
- 18LH04 — 18LH04 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH06 — 24LH06 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH07 — 24LH07 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES.



KEY PLAN

1 SECOND FLOOR FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: ____

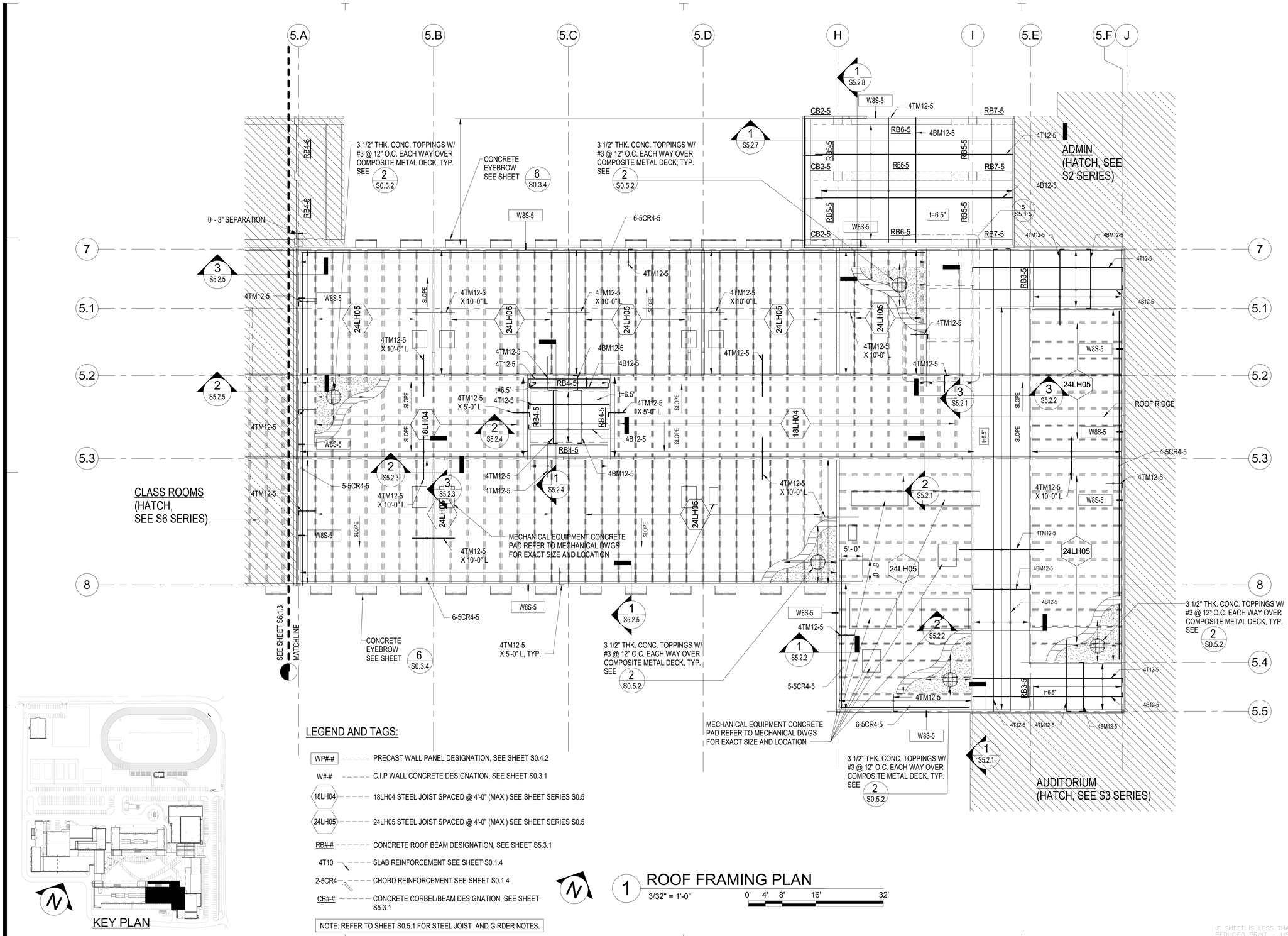
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
SECOND FLOOR
FRAMING PLAN
PROGRAMMING
DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S5.1.2
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



KEY PLAN

LEGEND AND TAGS:

WP##	PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
W##	C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
18LH04	18LH04 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
24LH05	24LH05 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
RB##	CONCRETE ROOF BEAM DESIGNATION, SEE SHEET S5.3.1
4T10	SLAB REINFORCEMENT SEE SHEET S0.1.4
2-5CR4	CHORD REINFORCEMENT SEE SHEET S0.1.4
CB##	CONCRETE CORBEL/BEAM DESIGNATION, SEE SHEET S5.3.1

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES.

1 ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S5.1.3
Sheet No. ____ of ____

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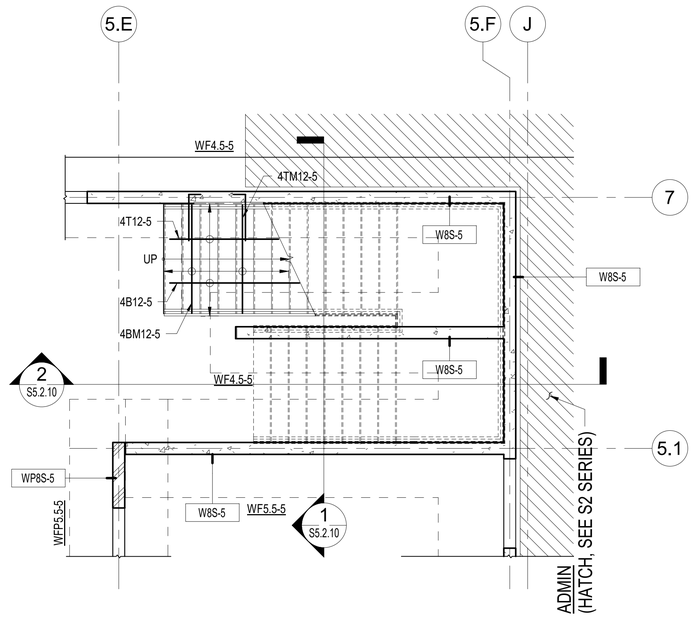
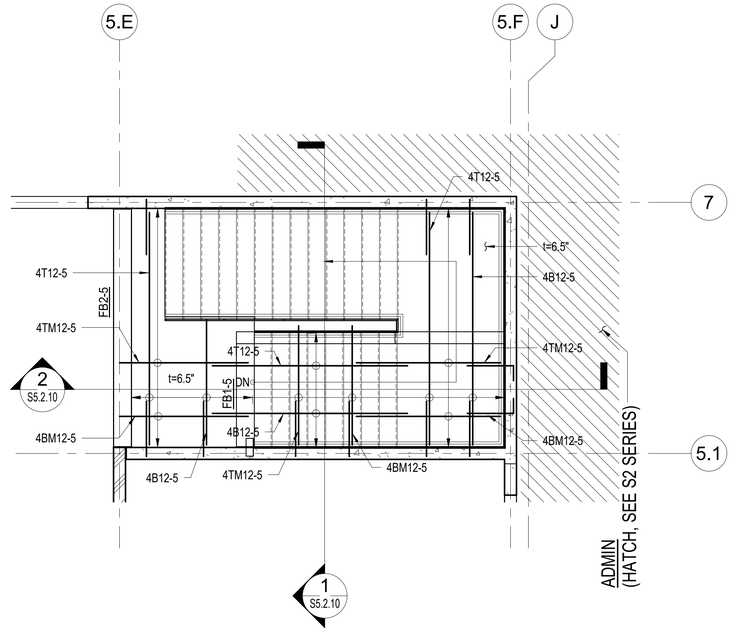


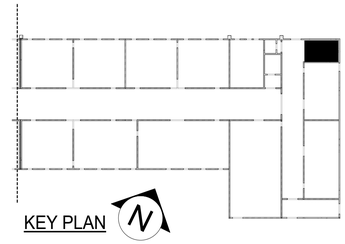
1 STAIR FOUNDATION PLAN

1/4" = 1'-0"



2 STAIR SECOND FLOOR FRAMING PLAN

1/4" = 1'-0"



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Project

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title

CLASSROOMS:

A - WING (EAST)
STAIR FRAMING PLAN

PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S5.1.4

Sheet No. ____ of ____

IF SHEET IS LESS THAN 24" X 36"
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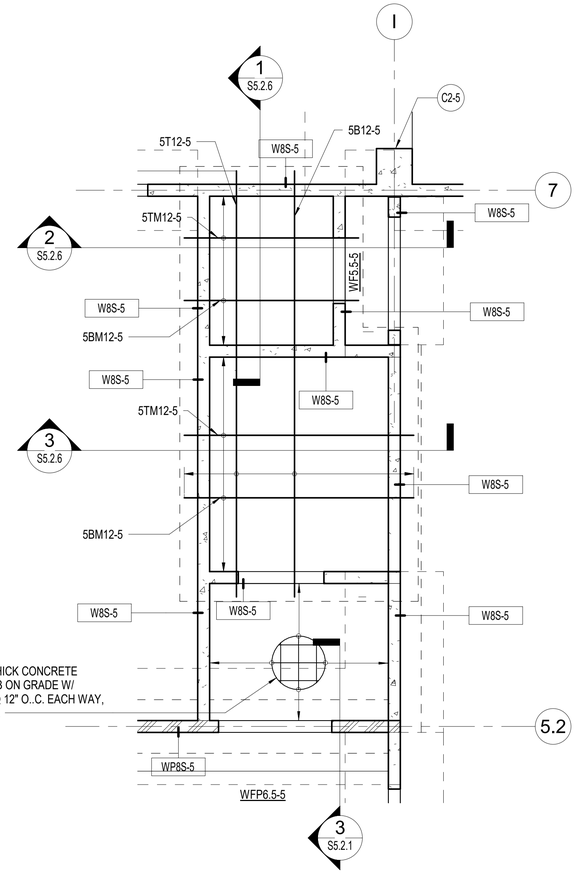
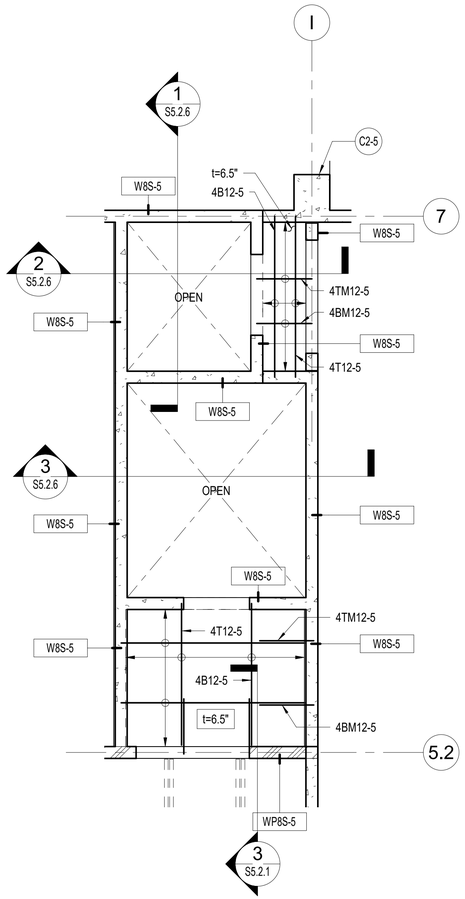
NOT FOR CONSTRUCTION



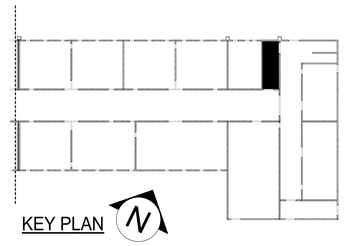
1 FOUNDATION PLAN

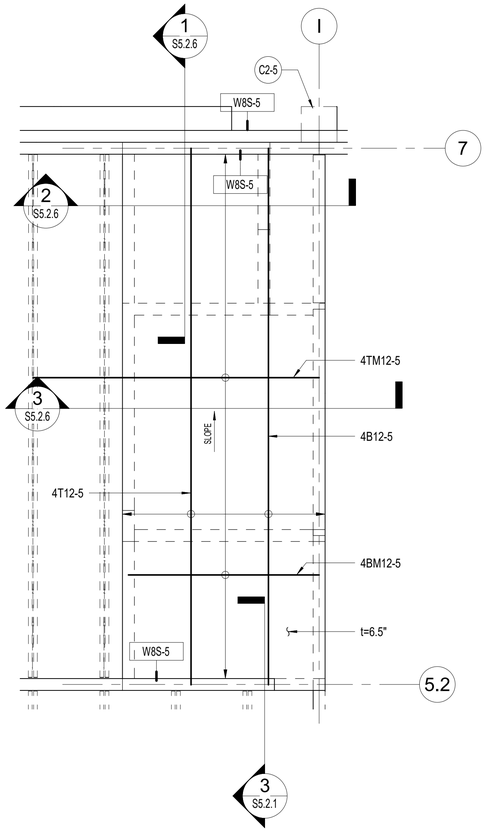
1/4" = 1'-0" 0' 1' 2' 4' 8'



2 SECOND FLOOR FRAMING PLAN

1/4" = 1'-0" 0' 1' 2' 4' 8'





5 ROOF FRAMING PLAN

1/4" = 1'-0" 0' 1' 2' 4' 8'

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DIRECT SUPERVISION. DATE: -

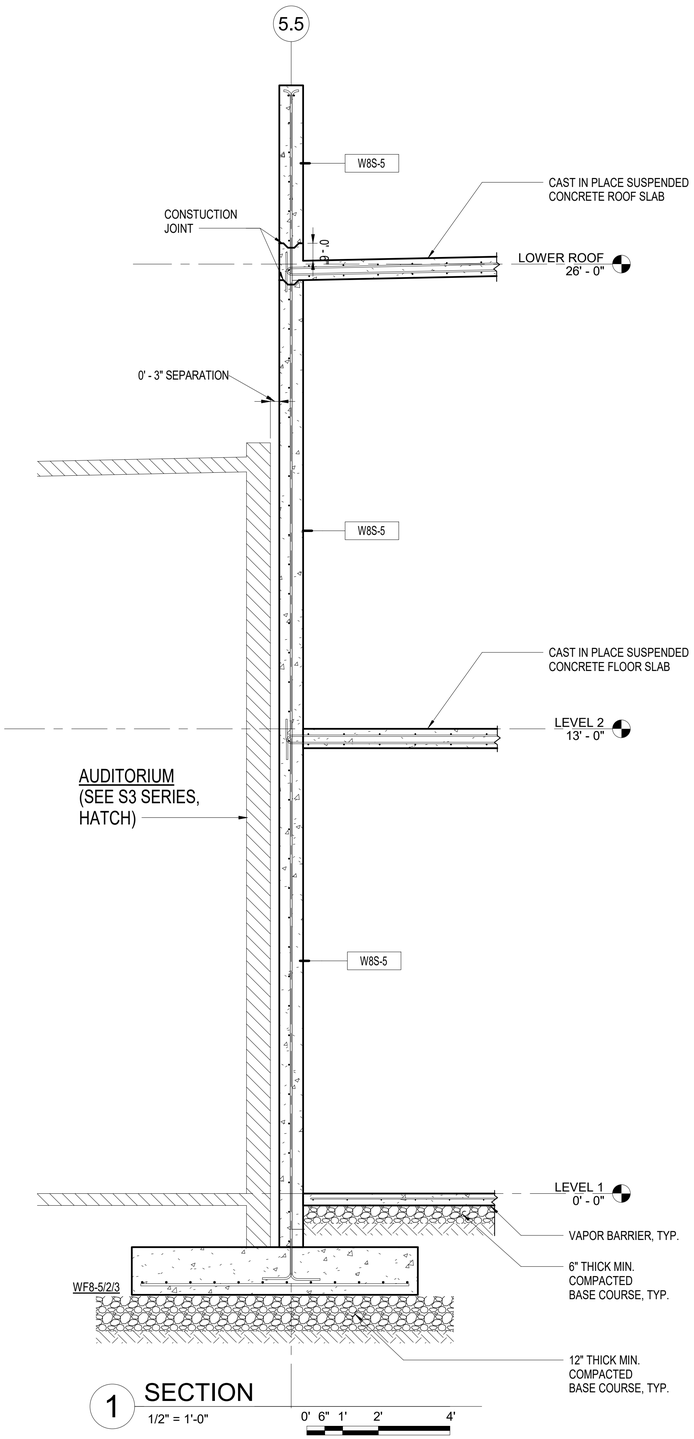
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
ELEVATOR FRAMING PLANS
PROGRAMMING DOCUMENT

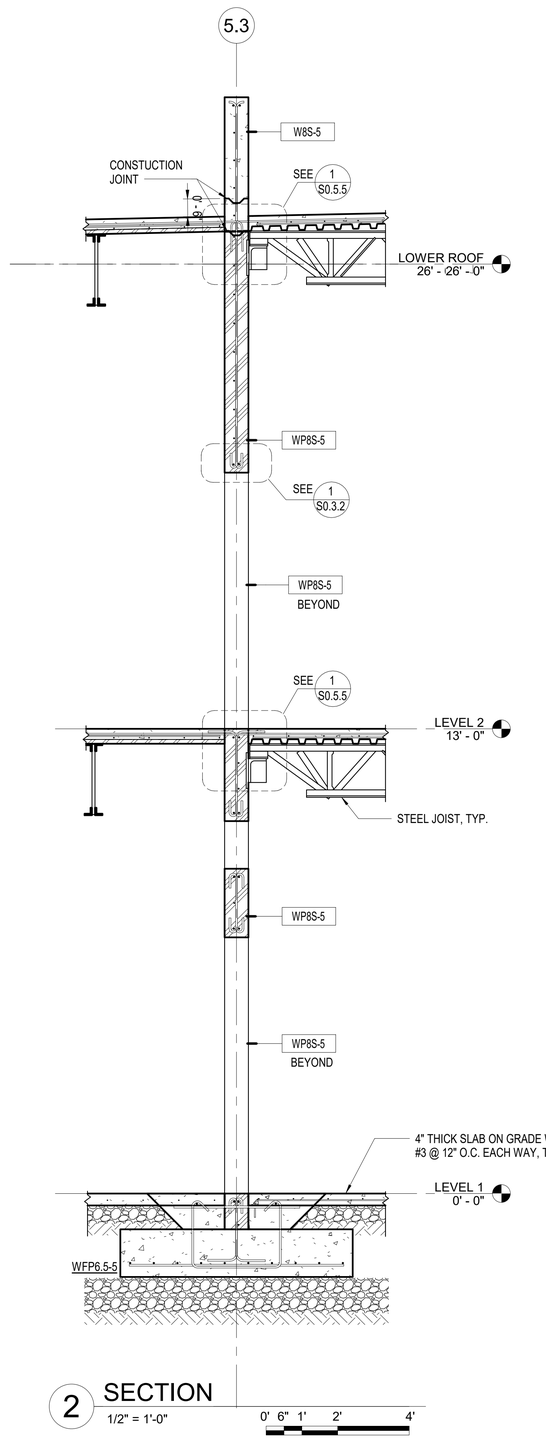
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.1.5
Sheet No. _____ of _____

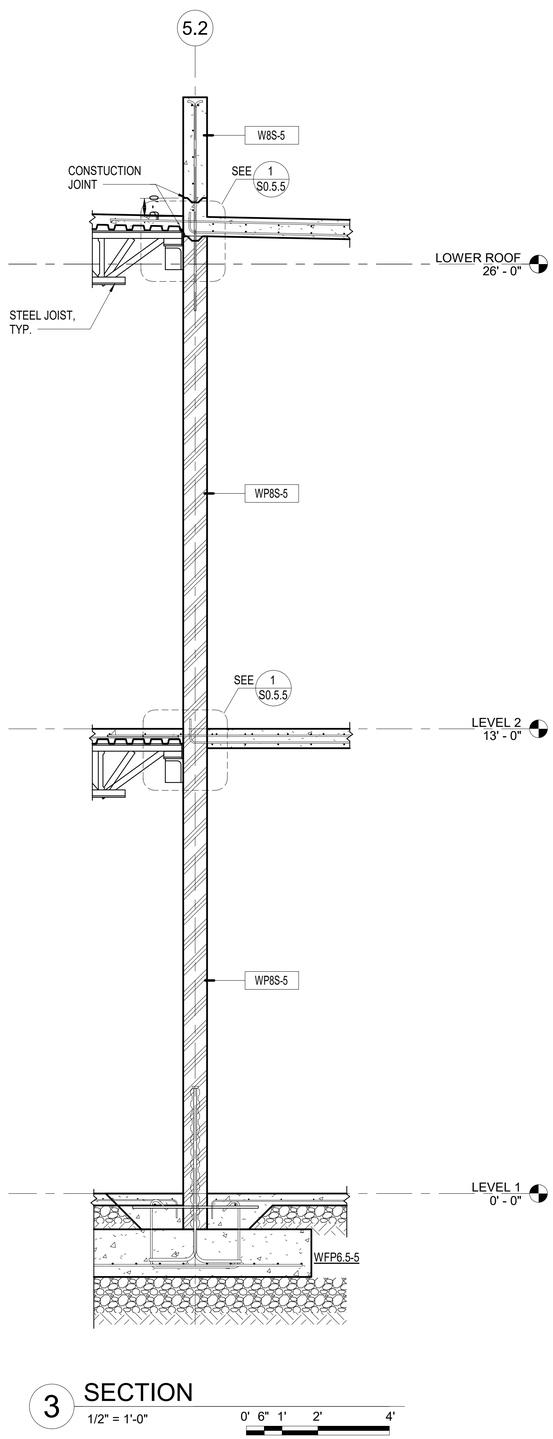
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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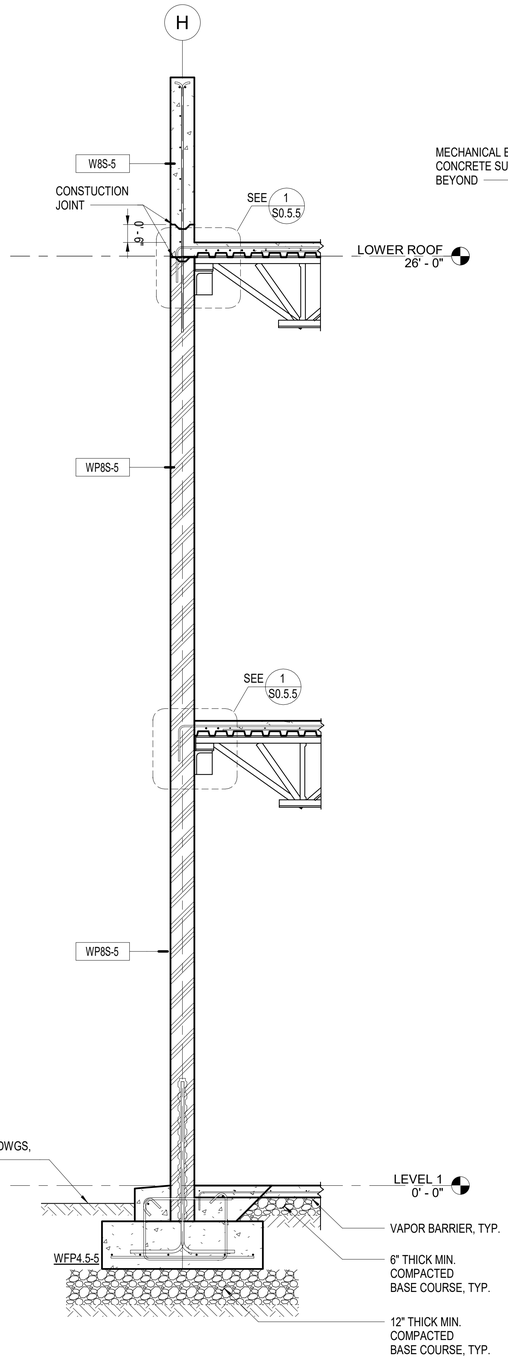
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTIONS
PROGRAMMING DOCUMENT

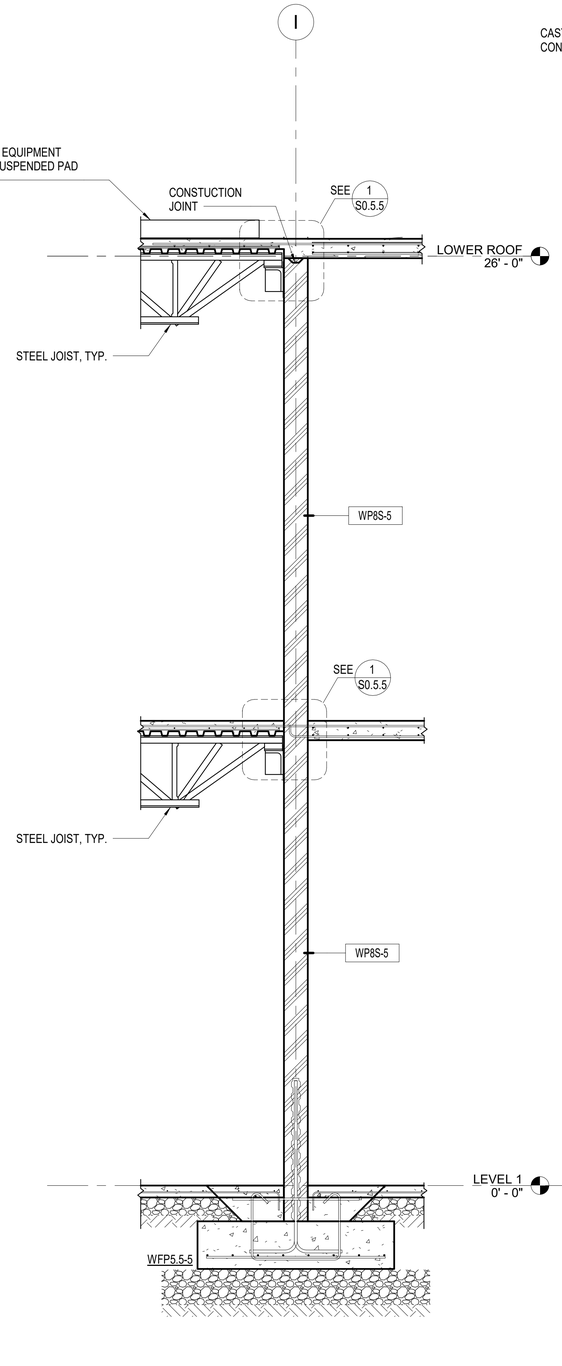
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.1
Sheet No. _____ of _____

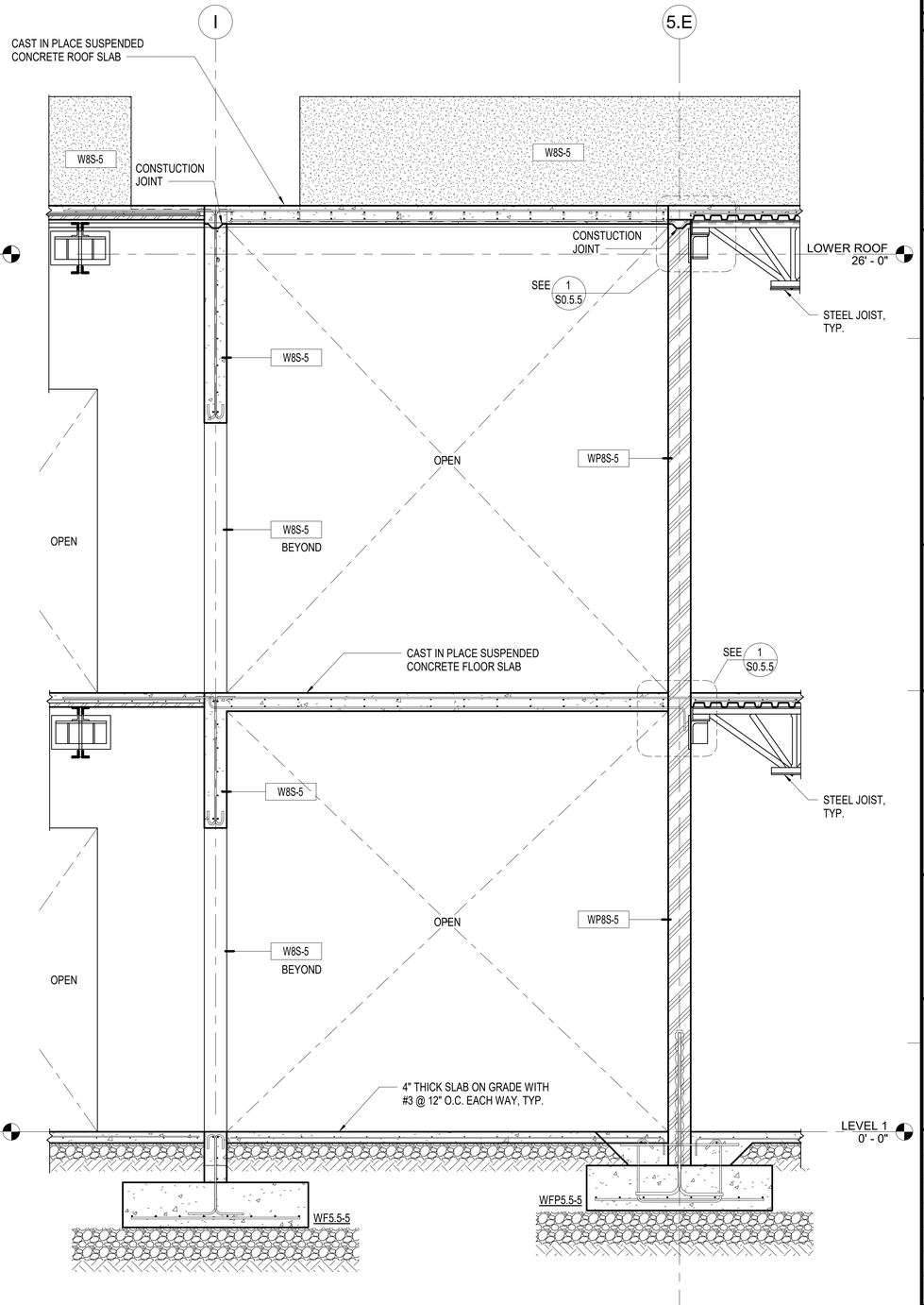
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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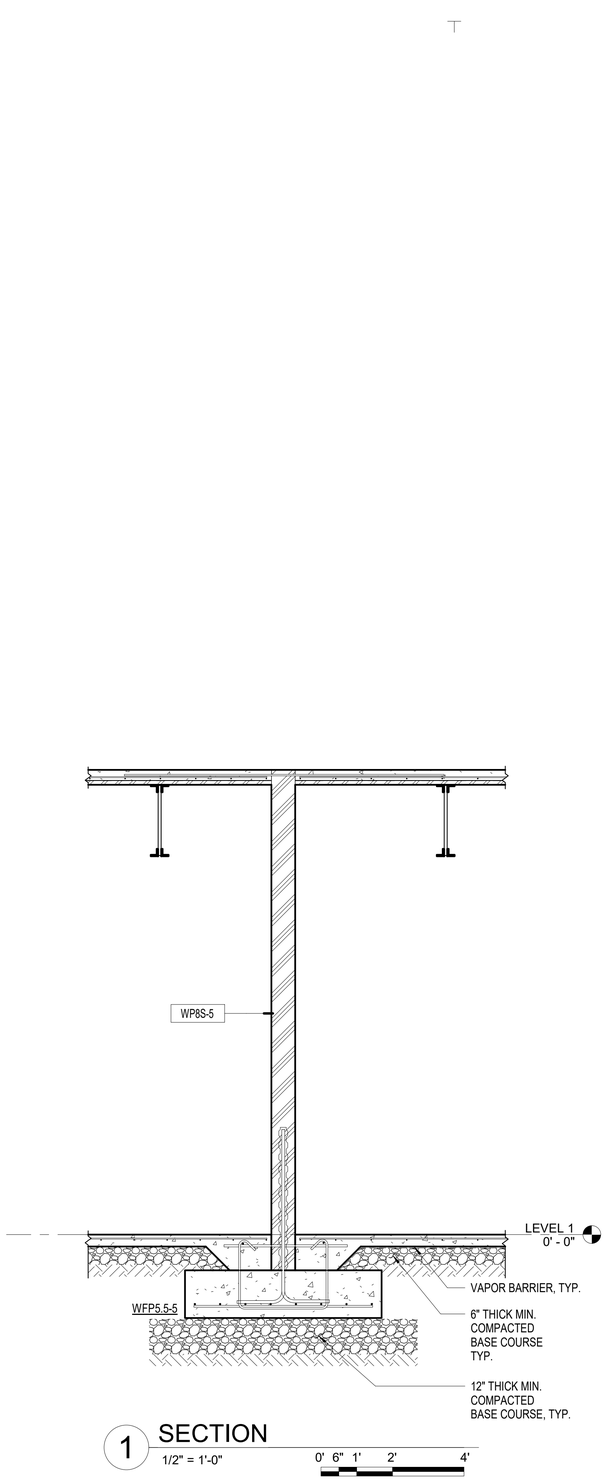
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTIONS
PROGRAMMING DOCUMENT

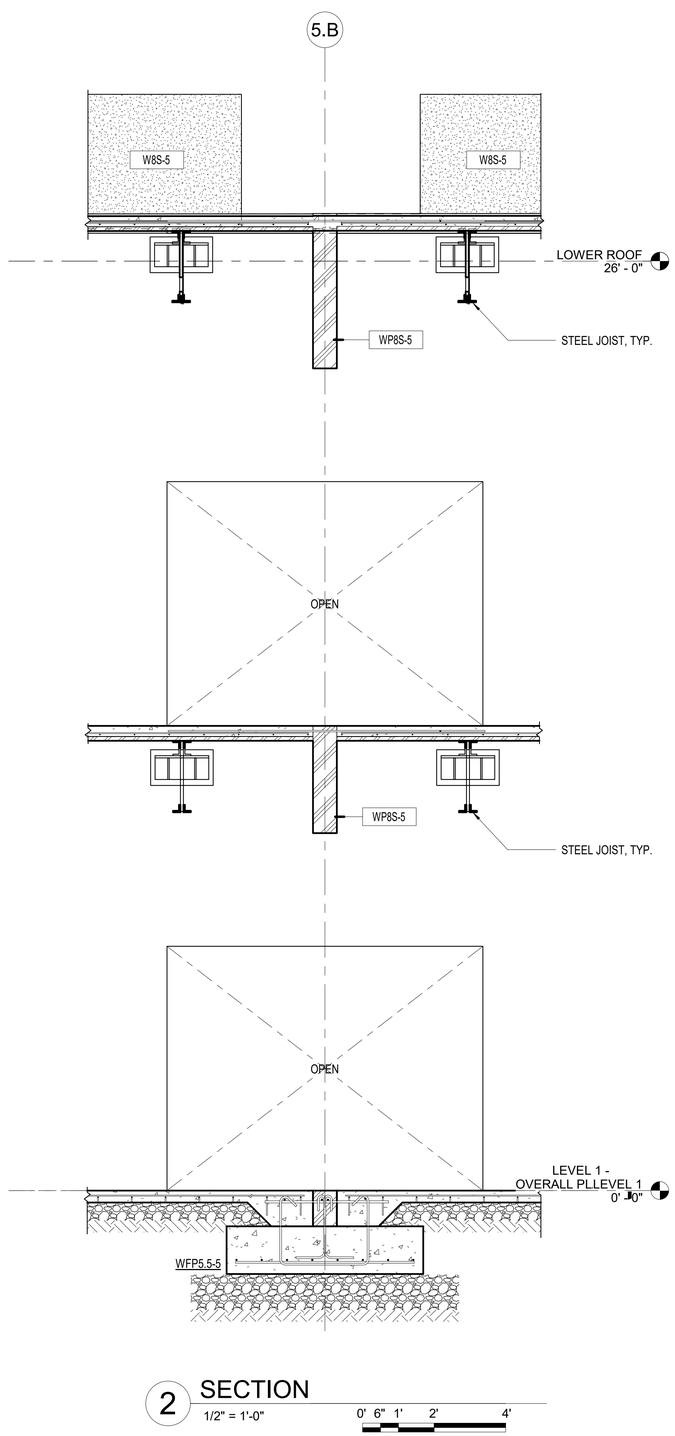
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.2
Sheet No. _____ of _____

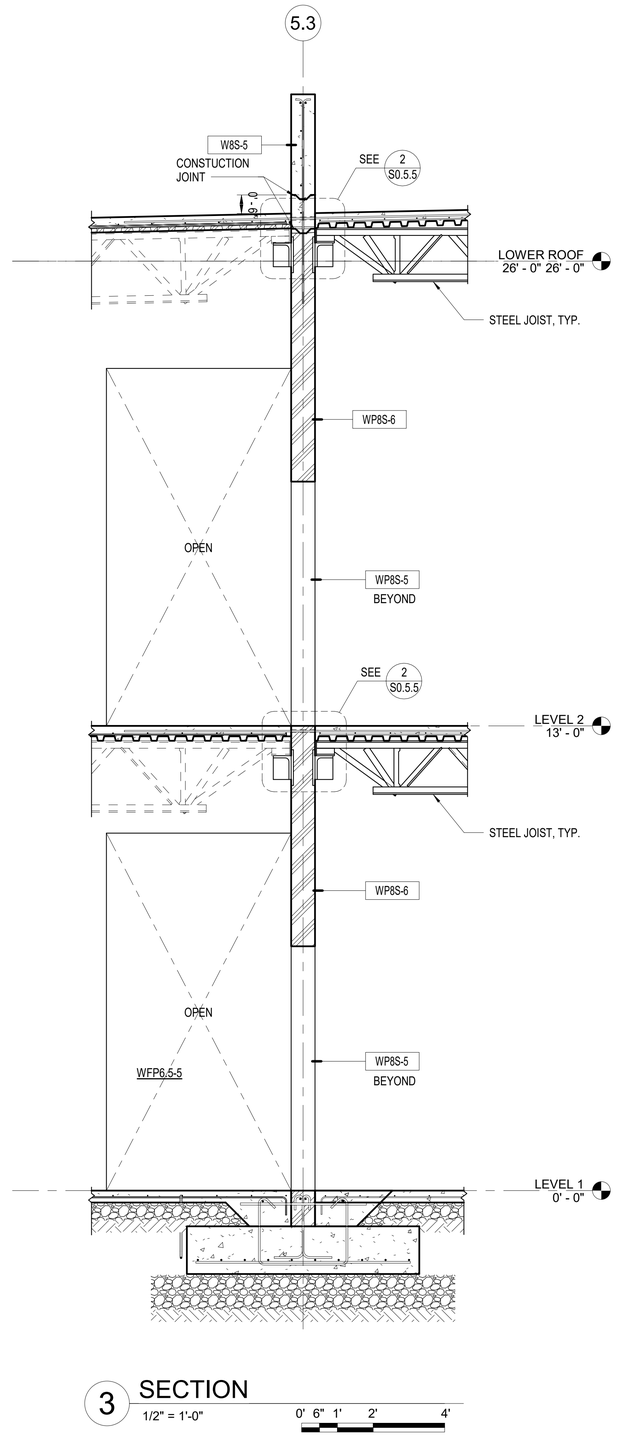
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"



2 SECTION
1/2" = 1'-0"



3 SECTION
1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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Project
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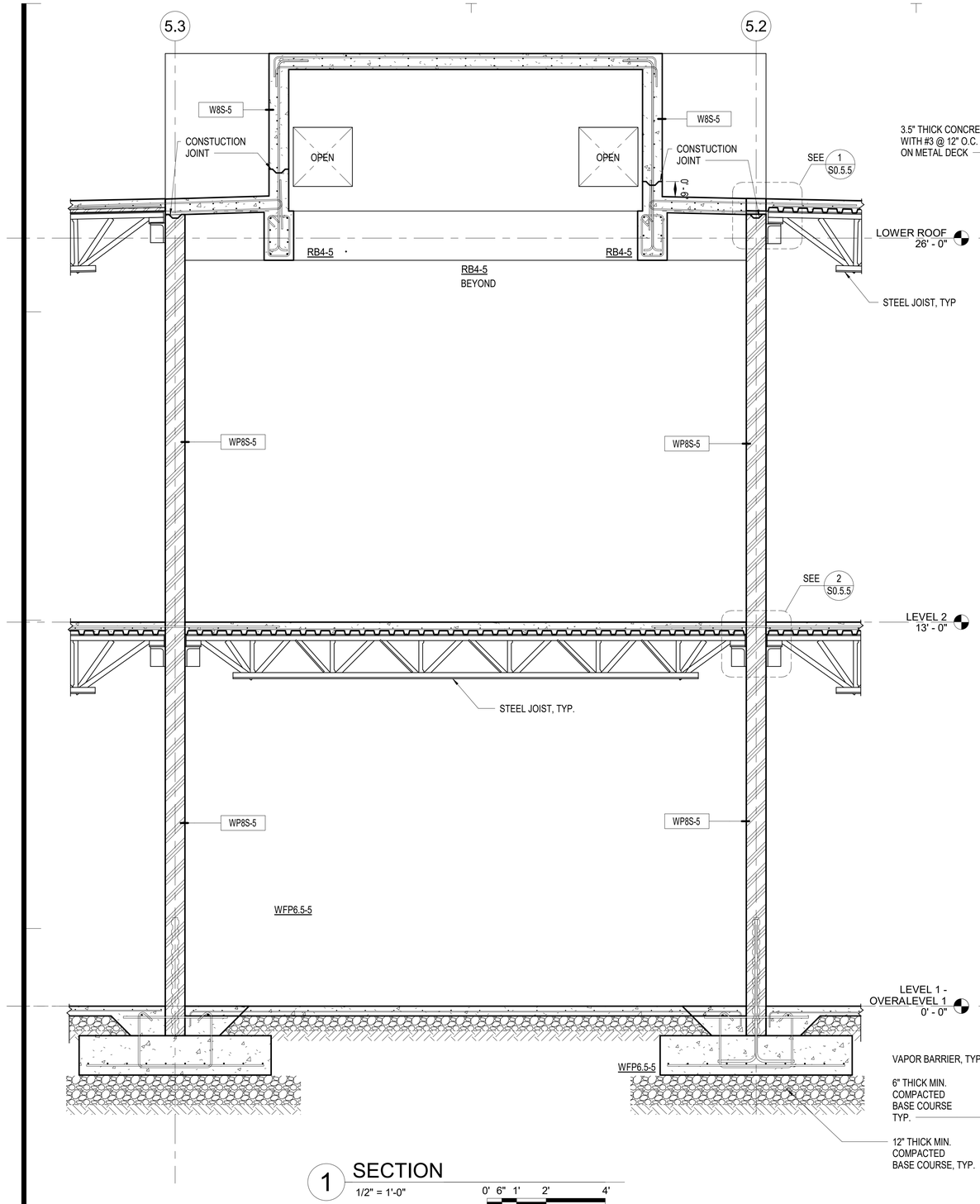
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
SECTIONS
PROGRAMMING DOCUMENT

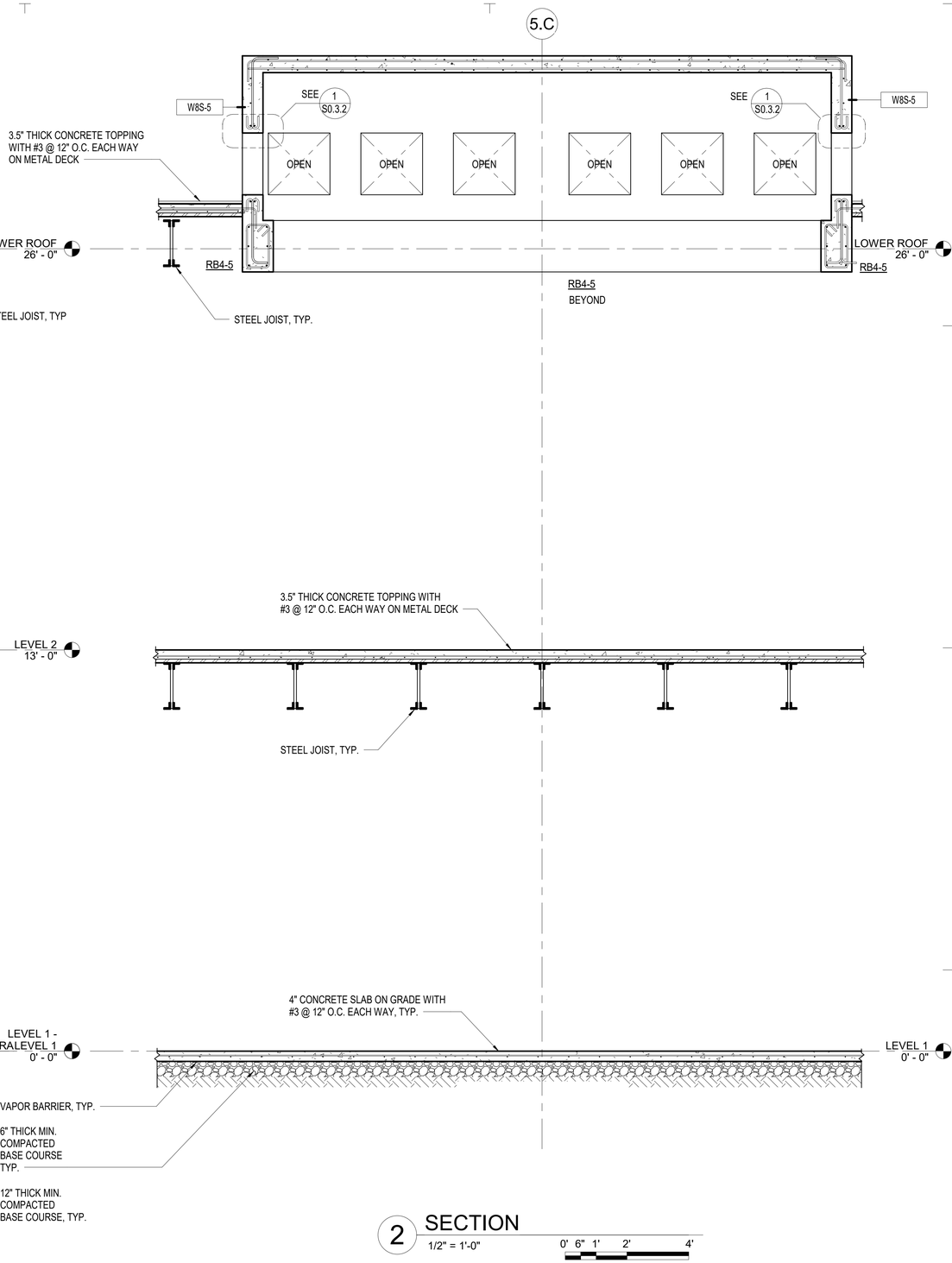
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S5.2.3
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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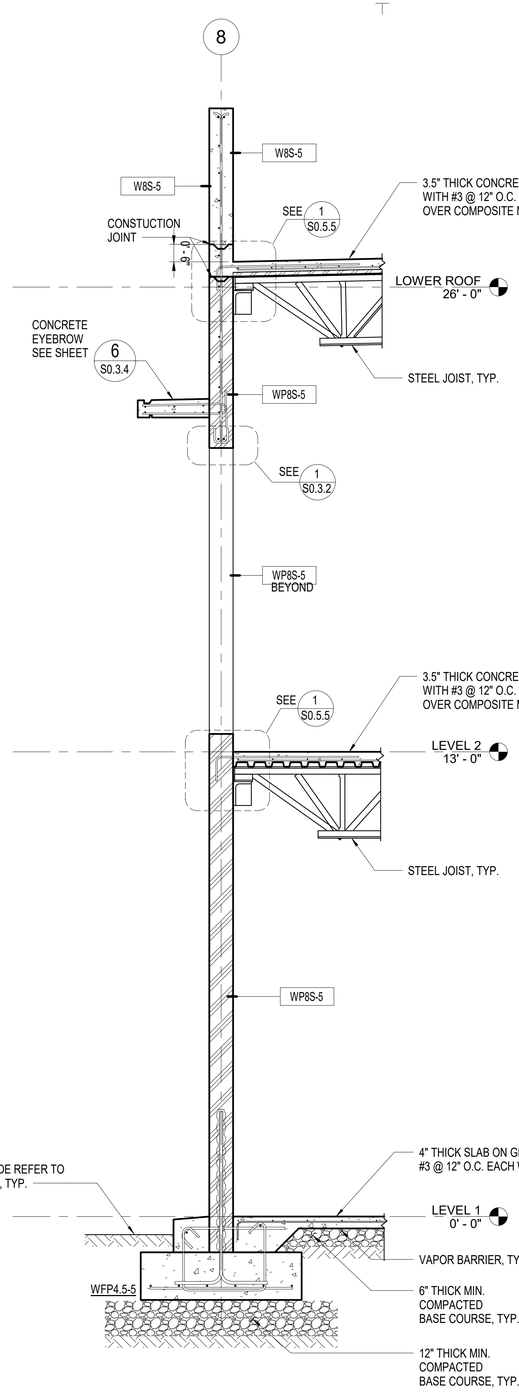
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTIONS
PROGRAMMING DOCUMENT

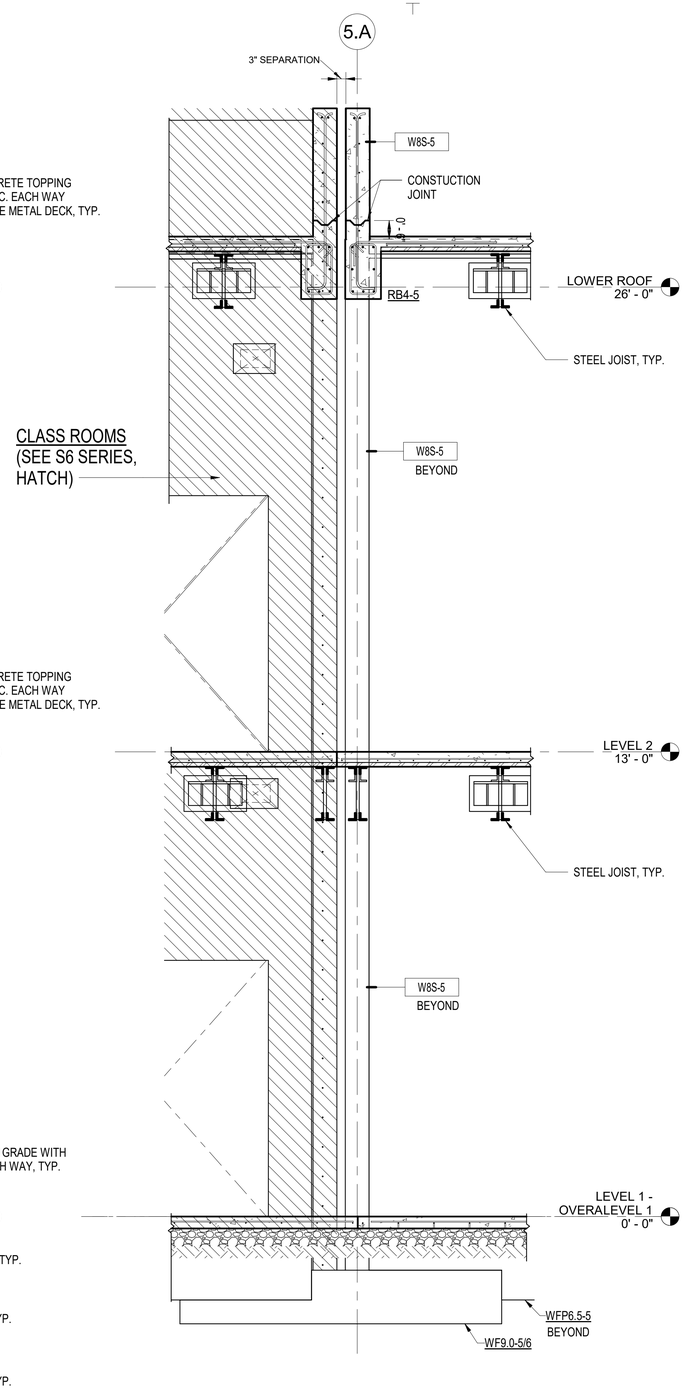
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.4
Sheet No. _____ of _____

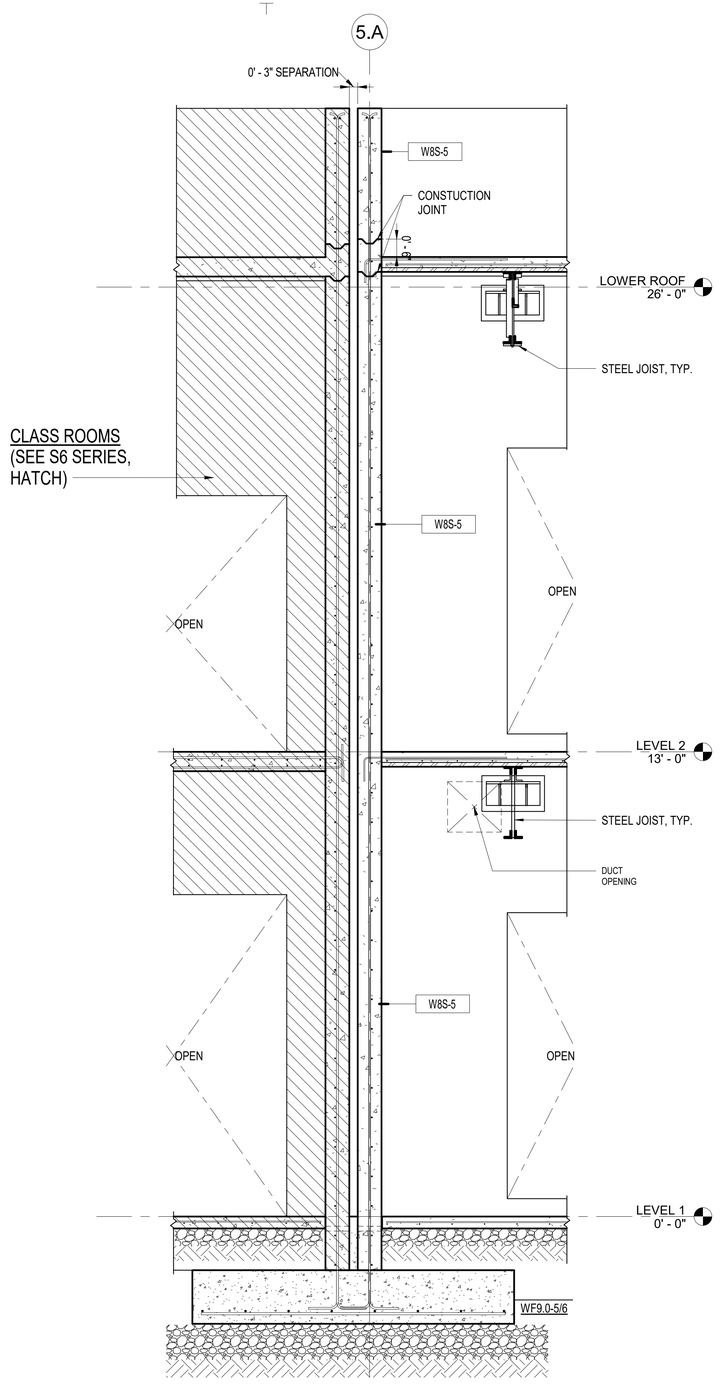
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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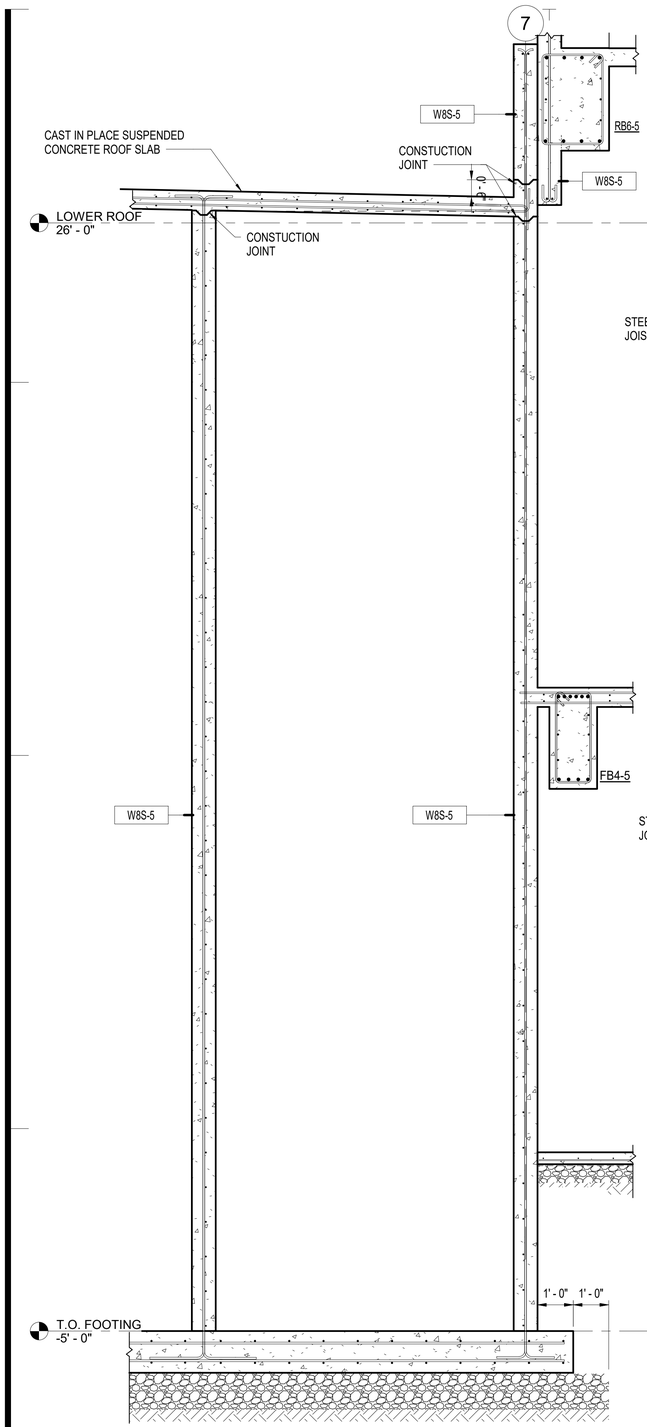
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTIONS
PROGRAMMING DOCUMENT

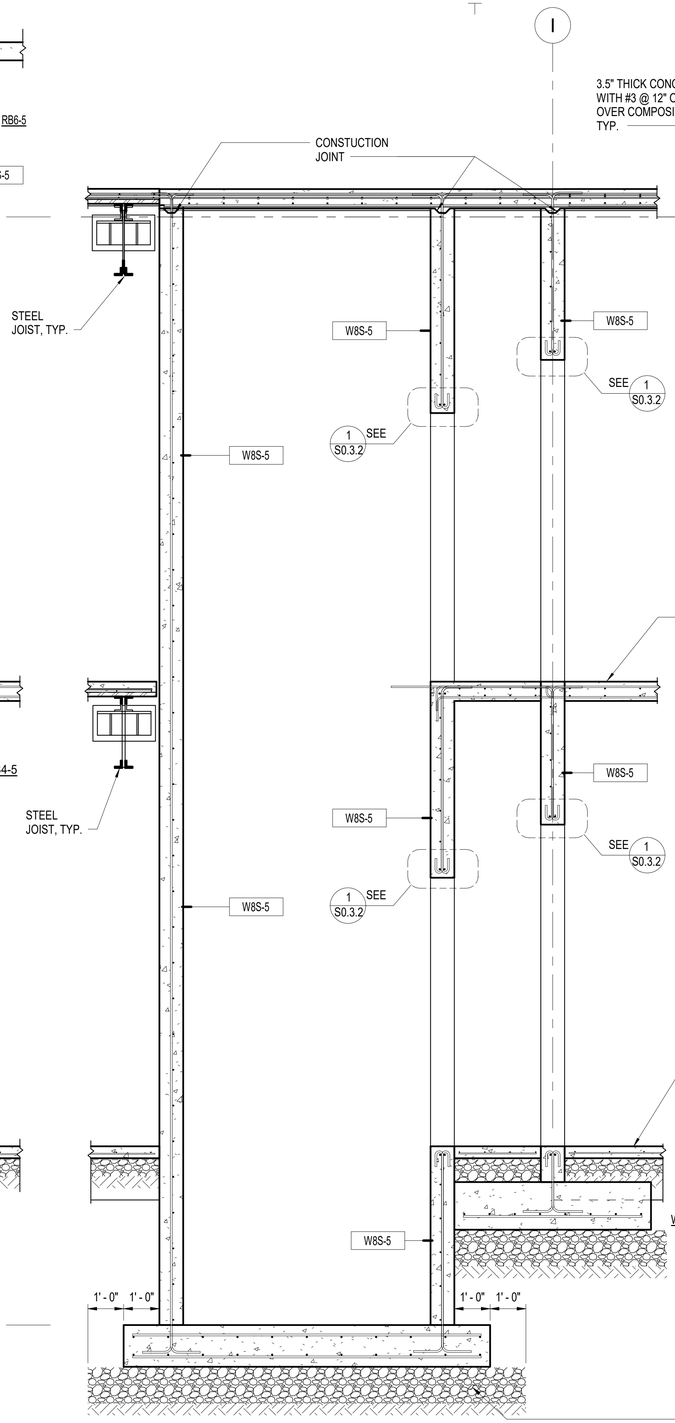
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.5
Sheet No. ____ of ____

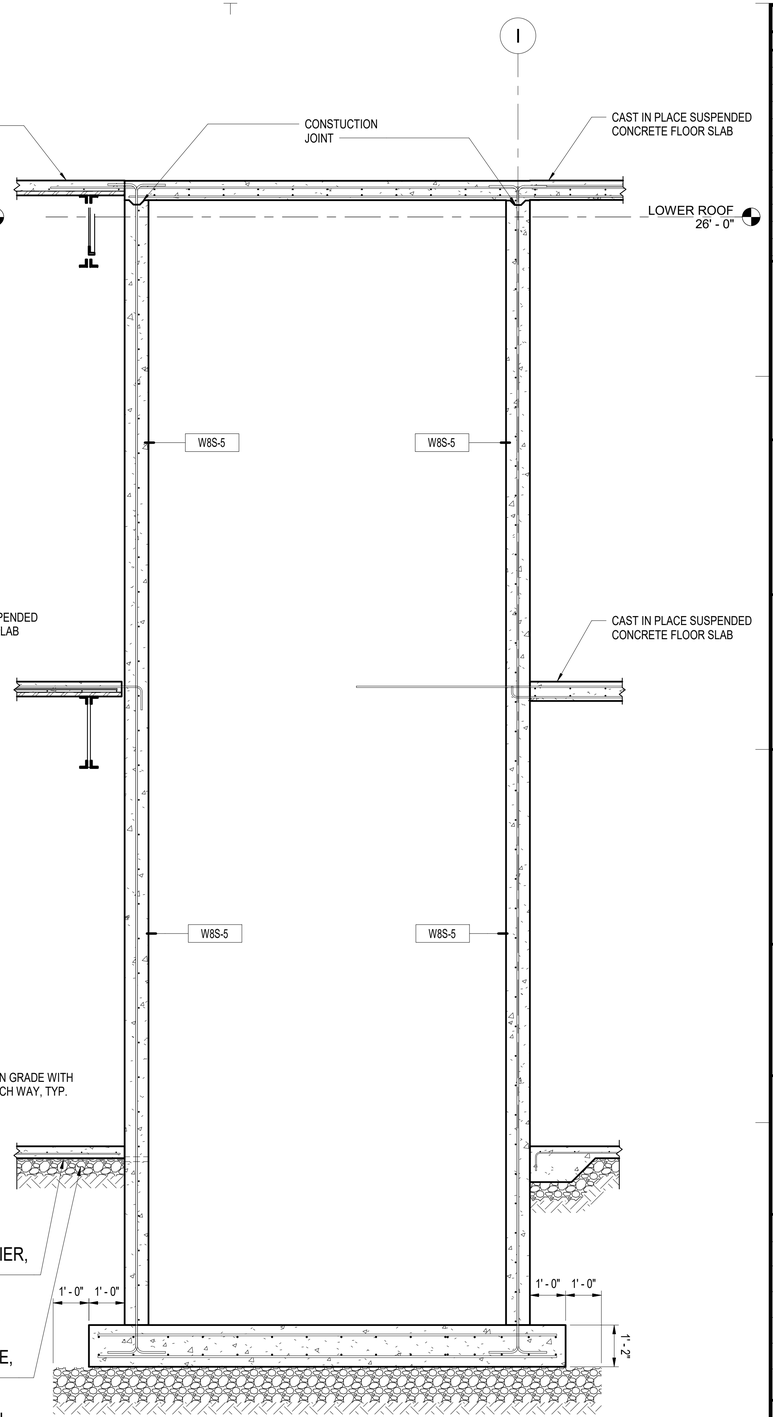
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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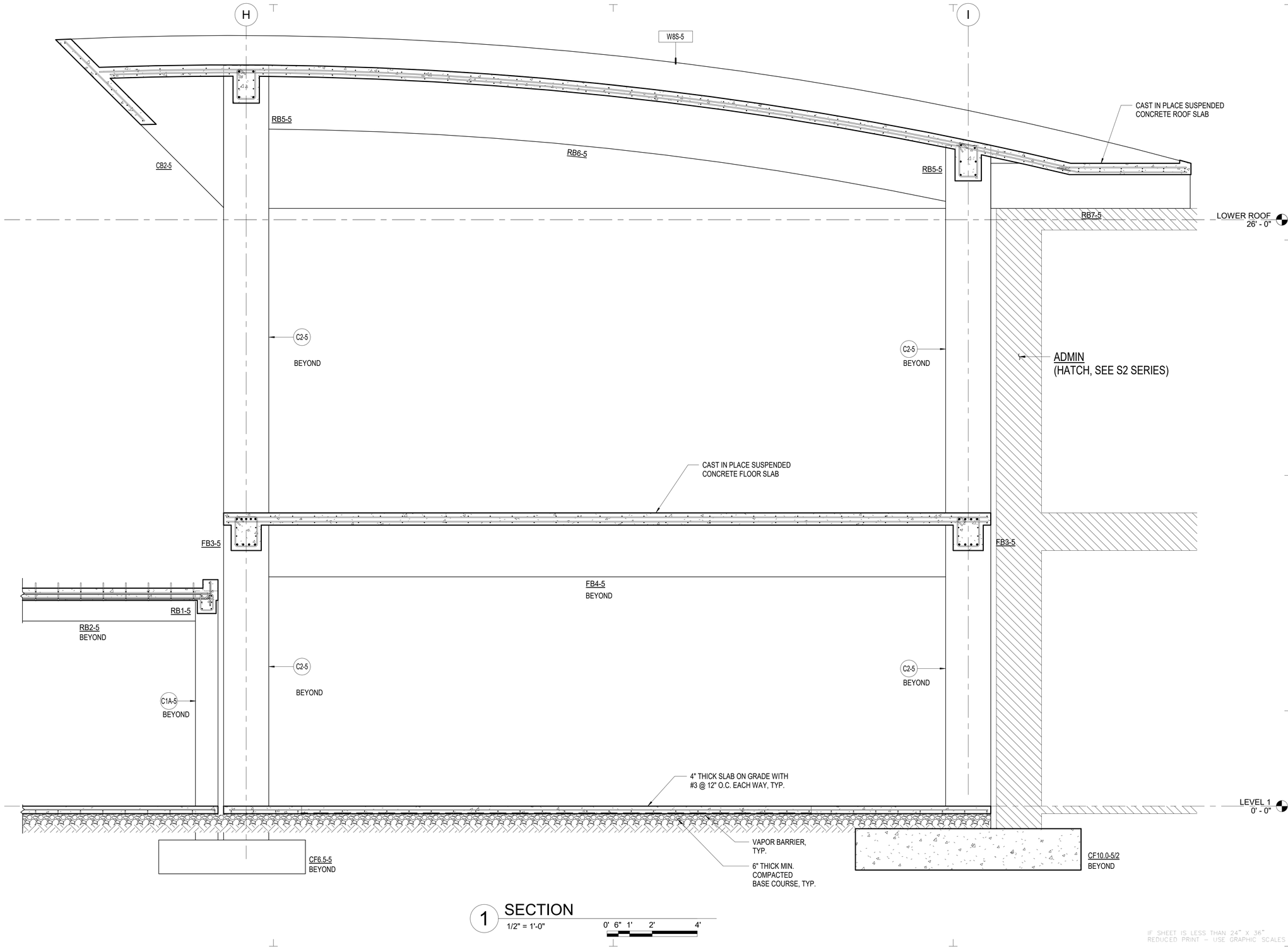
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.6
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT
THIS PLAN WAS PREPARED
BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: ____

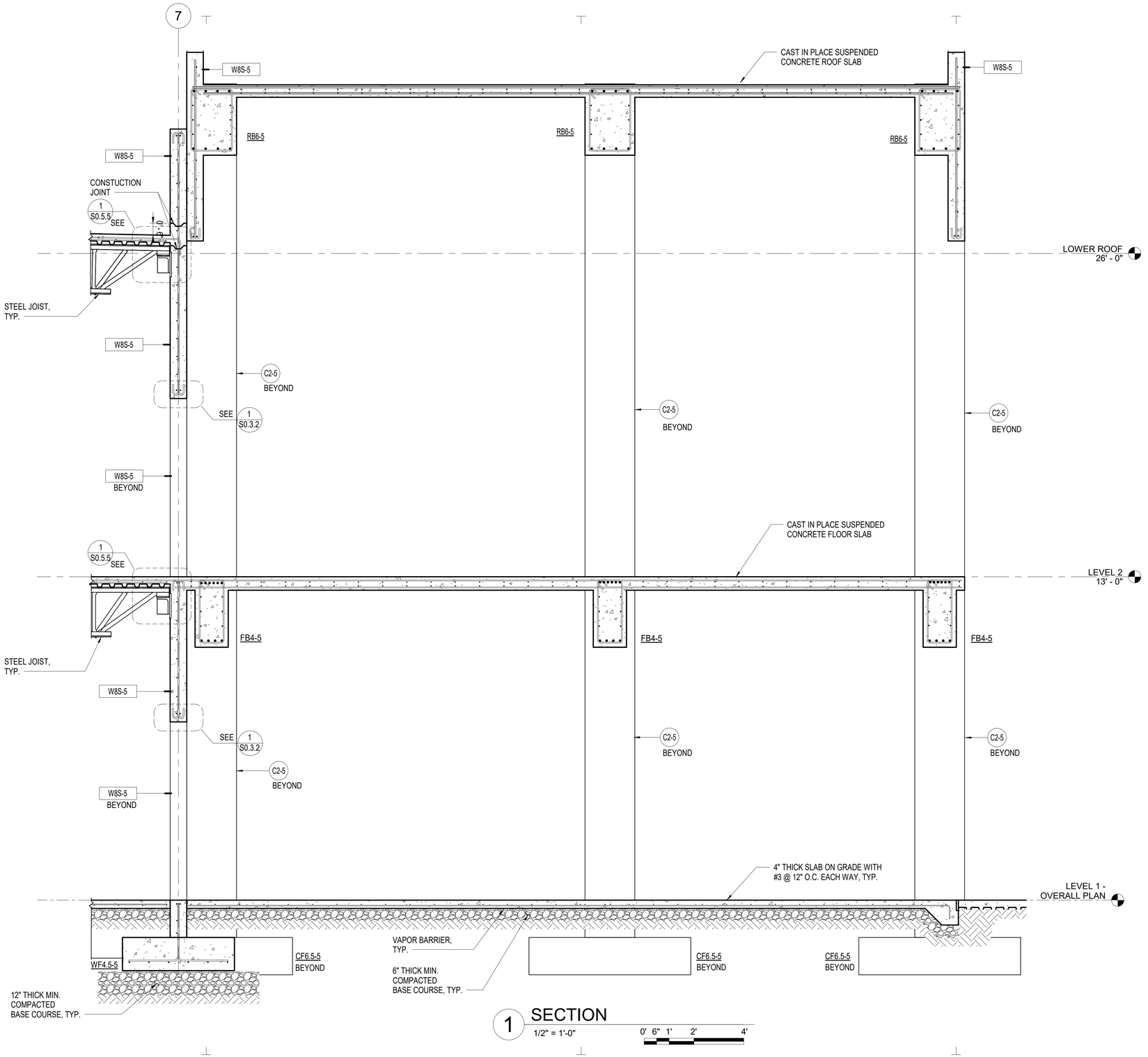
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.7
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

NOT FOR CONSTRUCTION

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
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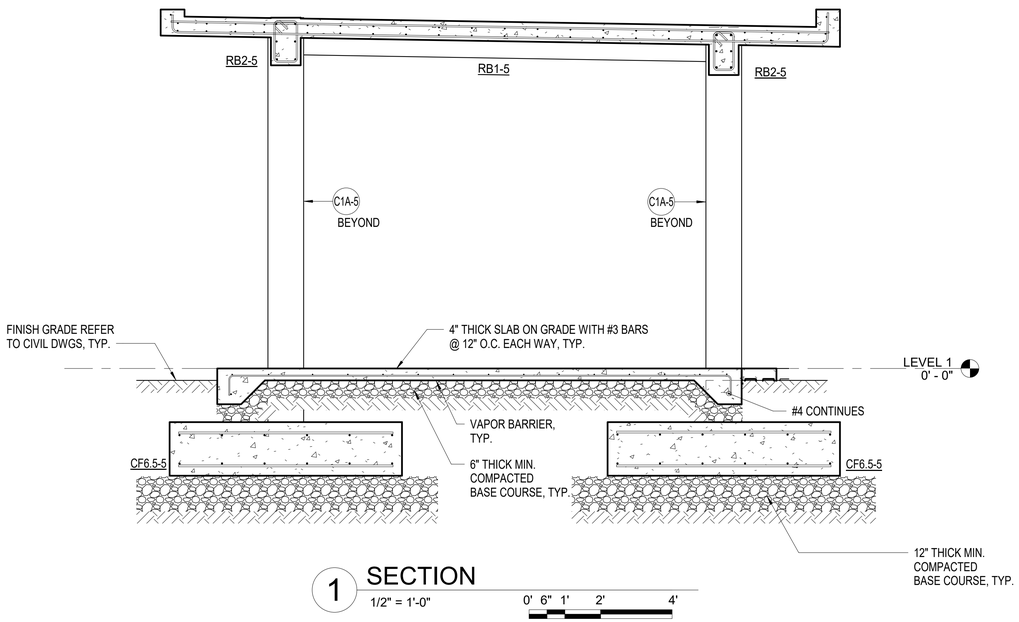
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTION
PROGRAMMING DOCUMENT

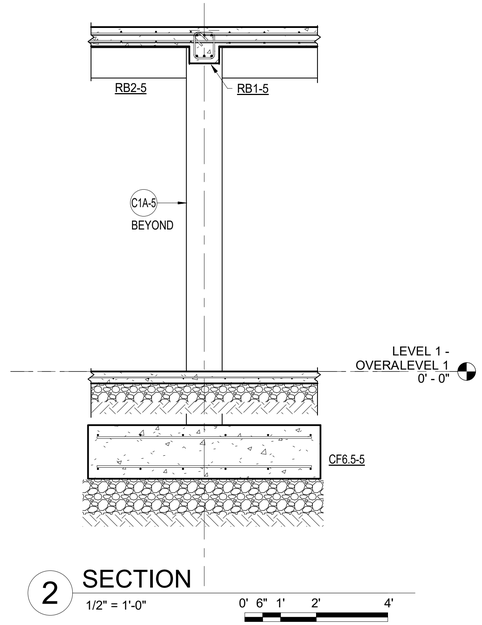
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S5.2.8
Sheet No. _____ of _____



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

5.B



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

REVISION		
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.9
Sheet No. _____ of _____

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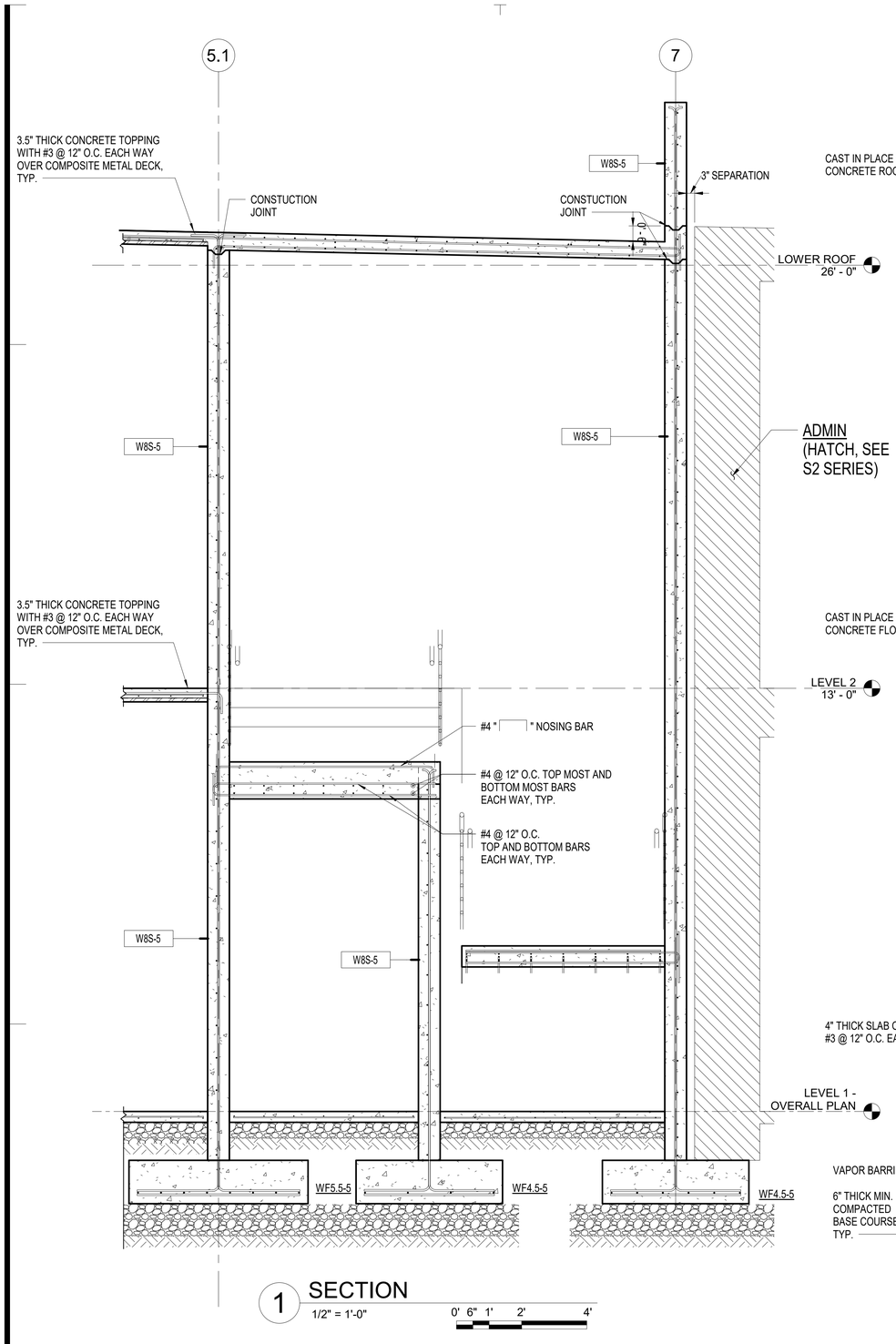
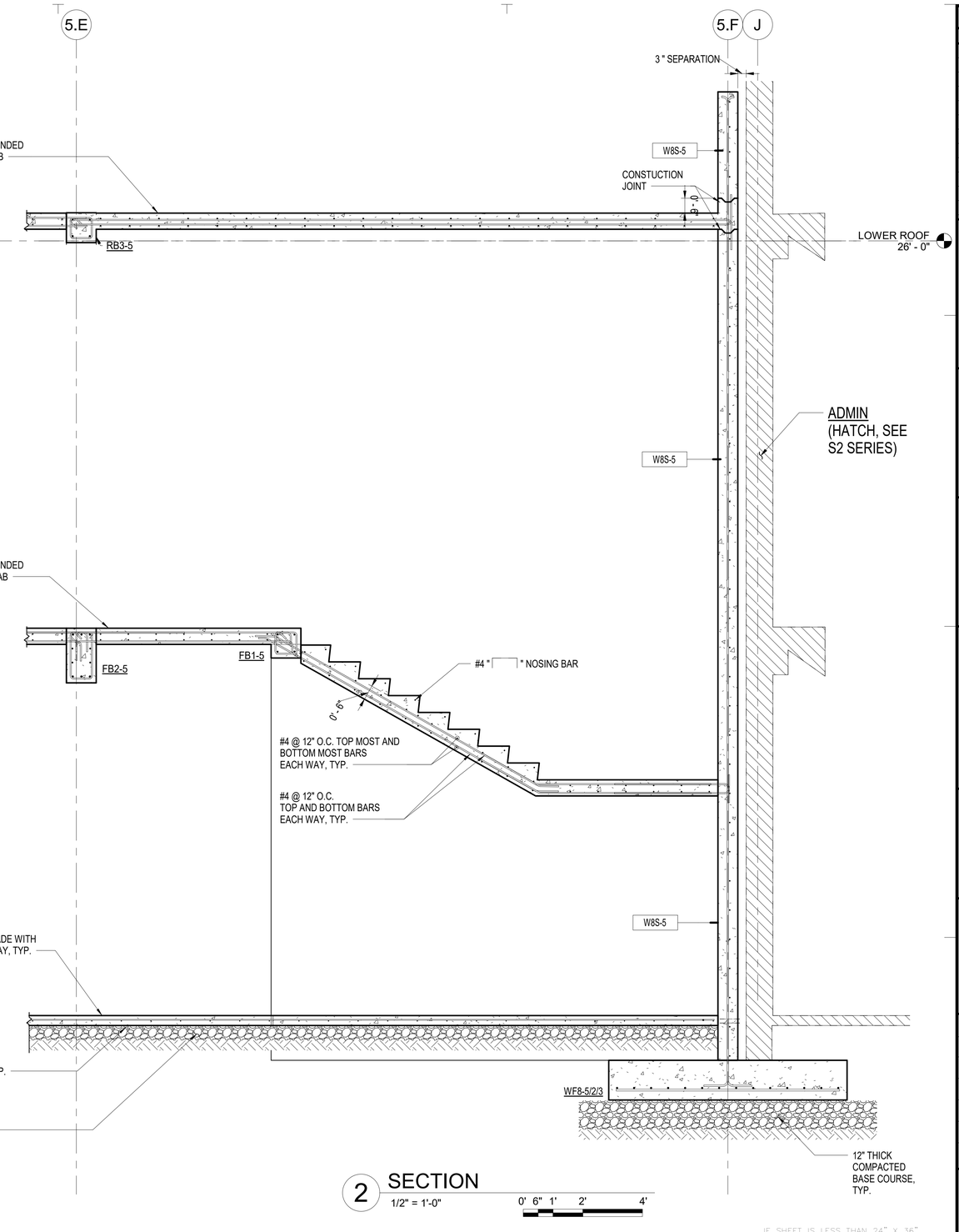


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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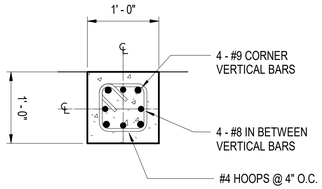
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST) SECTIONS
PROGRAMMING DOCUMENT

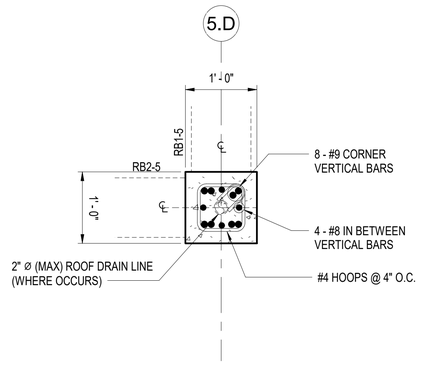
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.2.10
Sheet No. _____ of _____

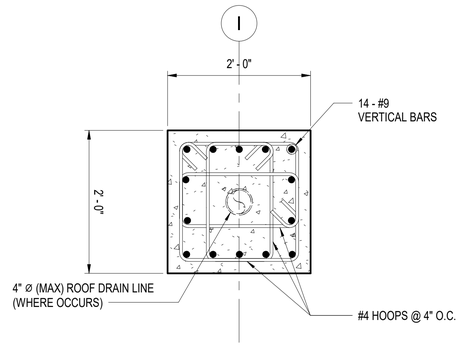
NOT FOR CONSTRUCTION



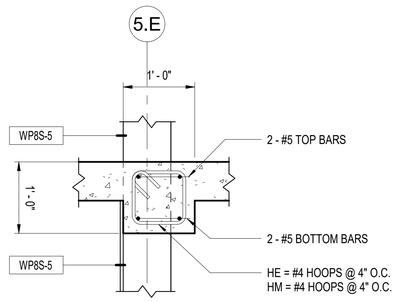
3 TYP. CONC. "C1-5" COLUMN DETAIL
1" = 1'-0"



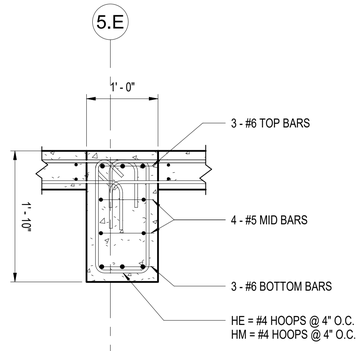
1 TYP. CONC. "C1A-5" COLUMN DETAIL
1" = 1'-0"



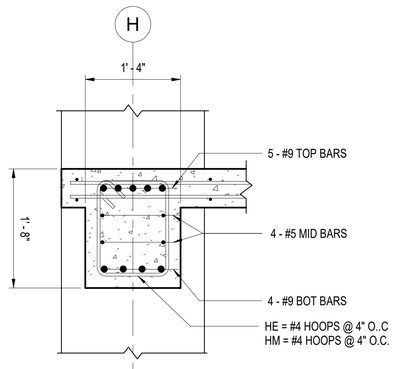
2 TYP. CONC. "C2-5" COLUMN DETAIL
1" = 1'-0"



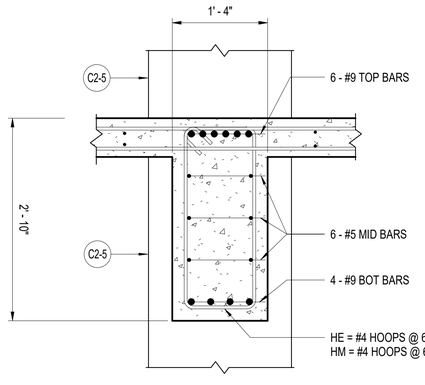
4 TYP. CONC. BEAM "FB1-5" DETAIL
1" = 1'-0"



5 TYP. CONC. BEAM "FB2-5" DETAIL
1" = 1'-0"



6 TYP. CONC. BEAM "FB3-5" DETAIL
1" = 1'-0"



7 TYP. CONC. BEAM "FB4-5" DETAIL
1" = 1'-0"

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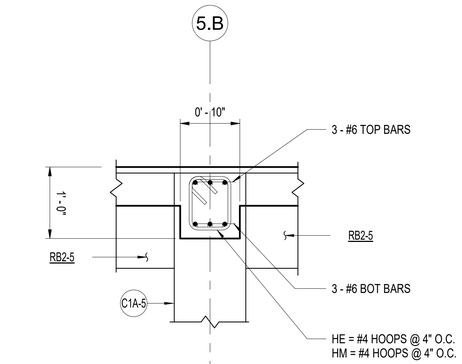
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
MISCELLANEOUS DETAIL
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

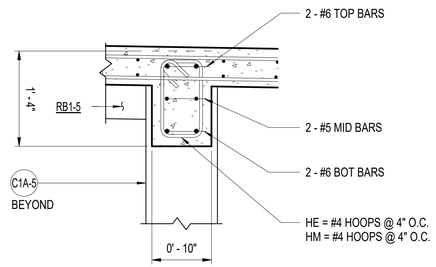
Drawing
S5.3.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



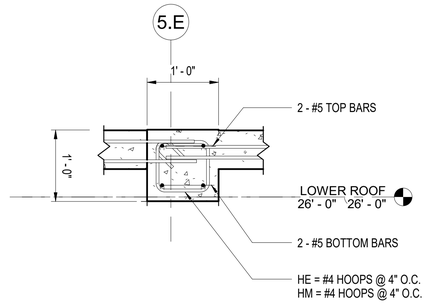
1 TYP. CONC. BEAM "RB1-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



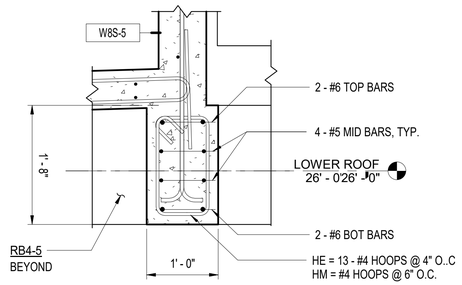
2 TYP. CONC. BEAM "RB2-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



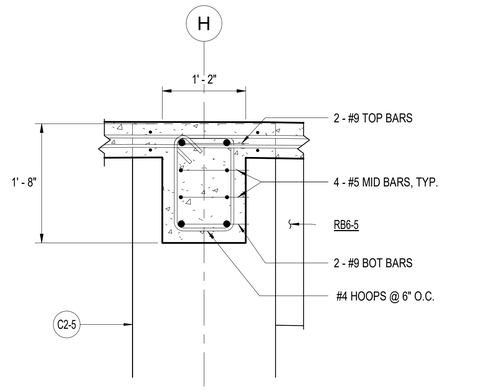
3 TYP. CONC. BEAM "RB3-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



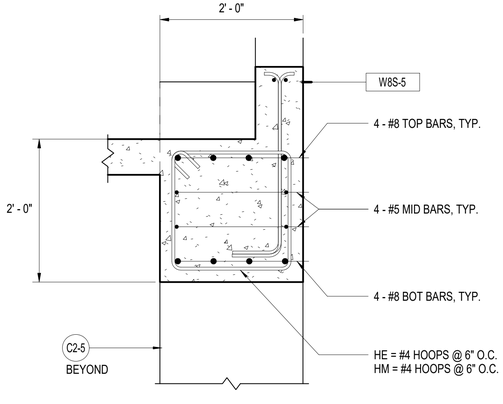
4 TYP. CONC. BEAM "RB4-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



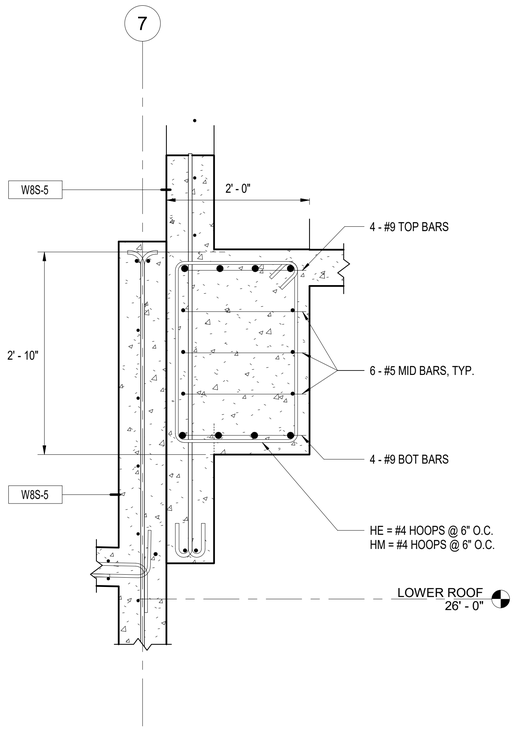
5 TYP. CONC. BEAM "RB5-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



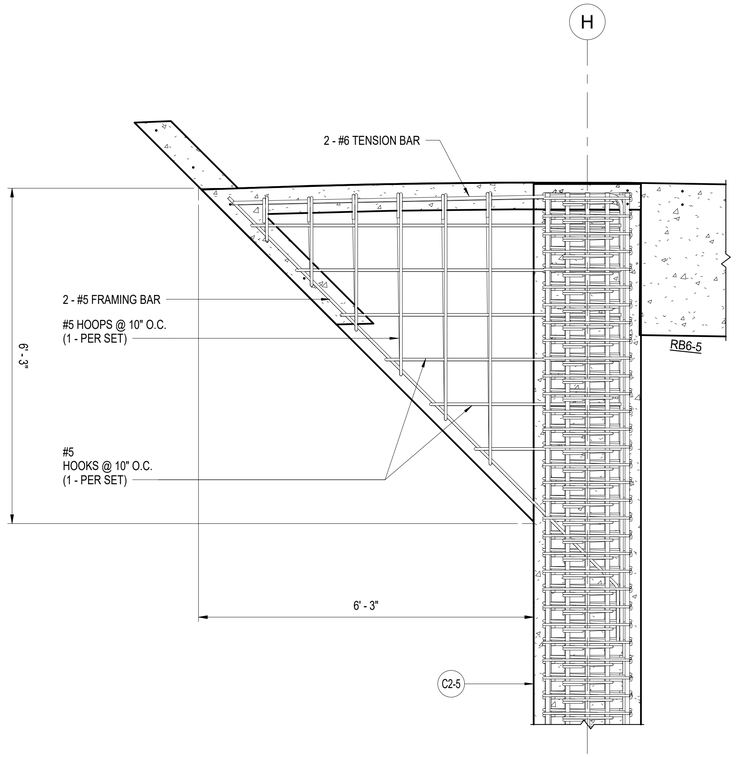
6 TYP. CONC. BEAM "RB7-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



7 TYP. CONC. BEAM "RB6-5" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



8 TYP. "CB2-5" CONC. CORBEL/BEAM DETAIL

3/4" = 1'-0" 0' 6" 1' 2' 4'

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REVISION

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
MISCELLANEOUS DETAIL
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S5.3.2
Sheet No. _____ of _____

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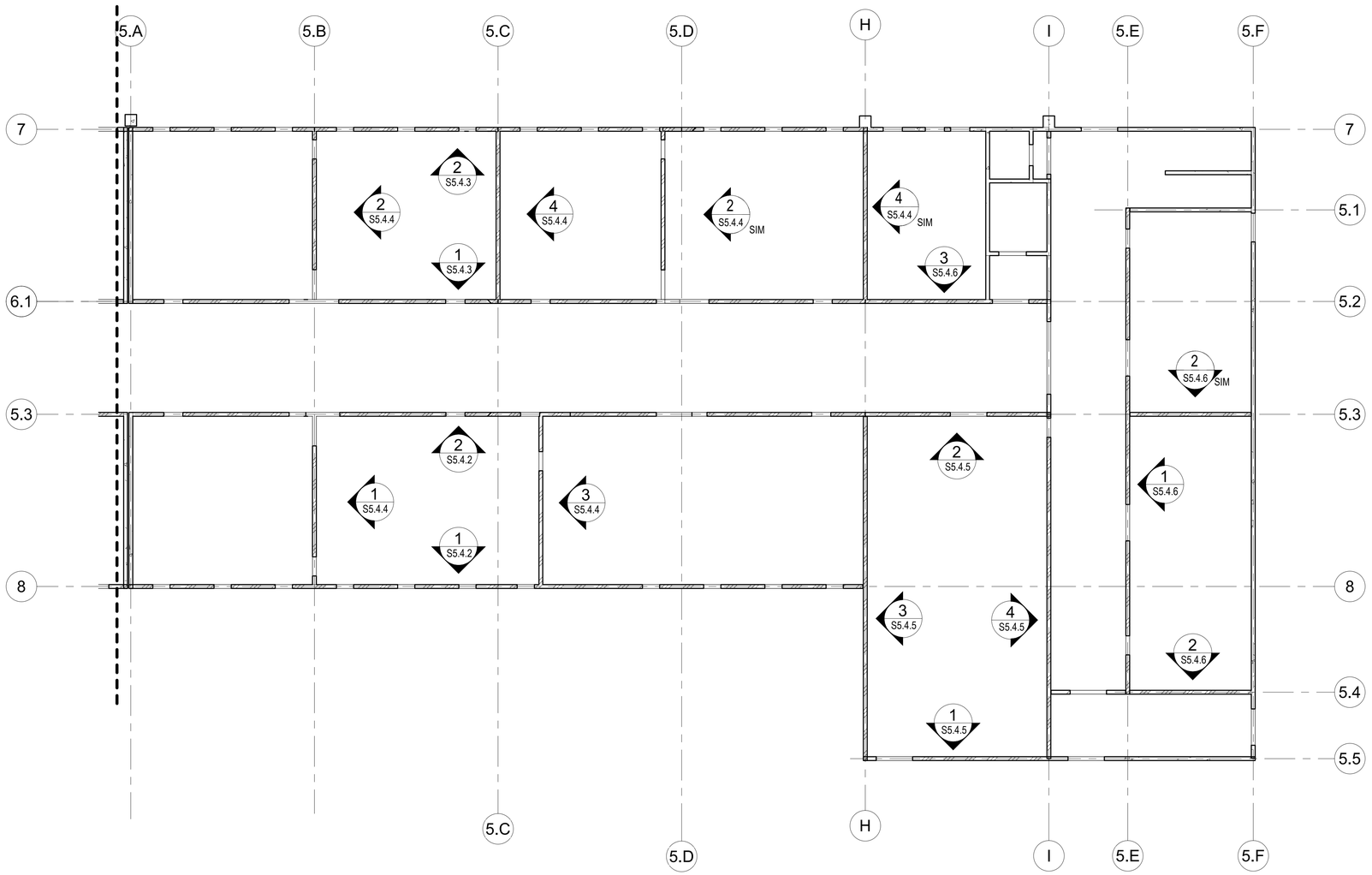

1 A- WING PRECAST WALL PANEL KEY PLAN (EAST)

REVISION

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Title
CLASSROOMS:
A - WING (EAST)
PRECAST PANEL KEY PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	3/32" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.4.1
Sheet No. _____ of _____

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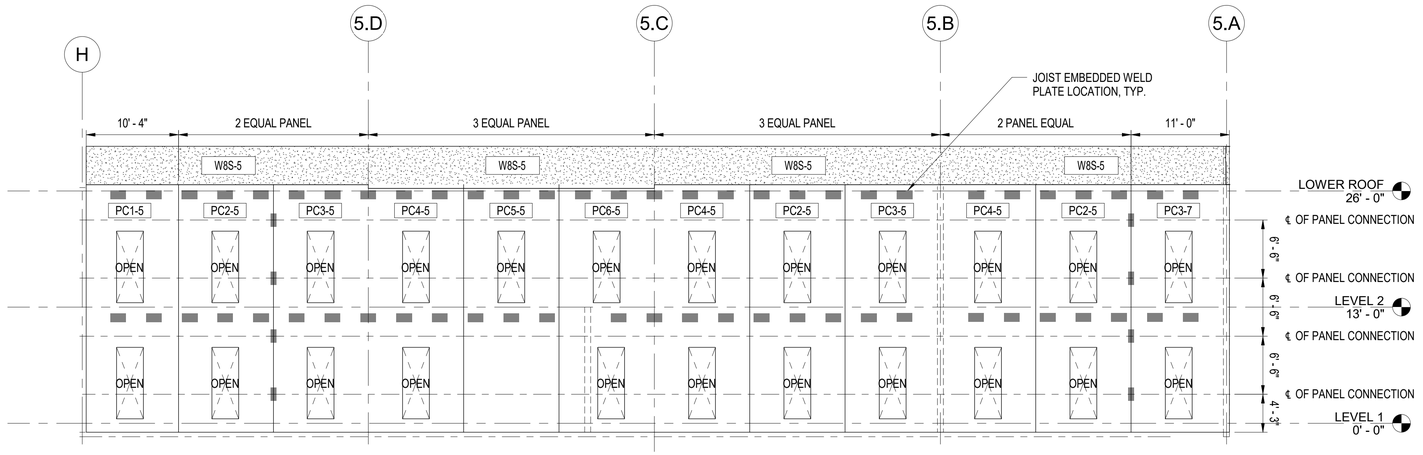
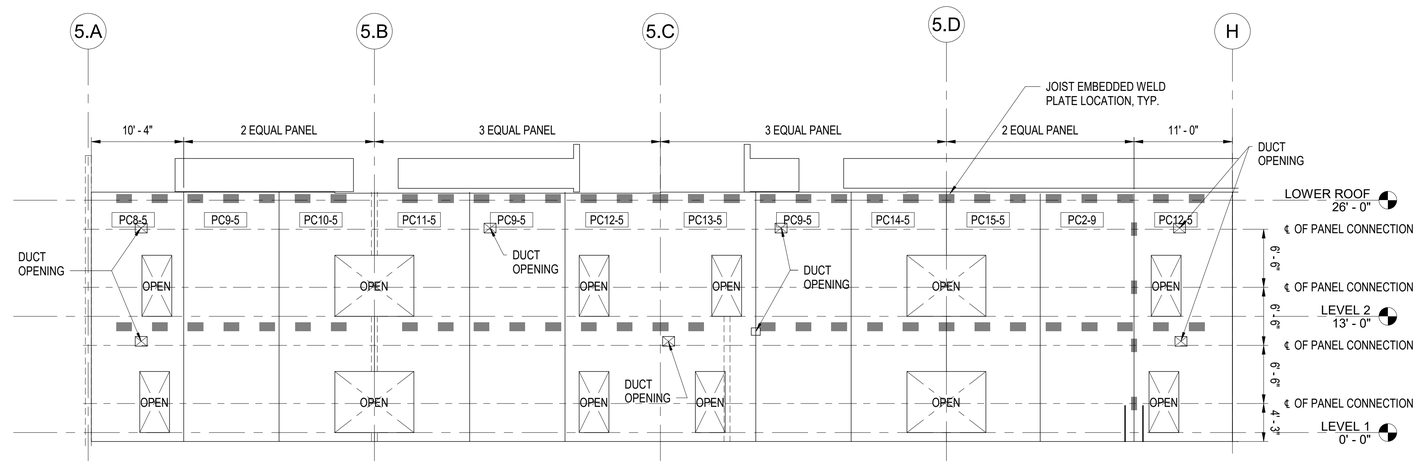


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 8

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.3

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Project
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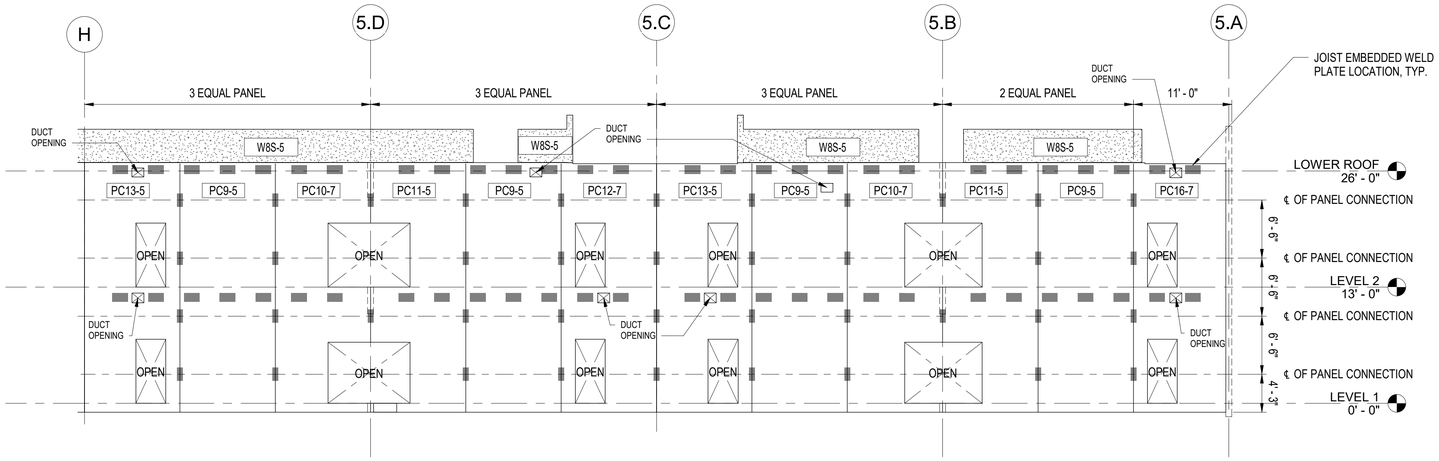
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.4.2
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

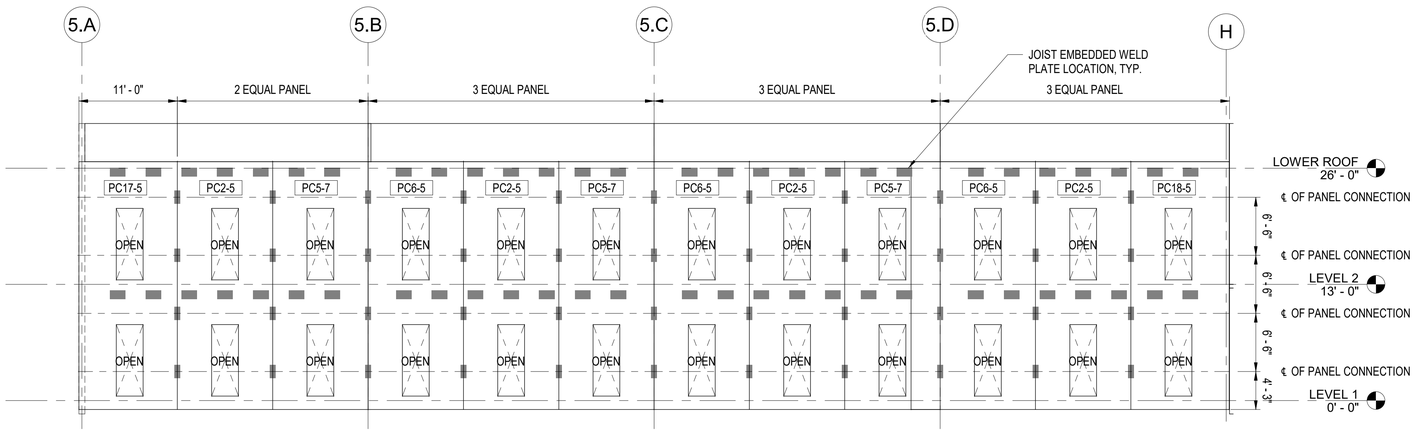


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.2

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 7

1/8" = 1'-0" 0' 2' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.4.3
Sheet No. ____ of ____

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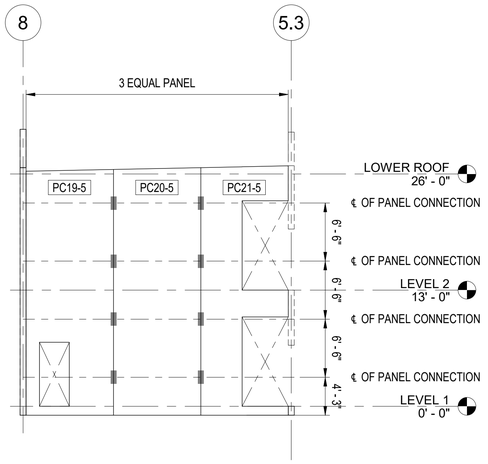
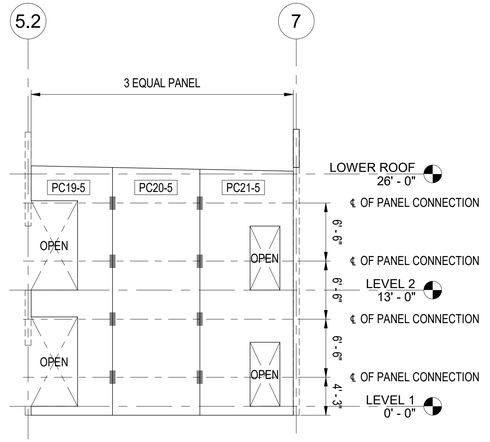


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.B

1/8" = 1'-0" 0' 2' 4' 8' 16'

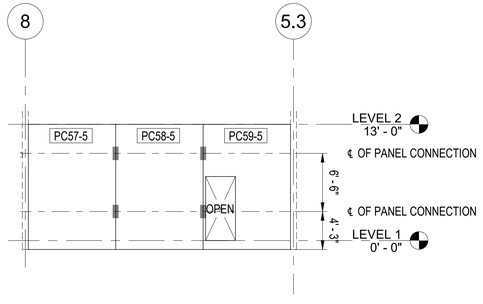


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.B & 5.D

1/8" = 1'-0" 0' 2' 4' 8' 16'

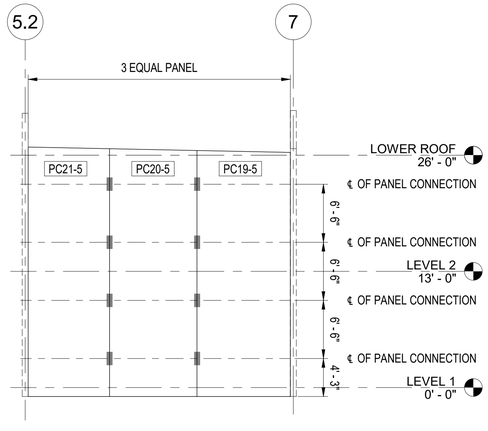
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.C

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 5C & H

1/8" = 1'-0" 0' 2' 4' 8' 16'

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REVISION

No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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P.O. Box 8900 Tamuning, Guam 96931

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.4.4
Sheet No. of

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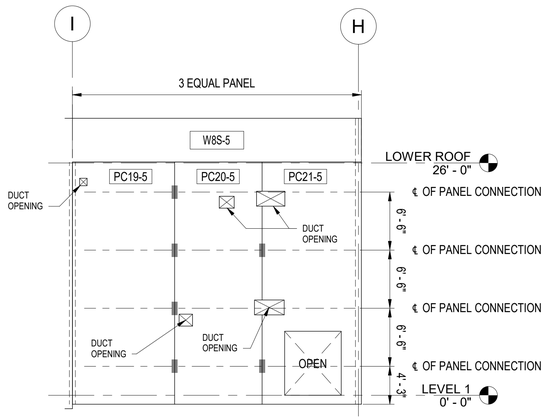
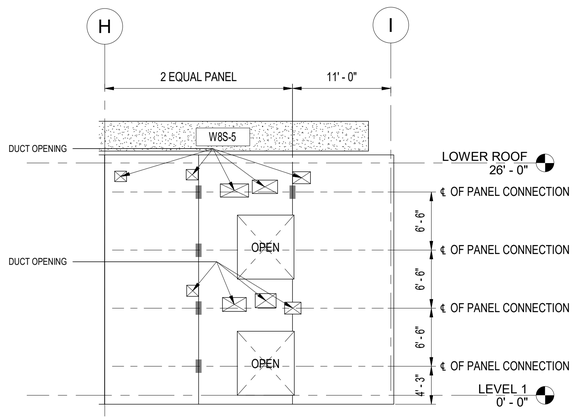


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.5

1/8" = 1'-0" 0' 2' 4' 8' 16'

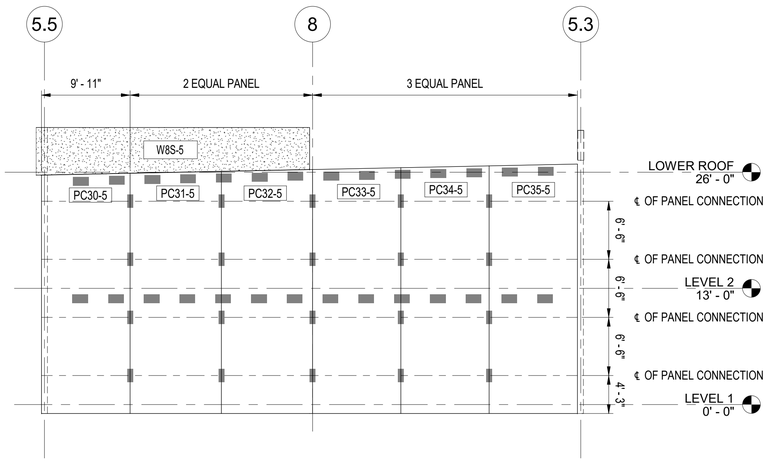


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.3

1/8" = 1'-0" 0' 2' 4' 8' 16'

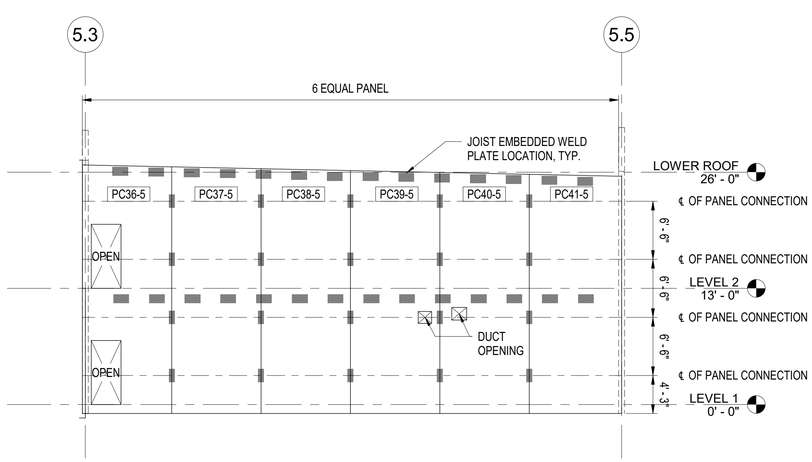
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE H

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE I

1/8" = 1'-0" 0' 2' 4' 8' 16'

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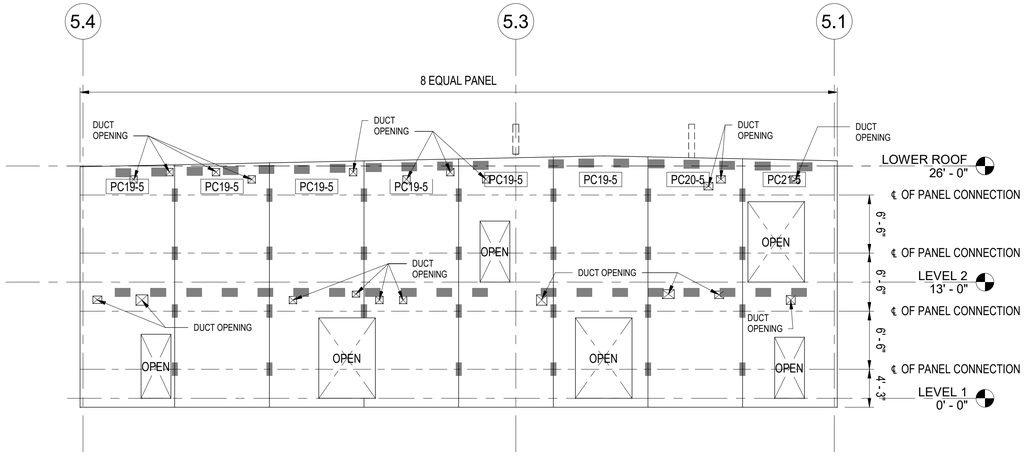
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (EAST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

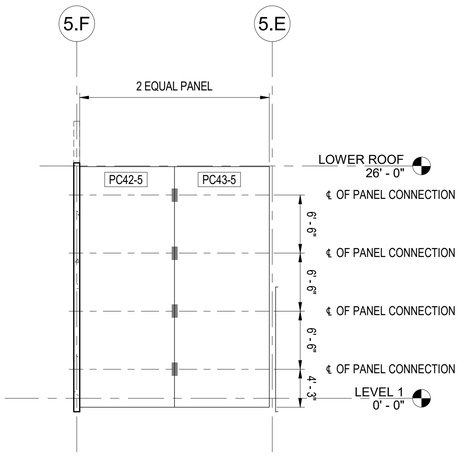
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.4.5
Sheet No. of



1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.G

1/8" = 1'-0" 0' 2' 4' 8' 16'

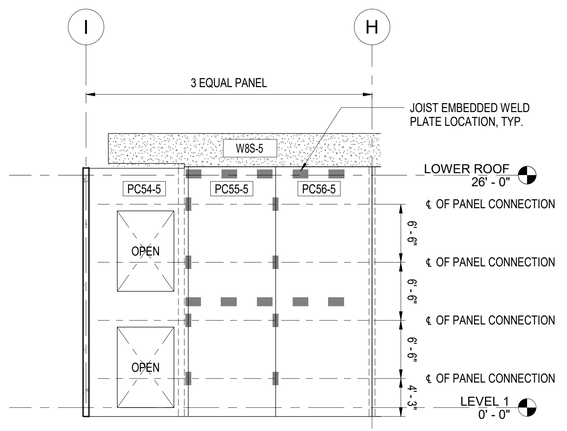


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.4 & 5.3

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 5.2

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S5.4.6
Sheet No. ____ of ____

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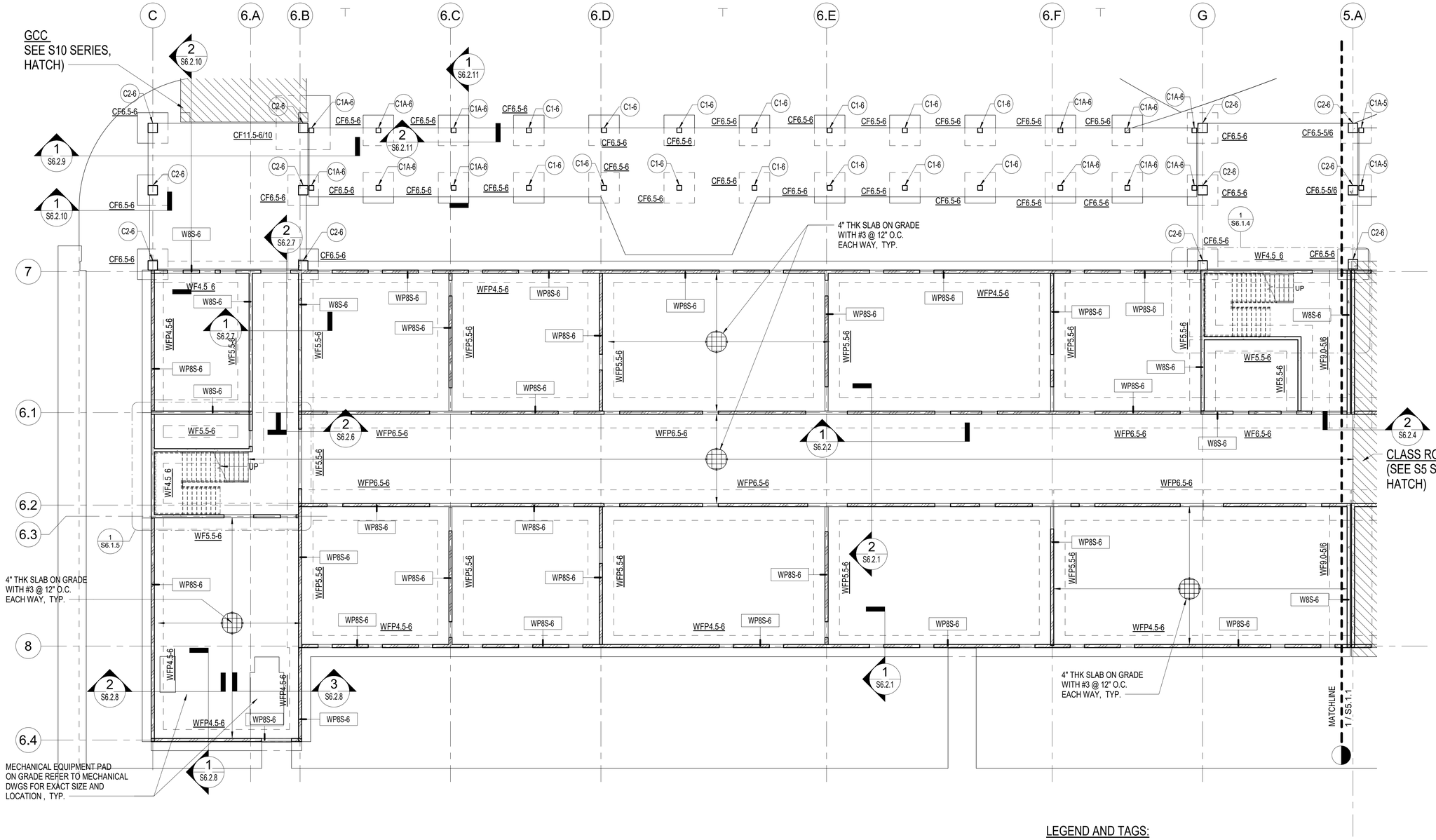

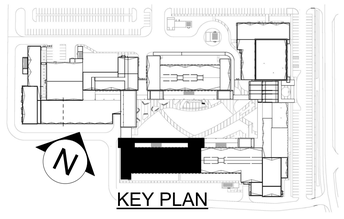

KEY PLAN

LEGEND AND TAGS:

- WFP#-# ----- WALL FOOTING DESIGNATION, SEE SHEET S0.4.1
- WF#-# ----- WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
- CF#-# ----- COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
- C#-# ----- CONCRETE COLUMN DESIGNATION, SEE SHEET S6.3.1
- WP#-# ----- WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# ----- WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1

N

1 FOUNDATION PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

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Project
GDOE
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Title
CLASSROOMS:
A - WING (WEST)
FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S6.1.1
Sheet No. _____ of _____

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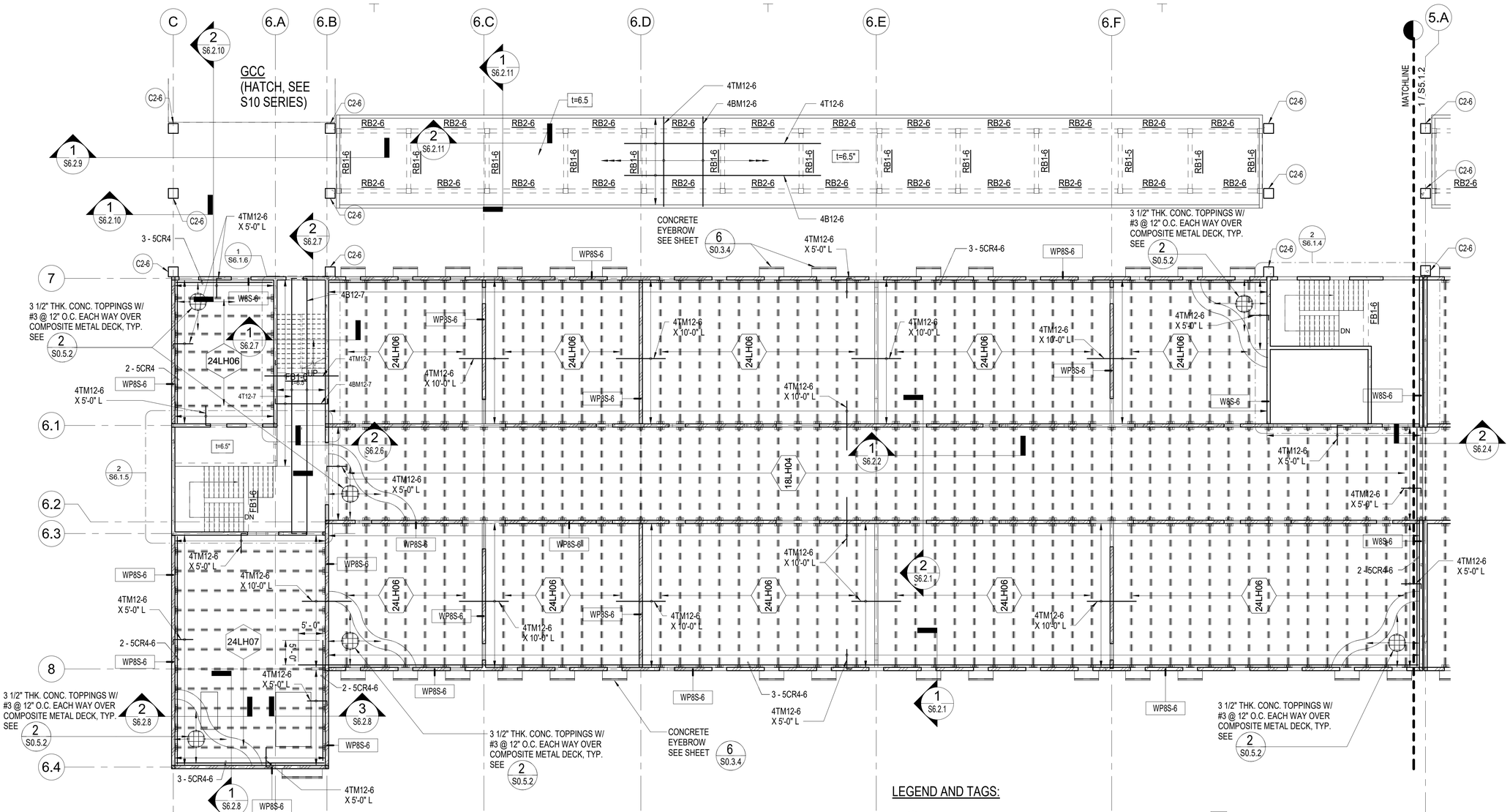

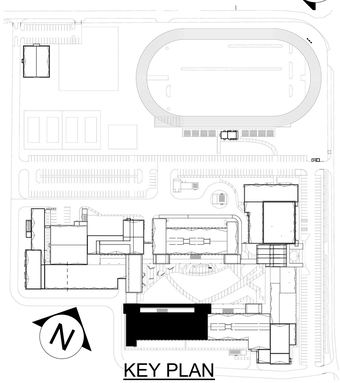

KEY PLAN

LEGEND AND TAGS:

- C#-# — CONCRETE COLUMN DESIGNATION, SEE SHEET S6.3.1
- WP#-# — WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# — WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- FB#-# — STEEL BEAM DESIGNATION, SEE SHEET S6.3.1
- FB#-# — CONCRETE FLOOR BEAM DESIGNATION SEE SHEET S6.3.1
- RB#-# — CONCRETE ROOF BEAM DESIGNATION SEE SHEET S6.3.1
- 4T#-# — SLAB REINFORCEMENT SEE SHEET S0.1.3
- 4CR#-# — CHORD REINFORCEMENT SEE SHEET S0.1.3

- 18LH04 — 18LH04 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH06 — 24LH06 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH07 — 24LH07 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES.



1 SECOND FLOOR FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36"
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
SECOND FLOOR
FRAMING PLAN
PROGRAMMING
DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S6.1.2

Sheet No. ____ of ____

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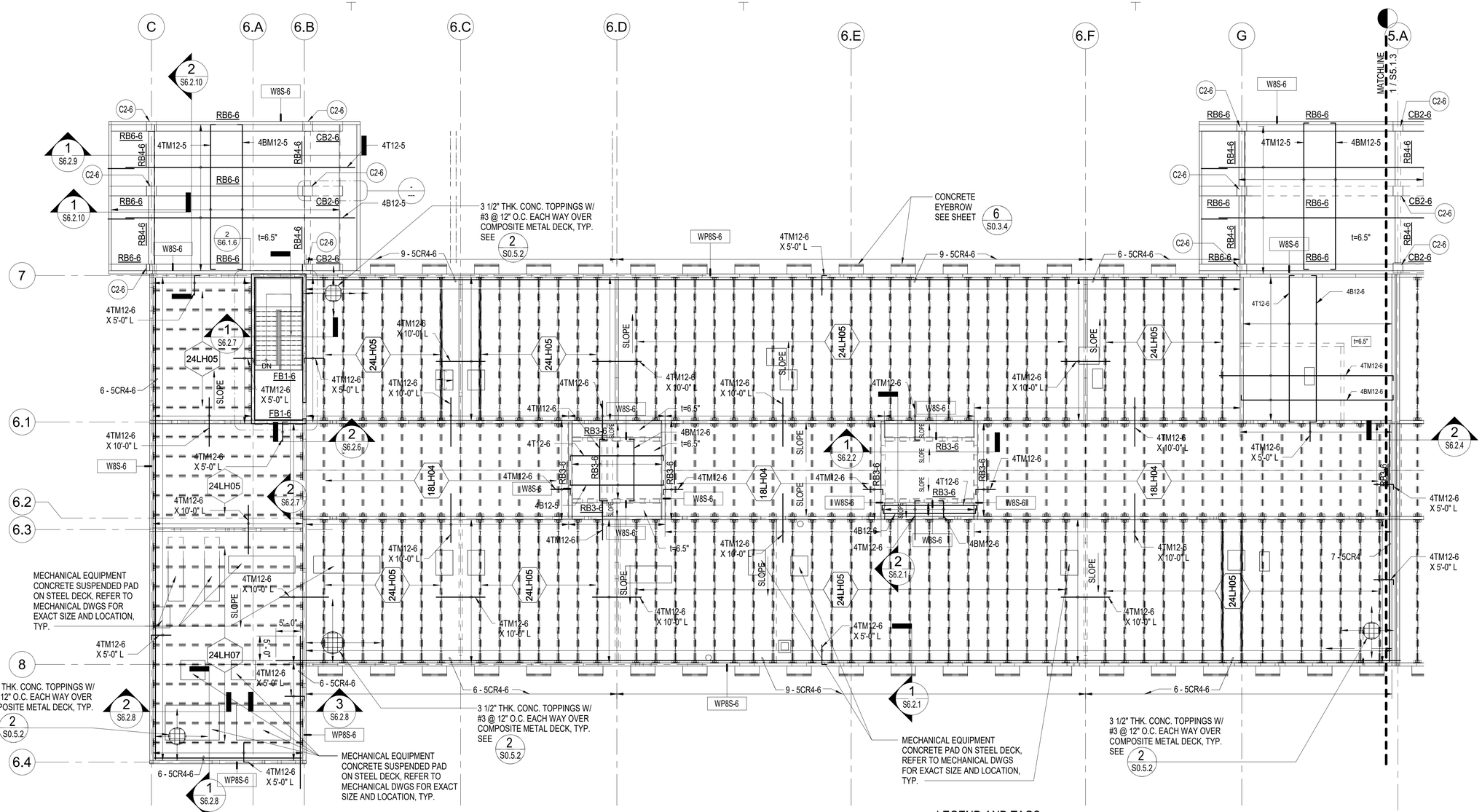

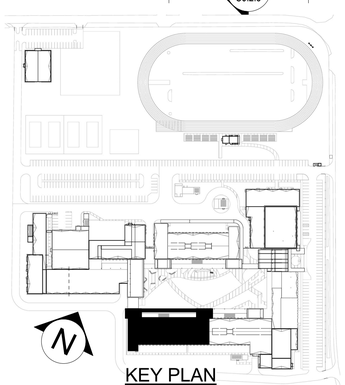

KEY PLAN

LEGEND AND TAGS:

- WP#-# ------ PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W8#-# ------ C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- 18LH04 ------ 18LH04 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH05 ------ 24LH05 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH07 ------ 24LH07 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- RB#-# ------ CONCRETE BEAM DESIGNATION, SEE SHEET S5.3.1, & S6.3.2
- 4T#-# ------ SLAB REINFORCEMENT, SEE SHEET S0.1.4
- 4CR#-# ------ CHORD REINFORCEMENT, SEE SHEET S0.1.4
- CB#-# ------ CONCRETE CORBEL/BEAM DESIGNATION, SEE SHEET S6.3.1

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES.

1 ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S6.1.3
Sheet No. of

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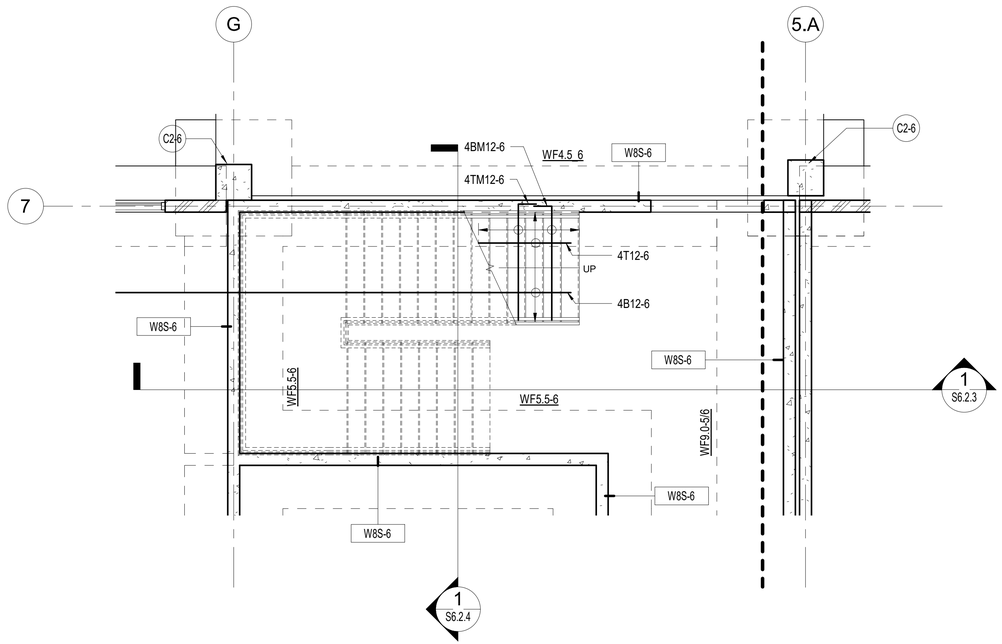
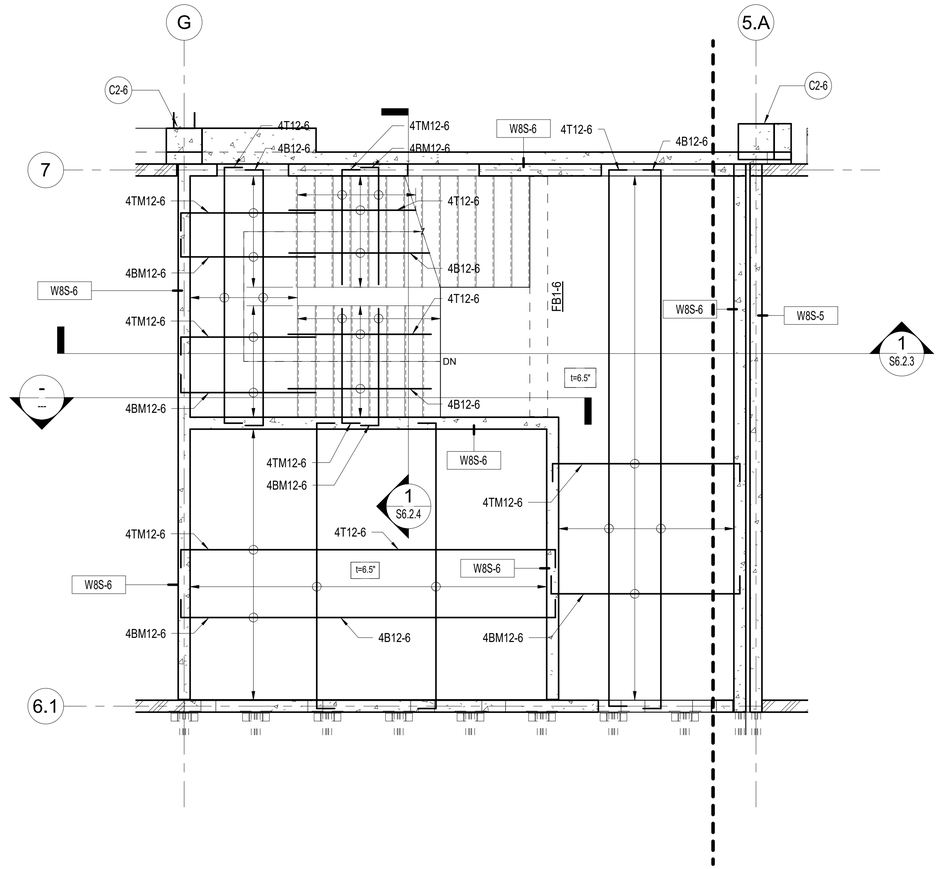


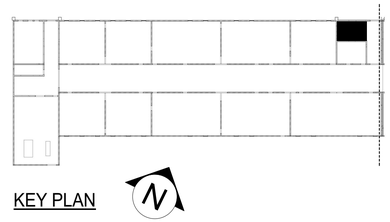
1 STAIR #1 FOUNDATION PLAN

1/4" = 1'-0"



2 STAIR #1FLOOR FRAMING PLAN

1/4" = 1'-0"



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Project

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title

CLASSROOMS:

A - WING (WEST)
STAIR #1 FRAMING PLAN/SECTION
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S6.1.4

Sheet No. _____ of _____

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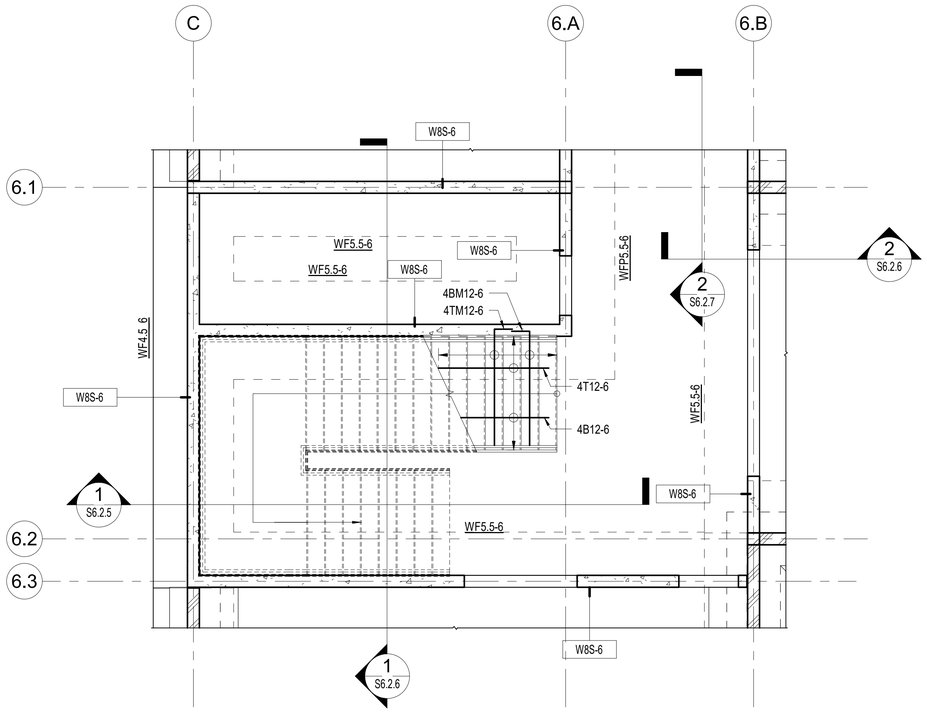
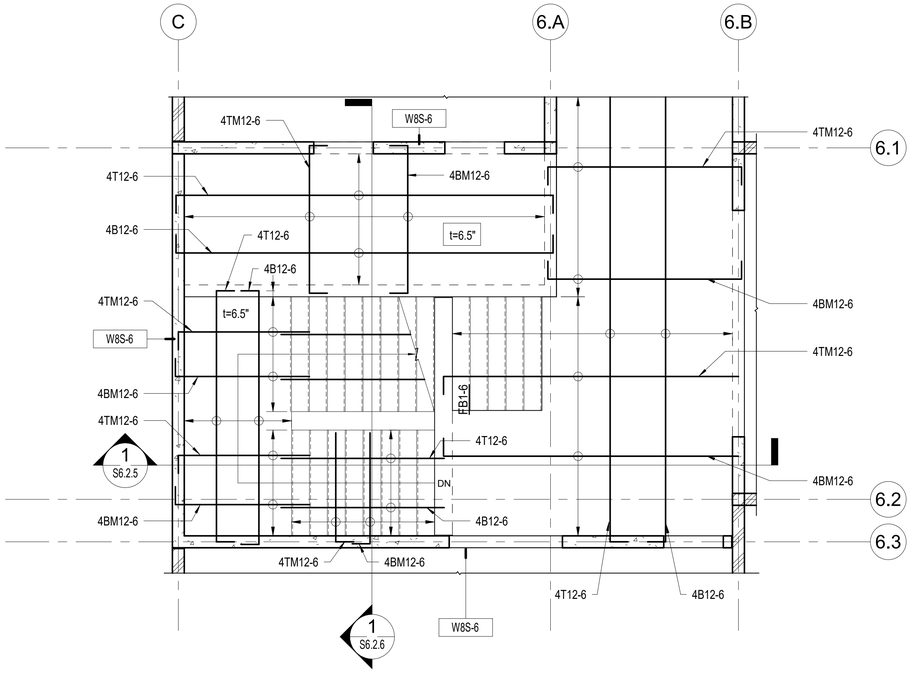


1 STAIR #2 FOUNDATION PLAN_1B

1/4" = 1'-0"

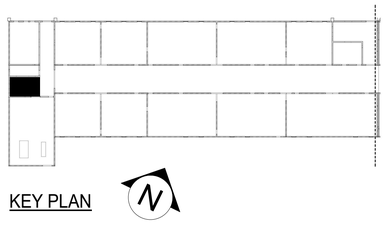
0' 1' 2' 4' 8'



2 STAIR #2 SECOND FLOOR FRAMING PLAN_2B

1/4" = 1'-0"

0' 1' 2' 4' 8'



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Project

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SIMON SANCHEZ HIGH SCHOOL

Title

CLASSROOMS:

A - WING (WEST)
STAIR #2 FRAMING PLAN/SECTION_1B/2B
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S6.1.5

Sheet No.____ of ____

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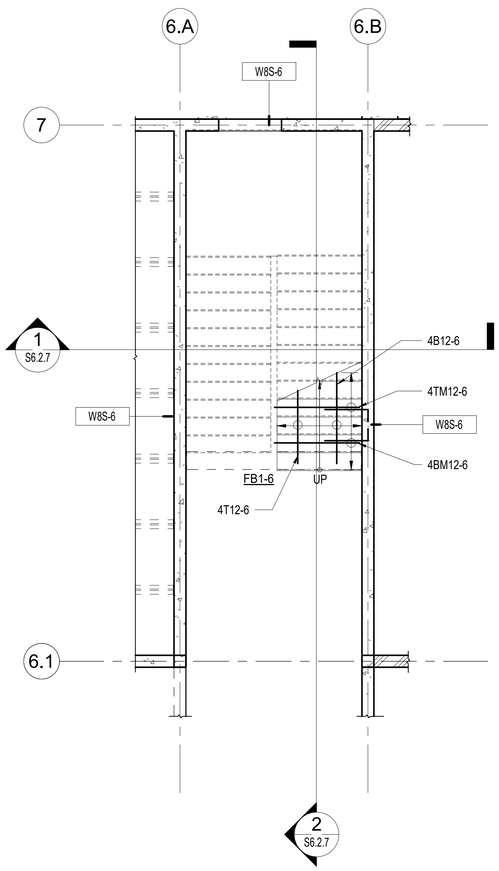
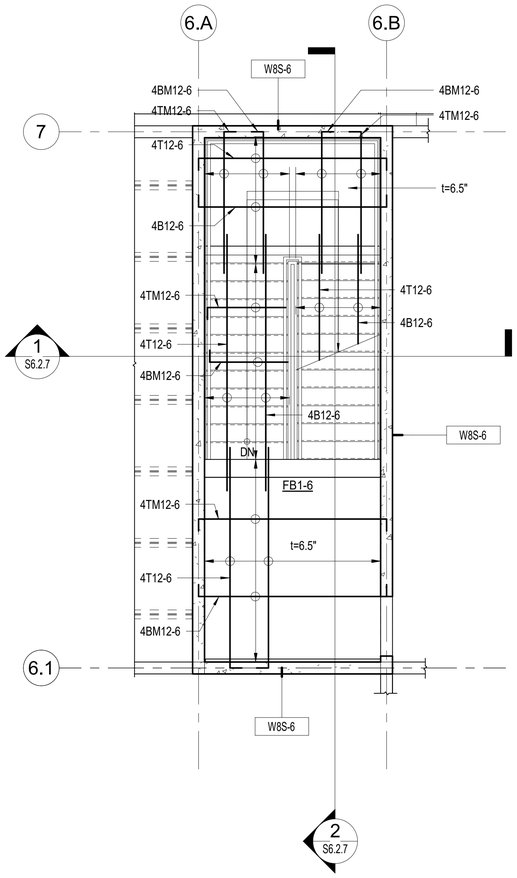


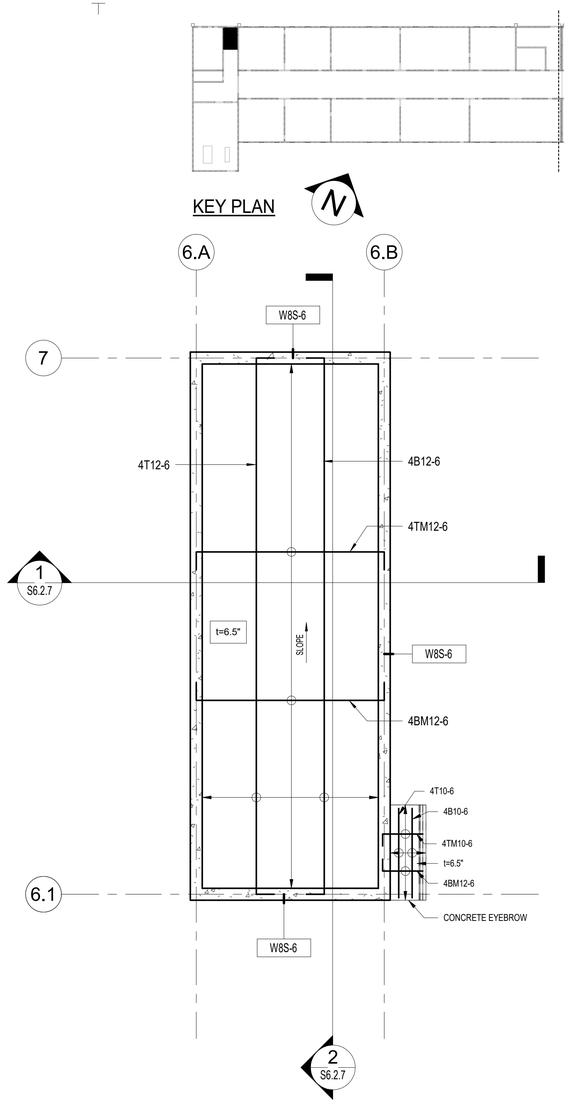
1 STAIR #3 2ND FLOOR FRAMING PLAN

1/4" = 1'-0"



2 STAIR #3 LOWER ROOF FRAMING PLAN

1/4" = 1'-0"



3 UPPER ROOF FRAMING PLAN

1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: _____

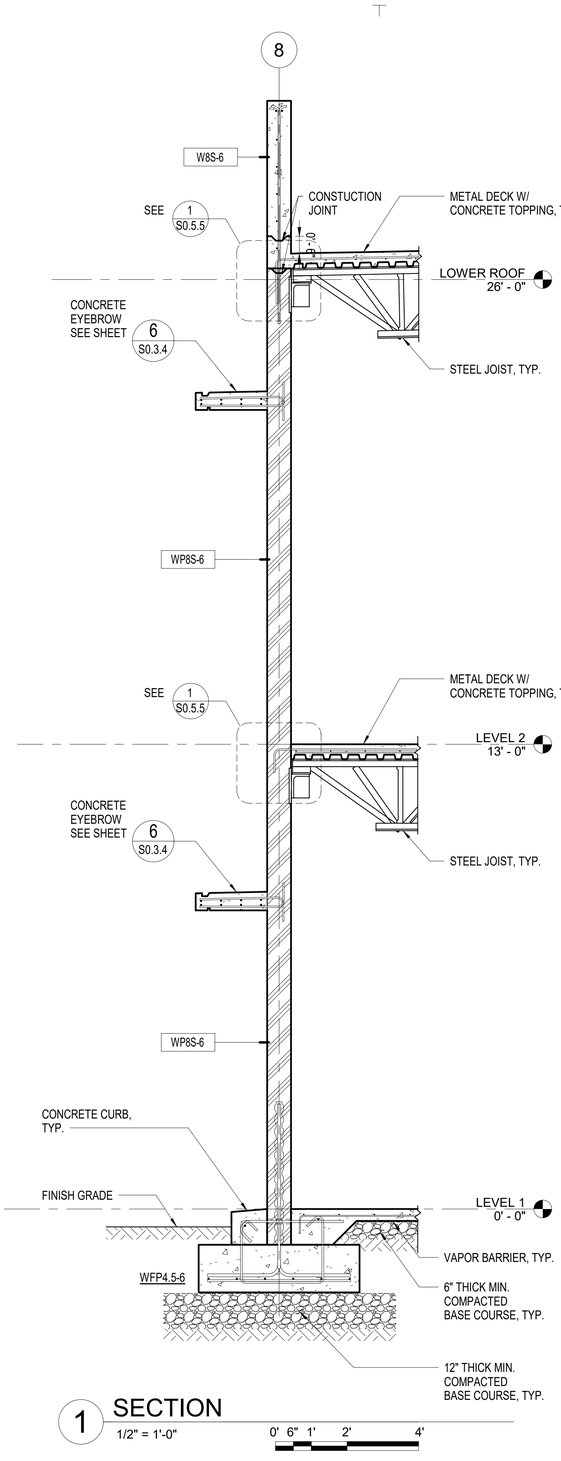
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
STAIR #3 FRAMING PLANS
PROGRAMMING DOCUMENT

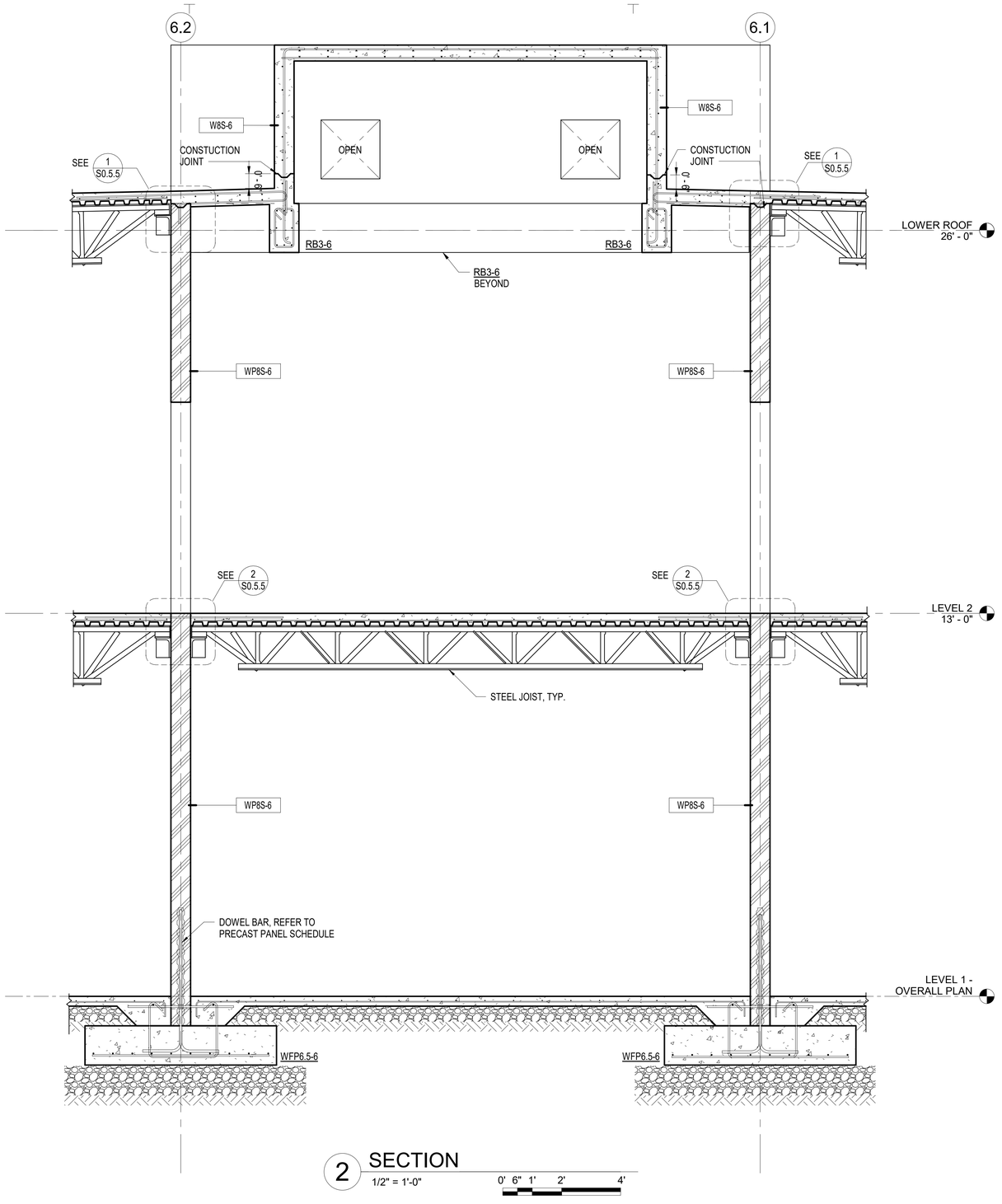
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.1.6
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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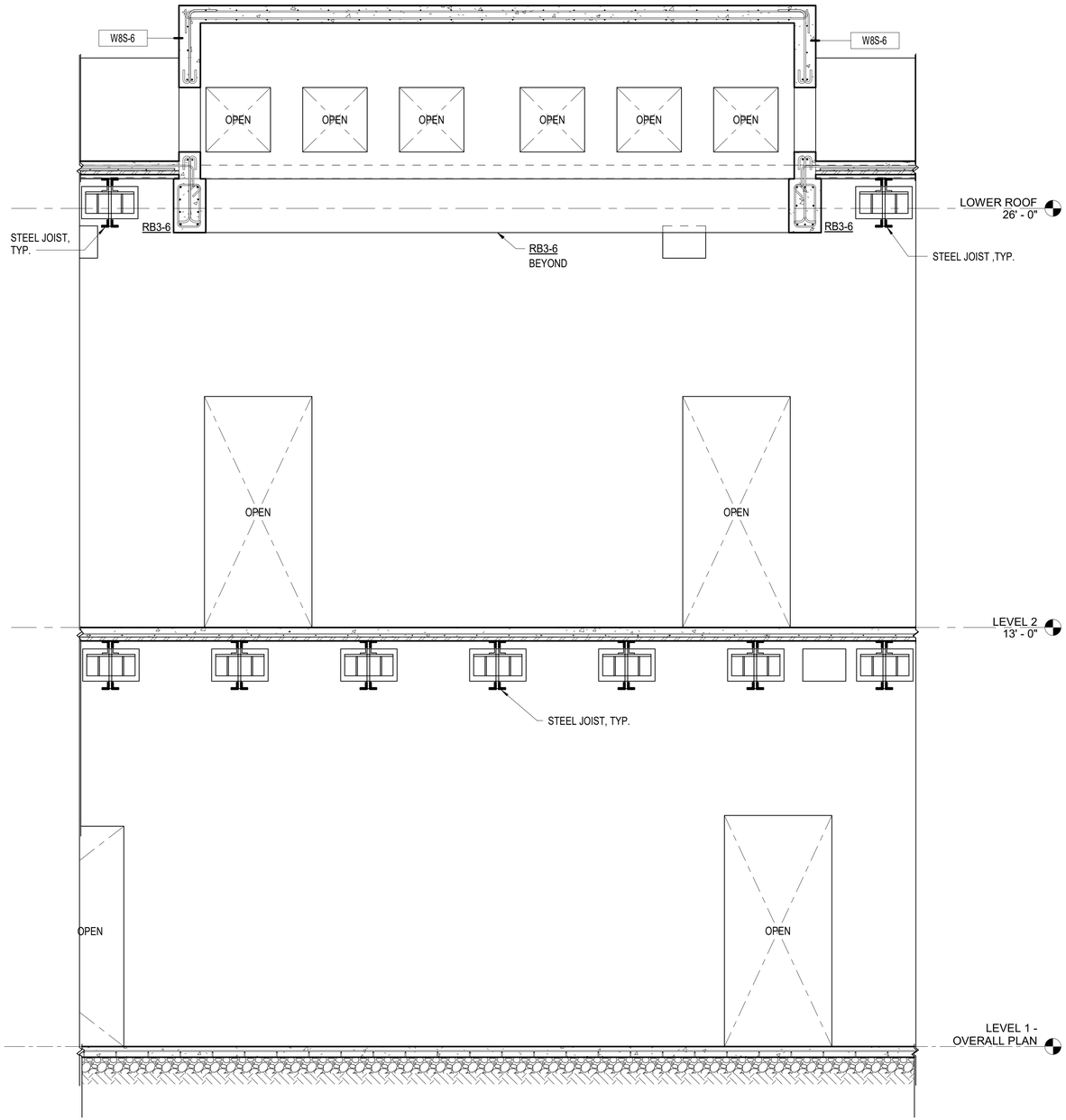
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.2.1
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

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Project

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SIMON SANCHEZ HIGH SCHOOL

Title

CLASSROOMS:

A - WING (WEST)
SECTIONS

PROGRAMMING
DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

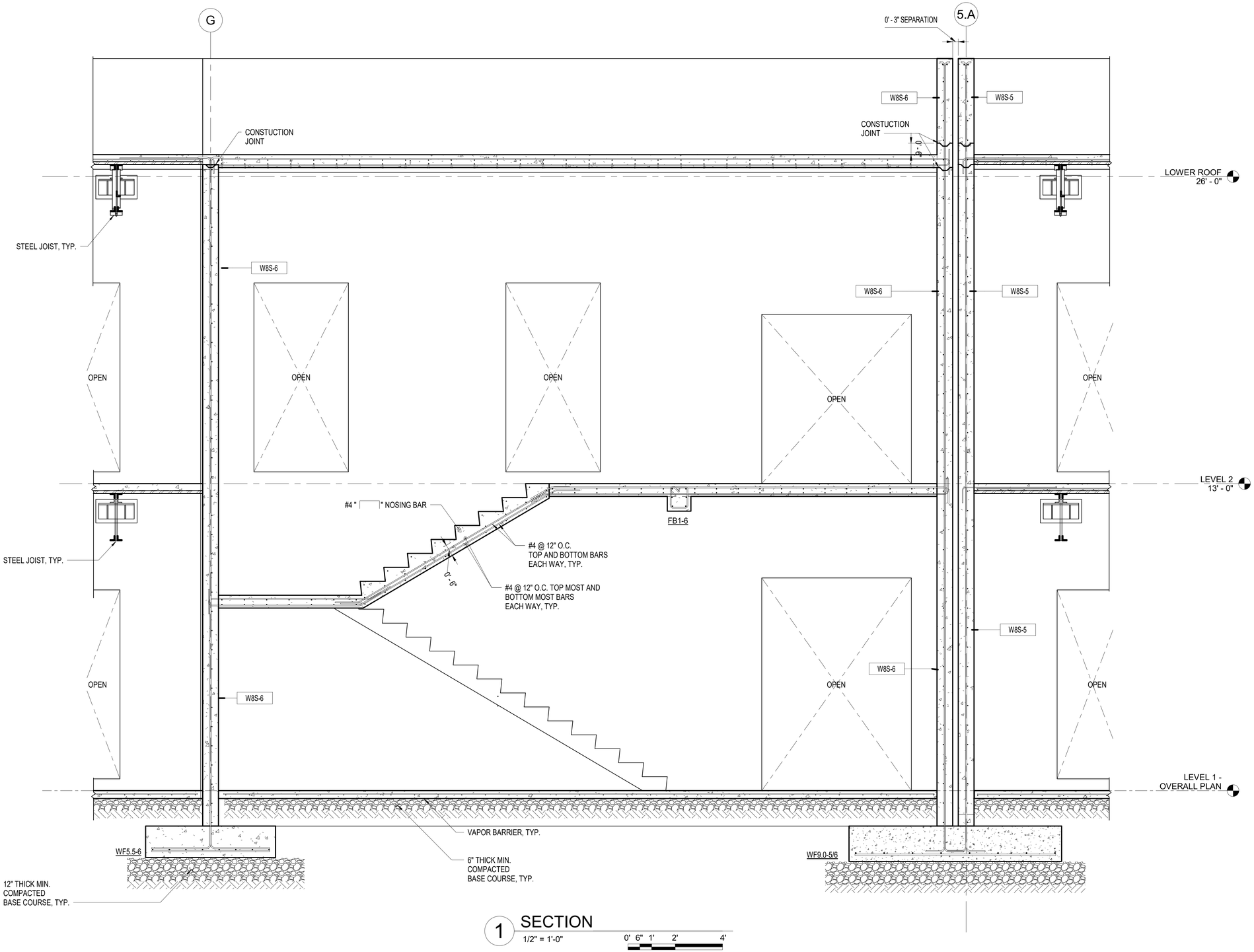
Drawing

S6.2.2

Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

NOT FOR CONSTRUCTION



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Title

CLASSROOMS:

A - WING (WEST) SECTIONS

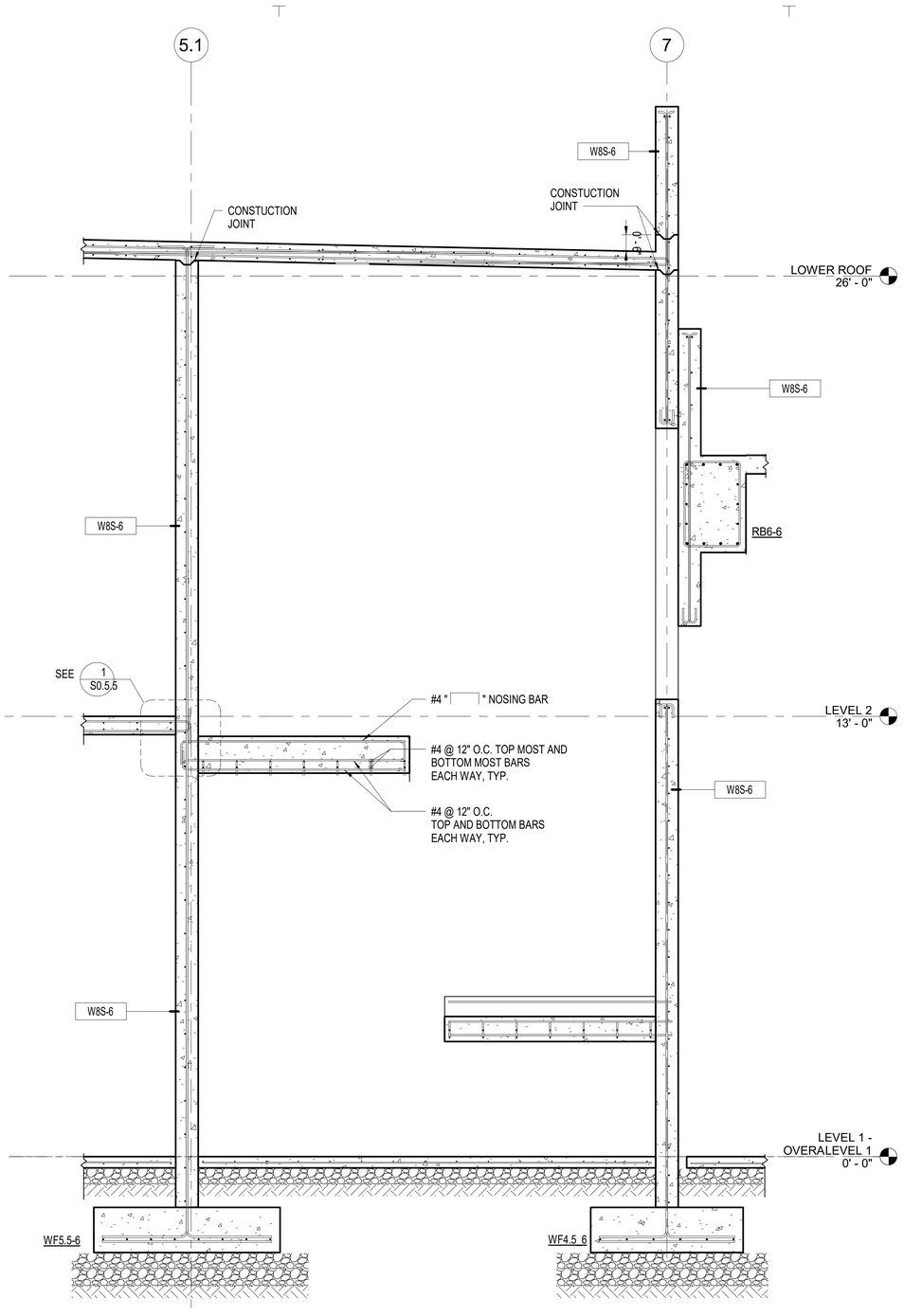
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

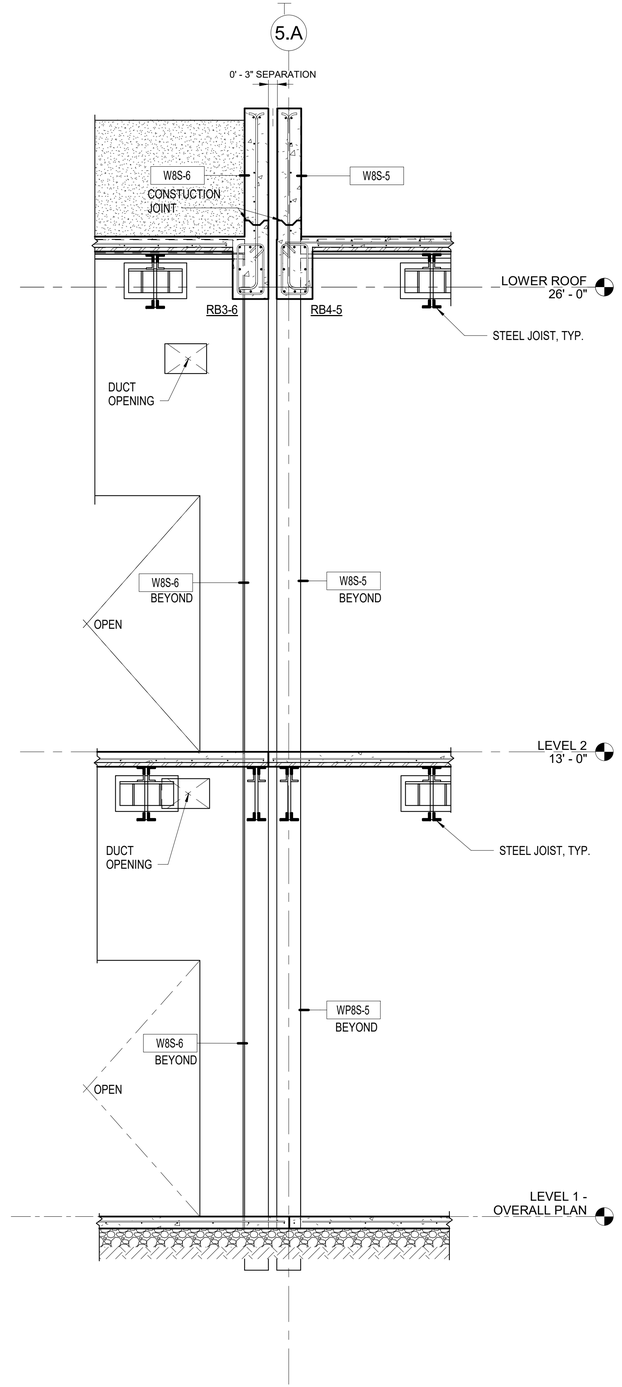
Drawing

S6.2.3

Sheet No. of



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project
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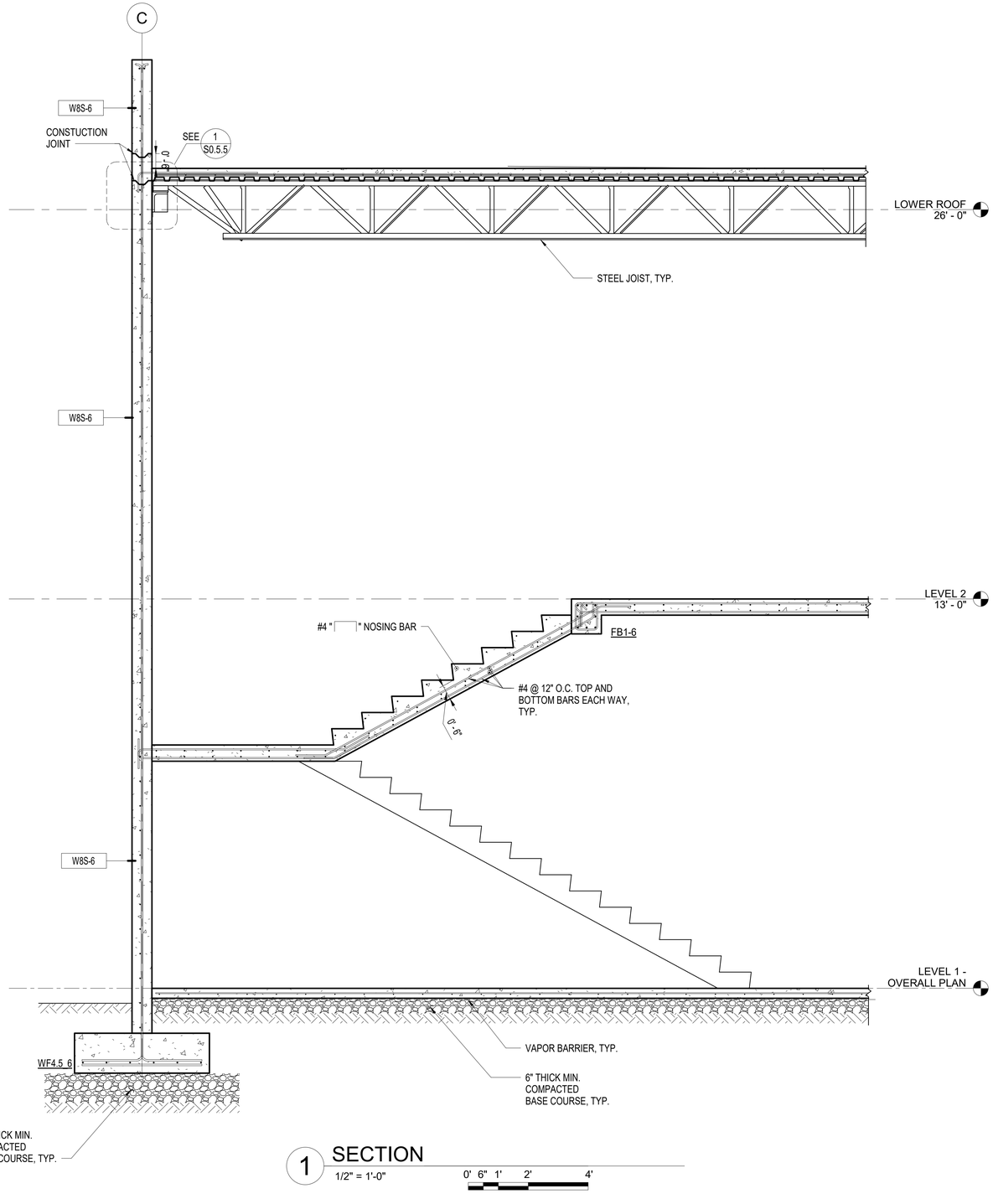
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S6.2.4
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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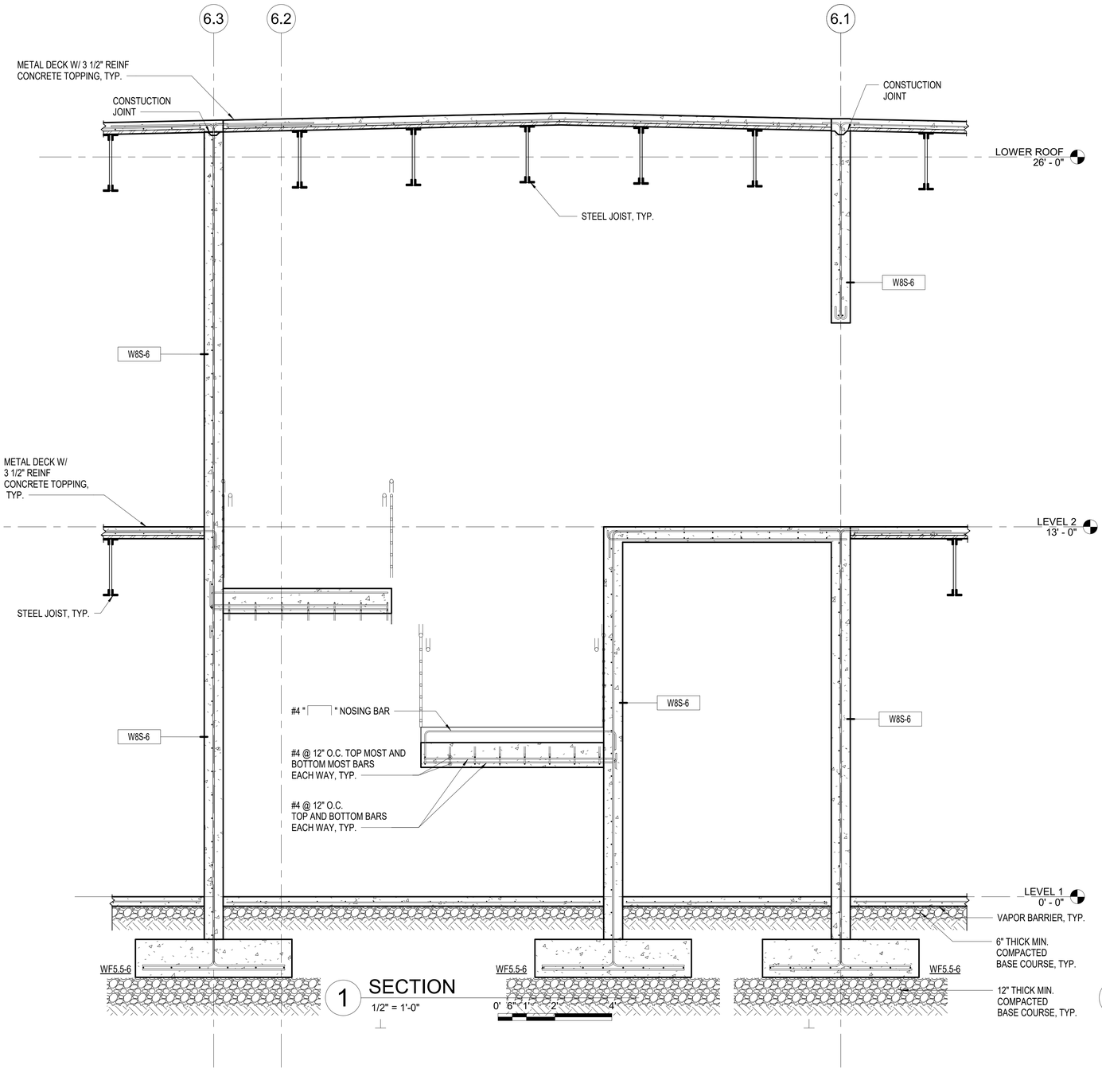
Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

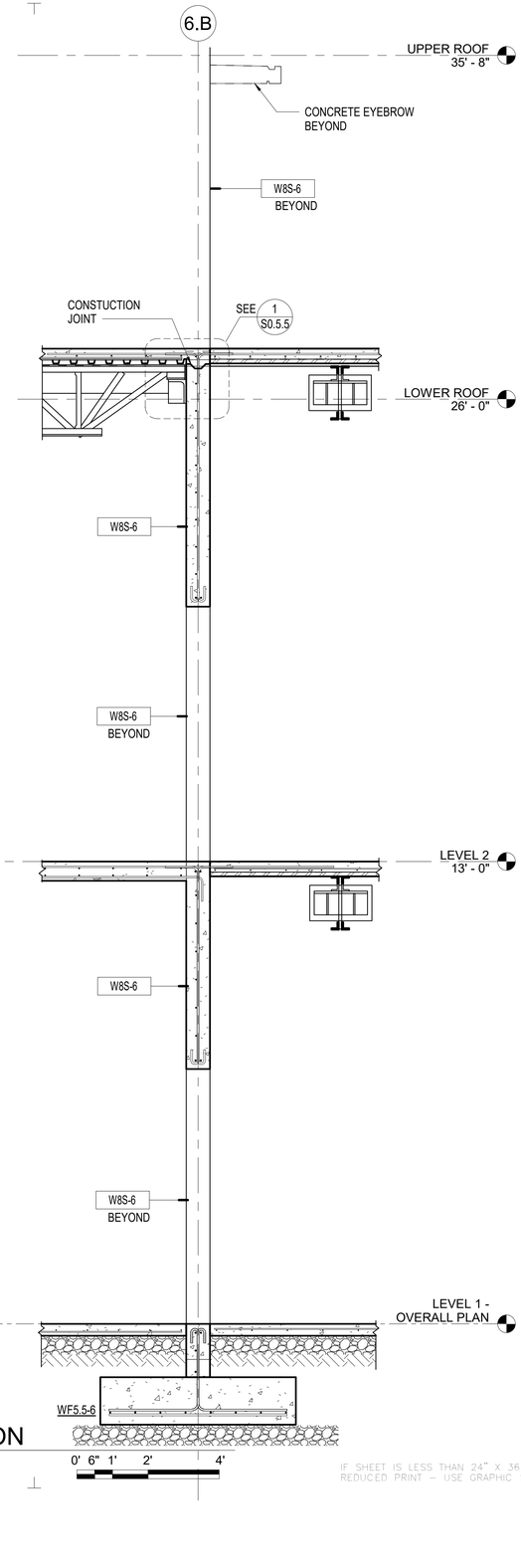
Drawing
S6.2.5
Sheet No._____ of _____

NOT FOR CONSTRUCTION

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



1 SECTION
1/2" = 1'-0"



2 SECTION
1/2" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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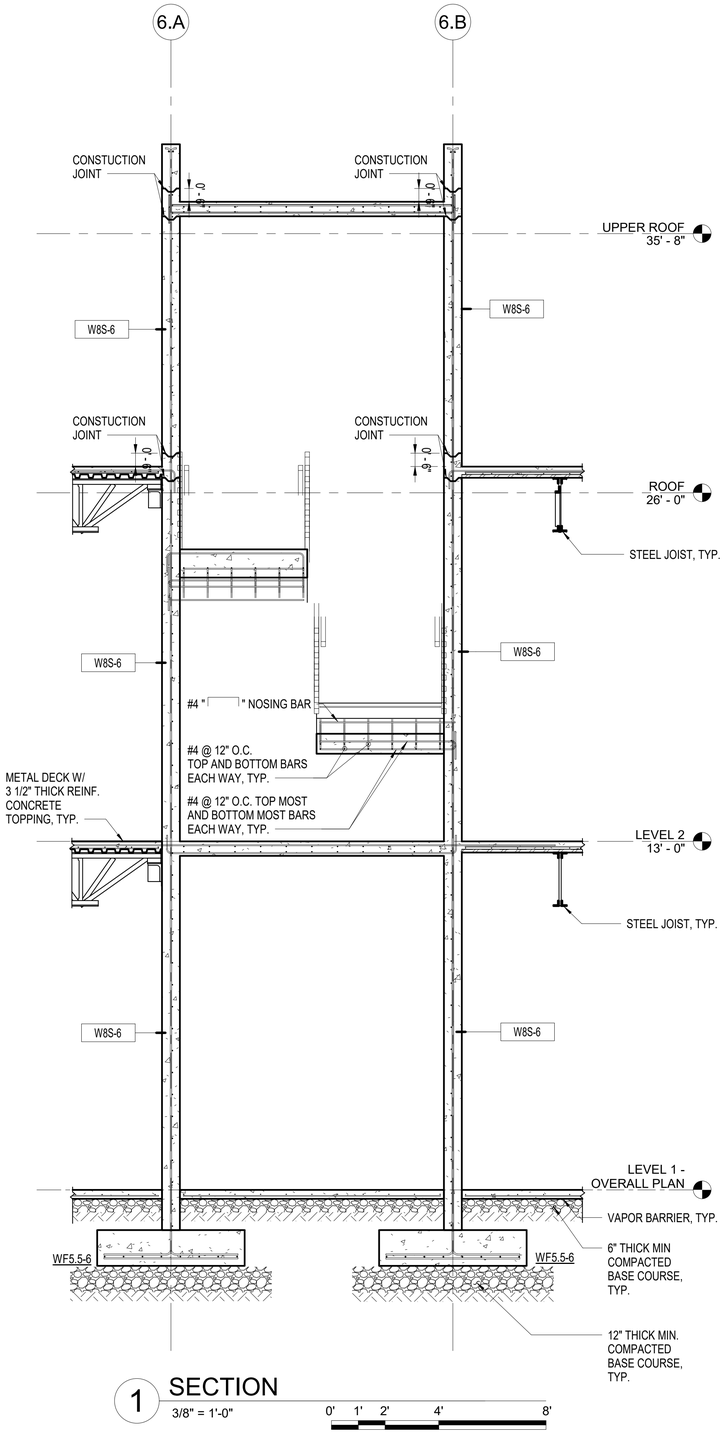
Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

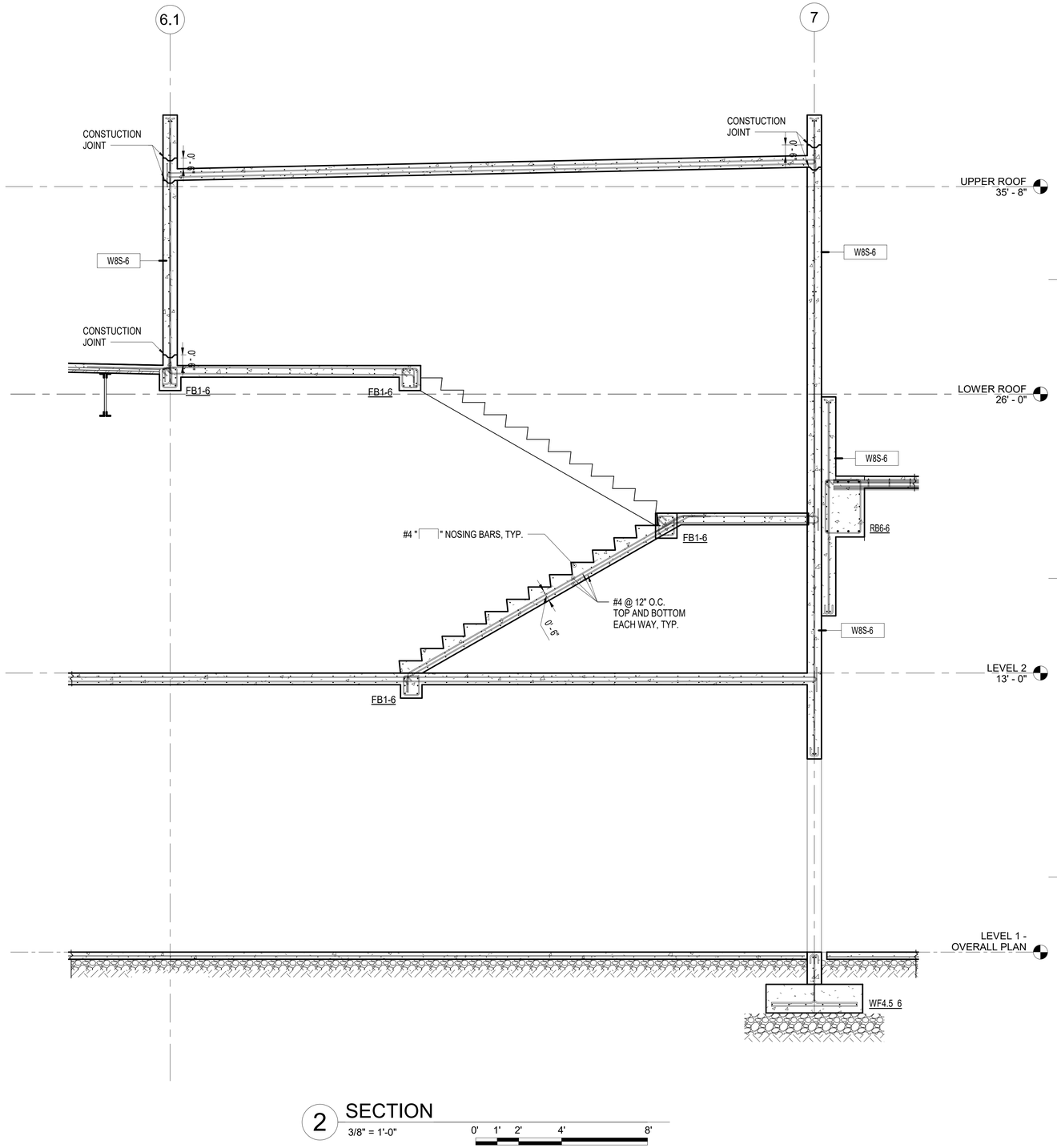
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.2.6
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'



2 SECTION
3/8" = 1'-0"
0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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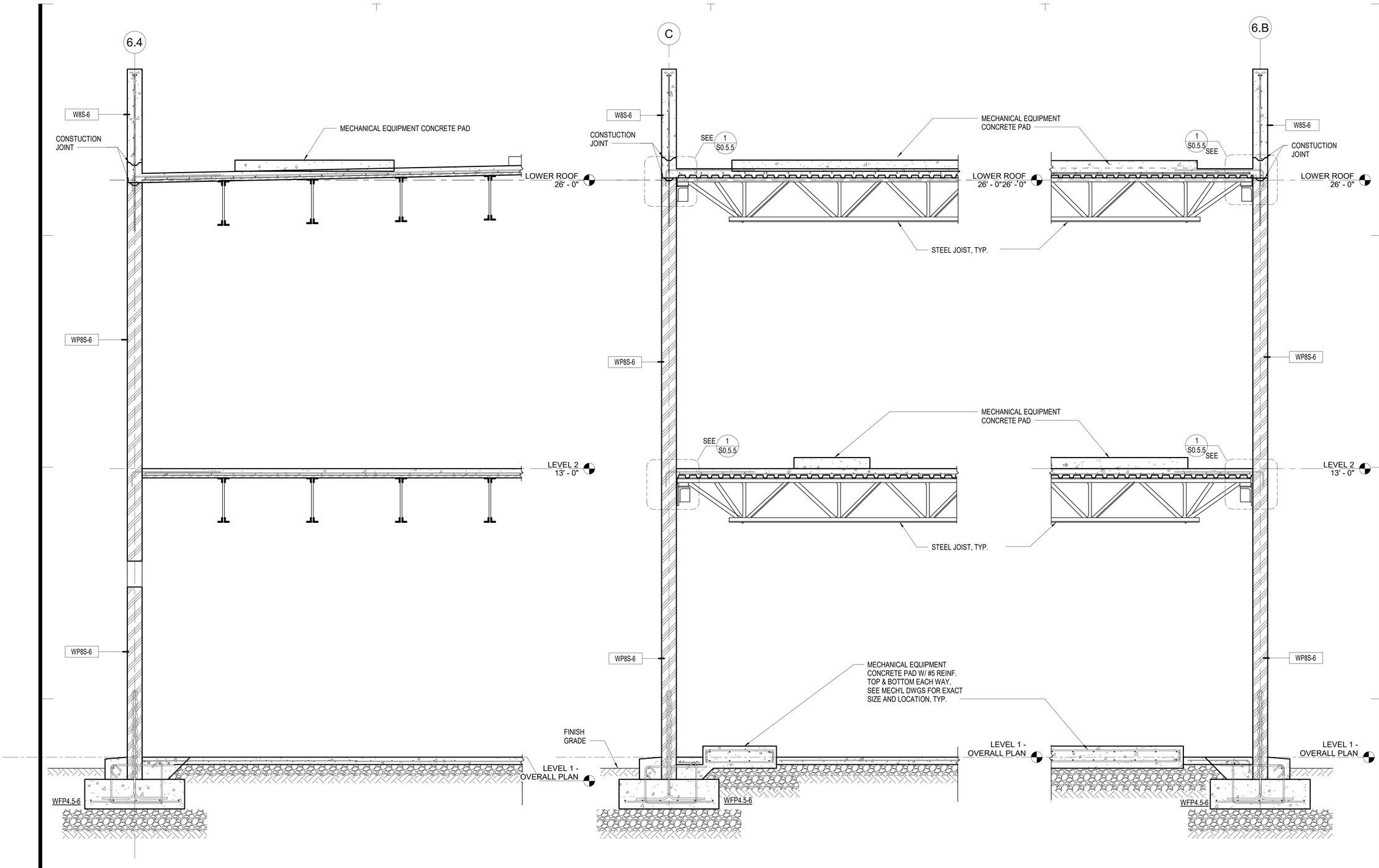
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.2.7
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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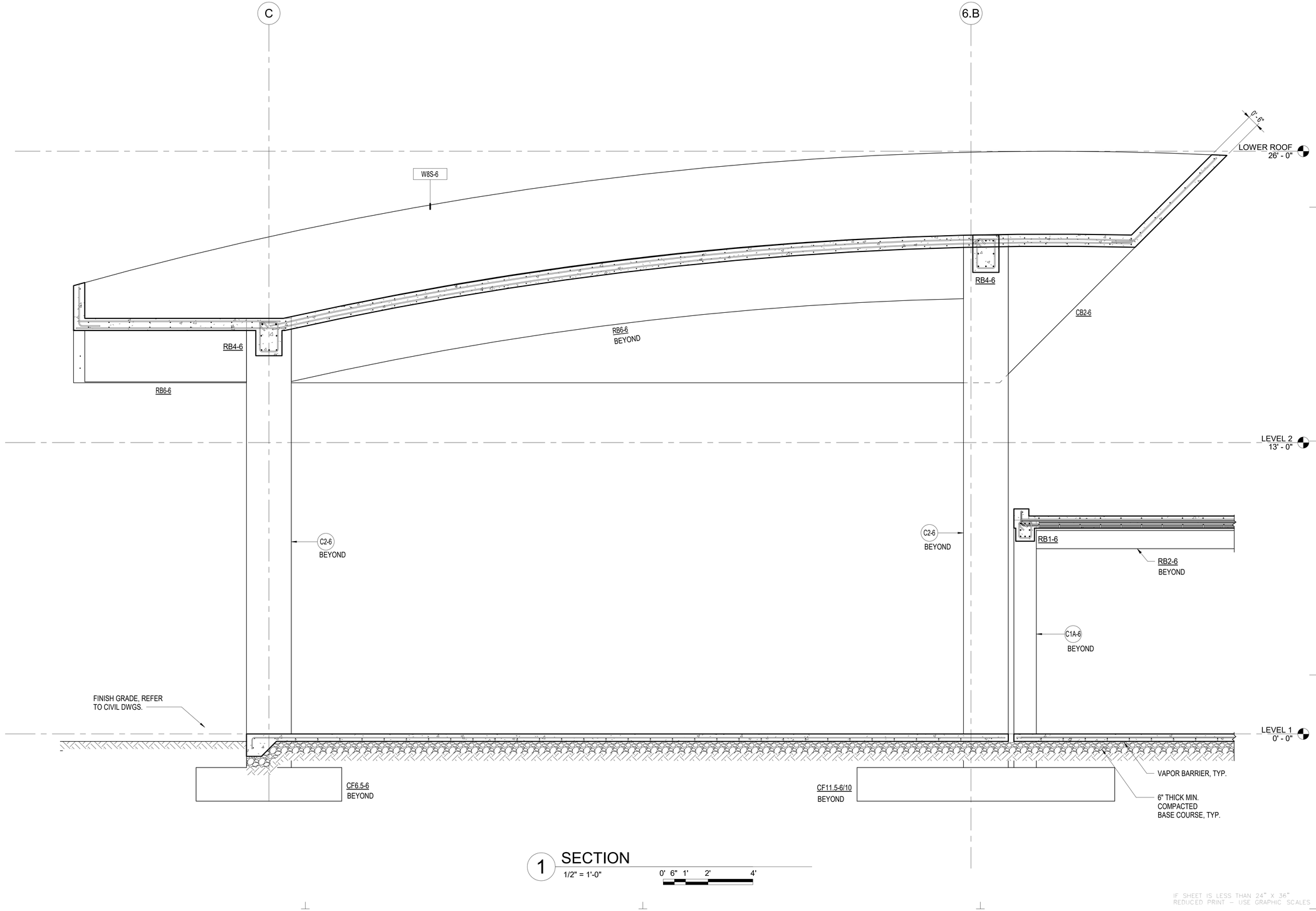
Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S6.2.8
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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Title

CLASSROOMS:

A - WING (WEST)
SECTIONS

PROGRAMMING DOCUMENT

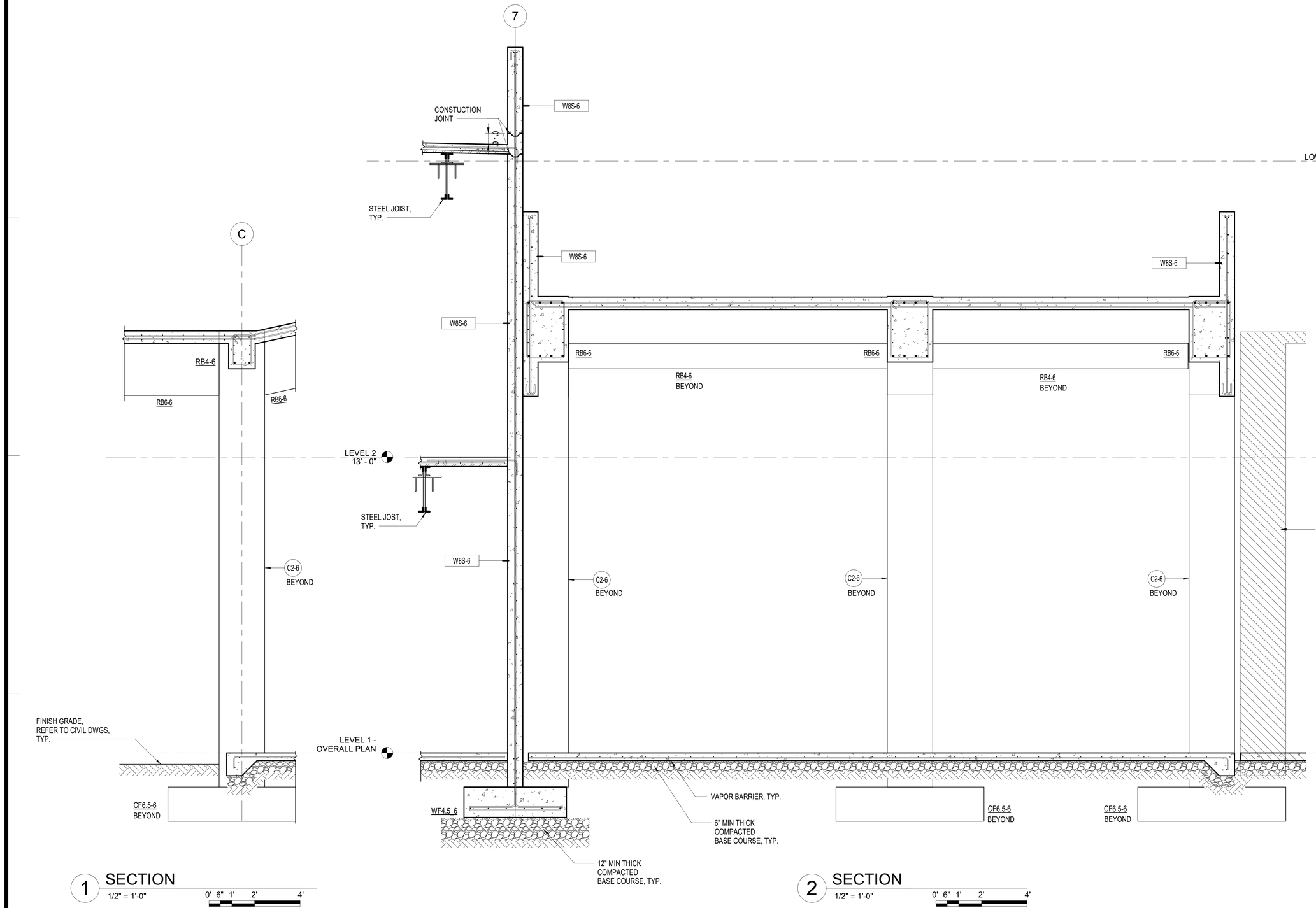
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S6.2.9

Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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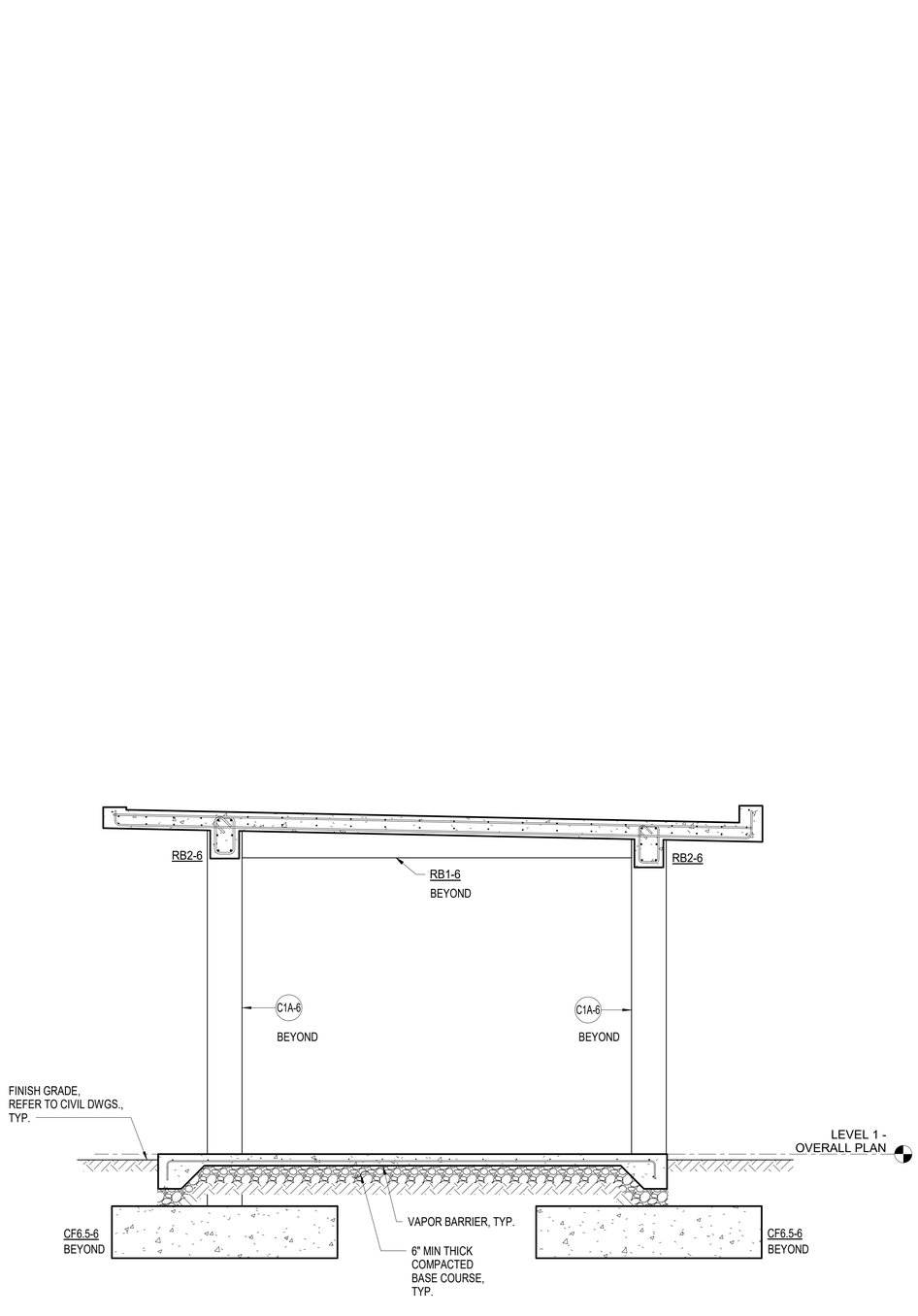
Title
CLASSROOMS:
A - WING (WEST) SECTIONS
PROGRAMMING DOCUMENT

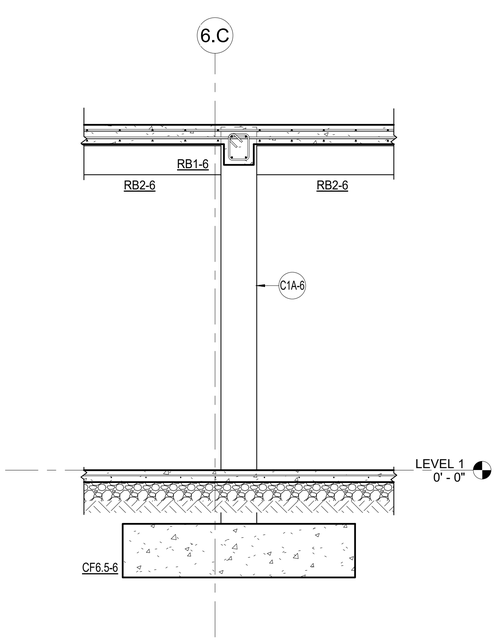
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.2.10
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
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Title
CLASSROOMS:
A - WING (WEST)
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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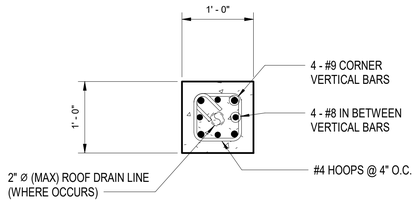
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

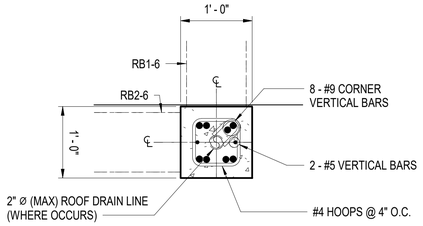
Drawing
S6.2.11
Sheet No. of

NOT FOR CONSTRUCTION



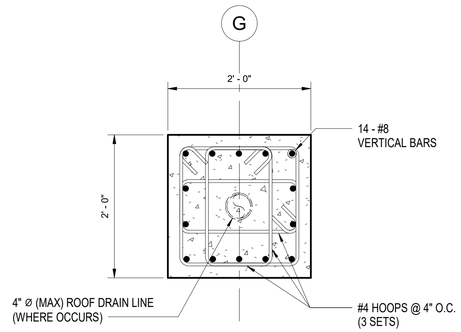
1 TYP. CONC. "C1-6" COLUMN DETAIL

1" = 1'-0"



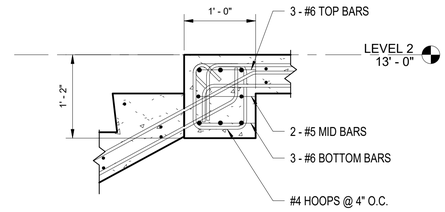
2 TYP. CONC. "C1A-6" COLUMN DETAIL

1" = 1'-0"



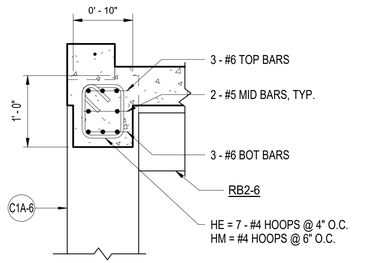
3 TYP. CONC. "C2-6" COLUMN DETAIL

1" = 1'-0"



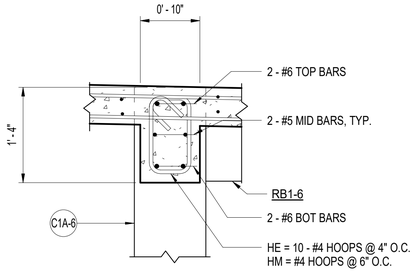
4 TYP. CONC. BEAM "FB1-6" DETAIL

1" = 1'-0"



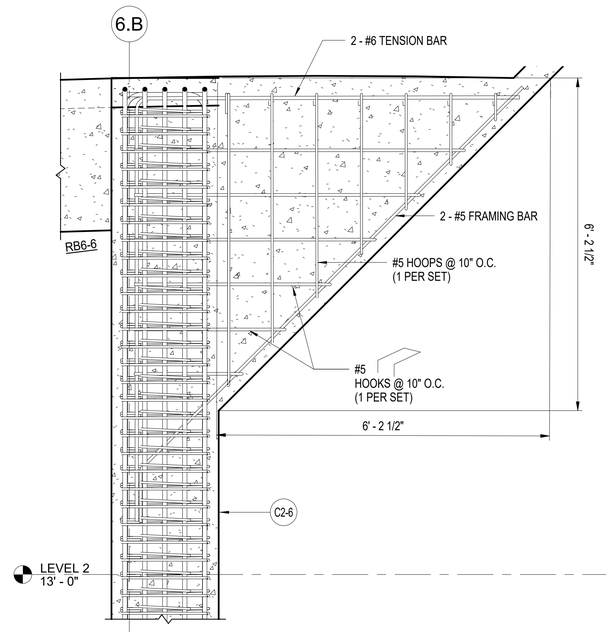
5 TYP. CONC. BEAM "RB1-6" DETAIL

1" = 1'-0"



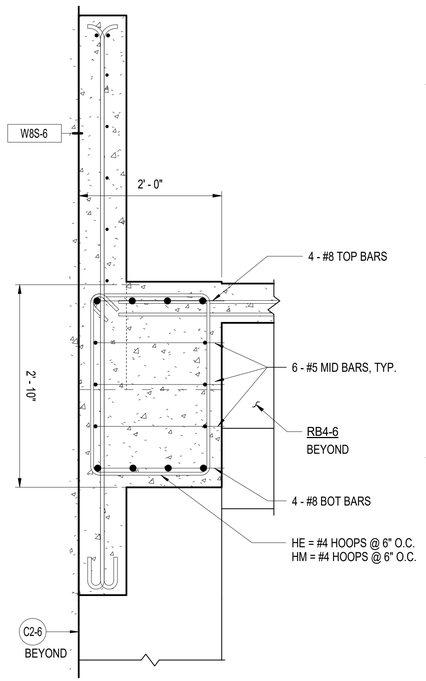
6 TYP. CONC. BEAM "RB2-6" DETAIL

1" = 1'-0"



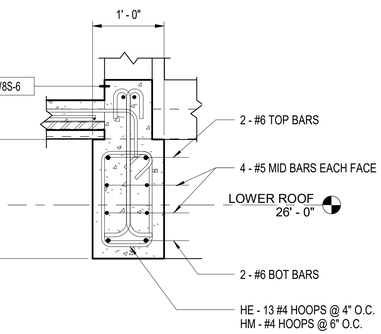
9 TYP. "CB2-6" CONC. CORBEL/BEAM DET.

3/4" = 1'-0"



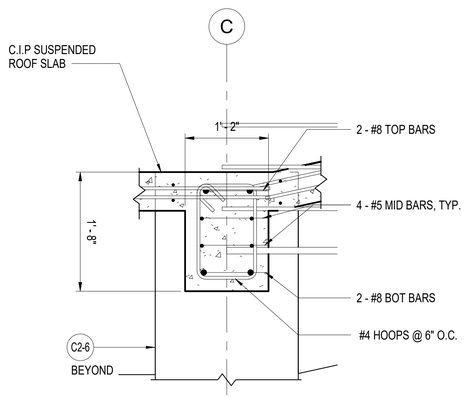
10 TYP. CONC. BEAM "RB5-6" DETAIL

1" = 1'-0"



7 TYP. CONC. BEAM "RB3-6" DETAIL

1" = 1'-0"



8 TYP. CONC. BEAM "RB4-6" DETAIL

1" = 1'-0"

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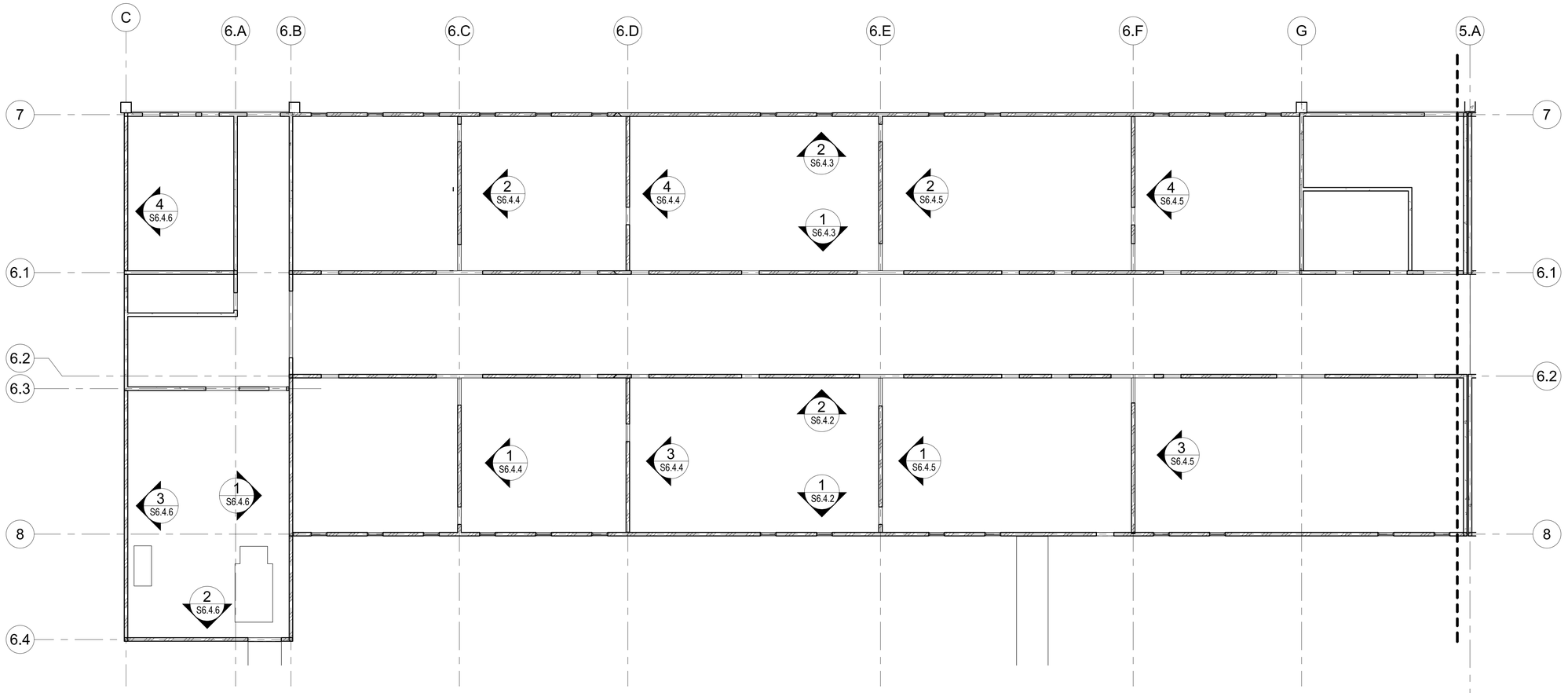
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
MISCELLANEOUS DETAIL
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S6.3.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 A - WING PRECAST WALL PANEL KEY PLAN (WEST)

REVISION		
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Title
CLASSROOMS:
A - WING (WEST)
PRECAST PANEL KEY PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	3/32" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.4.1
Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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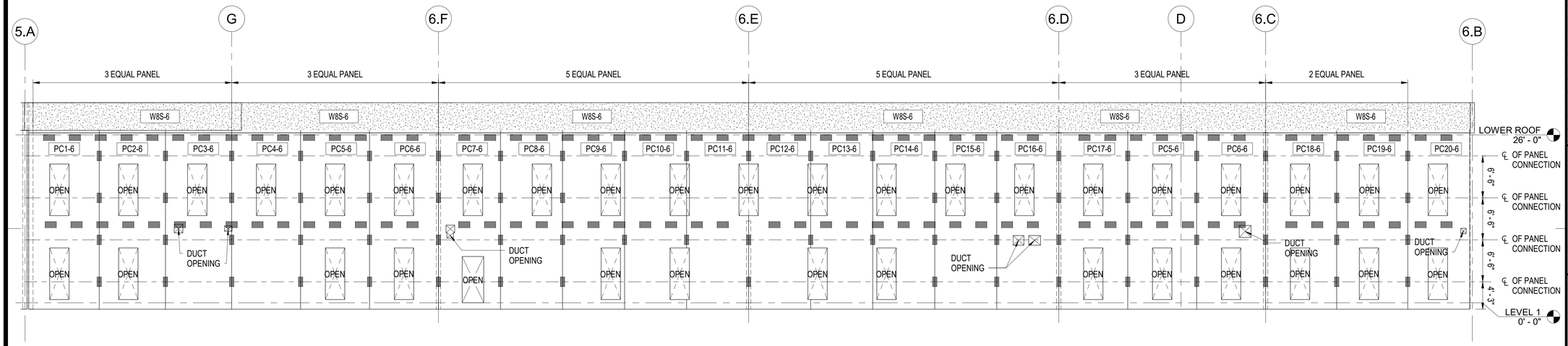


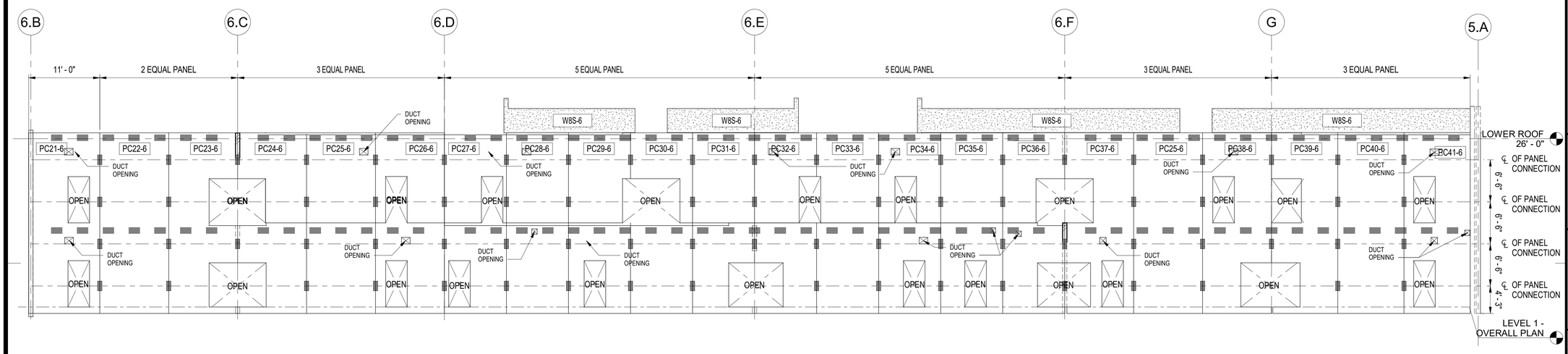
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 8

1/8" = 1'-0"

0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.2

1/8" = 1'-0"

0' 2' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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CLASSROOMS:
A - WING (WEST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.4.2
Sheet No. ____ of ____

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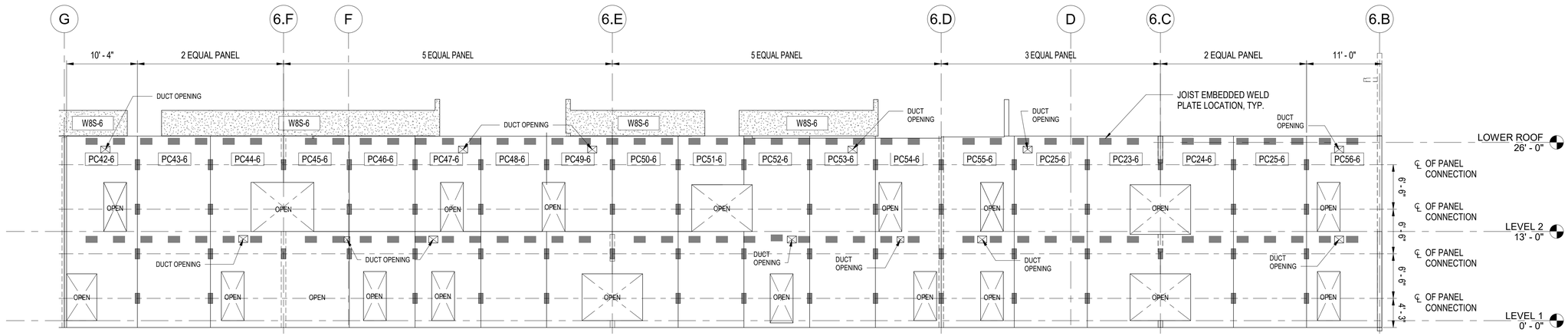
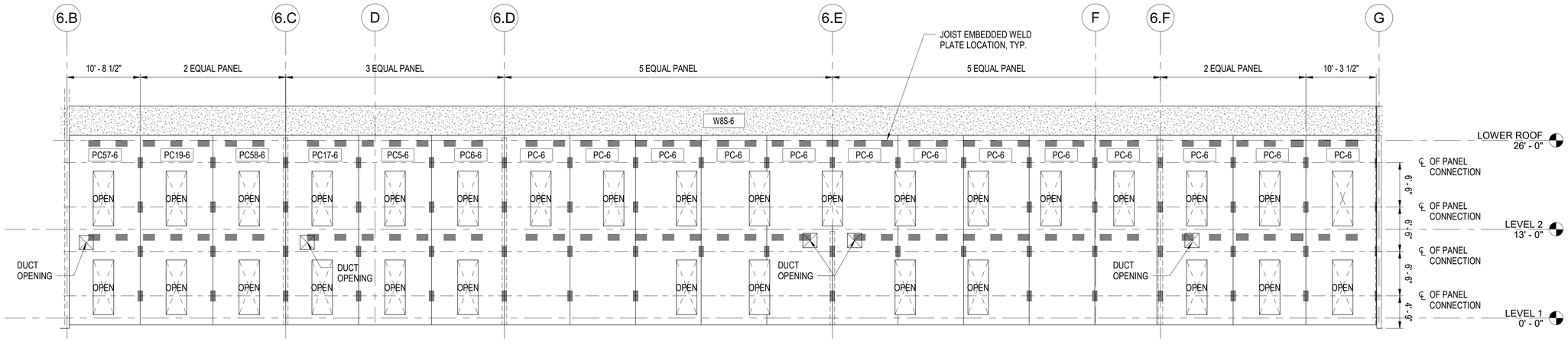


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.1

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 7

1/8" = 1'-0" 0' 2' 4' 8' 16'

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SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.4.3
Sheet No. _____ of _____

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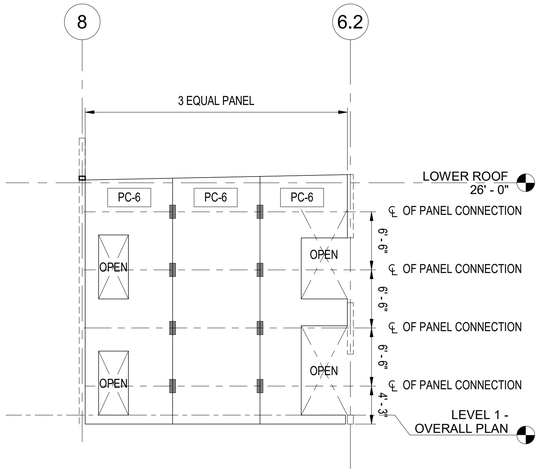
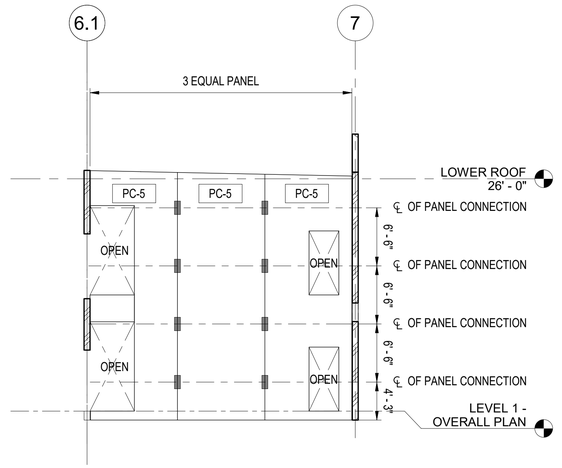


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.C

1/8" = 1'-0" 0' 2' 4' 8' 16'

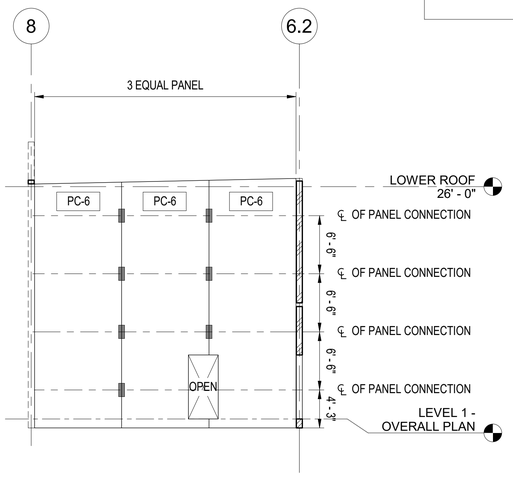


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.C

1/8" = 1'-0" 0' 2' 4' 8' 16'

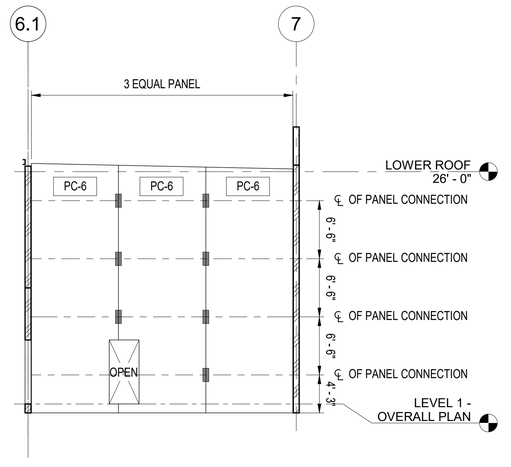
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.D

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.D

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Project
GDOE
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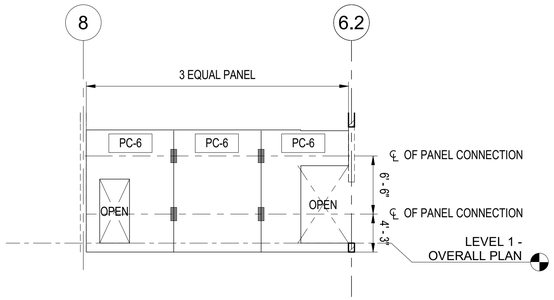
Title
CLASSROOMS:
A - WING (WEST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

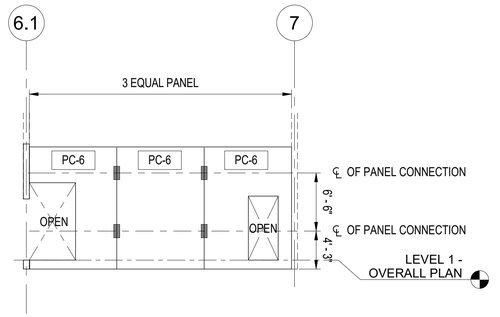
Drawing
S6.4.4
Sheet No. of

NOT FOR CONSTRUCTION



1 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.E

1/8" = 1'-0" 0' 2' 4' 8' 16'

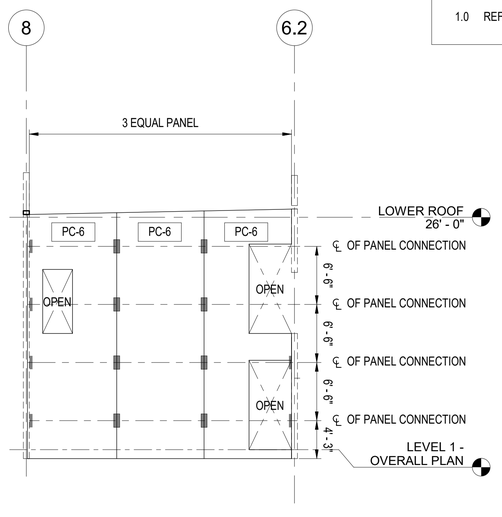


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.E

1/8" = 1'-0" 0' 2' 4' 8' 16'

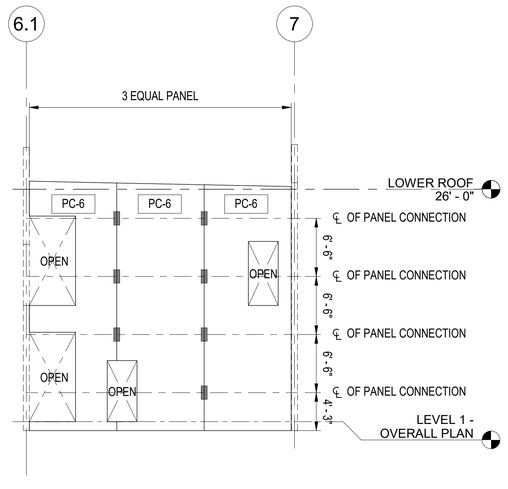
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.F

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.F

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Title
CLASSROOMS:
A - WING (WEST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S6.4.5
Sheet No. ____ of ____

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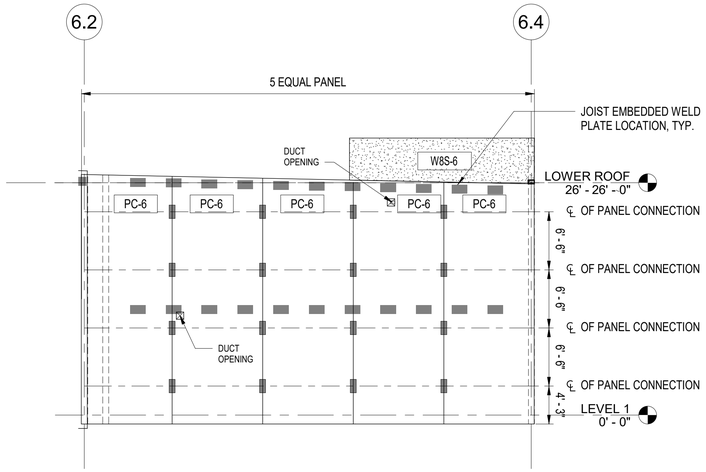
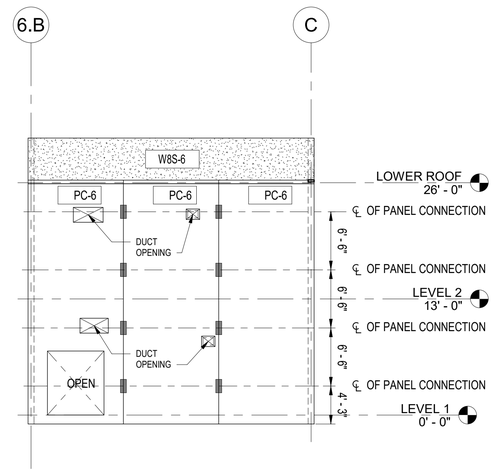


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.B

1/8" = 1'-0"

0' 2' 4' 8' 16'



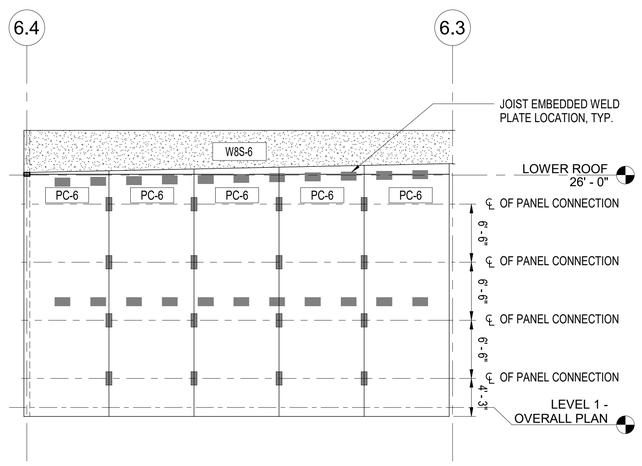
2 WALL PANEL ASSEMBLY ALONG GRIDLINE 6.4

1/8" = 1'-0"

0' 2' 4' 8' 16'

NOTE:

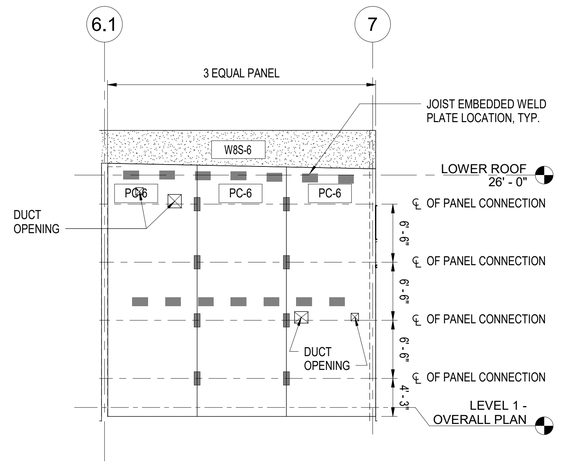
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE C

1/8" = 1'-0"

0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE C

1/8" = 1'-0"

0' 2' 4' 8' 16'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
A - WING (WEST)
PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S6.4.6
Sheet No. ____ of ____

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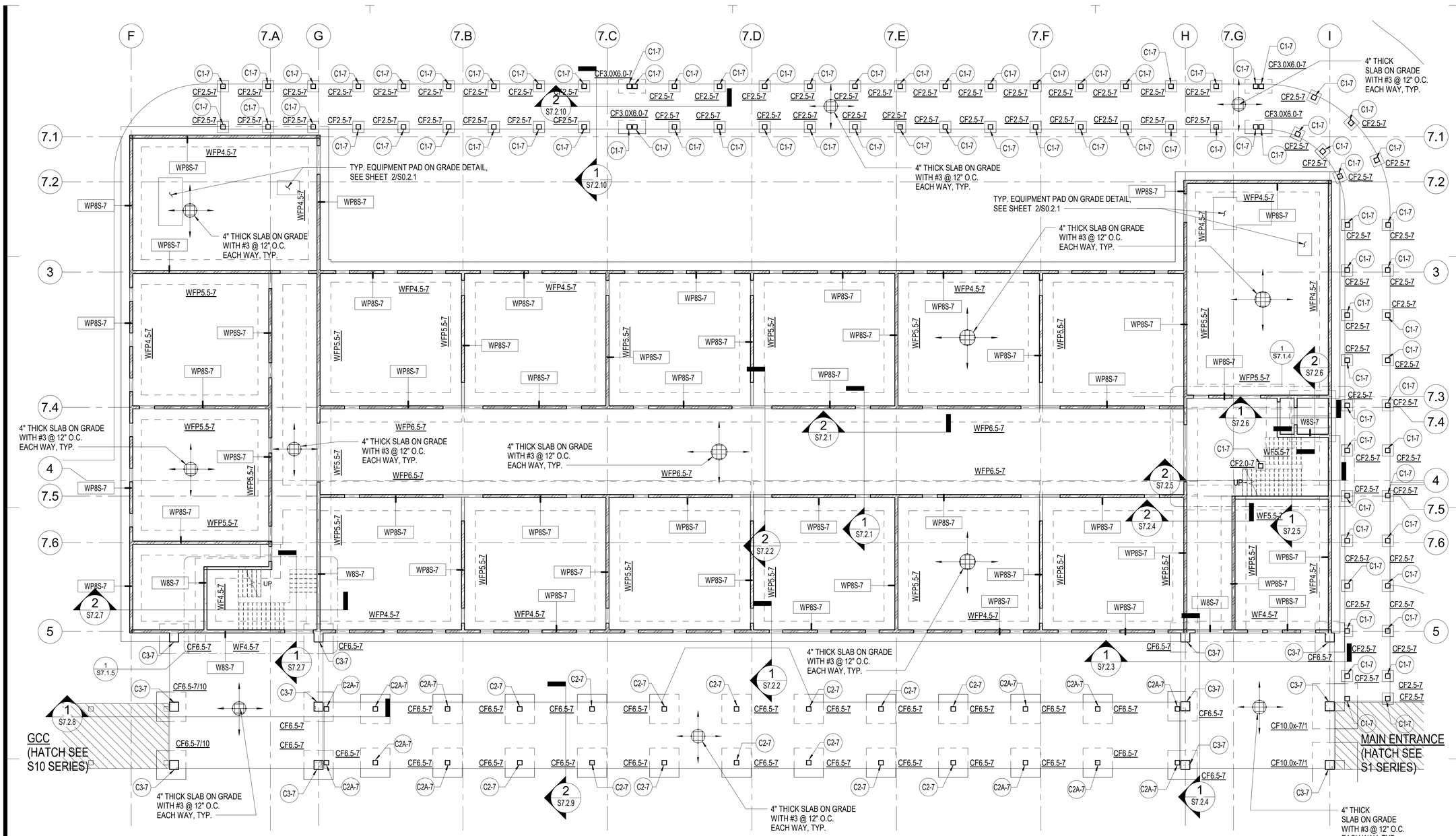
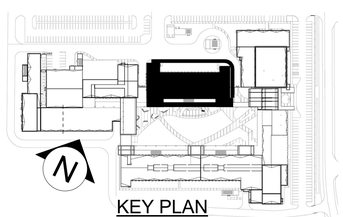


LEGEND AND TAGS:

- WFP#-# ------ WALL PRECAST FOOTING DESIGNATION, SEE SHEET S0.4.1
- WF#-# ------ WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
- CF#-# ------ COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
- C# ------ CONCRETE COLUMN DESIGNATION, SEE SHEET S7.3.1
- WP8#-# ------ WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W8#-# ------ WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1



KEY PLAN

1 FOUNDATION PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

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Title
CLASSROOMS:
B - WING FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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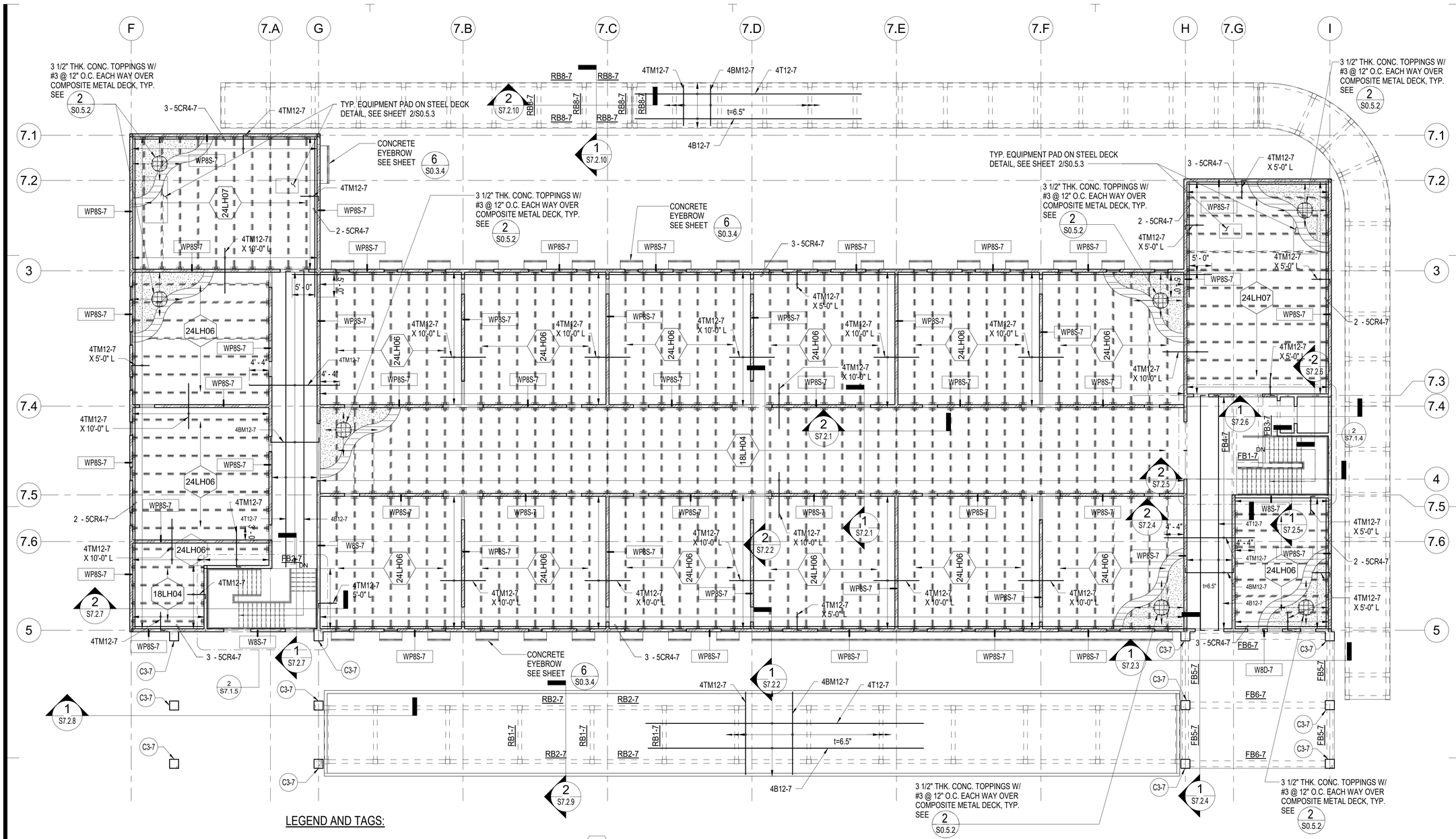
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S7.1.1
Sheet No. ____ of ____



LEGEND AND TAGS:

- C#-# ------ CONCRETE COLUMN DESIGNATION, SEE SHEET S5.3.1
- WP#-# ------ WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# ------ WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- FB#-# ------ STEEL BEAM DESIGNATION, SEE SHEET S7.3.1
- FB#-# ------ CONCRETE BEAM DESIGNATION SEE SHEET S7.3.1
- FB#-# ------ CONCRETE BEAM DESIGNATION SEE SHEET S7.3.1
- RB#-# ------ CONCRETE BEAM DESIGNATION SEE SHEET S7.3.1
- 4T12-# ------ SLAB REINFORCEMENT SEE SHEET S0.1.4

- 18LH04 ------ 18LH04 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH06 ------ 24LH06 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH07 ------ 24LH07 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES.

KEY PLAN

1 2ND FLOOR FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B -WING 2ND FLOOR FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S7.1.2
Sheet No. _____ of _____

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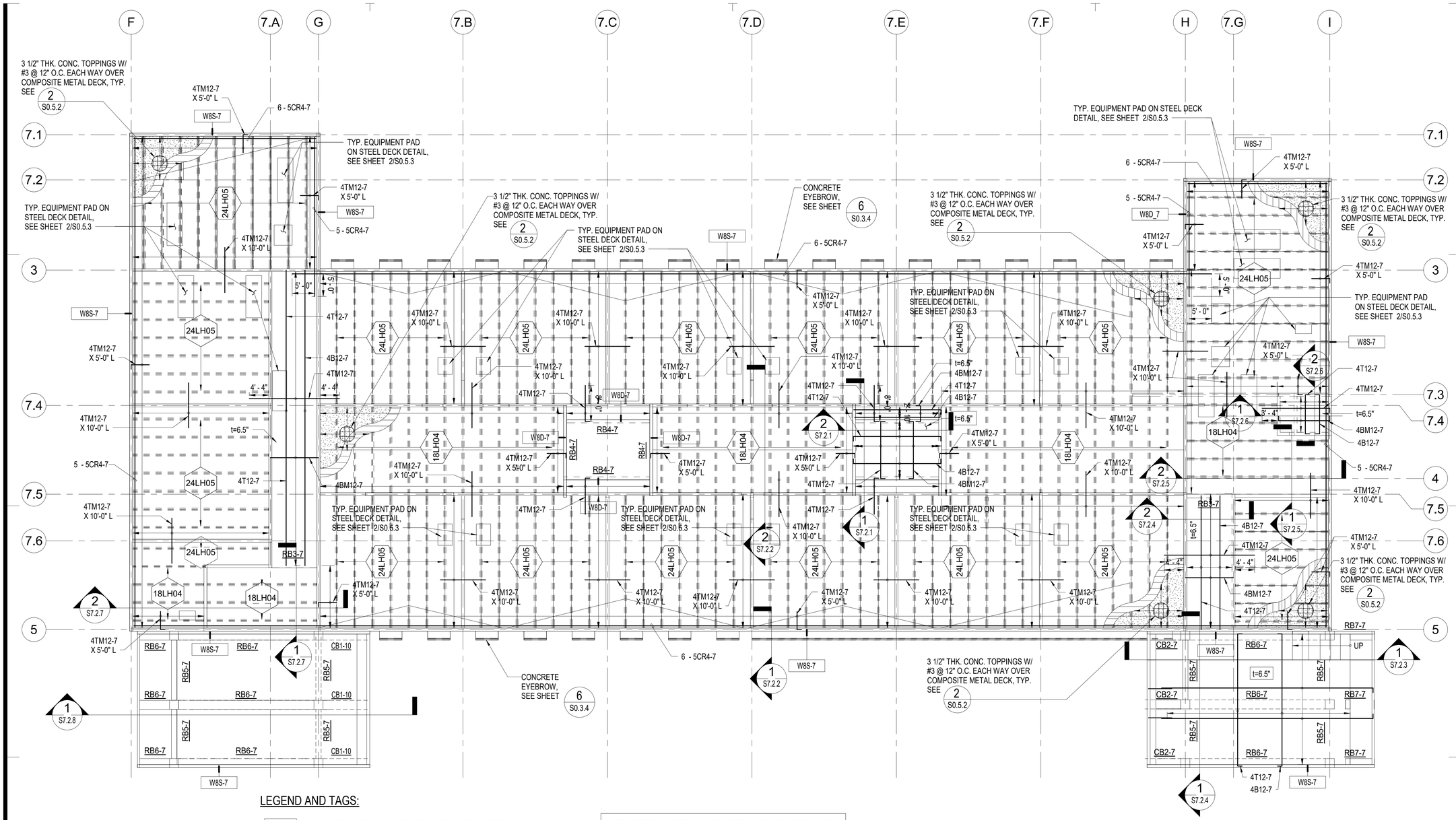
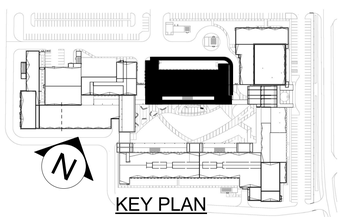


LEGEND AND TAGS:

- WP#-# ------ PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# ------ C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- 18LH04 ------ 18LH04 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 24LH05 ------ 24LH05 STEEL JOIST SPACED @ 4'-0" (MAX.) SEE SHEET SERIES S0.5
- RB#-# ------ STEEL BEAM DESIGNATION , SEE SHEET 7.3.1
- RB#-# ------ CONCRETE BEAM DESIGNATION, SEE SHEET S7.3.1, & S7.3.2
- 4T12-# ------ SLAB REINFORCEMENT SEE SHEET S0.1.4
- 4CR-# ------ CHORD REINFORCEMENT SEE SHEET S0.1.4
- CB#-# ------ CONCRETE CORBEL/BEAM DESIGNATION, SEE SHEET S7.3.2, & S10.3.1

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES.



KEY PLAN

1 LOWER ROOF

3/32" = 1'-0"

0' 4' 8' 16' 32'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B -WING LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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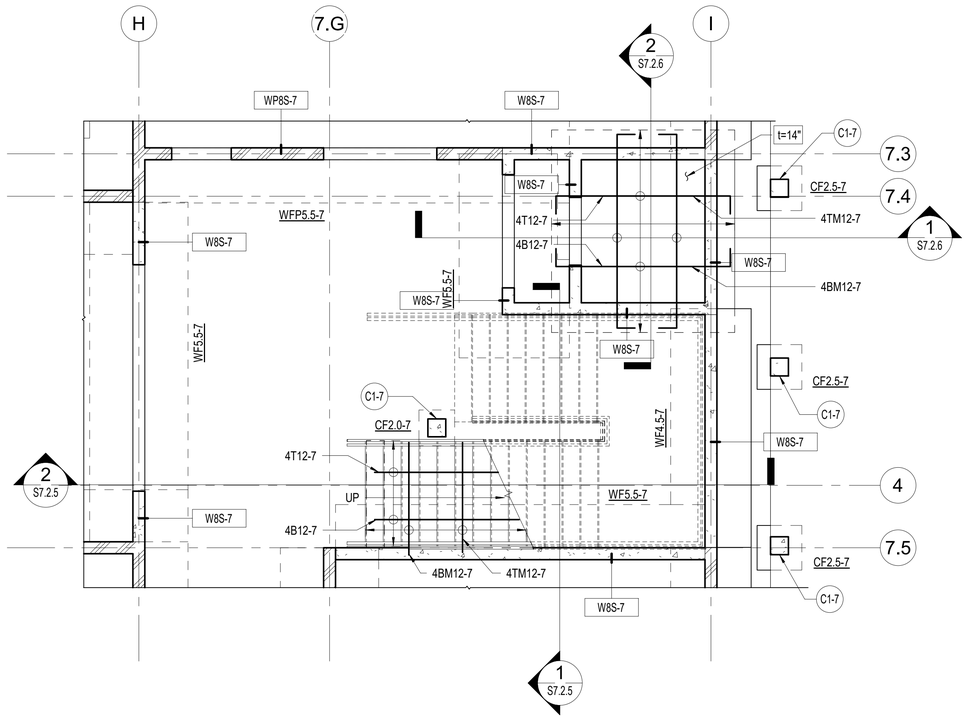
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

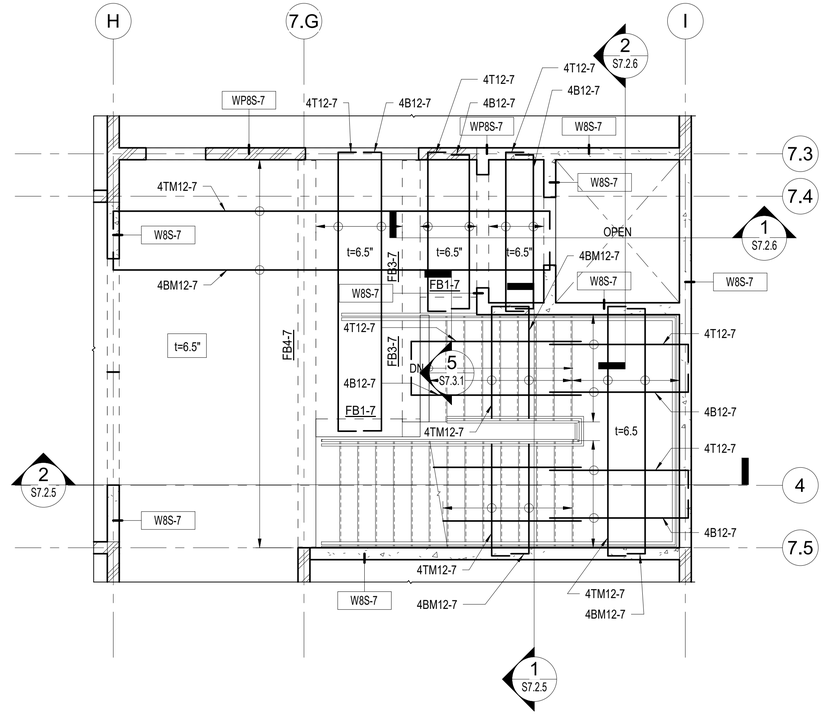
Drawing
S7.1.3
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



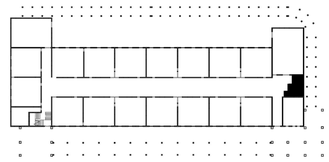
1 STAIR #1/ELEVATOR FOUNDATION PLAN

1/4" = 1'-0" 0' 1' 2' 4' 8'



2 STAIR #1/ELEVATOR SECOND FLOOR FRAMING PLAN

1/4" = 1'-0" 0' 1' 2' 4' 8'



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Title
CLASSROOMS:
B - WING
STAIR #1/ELEVATOR FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.1.4
Sheet No. _____ of _____

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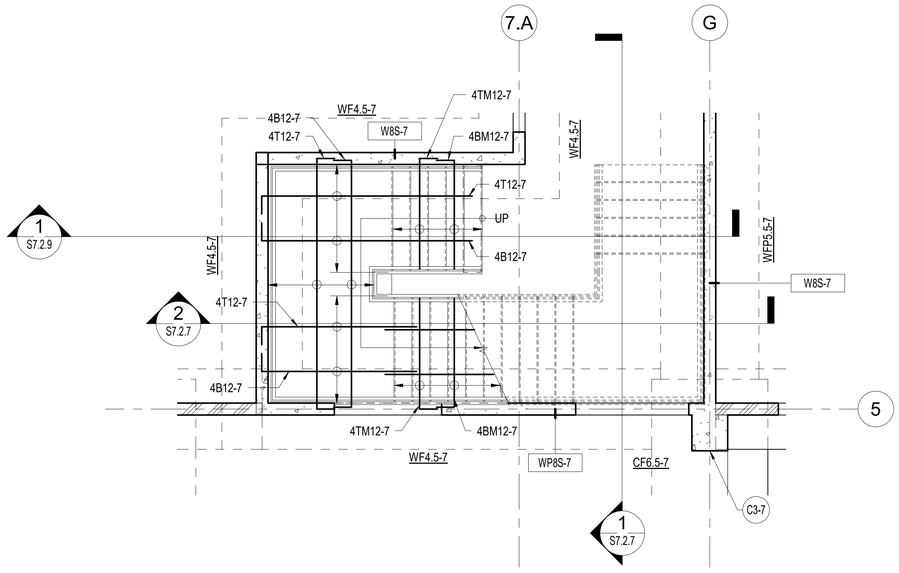
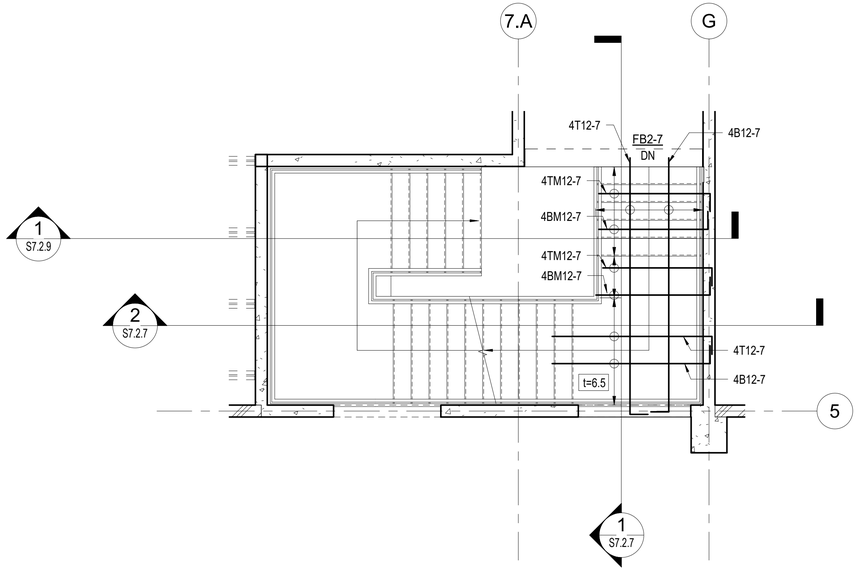


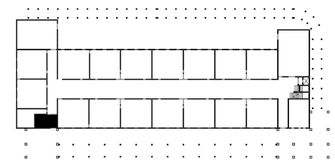
1 STAIR #2 FOUNDATION PLAN

1/4" = 1'-0" 0' 1' 2' 4' 8'



2 STAIR #2 SECOND FLOOR FRAMING PLAN

1/4" = 1'-0" 0' 1' 2' 4' 8'



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CLASSROOMS:
B - WING
STAIR #2 FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/4" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S7.1.5

Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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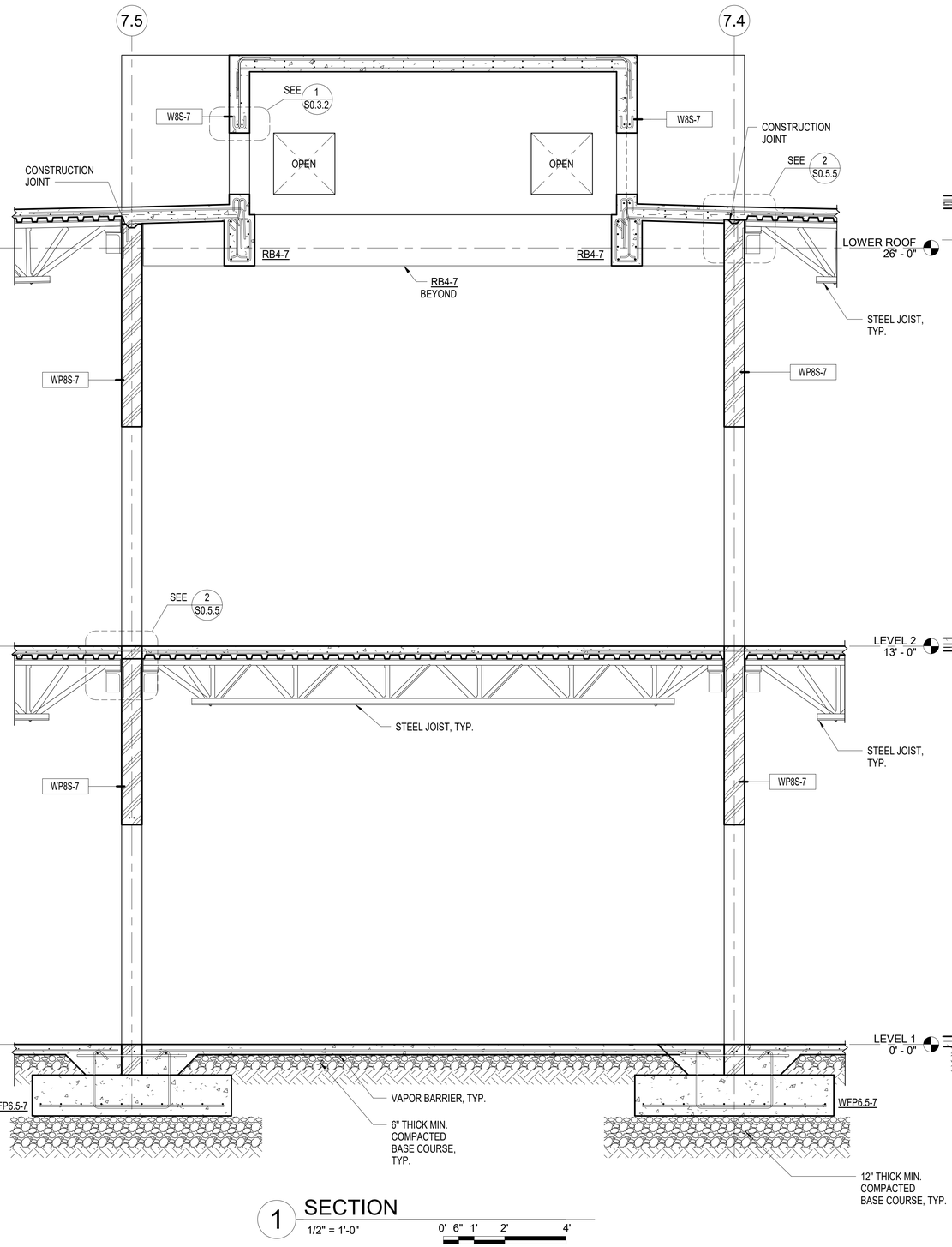
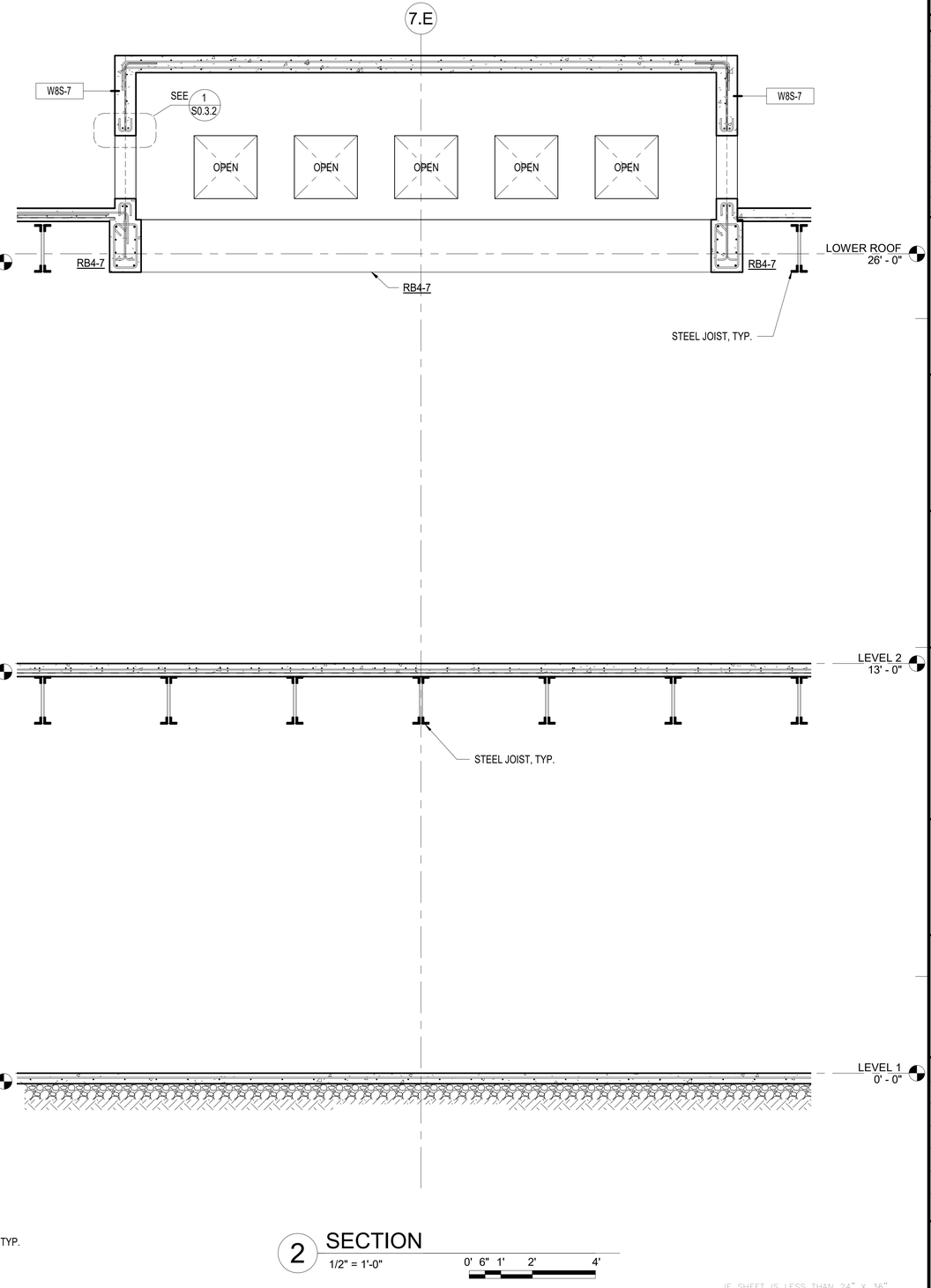


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
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Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S7.2.1
Sheet No. _____ of _____

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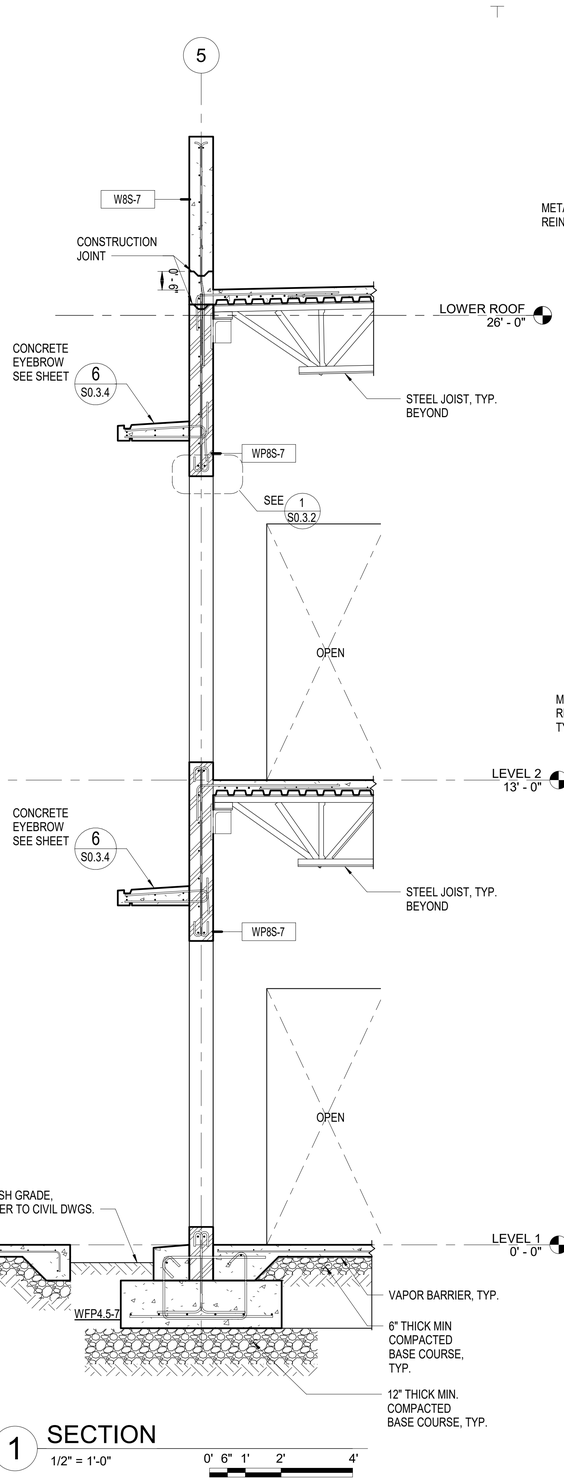

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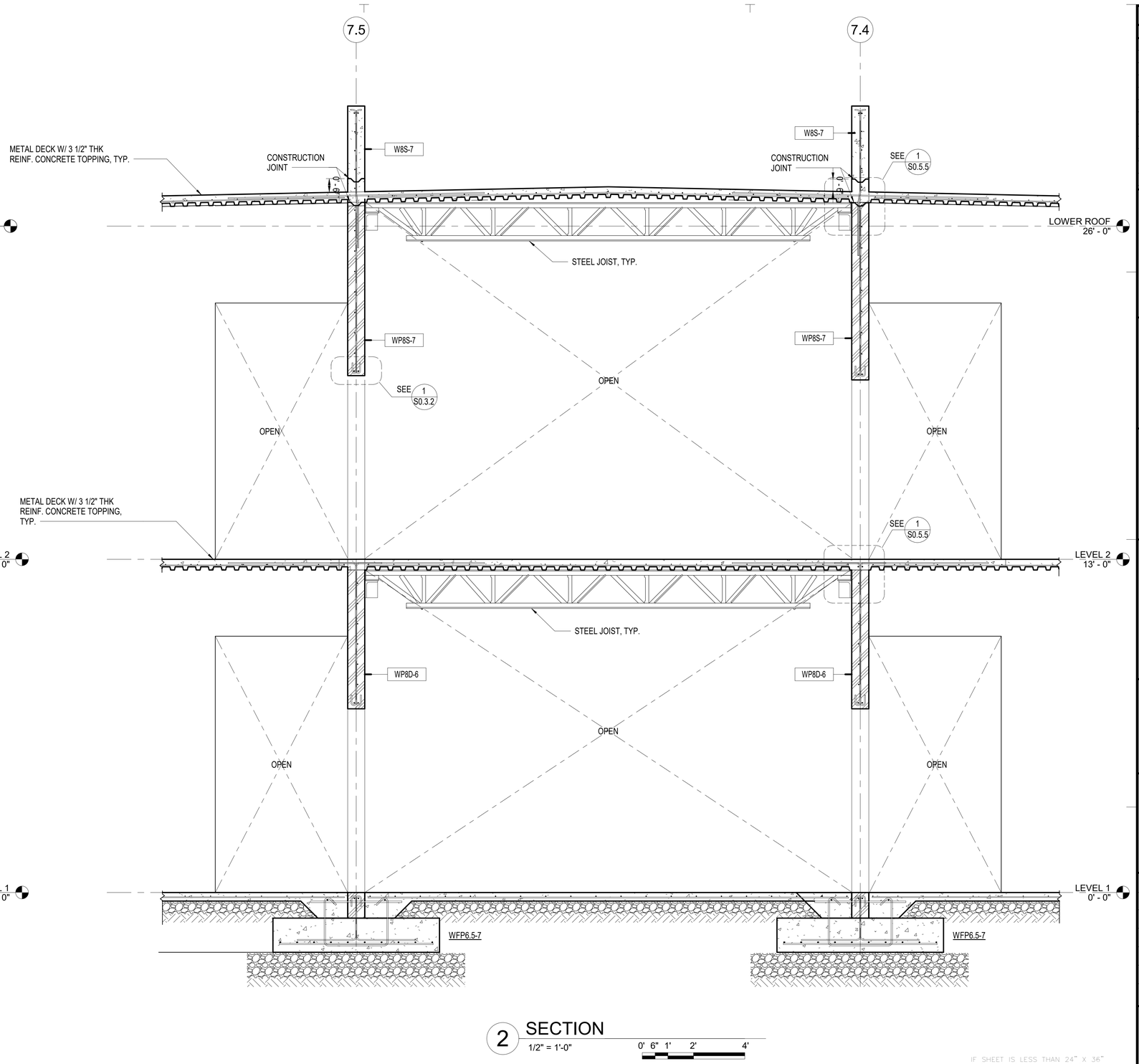

2 SECTION
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Title
CLASSROOMS:
B - WING SECTIONS
PROGRAMMING DOCUMENT

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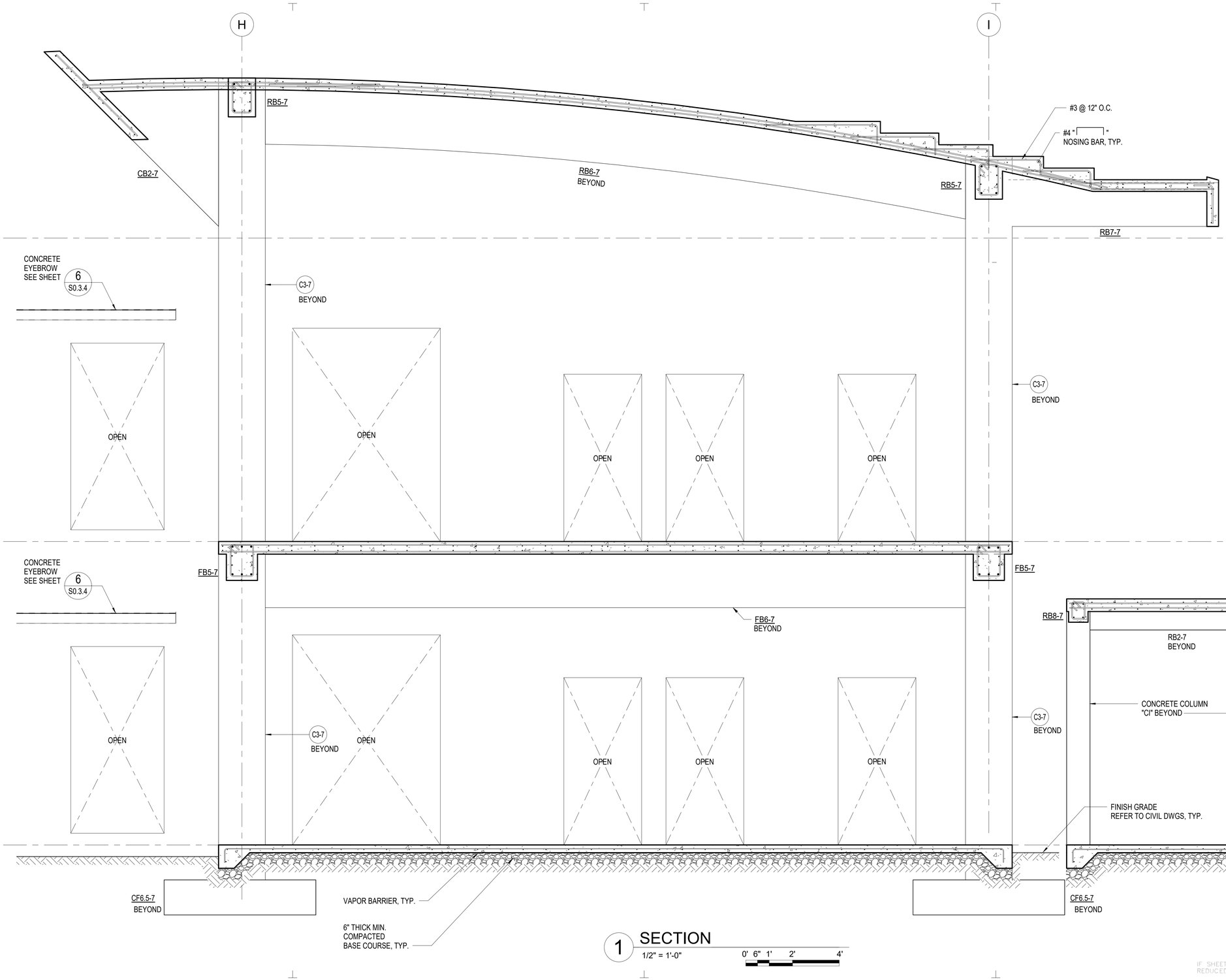
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.2.2
Sheet No. of

NOT FOR CONSTRUCTION



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REDUCED PRINT – USE GRAPHIC SCALES

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Title
CLASSROOMS:
B - WING SECTIONS
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Project	File

Drawing
S7.2.3
Sheet No. _____ of _____

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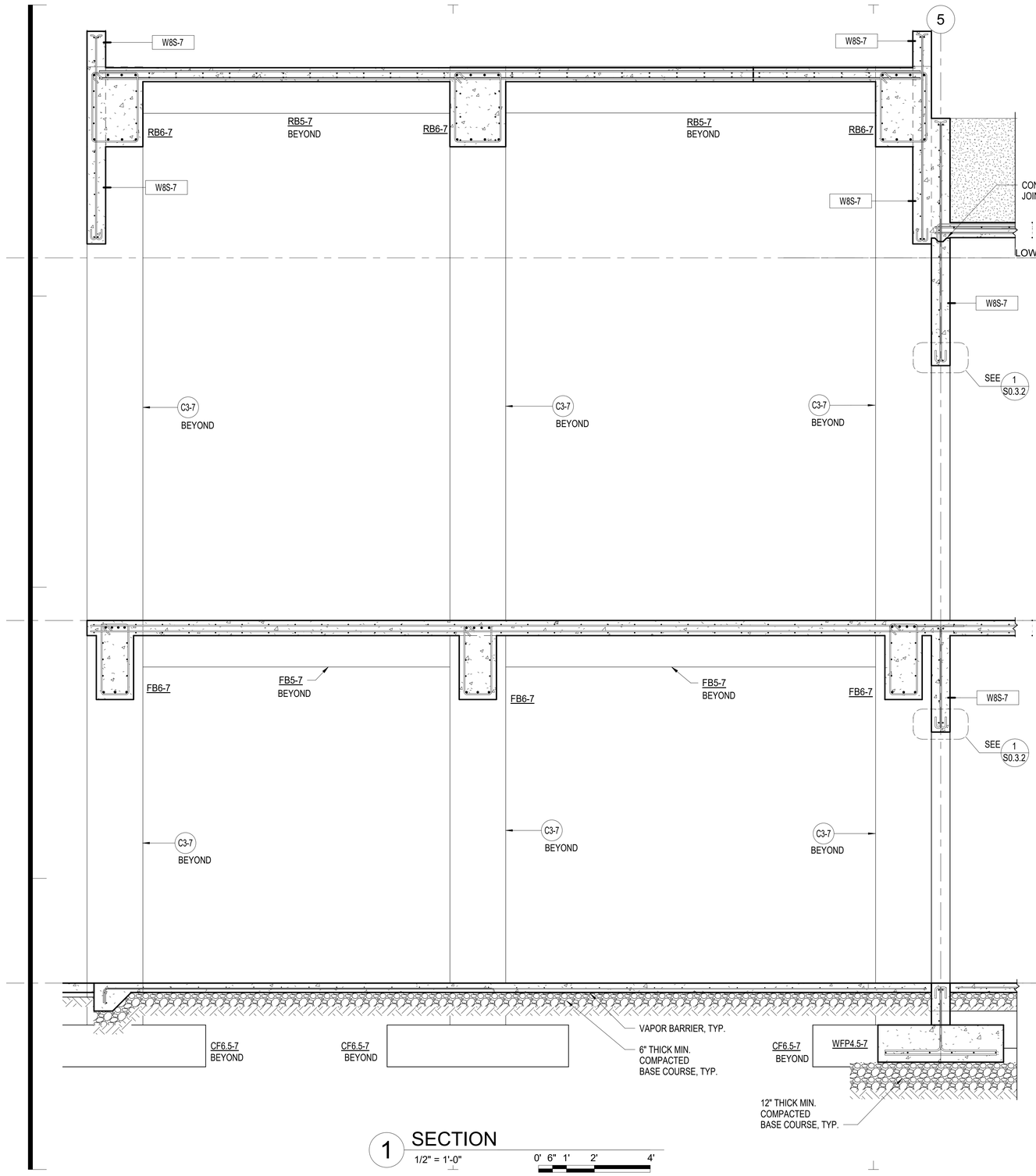

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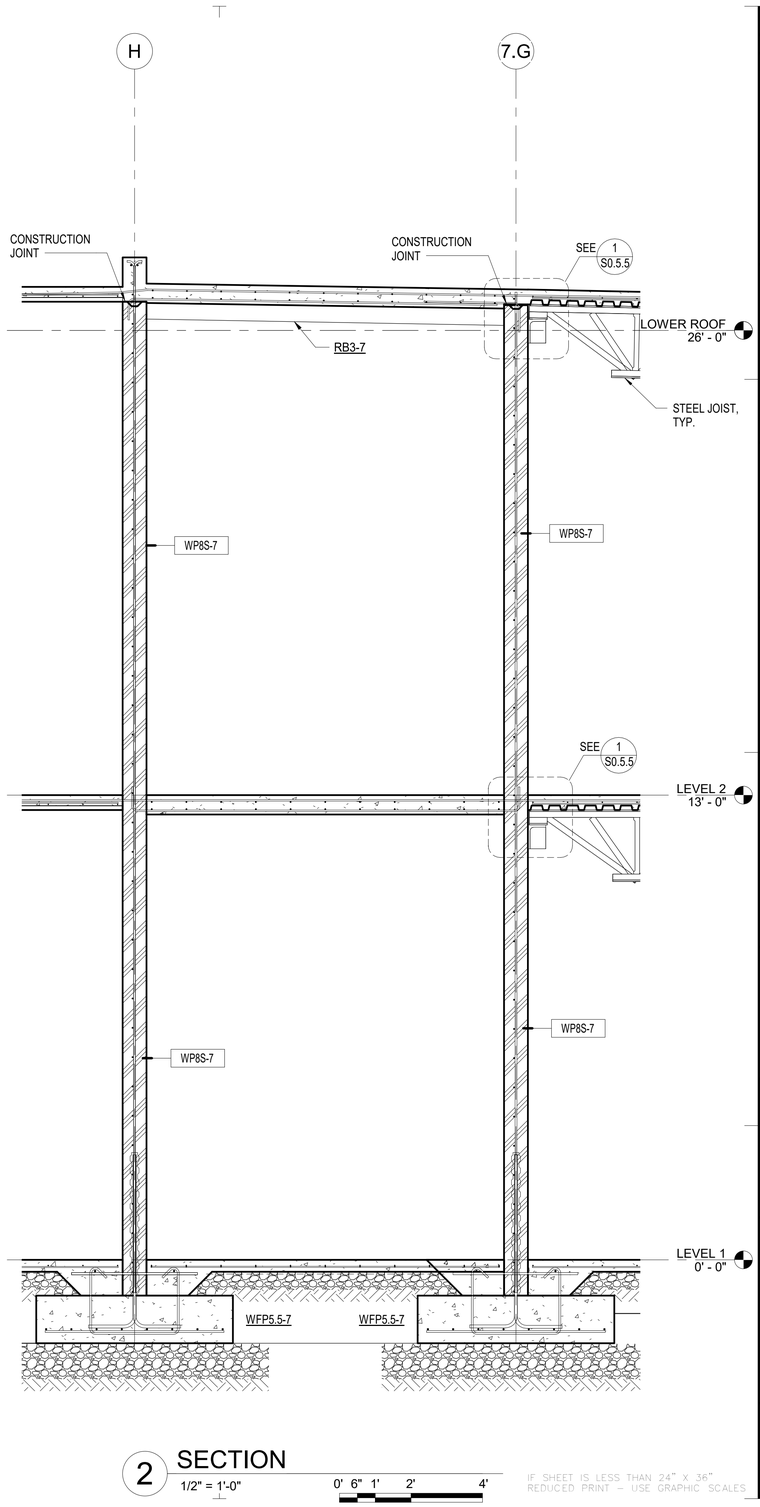

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Title
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B - WING SECTIONS
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Drawing
S7.2.4
Sheet No. _____ of _____

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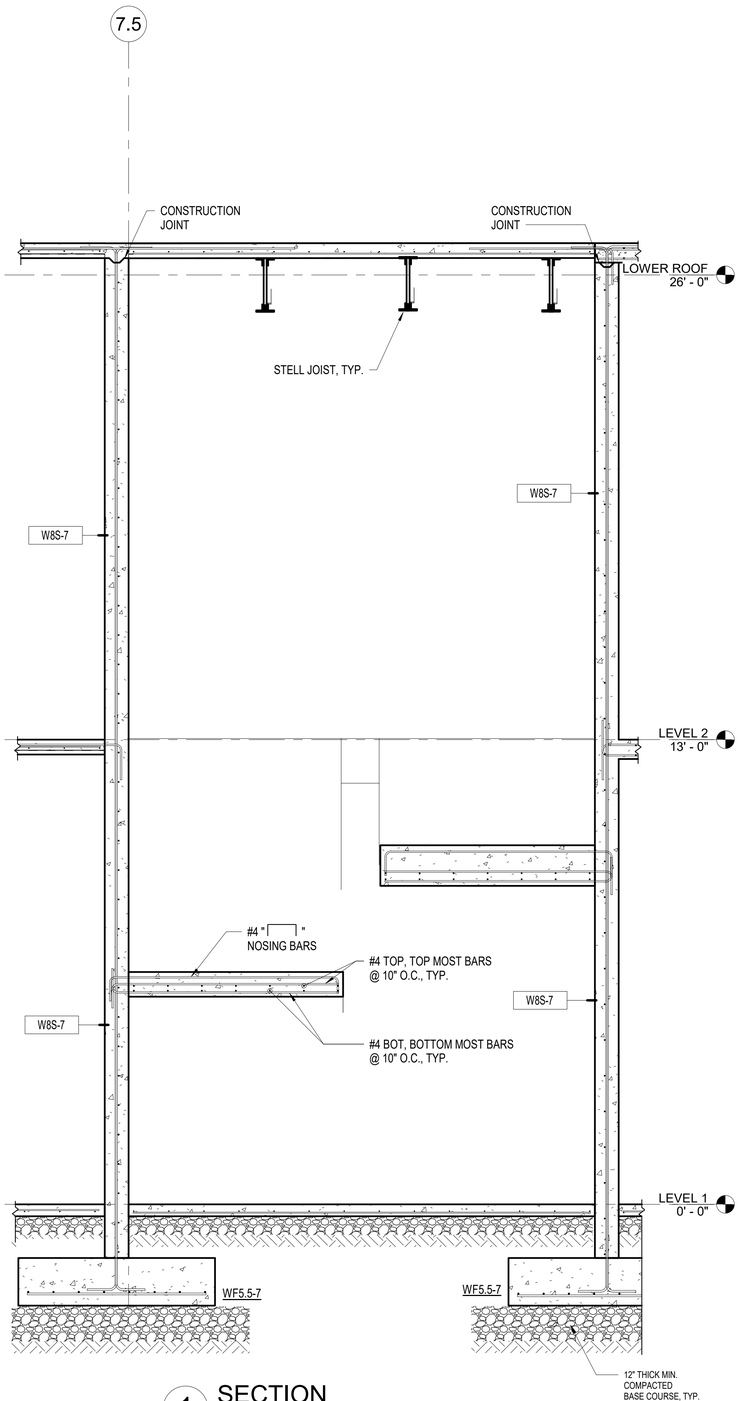

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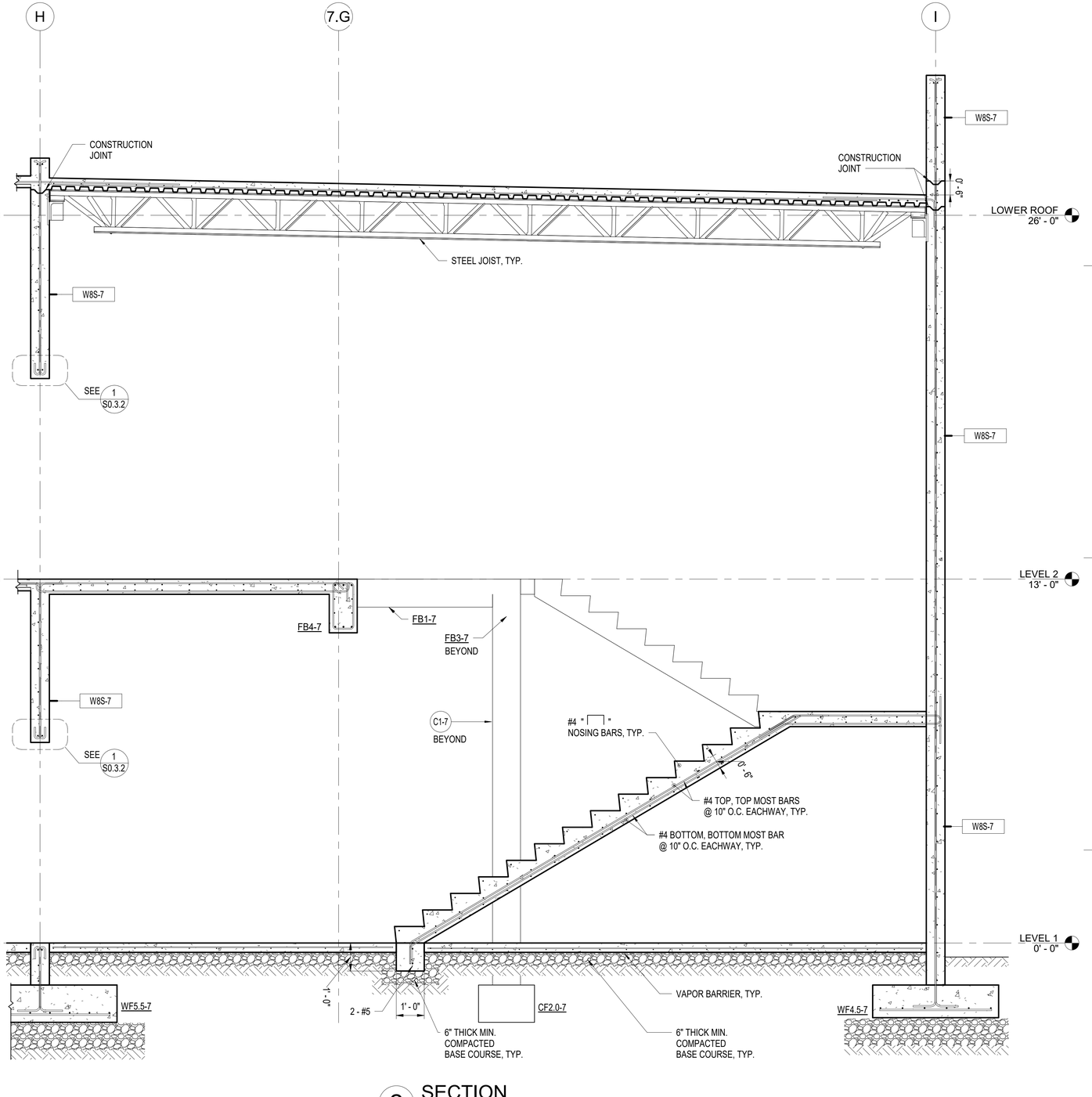

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SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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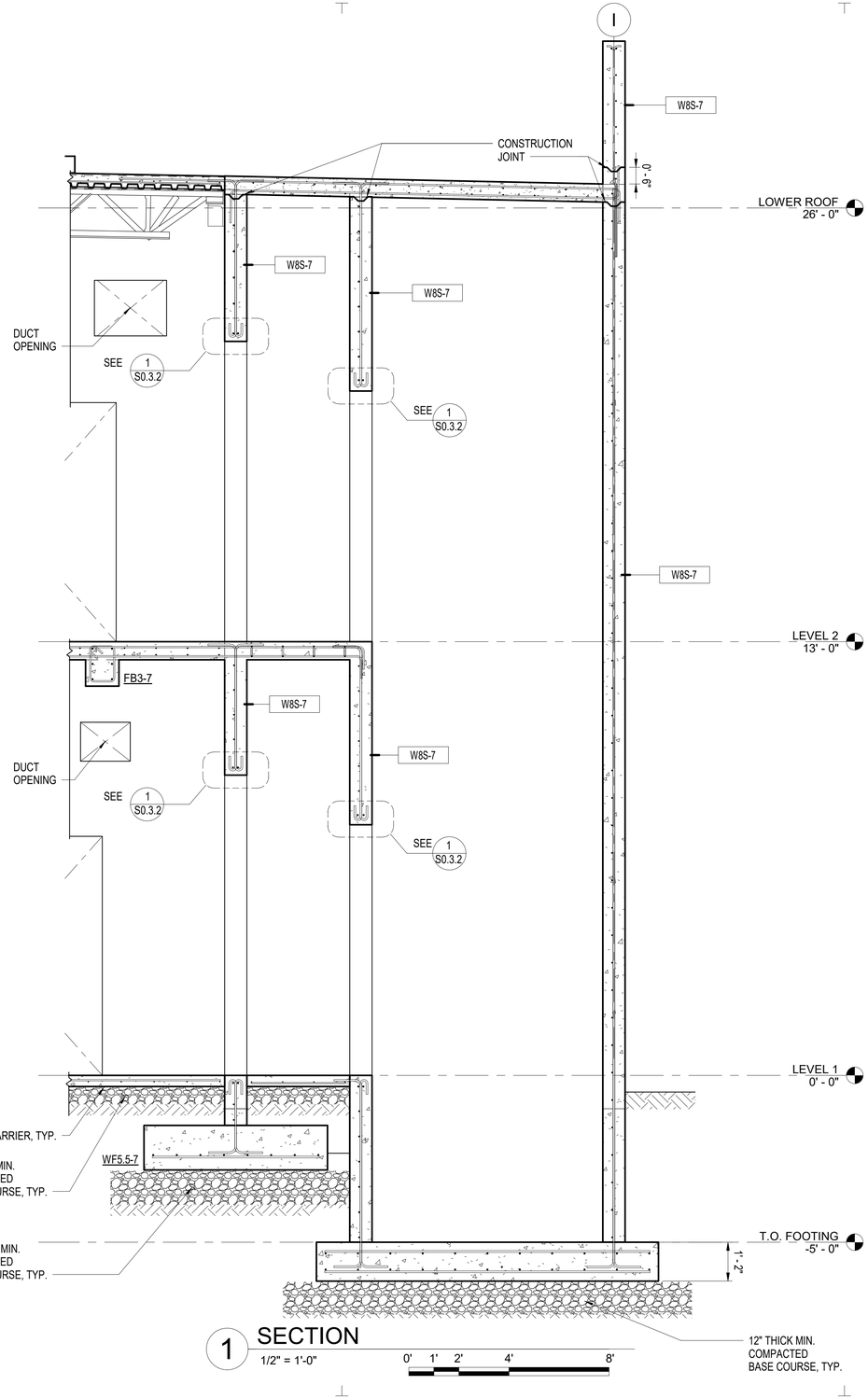
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.2.5
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 SECTION
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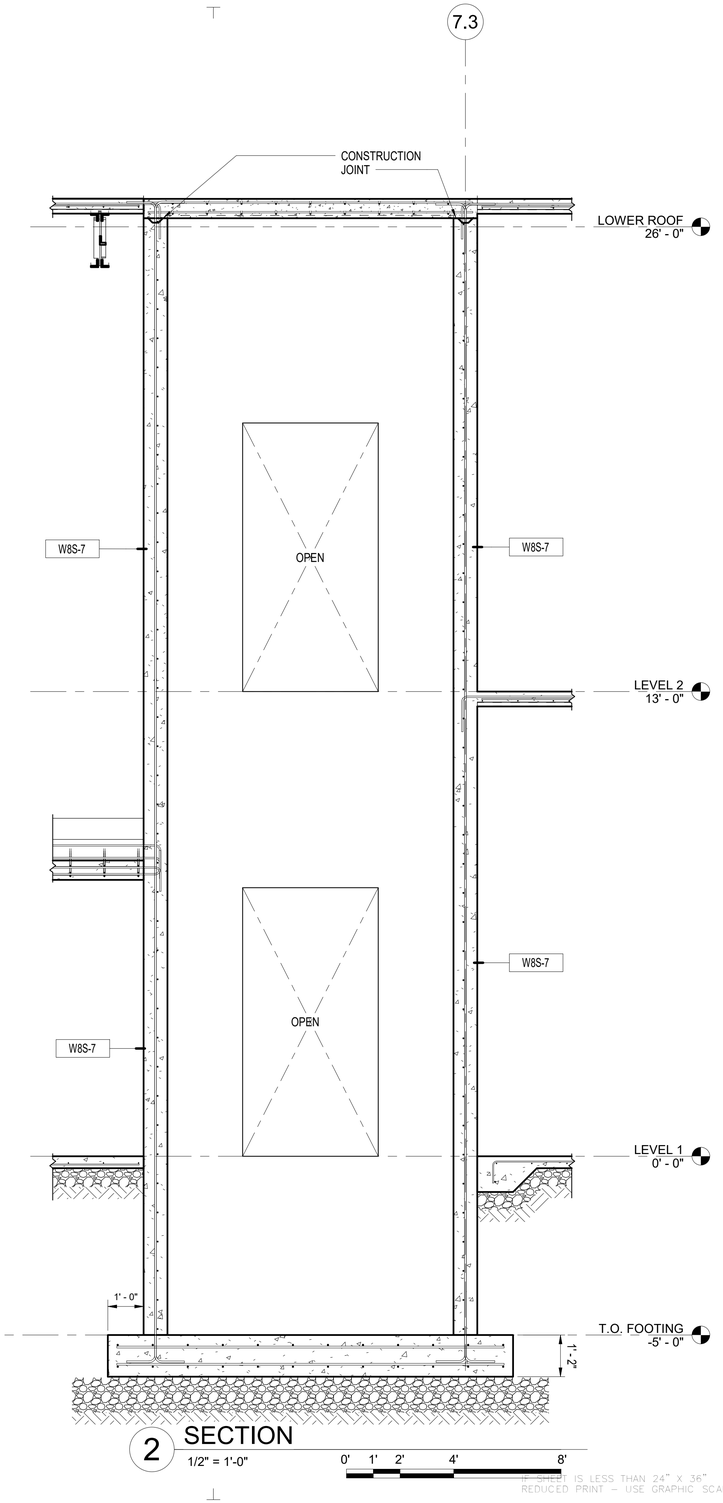
0' 1' 2' 4' 8'



2 SECTION
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Title
CLASSROOMS:
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Date:	03/31/25
Project	File

Drawing
S7.2.6
Sheet No. _____ of _____

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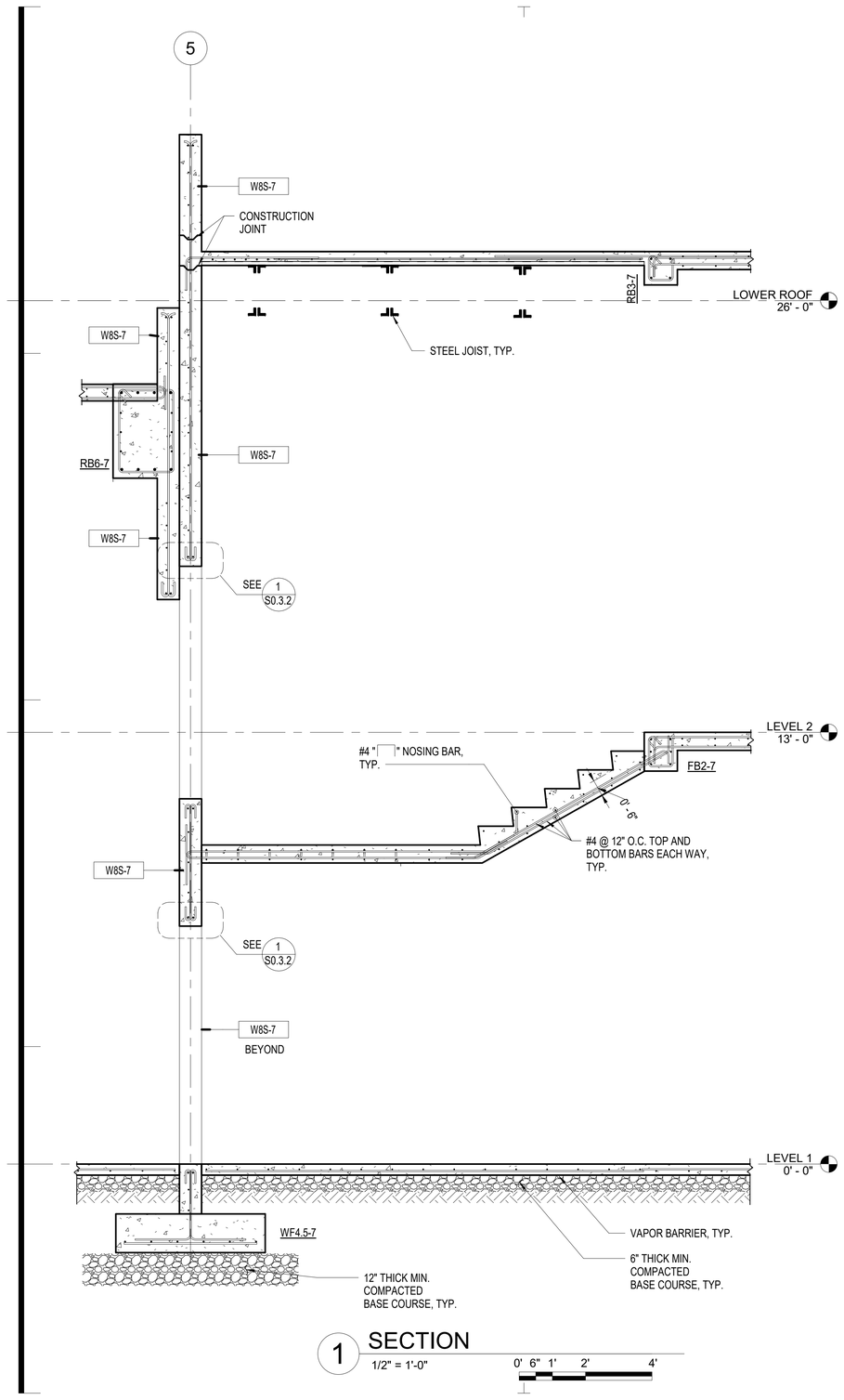
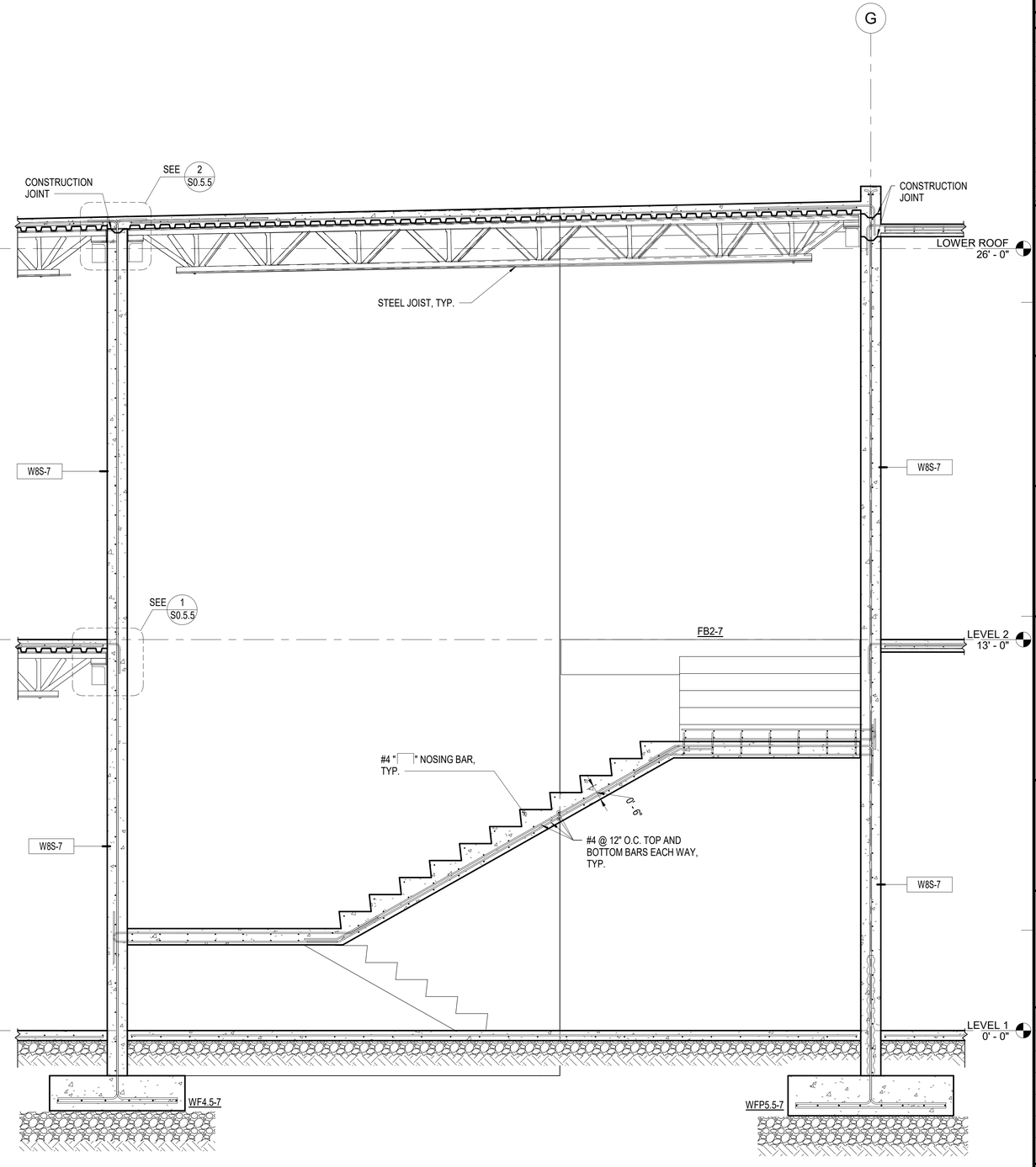


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



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Title
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Checked	TPC/CDC
Supv:	TPC
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Date:	03/31/25
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Drawing
S7.2.7
Sheet No. of

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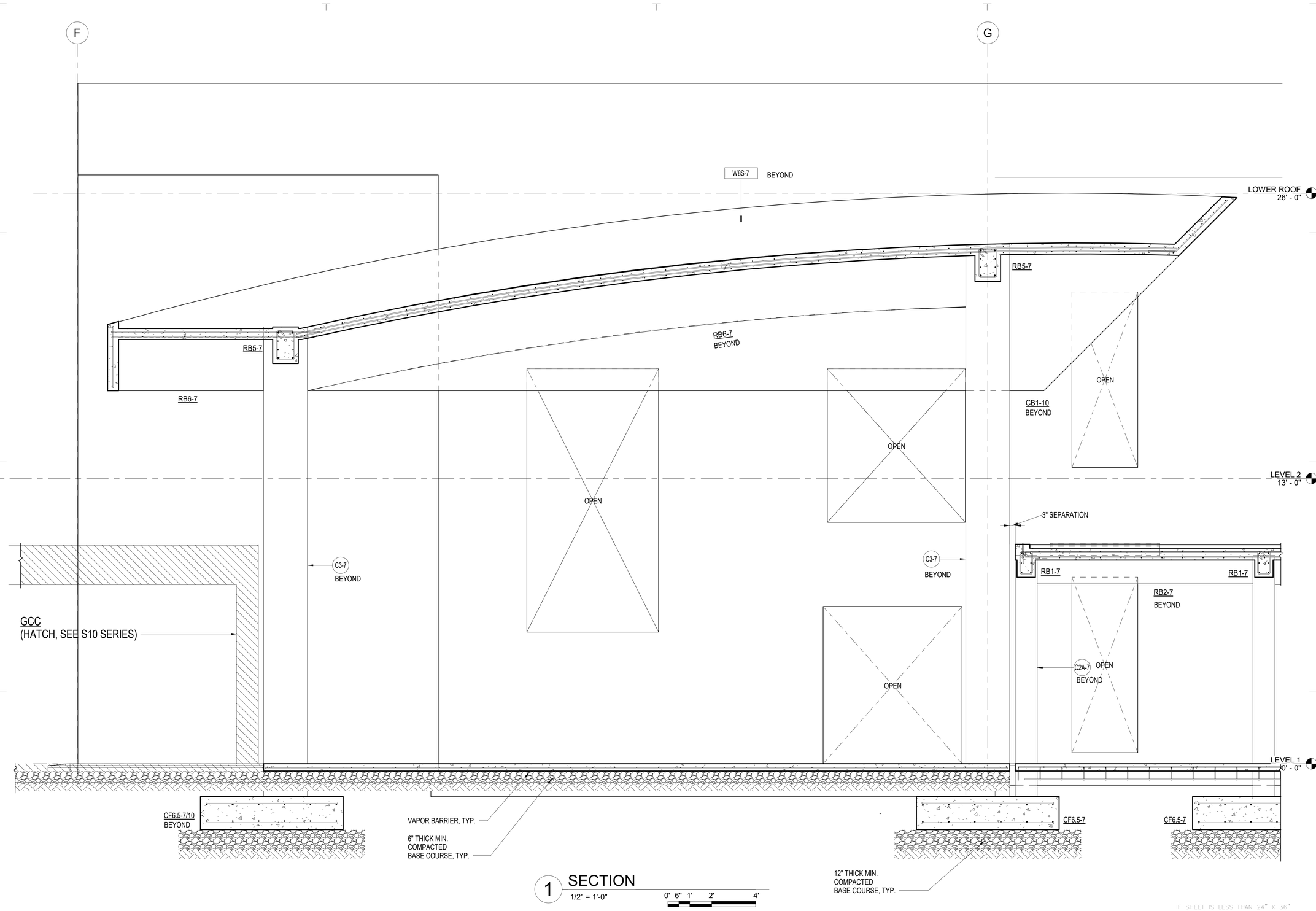

1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING SECTION
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.2.8
Sheet No. _____ of _____

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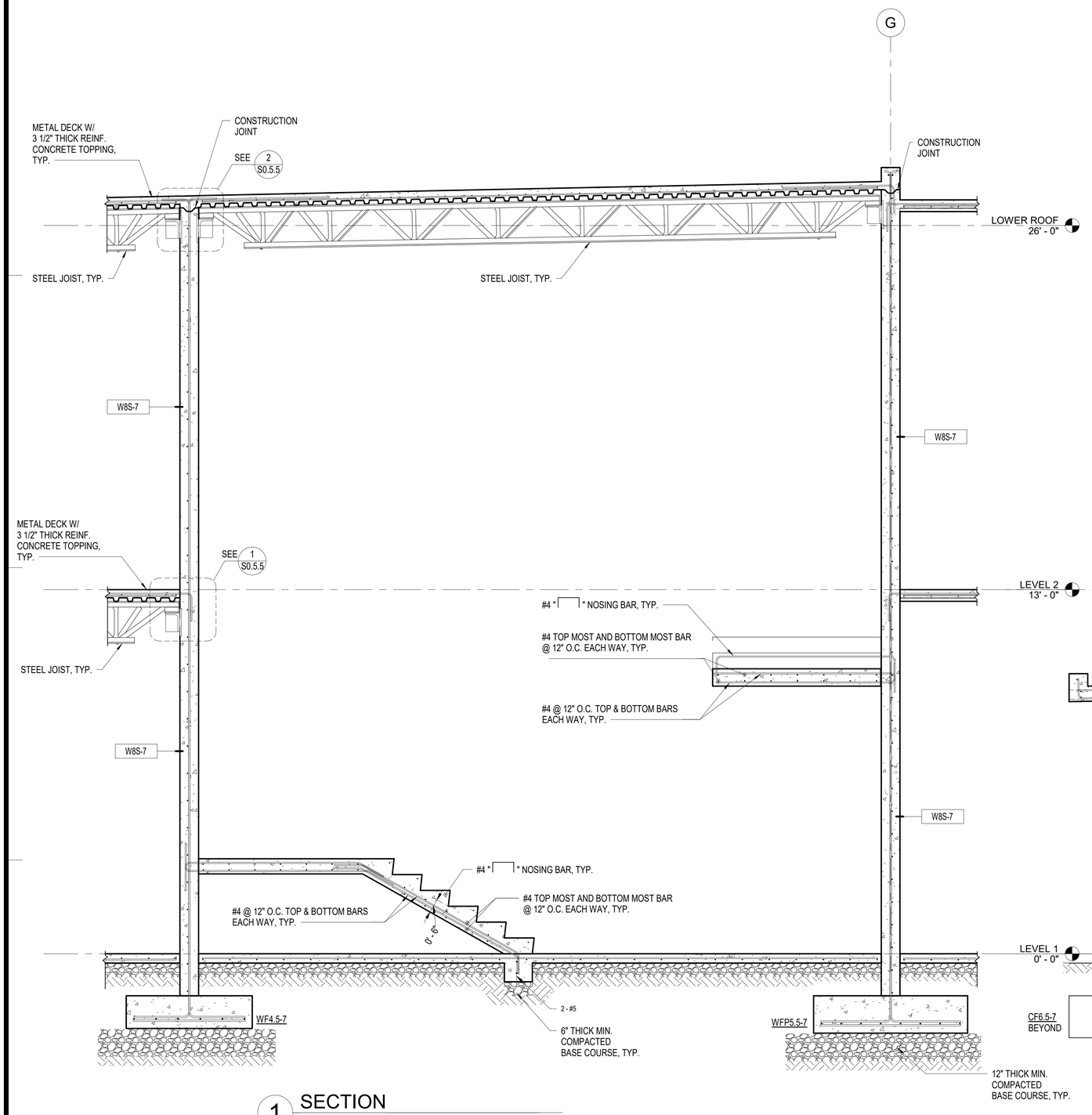

1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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Title
CLASSROOMS:
B - WING SECTIONS
PROGRAMMING DOCUMENT

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Checked	TPC/CDC
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Date:	03/31/25
Project	File

Drawing
S7.2.9
Sheet No. _____ of _____

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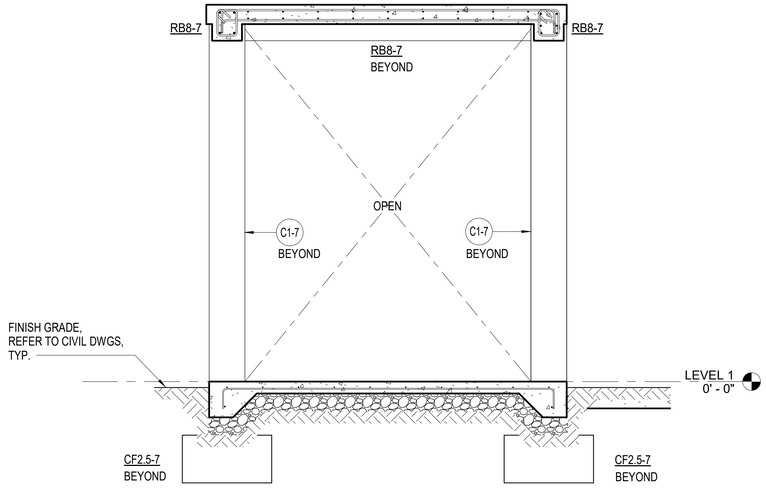

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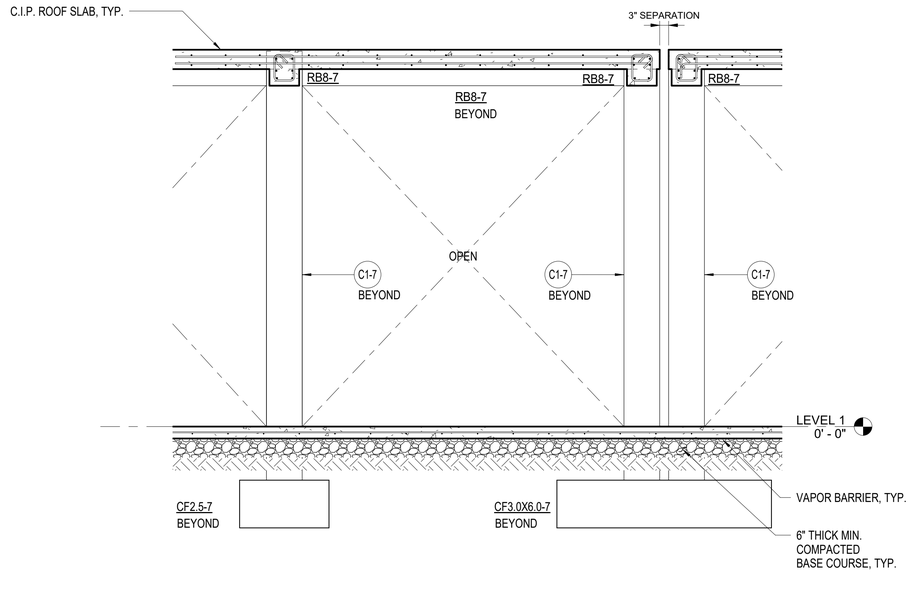

2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
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REVISION		
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.2.10
Sheet No. of

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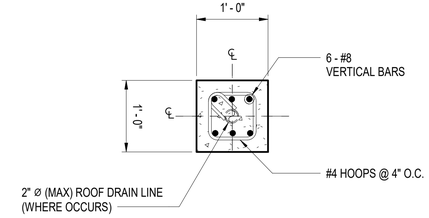

1 TYP. CONC C1-7 COLUMN DETAIL

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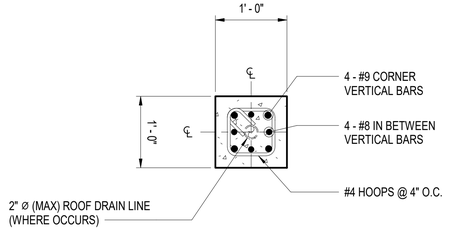

2 TYP. CONC C2-7 COLUMN DETAIL

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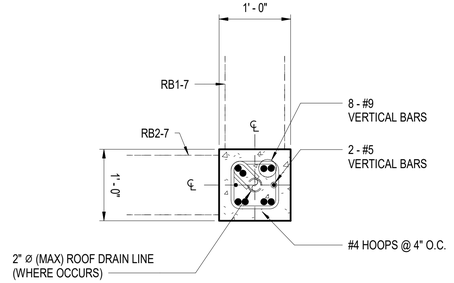

3 TYP. CONC C2A-7 COLUMN DETAIL

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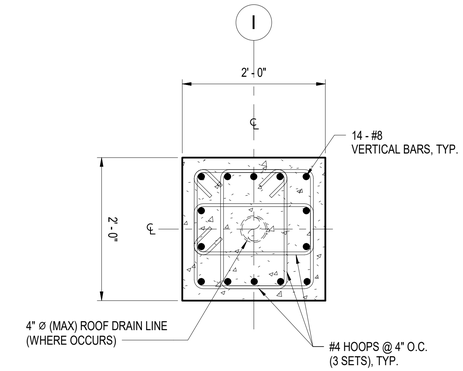
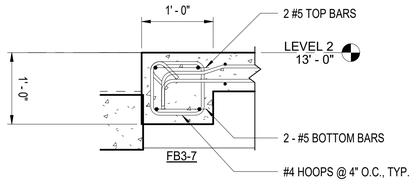


4 TYP. CONC C3-7 COLUMN DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



5 TYP. CONC. BEAM "FB1-7" DETAIL

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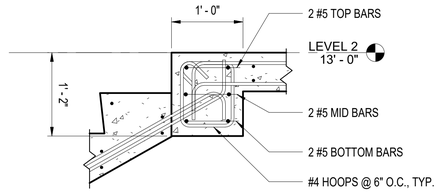

6 TYP. CONC. BEAM "FB2-7" DETAIL

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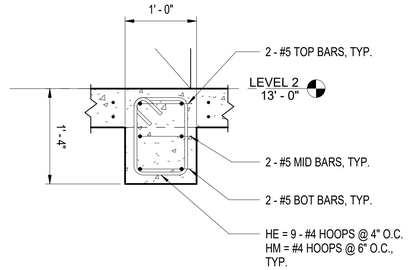

7 TYP. CONC. BEAM "FB3-7" DETAIL

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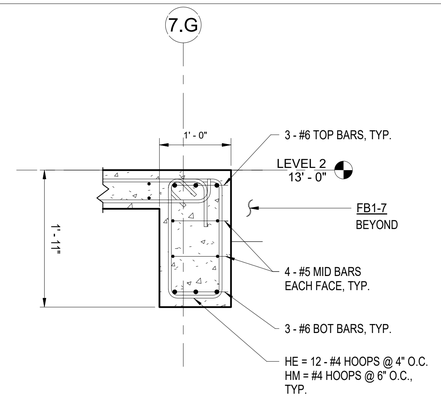

8 TYP. CONC. BEAM "FB4-7" DETAIL

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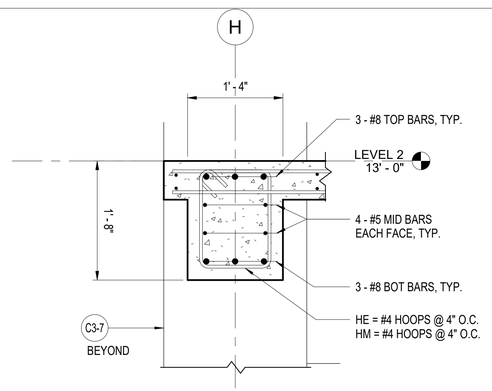

9 TYP. CONC. BEAM "FB5-7" DETAIL

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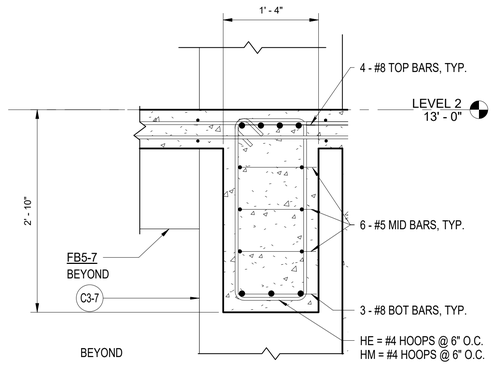

10 TYP. CONC. BEAM "FB6-7" DETAIL

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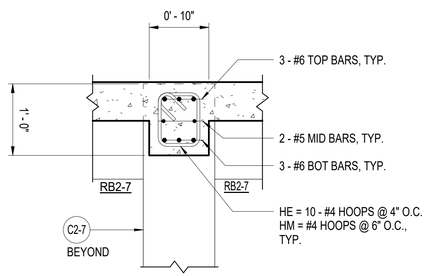

11 TYP. CONC. BEAM "RB1-7" DETAIL

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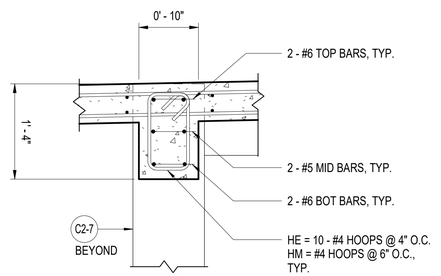

12 TYP. CONC. BEAM "RB2-7" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'

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PROGRAMMING DOCUMENT

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Checked	TPC/CDC
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Scale:	1" = 1'-0"
Date:	03/31/25
Project File	

Drawing
S7.3.1

Sheet No. of

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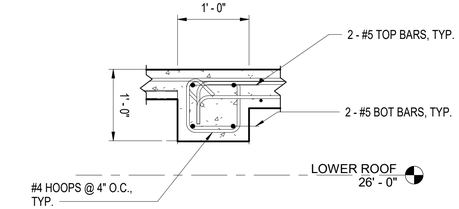
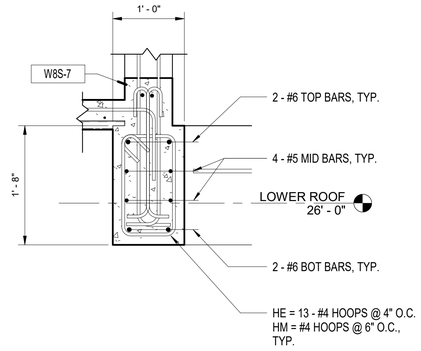


1 TYP. CONC. BEAM "RB3-7" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



2 TYP. CONC. BEAM "RB4-7" DETAIL

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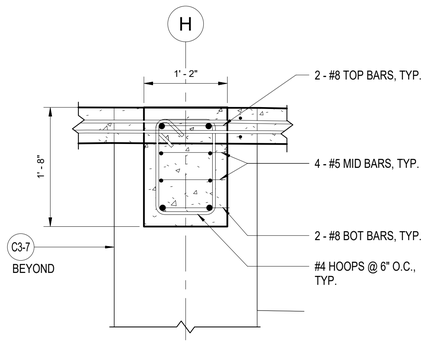

3 TYP. CONC. BEAM "RB5-7" DETAIL

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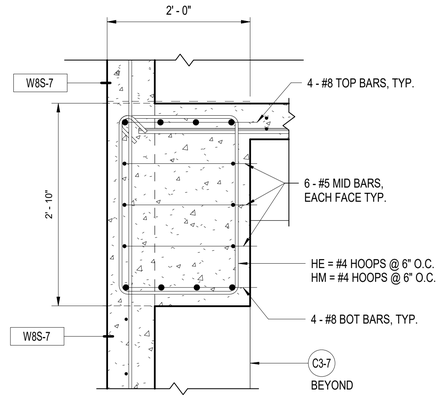

4 TYP. CONC. BEAM "RB6-7" DETAIL

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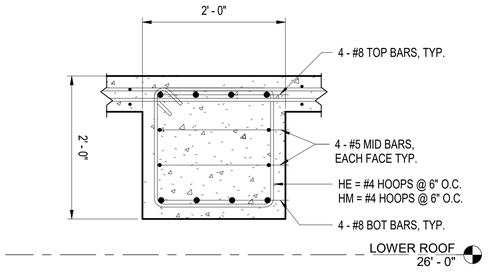

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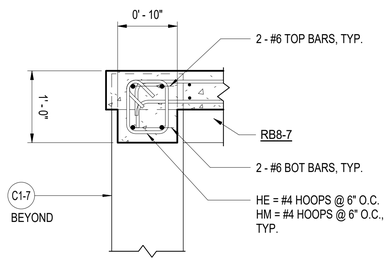

6 TYP. CONC. BEAM "RB8-7" DETAIL

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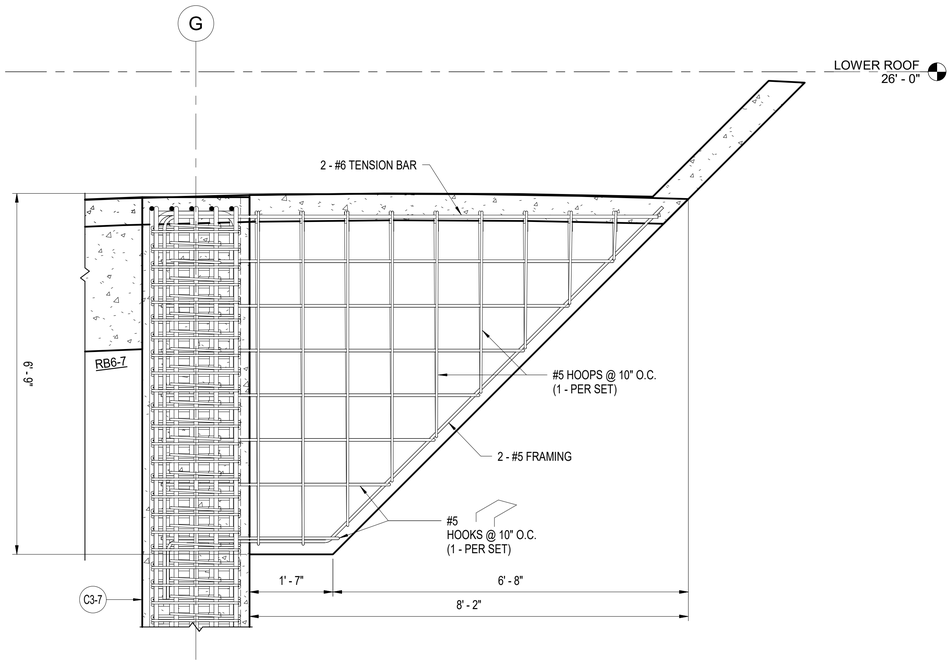

7 TYP. "CB1-7" CONC. CORBEL/BEAM DETAIL

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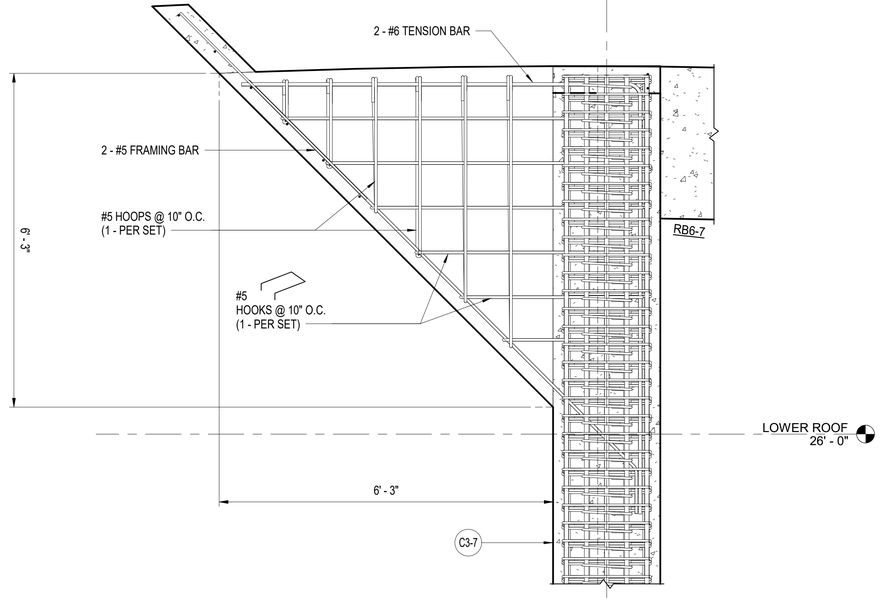

8 TYP. "CB2-7" CONC. CORBEL/BEAM DETAIL

3/4" = 1'-0" 0' 6" 1' 2' 4'

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Title
CLASSROOMS:
B - WING MISCELLANEOUS DETAIL
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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Date:	03/31/25
Project	File

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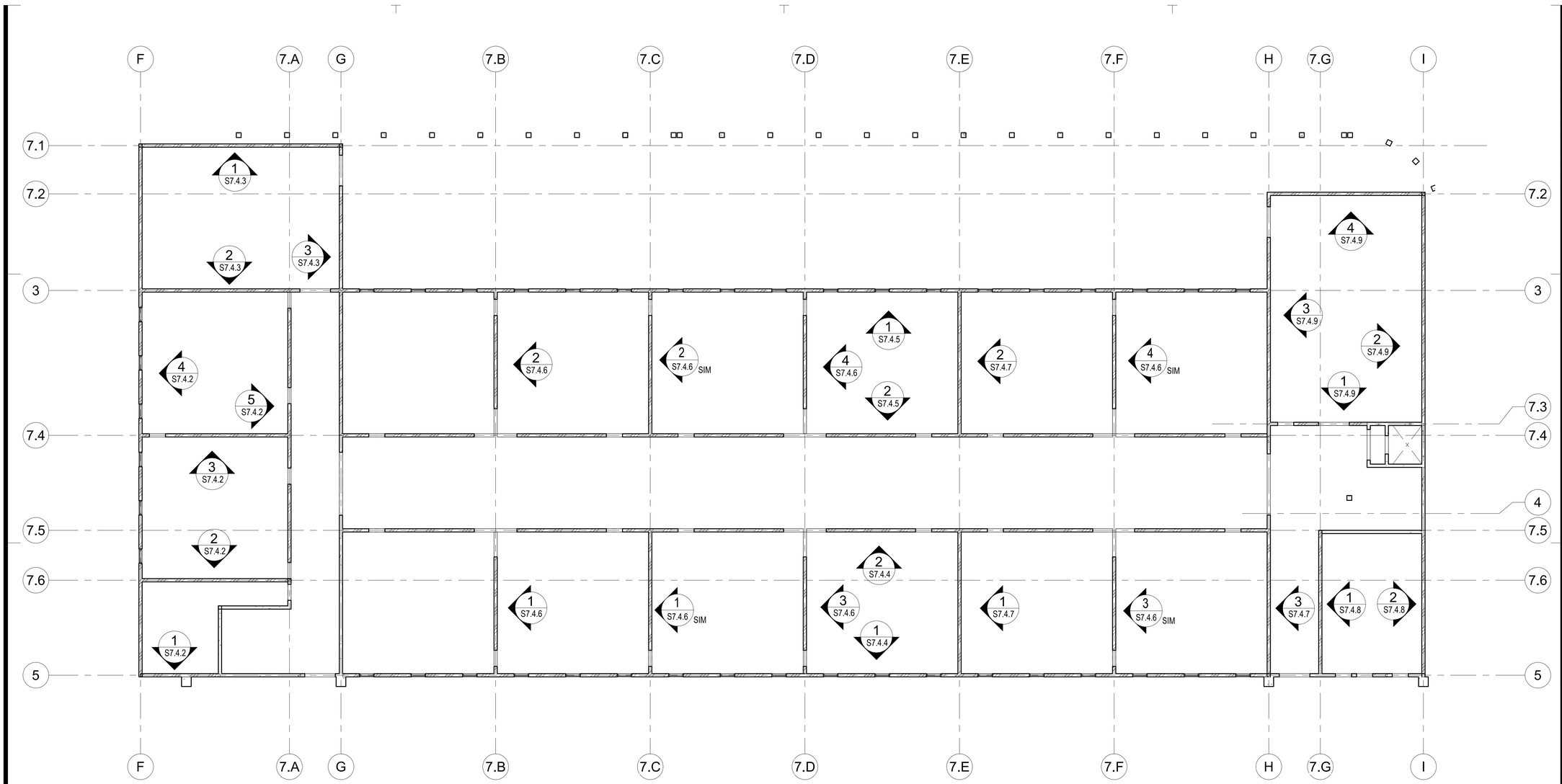

1 PRECAST WALL PANEL KEY PLAN

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SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL KEY PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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Checked	TPC/CDC
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Date:	03/31/25
Project File	

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S7.4.1
Sheet No. ____ of ____

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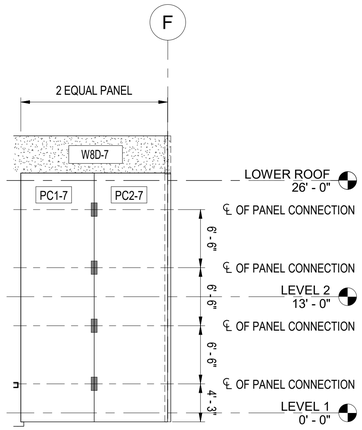
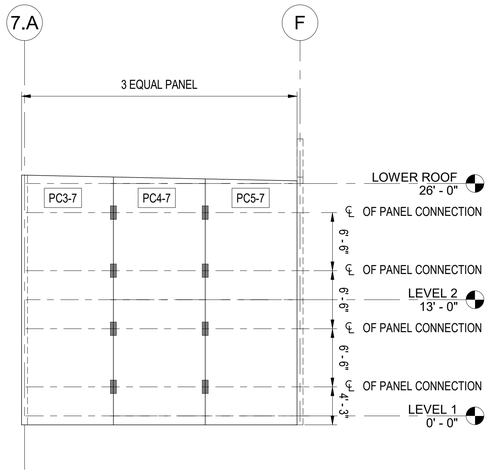


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5

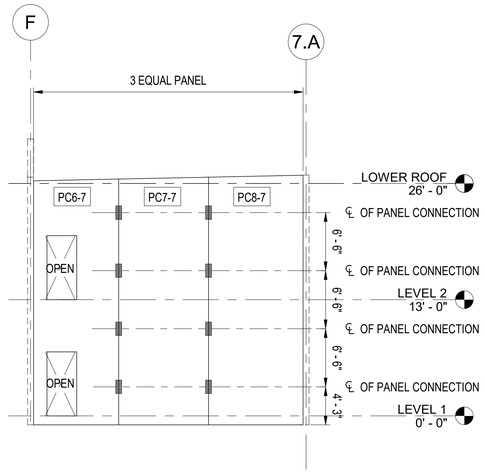
1/8" = 1'-0" 0' 2' 4' 8' 16'



NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.

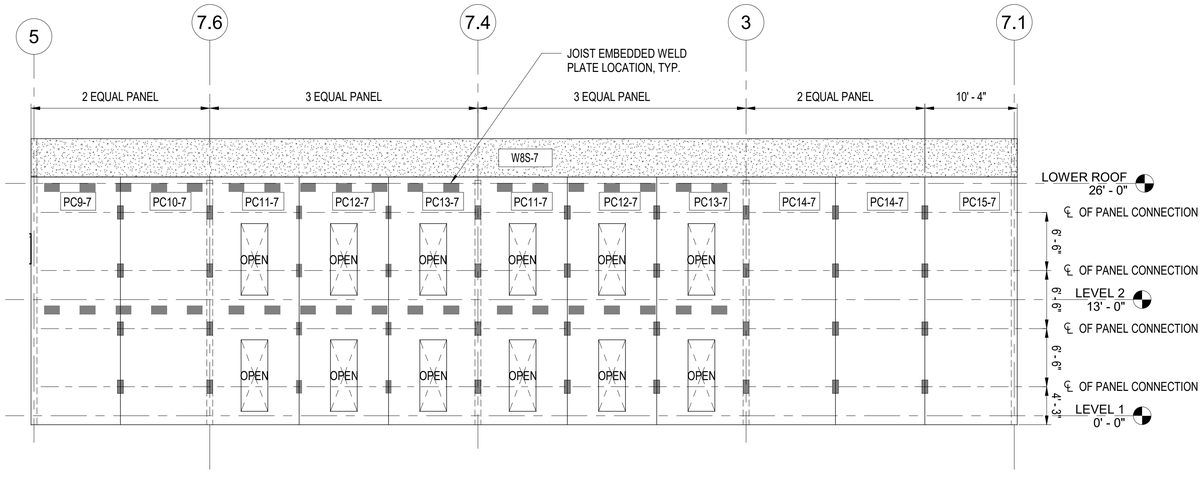
2 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.6

1/8" = 1'-0" 0' 2' 4' 8' 16'



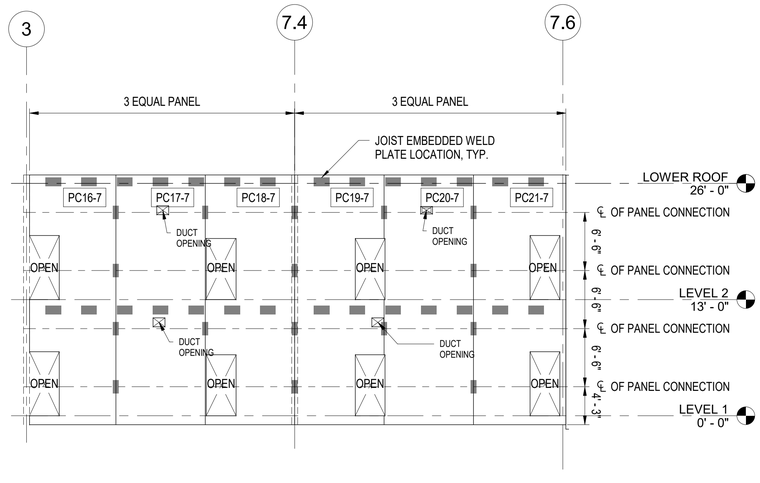
3 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.4

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRID LINE F

1/8" = 1'-0" 0' 2' 4' 8' 16'



5 WALL PANEL ASSEMBLY ALONG GRID LINE 7.A

1/8" = 1'-0" 0' 2' 4' 8' 16'

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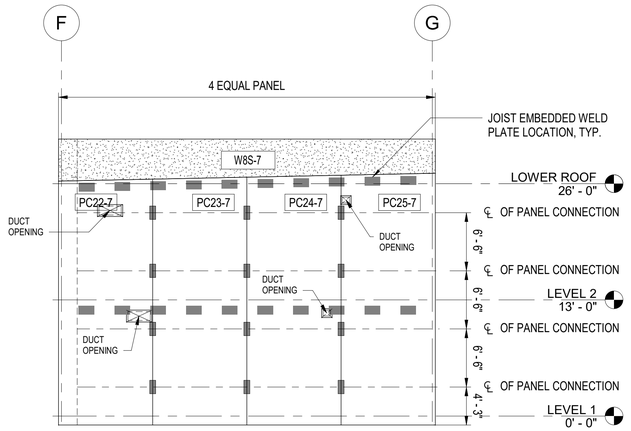
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

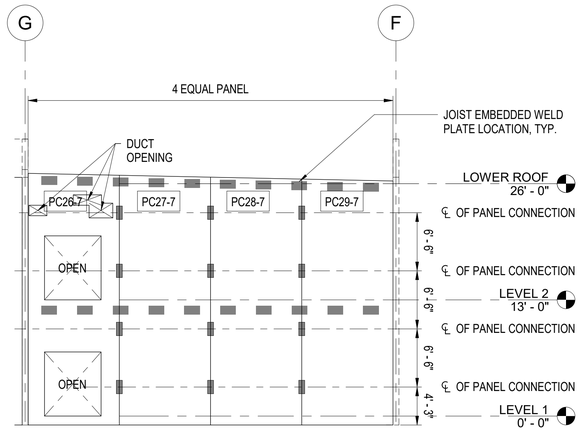
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.2
Sheet No. of



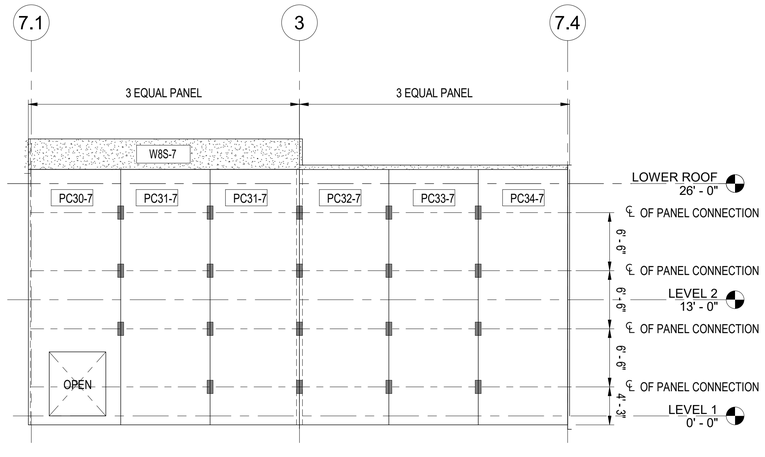
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.1

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 3

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE G

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.

REVISION

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

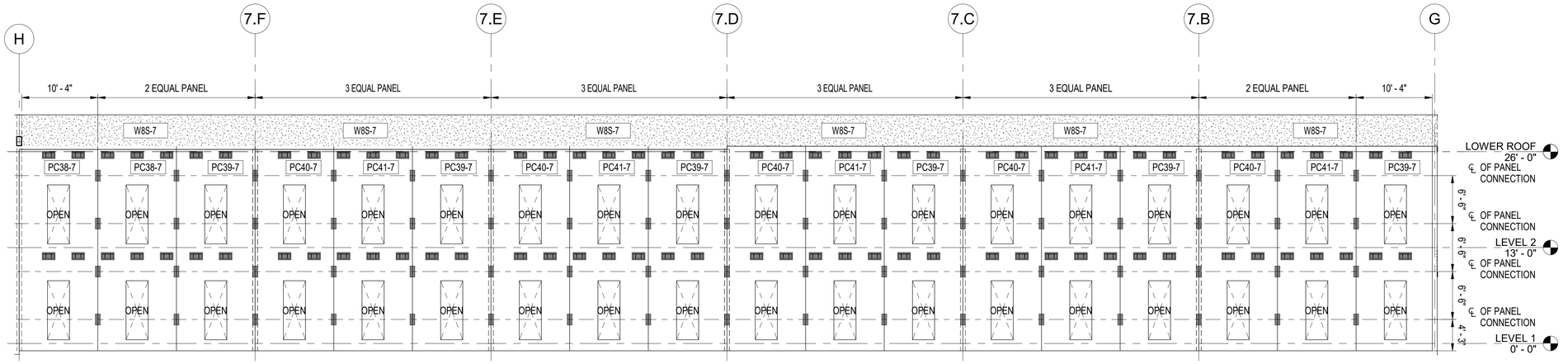
Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.3
Sheet No. of

NOT FOR CONSTRUCTION

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

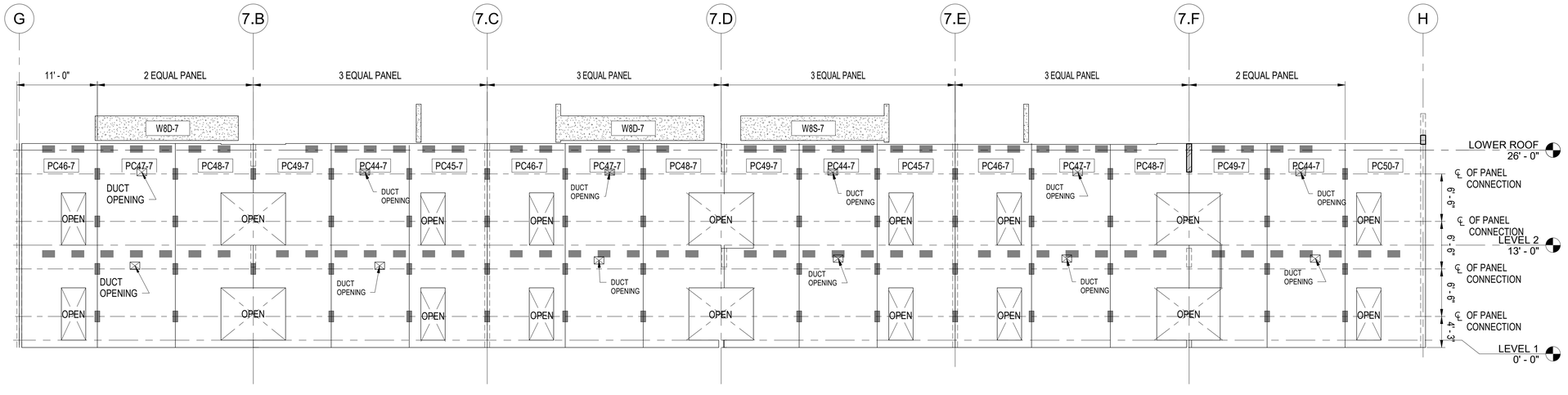


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5

1/8" = 1'-0"

0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.5

1/8" = 1'-0"

0' 2' 4' 8' 16'

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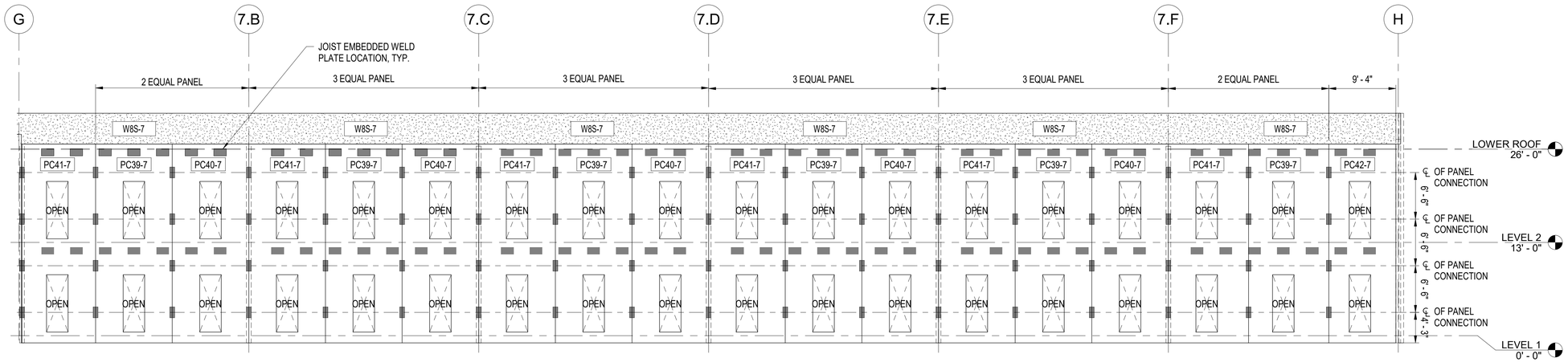
Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.4
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

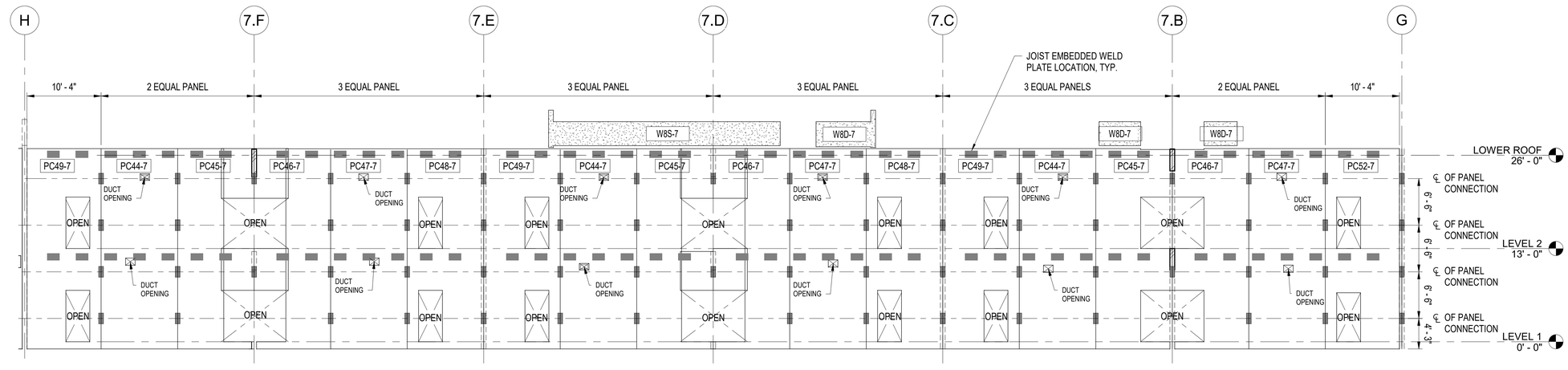


1 WALL PANEL ASSEMBLY ALONG GRID LINE 3

1/8" = 1'-0"

0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRID LINE 7.4

1/8" = 1'-0"

0' 2' 4' 8' 16'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.5
Sheet No. ____ of ____

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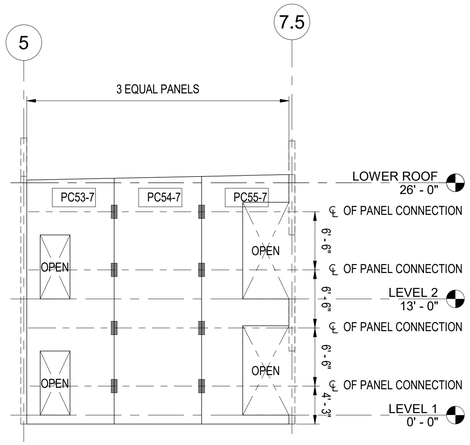
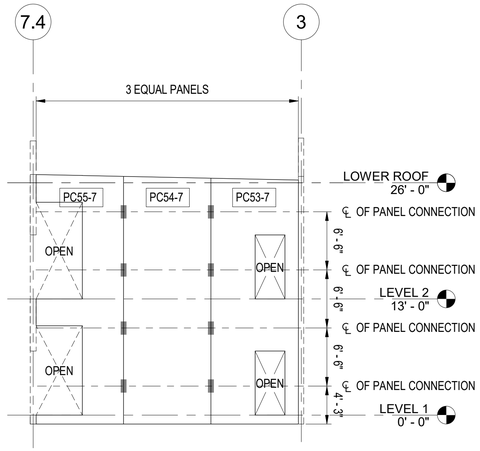


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.B

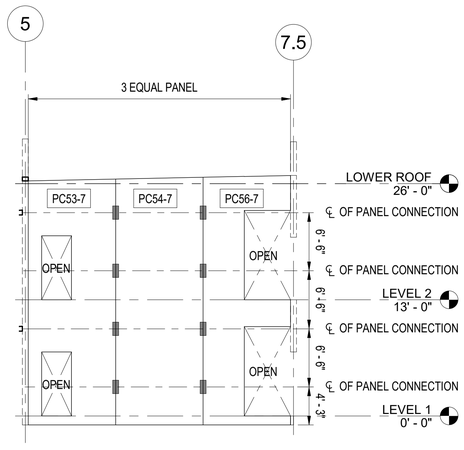
1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.B

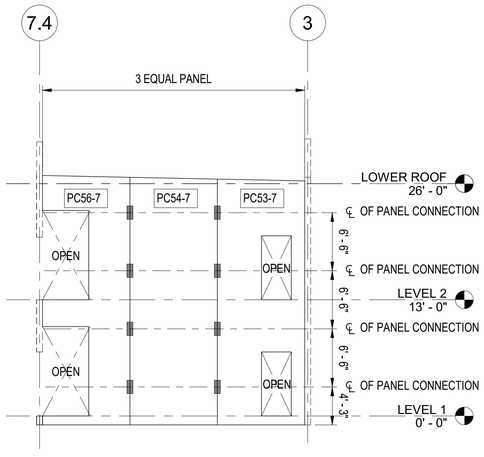
1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.D, & 7.F

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.D, & 7.F

1/8" = 1'-0" 0' 2' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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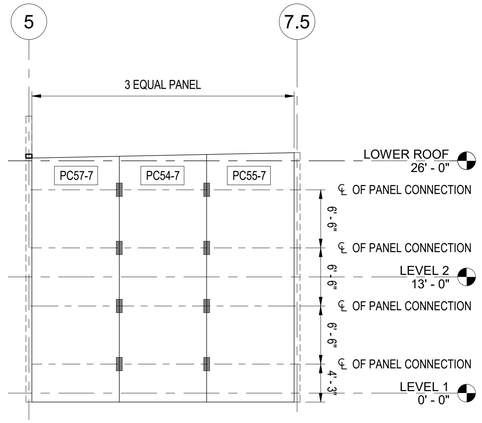
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

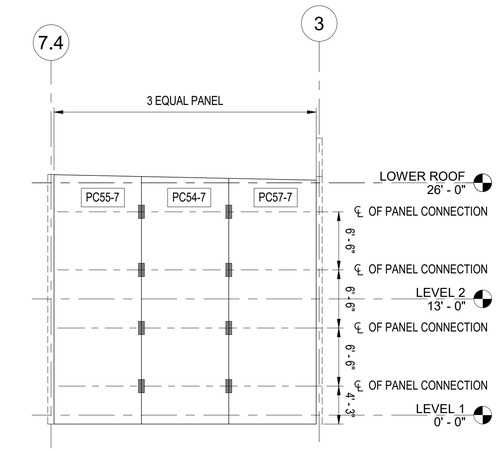
Drawing
S7.4.6
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



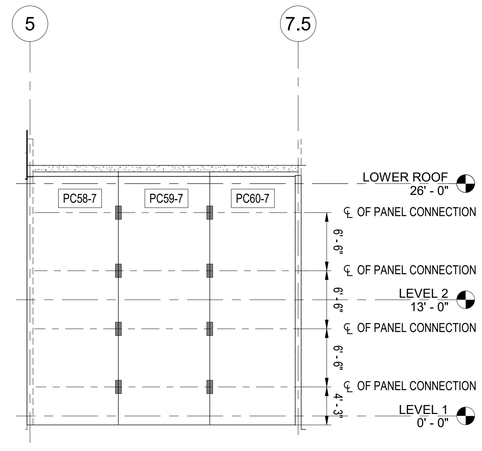
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.E

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.E

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE H

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.

REVISION		
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.7
Sheet No. of

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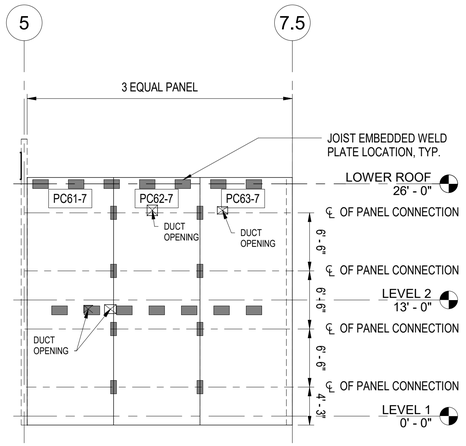
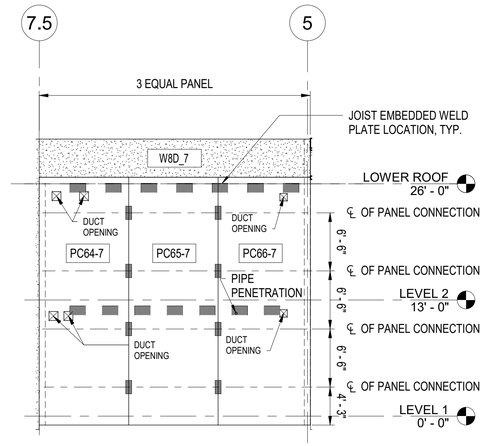


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.H

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE I

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.

REVISION		
No.	Description	Date

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.8
Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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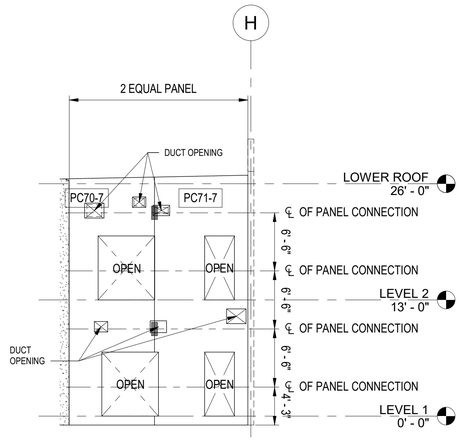
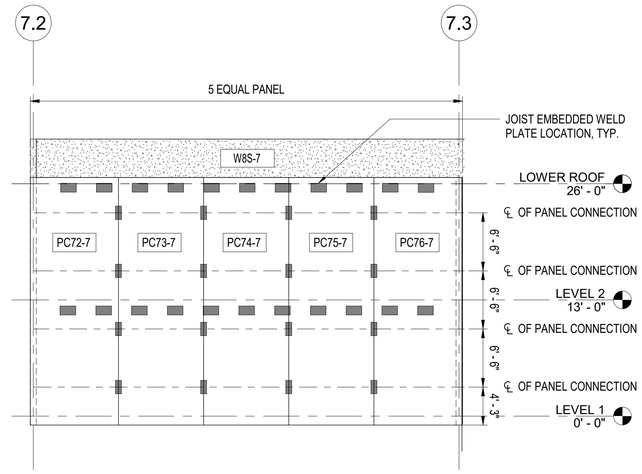


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.3

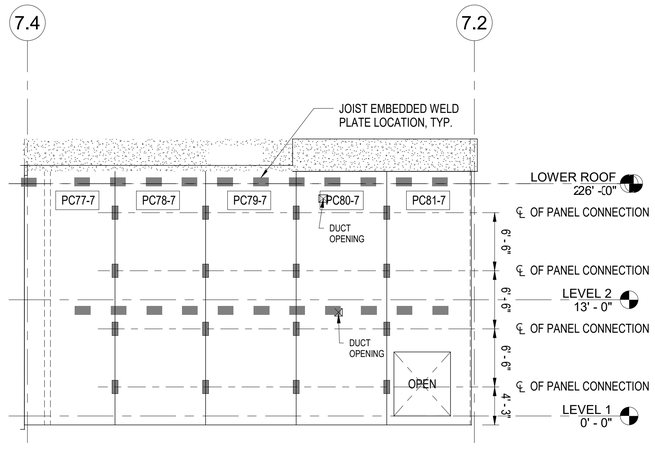
1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE I

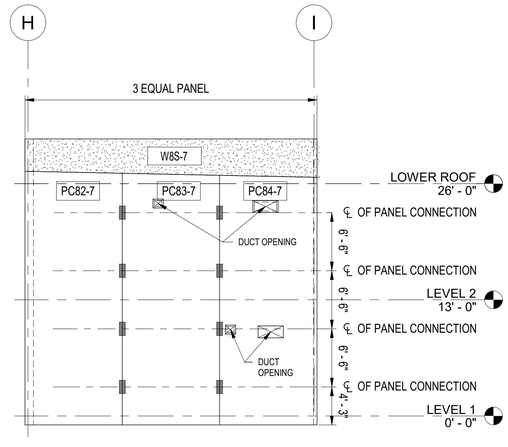
1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:
1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



3 WALL PANEL ASSEMBLY ALONG GRIDLINE H

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 7.2

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CLASSROOMS:
B - WING
WALL PRECAST PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S7.4.9
Sheet No. of

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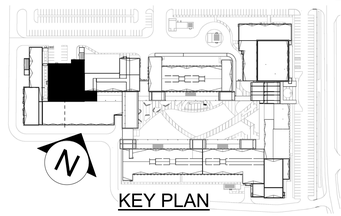
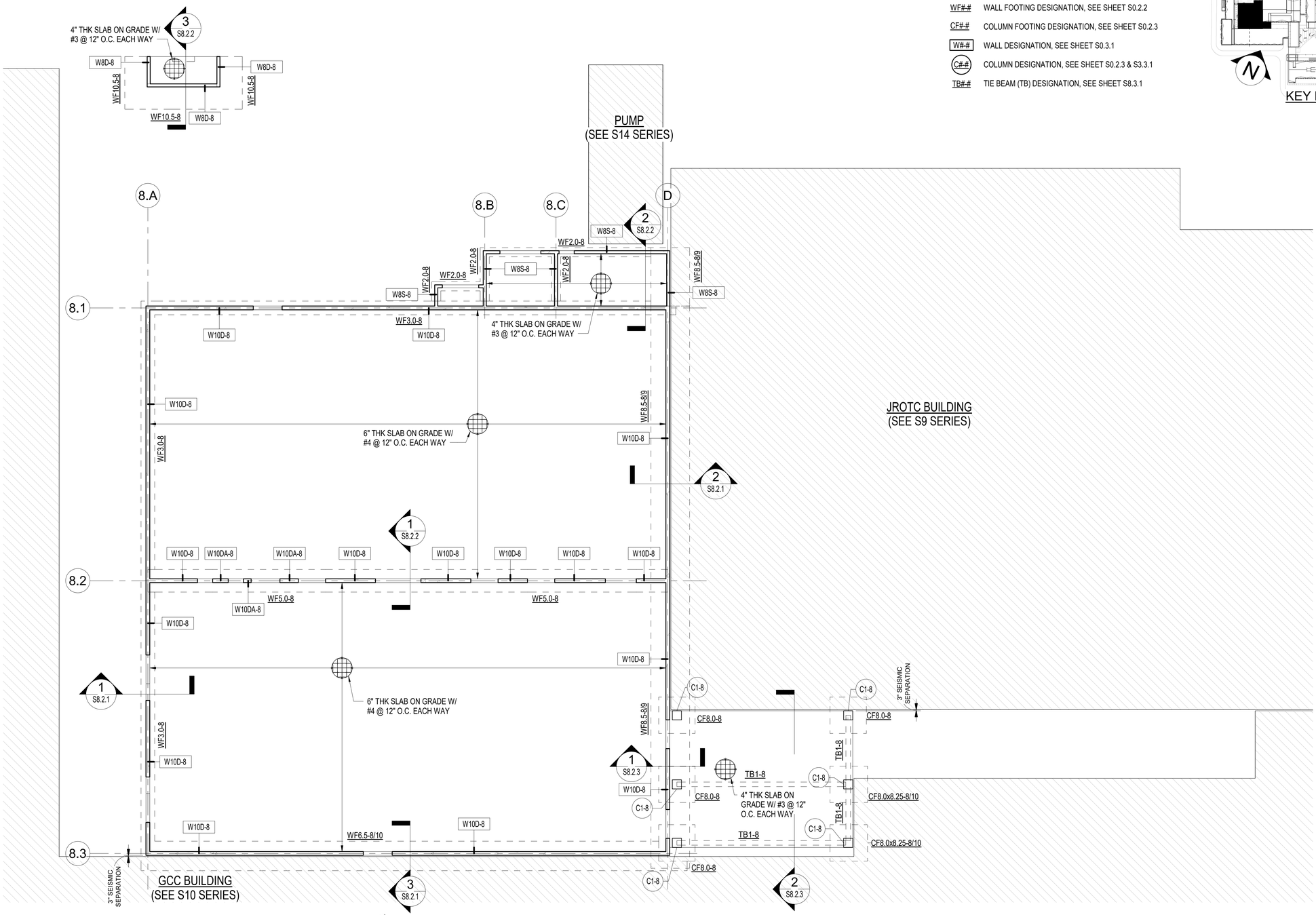
LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
CF#-#	COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
C#-#	COLUMN DESIGNATION, SEE SHEET S0.2.3 & S3.3.1
TB#-#	TIE BEAM (TB) DESIGNATION, SEE SHEET S8.3.1



KEY PLAN



N 1 FOUNDATION PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CAFETERIA

FOUNDATION PLAN

PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

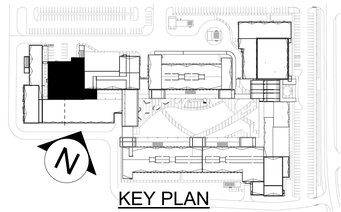
Drawing
S8.1.1

Sheet No. ____ of ____

NOT FOR CONSTRUCTION

LEGEND AND TAGS

- W#-# — WALL DESIGNATION, SEE SHEET S0.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- t=# — SLAB THICKNESS DESIGNATION (INCHES)



KEY PLAN

PUMP
(SEE S14 SERIES)

8.A 8.B 8.C D

8.1 8.2 8.3

2 S8.2.2

t=6.5"

4TM12 4TM12 4TM12 4BM12 4B12 4TM12

3' - 0" 3' - 0" 3' - 0"

W10D-8

1 S8.2.2

2 S8.2.1

JROTC BUILDING
(SEE S9 SERIES)

CONCRETE EYEBROW, SEE DETAIL 6 / S0.3.4, TYP.

1 S8.2.1

3" SEISMIC SEPARATION

RB2-8 RB3-8 4B12 4BM12 4TM12 t=6.5" RB3-8 4TM12 RB1-8 4TM12 4' - 0" 4' - 0" RB2-8

1 S8.2.3

2 S8.2.3

3" SEISMIC SEPARATION

GCC BUILDING
(SEE S10 SERIES)

3 S8.2.1

N

1 LOWER ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

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SIMON SANCHEZ HIGH SCHOOL

Title
CAFETERIA
LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

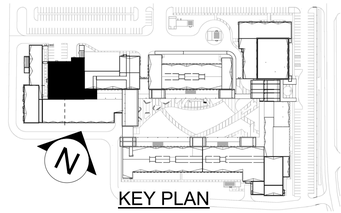
Drawing
S8.1.2
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

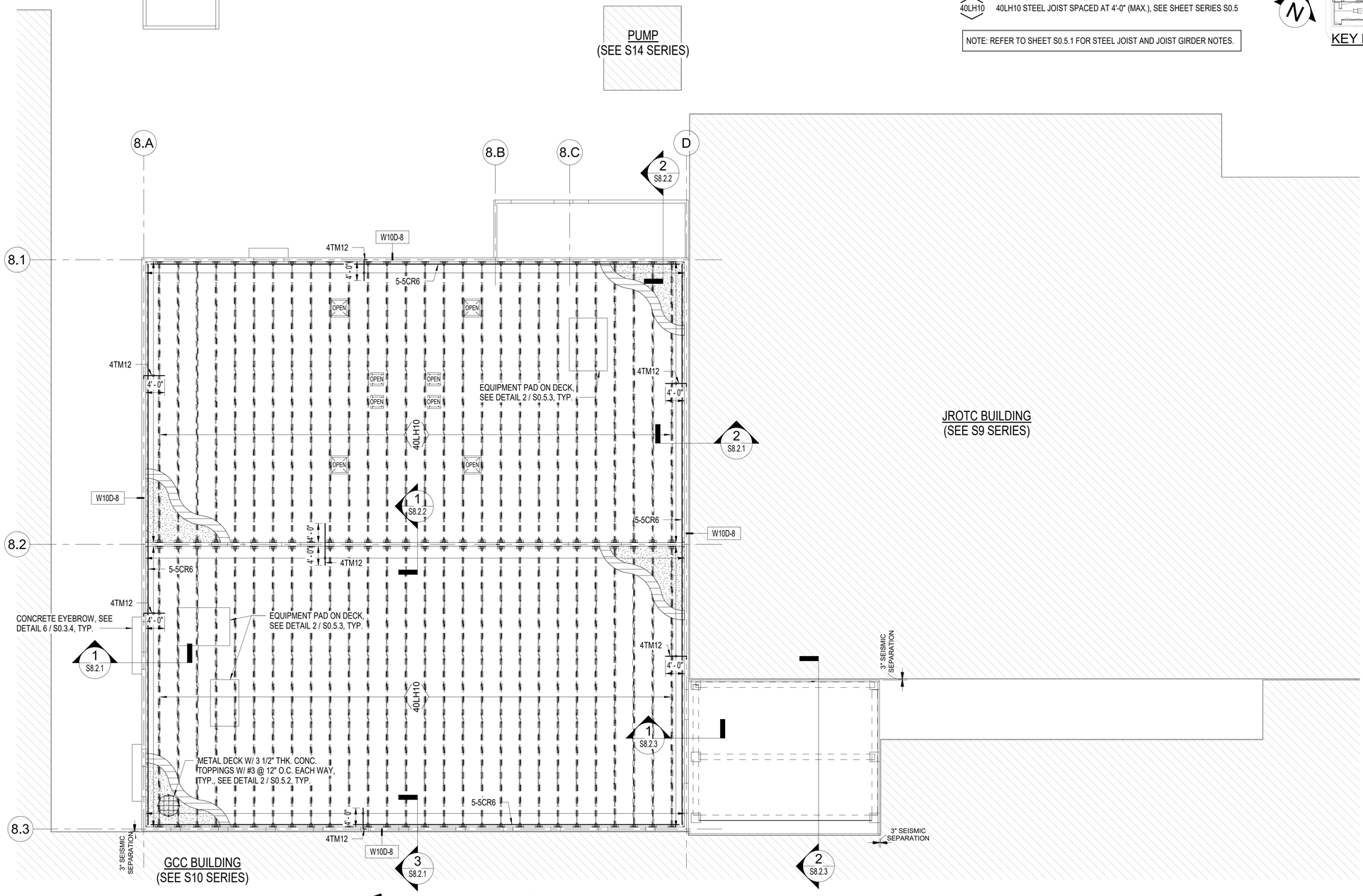
LEGEND AND TAGS

- W#-# — WALL DESIGNATION, SEE SHEET S0.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 5-4CR6 — CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 40LH10 — 40LH10 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.



KEY PLAN



1 UPPER ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Planning
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

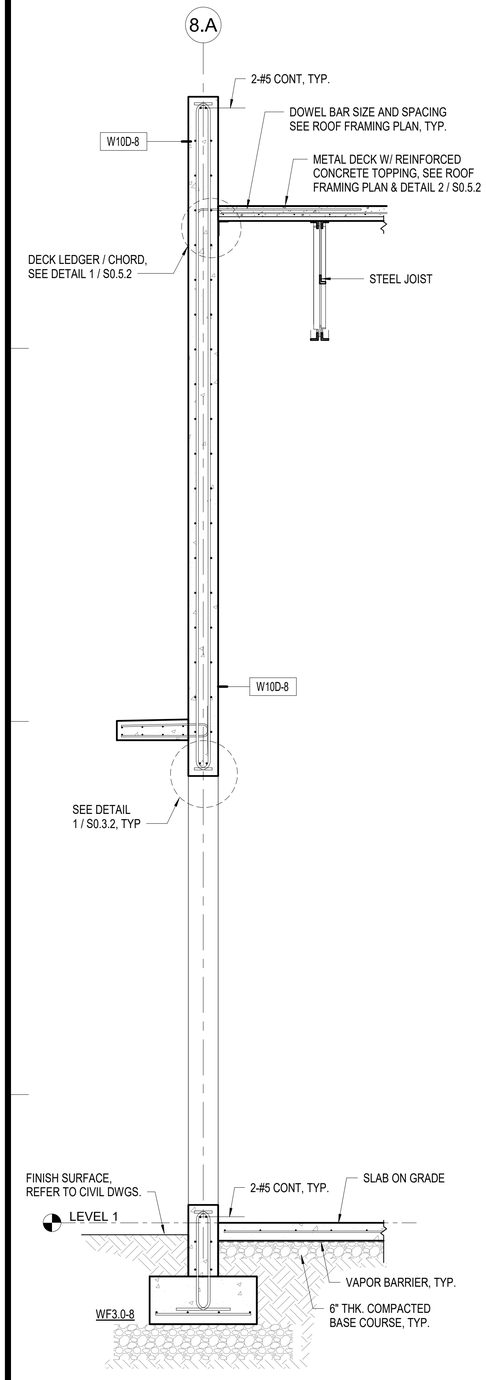
Title
CAFETERIA
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

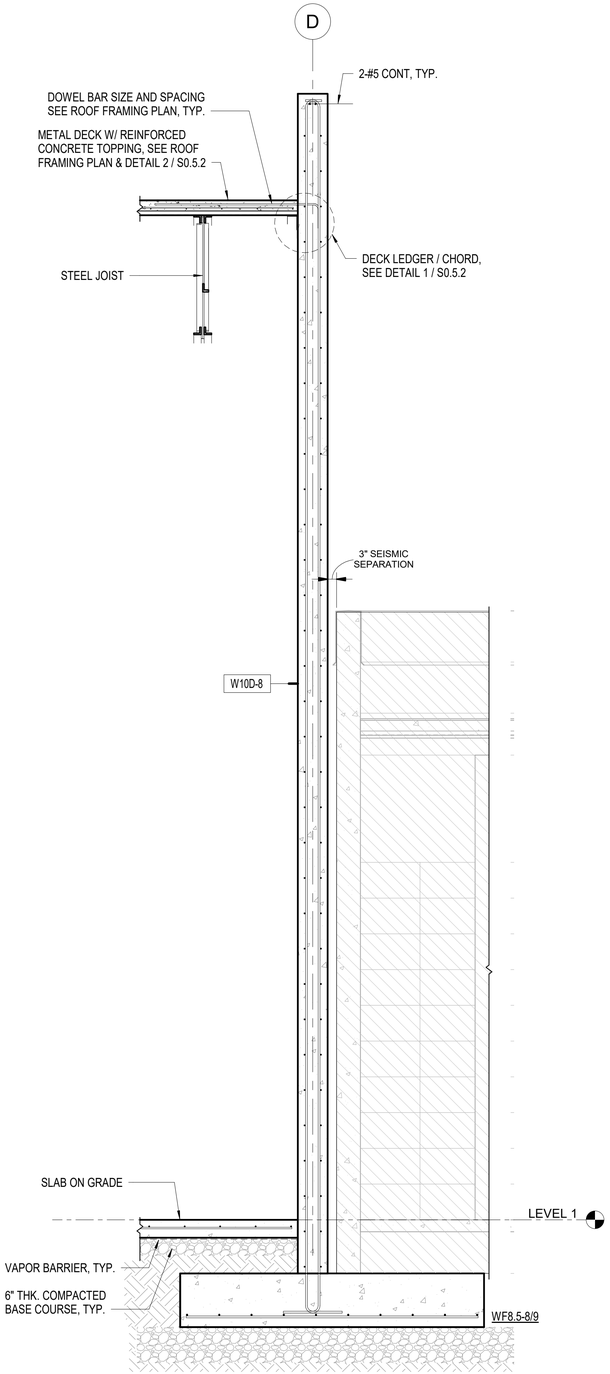
Drawing
S8.1.3

Sheet No. ____ of ____

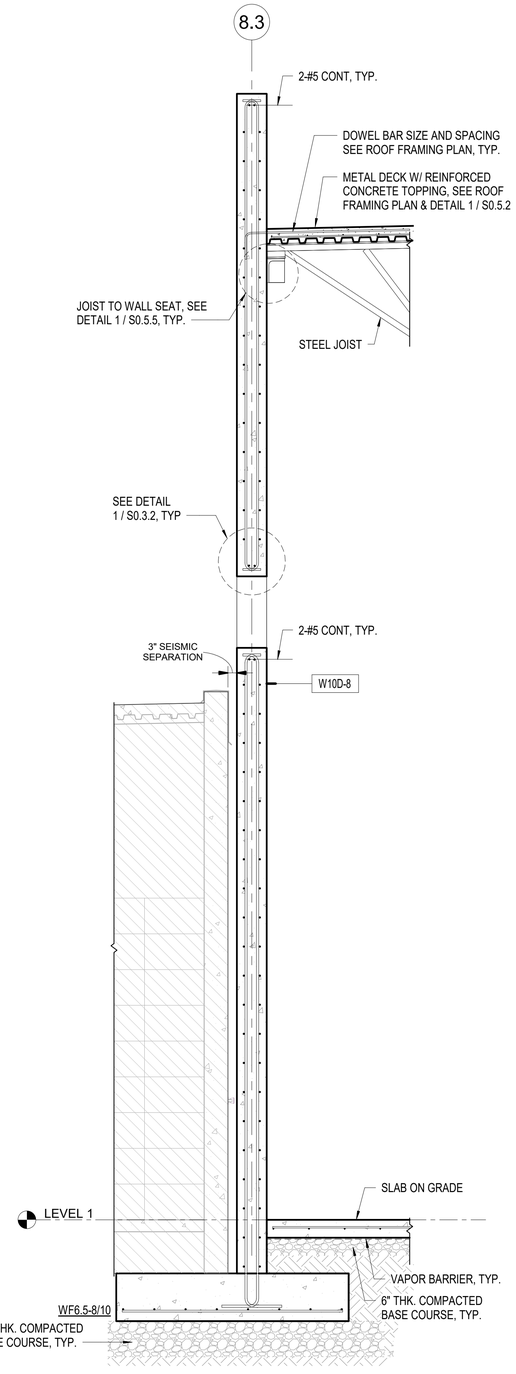
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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DIRECT SUPERVISION. DATE: -

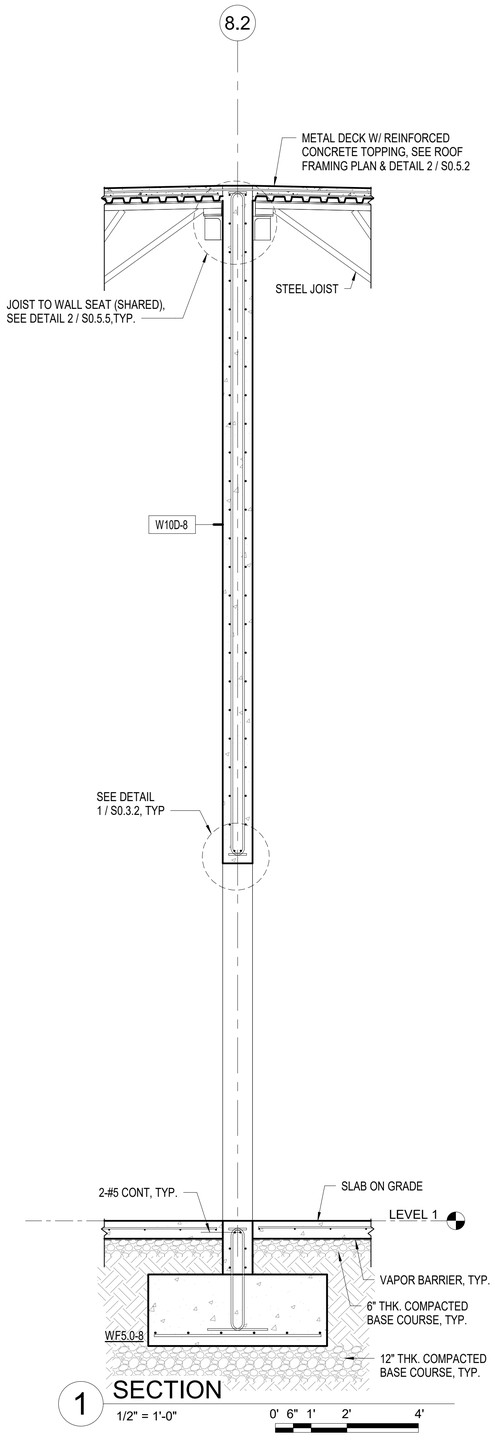
Project
GDOE
SIMON SANCHEZ HIGH
SCHOOL

Title
CAFETERIA
SECTIONS
PROGRAMMING
DOCUMENT

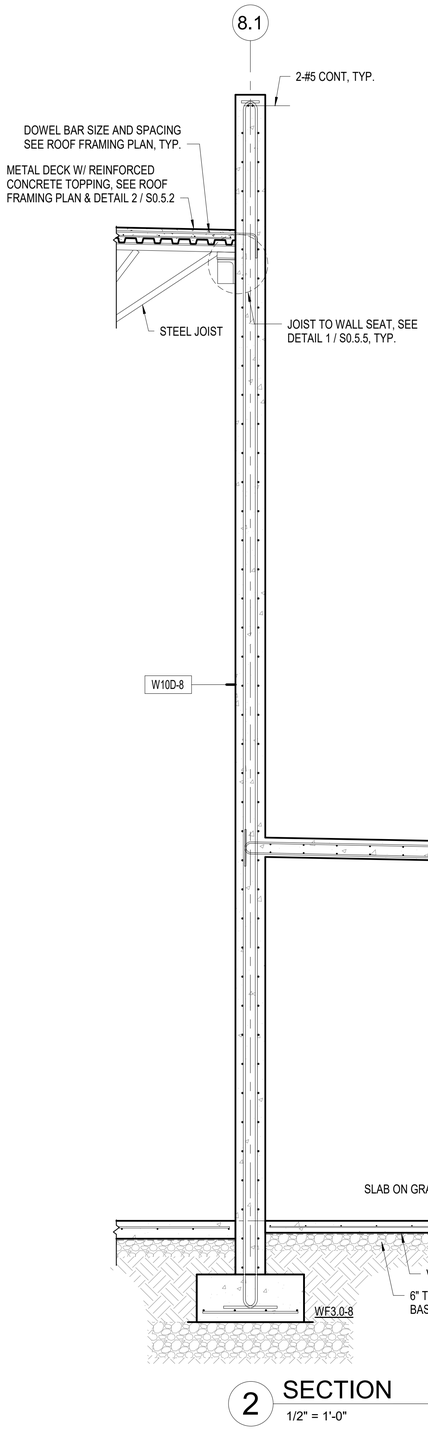
Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S8.2.1
Sheet No. of

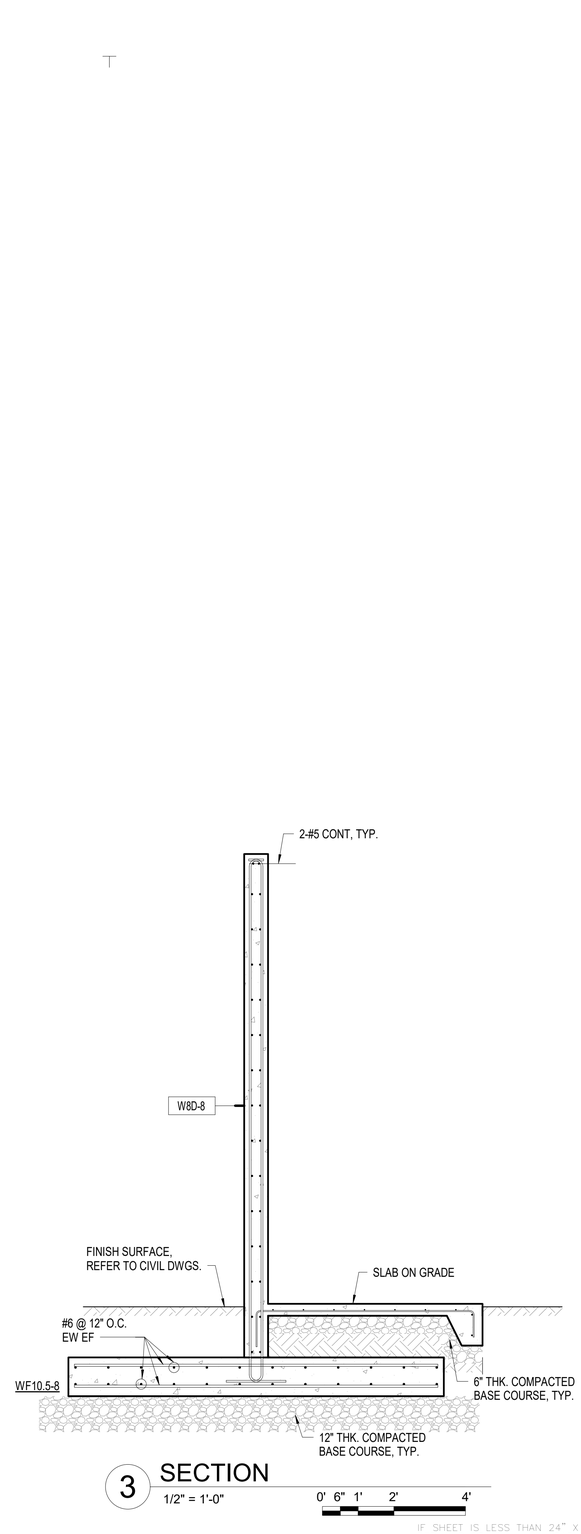
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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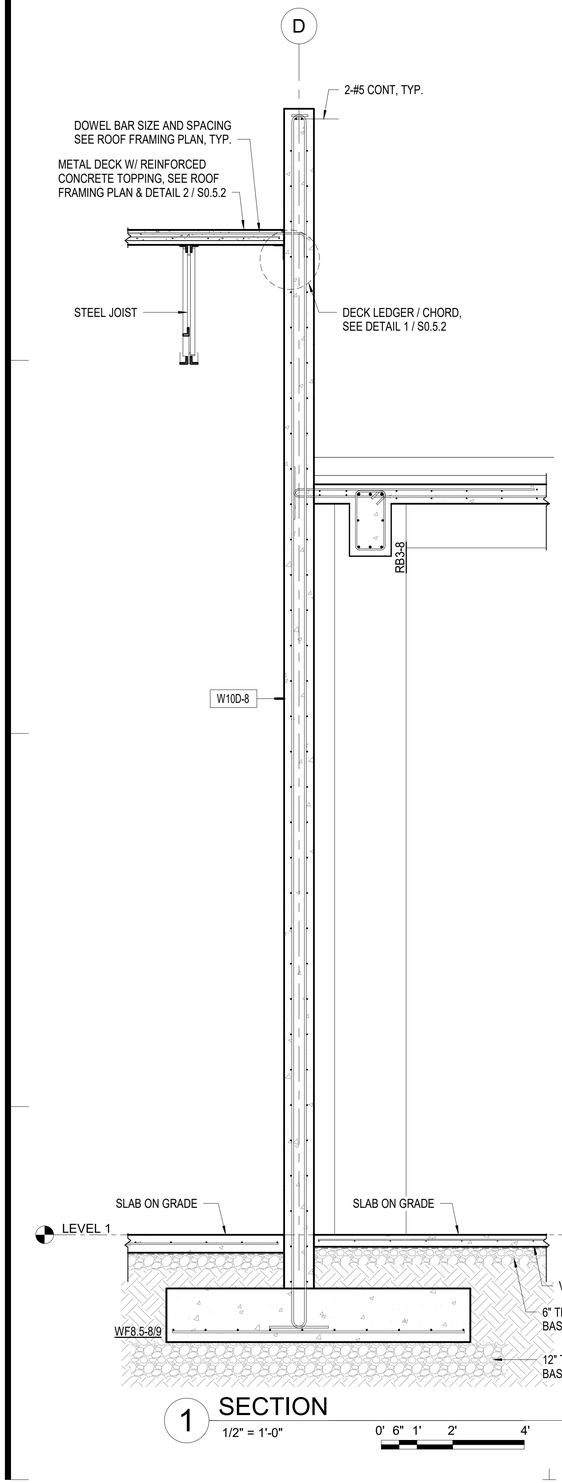
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CAFETERIA
SECTIONS
PROGRAMMING DOCUMENT

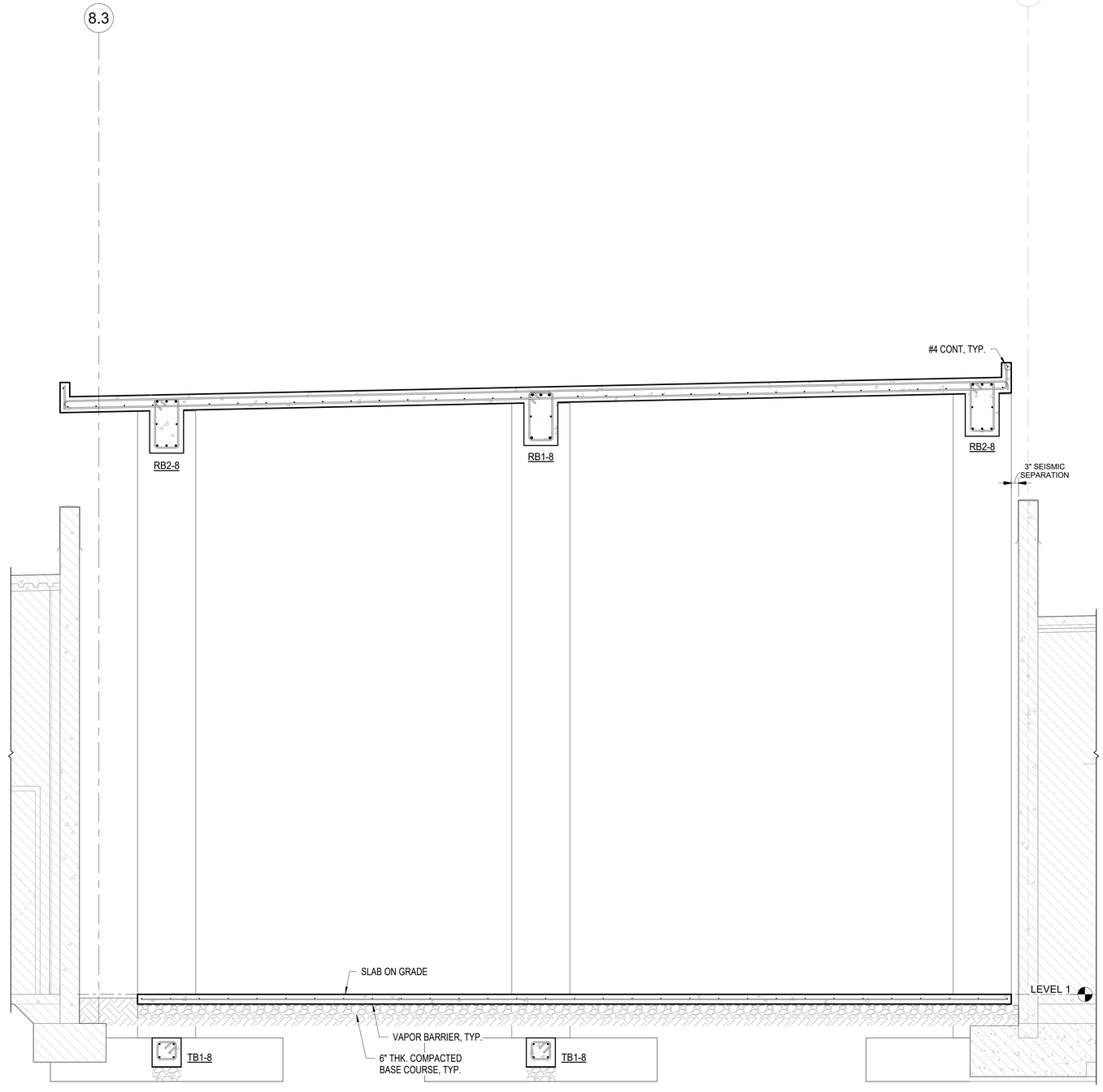
Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S8.2.2
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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DIRECT SUPERVISION. DATE: _____

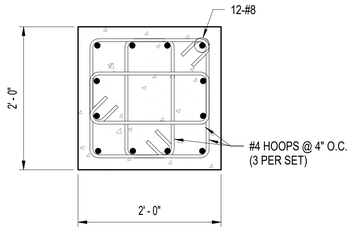
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CAFETERIA
SECTION
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S8.2.3
Sheet No. _____ of _____

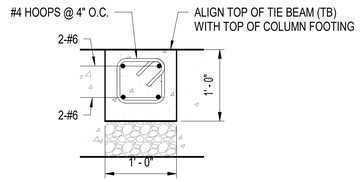
NOT FOR CONSTRUCTION



1 DETAIL C1-8

1" = 1'-0"

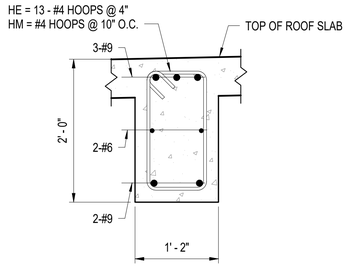
0' 3" 6" 1' 2'



5 DETAIL TB1-8

1" = 1'-0"

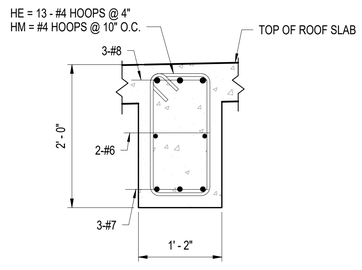
0' 3" 6" 1' 2'



2 DETAIL RB1-8

1" = 1'-0"

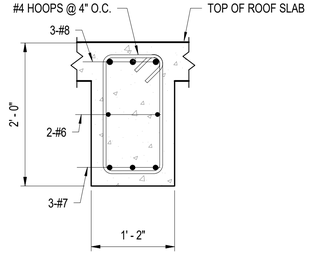
0' 3" 6" 1' 2'



3 DETAIL RB2-8

1" = 1'-0"

0' 3" 6" 1' 2'



4 DETAIL RB3-8

1" = 1'-0"

0' 3" 6" 1' 2'

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REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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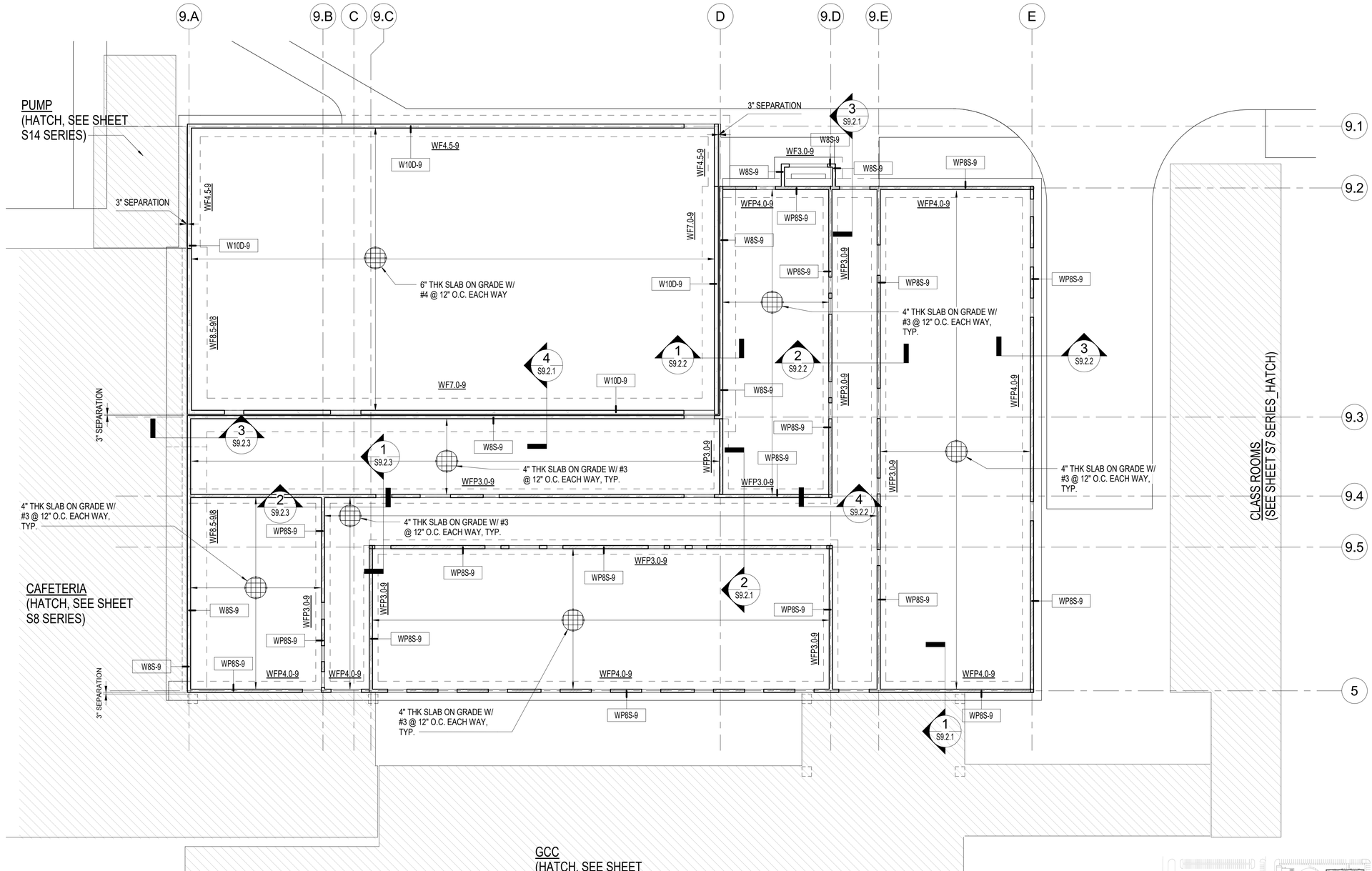
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
CAFETERIA
MISCELLANEOUS DETAILS
PROGRAMMING DOCUMENT

Designed:	TPC/JPP
Drawn	PCP
Checked	TPC/JPP
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S8.3.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



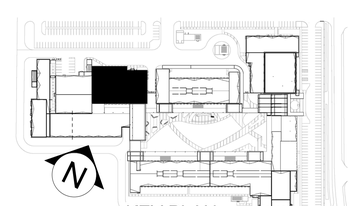
LEGEND AND TAGS

- WF#-# ---- WALL FOOTING DESIGNATION FOR WALL C.I.P, SEE SHEET S0.2.2
- WFP#-# ---- WALL FOOTING DESIGNATION FOR WALL PRECAST, SEE SHEET S0.4.1
- WP8-9 ---- PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# ---- C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- CF#-# ---- COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3

1 FOUNDATION PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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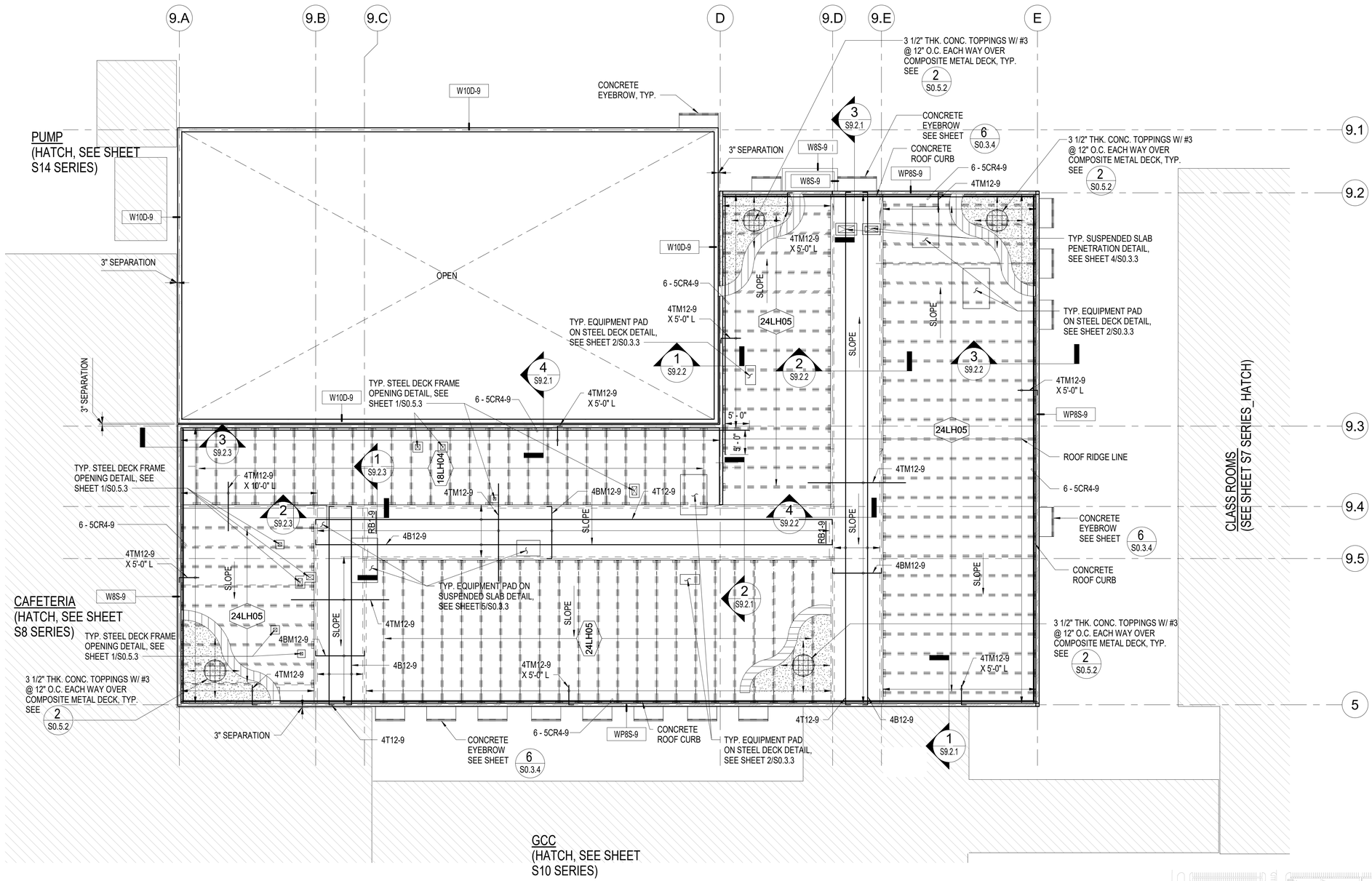
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
JROTC AND FIRING RANGE:
FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S9.1.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



LEGEND AND TAGS

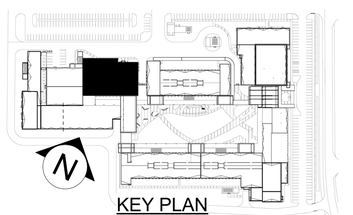
- WP#-# — PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# — CAST-IN-PLACE WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- 24LH05 — 24LH05 STEEL JOIST SPACED AT 4'-0" (MAX.) SEE SHEET SERIES S0.5
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 2 -5CR4 — CHORD STEEL REINFORCEMENT, SEE SHEET S0.1.4
- RB1-9 — CONCRETE BEAM DESIGNATION, SEE SHEET S9.3.1

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.

1 LOWER ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36"
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REVISION

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
JROTC AND FIRING RANGE:
LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S9.1.2
Sheet No. _____ of _____

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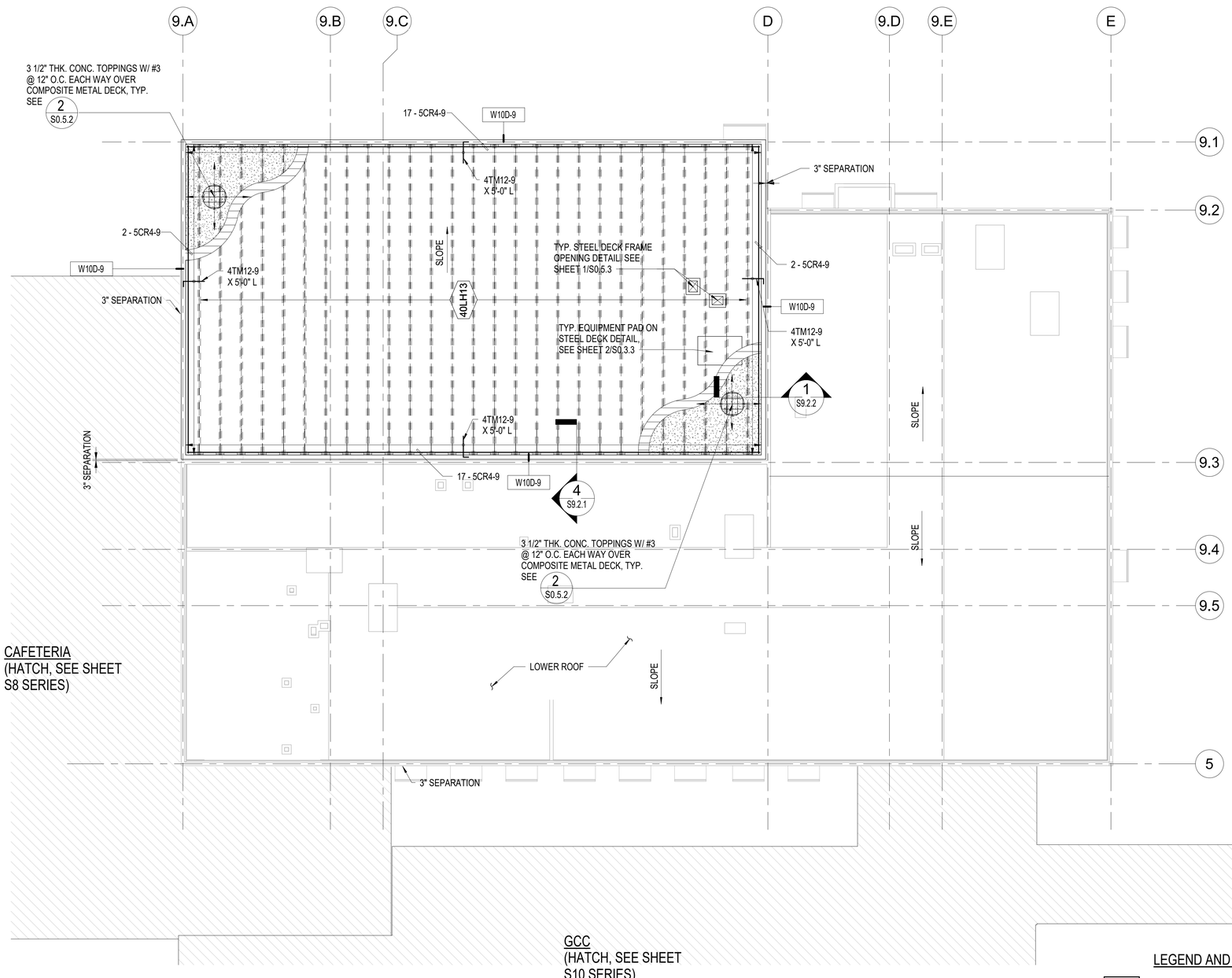

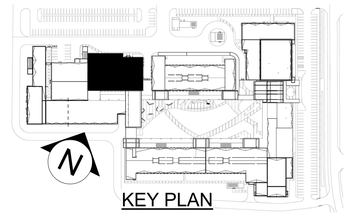

LEGEND AND TAGS

WP#-#	PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
W#-#	CAST-IN-PLACE WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
40LH13	40LH13 STEEL JOIST SPACED AT 4'-0" (MAX.) SEE SHEET SERIES S.0.5
4T12	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
2 -5CR4	CHORD STEEL REINFORCEMENT SEE SHEET S0.1.4

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND JOIST GIRDER NOTES.

1 UPPER ROOF FRAMING PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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■ GEOGRAPHIC INFORMATION SYSTEMS
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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: ____-____

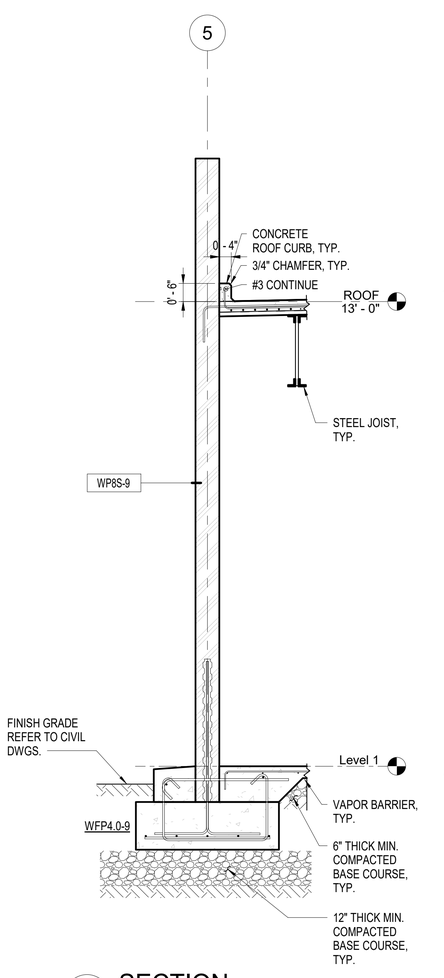
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
JROTC AND FIRING RANGE:
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

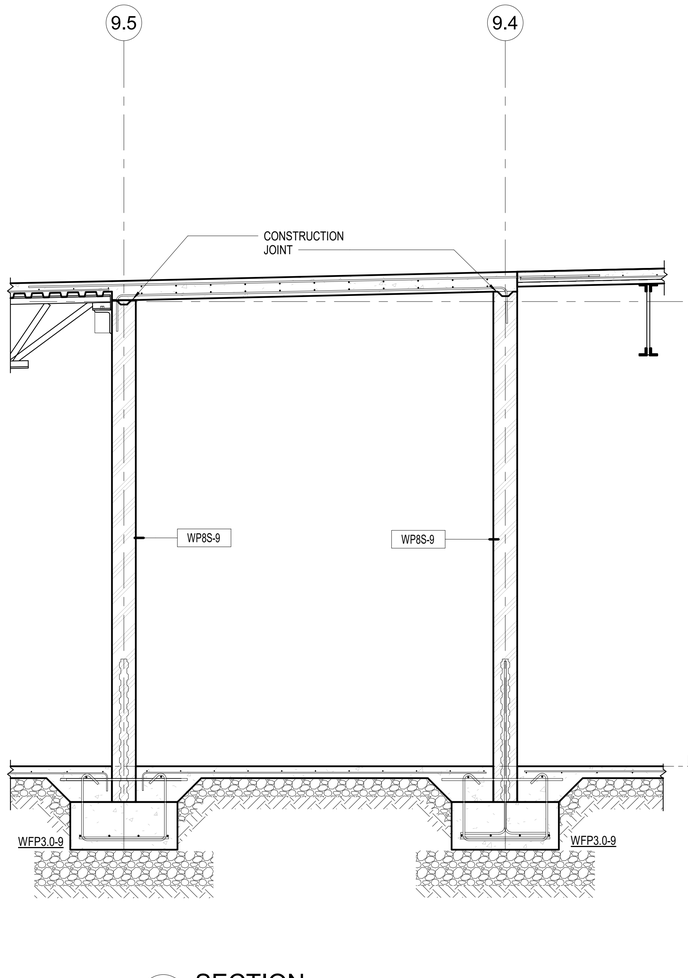
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S9.1.3
Sheet No. _____ of _____

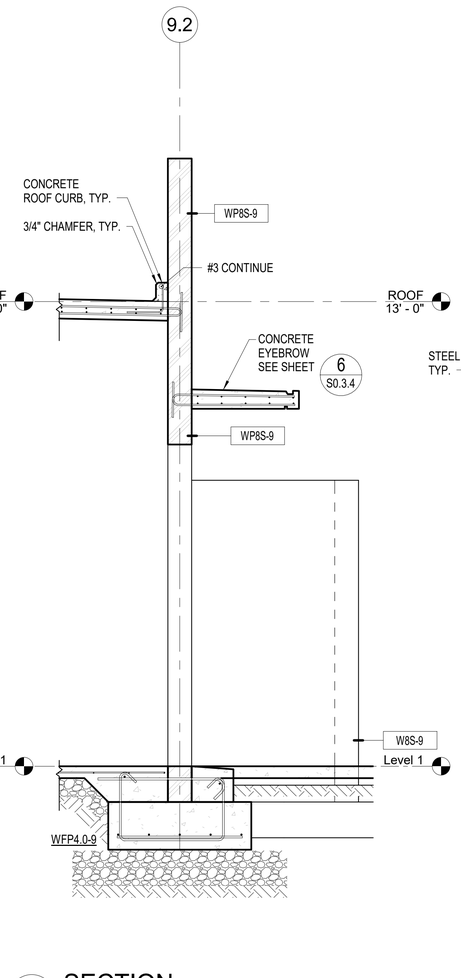
NOT FOR CONSTRUCTION



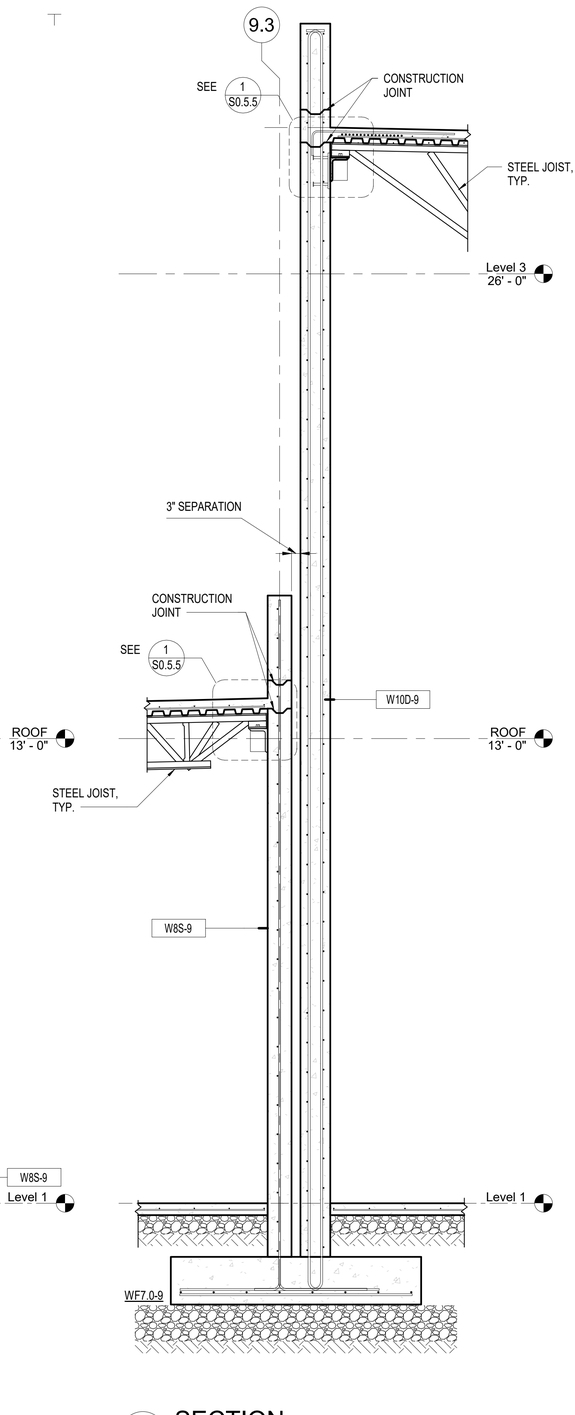
1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



4 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Planning
Interior Design

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I HEREBY CERTIFY THAT
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BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
JROTC AND FIRING RANGE:
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S9.2.1
Sheet No. _____ of _____

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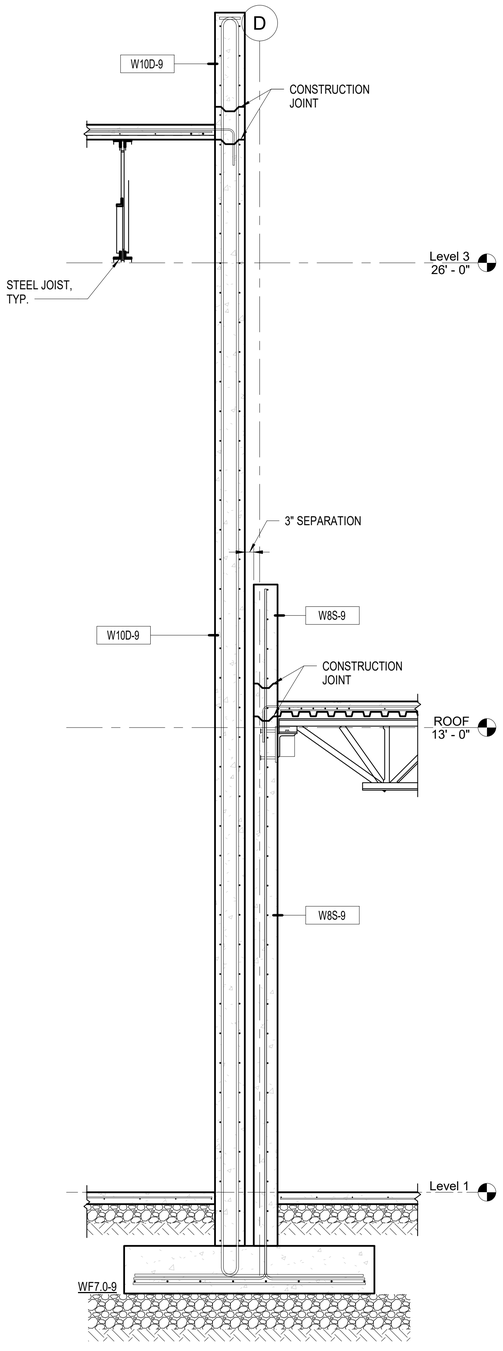
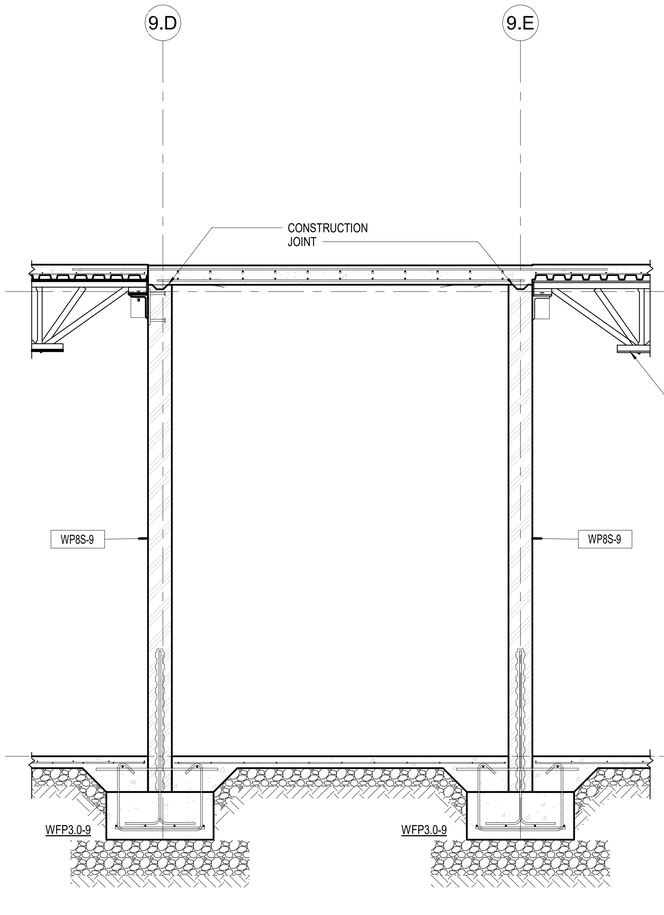


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



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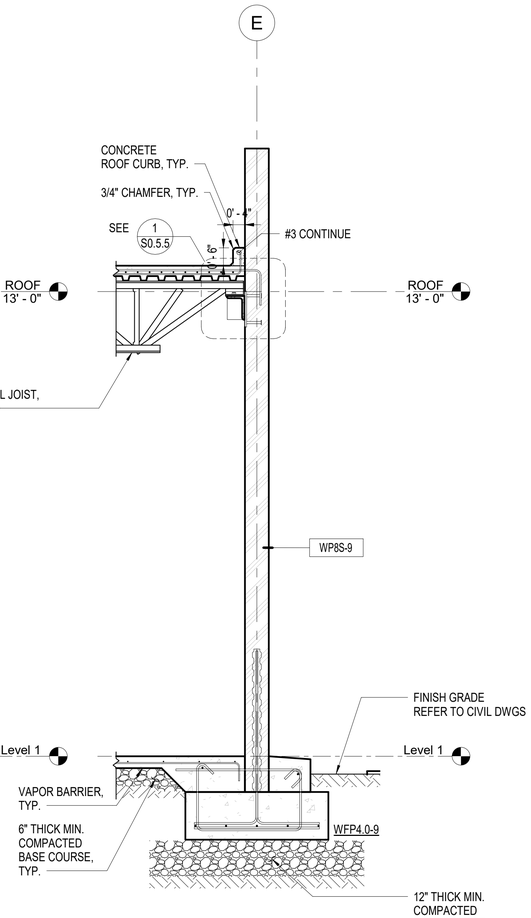
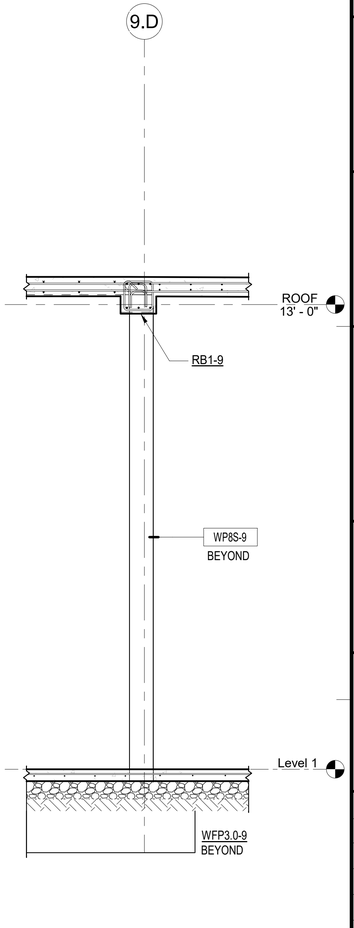


3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



4 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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Title
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SECTIONS
PROGRAMMING DOCUMENT

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Scale:	1/2" = 1'-0"
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S9.2.2
Sheet No._____ of _____

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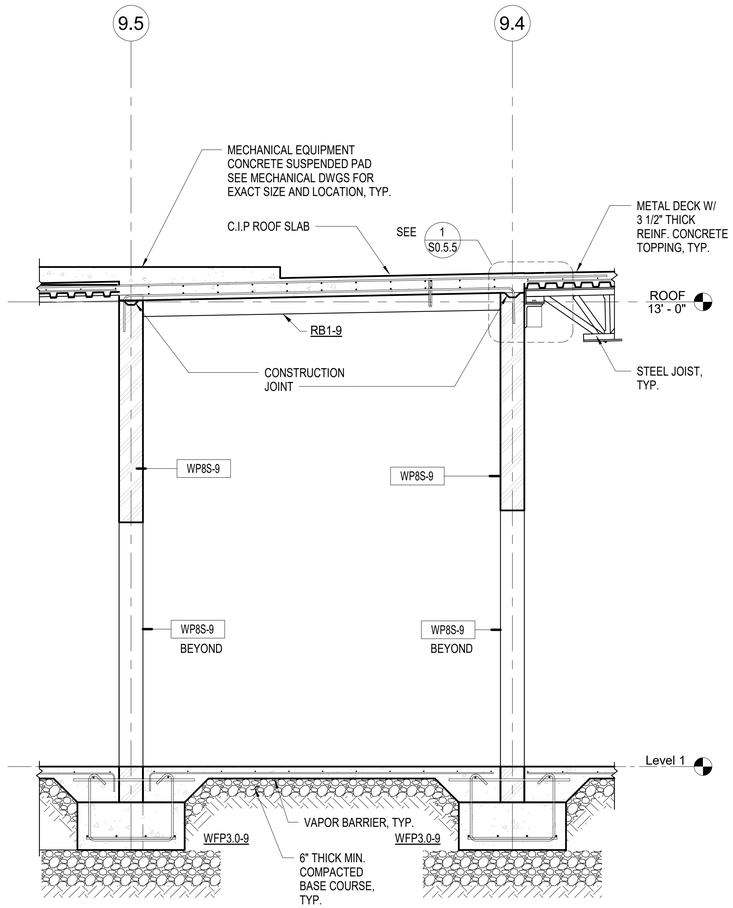
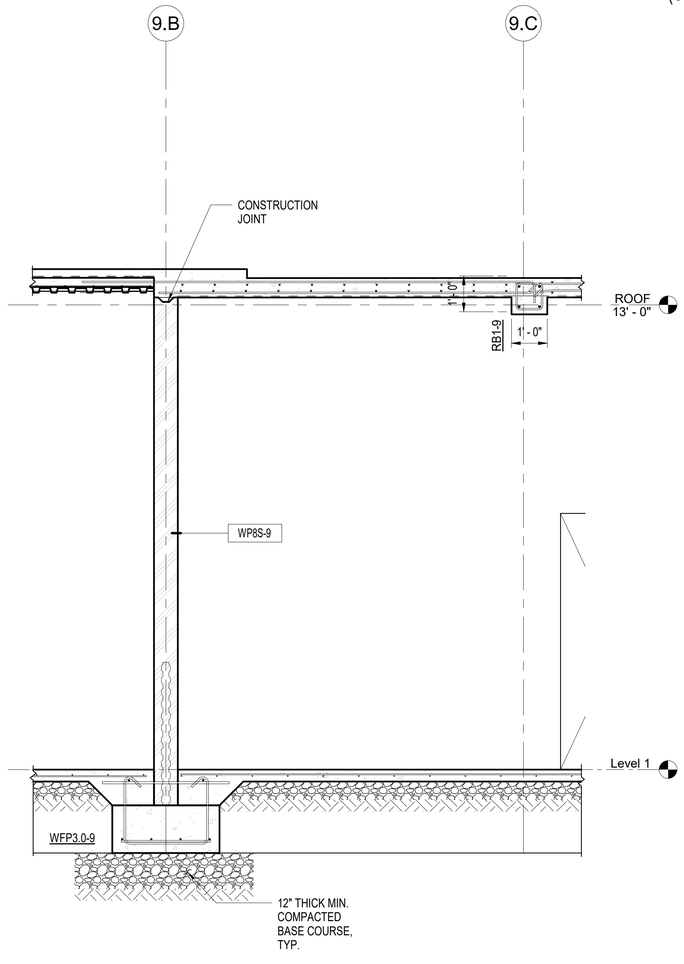


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
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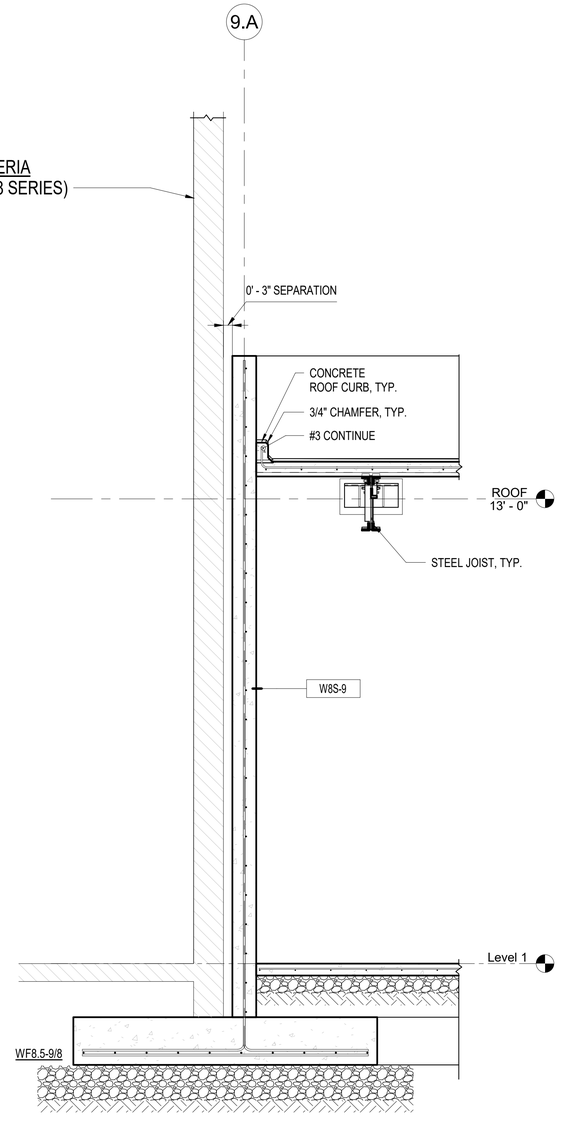
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S9.2.3
Sheet No. _____ of _____

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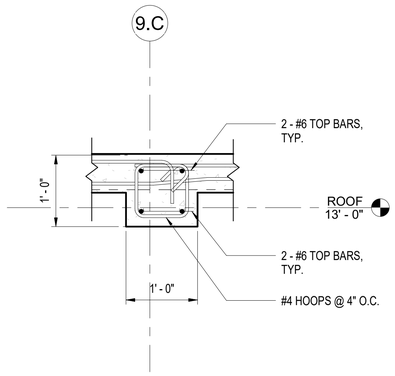

1 TYP. CONC. "RB1-9" BEAM DETAIL

1" = 1'-0"

0' 3" 6" 1' 2'

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TYPICAL CONCRETE COLUMN/BEAM DETAIL

PROGRAMMING DOCUMENT

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Checked	TPC/CDC
Supv:	TPC
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Date:	03/31/25
Project	File

Drawing

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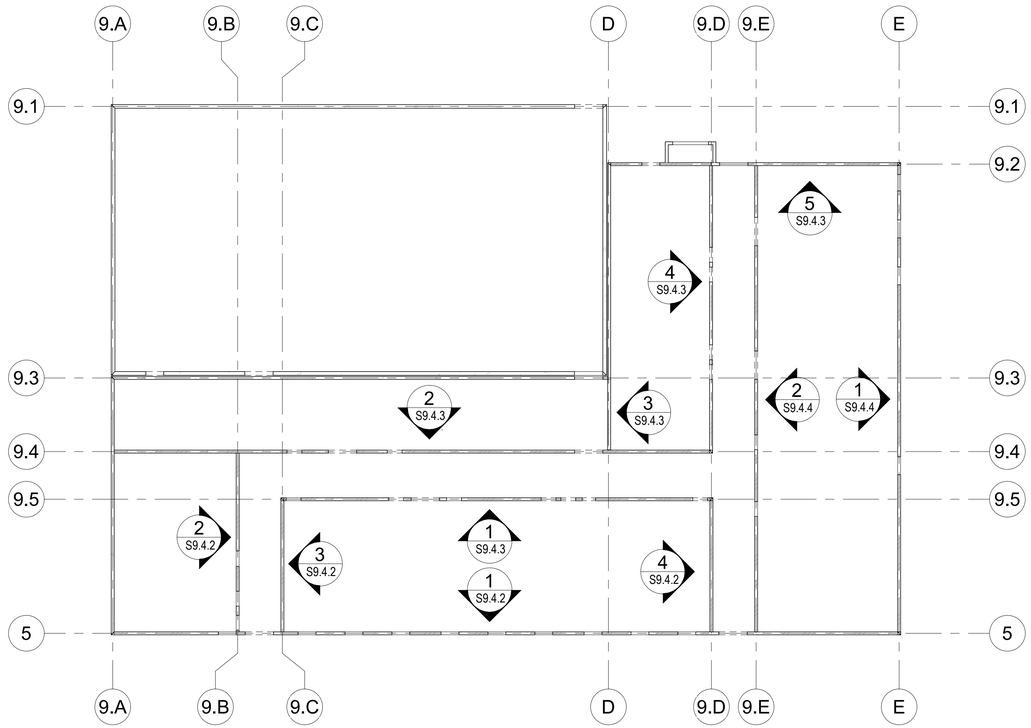

1 PRECAST WALL PANEL KEY PLAN

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Title
JROTC AND FIRING RANGE:
PRECAST WALL PANEL KEY PLAN/ELEVATION
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/16" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S9.4.1
Sheet No._____ of _____

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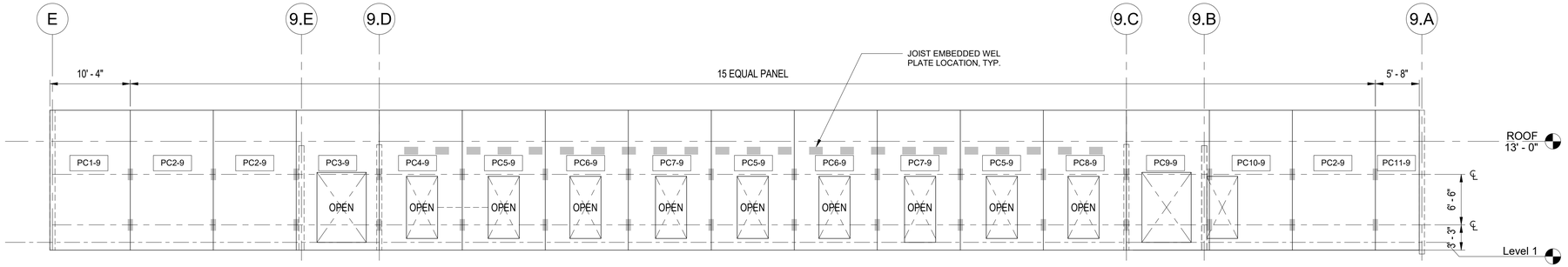
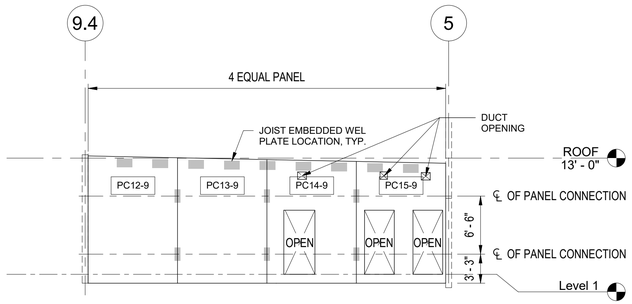


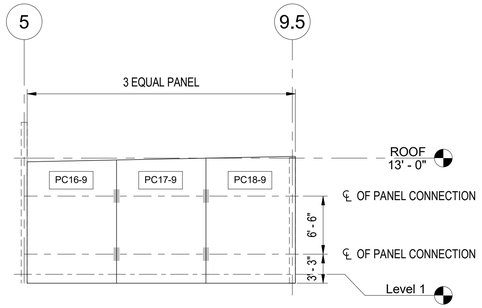
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 5

1/8" = 1'-0" 0' 2' 4' 8' 16'



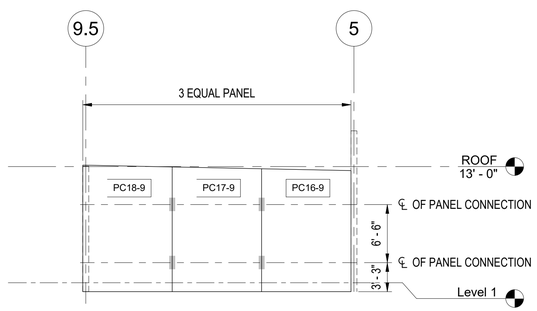
2 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.B

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.C

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.D

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
JROTC AND FIRING RANGE:
PRECAST WALL PANEL ELEVATION
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S9.4.2
Sheet No. ____ of ____

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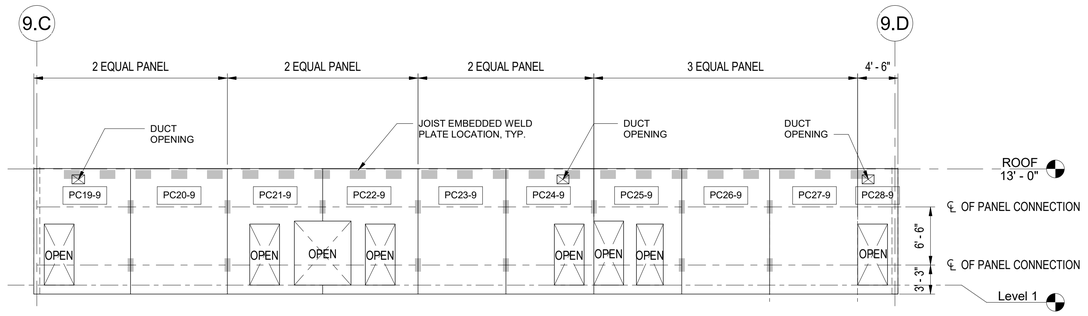
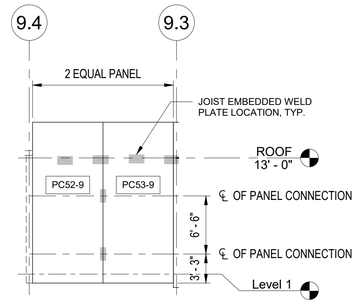


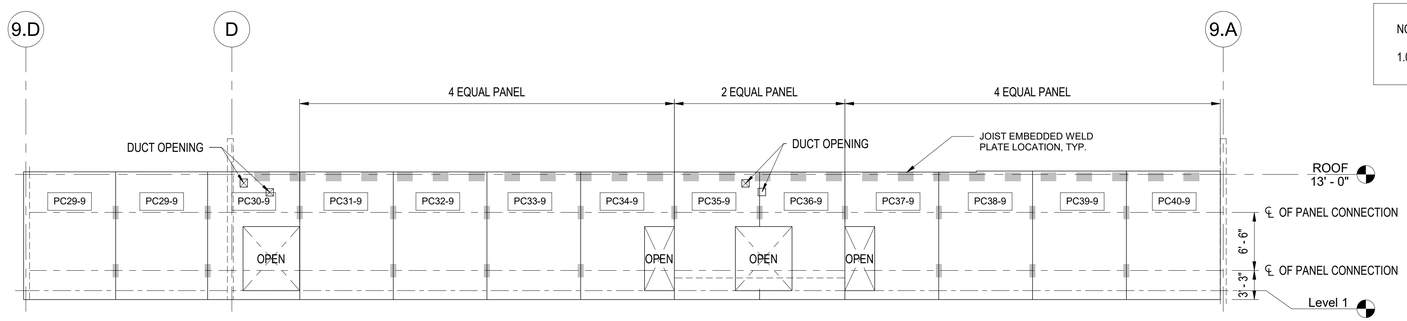
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.5

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE D

1/8" = 1'-0" 0' 2' 4' 8' 16'

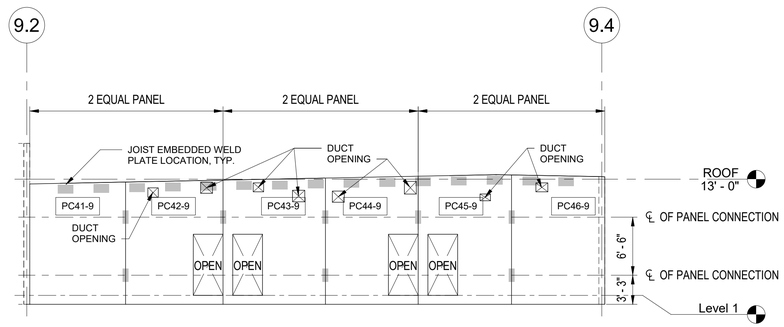


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.4

1/8" = 1'-0" 0' 2' 4' 8' 16'

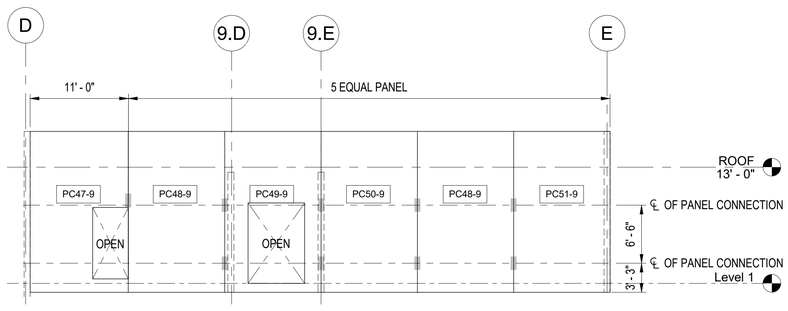
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.D

1/8" = 1'-0" 0' 2' 4' 8' 16'



5 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.2

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Title
JROTC AND FIRING RANGE:
PRECAST WALL PANEL ELEVATION
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

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S9.4.3
Sheet No. of

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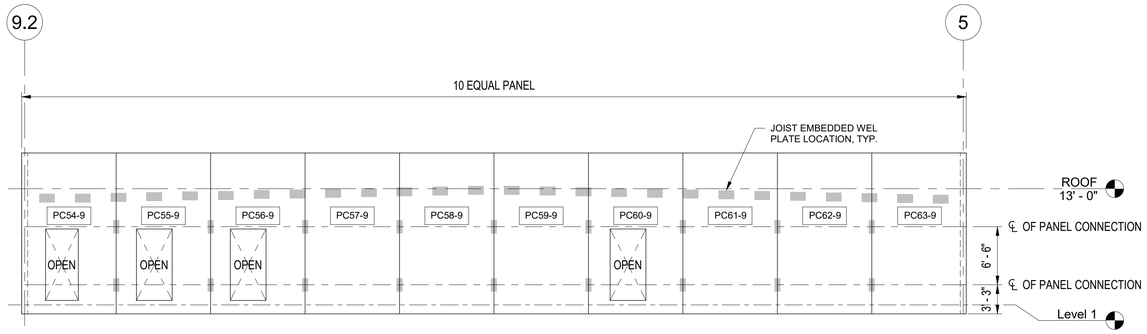
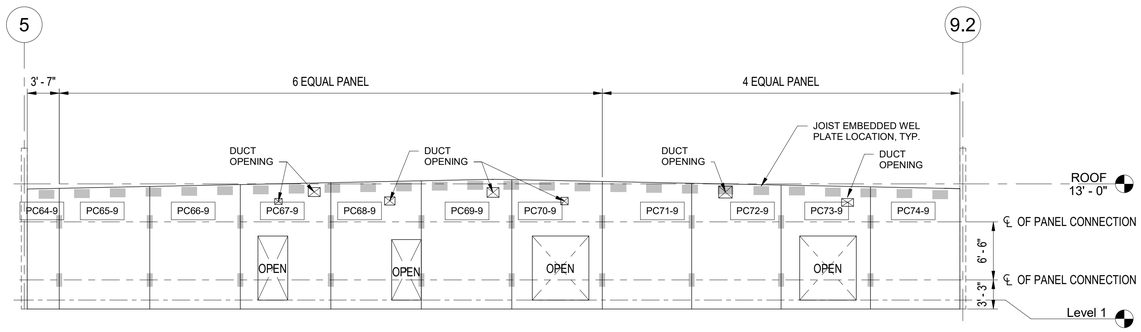


1 WALL PANEL ASSEMBLY ALONG GRIDLINE E

1/8" = 1'-0"

0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 9.E

1/8" = 1'-0"

0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.

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Title
JROTC AND FIRING RANGE:
PRECAST WALL PANEL ELEVATION
PROGRAMMING DOCUMENT

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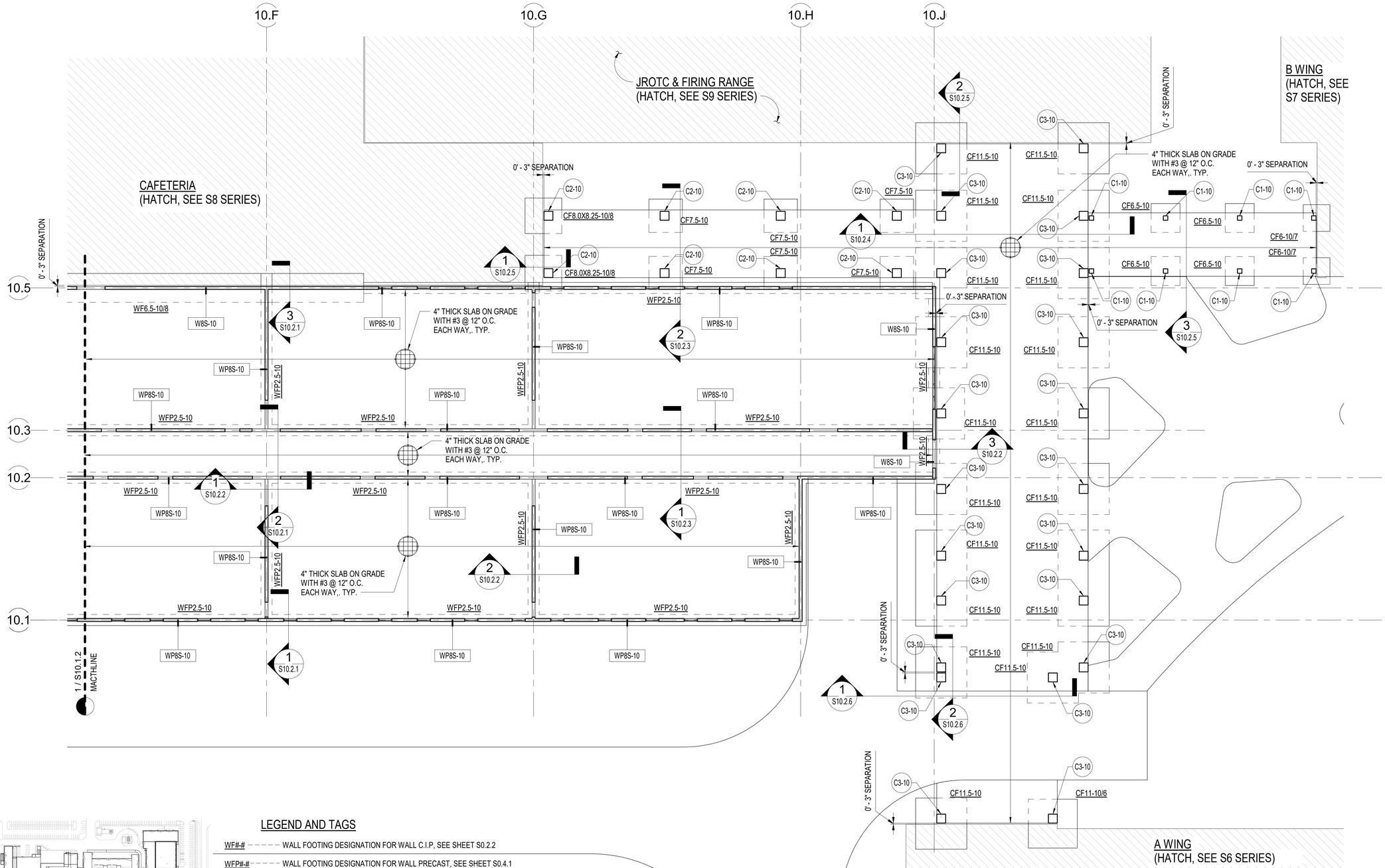

LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION FOR WALL C.I.P, SEE SHEET S0.2.2
WFP#-#	WALL FOOTING DESIGNATION FOR WALL PRECAST, SEE SHEET S0.4.1
WP#-#	PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
W#-#	C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
C1-#	COLUMN DESIGNATION, SEE SHEET S10.3.1
CF#-#	COLUMN FOOTING, SEE SHEET S0.2.3

KEY PLAN

1 FOUNDATION PLAN (1 OF 3)

3/32" = 1'-0"

0' 4' 8' 16' 32'

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FOUNDATION PLAN
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WF#-# ------ WALL FOOTING DESIGNATION FOR WALL C.I.P, SEE SHEET S0.2.2

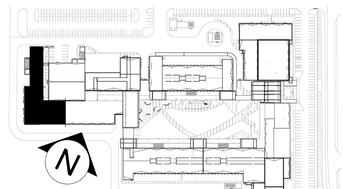
WFP#-# ------ WALL FOOTING DESIGNATION FOR WALL PRECAST, SEE SHEET S0.4.1

WP#-# ------ PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2

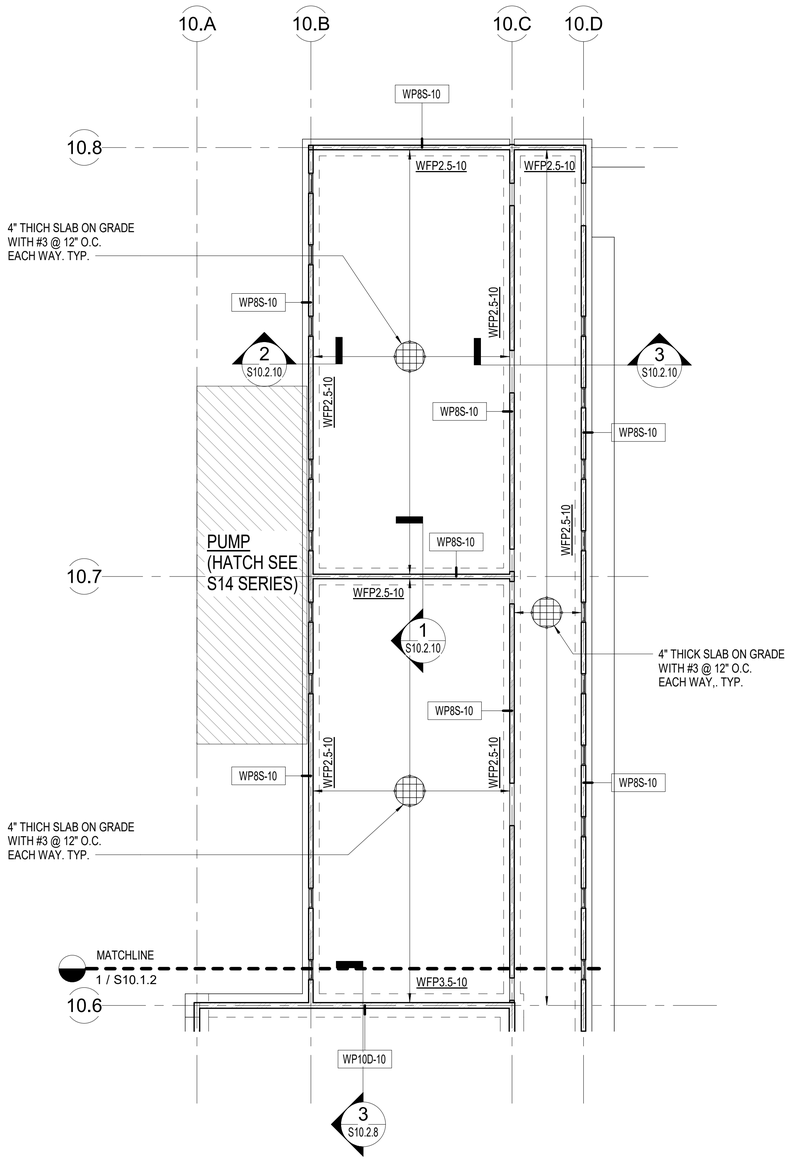
W#-# ------ C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1

C1-# ------ COLUMN DESIGNATION, SEE SHEET S10.3.1

CF#-# ------ COLUMN FOOTING, SEE SHEET S0.2.3



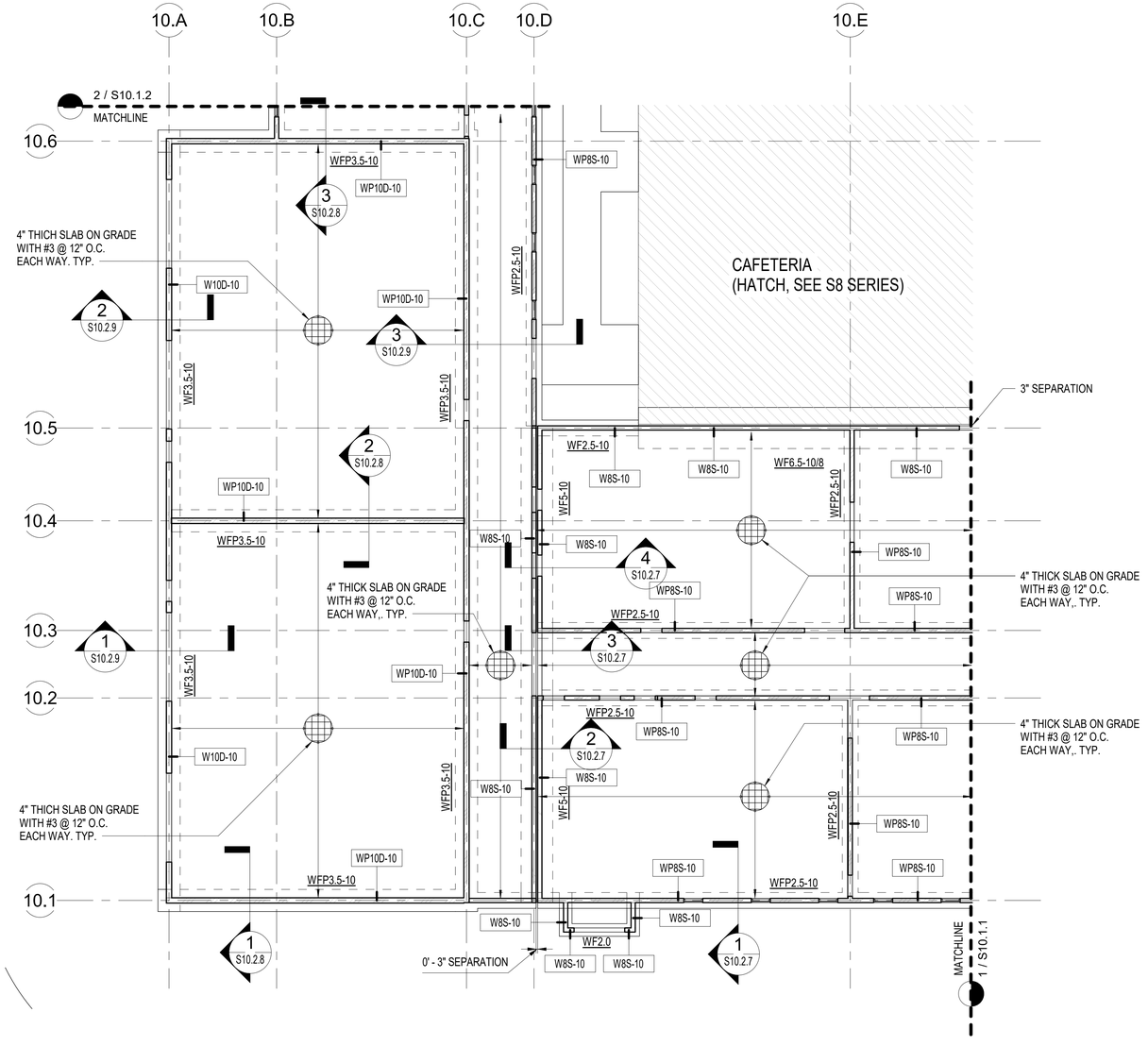
KEY PLAN



2 FOUNDATION PLAN (3 OF 3)

3/32" = 1'-0"

0' 4' 8' 16' 32'



N

1 FOUNDATION PLAN (2 OF 3)

3/32" = 1'-0"

0' 4' 8' 16' 32'

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SIMON SANCHEZ HIGH SCHOOL

Title

GCC:

FOUNDATION PLAN

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Date:	03/31/25
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Sheet No. _____ of _____

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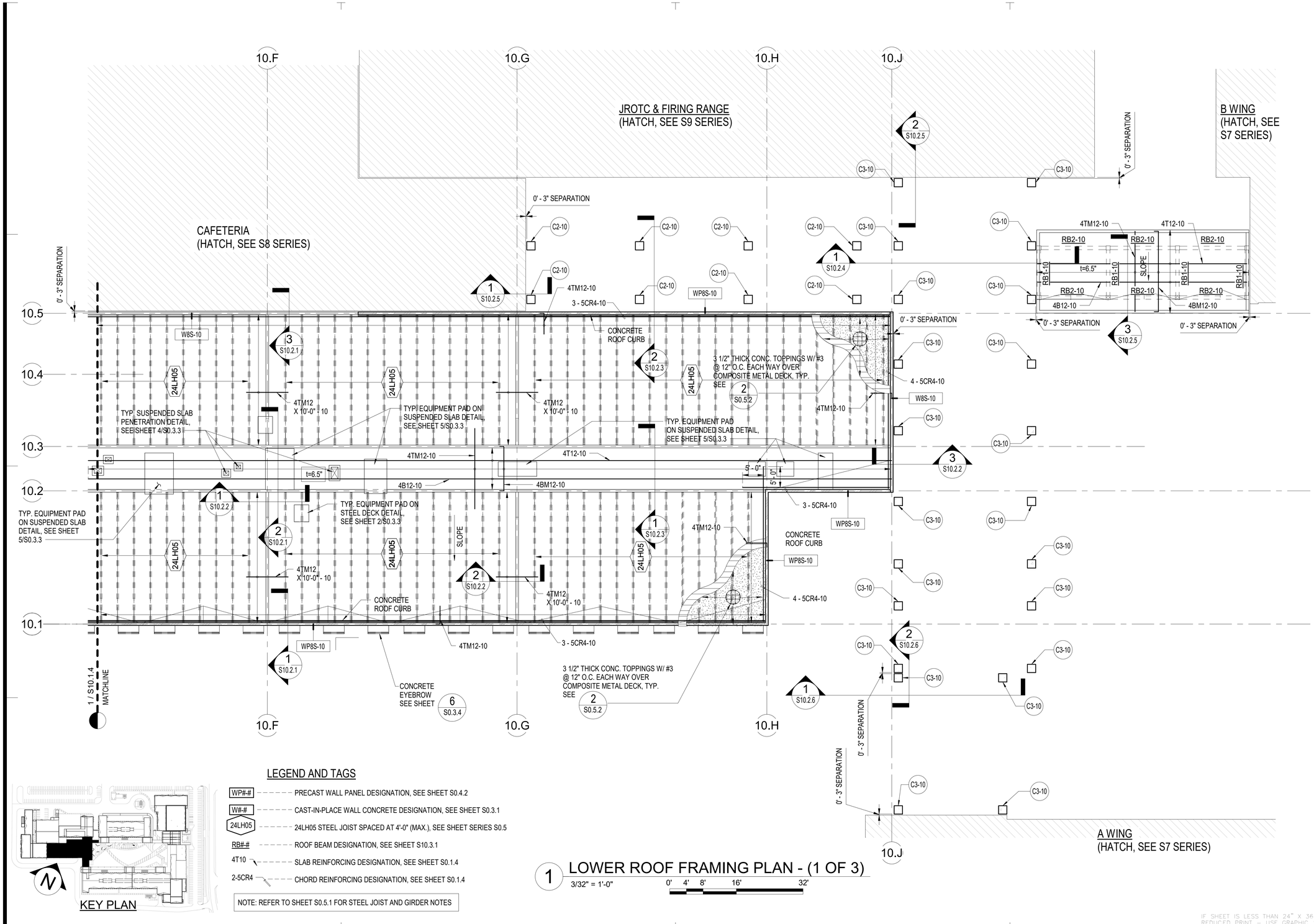

KEY PLAN

LEGEND AND TAGS

- WP#-# — PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# — CAST-IN-PLACE WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- 24LH05 — 24LH05 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
- RB#-# — ROOF BEAM DESIGNATION, SEE SHEET S10.3.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 2-5CR4 — CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES

1 LOWER ROOF FRAMING PLAN - (1 OF 3)

3/32" = 1'-0"

0' 4' 8' 16' 32'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GCC:
LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S10.1.3

Sheet No. ____ of ____

NOT FOR CONSTRUCTION

LEGEND AND TAGS

- WP#-# — PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W#-# — CAST-IN-PLACE WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- 24LH05 — 24LH05 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
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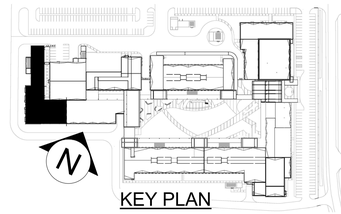
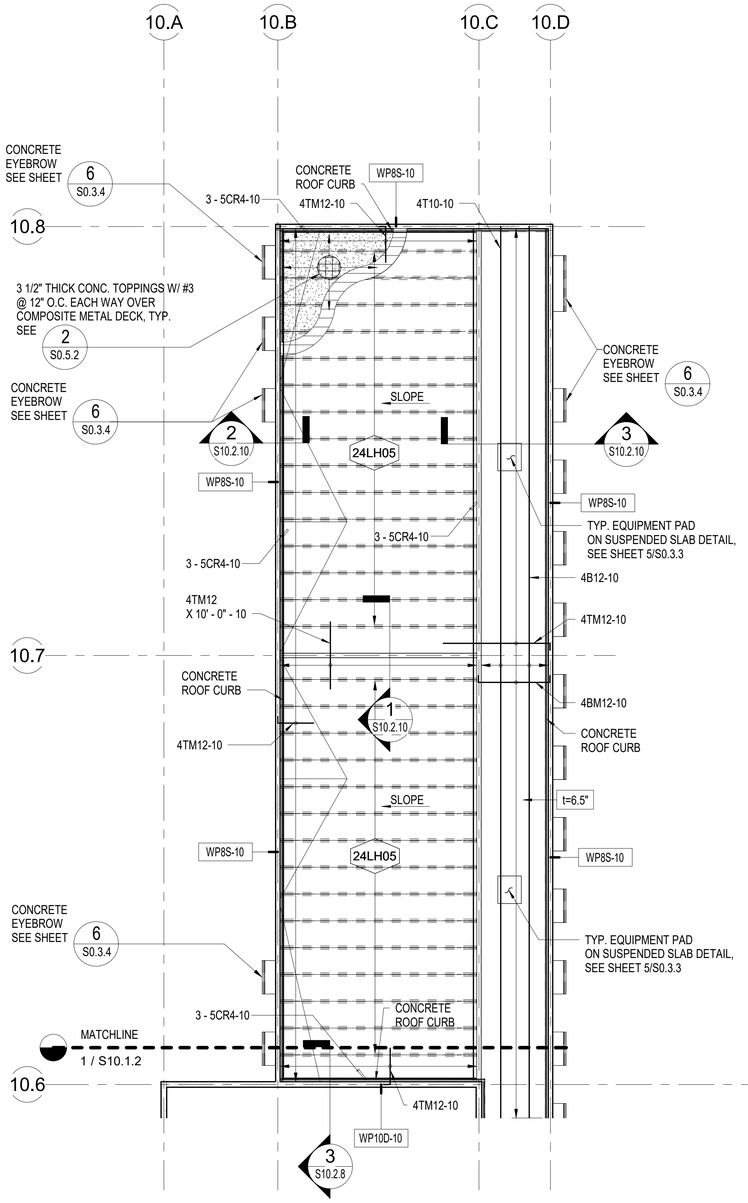
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 2-5CR4 — CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES

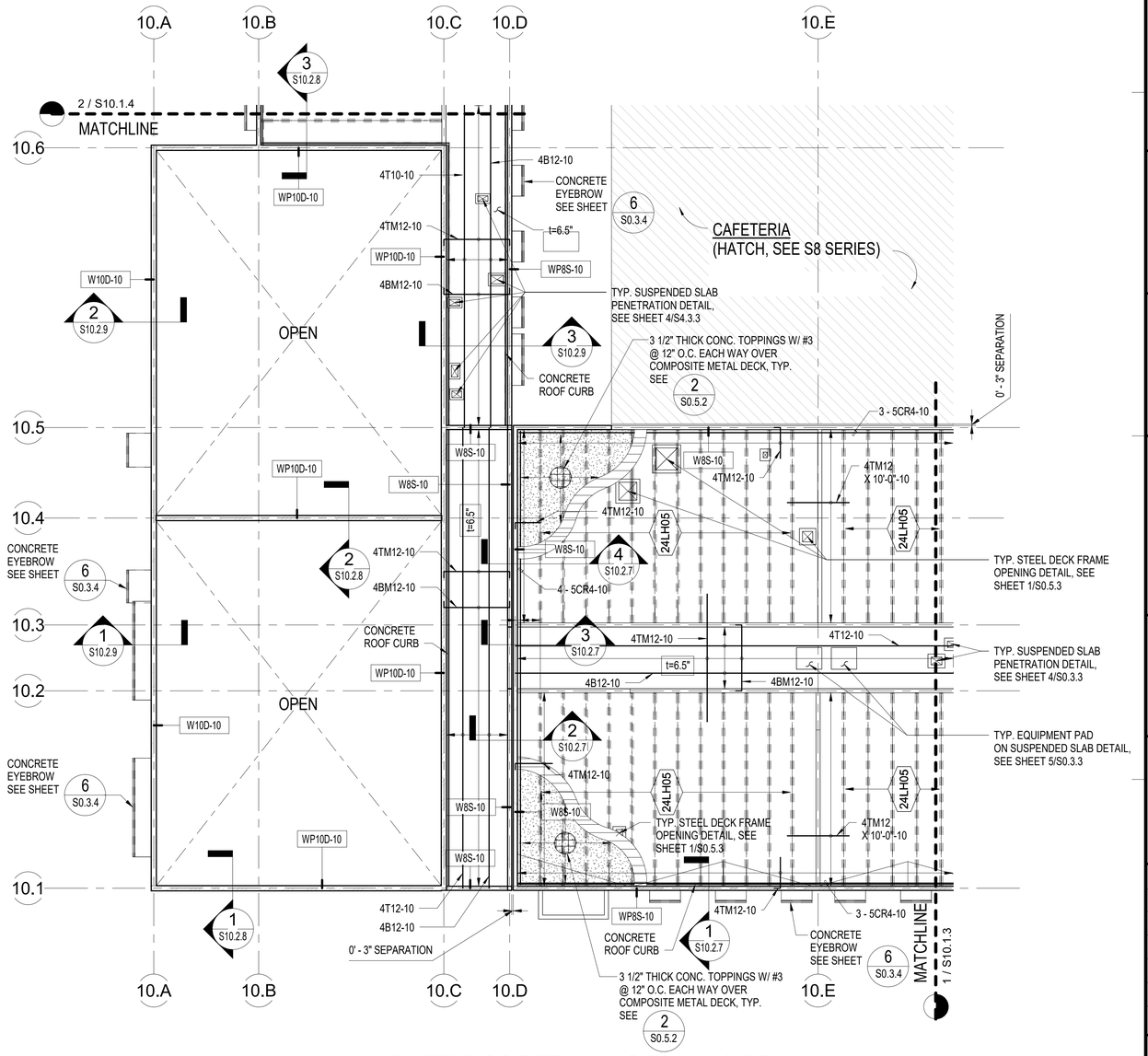




2 LOWER ROOF FRAMING PLAN - (3 OF 3)

3/32" = 1'-0"

0' 4' 8' 16' 32'



1 LOWER ROOF FRAMING PLAN (2 OF 3)

3/32" = 1'-0"

0' 4' 8' 16' 32'

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GCC:
LOWER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S10.1.4
Sheet No. _____ of _____

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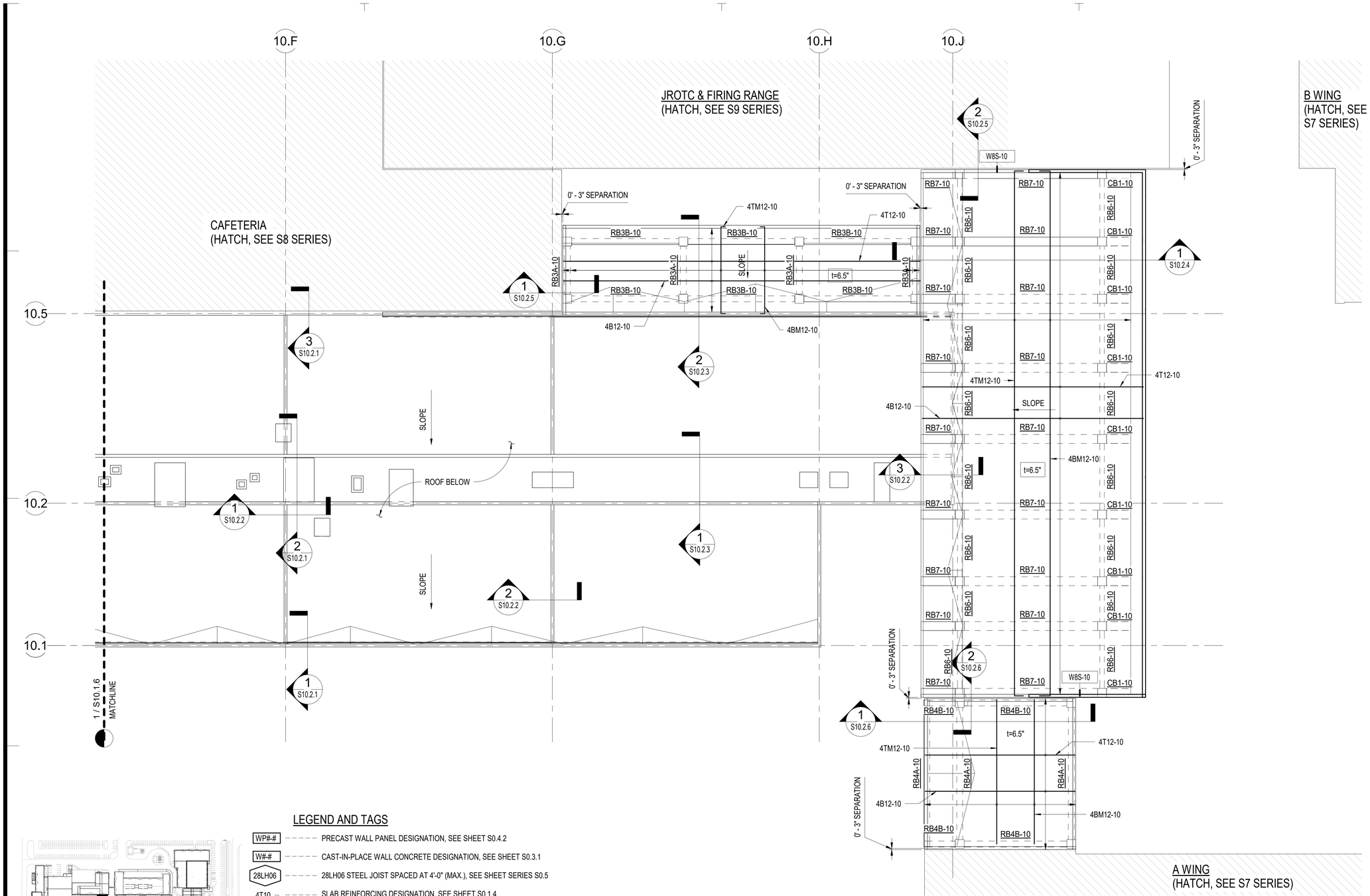
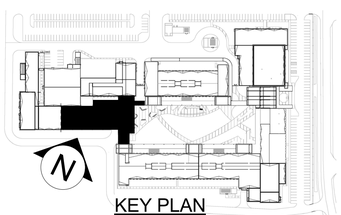


LEGEND AND TAGS

WP#-#	PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
W#-#	CAST-IN-PLACE WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
28LH06	28LH06 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
2-5CR4	CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4
CB#-#	TYP. "CB1-10" CONCRETE CORBEL/BEAM DESIGNATION, SEE SHEET S10.3.1

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES



KEY PLAN

1 UPPER ROOF FRAMING PLAN (1 OF 2)

3/32" = 1'-0"

0' 4' 8' 16' 32'

REVISION

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SIMON SANCHEZ HIGH SCHOOL

Title
GCC:
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project File	

Drawing
S10.1.5
Sheet No. ____ of ____

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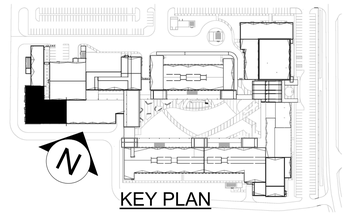
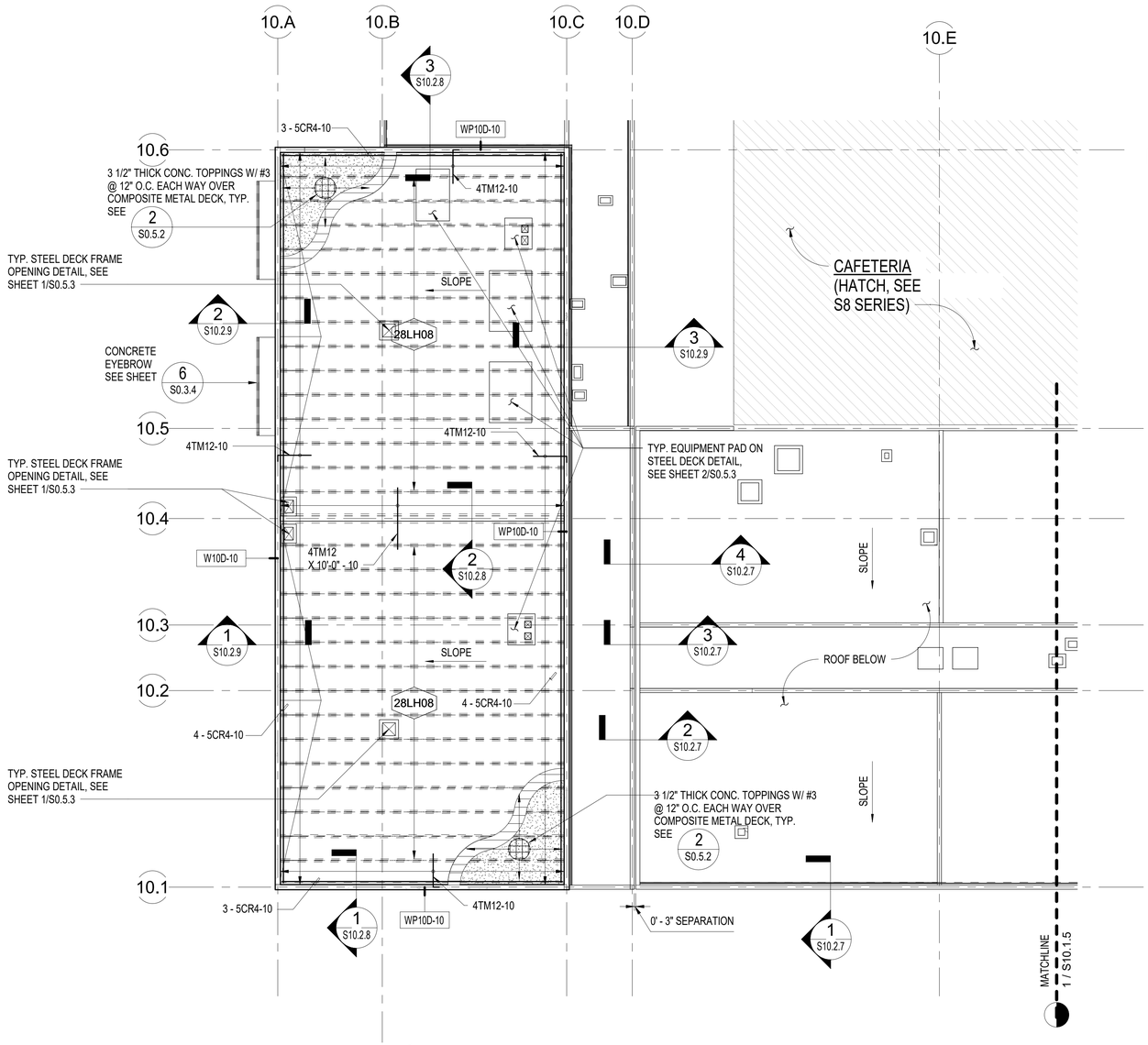


KEY PLAN



1 UPPER ROOF FRAMING PLAN (2 OF 2)

3/32" = 1'-0"

0' 4' 8' 16' 32'

LEGEND AND TAGS

WP#-#	PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
W#-#	CAST-IN-PLACE WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
28LH06	28LH06 STEEL JOIST SPACED AT 4'-0" (MAX.), SEE SHEET SERIES S0.5
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
2-5CR4	CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4
CB#-#	TYP. "CB1-10" CONCRETE CORBEL/BEAM DESIGNATION, SEE SHEET S10.3.1

NOTE: REFER TO SHEET S0.5.1 FOR STEEL JOIST AND GIRDER NOTES

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SIMON SANCHEZ HIGH SCHOOL

Title
GCC:
UPPER ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S10.1.6
Sheet No. _____ of _____

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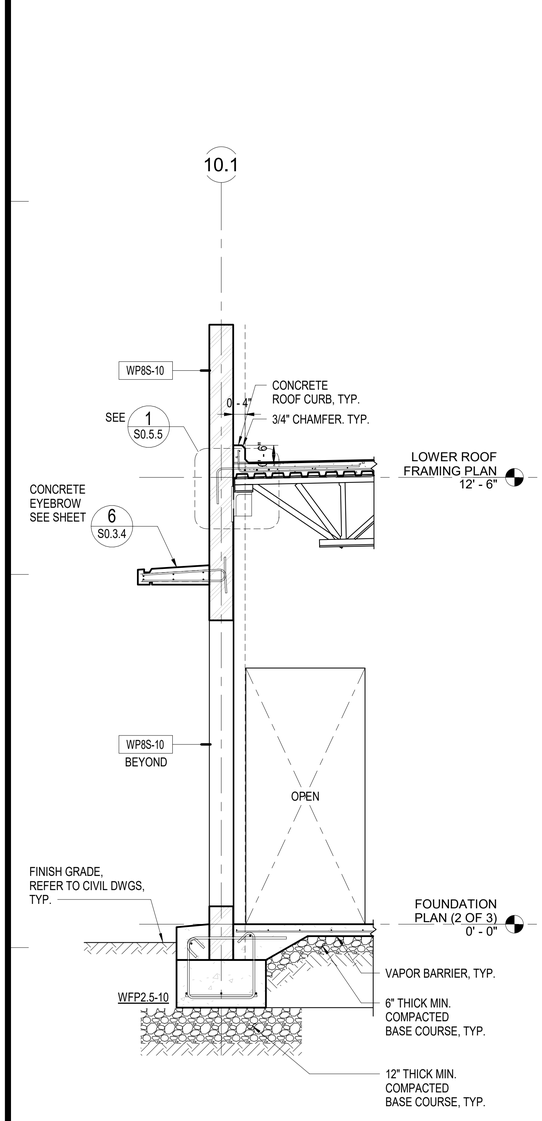

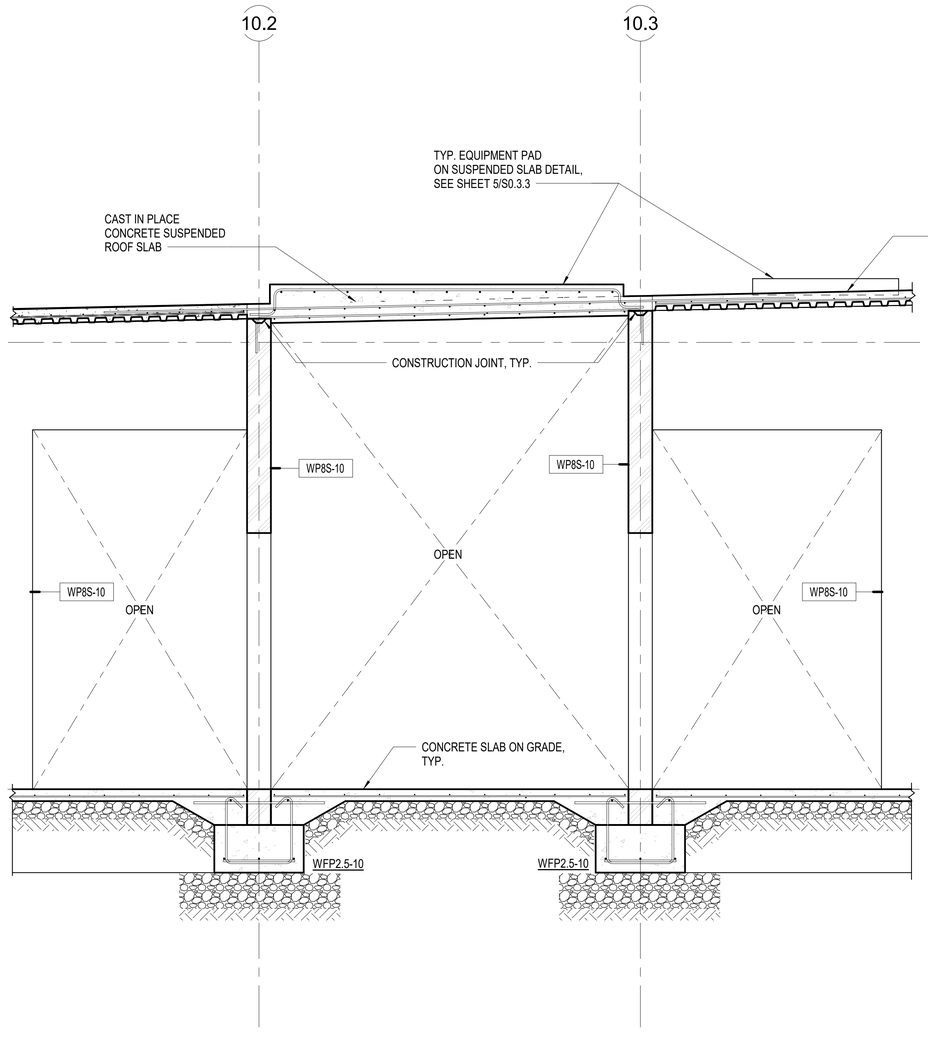

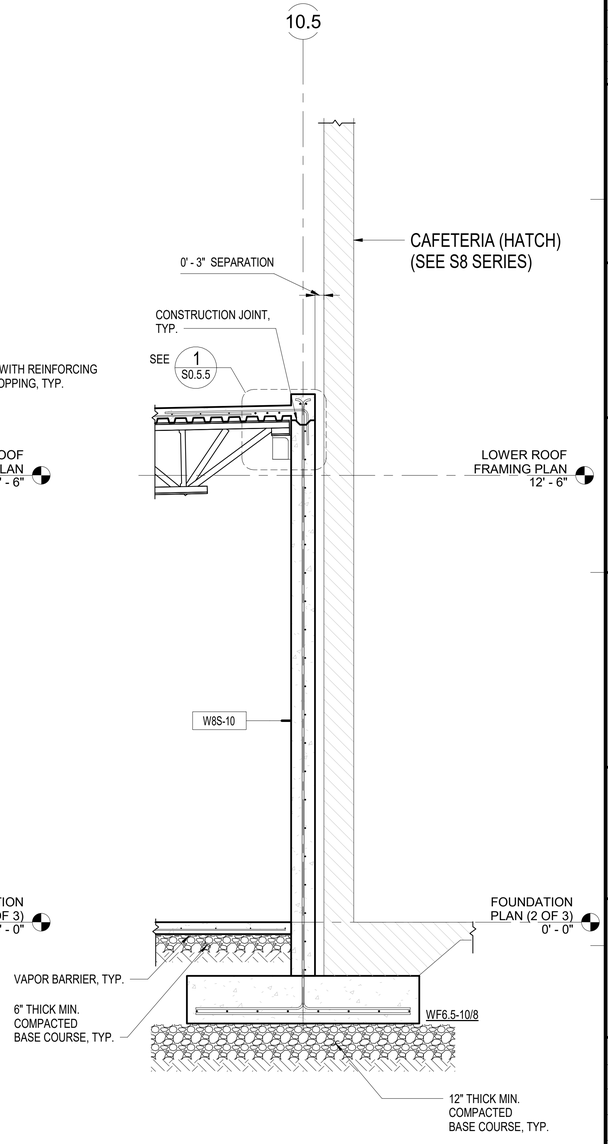

1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

2 PRECAST WALL PANEL KEY PLAN
1/2" = 1'-0"
0' 6" 1' 2' 4'

3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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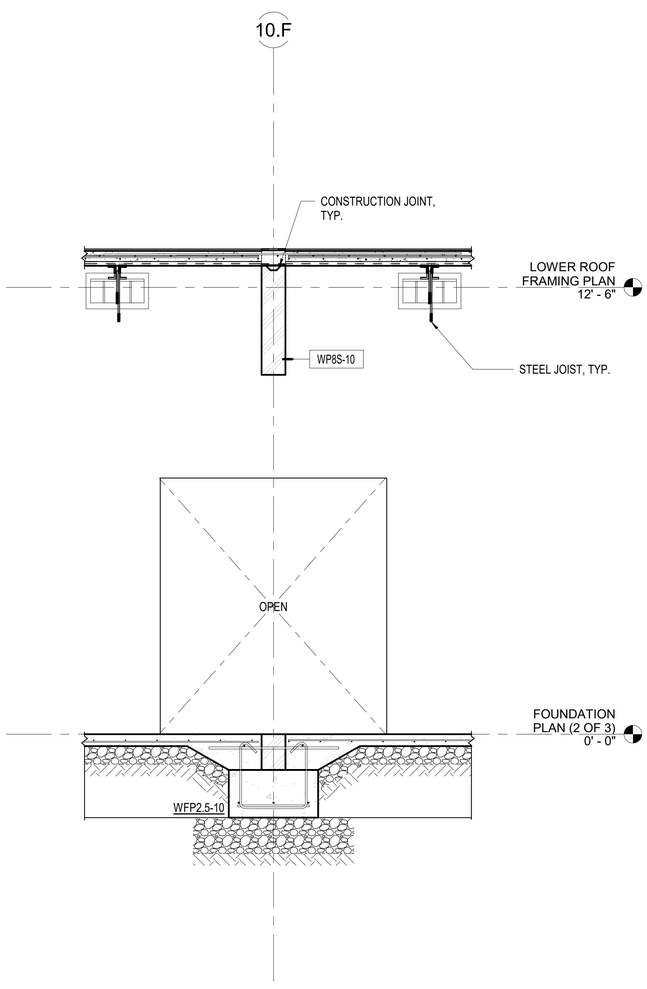
SIMON SANCHEZ HIGH SCHOOL

Title
GCC:
SECTIONS
PROGRAMMING DOCUMENT

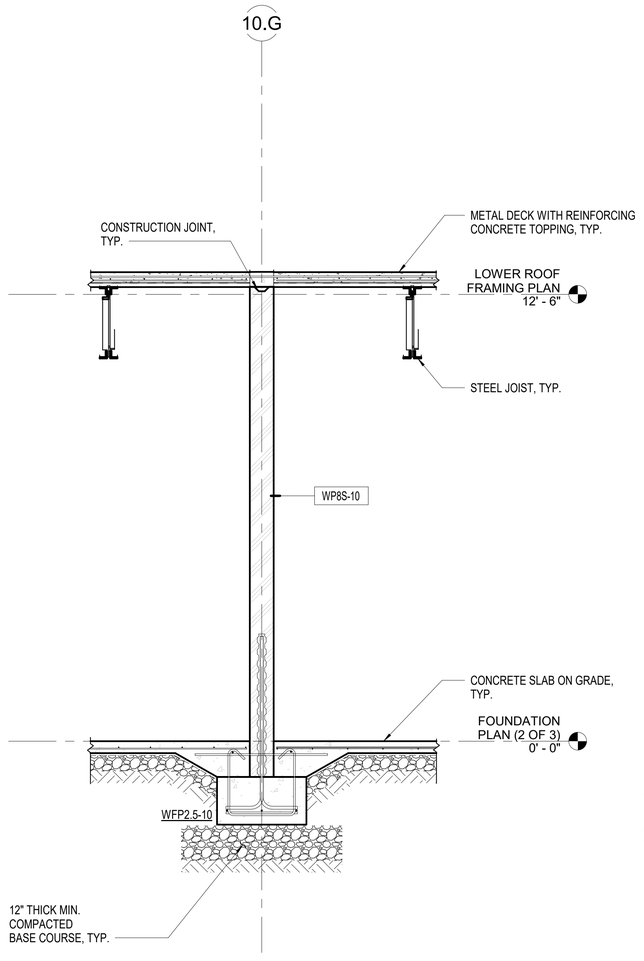
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.2.1
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
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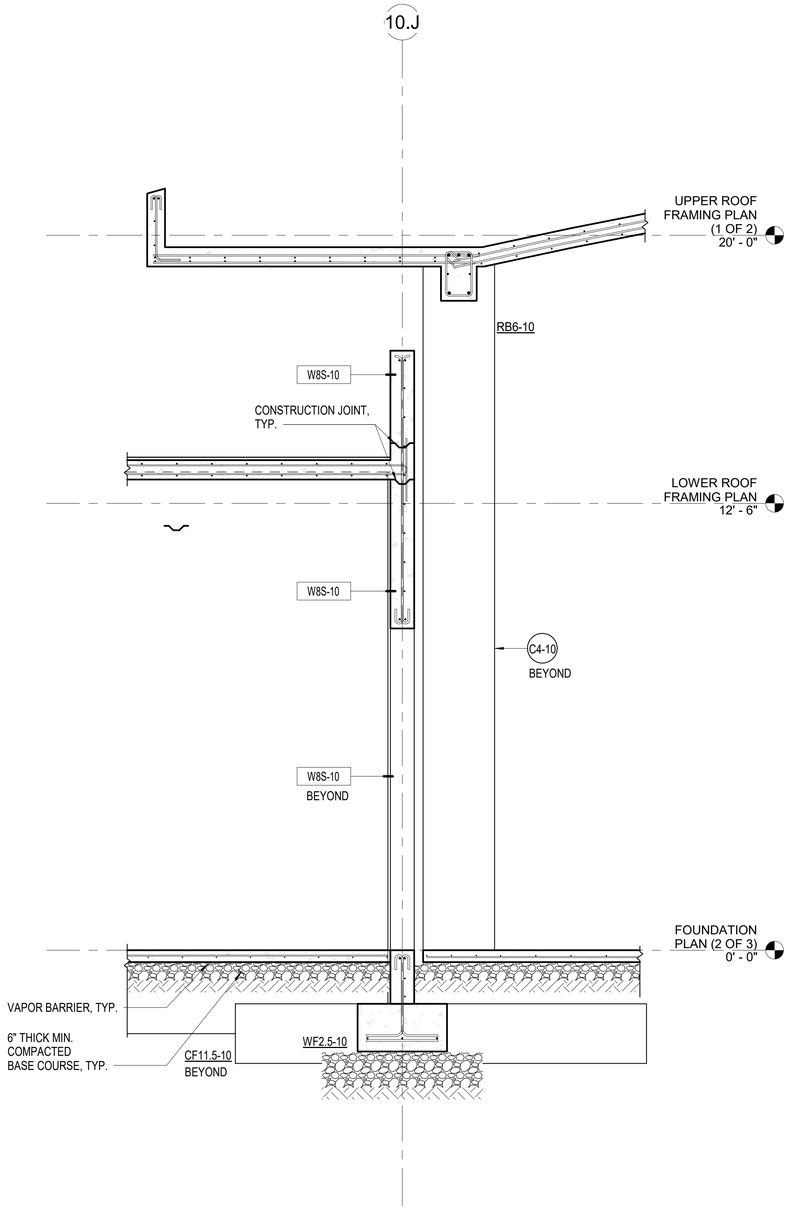
0' 6" 1' 2' 4'



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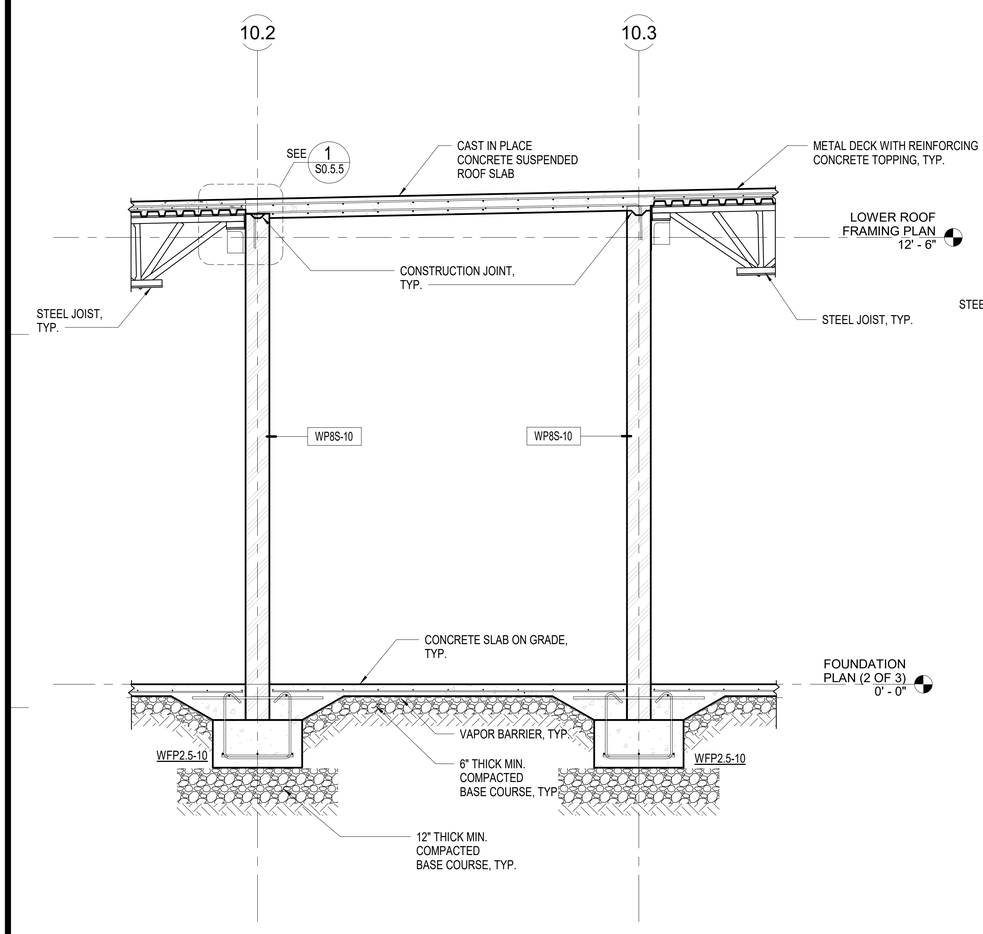
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.2.2
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



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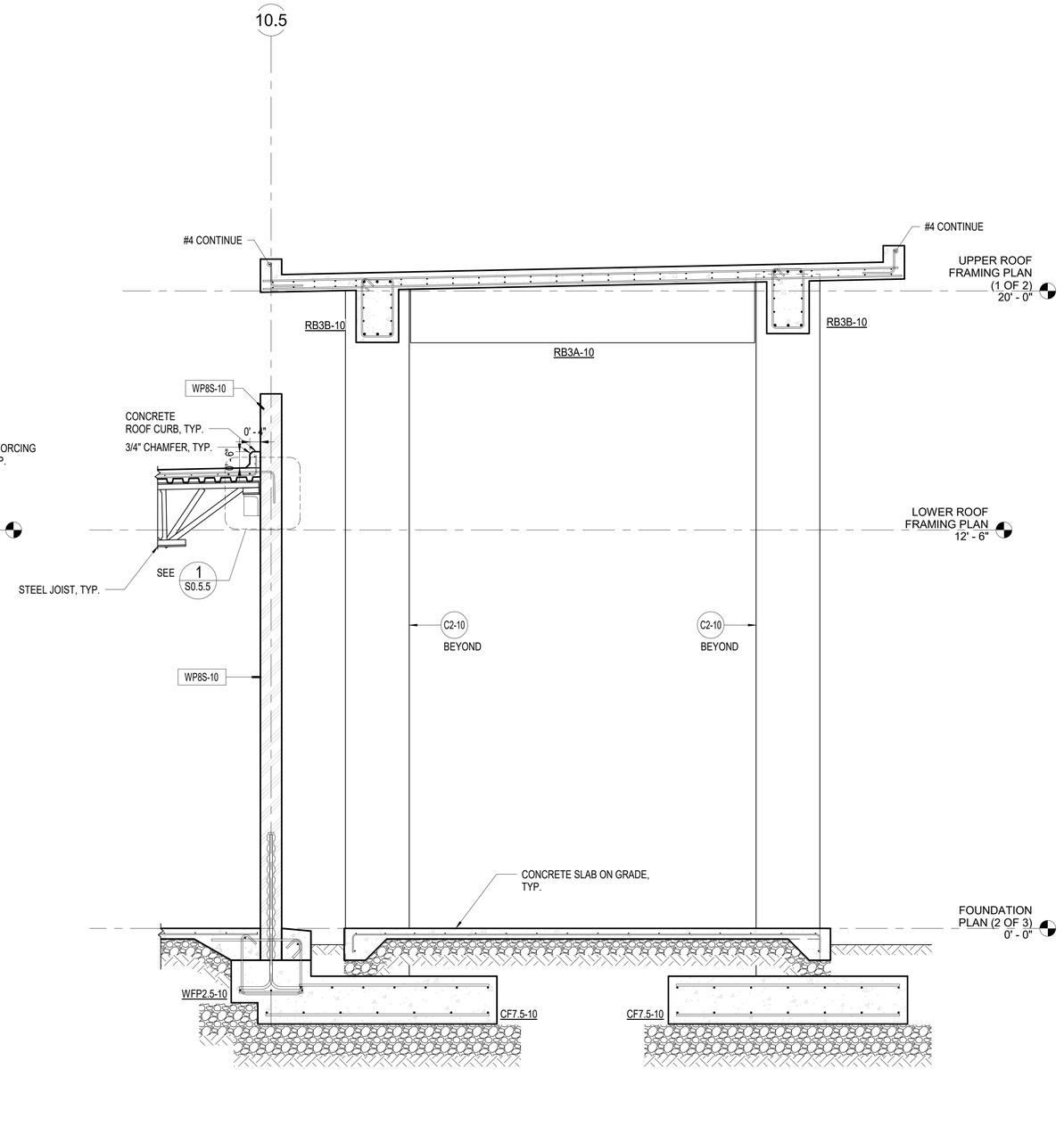

2 SECTION
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SIMON SANCHEZ HIGH SCHOOL

Title
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Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.2.3
Sheet No. _____ of _____

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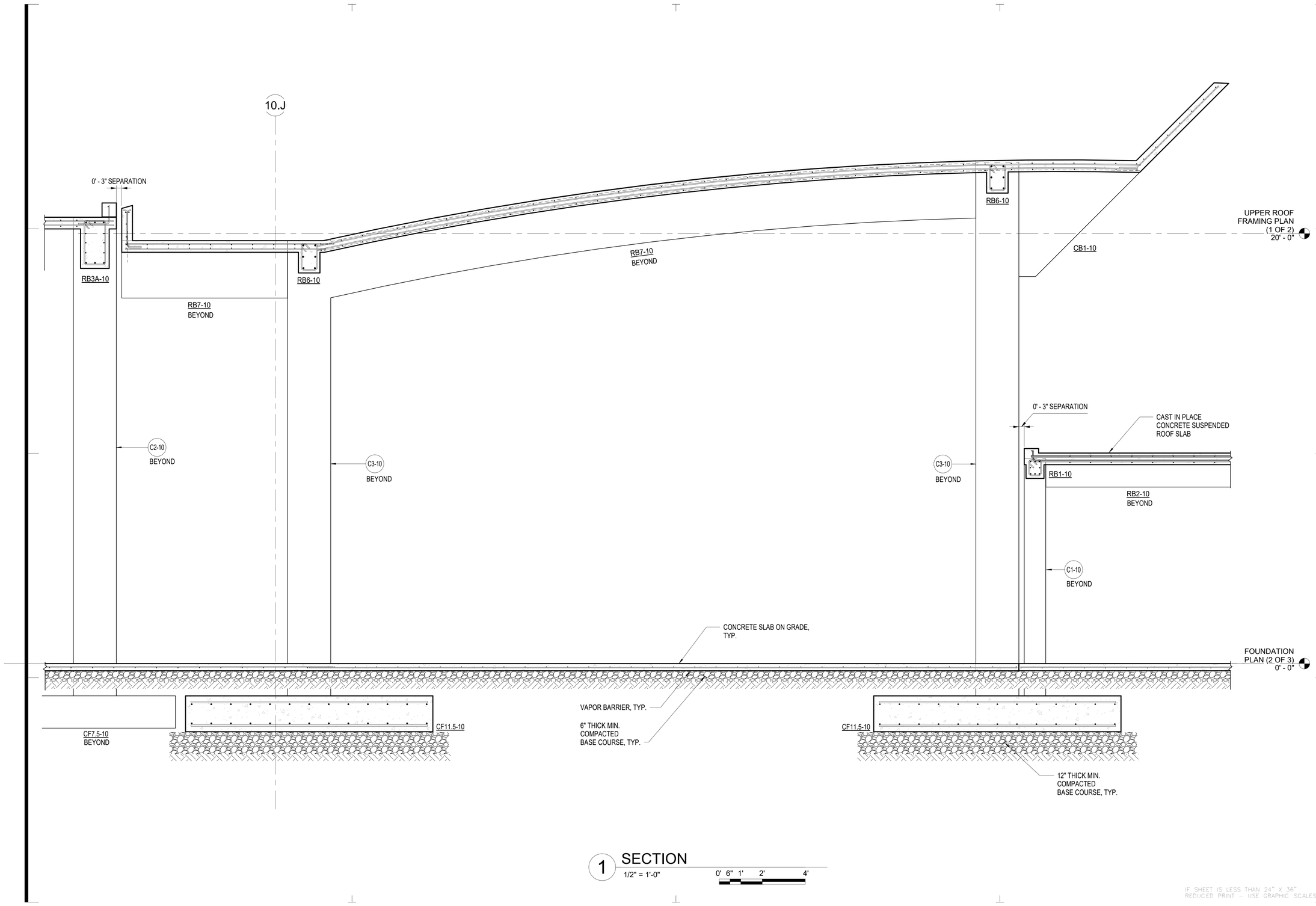

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Drawing
S10.2.4
Sheet No. _____ of _____

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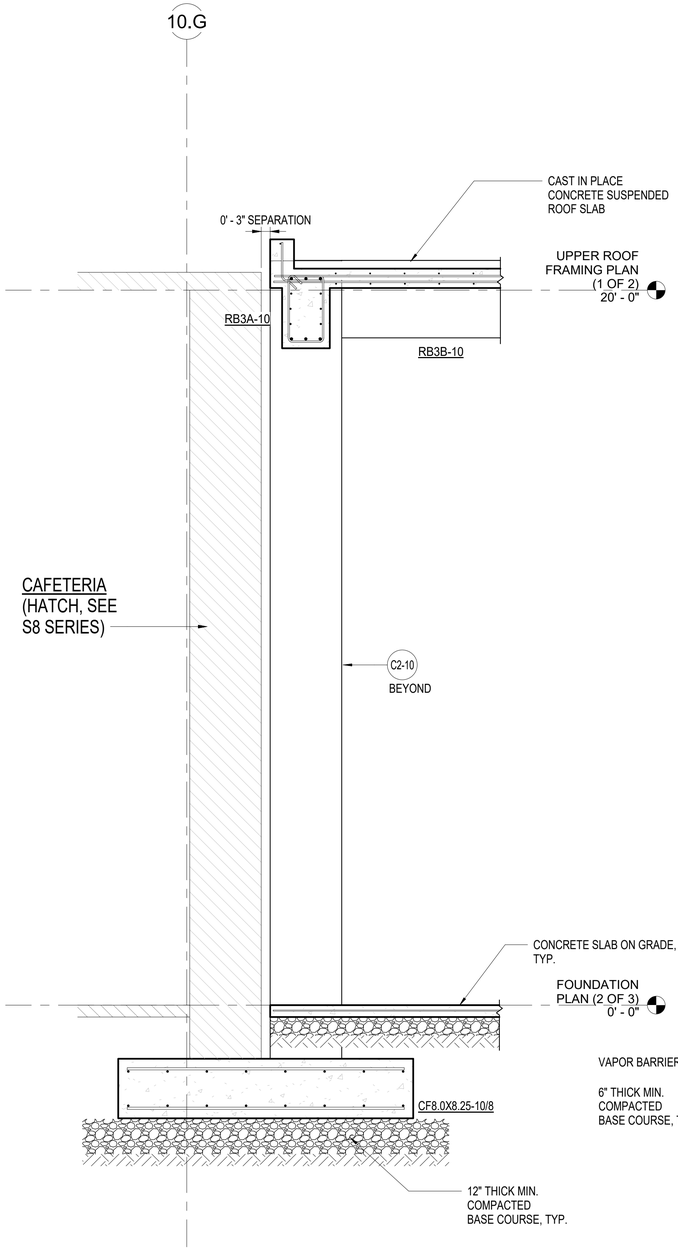

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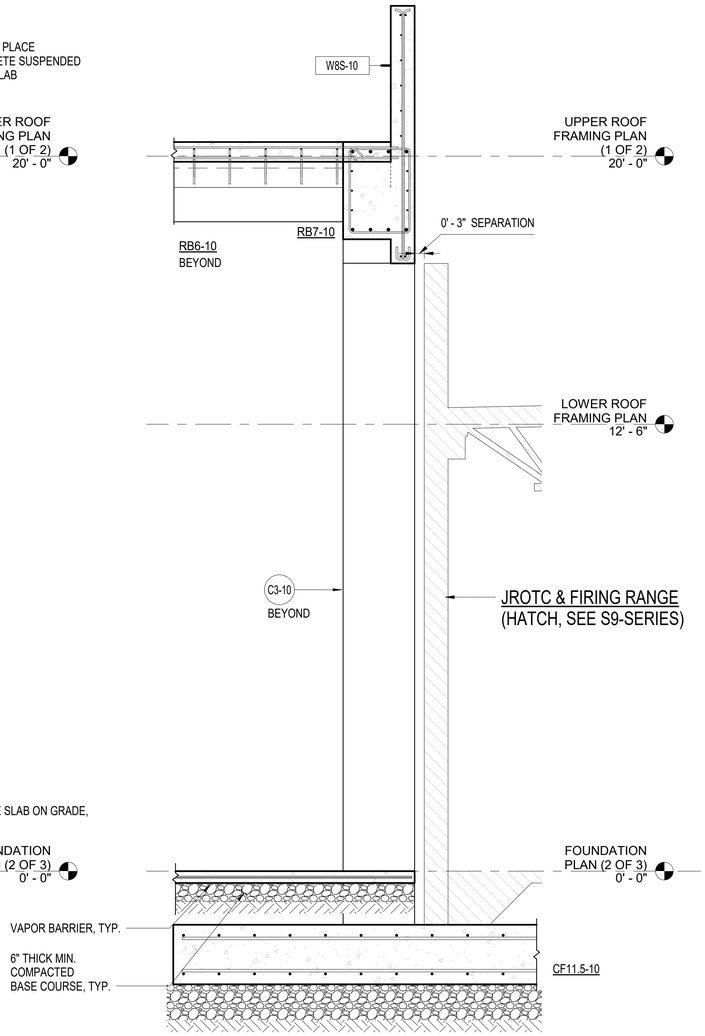

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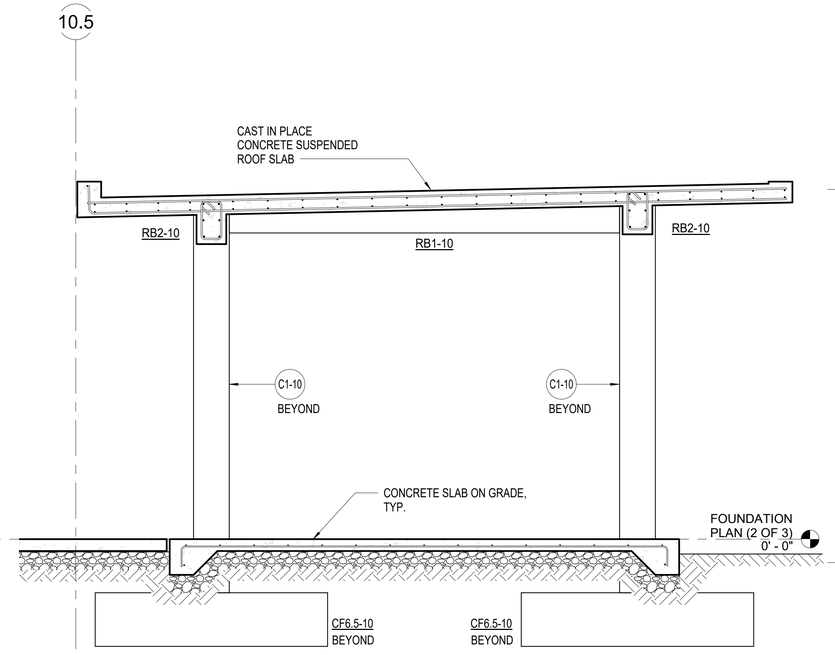

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Drawing
S10.2.5
Sheet No. of

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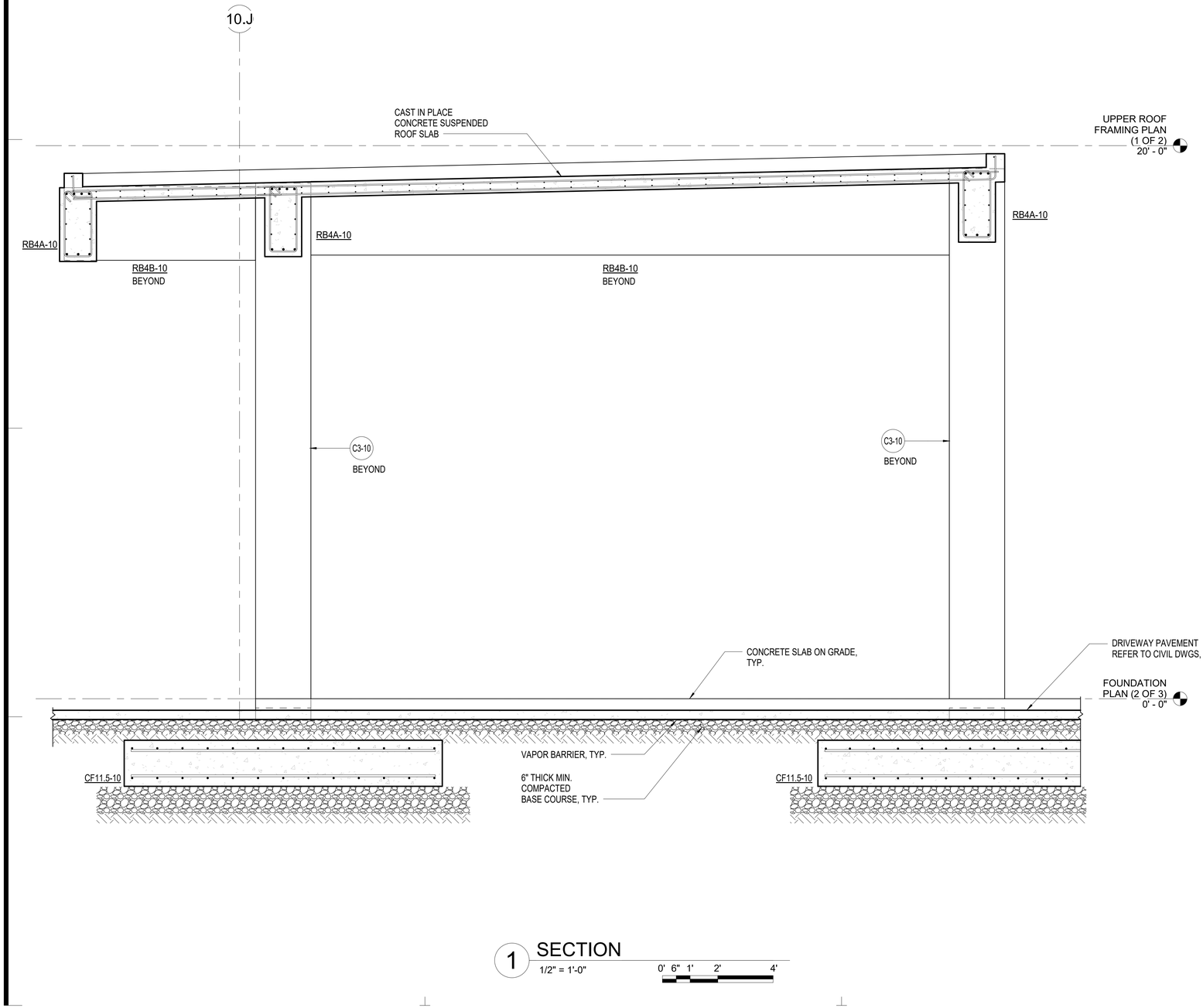

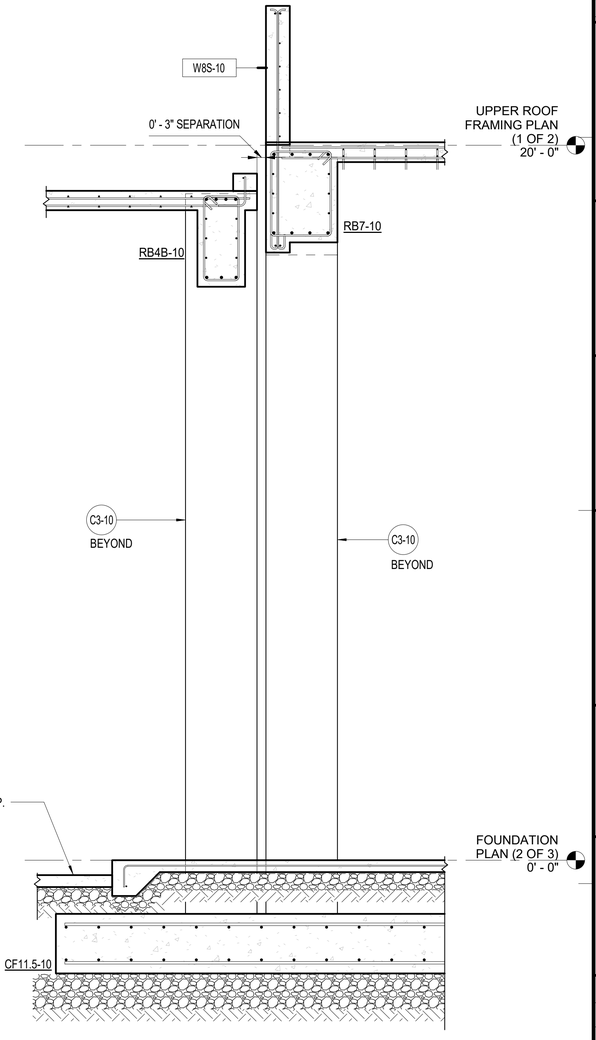

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Drawn	AGC
Checked	TPC/CDC
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Scale:	1/2" = 1'-0"
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Project	File

Drawing
S10.2.6
Sheet No. _____ of _____

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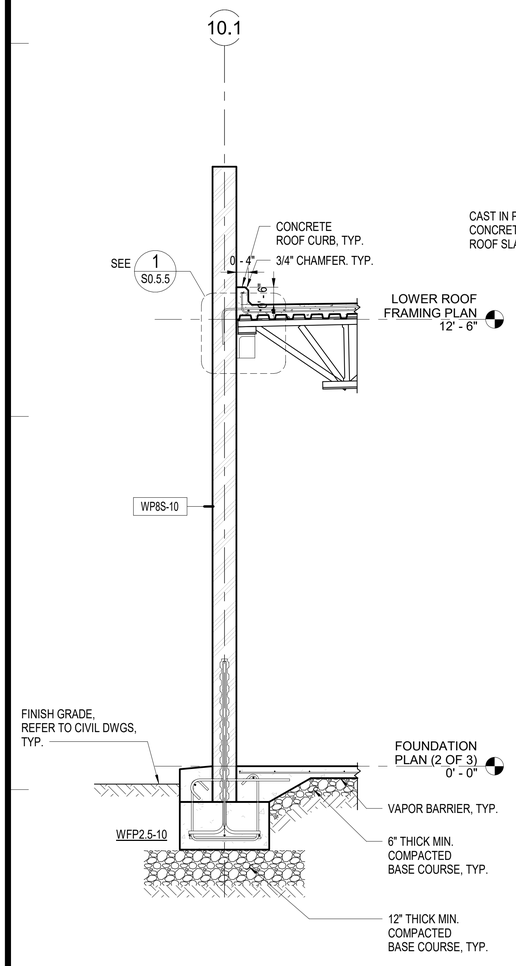
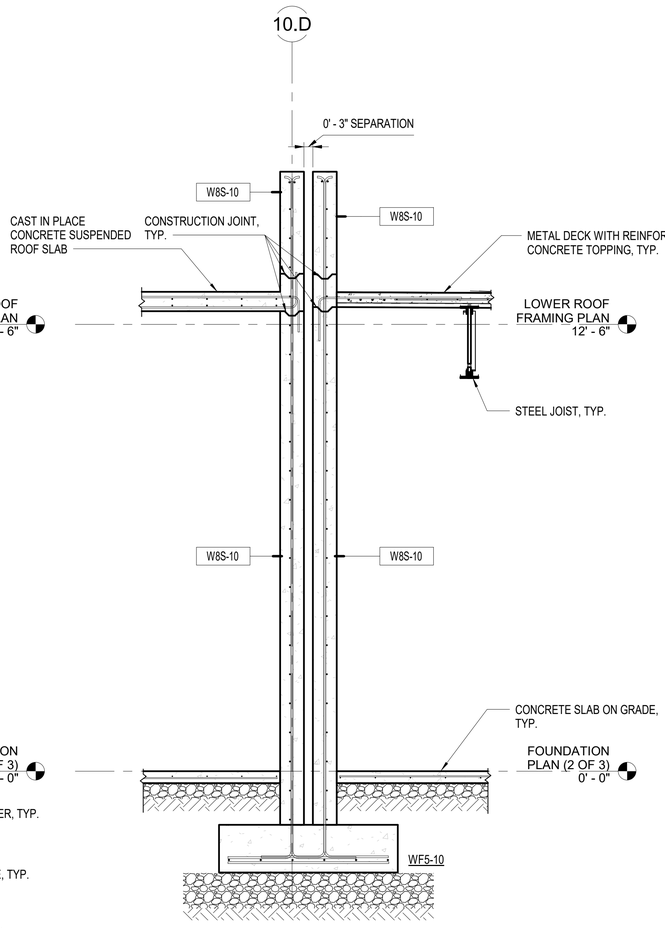


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



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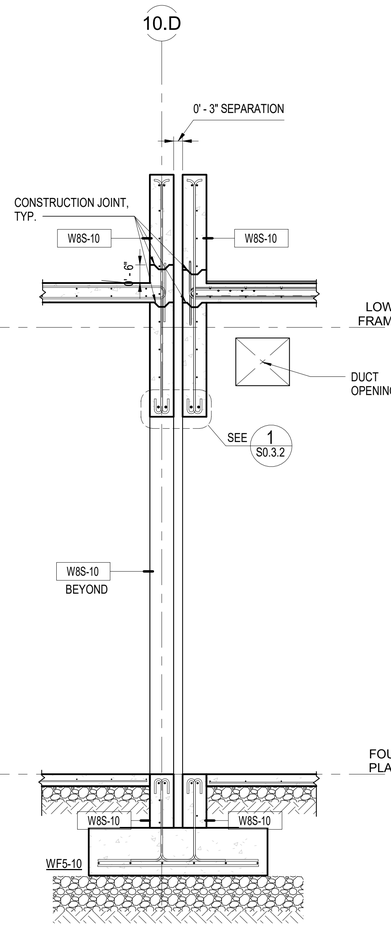

3 SECTION
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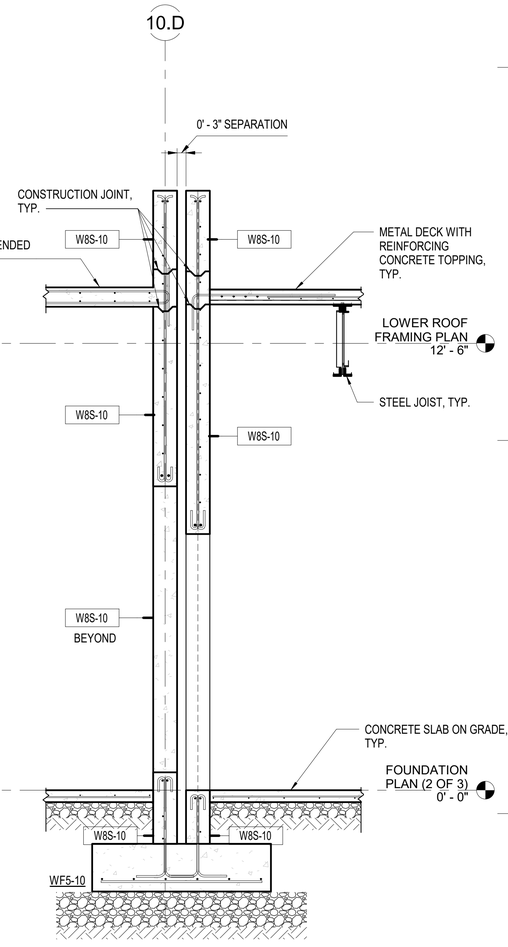

4 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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Project	File

Drawing
S10.2.7
Sheet No. _____ of _____

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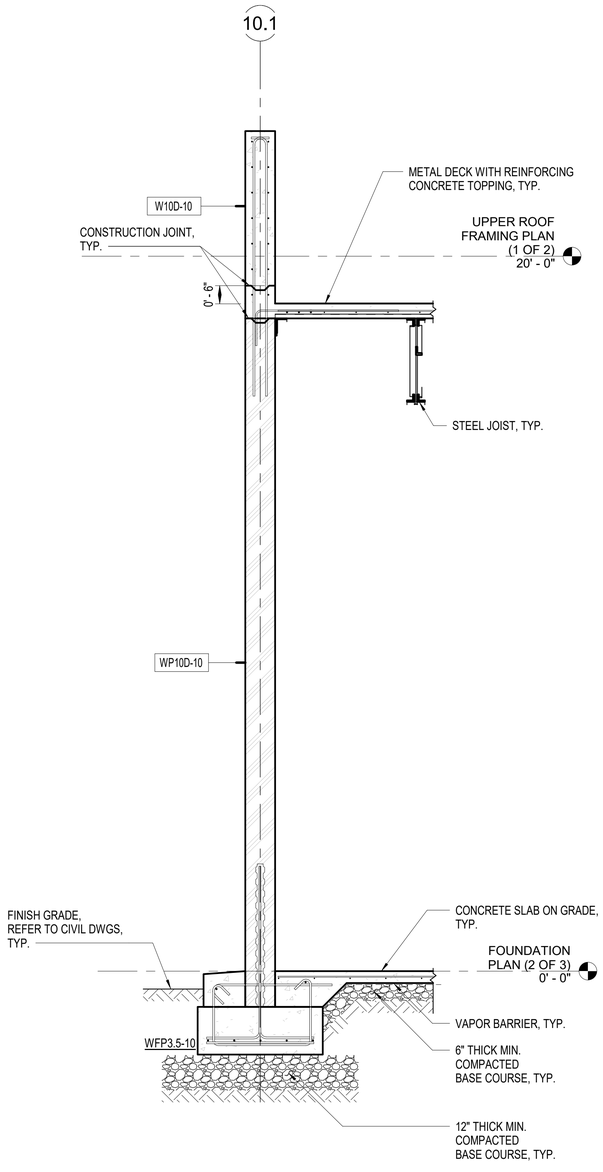
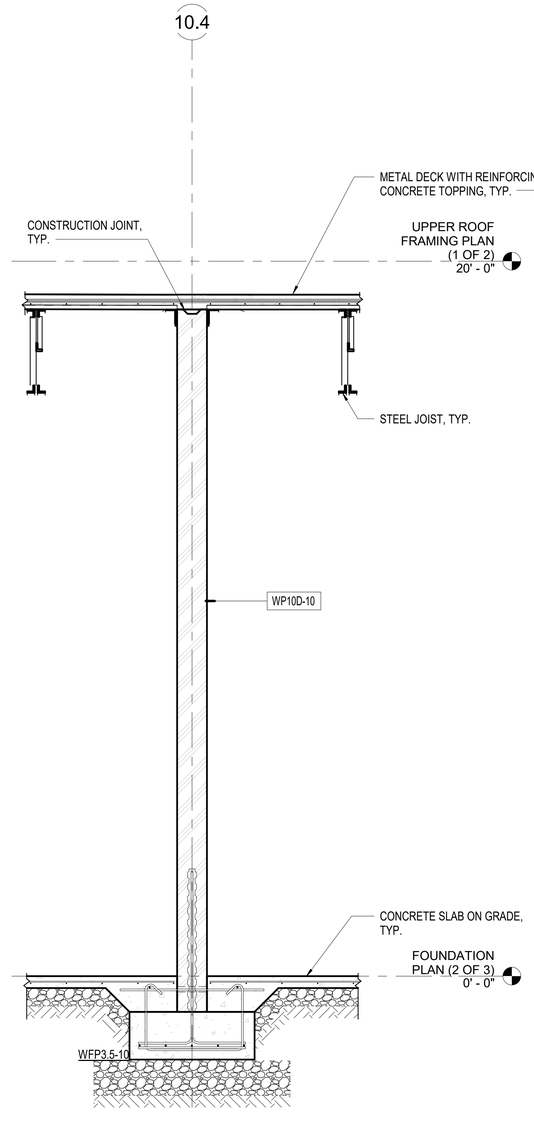


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
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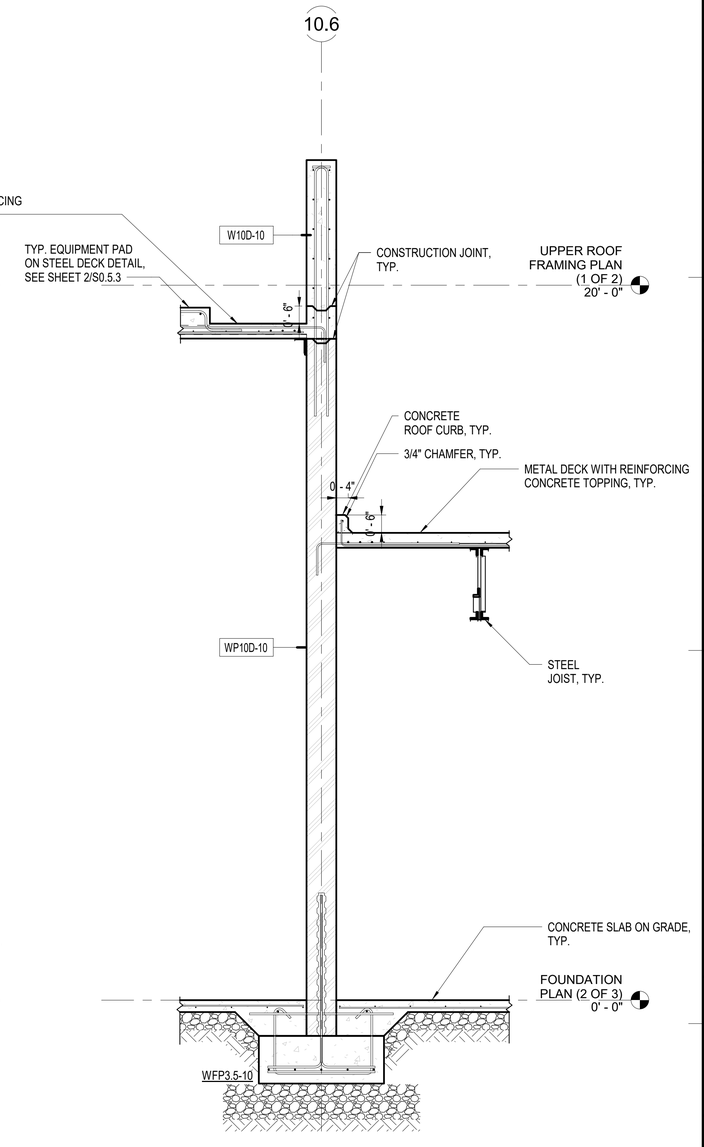

3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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GCC:
SECTIONS
PROGRAMMING DOCUMENT

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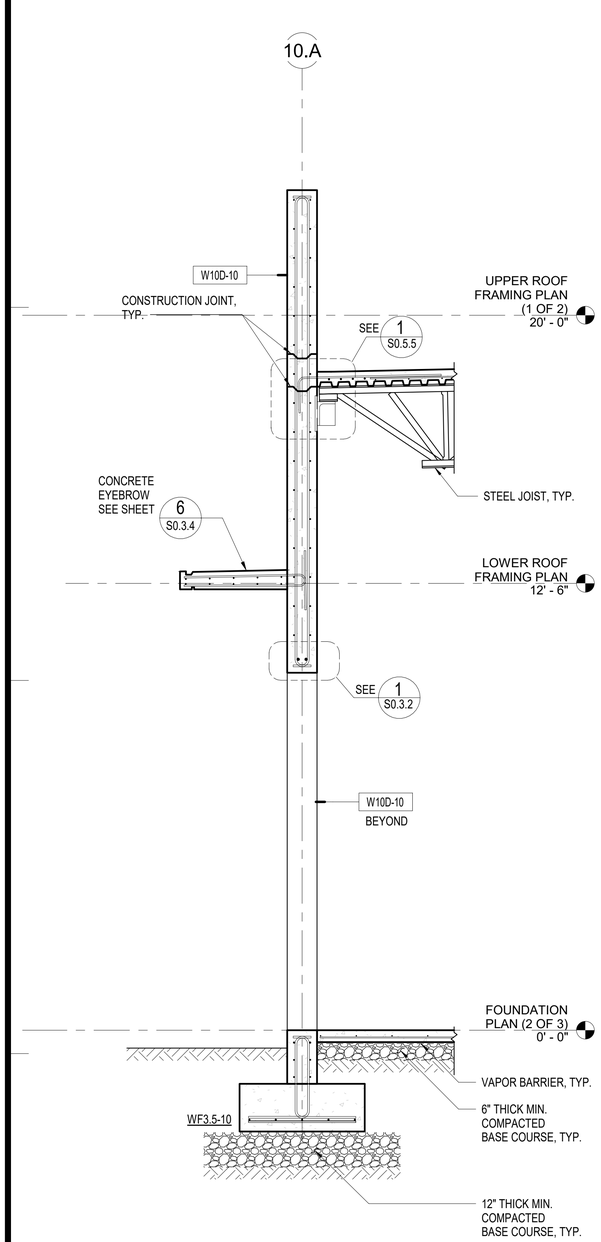
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

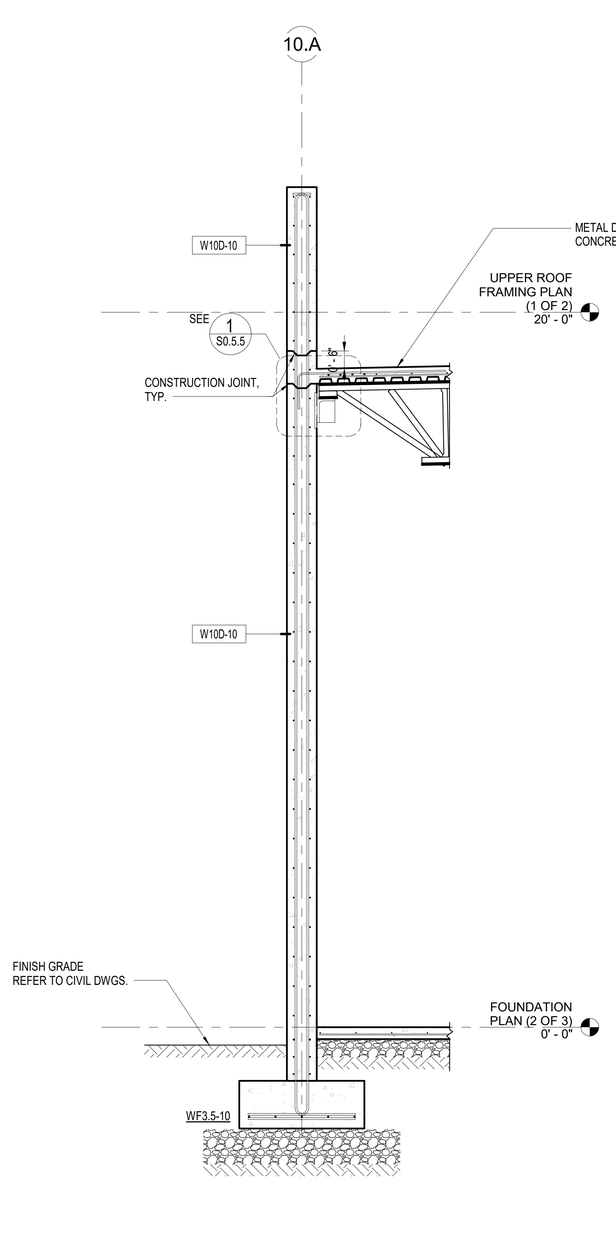
Drawing
S10.2.8

Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
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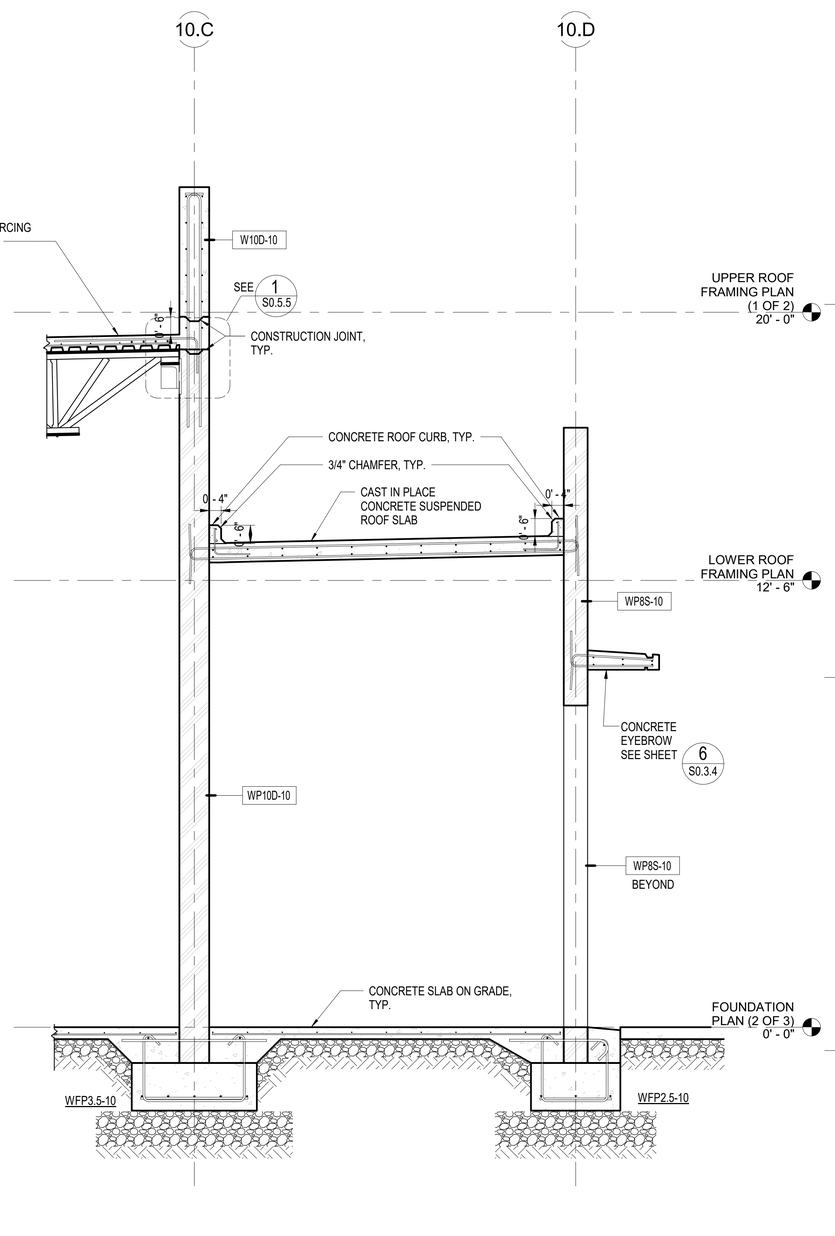

3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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SECTIONS
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Checked	TPC/CDC
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.2.9
Sheet No._____ of _____

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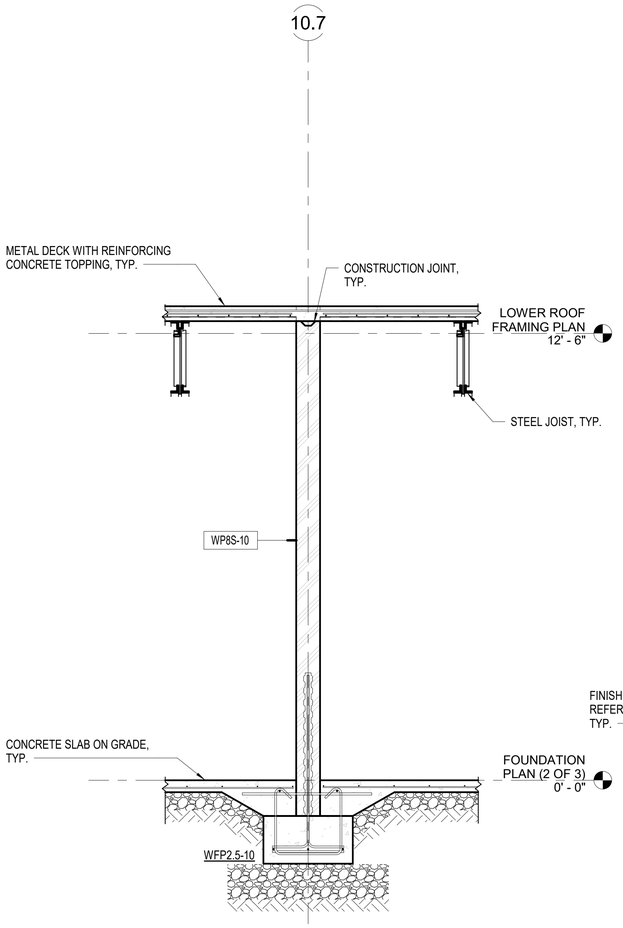
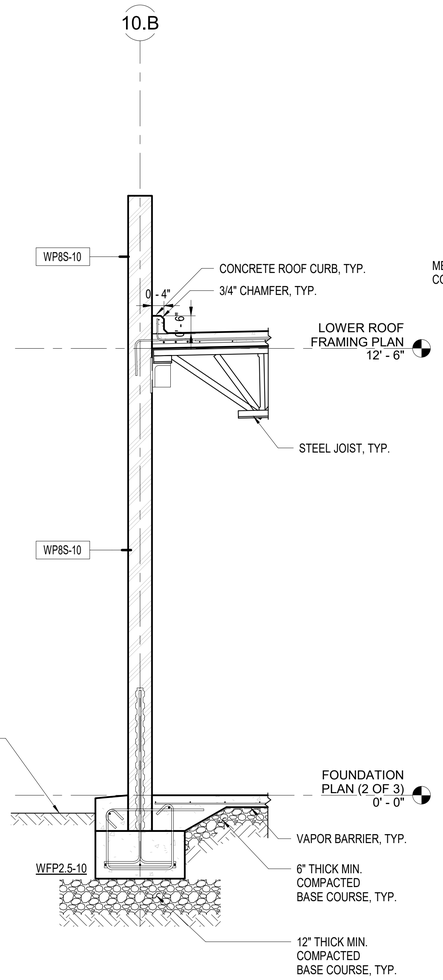
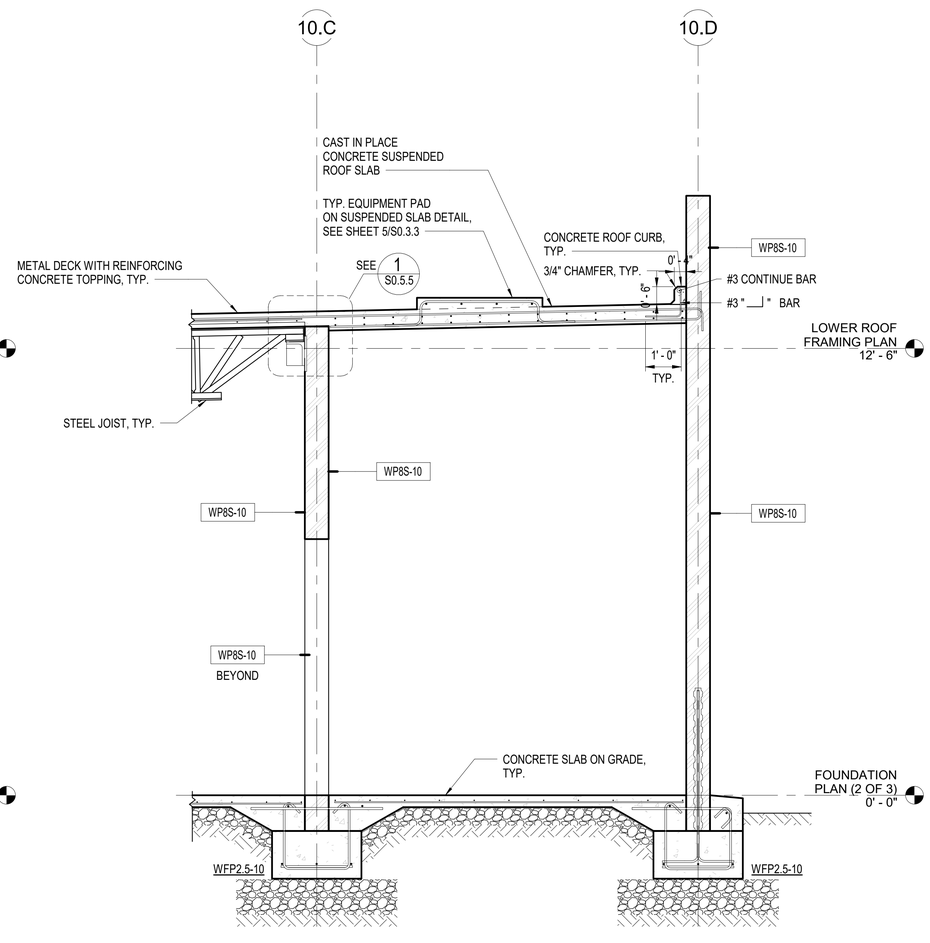


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

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S10.2.10
Sheet No. _____ of _____

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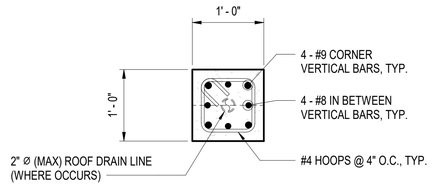
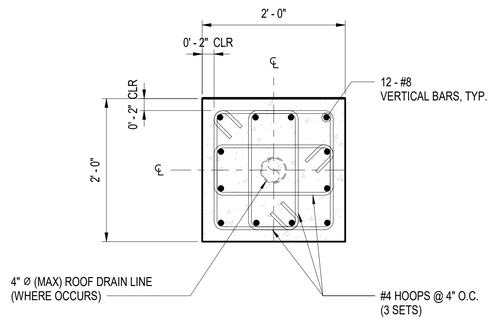


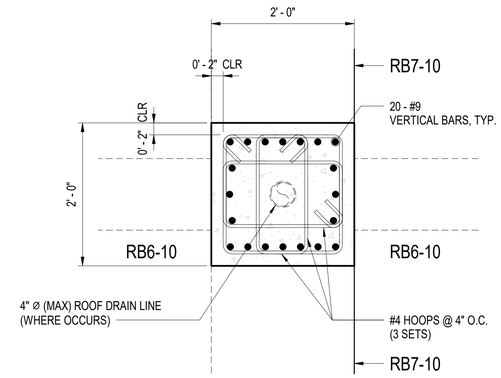
1 TYP. CONC. "C1-10" COLUMN DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



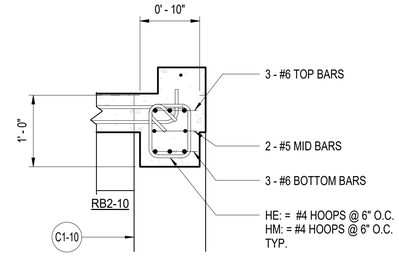
2 TYP. CONC. "C2-10" COLUMN DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



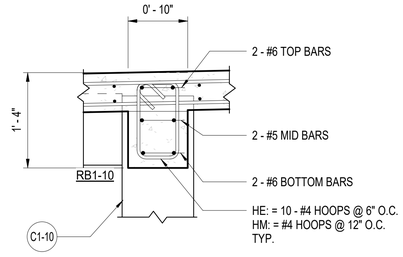
3 TYP. CONC. "C3-10" COLUMN DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



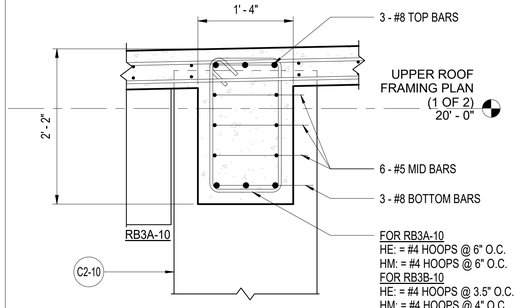
4 TYP. CONC. BEAM "RB1-10" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



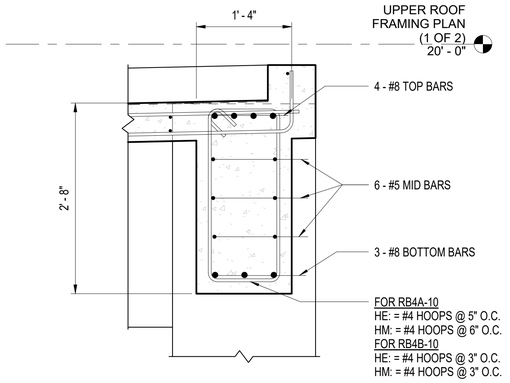
5 TYP. CONC. BEAM "RB2-10" DET.

1" = 1'-0" 0' 3" 6" 1' 2'



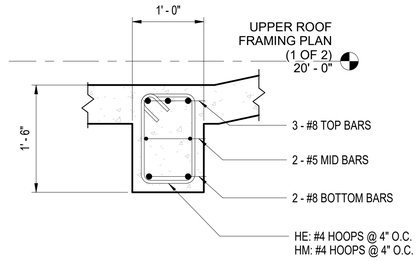
6 TYP. CONC. BEAM "RB3A & RB3B-10" DET.

1" = 1'-0" 0' 3" 6" 1' 2'



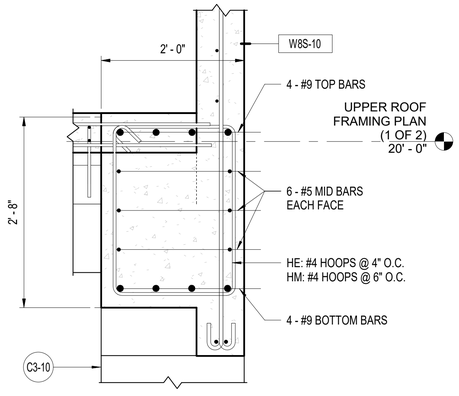
7 TYP. CONC. BEAM "RB4A & RB4B-10" DET.

1" = 1'-0" 0' 3" 6" 1' 2'



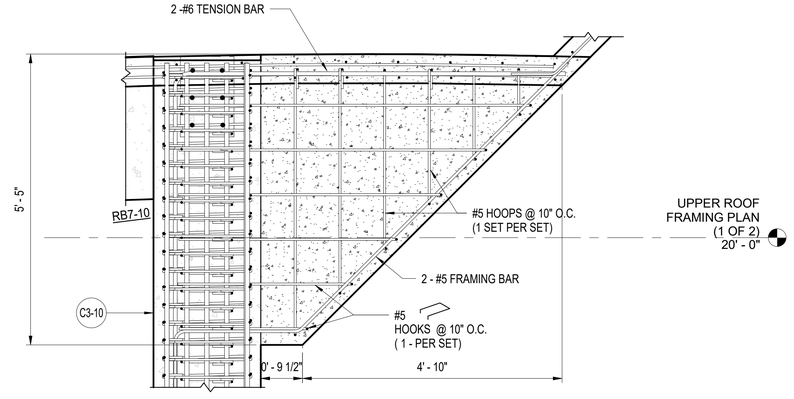
8 TYP. CONC. BEAM "RB6-10" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



9 TYP. CONC. BEAM "RB7-10" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'



10 TYP. "CB1-10" CONCRETE CORBEL/BEAM DETAIL

3/4" = 1'-0" 0' 6" 1' 2' 4'

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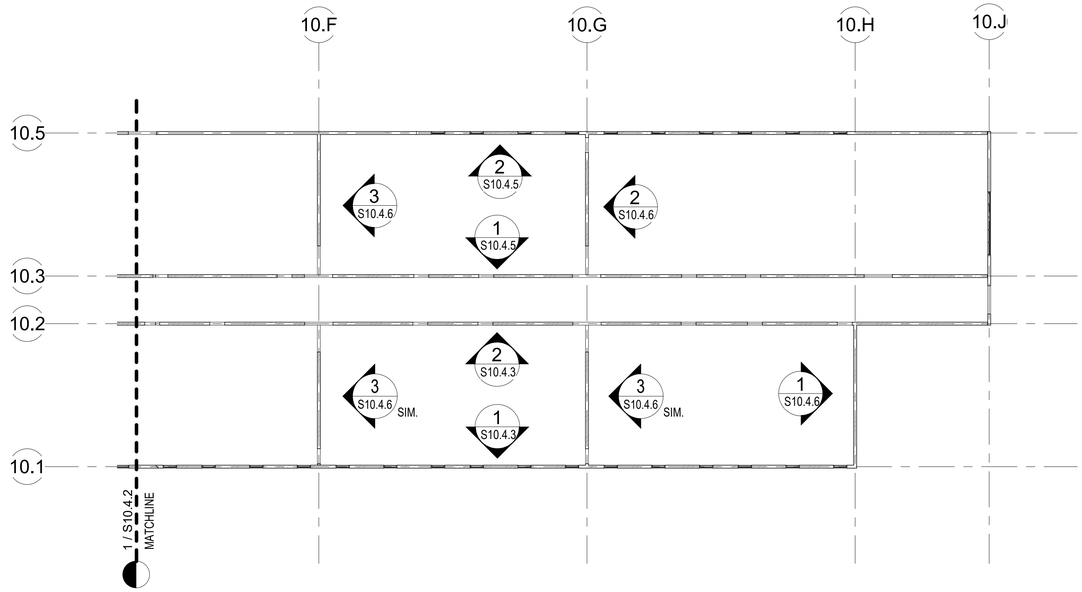
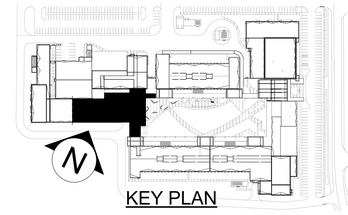
Sheet No. of



1 PRECAST WALL PANEL KEY PLAN (1 OF 3)

1/16" = 1'-0" 0' 4' 8' 16' 32'



KEY PLAN

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Title
GCC:
PRECAST WALL PANEL KEY PLAN (1 OF 3)
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
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Checked	TPC/CDC
Supv:	TPC
Scale:	1/16" = 1'-0"
Date:	03/31/25
Project	File

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S10.4.1
Sheet No. _____ of _____

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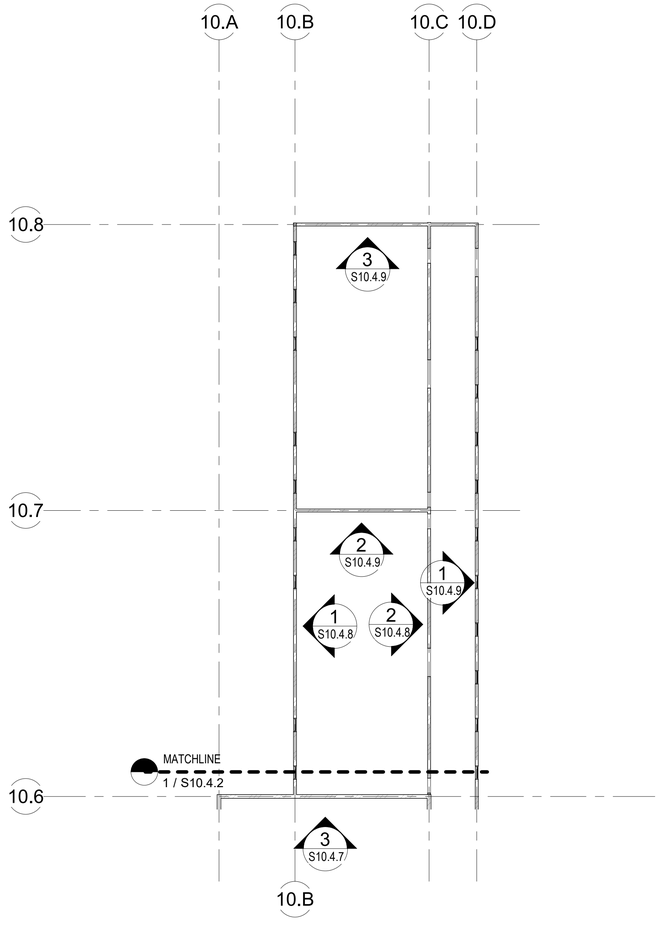
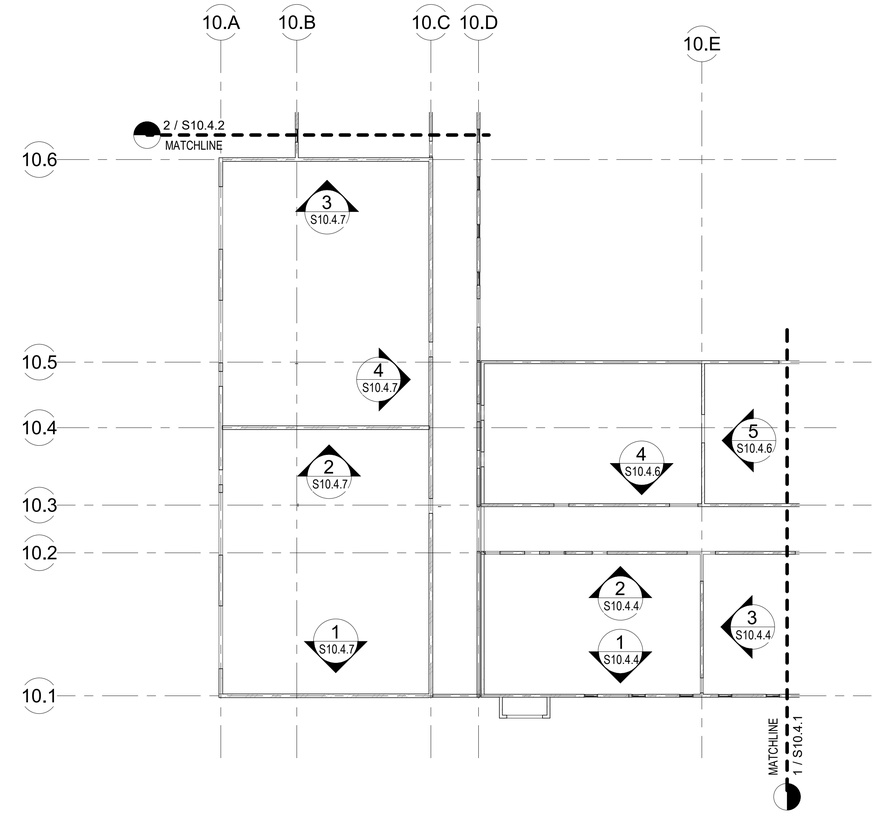


2 PRECAST WALL PANEL KEY PLAN (3 OF 3)

1/16" = 1'-0"

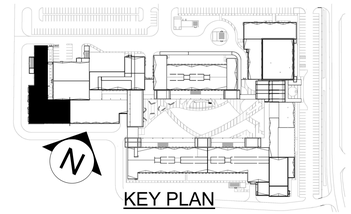
0' 4' 8' 16' 32'



1 PRECAST WALL PANEL KEY PLAN (2 OF 3)

1/16" = 1'-0"

0' 4' 8' 16' 32'



KEY PLAN

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GCC:

PRECAST WALL PANEL KEY PLAN (2 & 3 OF 3)
PROGRAMMING DOCUMENT

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Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/16" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S10.4.2

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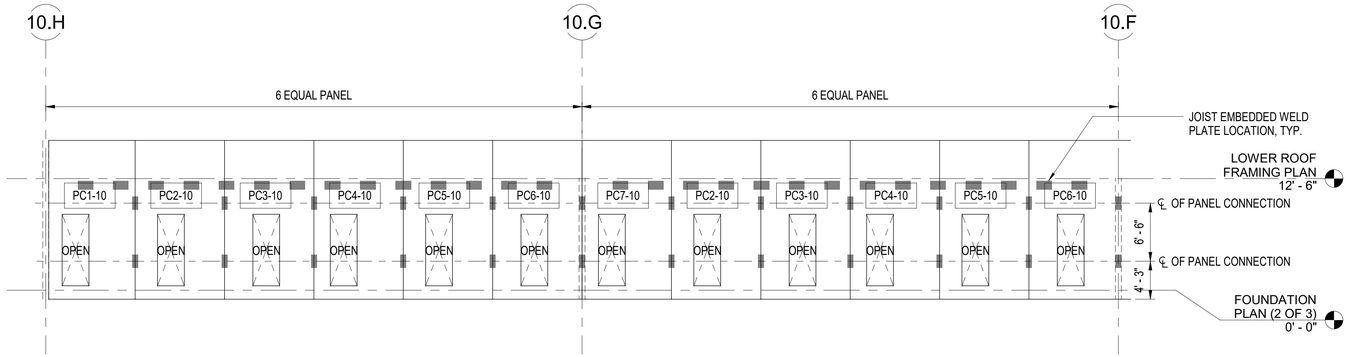
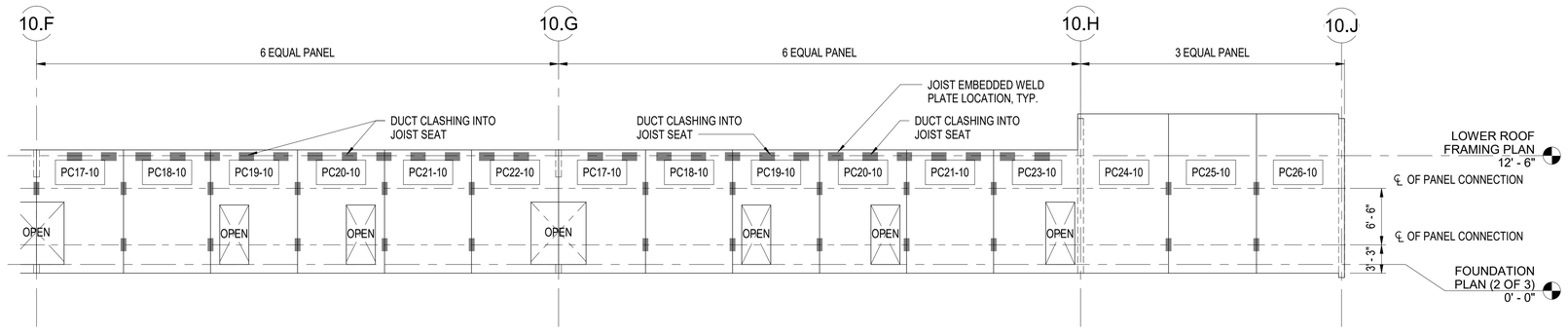


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.1

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.2

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Title
GCC:
PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

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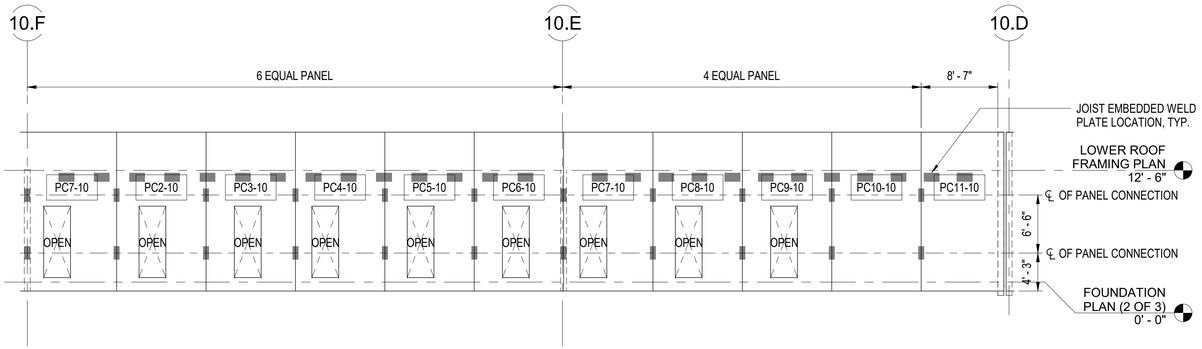
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

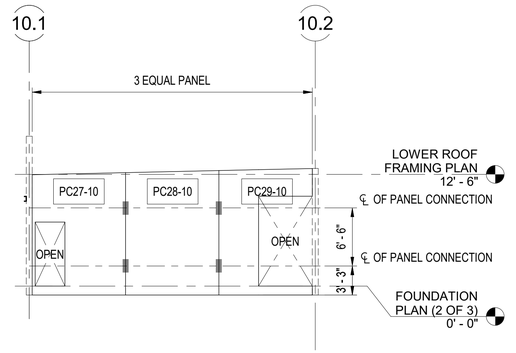
Drawing
S10.4.3
Sheet No. of

NOT FOR CONSTRUCTION



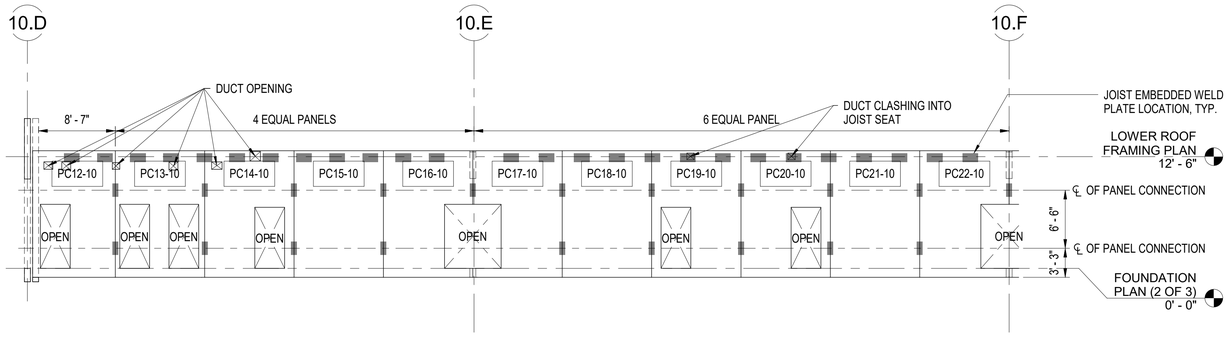
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.1

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.E, 10.G & 10.F

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.2

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.

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PRECAST WALL PANEL ELEVATIONS
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Designed:	TPC/CDC
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Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.4.4
Sheet No. of

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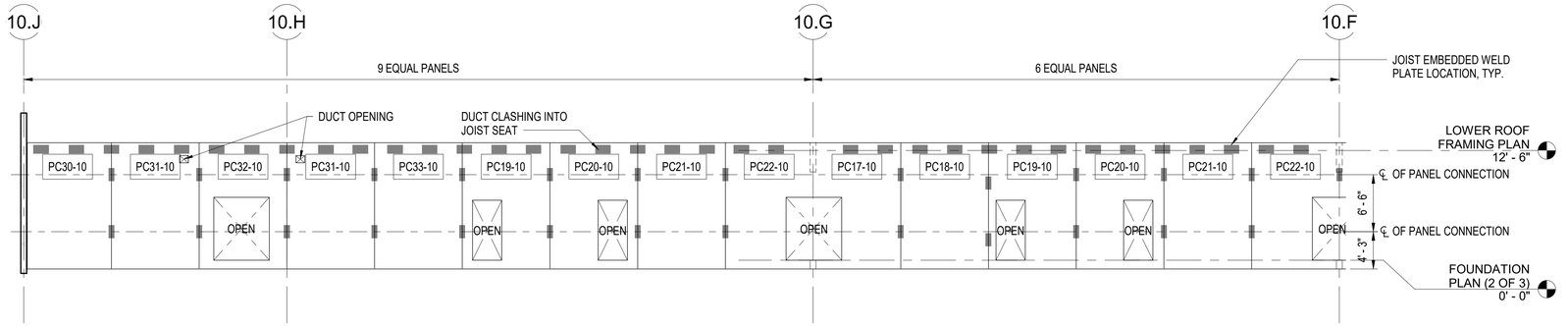
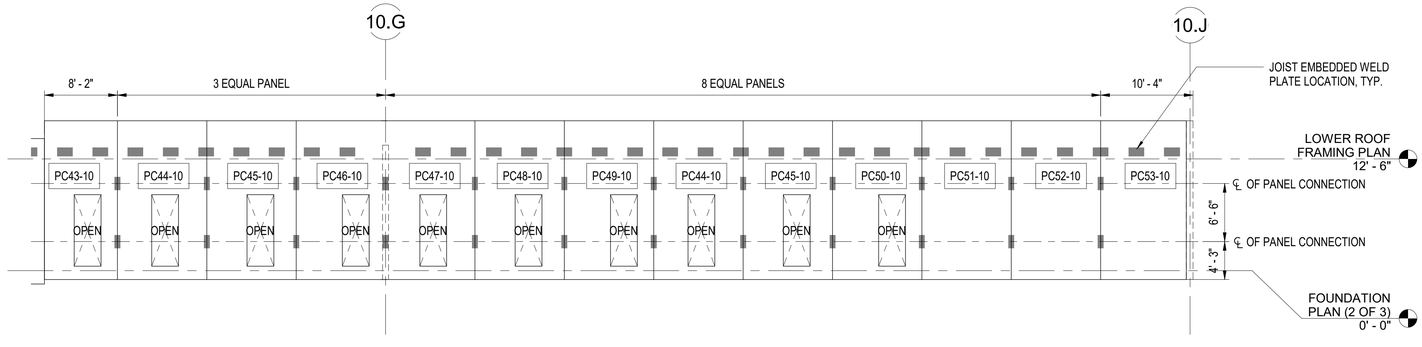
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.



1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.3

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.5

1/8" = 1'-0" 0' 2' 4' 8' 16'

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Title
GCC:
PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.4.5
Sheet No. _____ of _____

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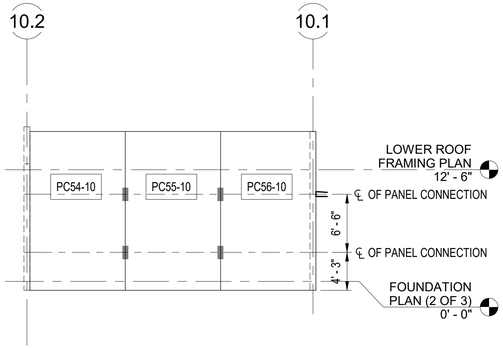
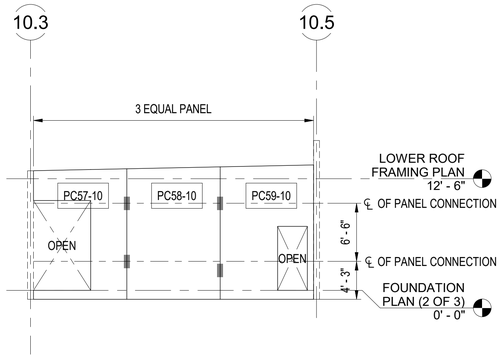


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.H

1/8" = 1'-0" 0' 2' 4' 8' 16'

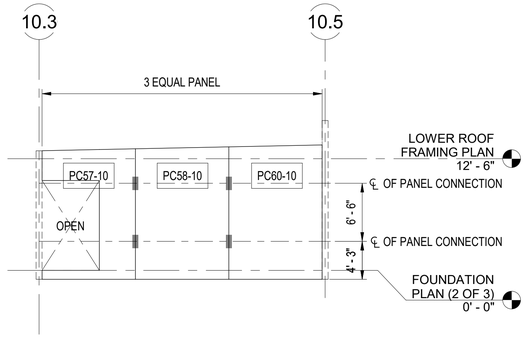


2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.G

1/8" = 1'-0" 0' 2' 4' 8' 16'

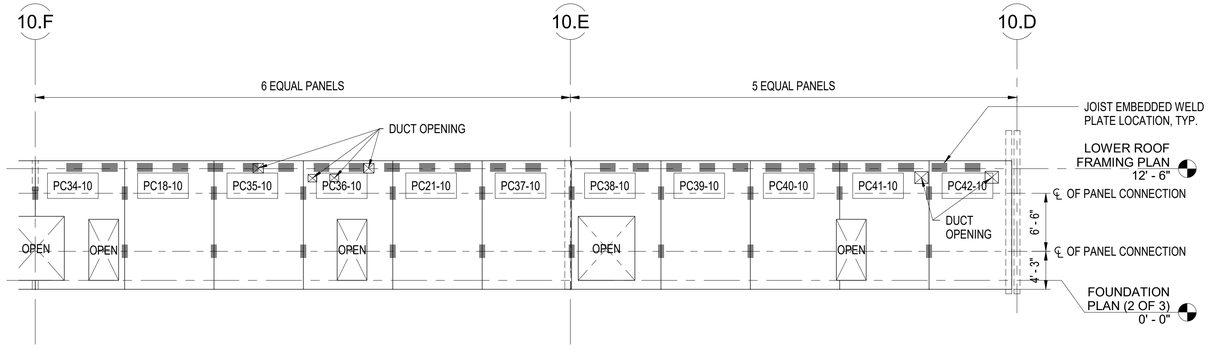
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.



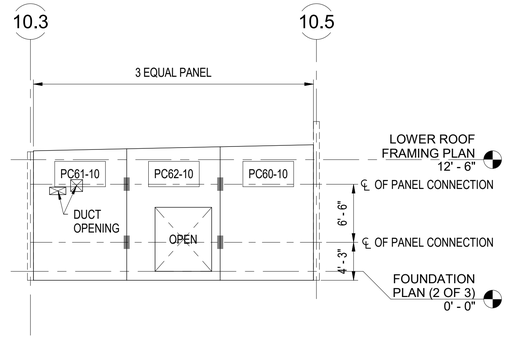
3 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.F

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.3

1/8" = 1'-0" 0' 2' 4' 8' 16'



5 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.E

1/8" = 1'-0" 0' 2' 4' 8' 16'

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PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

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Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.4.6
Sheet No. of

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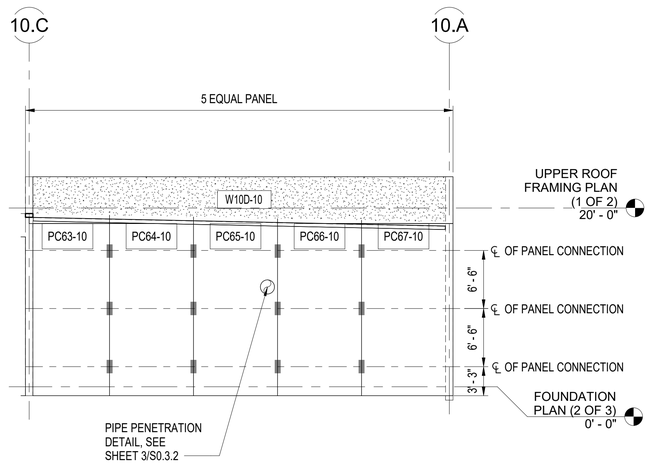
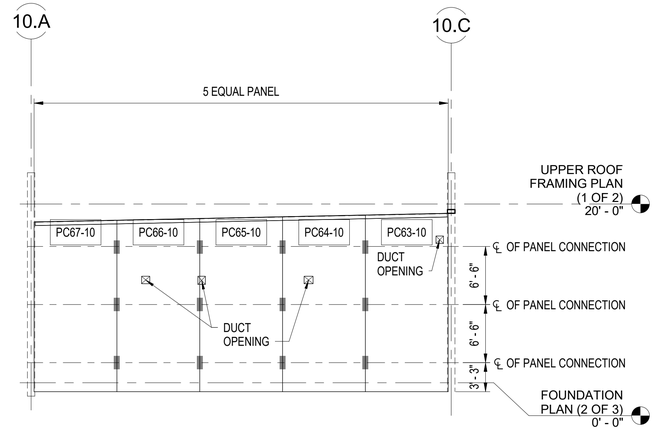


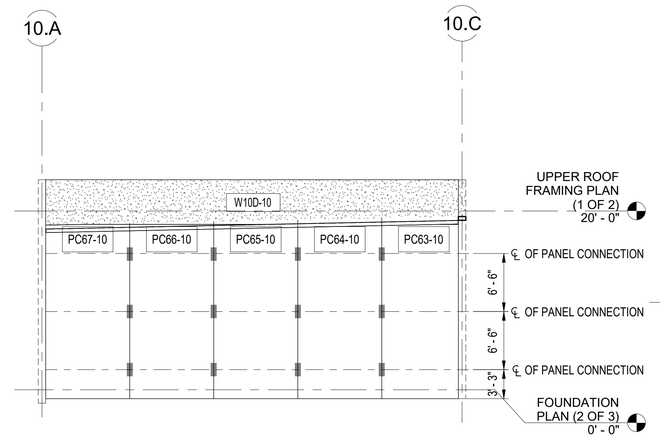
1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.1

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.4

1/8" = 1'-0" 0' 2' 4' 8' 16'

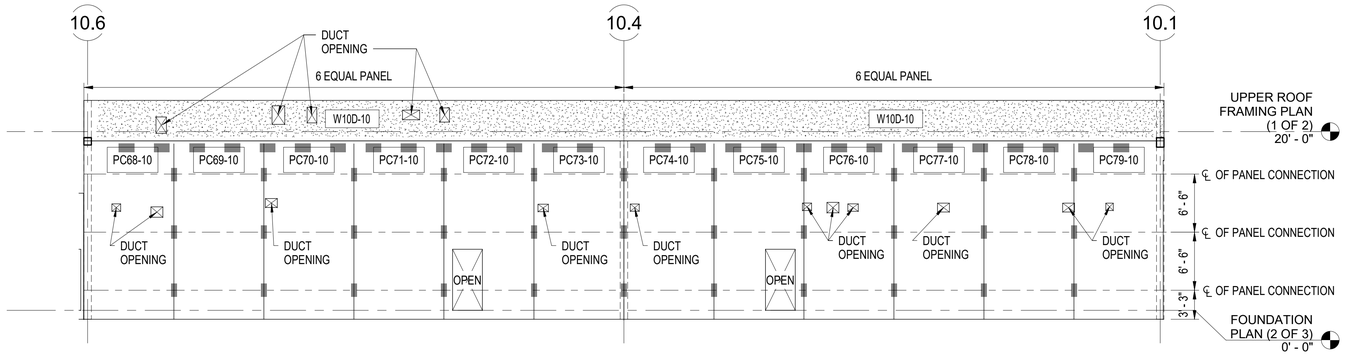


3 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.6

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.C

1/8" = 1'-0" 0' 2' 4' 8' 16'

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GCC:
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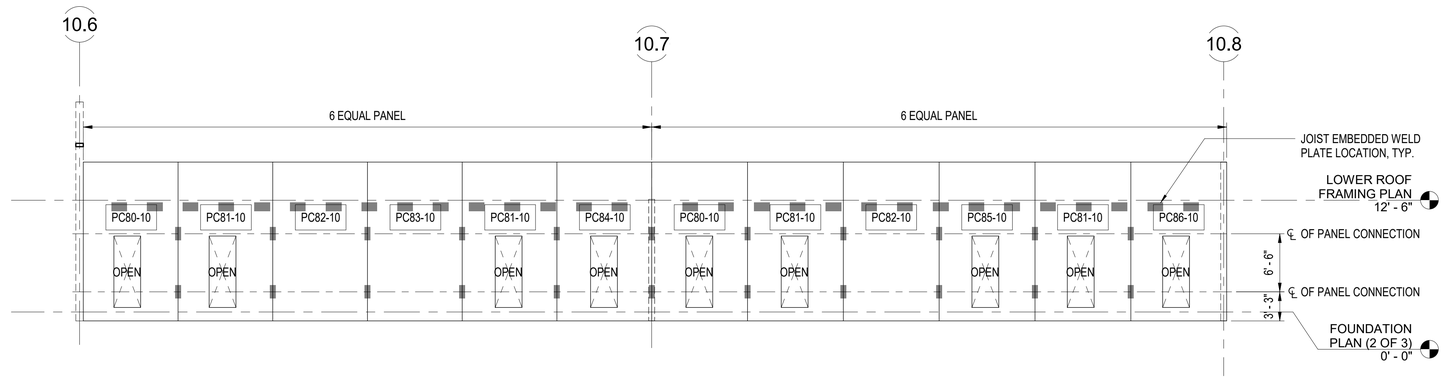
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.4.7
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

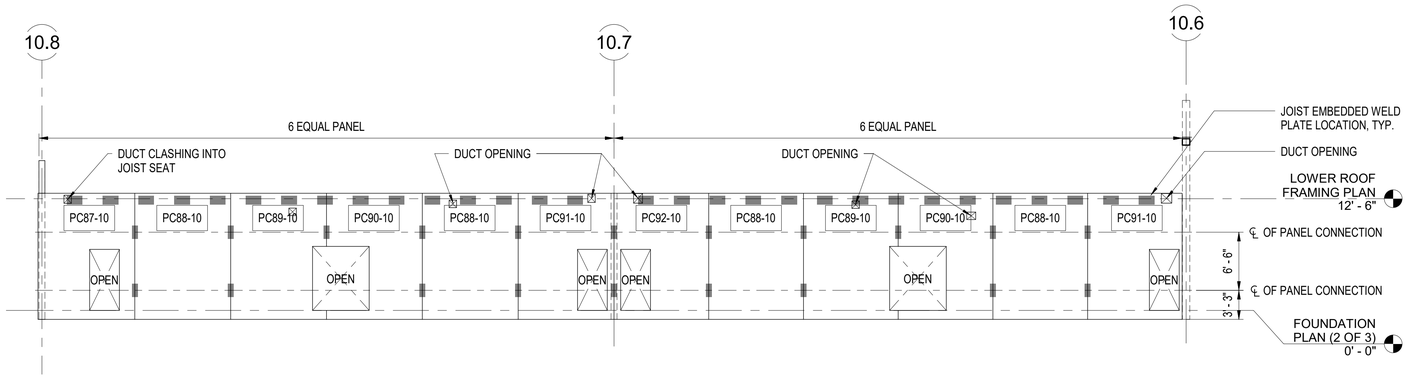


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.B

1/8" = 1'-0" 0' 2' 4' 8' 16'

NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.C

1/8" = 1'-0" 0' 2' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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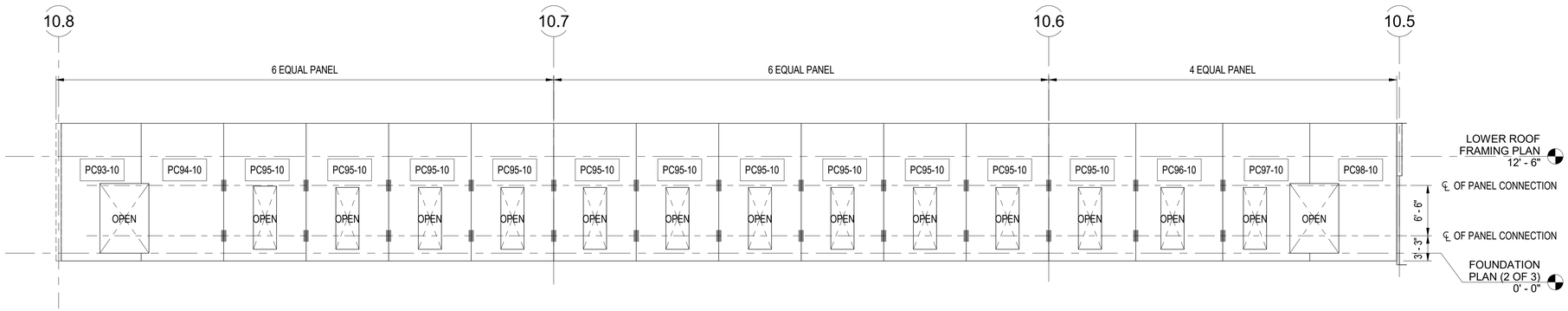
GCC:
PRECAST WALL PANEL ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.4.8
Sheet No. of

NOT FOR CONSTRUCTION

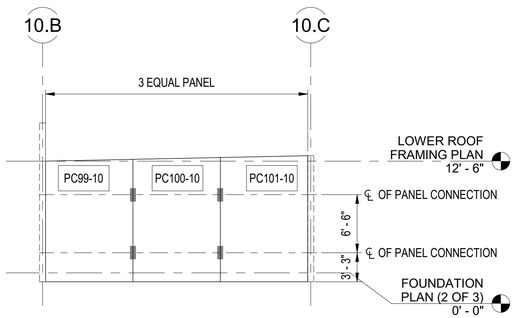


1 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.D

1/8" = 1'-0" 0' 2' 4' 8' 16'

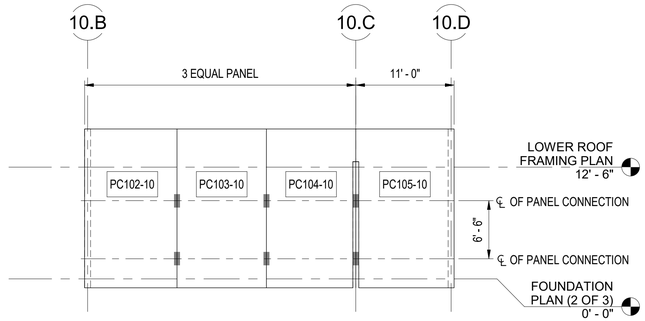
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL ELEVATION.



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.7

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 10.8

1/8" = 1'-0" 0' 2' 4' 8' 16'

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PRECAST WALL PANEL ELEVATIONS
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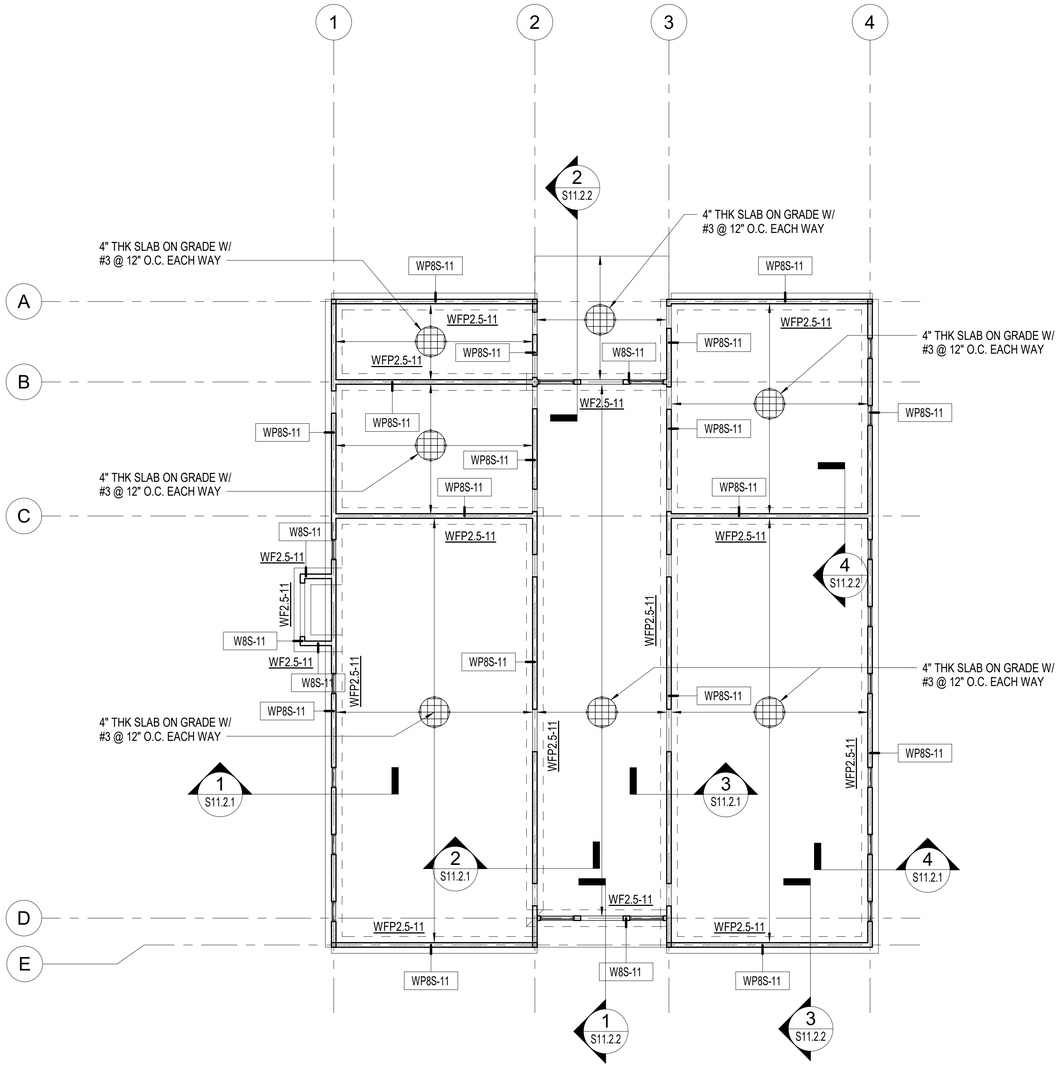
Designed:	TPC/CDC
Drawn	AGC
Checked	TPC/CDC
Supv:	TPC
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S10.4.9
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

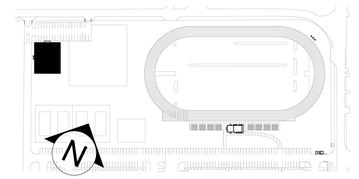


N

1 FOUNDATION PLAN

3/32" = 1'-0"

0' 4' 8' 16' 32'



KEY PLAN

LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION FOR WALL C.I.P, SEE SHEET S0.2.2
WFP#-#	WALL FOOTING DESIGNATION FOR WALL PRECAST, SEE SHEET S0.4.1
WP#-#	PRECAST WALL PANEL WALL DESIGNATION, SEE SHEET S0.4.2
W#-#	C.I.P WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1

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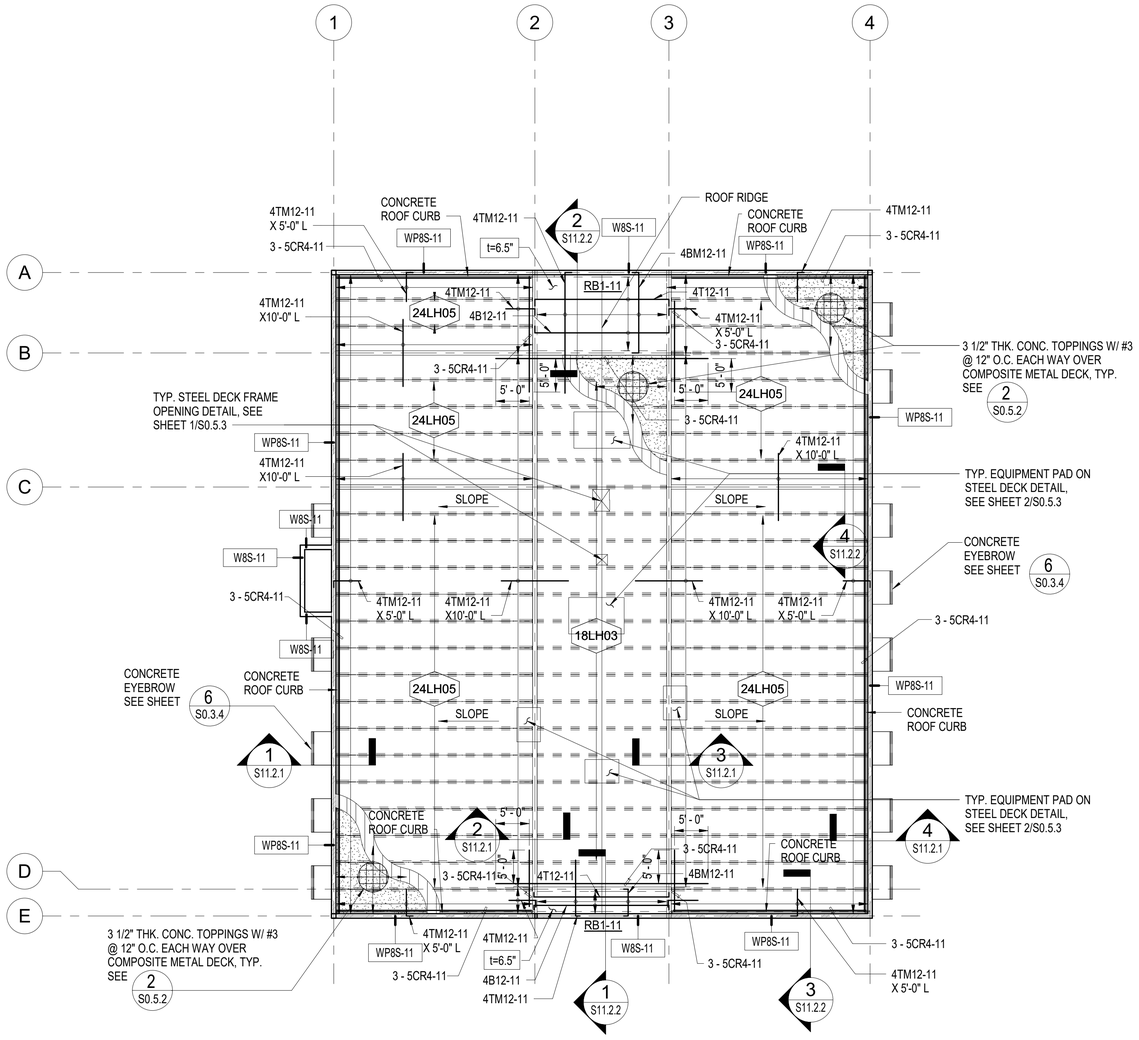
FOUNDATION PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

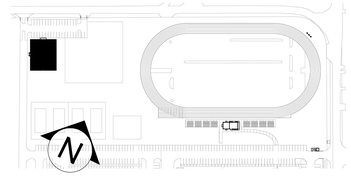
Drawing
S11.1.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

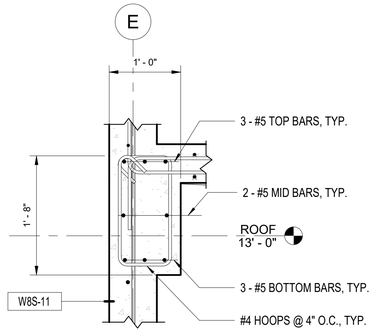


1 ROOF FRAMING PLAN

3/32" = 1'-0" 0' 4' 8' 16' 32'



KEY PLAN



2 TYP. ROOF BEAM "RB1-11" DETAIL

1" = 1'-0" 0' 3" 6" 1' 2'

LEGEND AND TAGS

- WP#-# — PRECAST WALL PANEL DESIGNATION, SEE SHEET S0.4.2
- W8#-# — CAST-IN-PLACE WALL CONCRETE DESIGNATION S0.3.1
- 18LH03 — 18LH03 STEEL JOIST SPACED AT 4'-0" (MAX.) SEE SHEET S0.5.1
- 24LH05 — 24LH05 STEEL JOIST SPACED AT 4'-0" (MAX.) SEE SHEET S0.5.1
- 4T10 — SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- 3-5CR4 — CHORD REINFORCING DESIGNATION, SEE SHEET S0.1.4

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CREDIT RECOVERY:
ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
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Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

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S11.1.2
Sheet No. _____ of _____

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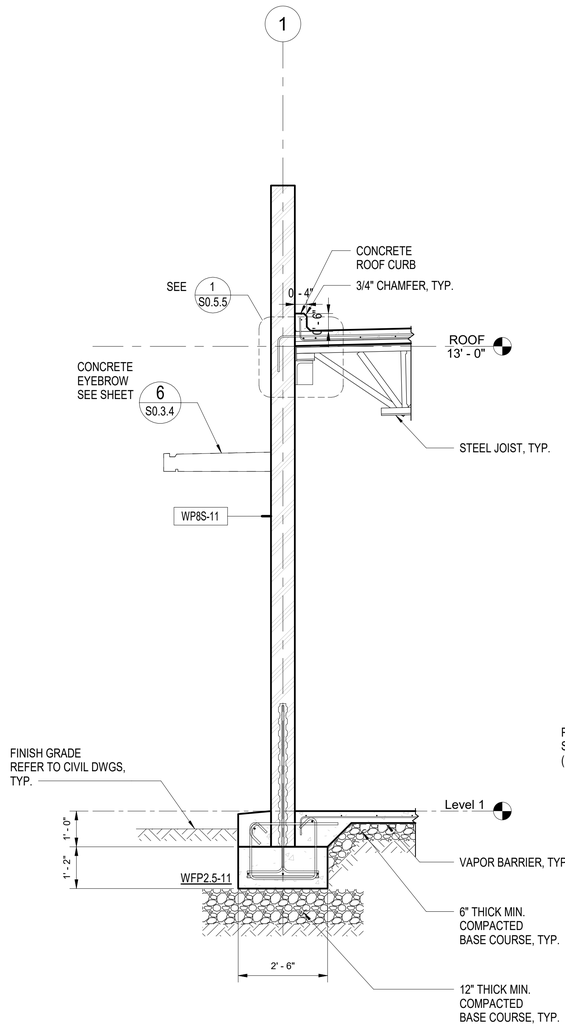
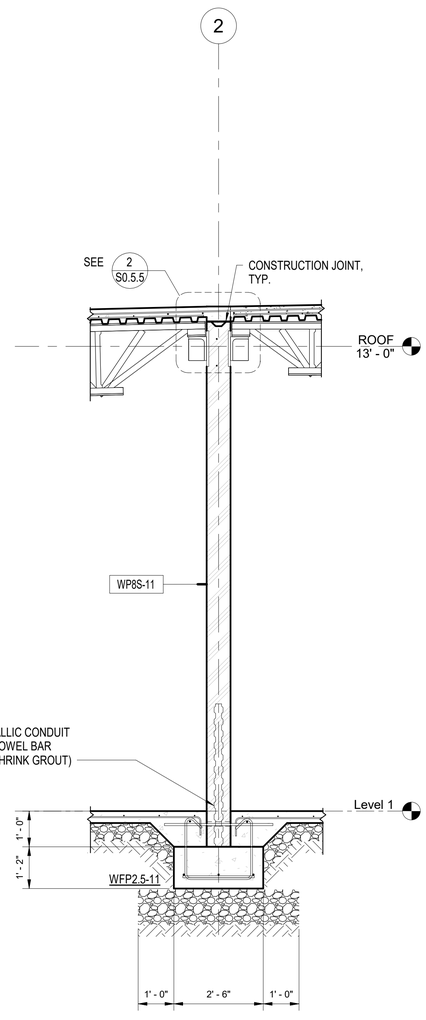
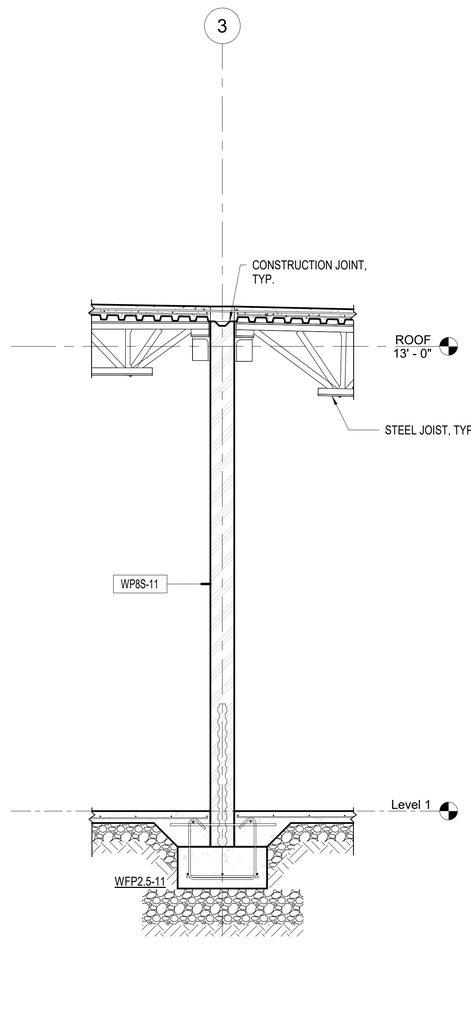


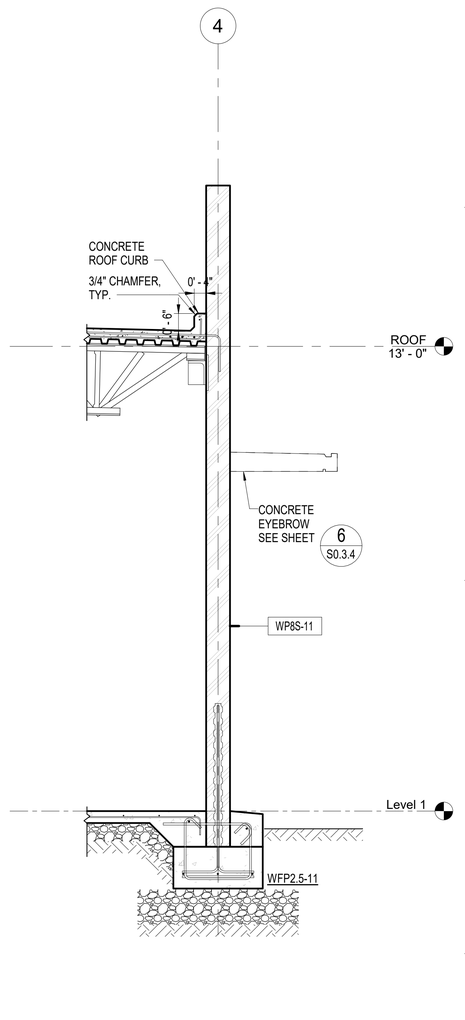
1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



4 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

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SIMON SANCHEZ HIGH SCHOOL

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SECTIONS
PROGRAMMING DOCUMENT

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Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

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S11.2.1
Sheet No. ____ of ____

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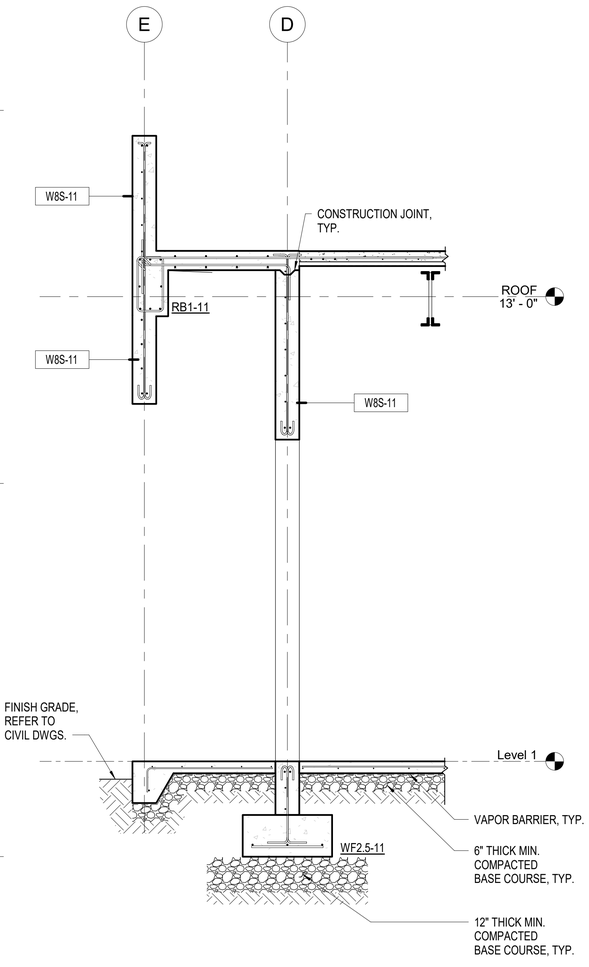

1 SECTION
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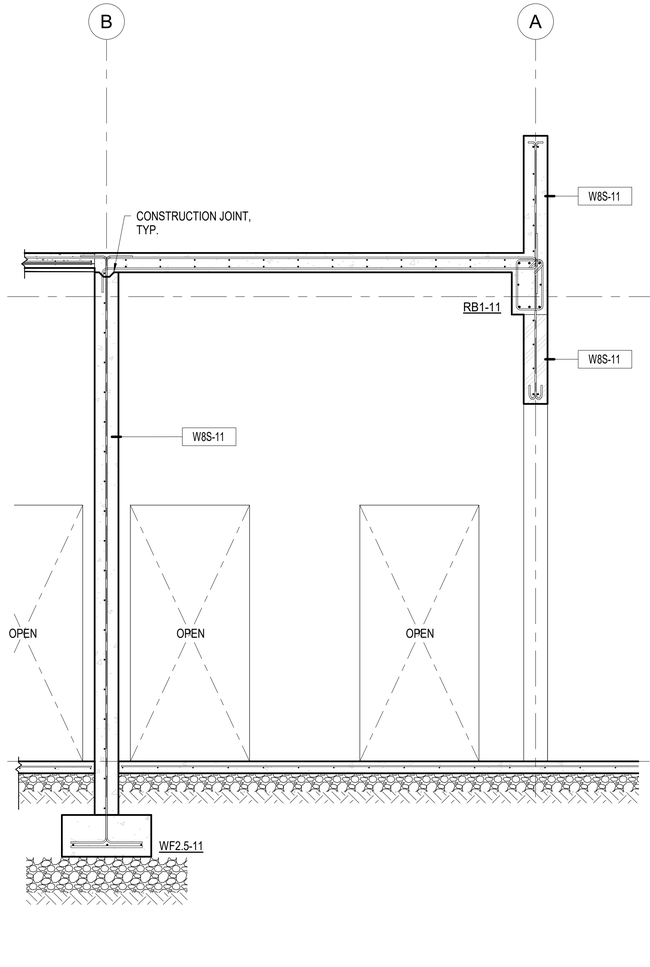
0' 6" 1' 2' 4'



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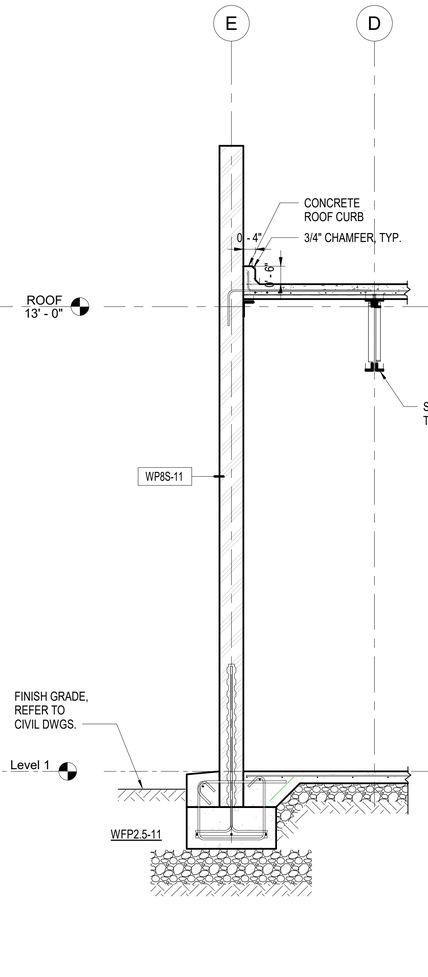
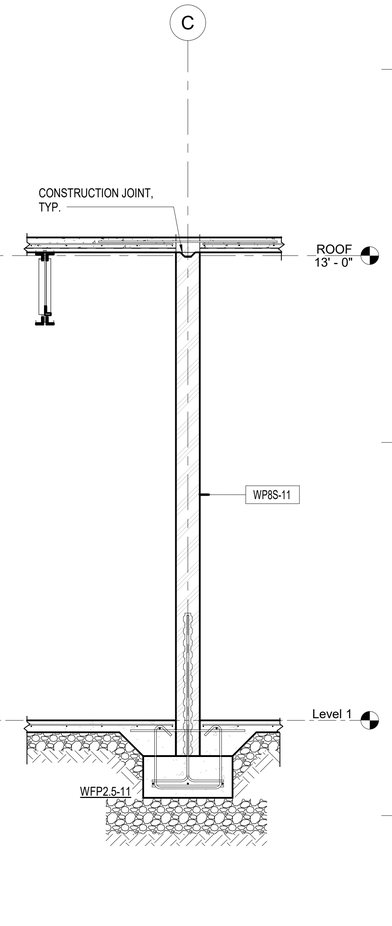


3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



4 SECTION
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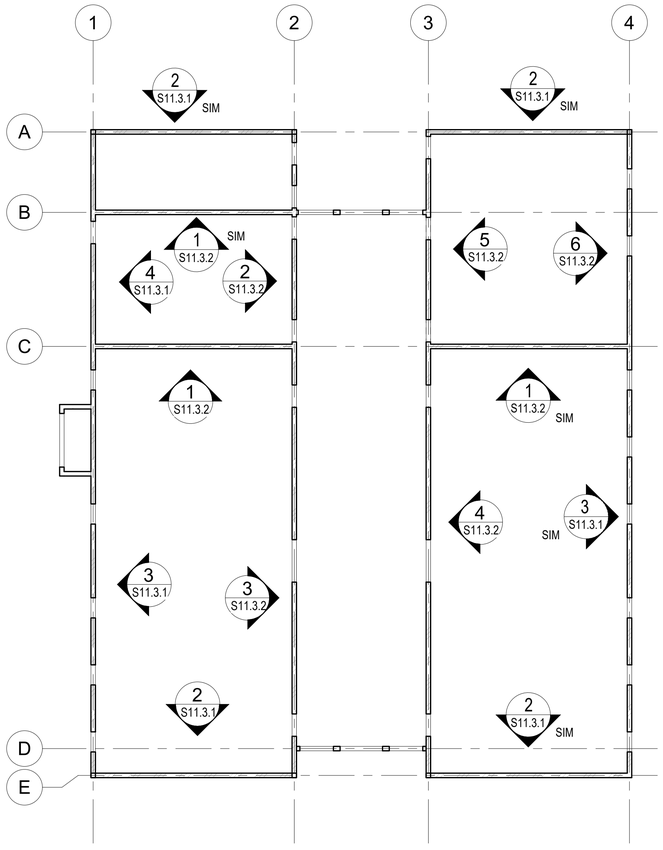
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S11.2.2
Sheet No. ____ of ____

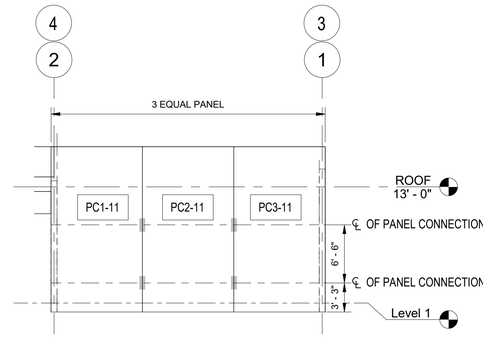
NOT FOR CONSTRUCTION



1 PRECAST WALL PANEL KEY PLAN

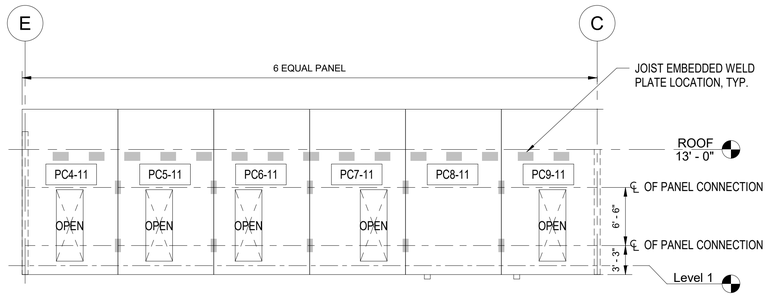
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



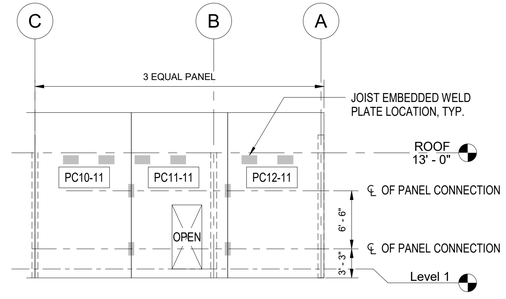
2 WALL PANEL ASSEMBLY ALONG GRIDLINE E, A

1/8" = 1'-0" 0' 2' 4' 8' 16'



3 WALL PANEL ASSEMBLY ALONG GRIDLINE 1, 4

1/8" = 1'-0" 0' 2' 4' 8' 16'



4 WALL PANEL ASSEMBLY ALONG GRIDLINE 1

1/8" = 1'-0" 0' 2' 4' 8' 16'

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PRECAST WALL PANEL KEY PLAN/ ELEVATION
PROGRAMMING DOCUMENT

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Date:	03/31/25
Project	File

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S11.3.1
Sheet No. _____ of _____

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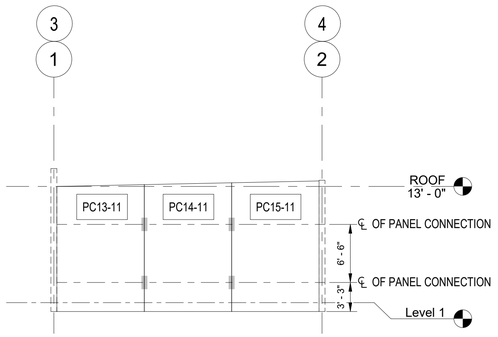
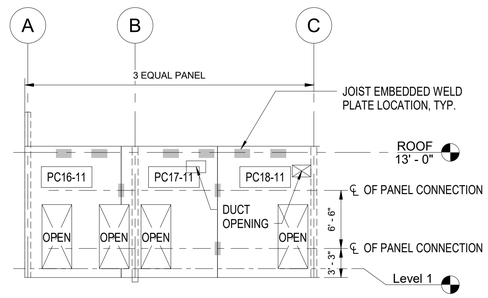


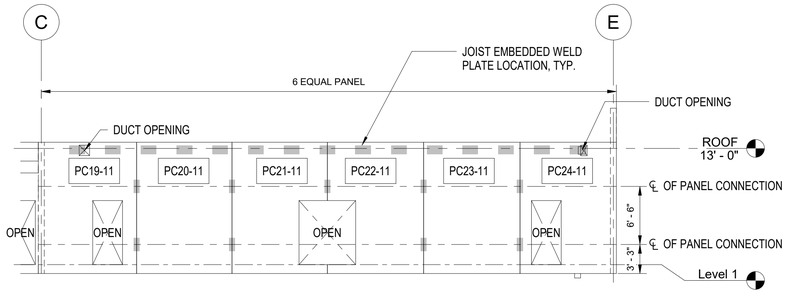
1 WALL PANEL ASSEMBLY ALONG GRIDLINE C, B

1/8" = 1'-0" 0' 2' 4' 8' 16'



2 WALL PANEL ASSEMBLY ALONG GRIDLINE 2

1/8" = 1'-0" 0' 2' 4' 8' 16'

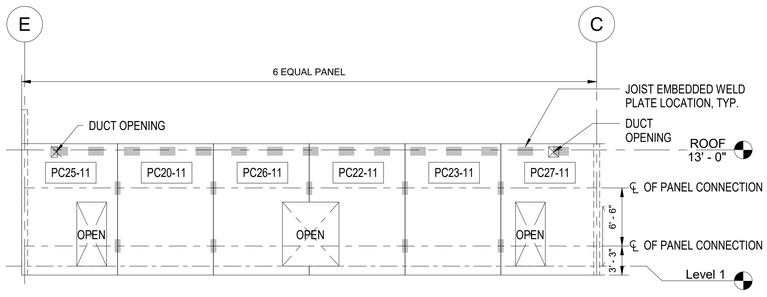


3 WALL PANEL ASSEMBLY ALONG GRIDLINE 2

1/8" = 1'-0" 0' 2' 4' 8' 16'

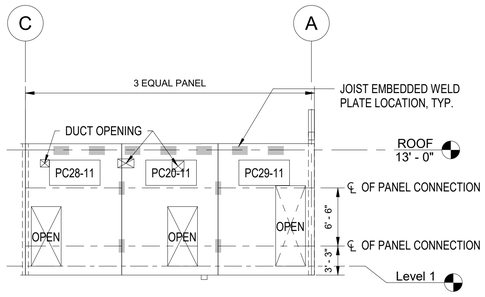
NOTE:

1.0 REFER TO S0.4 SERIES FOR PANEL SCHEDULES, DETAILS, & TYPICAL PANEL TYPE ELEVATION.



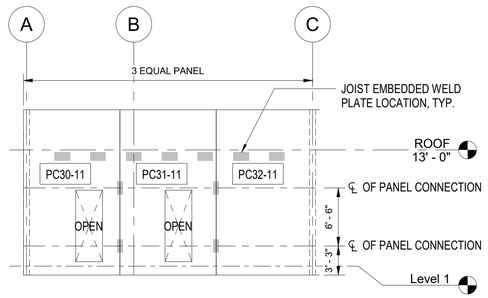
4 WALL PANEL ASSEMBLY ALONG GRIDLINE 3

1/8" = 1'-0" 0' 2' 4' 8' 16'



5 WALL PANEL ASSEMBLY ALONG GRIDLINE 3

1/8" = 1'-0" 0' 2' 4' 8' 16'



6 WALL PANEL ASSEMBLY ALONG GRIDLINE 4

1/8" = 1'-0" 0' 2' 4' 8' 16'

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PRECAST WALL PANEL ELEVATION PROGRAMMING DOCUMENT

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Scale:	1/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S11.3.2
Sheet No. _____ of _____

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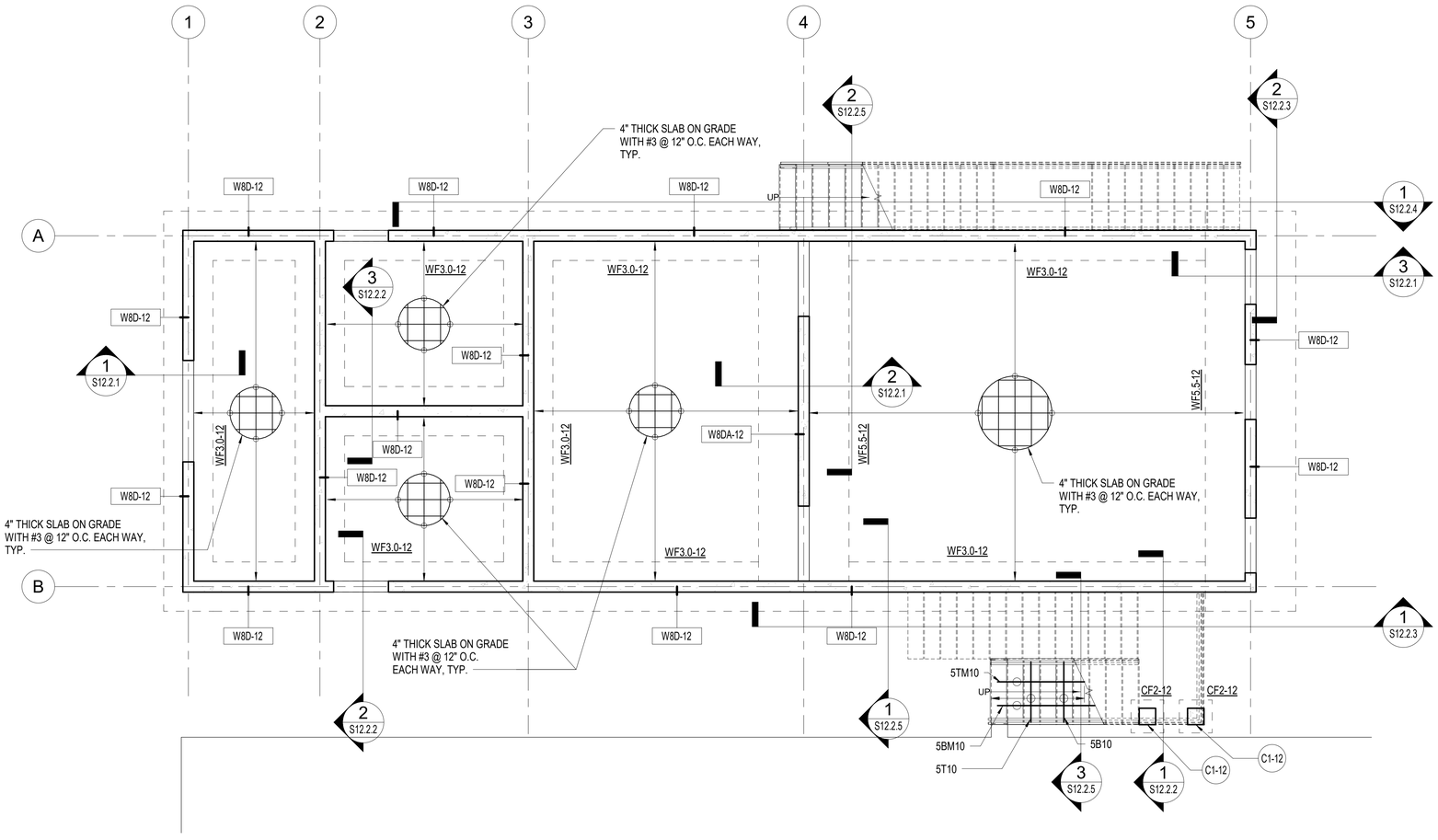
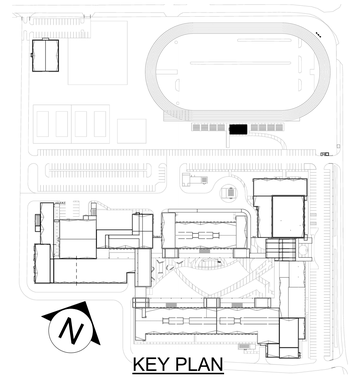


1 FOUNDATION PLAN

1/4" = 1'-0"

0' 1' 2' 4' 8'



KEY PLAN

LEGEND AND TAGS

C1-# ---- COLUMN DESIGNATION SEE SHEET S12-3.1

WF#-# ---- WALL FOOTING DESIGNATION, SEE SHEET S0.2.2

W#-# ---- WALL CONCRETE CAST-IN PLACE DESIGNATION, SEE SHEET S0.3.1

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FOUNDATION PLAN

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Date:	03/31/25
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Drawing

S12.1.1

Sheet No._____ of _____

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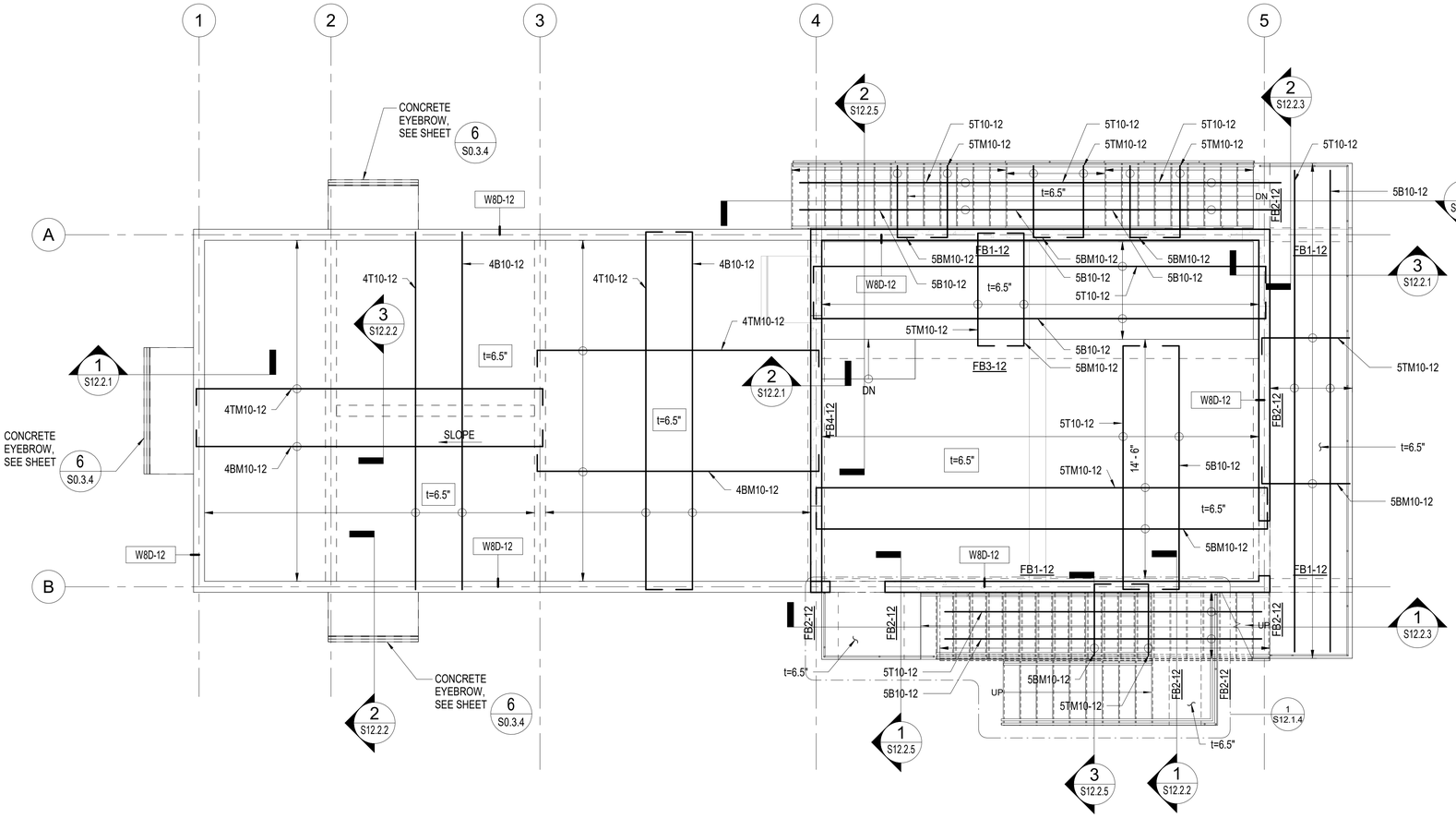

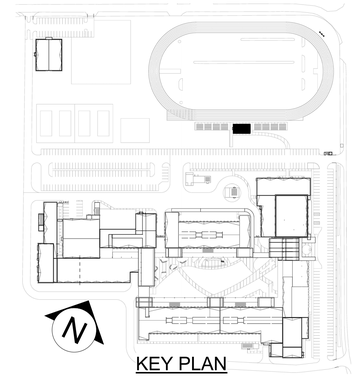

LEGEND AND TAGS

- W#-# ------ WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
- 4T10 ------ SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
- FB#-# ------ FLOOR CONCRETE BEAM DESIGNATION, SEE SHEET S12.3.1
- RB#-# ------ ROOF CONCRETE BEAM DESIGNATION, SEE SHEET S12.3.1

1 2ND FLOOR FRAMING AND LOWER ROOF FRAMING PLAN

1/4" = 1'-0"

0' 1' 2' 4' 8'

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Title
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2ND FLOOR FRAMING PLAN
PROGRAMMING DOCUMENT

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Checked	TPC/CDC/KVB
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Date:	03/31/25
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Drawing
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Sheet No._____ of _____

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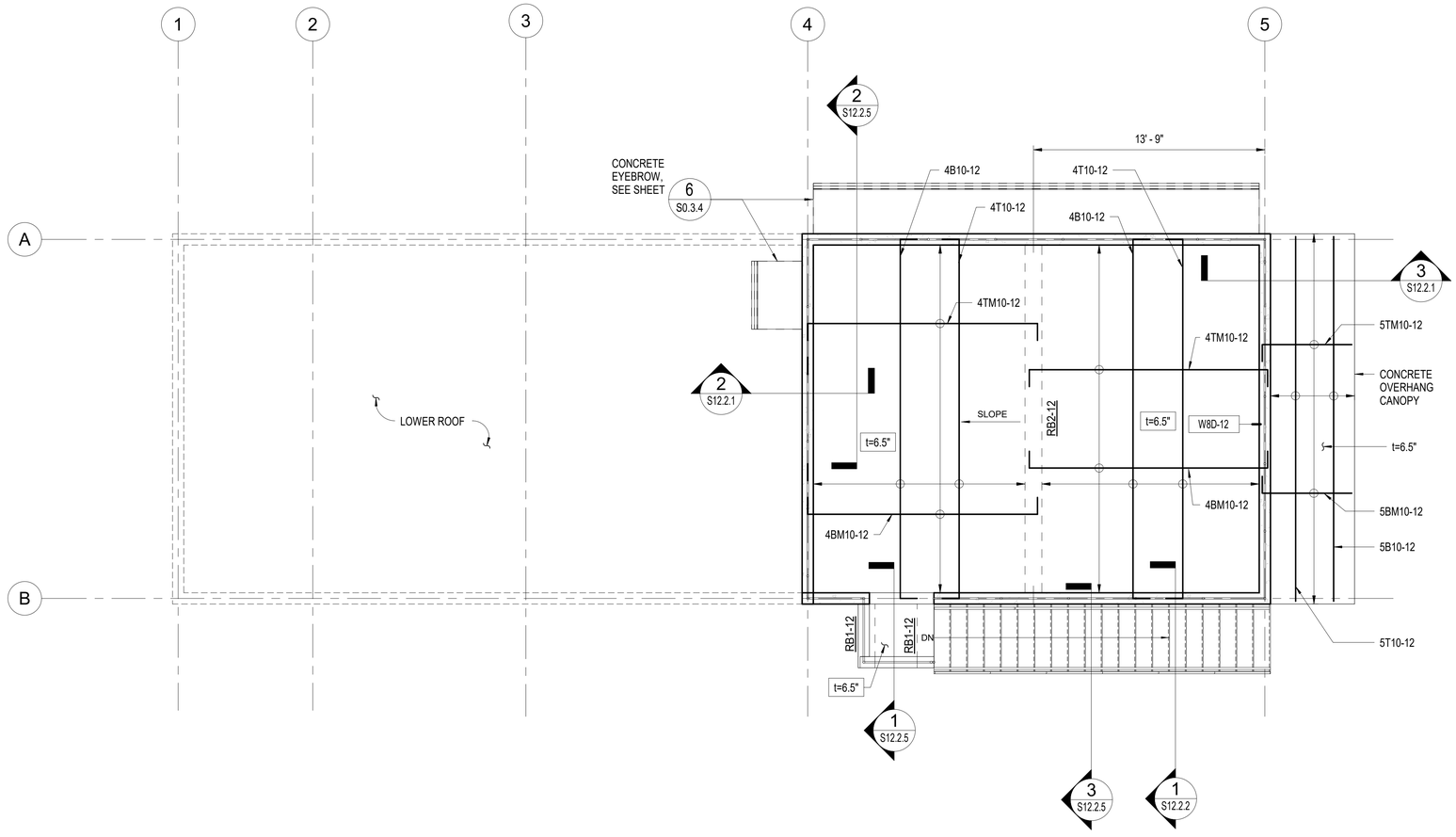

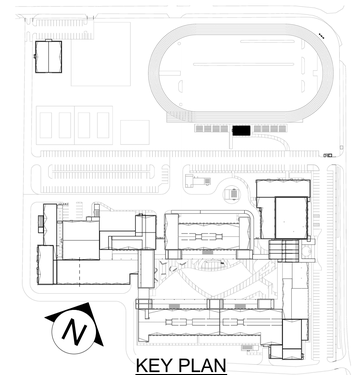

KEY PLAN

LEGEND AND TAGS

W#-#	WALL CONCRETE DESIGNATION, SEE SHEET S0.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
FB#-#	FLOOR CONCRETE BEAM DESIGNATION, SEE SHEET S12.3.1
RB#-#	ROOF CONCRETE BEAM DESIGNATION, SEE SHEET S12.3.1



1 ROOF FRAMING PLAN

1/4" = 1'-0"

0' 1' 2' 4' 8'

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ROOF FRAMING PLAN
PROGRAMMING DOCUMENT

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Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
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S12.1.3
Sheet No._____ of _____

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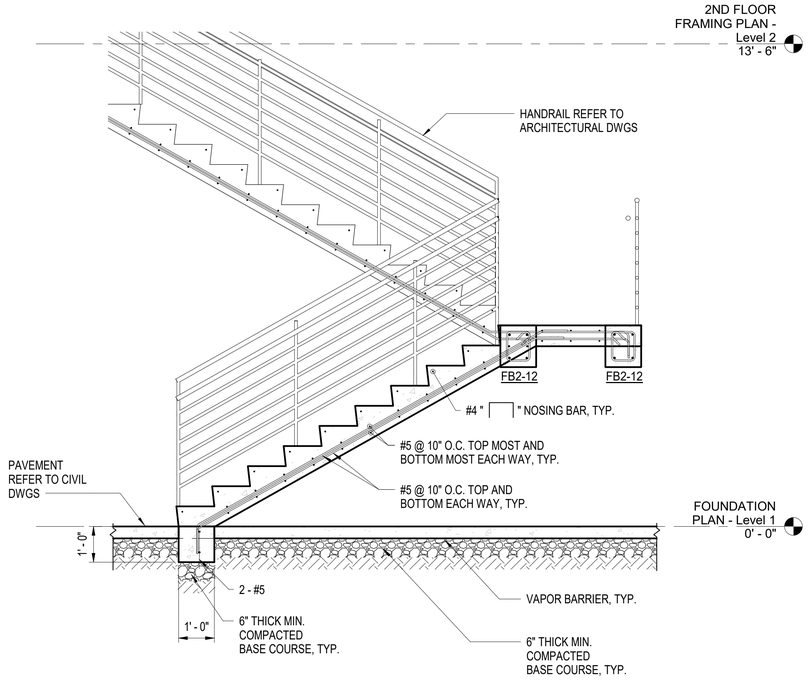
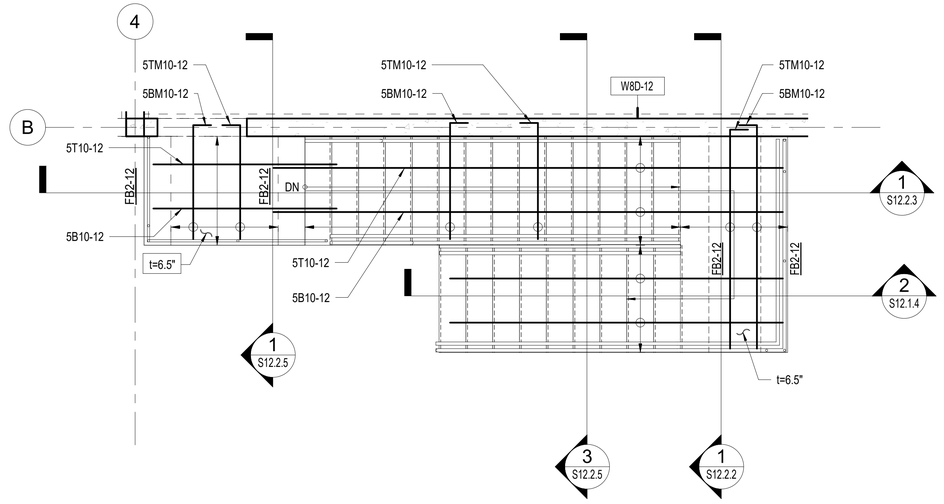


2 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'



1 STAIR FRAMING DETAIL

3/8" = 1'-0"

0' 1' 2' 4' 8'

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STAIR FRAMING DETAIL

PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
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Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing

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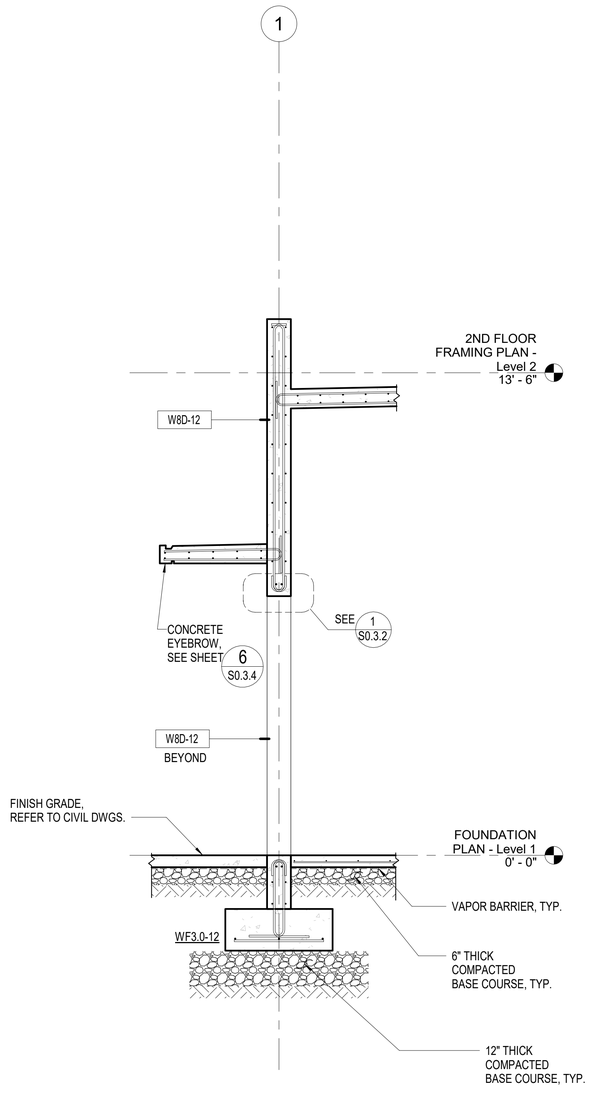
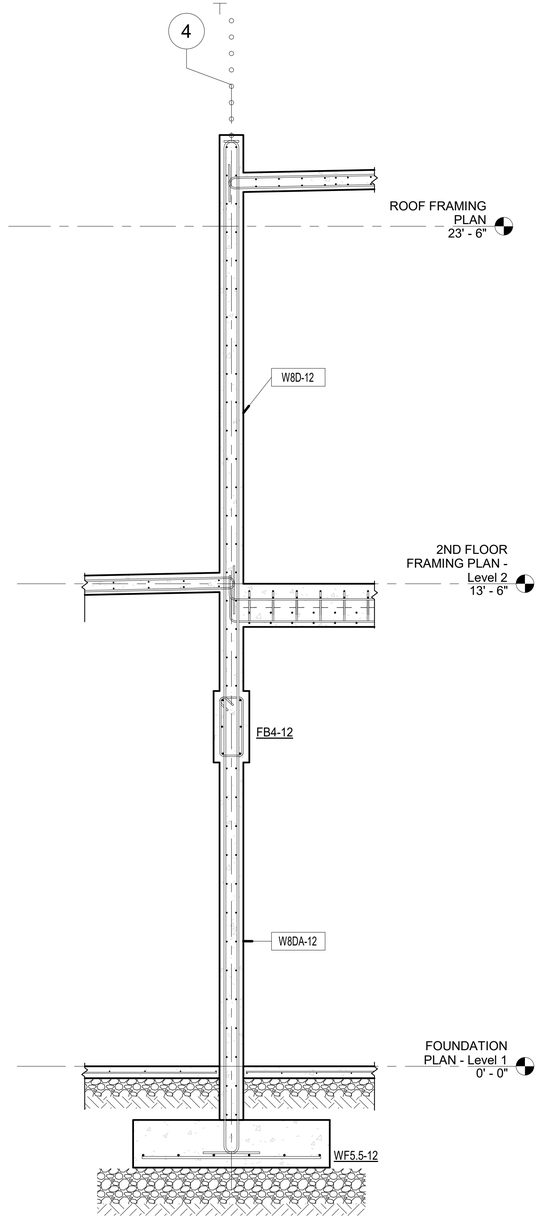
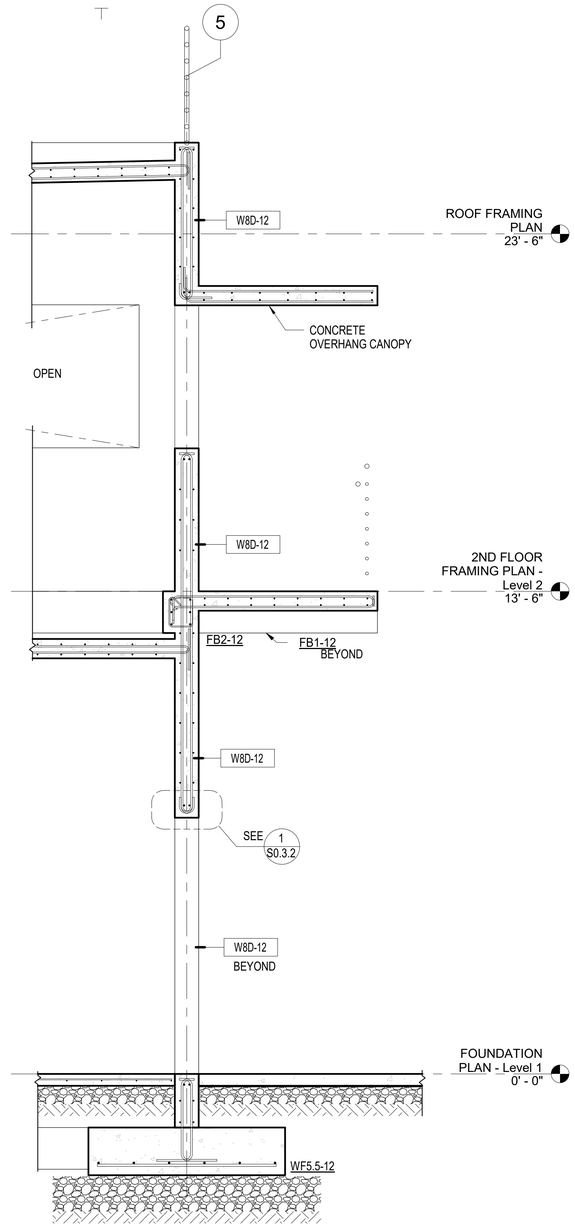


1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
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■ DEVELOPMENT CONSULTATION
■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT
THIS PLAN WAS PREPARED
BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: _____

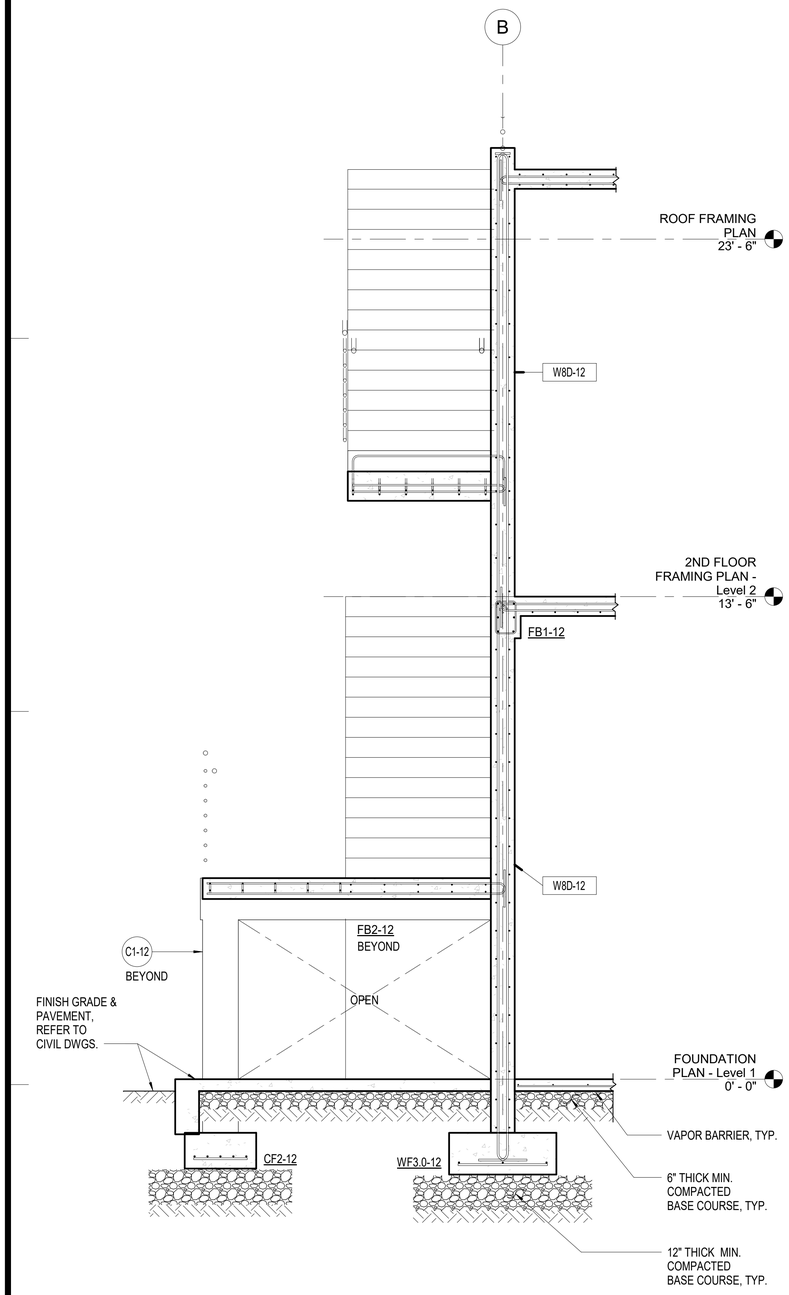
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRESS BOX :
SECTIONS
PROGRAMMING DOCUMENT

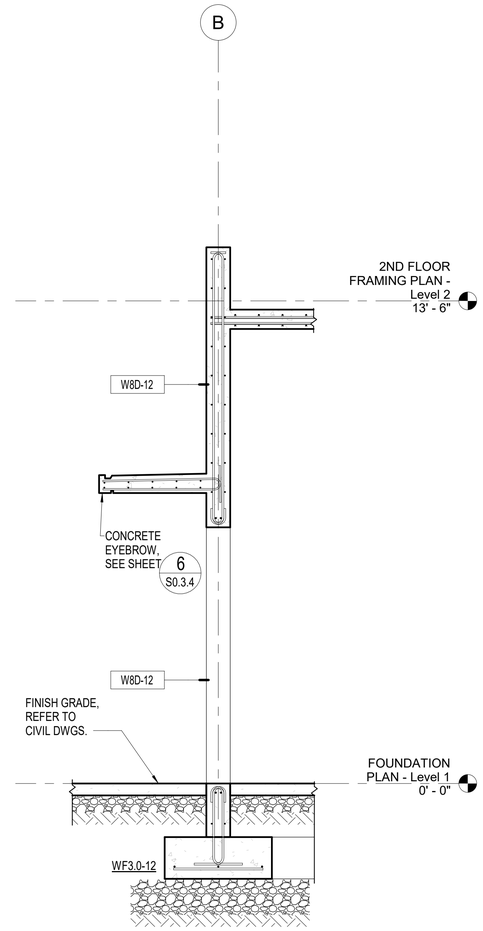
Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S12.2.1
Sheet No. _____ of _____

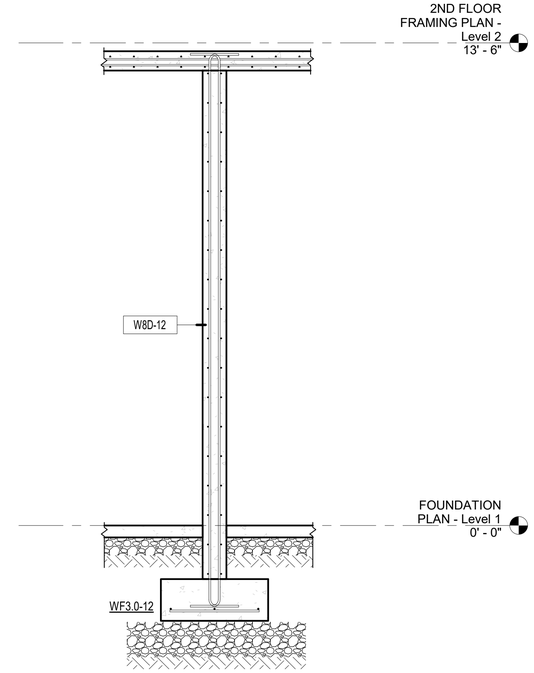
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

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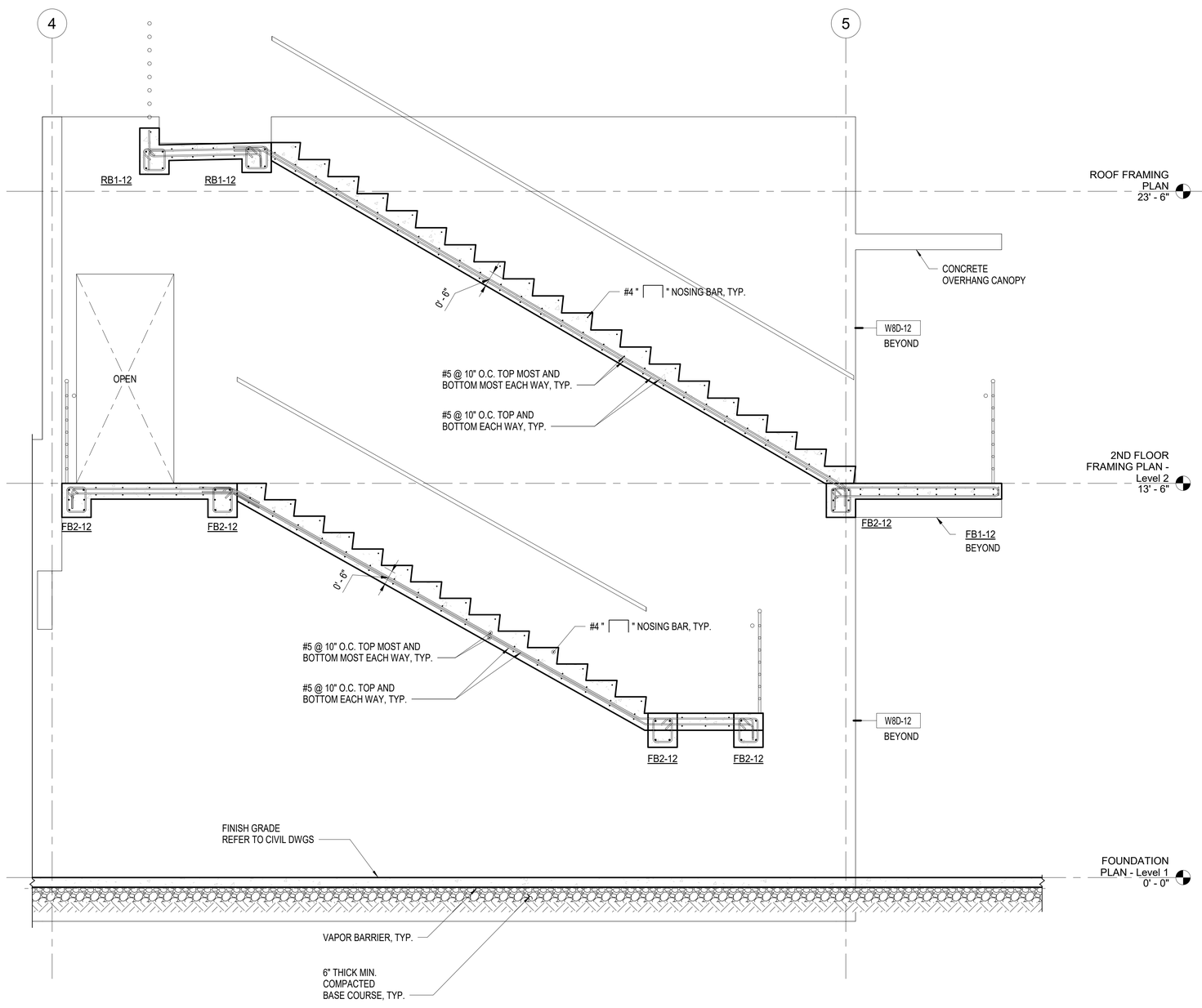
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

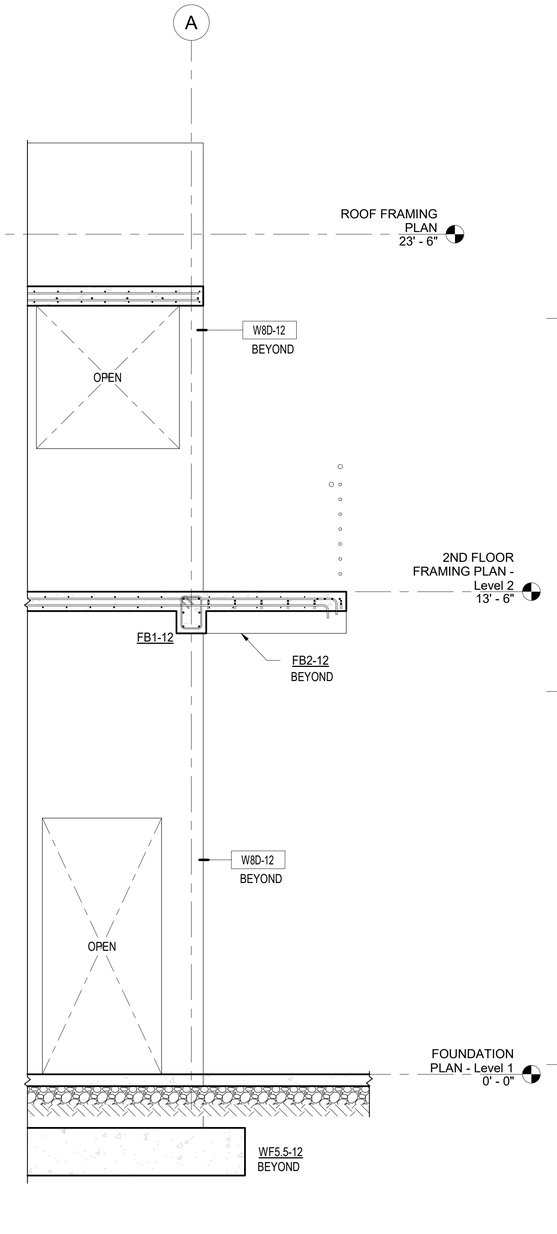
Title
PRESS BOX :
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S12.2.2
Sheet No. _____ of _____

NOT FOR CONSTRUCTION





1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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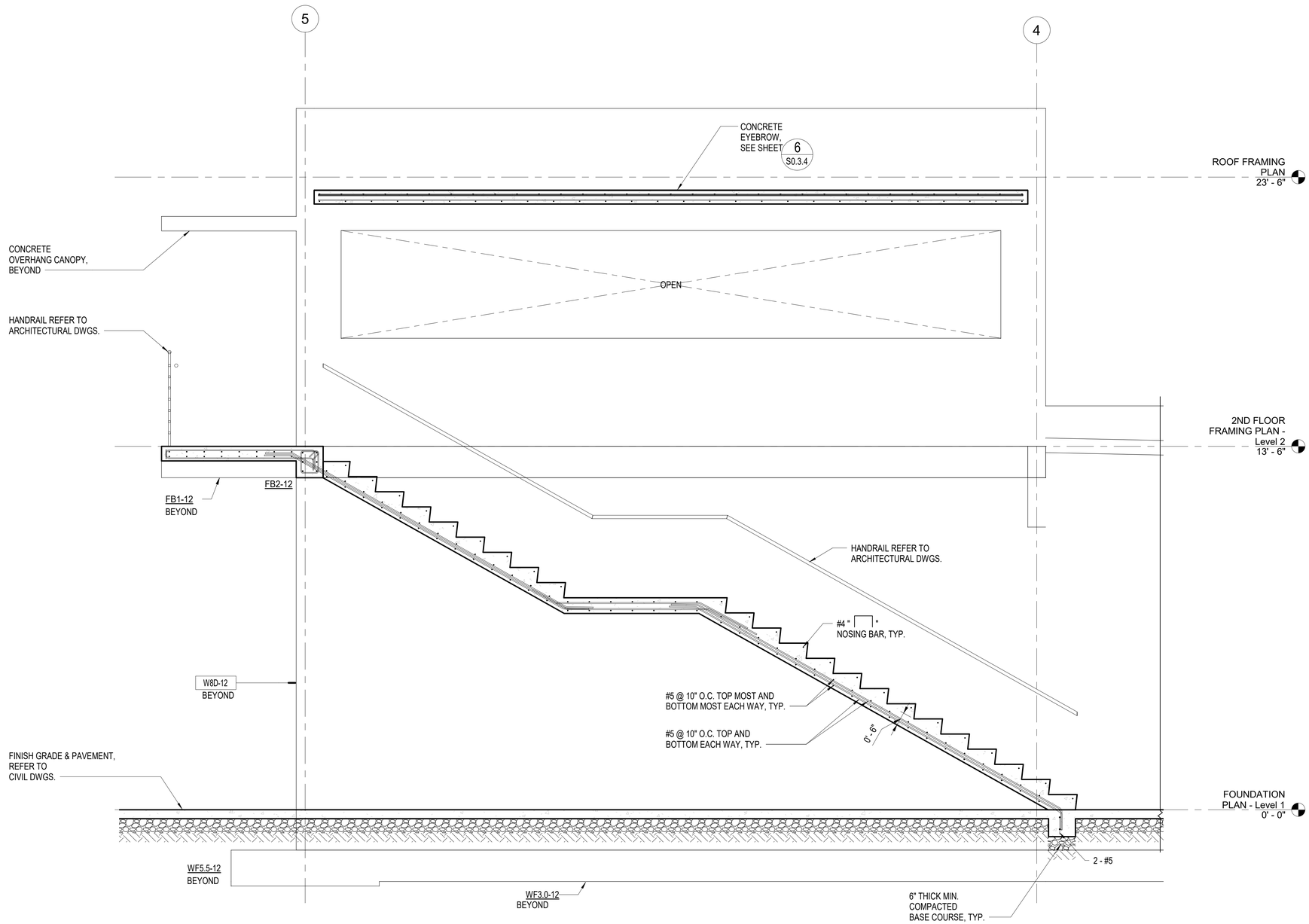
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRESS BOX :
SECTION
PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S12.2.3
Sheet No. of

NOT FOR CONSTRUCTION



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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Project
GDOE
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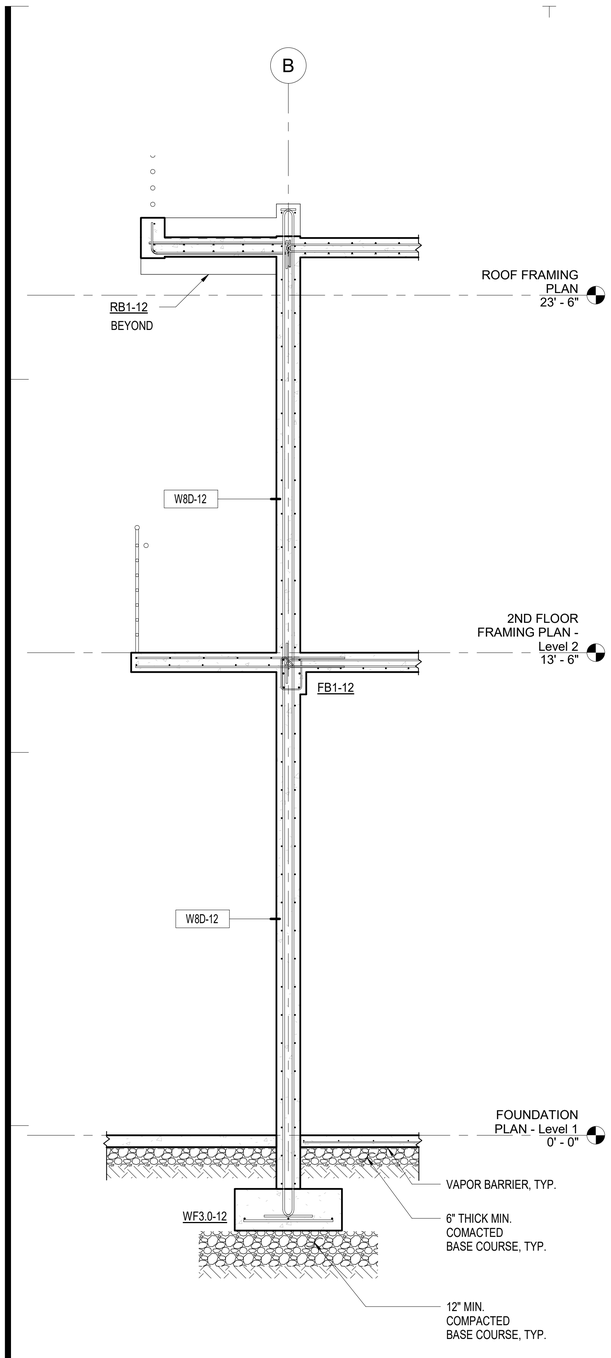
Title
PRESS BOX :
SECTIONS
PROGRAMMING DOCUMENT

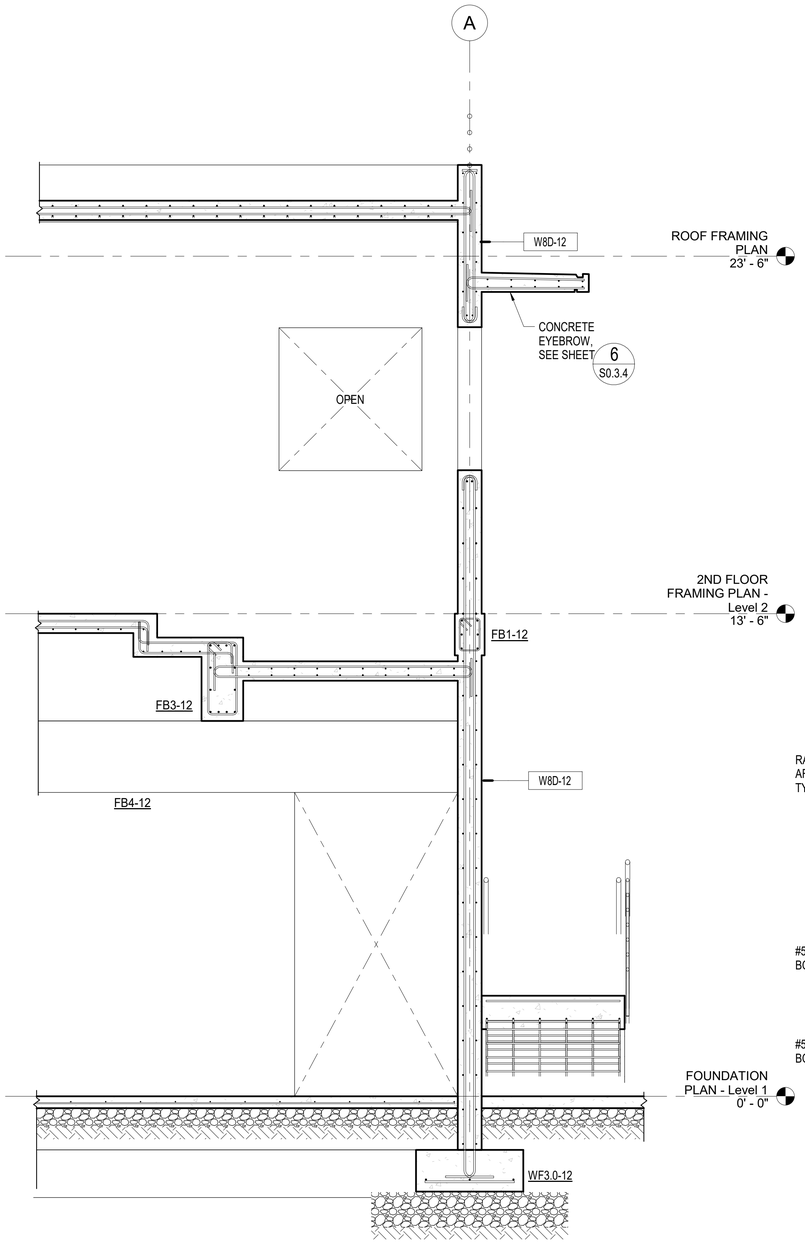
Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S12.2.4
Sheet No. _____ of _____

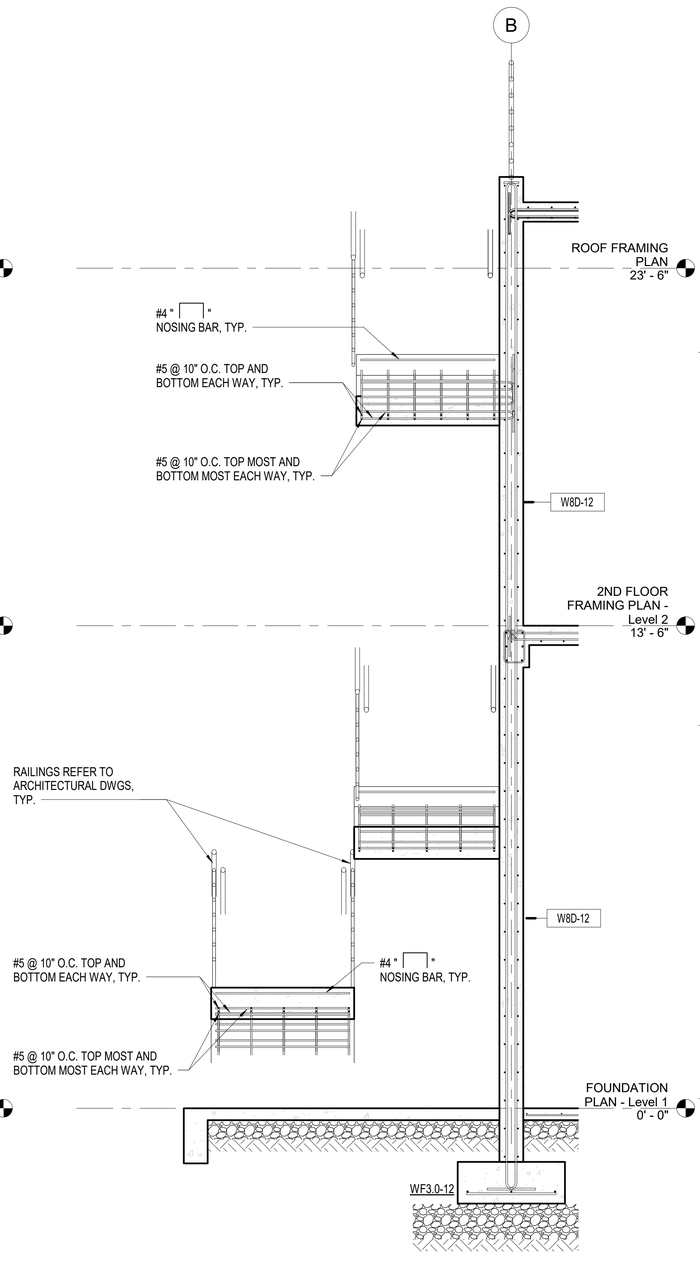
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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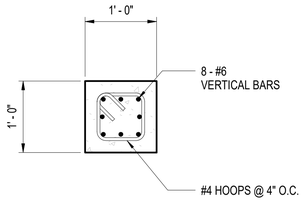
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRESS BOX :
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

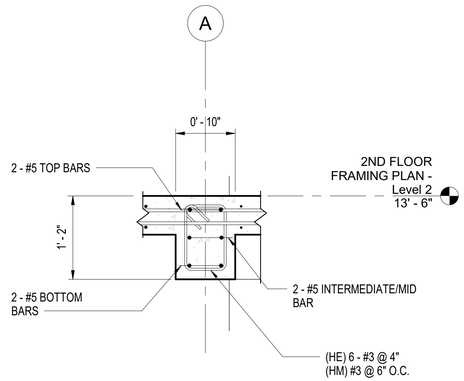
Drawing
S12.2.5
Sheet No. of

NOT FOR CONSTRUCTION



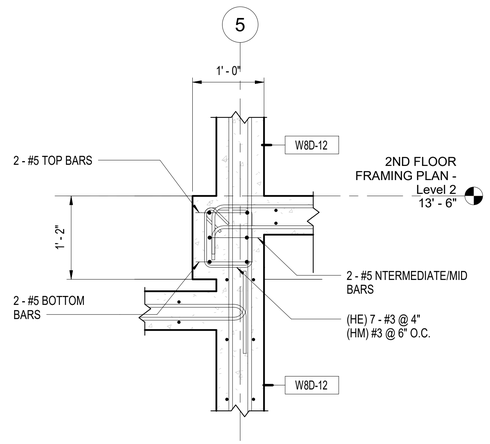
1 TYP. CONC. "C1-12" COLUMN DETAIL

1" = 1'-0"



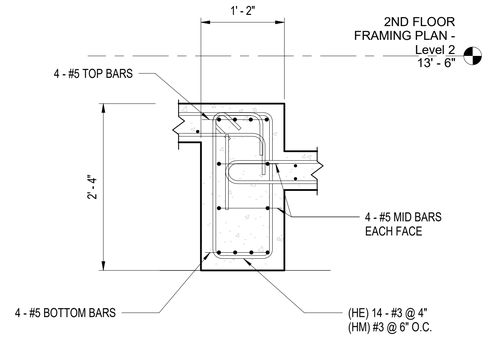
2 TYP. "FB1-12" FLOOR BEAM DETAIL

1" = 1'-0"



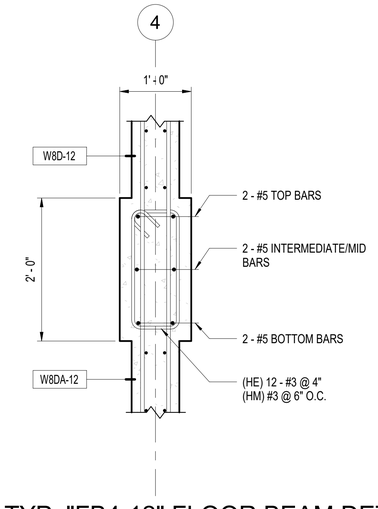
3 TYP. "FB2-12" FLOOR BEAM DETAIL

1" = 1'-0"



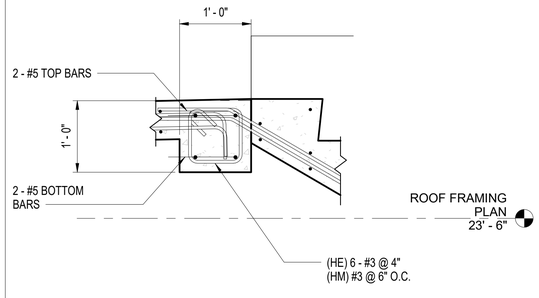
4 TYP. "FB3-12" FLOOR BEAM DETAIL

1" = 1'-0"



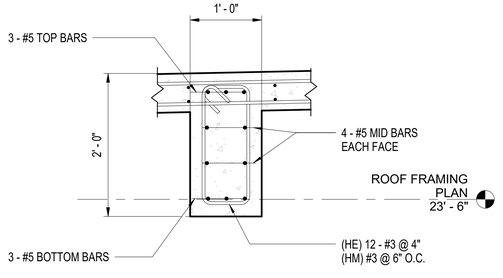
5 TYP. "FB4-12" FLOOR BEAM DETAIL

1" = 1'-0"



6 TYP. "RB1-12" ROOF BEAM DETAIL

1" = 1'-0"



7 TYP. "RB2-12" ROOF BEAM DETAIL

1" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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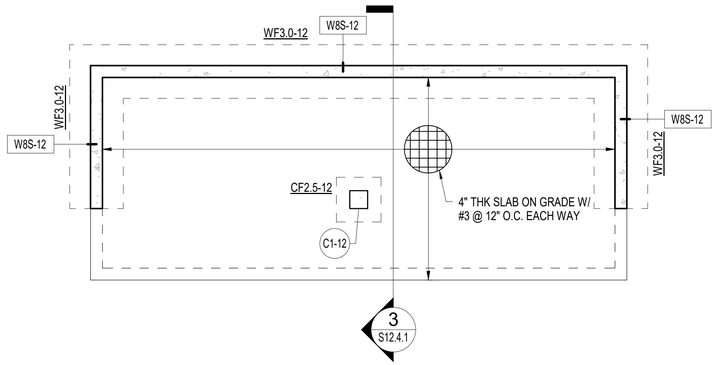
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PRESS BOX :
TYPICAL BEAM DETAIL
PROGRAMMING DOCUMENT

Designed:	TPC/CDC/KVB
Drawn	AGC
Checked	TPC/CDC/KVB
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

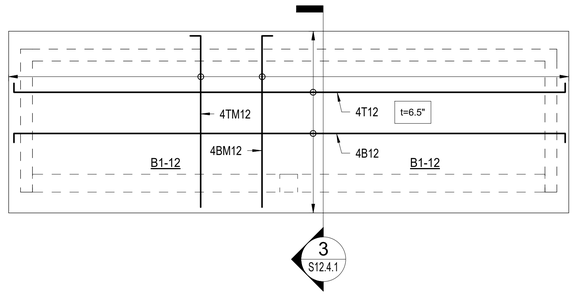
Drawing
S12.3.1
Sheet No. of

NOT FOR CONSTRUCTION



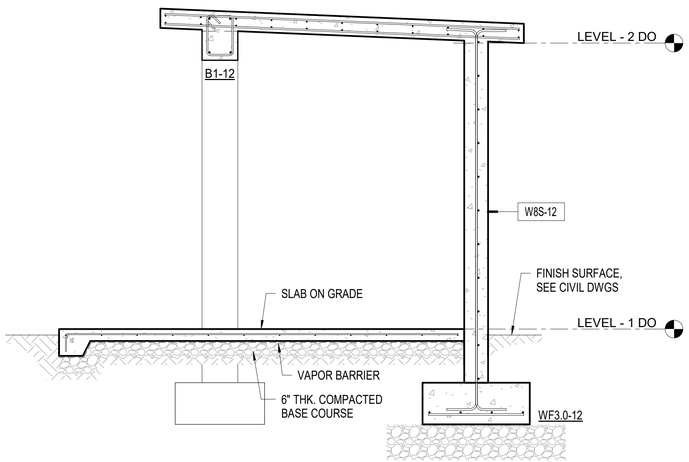
1 FOUNDATION PLAN (DUGOUT)

1/4" = 1'-0" 0' 1' 2' 4' 8'



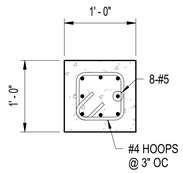
2 ROOF FRAMING PLAN (DUGOUT)

1/4" = 1'-0" 0' 1' 2' 4' 8'



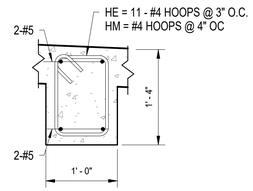
3 SECTION

1/2" = 1'-0" 0' 6" 1' 2' 4'



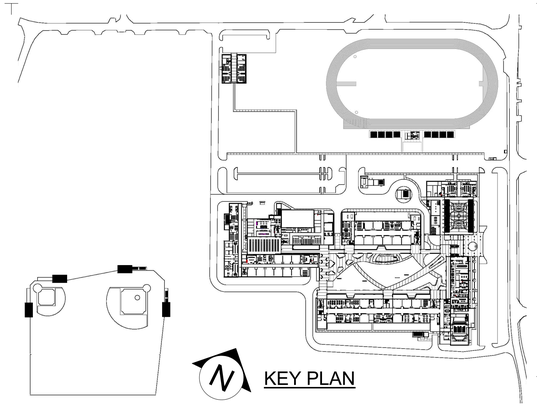
4 DETAIL C1-12

1" = 1'-0" 0' 3" 6" 1' 2'



5 DETAIL B1-12

1" = 1'-0" 0' 3" 6" 1' 2'



LEGEND AND TAGS

W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4
WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
C#-#	COLUMN DESIGNATION, SEE SHEET S0.2.3 & THIS SHEET
CF#-#	COLUMN FOOTING DESIGNATION, SEE SHEET S0.2.3
B#-#	BEAM DESIGNATION, SEE SHEET S0.1.4 & THIS SHEET

REVISION

No.	Description	Date

TRMA
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Architecture
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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
MISC. STRUCTURE
(DUGOUT) FND, ROOF FRAMING PLAN, SECT & DETAIL
PROGRAMMING DOCUMENT

Designed:	TPC/KVB
Drawn	PCP
Checked	TPC/KVB
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project File	

Drawing
S12.4.1
Sheet No. ____ of ____

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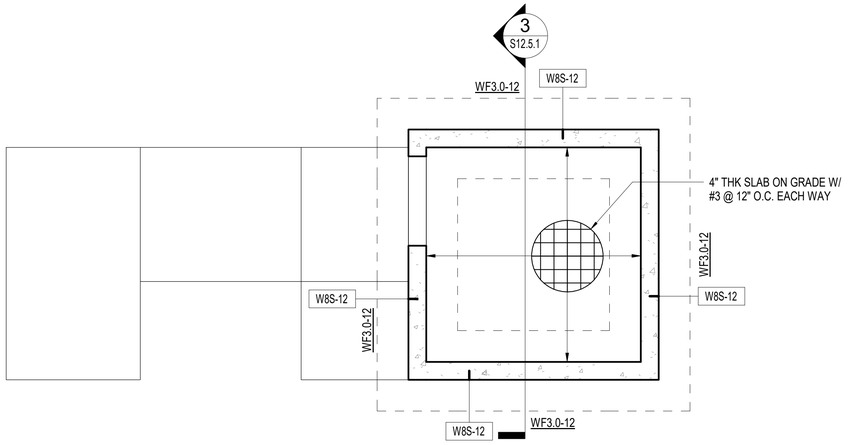
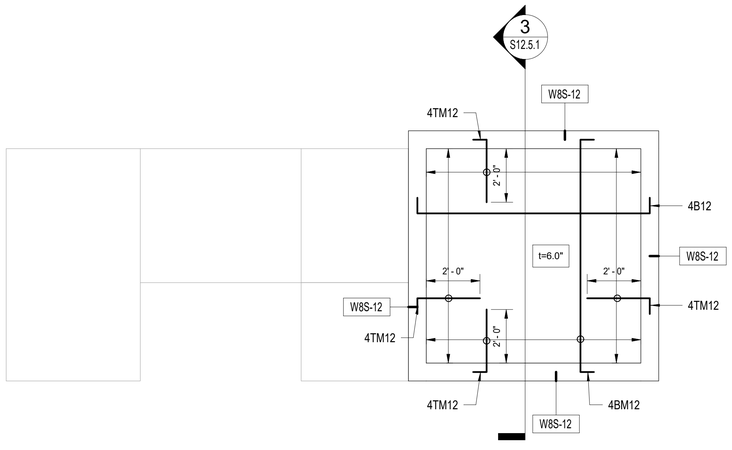


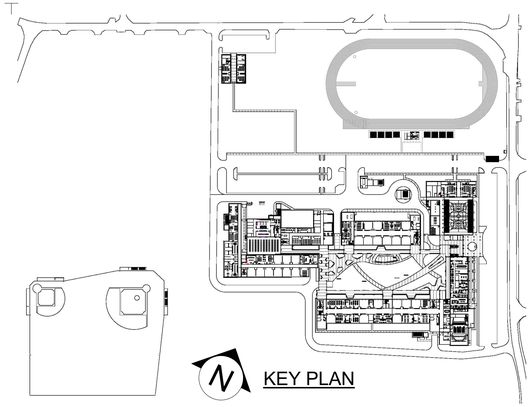
1 FOUNDATION PLAN (GUARD POST)

3/8" = 1'-0" 0' 1' 2' 4' 8'



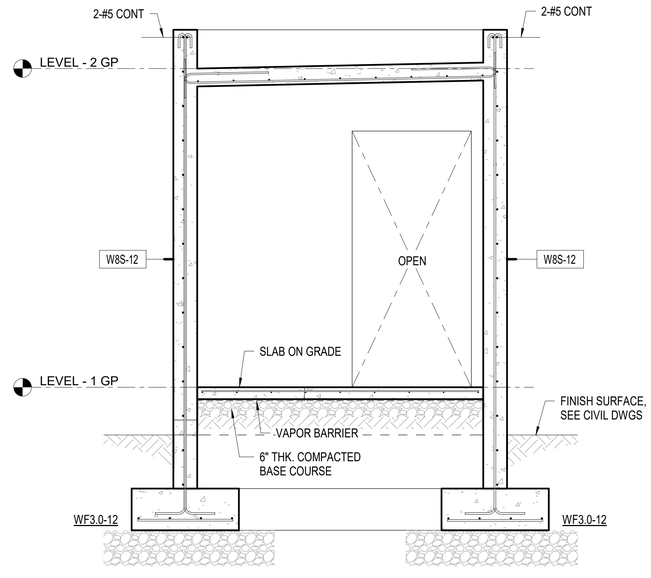
2 ROOF FRAMING PLAN (GUARD POST)

3/8" = 1'-0" 0' 1' 2' 4' 8'



LEGEND AND TAGS

WF#-##	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
t=#	SLAB THICKNESS DESIGNATION (INCHES)



3 SECTION

1/2" = 1'-0" 0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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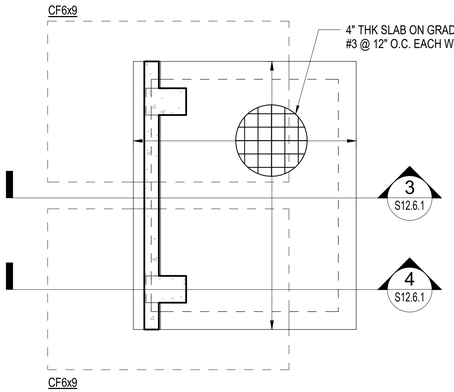
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
MISC. STRUCTURE
(GUARD POST) FND, ROOF FRAMING PLAN AND SECTION
PROGRAMMING DOCUMENT

Designed:	TPC/KVB
Drawn	PCP
Checked	TPC/KVB
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S12.5.1
Sheet No. ____ of ____

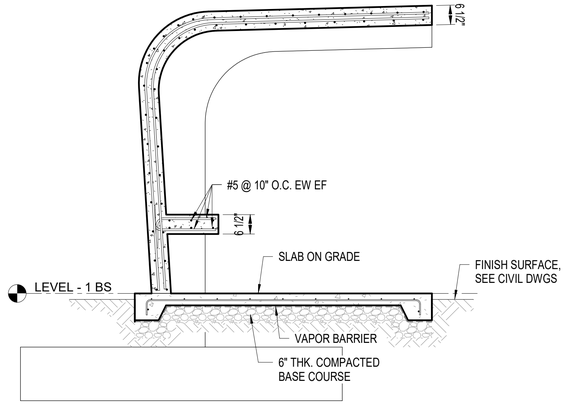
NOT FOR CONSTRUCTION



1 FOUNDATION PLAN (BUS STOP)

3/8" = 1'-0"

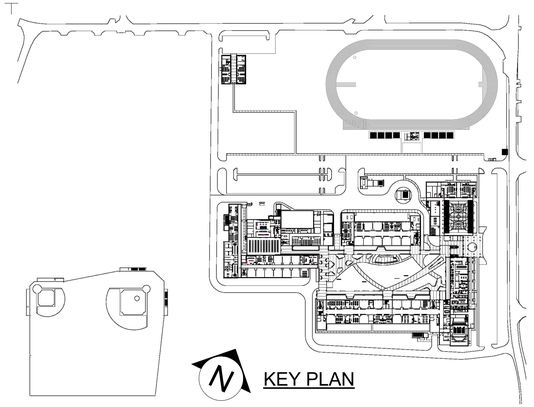
0' 1' 2' 4' 8'

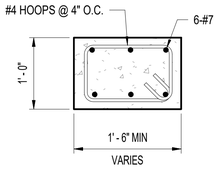


3 SECTION

1/2" = 1'-0"

0' 1' 2' 4' 8'

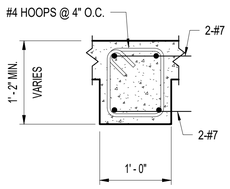




5 DETAIL

1" = 1'-0"

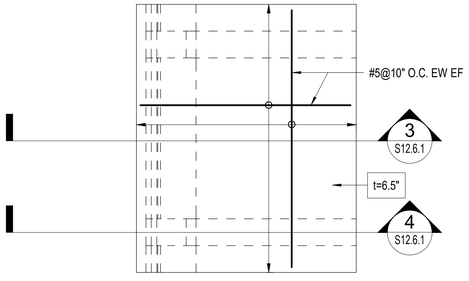
0' 3" 6" 1' 2'



6 DETAIL

1" = 1'-0"

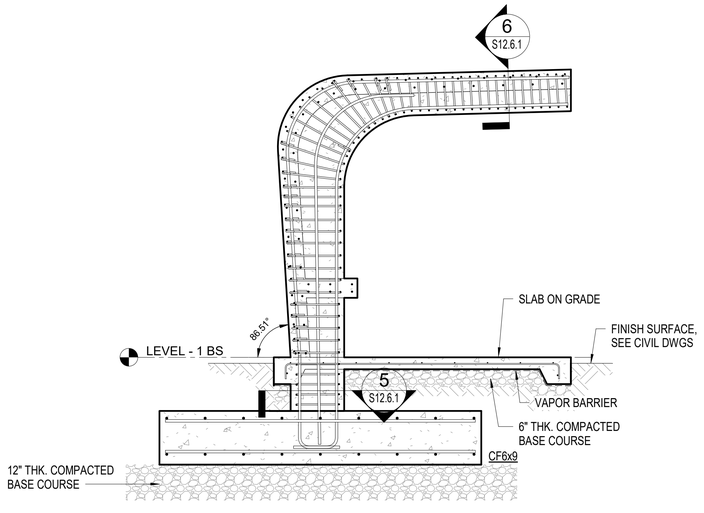
0' 3" 6" 1' 2'



2 ROOF FRAMING PLAN (BUS STOP)

3/8" = 1'-0"

0' 1' 2' 4' 8'



4 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Planning
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P.O. Box 8900 Tamuning, Guam 96931

I HEREBY CERTIFY THAT
THIS PLAN WAS PREPARED
BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: -

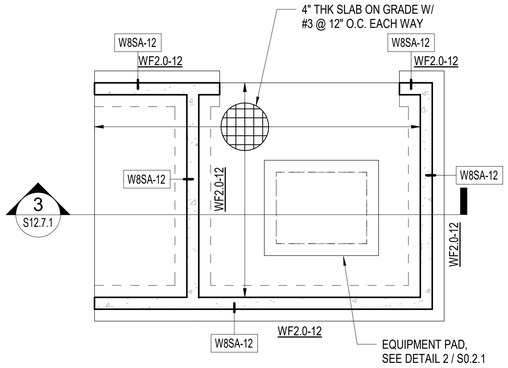
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
MISC. STRUCTURE
(BUS STOP) FND, FRAMING PLAN AND SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/KVB
Drawn	PCP
Checked	TPC/KVB
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

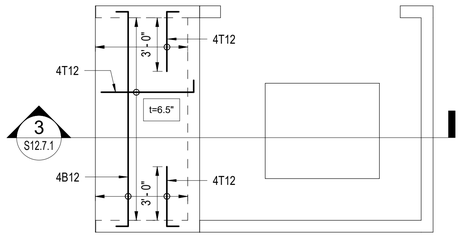
Drawing
S12.6.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



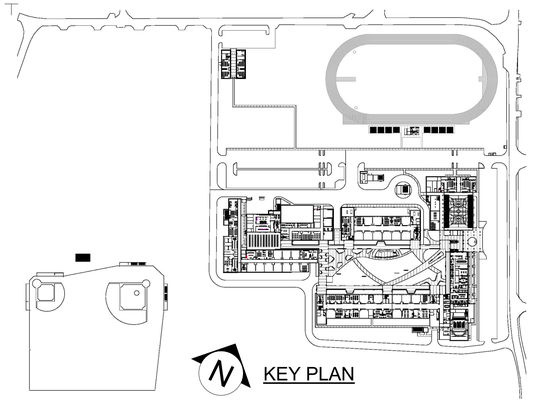
1 FOUNDATION PLAN (TRANSFORMER SHIELD WALL)

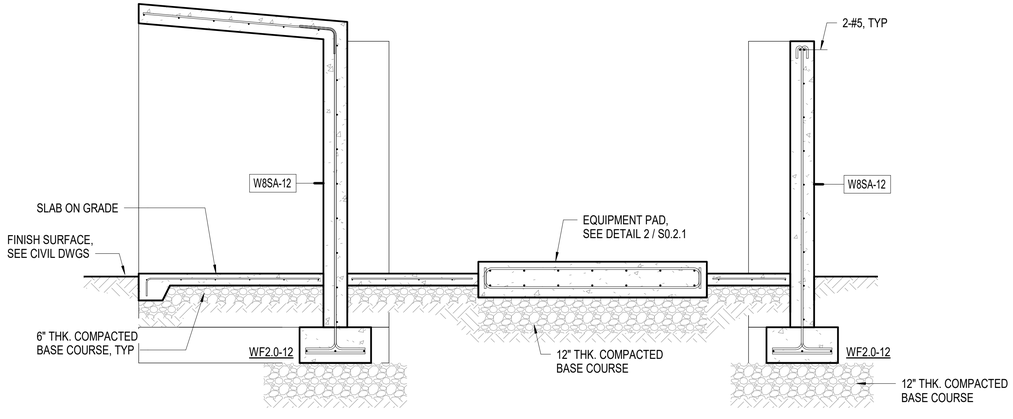
1/4" = 1'-0" 0' 1' 2' 4' 8'



2 ROOF FRAMING PLAN (TRANSFORMER SHIELD WALL)

1/4" = 1'-0" 0' 1' 2' 4' 8'





3 SECTION

1/2" = 1'-0" 0' 6" 1' 2' 4'

REVISION

No.	Description	Date

TRMA
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P.O. Box 8909 Tamuning, Guam 96931

I HEREBY CERTIFY THAT
THIS PLAN WAS PREPARED
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DIRECT SUPERVISION. DATE: _____

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

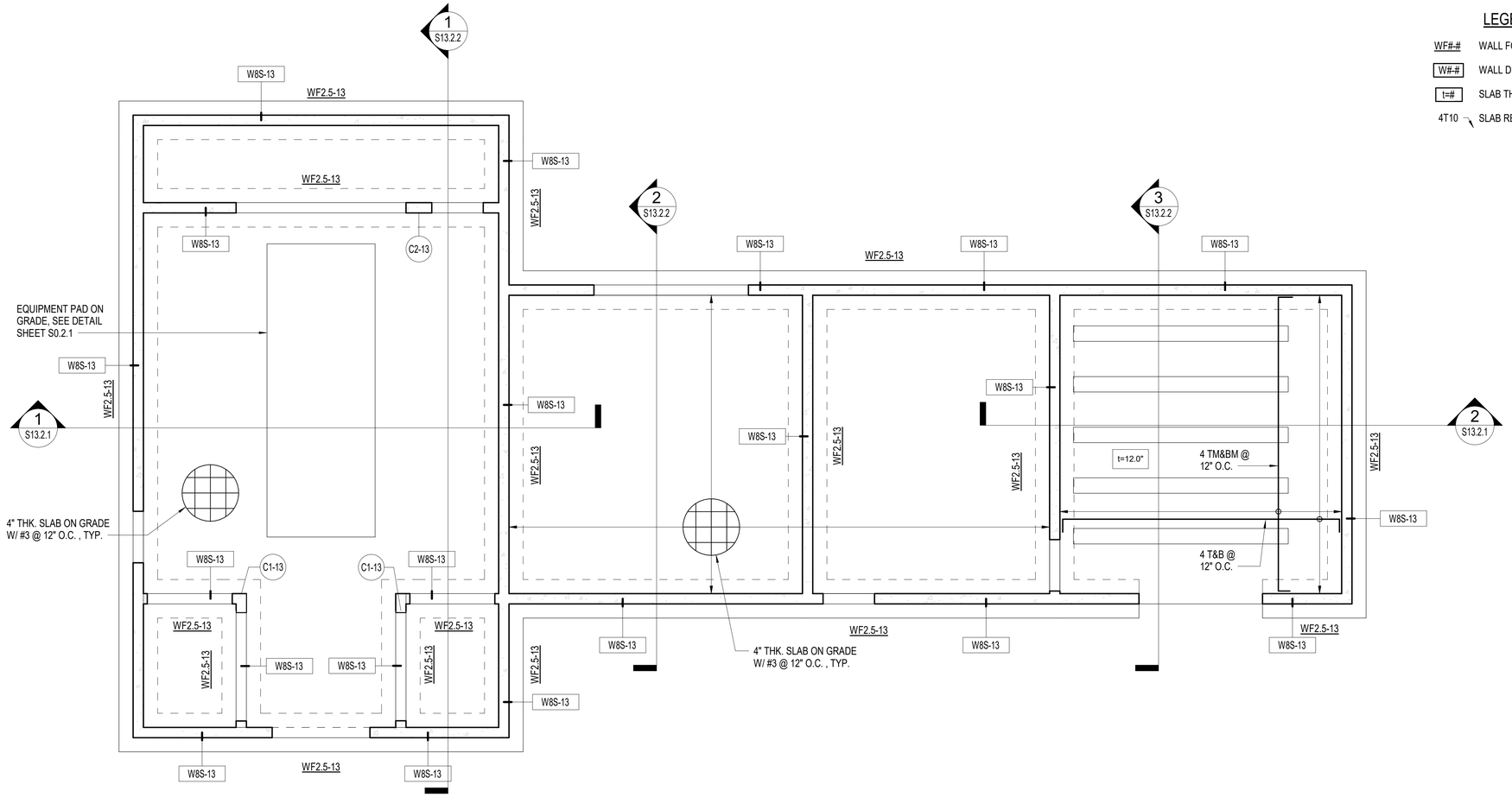
Title
MISC. STRUCTURE
(TRANS. SHIELD WALL) FND, ROOF FRAMING PLAN & SECTION
PROGRAMMING DOCUMENT

Designed:	TPC/ABR
Drawn	PCP
Checked	TPC/ABR
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S12.7.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

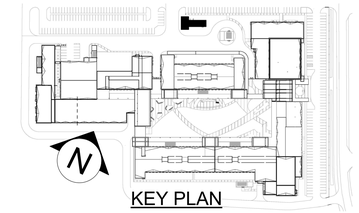
IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES



FOUNDATION PLAN

1/4" = 1'-0"

0' 1' 2' 4' 8'



KEY PLAN

LEGEND AND TAGS

WF#.#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
t=#	SLAB THICKNESS DESIGNATION (INCHES)
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4

REVISION

No.	Description	Date

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Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

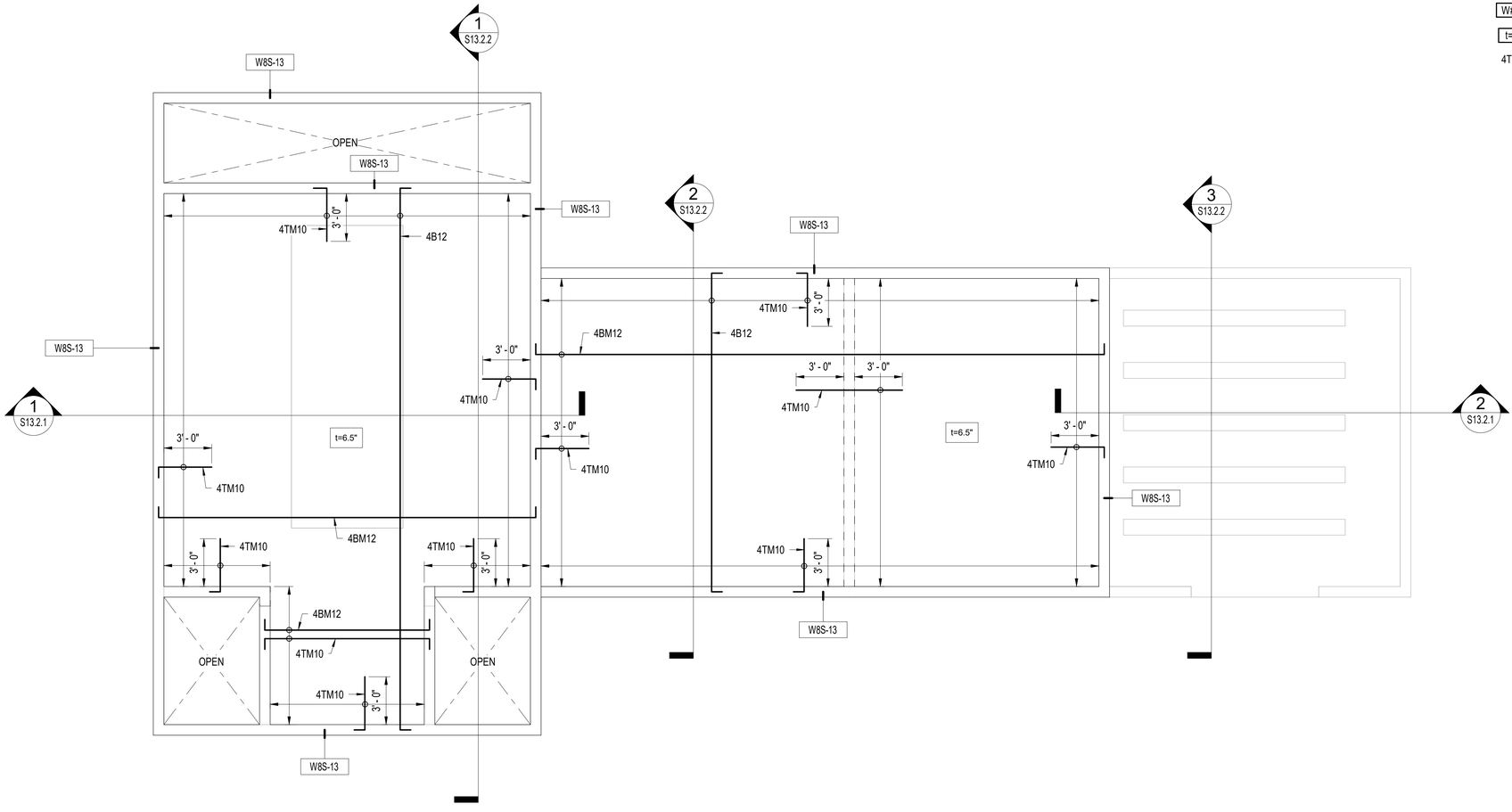
Title
GENERATOR BUILDING
FOUNDATION PLAN
PROGRAMMING DOCUMENT

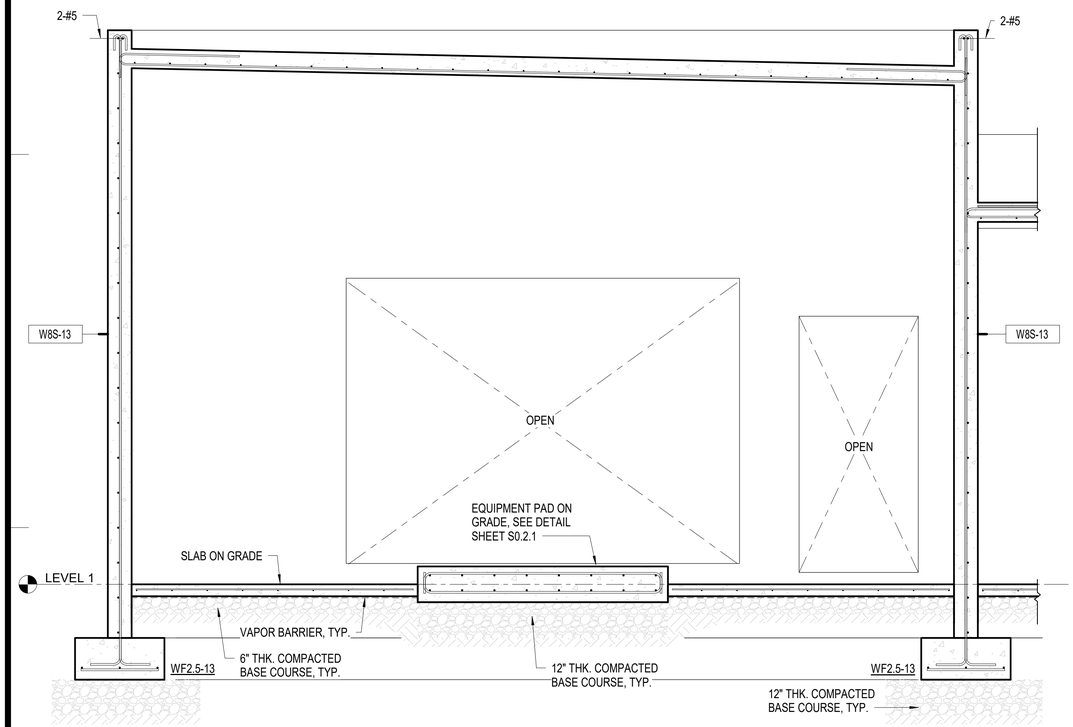
Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing
S13.1.1
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

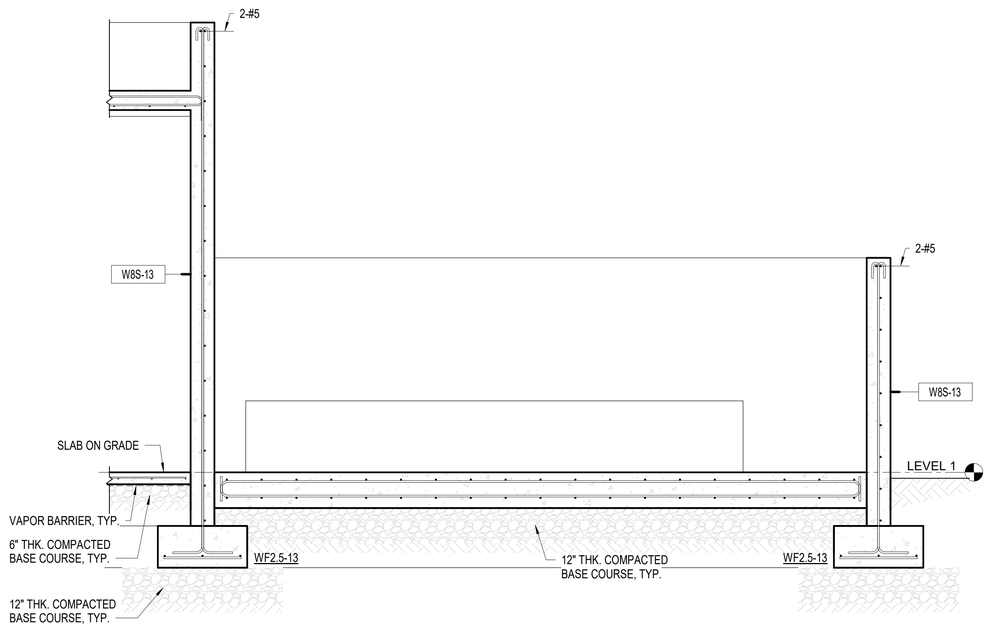

1
S13.2.2
2
S13.2.2
3
S13.2.2
1
S13.2.1
2
S13.2.1
W8S-13
OPEN
4TM10
3' - 0"
4B12
4BM12
t=6.5"
4TM10
4TM10
4TM10



1 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'



2 SECTION

1/2" = 1'-0"

0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title

GENERATOR BUILDING

SECTIONS

PROGRAMMING DOCUMENT

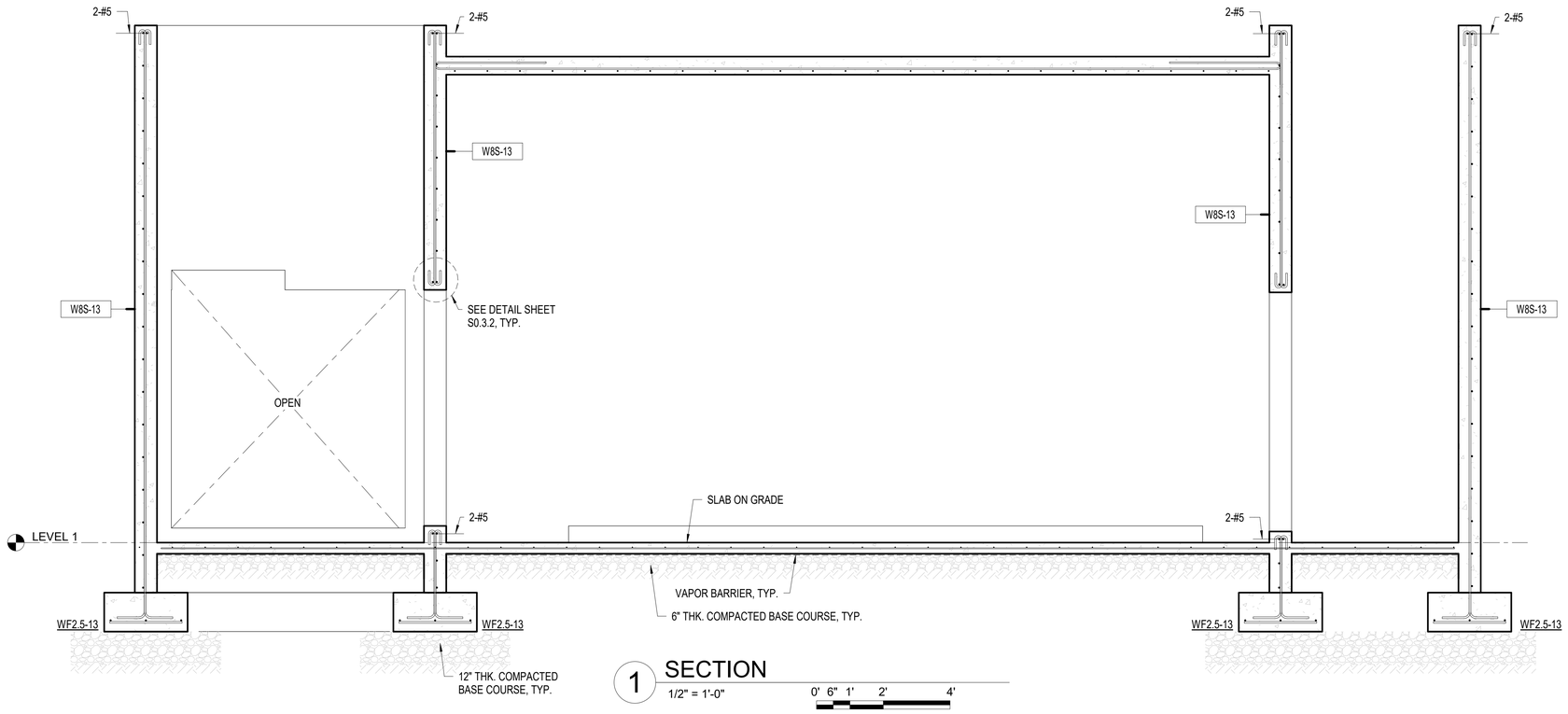
Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing

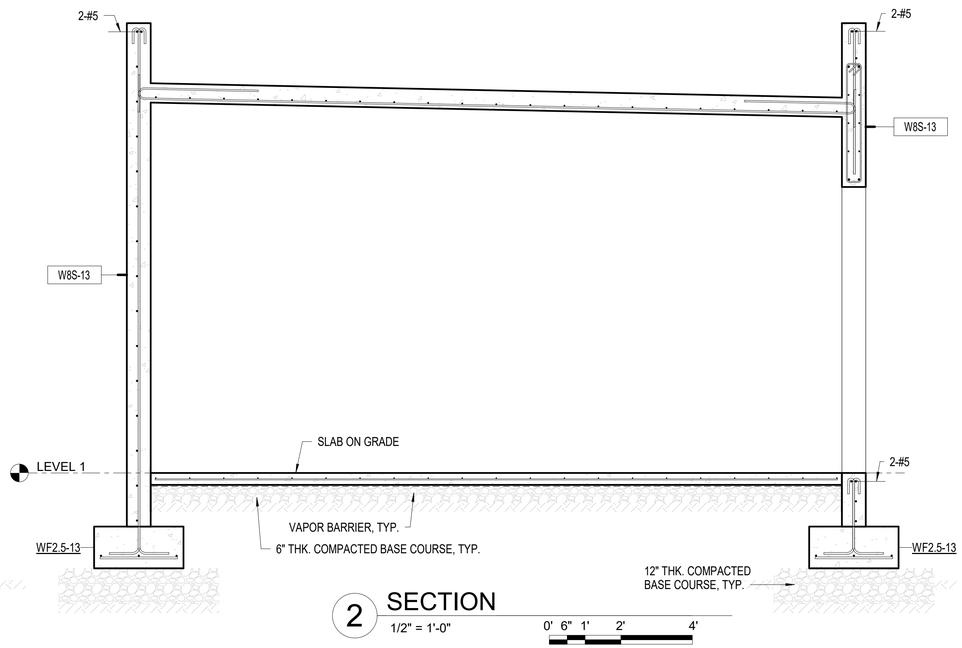
S13.2.1

Sheet No. _____ of _____

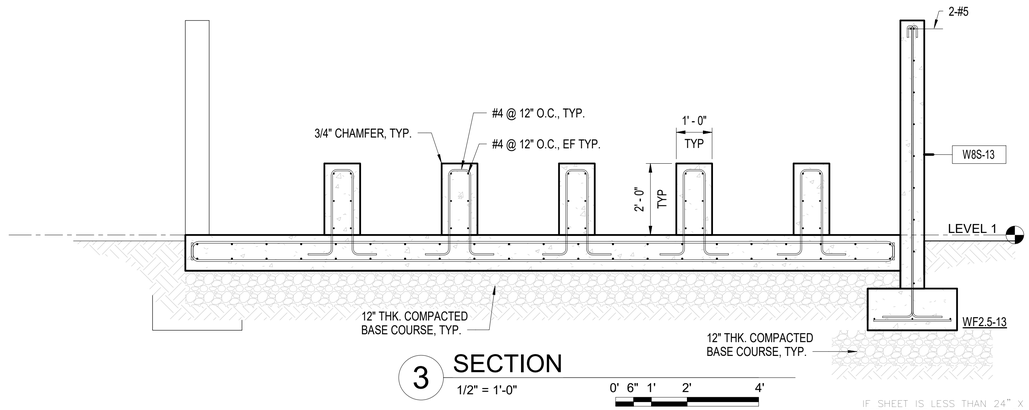
NOT FOR CONSTRUCTION



1 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



2 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'



3 SECTION
1/2" = 1'-0"
0' 6" 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. DATE: ____-____

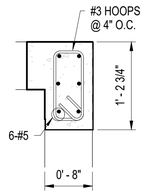
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GENERATOR BUILDING
SECTIONS
PROGRAMMING DOCUMENT

Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1/2" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S13.2.2
Sheet No. ____ of ____

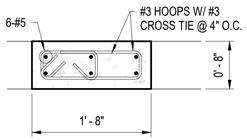
NOT FOR CONSTRUCTION



1 DETAIL C1-13

1" = 1'-0"

0' 3" 6" 1' 2'



2 DETAIL C2-13

1" = 1'-0"

0' 3" 6" 1' 2'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
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DIRECT SUPERVISION. DATE: -

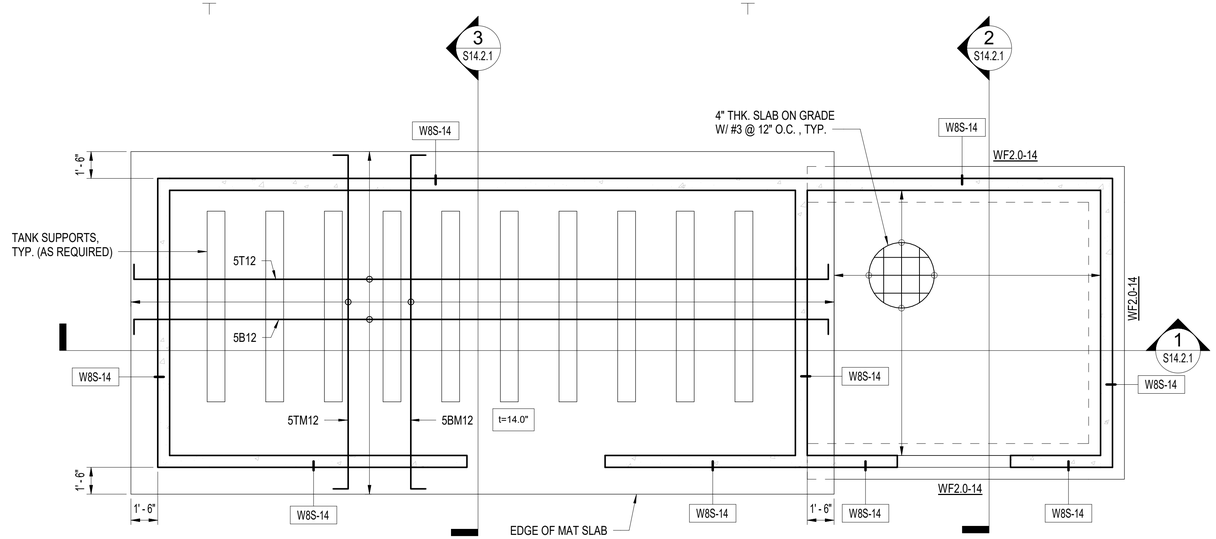
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
GENERATOR BUILDING
MISCELLANEOUS DETAILS
PROGRAMMING DOCUMENT

Designed:	TPC/EEE
Drawn	PCP
Checked	TPC/EEE
Supv:	TPC
Scale:	1" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S13.3.1
Sheet No. of

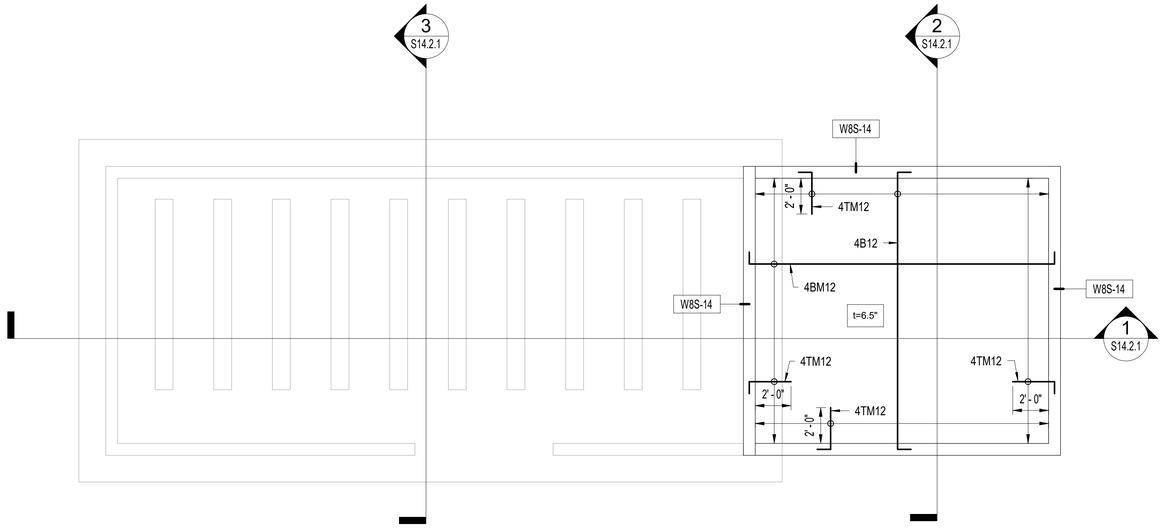
NOT FOR CONSTRUCTION



TYPE 1 - FOUNDATION PLAN

1/4" = 1'-0"

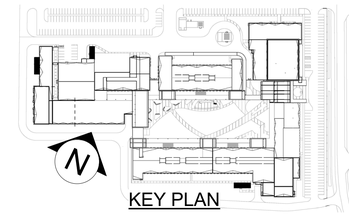
0' 1' 2' 4' 8'



TYPE 1 - ROOF FRAMING PLAN

1/4" = 1'-0"

0' 1' 2' 4' 8'



KEY PLAN

LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
t=#	SLAB THICKNESS DESIGNATION (INCHES)
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4

REVISION

No.	Description	Date

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Project

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title

PUMP BUILDINGS

TYPE 1 - FOUNDATION AND ROOF FRAMING PLAN

PROGRAMMING DOCUMENT

Designed:	JPP
Drawn	PCP/AGC
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

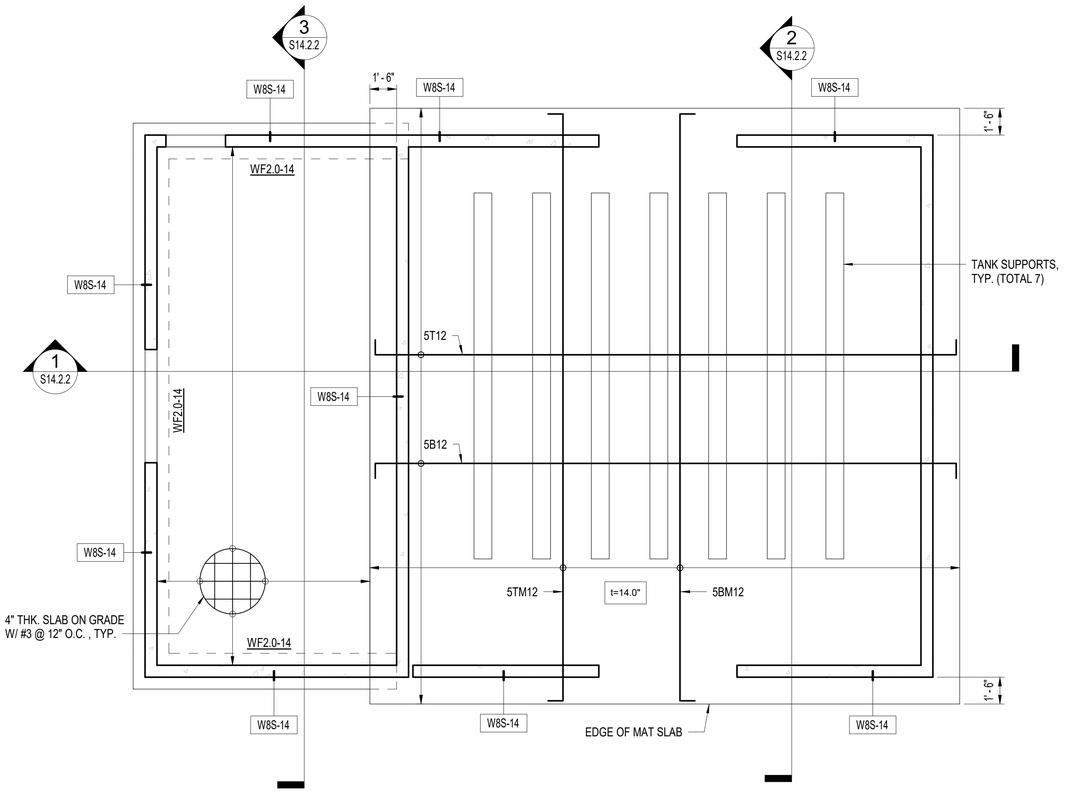
Drawing

S14.1.1

Sheet No. _____ of _____

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

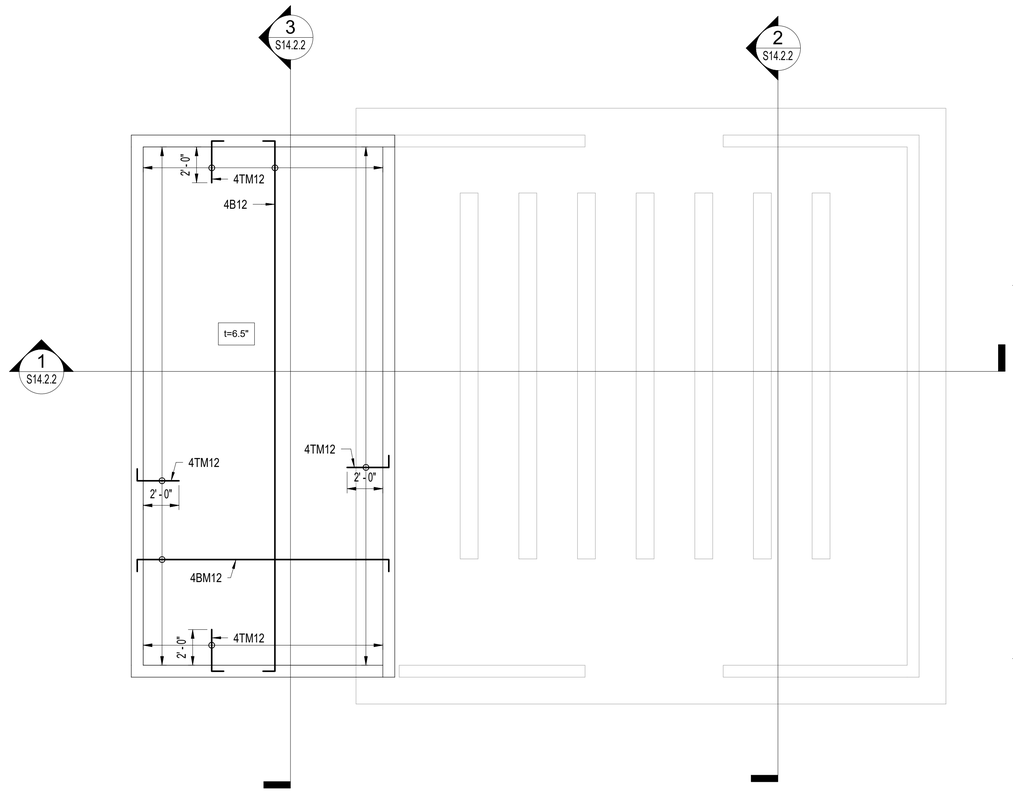
NOT FOR CONSTRUCTION



TYPE 2 - FOUNDATION PLAN

1/4" = 1'-0"

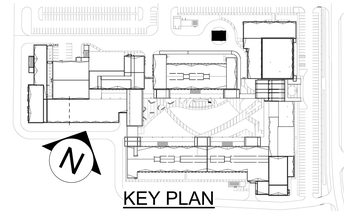
0' 1' 2' 4' 8'



TYPE 2 - ROOF FRAMING PLAN

1/4" = 1'-0"

0' 1' 2' 4' 8'



KEY PLAN

LEGEND AND TAGS

WF#-#	WALL FOOTING DESIGNATION, SEE SHEET S0.2.2
W#-#	WALL DESIGNATION, SEE SHEET S0.3.1
t=#	SLAB THICKNESS DESIGNATION (INCHES)
4T10	SLAB REINFORCING DESIGNATION, SEE SHEET S0.1.4

REVISION		
No.	Description	Date

TRMA
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Project

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title

PUMP BUILDINGS

TYPE 2 - FOUNDATION AND ROOF FRAMING PLAN

PROGRAMMING DOCUMENT

Designed:	JPP
Drawn	PCP/AGC
Checked	TPC/JPP
Supv:	TPC
Scale:	As indicated
Date:	03/31/25
Project	File

Drawing

S14.1.2

Sheet No. _____ of _____

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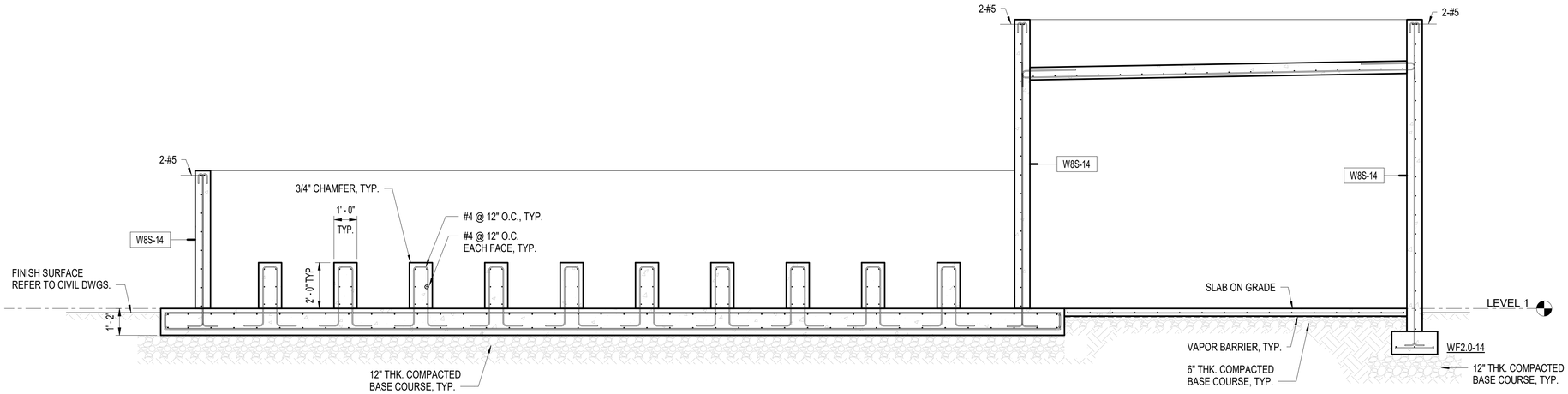
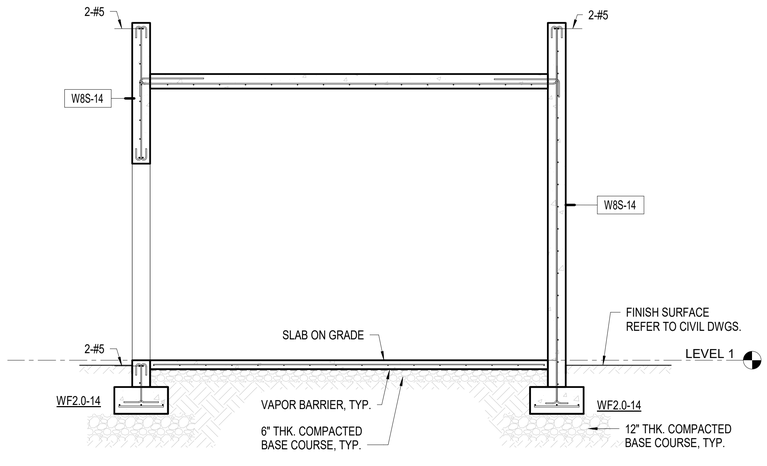


1 SECTION

3/8" = 1'-0"

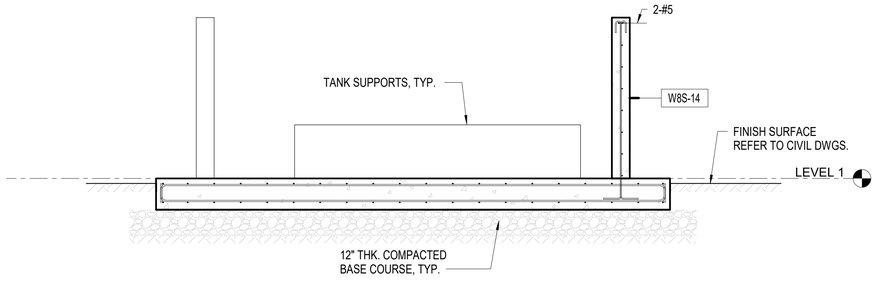
0' 1' 2' 4' 8'



2 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'



3 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION

No.	Description	Date

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BY ME OR UNDER MY
DIRECT SUPERVISION. DATE: -

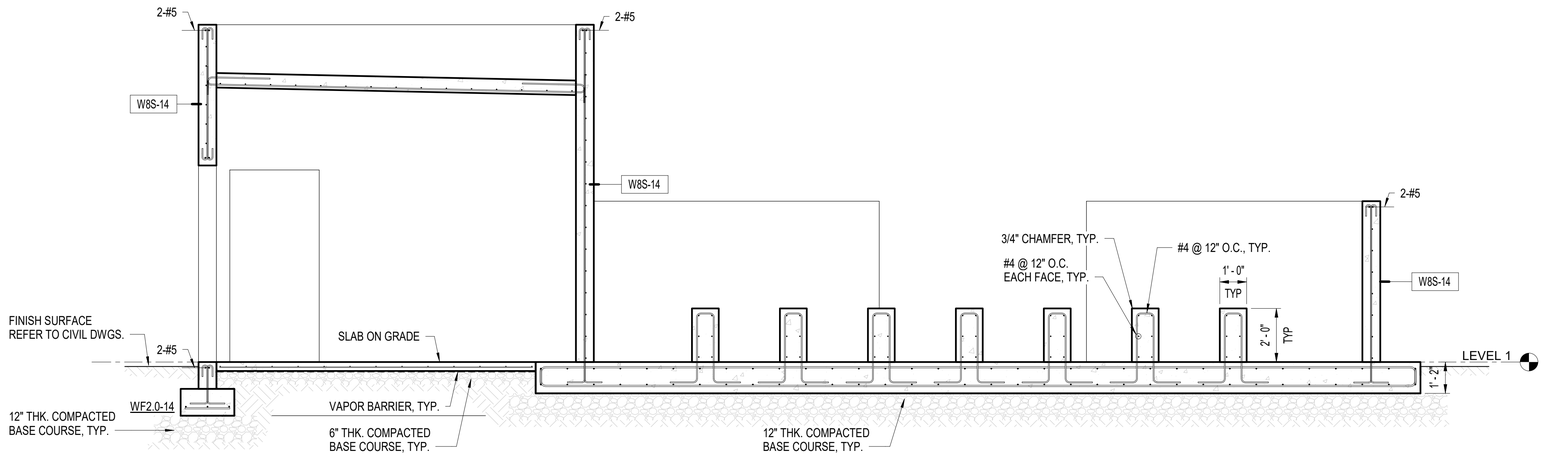
Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
PUMP BUILDINGS
TYPE 1 - SECTIONS
PROGRAMMING DOCUMENT

Designed:	JPP
Drawn	PCP/AGC
Checked	TPC/JPP
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing
S14.2.1
Sheet No. of

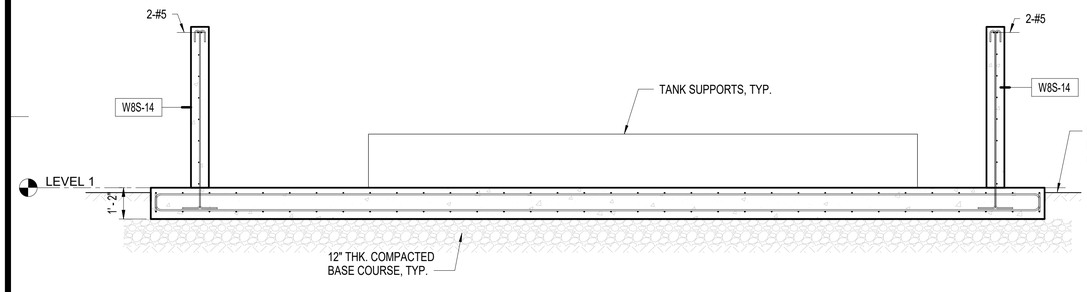
NOT FOR CONSTRUCTION



1 SECTION

3/8" = 1'-0"

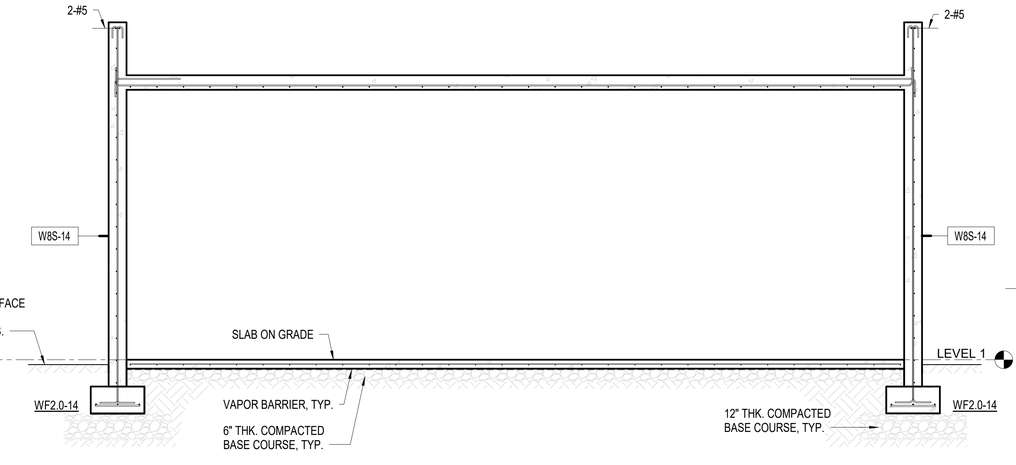
0' 1' 2' 4' 8'



2 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'



3 SECTION

3/8" = 1'-0"

0' 1' 2' 4' 8'

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■ GEOGRAPHIC INFORMATION SYSTEMS
P.O. Box 8900 Tamuning, Guam 96931

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Project

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title

PUMP BUILDINGS

TYPE 2 - SECTIONS

PROGRAMMING DOCUMENT

Designed:	JPP
Drawn	PCP/AGC
Checked	TPC/JPP
Supv:	TPC
Scale:	3/8" = 1'-0"
Date:	03/31/25
Project	File

Drawing

S14.2.2

Sheet No. _____ of _____

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MECHANICAL LEGEND AND ABBREVIATIONS

SYMBOL	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION
ACDP	ACDP	A/C CONDENSATE PUMP		COND	CONDENSER		NIC	NOT IN CONTRACT
AC	AC	AIR CURTAIN		CON'T	CONTINUATION/CONTINUED		NTS	NOT TO SCALE
ACCU	ACCU	AIR-COOLED CONDENSING UNIT		CW	COLD WATER		O.C.	ON CENTER
AHU	AHU	AIR HANDLING UNIT		DB	DRY BULB		OA	OUTSIDE AIR
CEF	CEF	CEILING EXHAUST FAN		DL	DOOR LOUVER		OAD	OUTSIDE AIR DUCT
DOAS	DOAS	DEDICATED OUTSIDE AIR SYSTEM		DU	DOOR UNDER-CUT		OD	OUTSIDE DIAMETER
EF	EF	EXHAUST FAN		EAD	EXHAUST AIR DUCT		PD	PRESSURE DROP
FCU	FCU	FAN COIL UNIT		EAT	ENTERING AIR TEMPERATURE		PH	PHASE
KEF	KEF	KITCHEN EXHAUST FAN		ELEC	ELECTRICAL		RAD	RETURN AIR DUCT
SF	SF	SUPPLY FAN		EAR	EXHAUST AIR REGISTER		RPM	REVOLUTIONS PER MINUTE
FD	F.D.	FIRE DAMPER		EVAP	EVAPORATOR		RAR	RETURN AIR REGISTER
	VD	VOLUME DAMPER		EWT	ENTERING WATER TEMPERATURE		RL	REFRIGERANT LIQUID LINE
SD		DUCT SMOKE DETECTOR		ESP	EXTERNAL STATIC PRESSURE		RLA	RATED LOAD AMPS
T		PROGRAMMABLE THERMOSTAT MOUNTED 60" AFFL.		EXT	EXTERNAL		RS	REFRIGERANT SUCTION LINE
OA		OUTSIDE AIR CONDITIONS TEMP/HUMIDITY SENSOR		FAD	FRESH AIR DUCT		SA	SUPPLY AIR
		NEW DUCT (SAD, OAD, EAD, RAD)		FLA	FULL LOAD AMPERE		SAD	SUPPLY AIR DUCT
		SUPPLY OUTLET (SIZE - TYPE - CFM)		FLEX	FLEXIBLE		SAR	SUPPLY AIR REGISTER
		RETURN OR EXHAUST INLET (SIZE - TYPE - CFM)		FT	FEET		SHTML	SHEET METAL
	°F	DEGREES FAHRENHEIT		GA	GAGE OR GAUGE		SPECS	SPECIFICATIONS
	Ø	DIAMETER		GAL	GALLONS		SP	STATIC PRESSURE
	AP	ACCESS PANEL		GALV	GALVANIZED		SSTL	STAINLESS STEEL
	ACD	AIR CONDITIONING DRAIN		GPM	GALLONS PER MINUTE		SW	SWITCH
	AMP	AMPERE/AMPERES		HP	HORSEPOWER		TEMP	TEMPERATURE
	ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE		HZ	HERTZ		TSP	TOTAL STATIC PRESSURE
	APPROX	APPROXIMATE		IFM	INDOOR FAN MOTOR		THK	THICK(NESS)
	ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITINING ENGINEERS		IN	INCHES		TV	TURNING VANE
	ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS		KW	KILOWATT		TYP	TYPICAL
	AVG	AVERAGE		LBS	POUNDS		UL	UNDERWRITERS LABORATORIES, INC.
	BDD	BACKDRAFT DAMPER		LD	LINEAR DIFFUSER		V	VOLTAGE/VOLTS
	BTU	BRITISH THERMAL UNIT		LVG	LEAVING		VAV	VARIABLE AIR VOLUME
	CAP	CAPACITY		LWT	LEAVING WATER TEMPERATURE		VD	VOLUME DAMPER
	CD	CEILING DIFFUSER		MAD	MAKE-UP AIR DUCT		VRV	VARIABLE REFRIGERANT VOLUME
	CFM	CUBIC FEET PER MINUTE		MD	MODULATING DAMPER		WB	WET BULB
	CO	CLEANOUT		MCA	MINIMUM CIRCUIT AMPACITY		WT	WEIGHT
	COMP	COMPRESSOR		MOCP	MAXIMUM OVER CURRENT PROTECTION			
	CONC	CONCRETE		MISC	MISCELLANEOUS			

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL LEGEND AND ABBREVIATIONS
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
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Date:	3/31/25
Project No.	NO.
File	

Drawing No.
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Sheet No. 1 of 0

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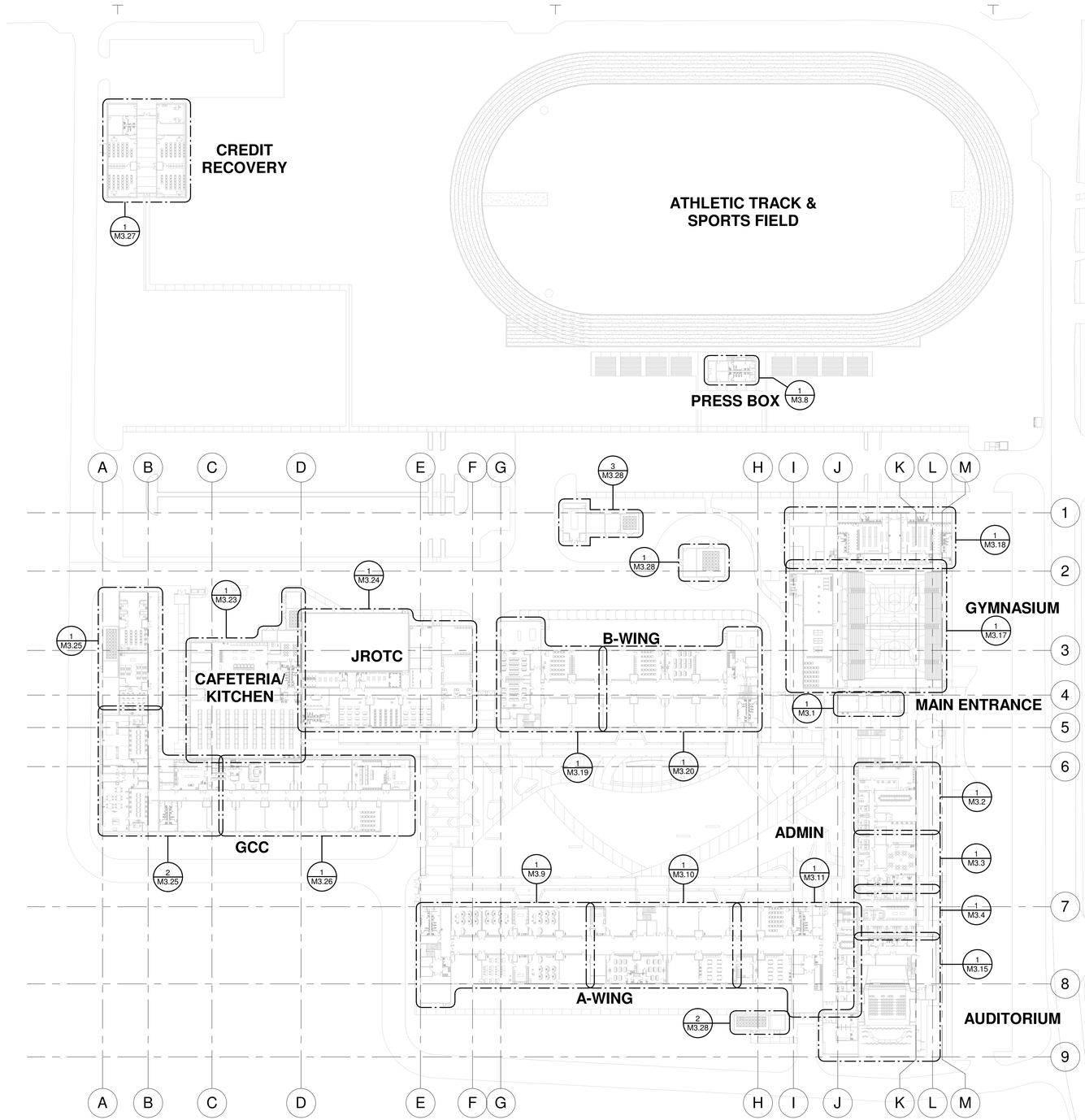

1 MECHANICAL OVERALL FIRST FLOOR PLAN
SCALE: 1" = 60'-0"

NORTH

GRAPHIC SCALE
0 10' 20' 30' 60' 120' 180'
SCALE: 1" = 60'-0"

FOR REFERENCE ONLY

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Title:
MECHANICAL OVERALL FIRST FLOOR PLAN
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/JQR
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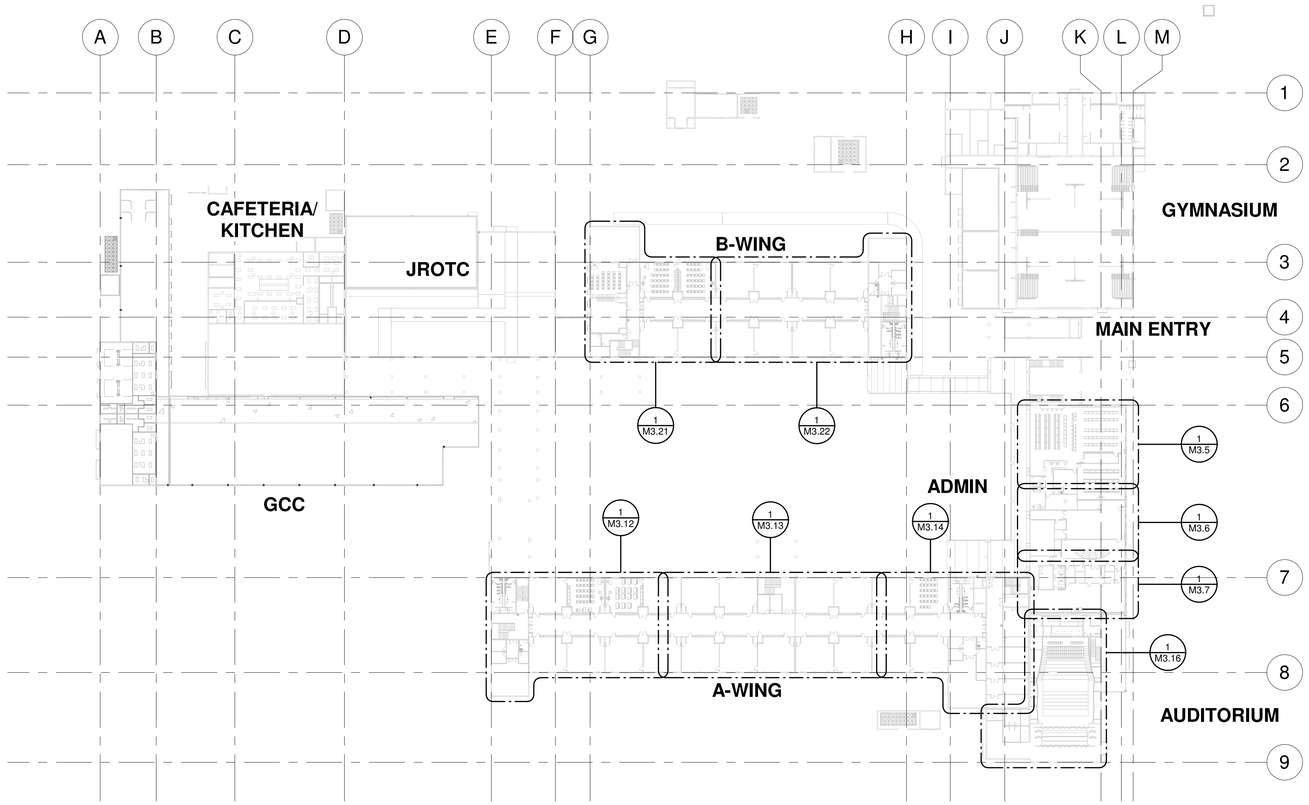
Date:	3/31/25
Project No. NO.	File

Drawing No.
M1.1
Sheet No._____ of _____



1 MECHANICAL OVERALL SECOND FLOOR PLAN

SCALE: 1" = 60'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:
MECHANICAL OVERALL SECOND FLOOR PLAN
PROGRAMMING DOCUMENT

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Project No. NO.	File

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Sheet No._____ of _____

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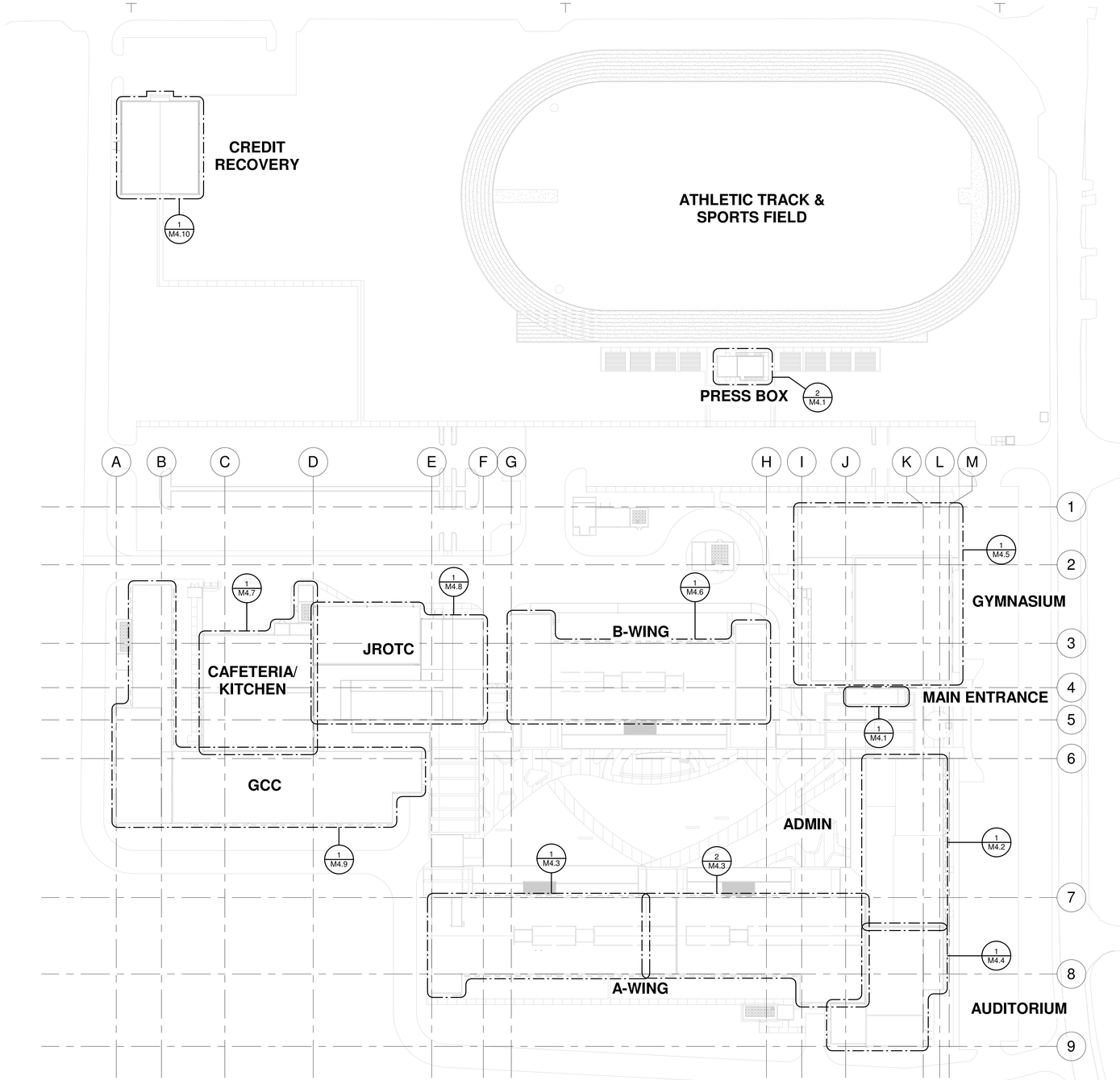

1 MECHANICAL OVERALL ROOF PLAN
SCALE: 1" = 60'-0"

NORTH

GRAPHIC SCALE
0 10' 20' 30' 60' 120' 180'
SCALE: 1" = 60'-0"

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL
OVERALL ROOF PLAN
PROGRAMMING
DOCUMENT

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Project No.: NO.	File

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Sheet No. _____ of _____

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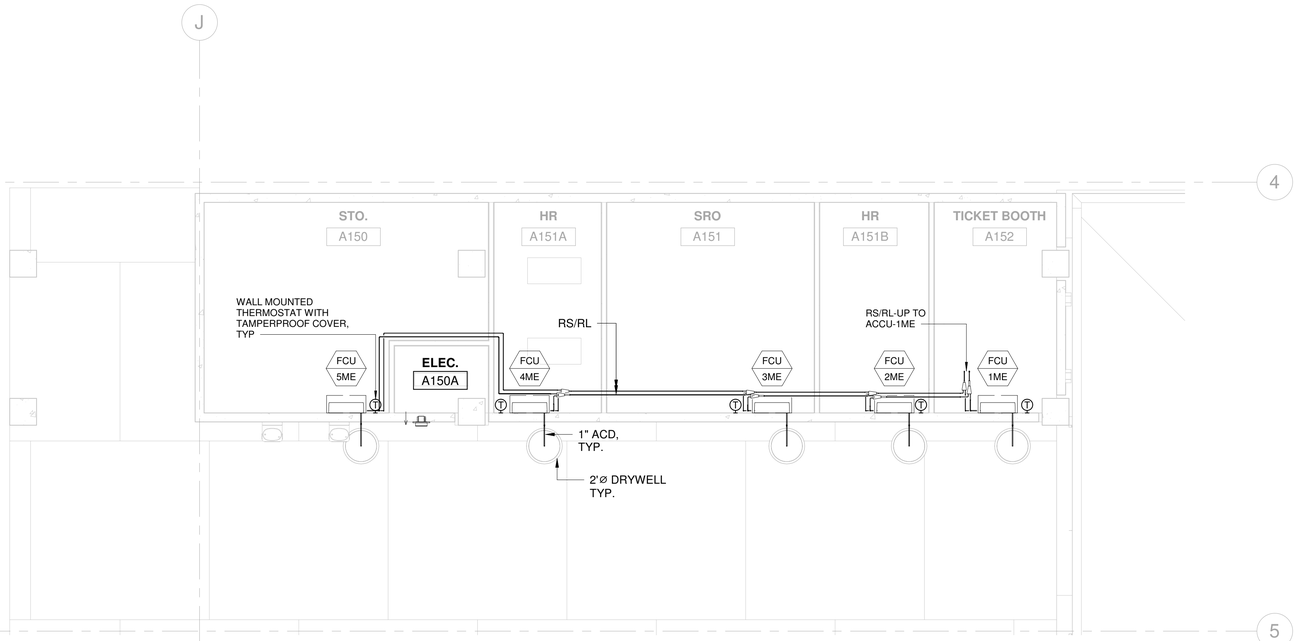
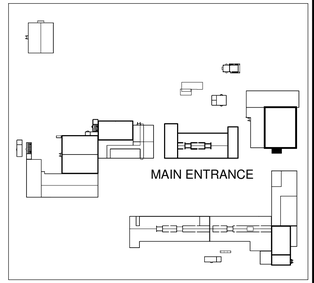


1 MAIN ENTRANCE MECHANICAL PLAN

SCALE: 3/16" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 1' 2' 4' 8' 16'

SCALE: 3/16" = 1'-0"

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MAIN ENTRANCE MECHANICAL PLAN

PROGRAMMING DOCUMENT

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Supv:	MPN
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Date:	3/31/25
Project No. -	File

Drawing No.
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Sheet No._____ of 0

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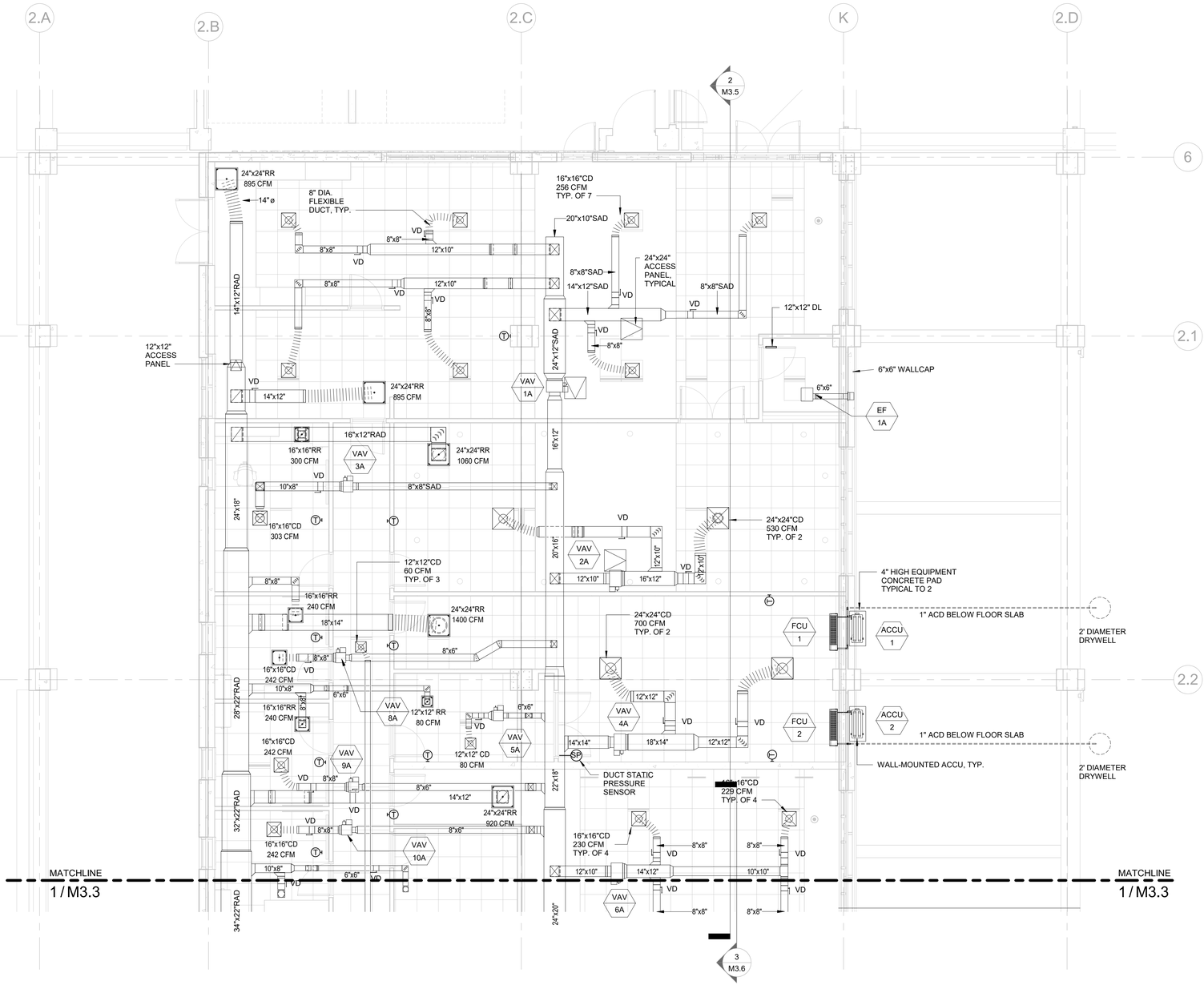

1 ADMIN PARTIAL MECHANICAL CEILING PLAN -LEVEL 1

SCALE: 3/16" = 1'-0"

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Title:
ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 1
PROGRAMMING DOCUMENT

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Drawing No.
M3.2
Sheet No._____ of 0

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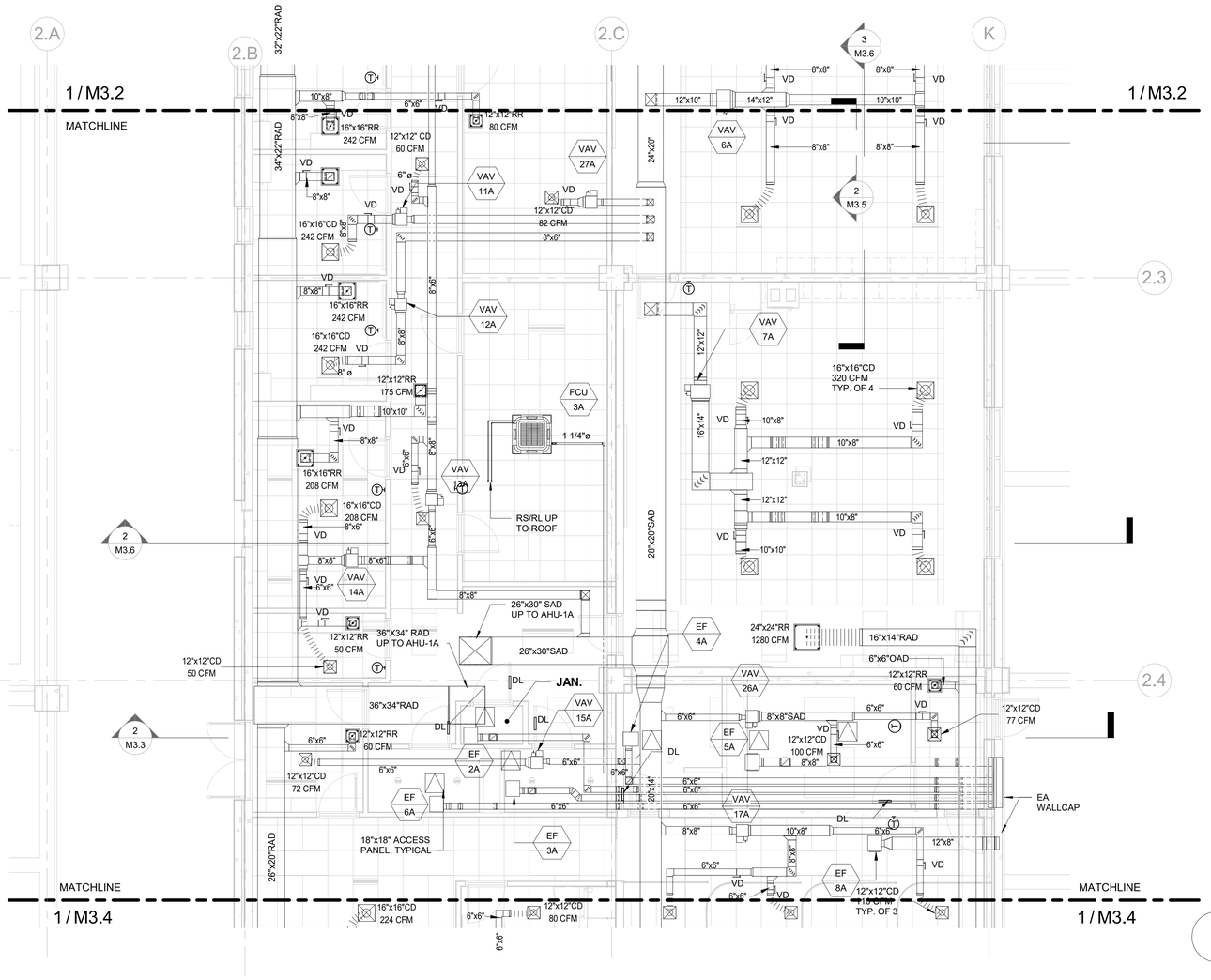
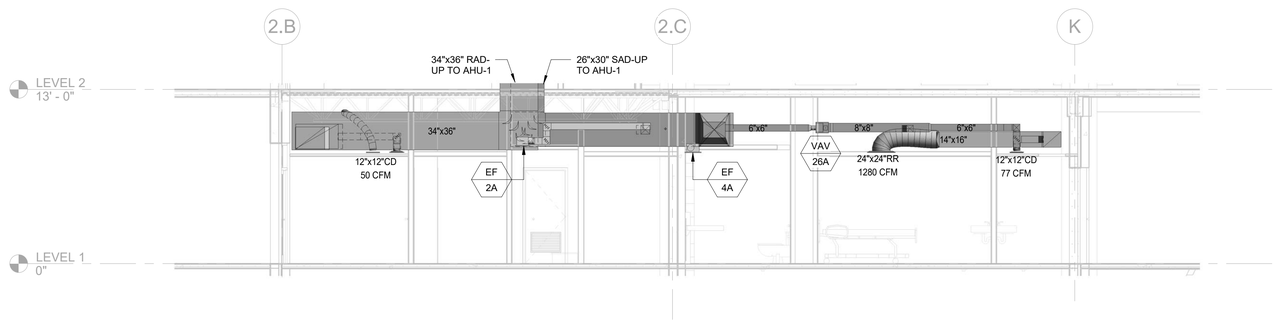


1 ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 1

SCALE: 3/16" = 1'-0"



2 MECHANICAL SECTION 1

SCALE: 3/16" = 1'-0"

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Title:
ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 1
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
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Project No.	File
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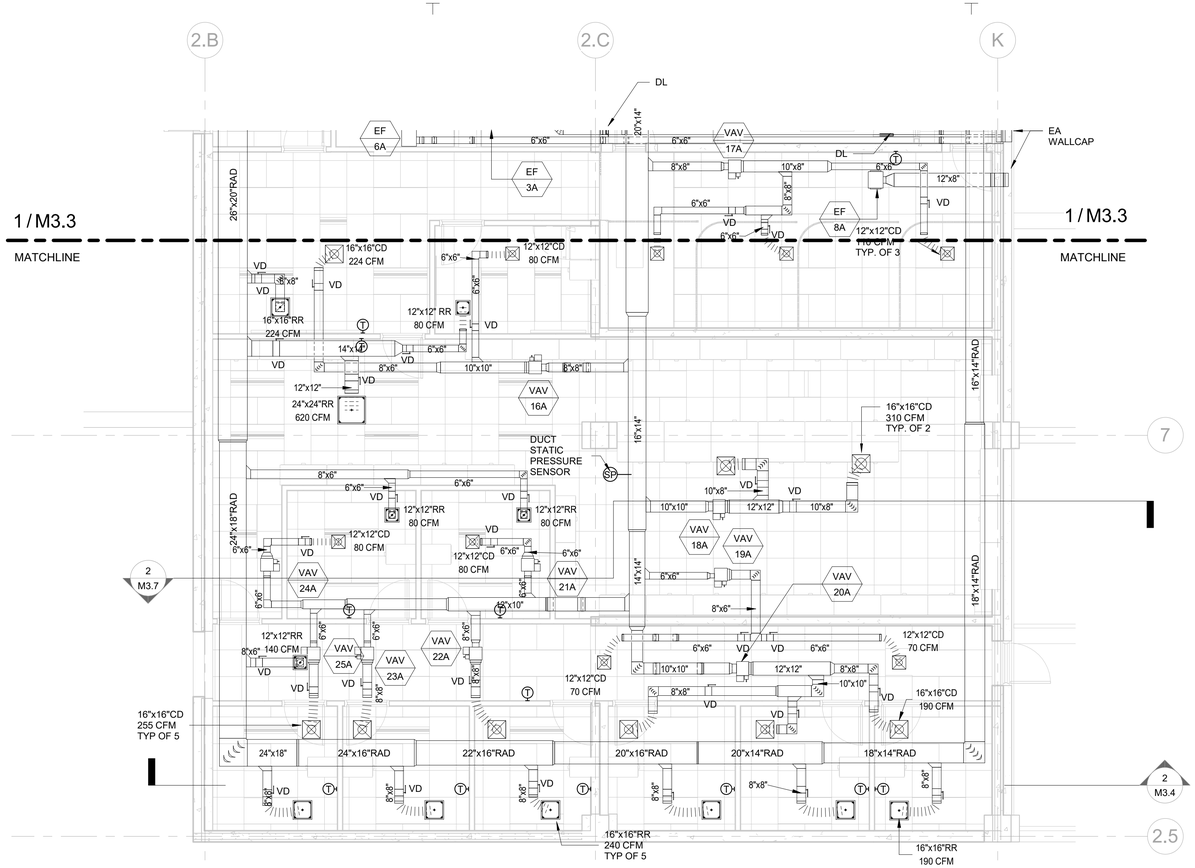

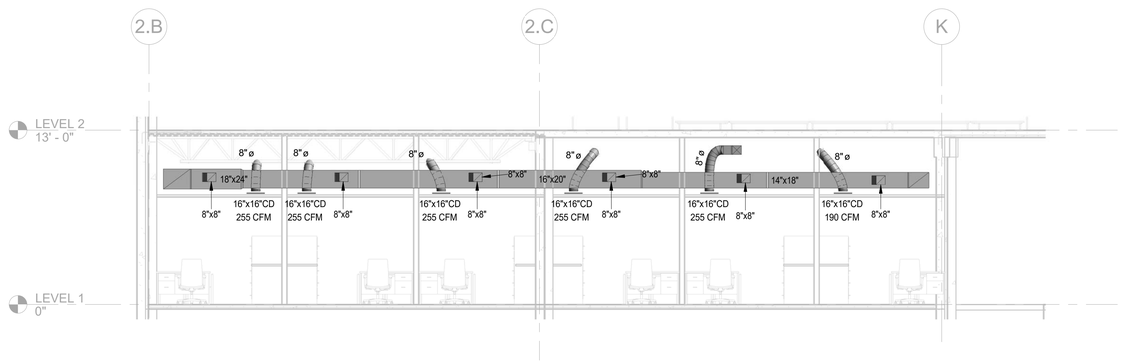

1 ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 1

SCALE: 3/16" = 1'-0"

2 MECHANICAL SECTION 1

SCALE: 3/16" = 1'-0"

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Title:
ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 AND MECHANICAL SECTION
PROGRAMMING DOCUMENT

Designed:	MN/ES/SR
Drawn:	SR/JP/EN
Checked:	MPN
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Scale:	3/16" = 1'-0"
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Project No.	XX-XXX
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Drawing No.
M3.4
Sheet No._____ of ____0

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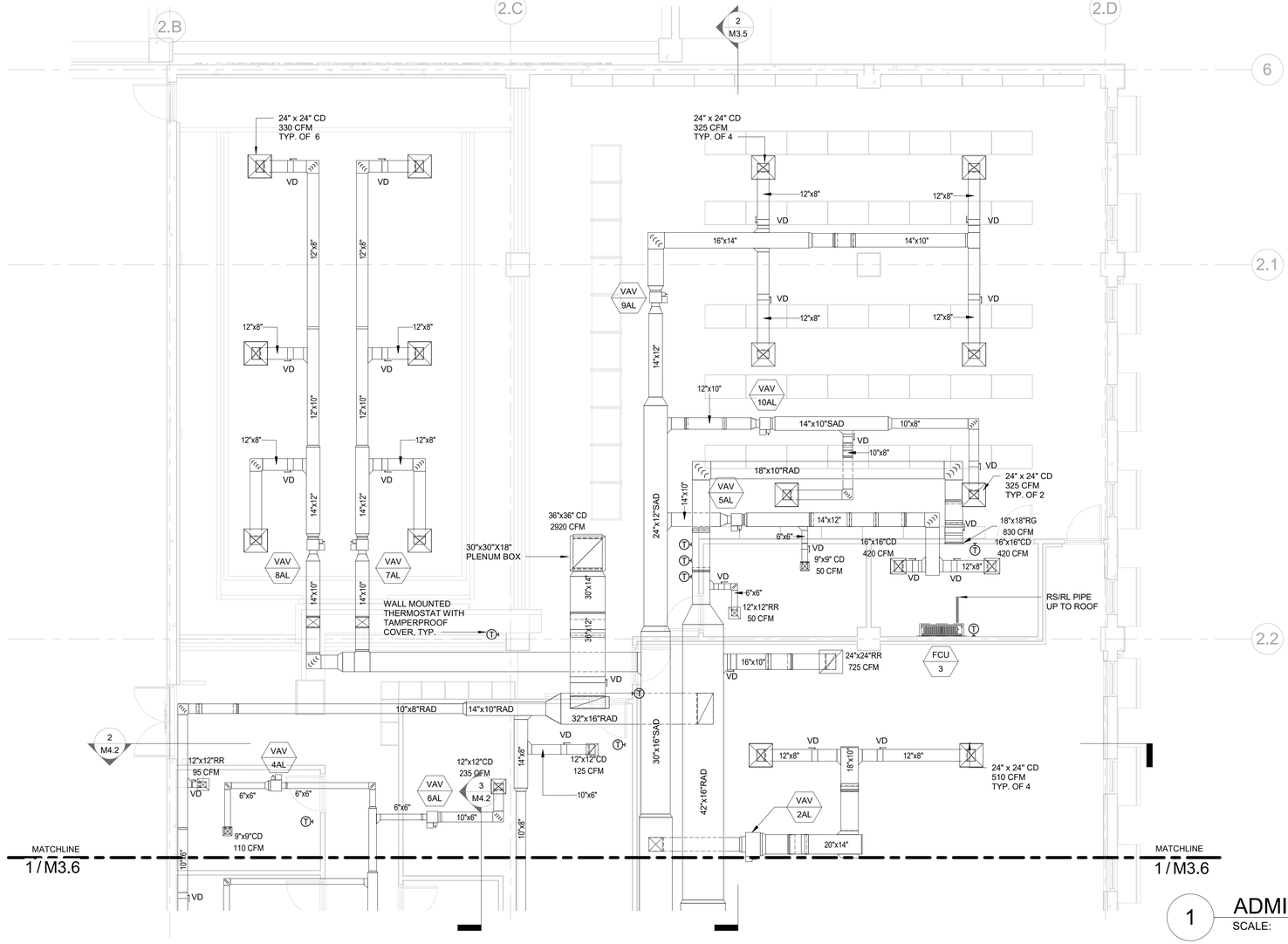

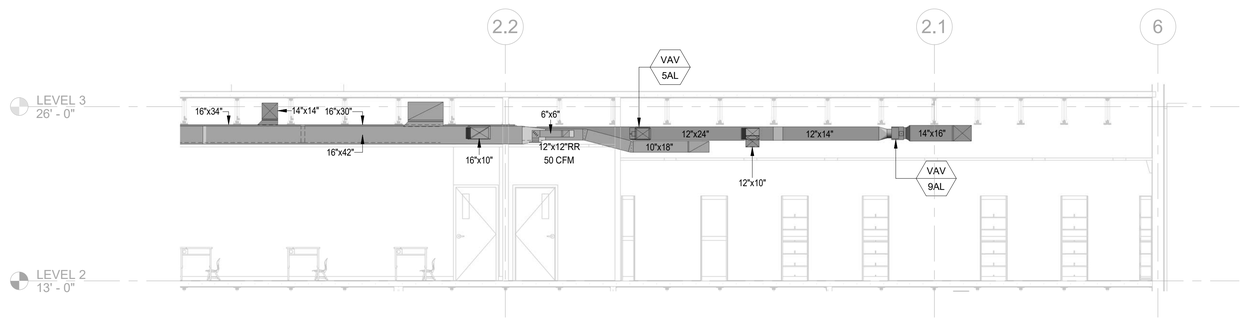

1 ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 2
SCALE: 3/16" = 1'-0"

2 MECHANICAL SECTION 1
SCALE: 3/16" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE
0 1' 2' 4' 8' 16'
SCALE: 3/16" = 1'-0"

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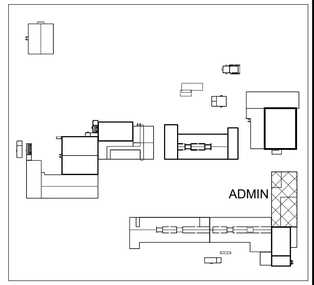

KEY PLAN

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ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 AND MECHANICAL SECTION
PROGRAMMING DOCUMENT

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Date:	3/31/25
Project No.	File
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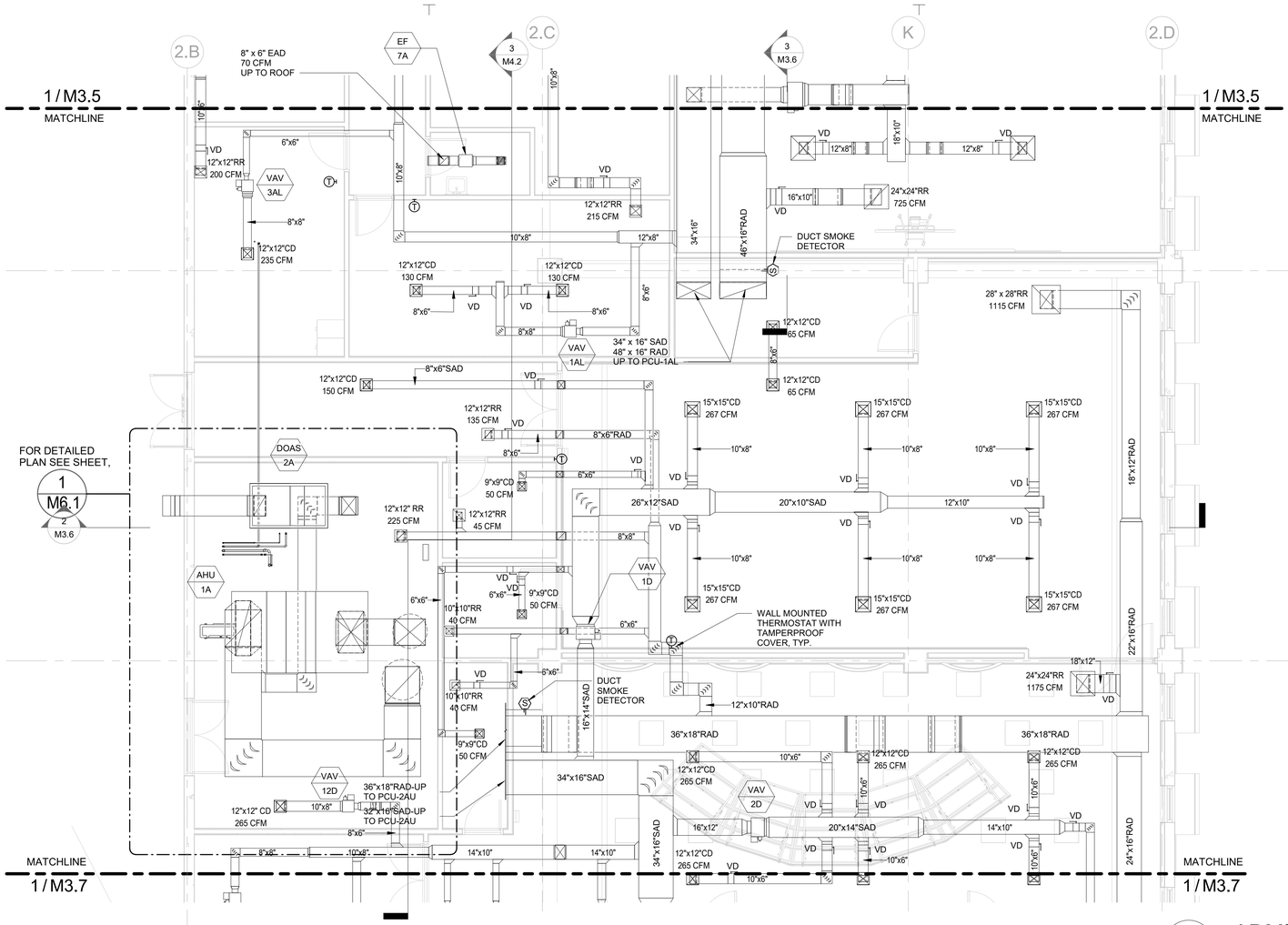
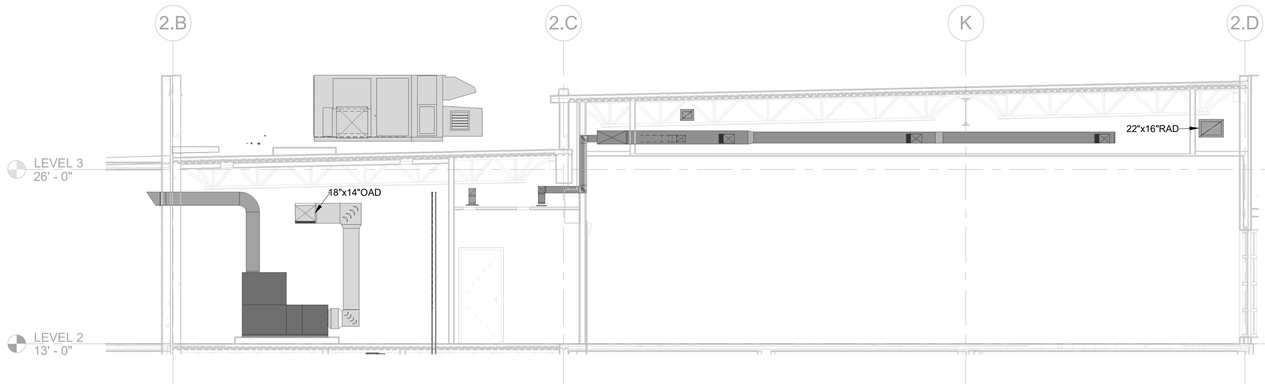


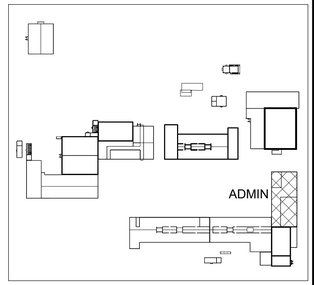
1 ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 2

SCALE: 3/16" = 1'-0"

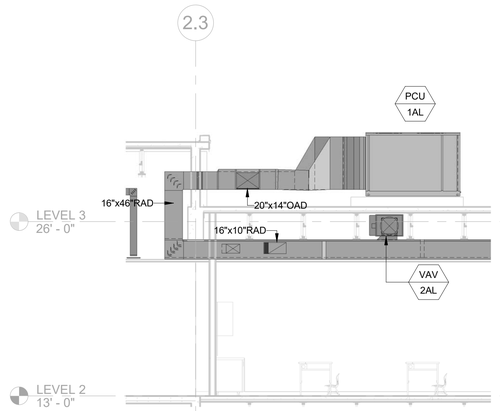


2 MECHANICAL SECTION 1

SCALE: 3/16" = 1'-0"



KEY PLAN



3 MECHANICAL SECTION 2

SCALE: 3/16" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 1' 2' 4' 8' 16'

SCALE: 3/16" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS		
No.	Description	Date

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
Planning
Interior Design

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 AND MECHANICAL SECTION
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/16" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.6
Sheet No._____ of 0

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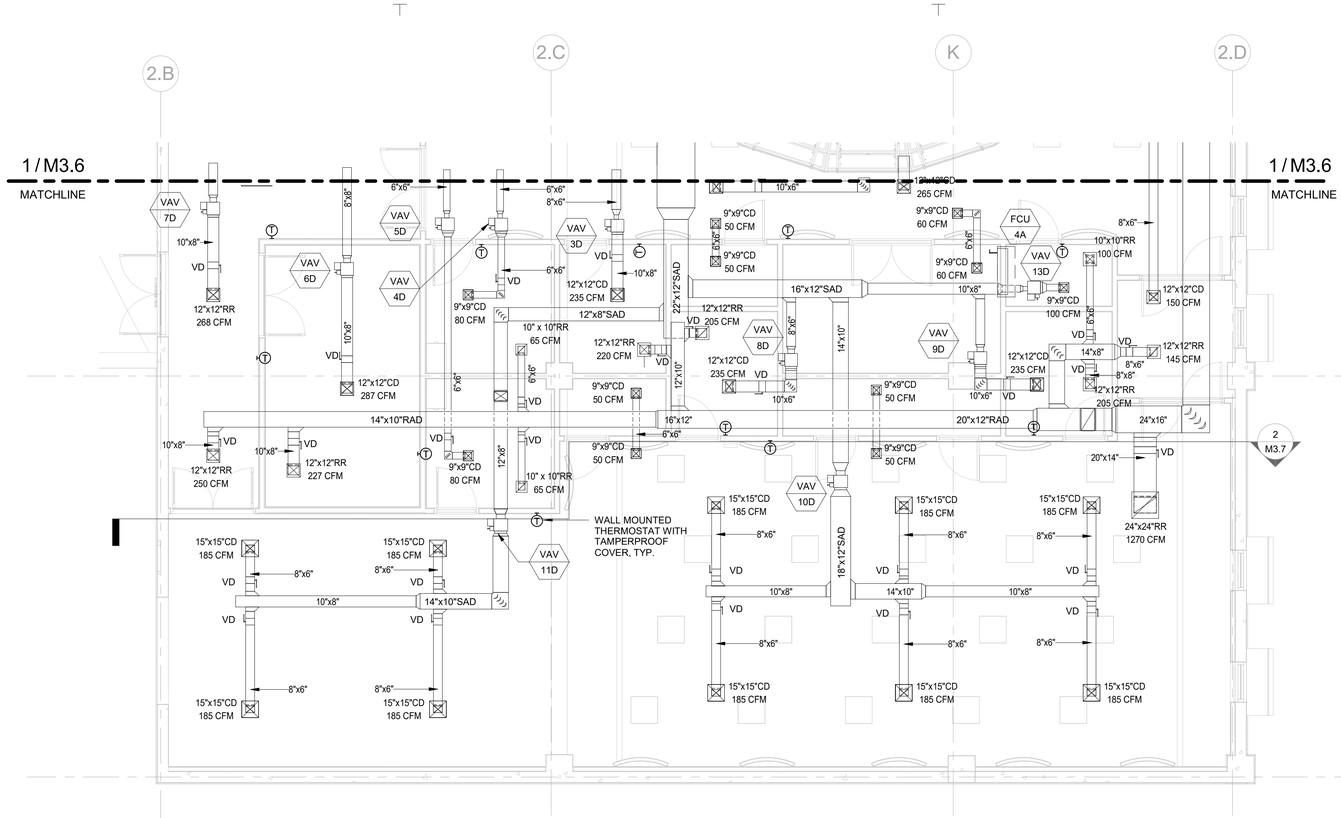
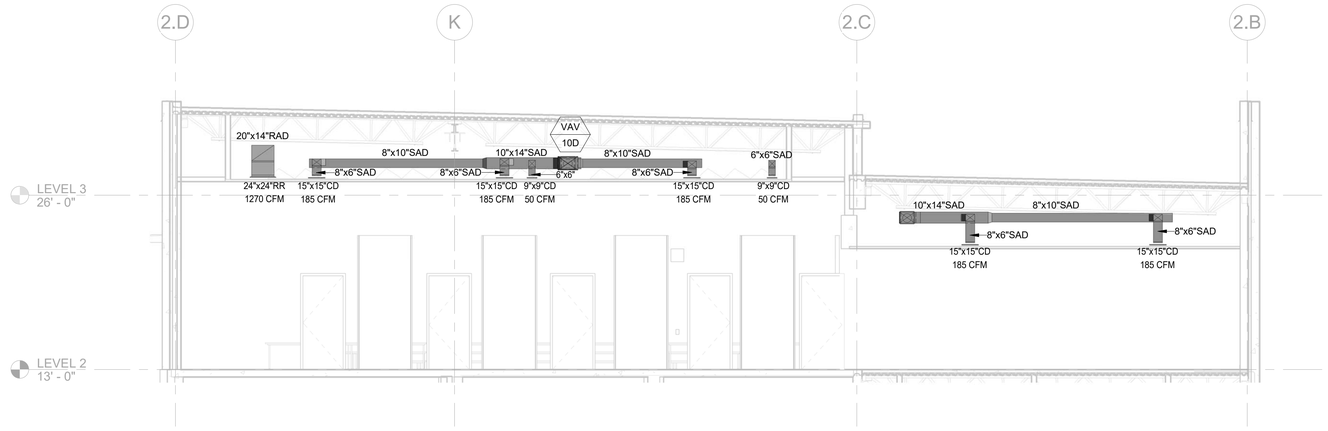


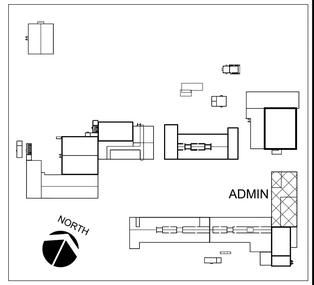
1 ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 2

SCALE: 3/16" = 1'-0"



2 MECHANICAL SECTION 1

SCALE: 3/16" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 1' 2' 4' 8' 16'

SCALE: 3/16" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ADMIN PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 AND MECHANICAL SECTION
PROGRAMMING DOCUMENT

Designed:	Designer
Drawn:	Author
Checked:	Checker
Supv:	Approver
Scale:	3/16" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.7
Sheet No. _____ of 0

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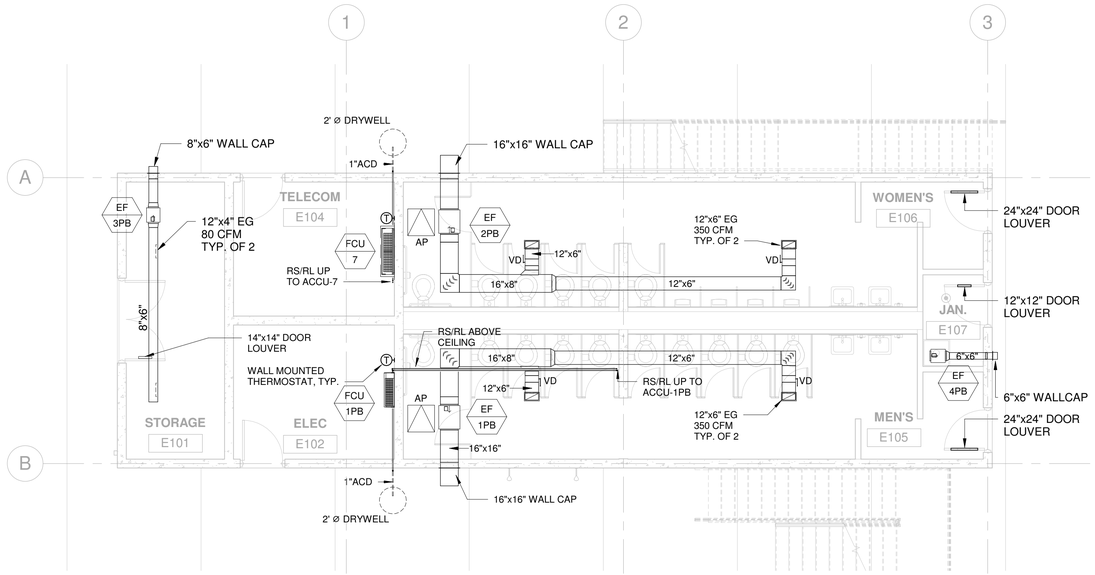
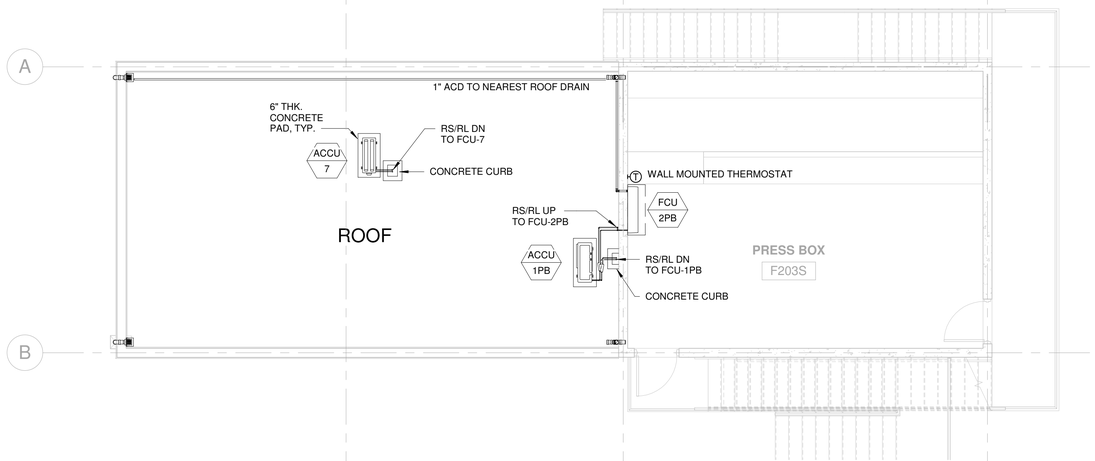


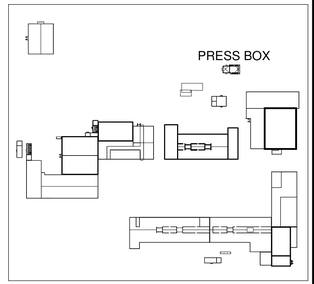
1 PRESS BOX MECHANICAL CEILING PLAN - LEVEL 1

SCALE: 3/16" = 1'-0"



2 PRESS BOX MECHANICAL CEILING PLAN - LEVEL 2

SCALE: 3/16" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 1' 2' 4' 8' 16'

SCALE: 3/16" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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SIMON SANCHEZ HIGH SCHOOL

Title:
PRESS BOX MECHANICAL CEILING PLAN - LEVEL 1 & 2
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/16" = 1'-0"
Date:	3/31/25
Project No.	File
-	

Drawing No.
M3.8
Sheet No. ____ of 0

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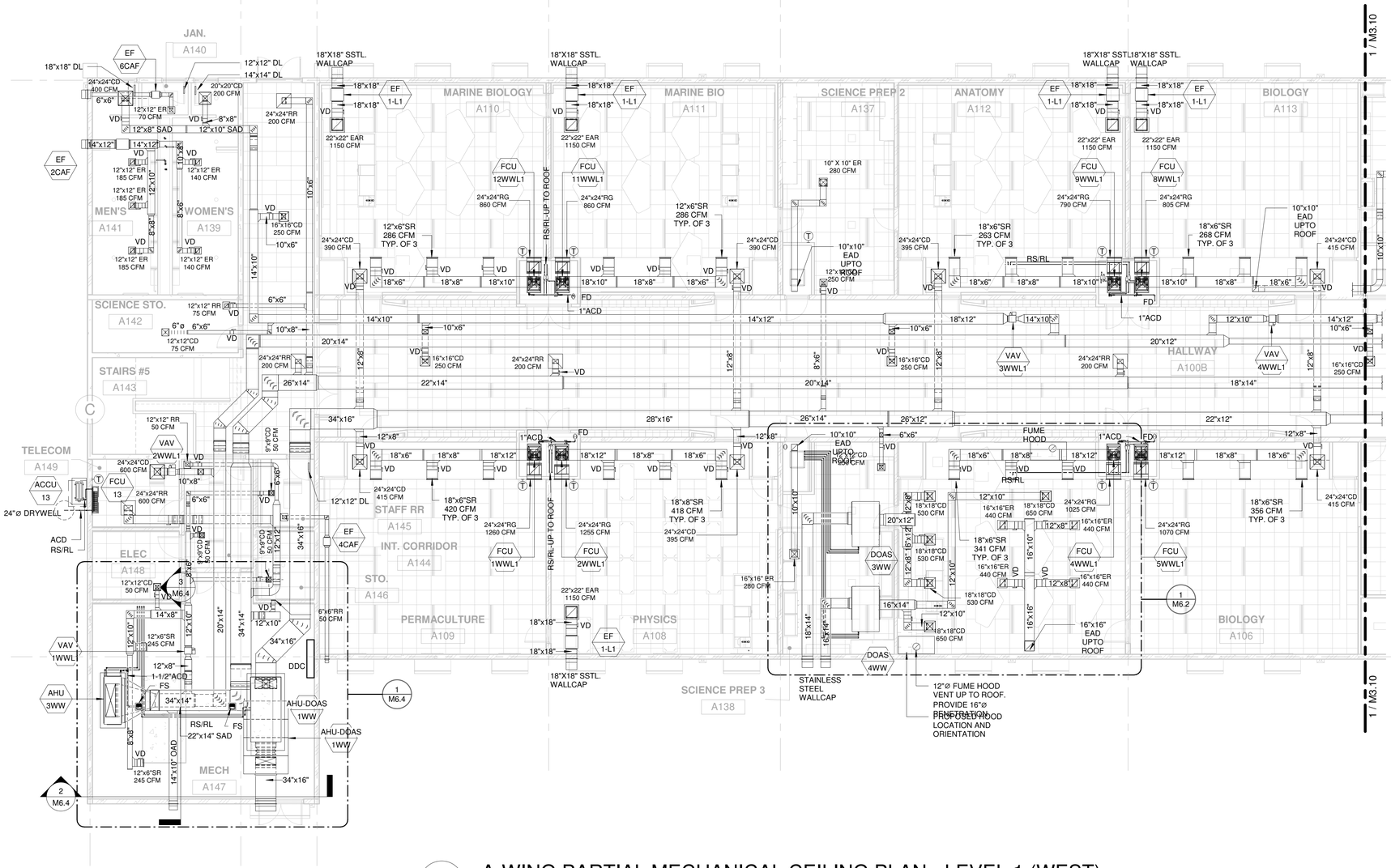

KEY PLAN

1 A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (WEST)
SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (WEST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.9
Sheet No. ____ of ____

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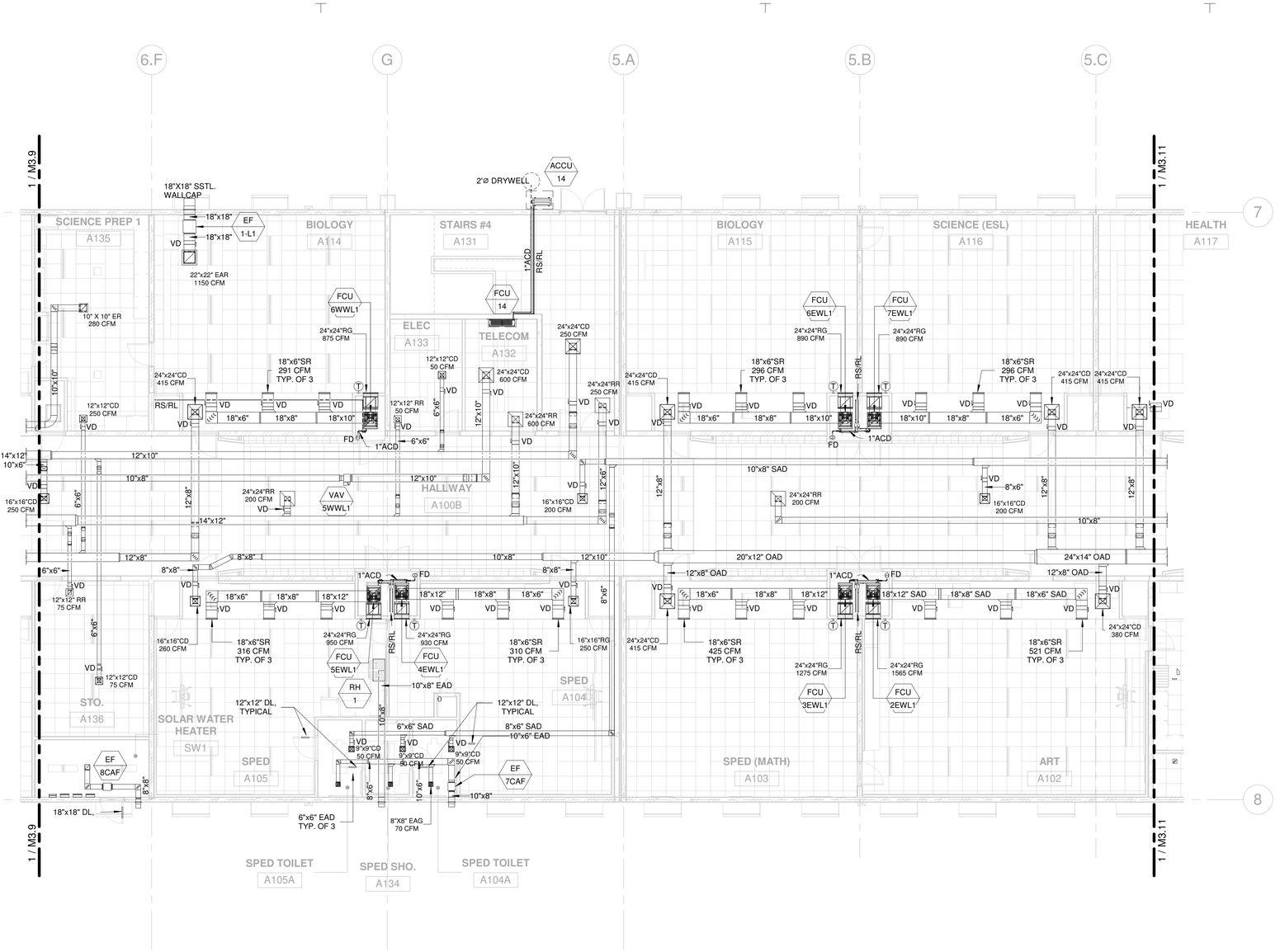
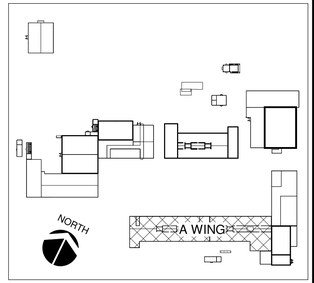


1 A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS		
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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1

PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.

M3.10

Sheet No. of

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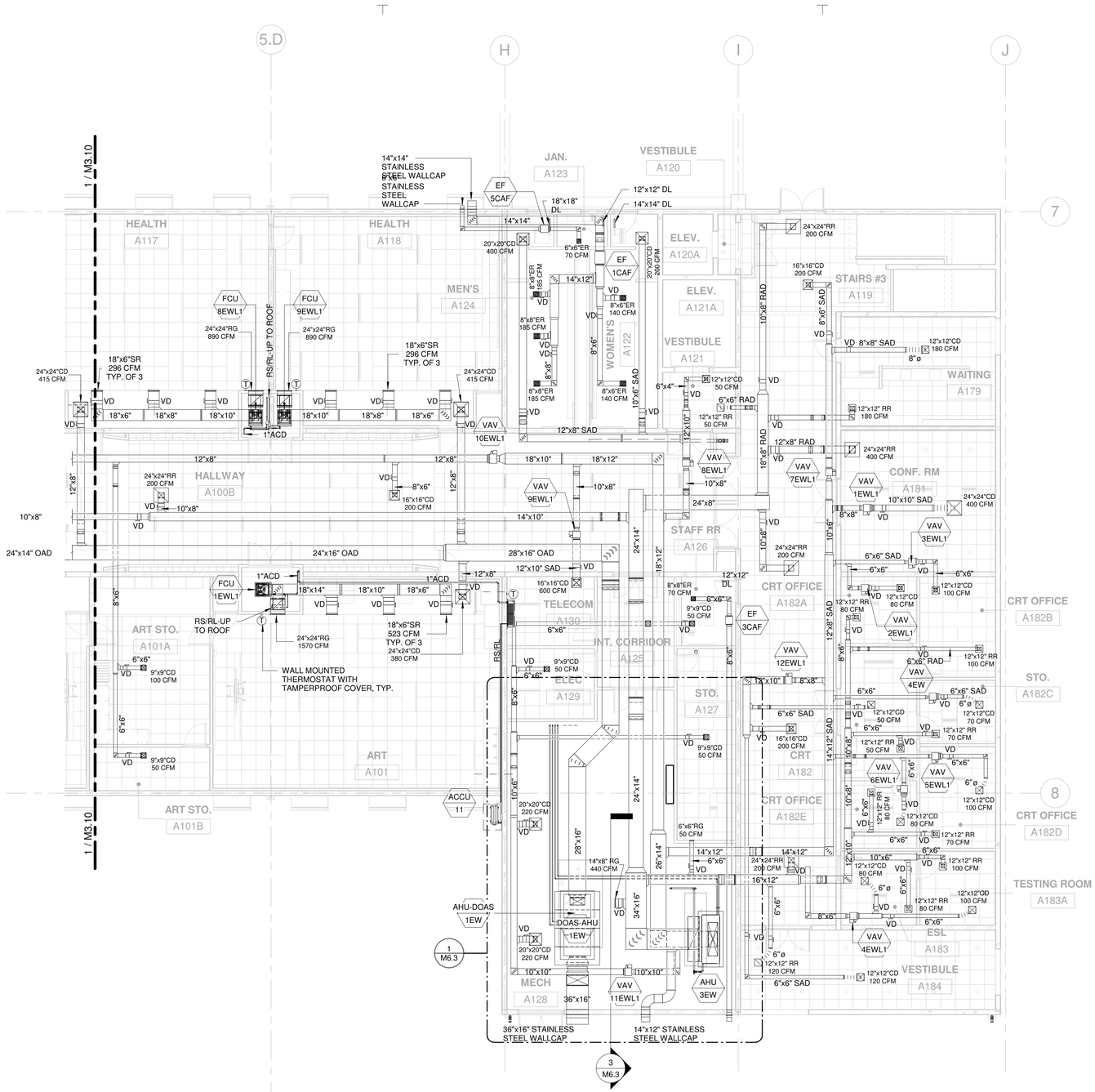
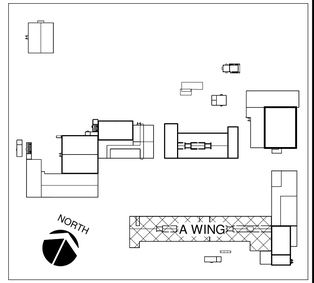


1 A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Title:
A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
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Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.11
Sheet No._____ of _____

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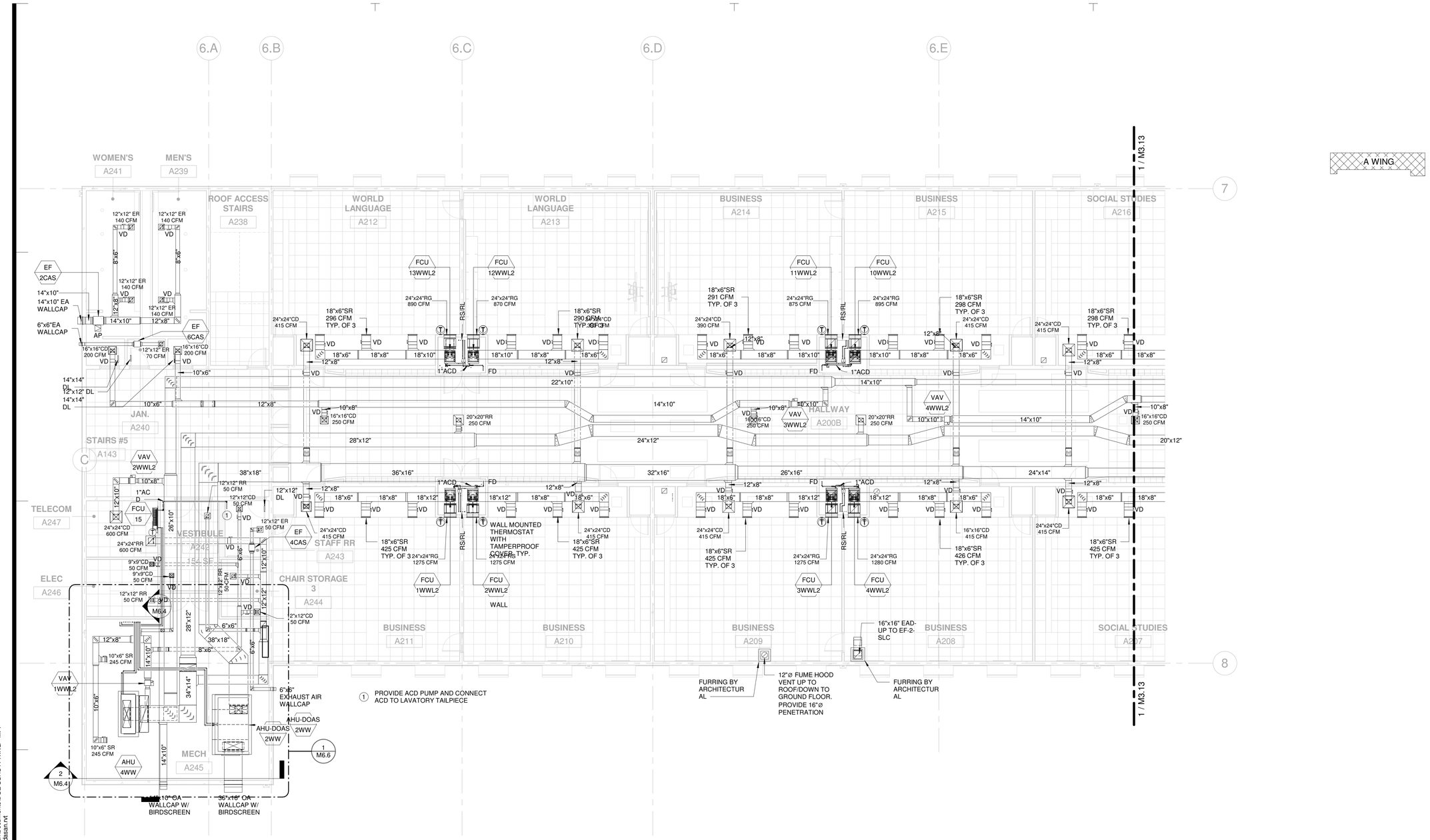

1 A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Project:

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SIMON SANCHEZ HIGH SCHOOL

Title:

A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
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Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.

M3.12

Sheet No._____ of _____

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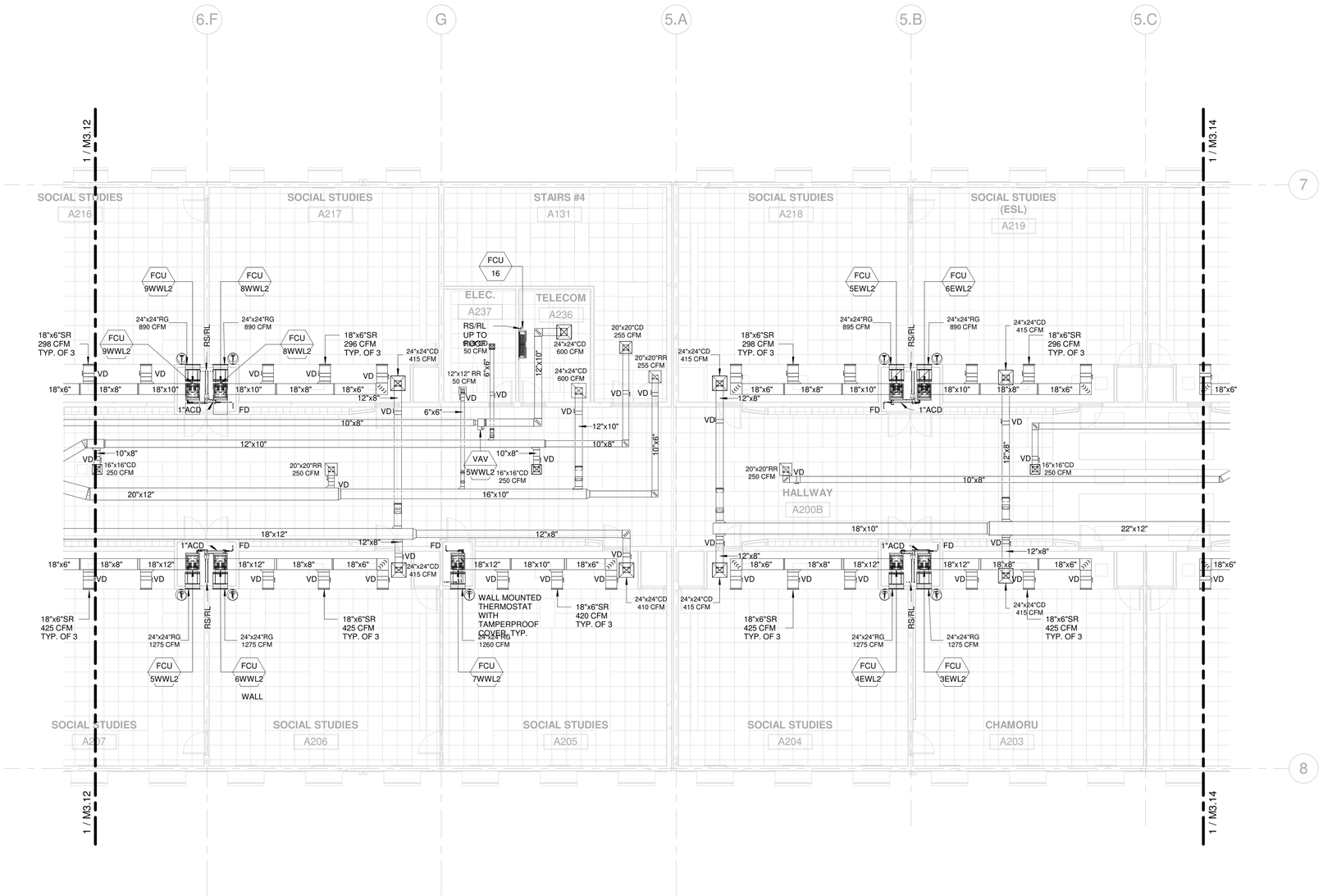
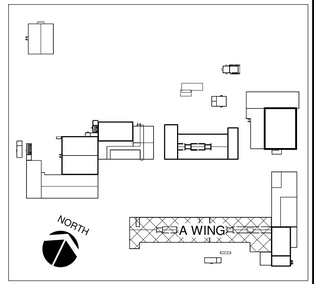


1 A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2

PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.

M3.13

Sheet No. of

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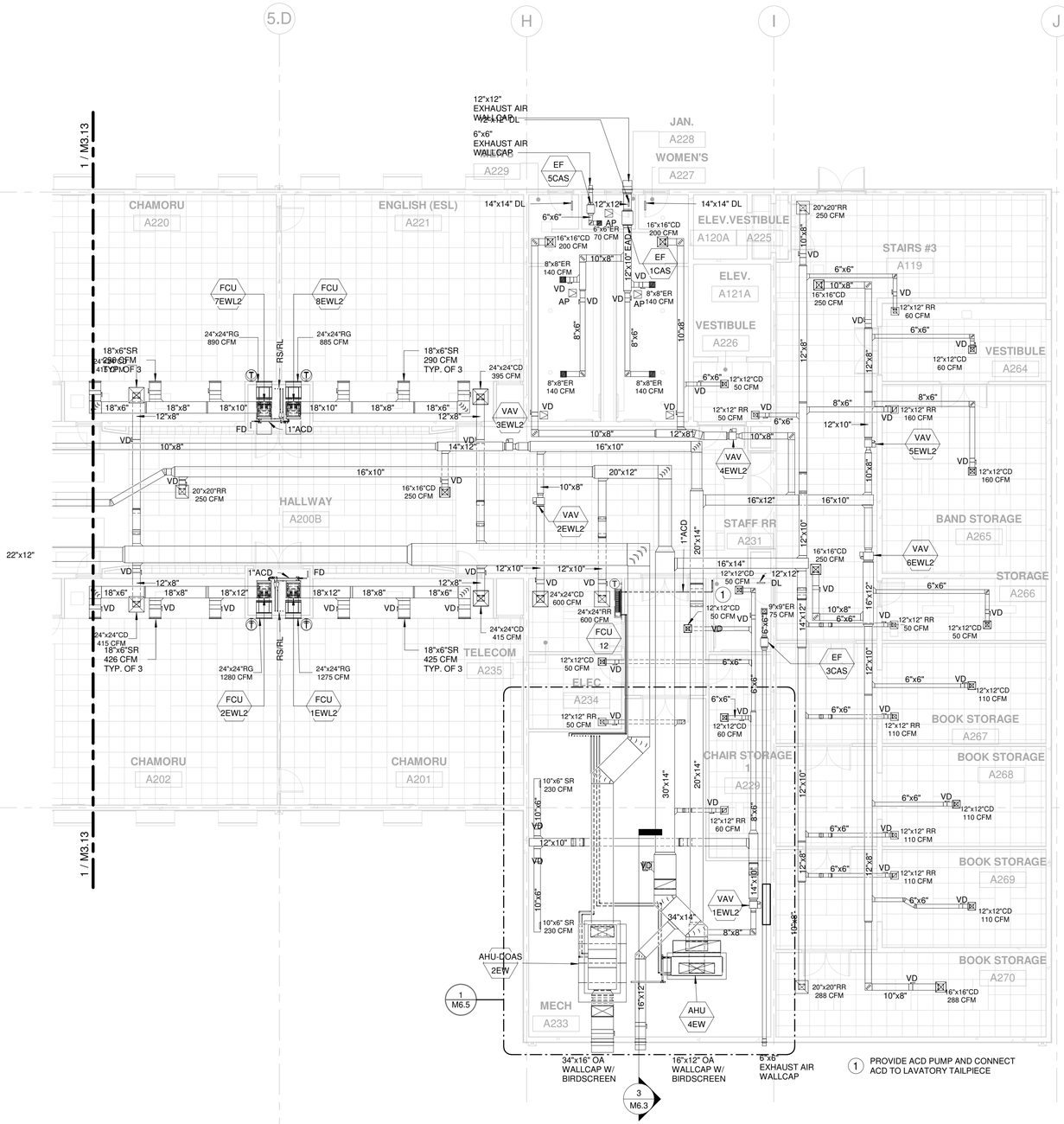
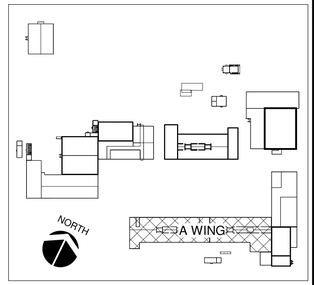


1 A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
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Project No.	File
XX-XXX	

Drawing No.
M3.14
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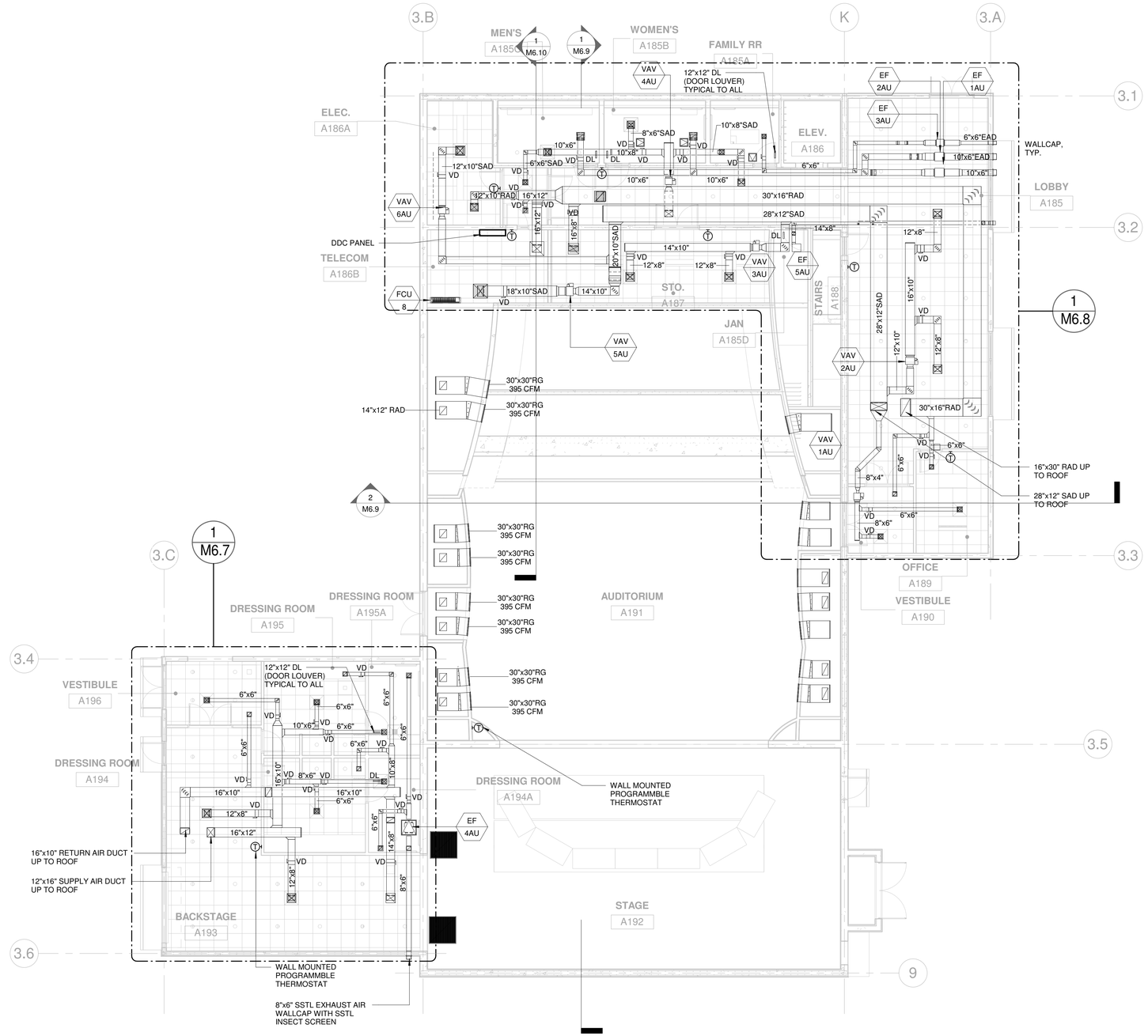

1 AUTOMATIC MECHANICAL CEILING PLAN - LEVEL 1

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM MECHANICAL REFLECTED CEILING PLAN - LEVEL 1
PROGRAMMING DOCUMENT

Designed:	MN/ES/JP
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.15
Sheet No. _____ of 0

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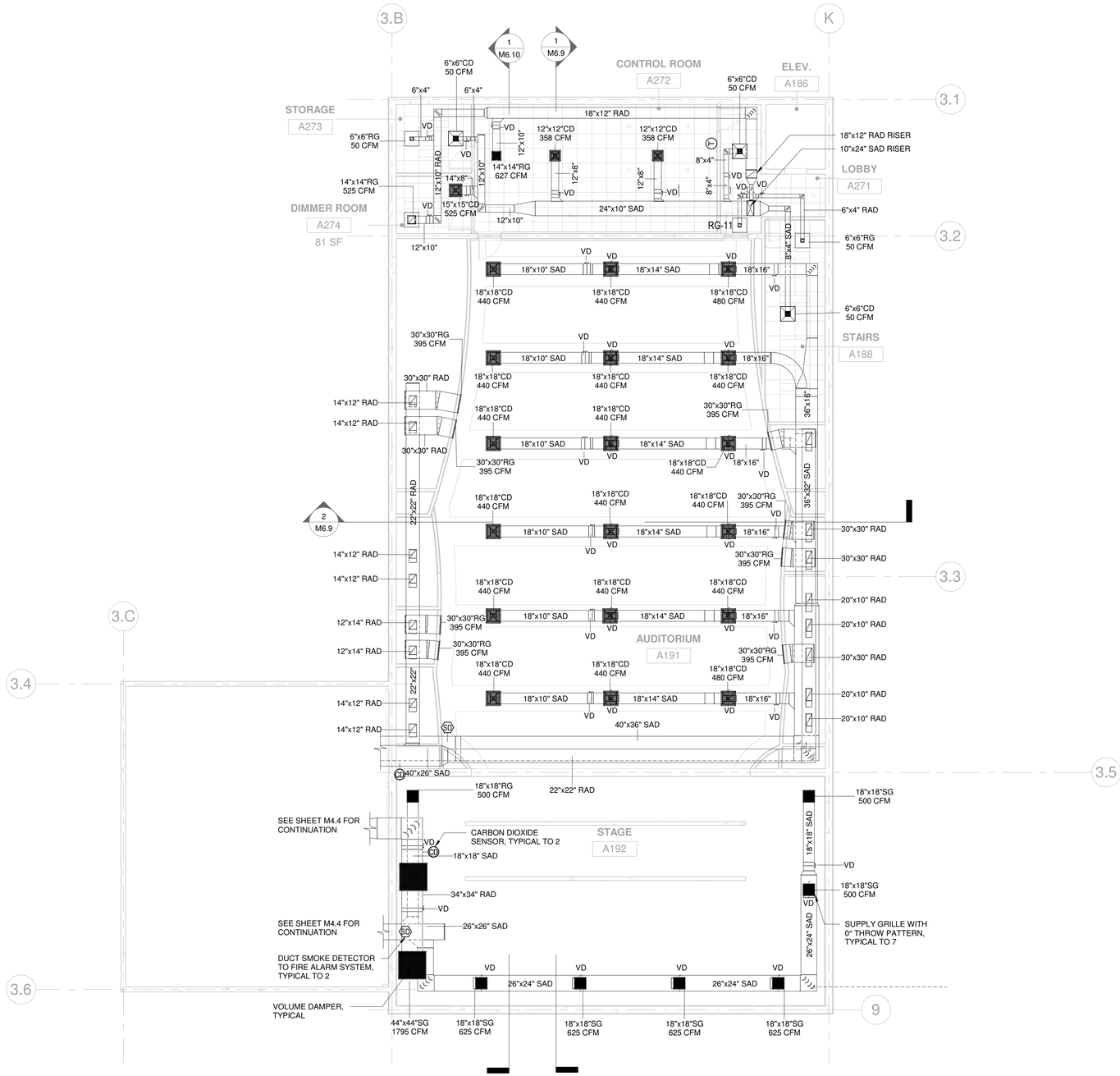

1 AUDITORIUM MECHANICAL CEILING PLAN - LEVEL 2

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM MECHANICAL REFLECTED CEILING PLAN - LEVEL 2
PROGRAMMING DOCUMENT

Designed:	MN/ES/JP
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
M3.16
Sheet No._____ of 0

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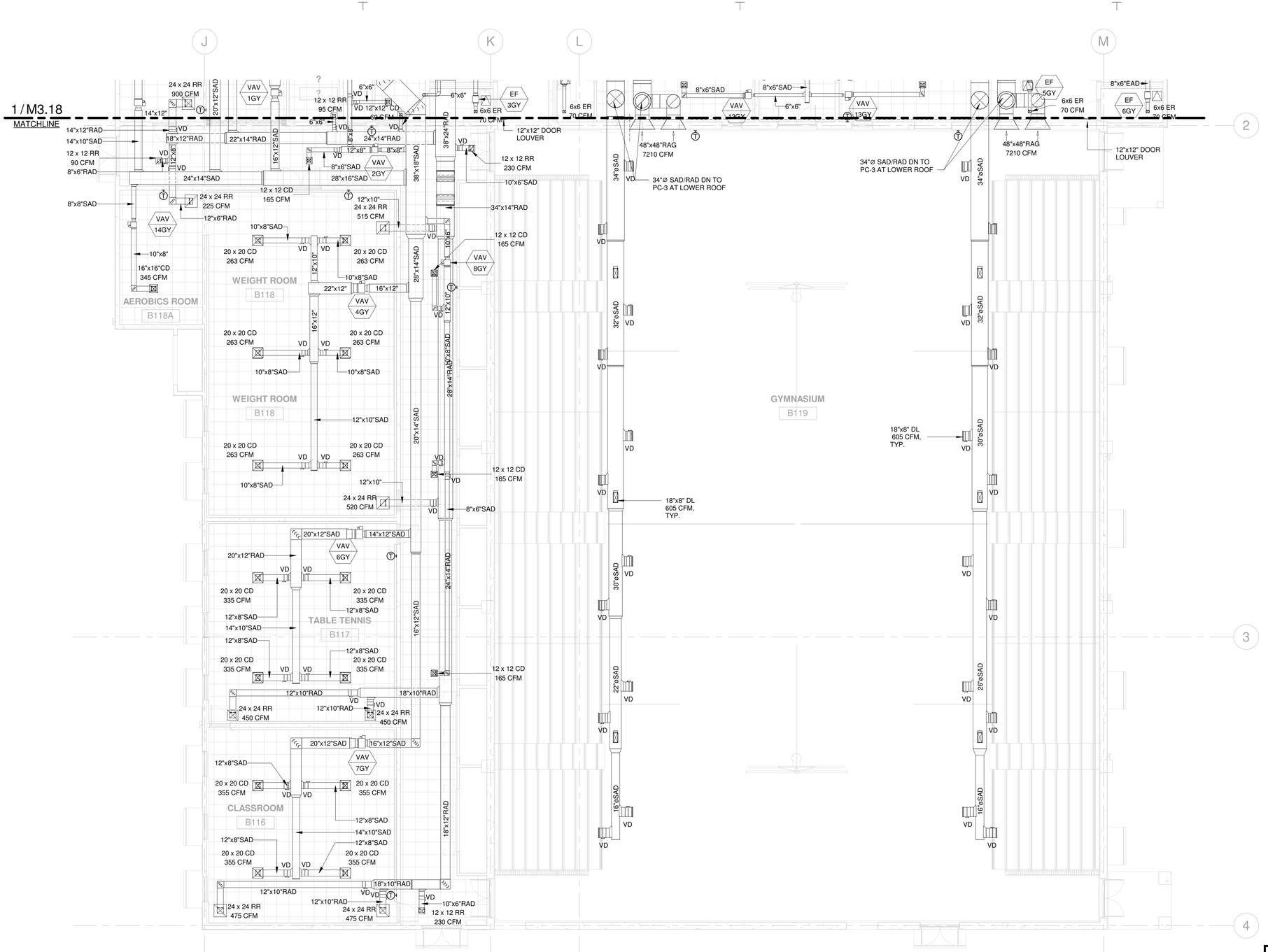

1 GYMNASIUM PARTIAL MECHANICAL CEILING PLAN
SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM PARTIAL MECHANICAL CEILING PLAN
PROGRAMMING DOCUMENT

Designed:	MN/ES/SR
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.17
Sheet No. ____ of 0

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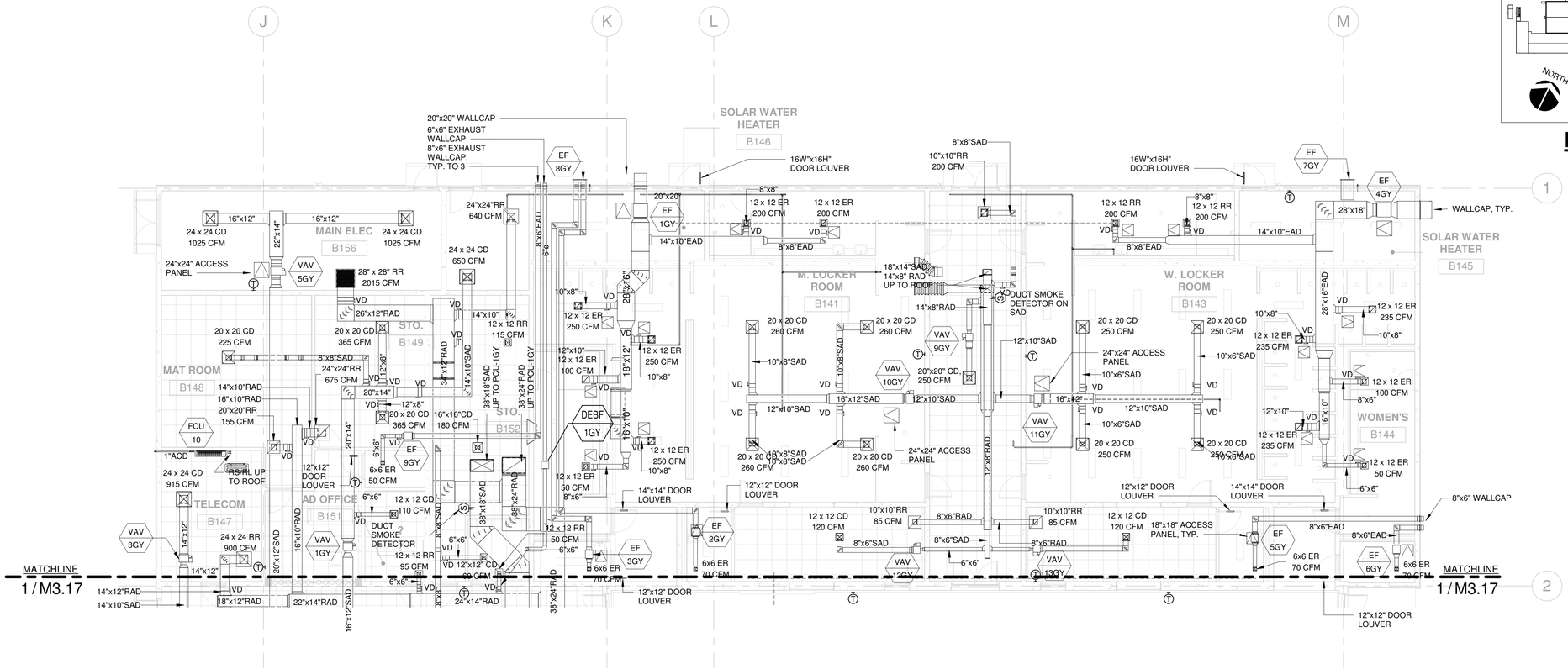
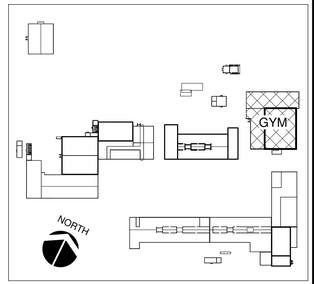


1 GYMNASIUM LOCKER ROOM MECHANICAL CEILING PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM LOCKER ROOM MECHANICAL CEILING PLAN
PROGRAMMING DOCUMENT

Designed:	MN/ES/SR
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.18
Sheet No._____ of 0

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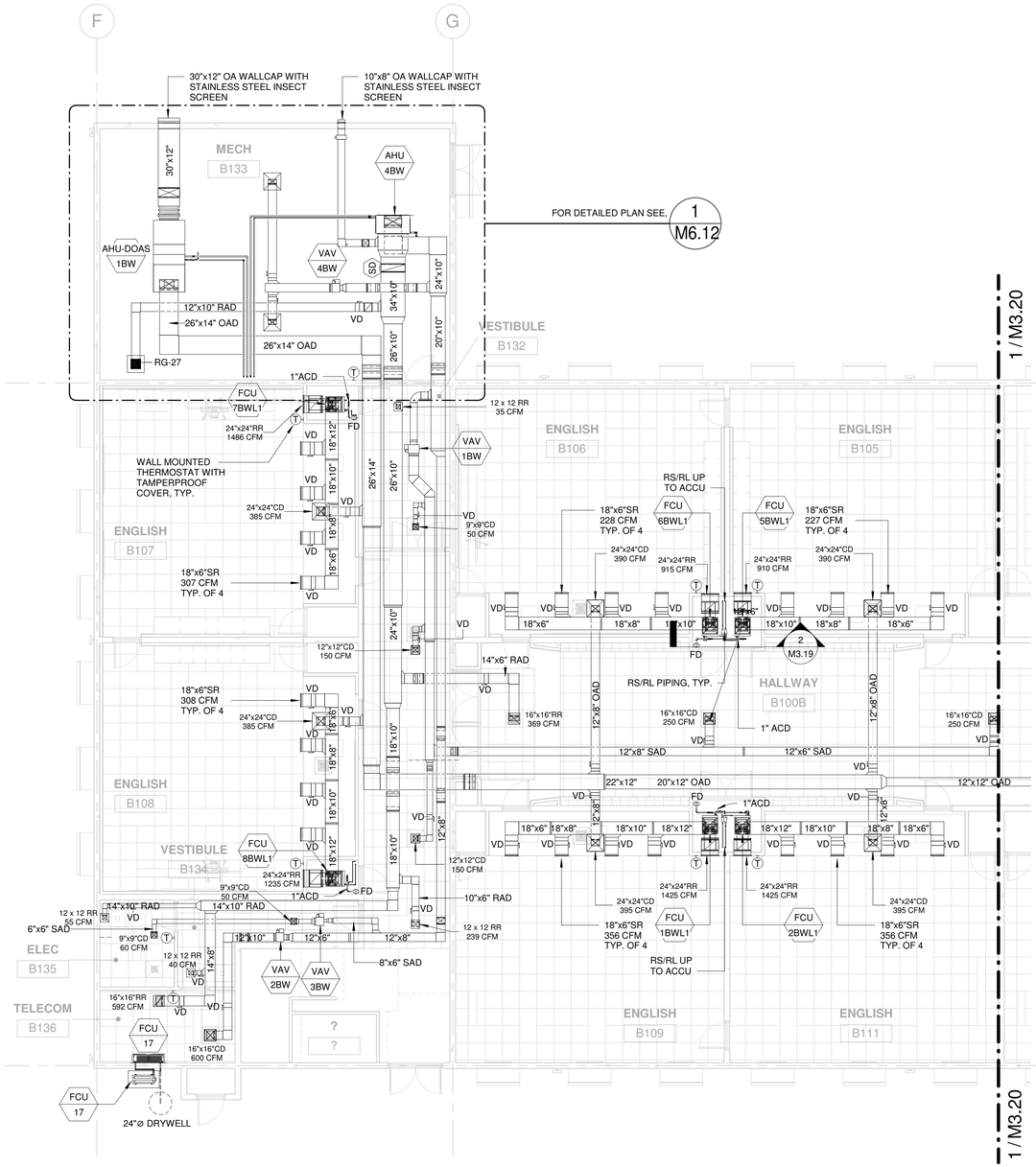
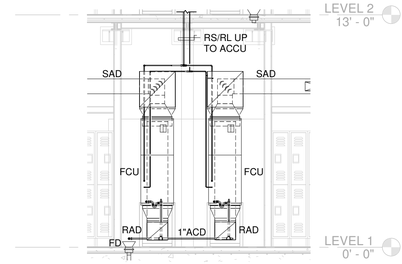


1 B-WING PARTIIAL MECHANICAL CEILING PLAN - LEVEL 1 (WEST)

SCALE: 1/8" = 1'-0"



2 SECTION - FCU CLOSET

SCALE: 1/4" = 1'-0"

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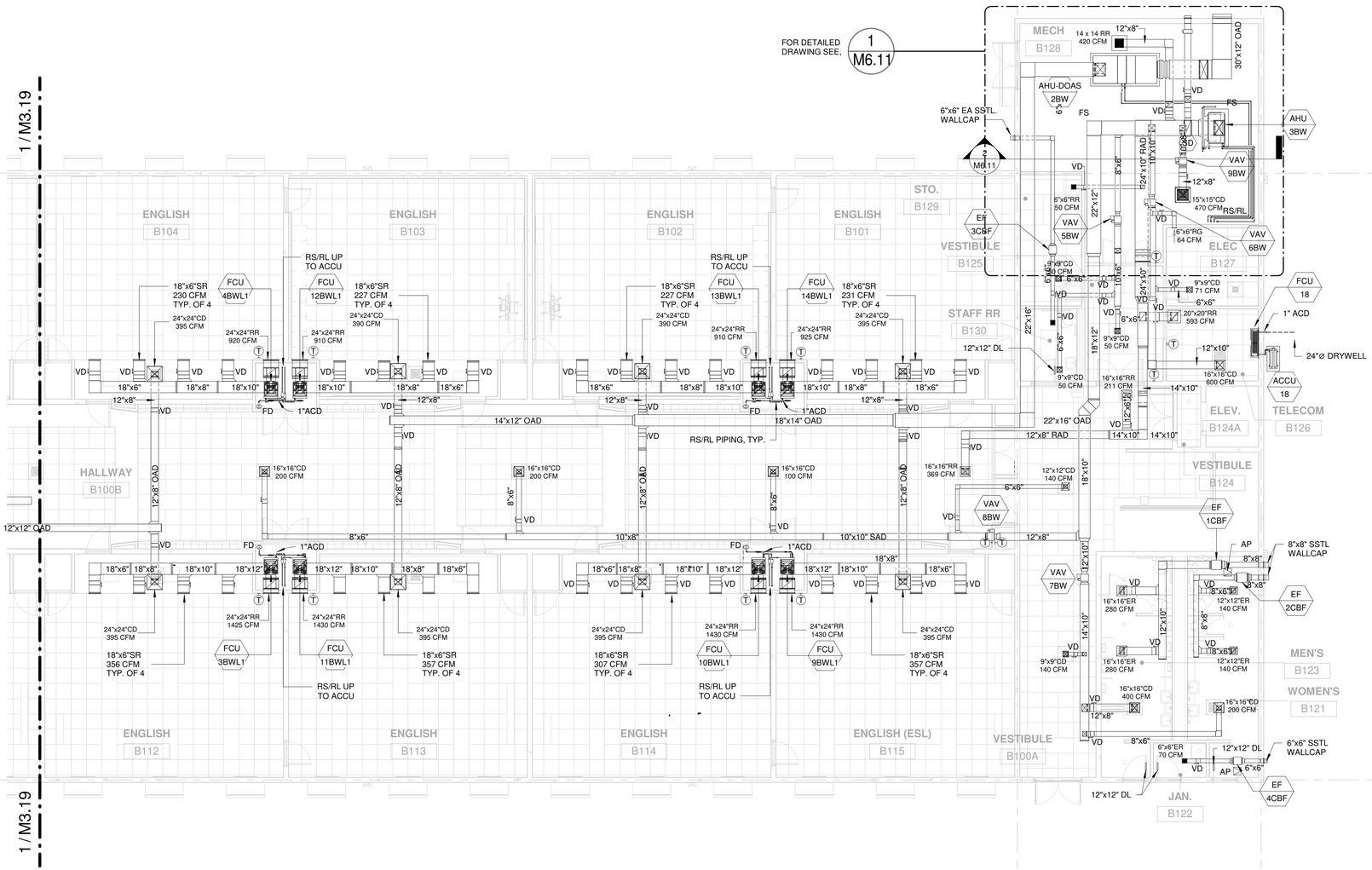
DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (WEST) & SECTION
PROGRAMMING DOCUMENT

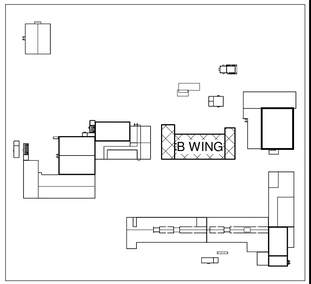
Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	As indicated
Date:	3/31/25
Project No.	File
No.	

Drawing No.
M3.19
Sheet No._____ of _____



1 B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 1 (EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
M3.20
Sheet No. _____ of _____

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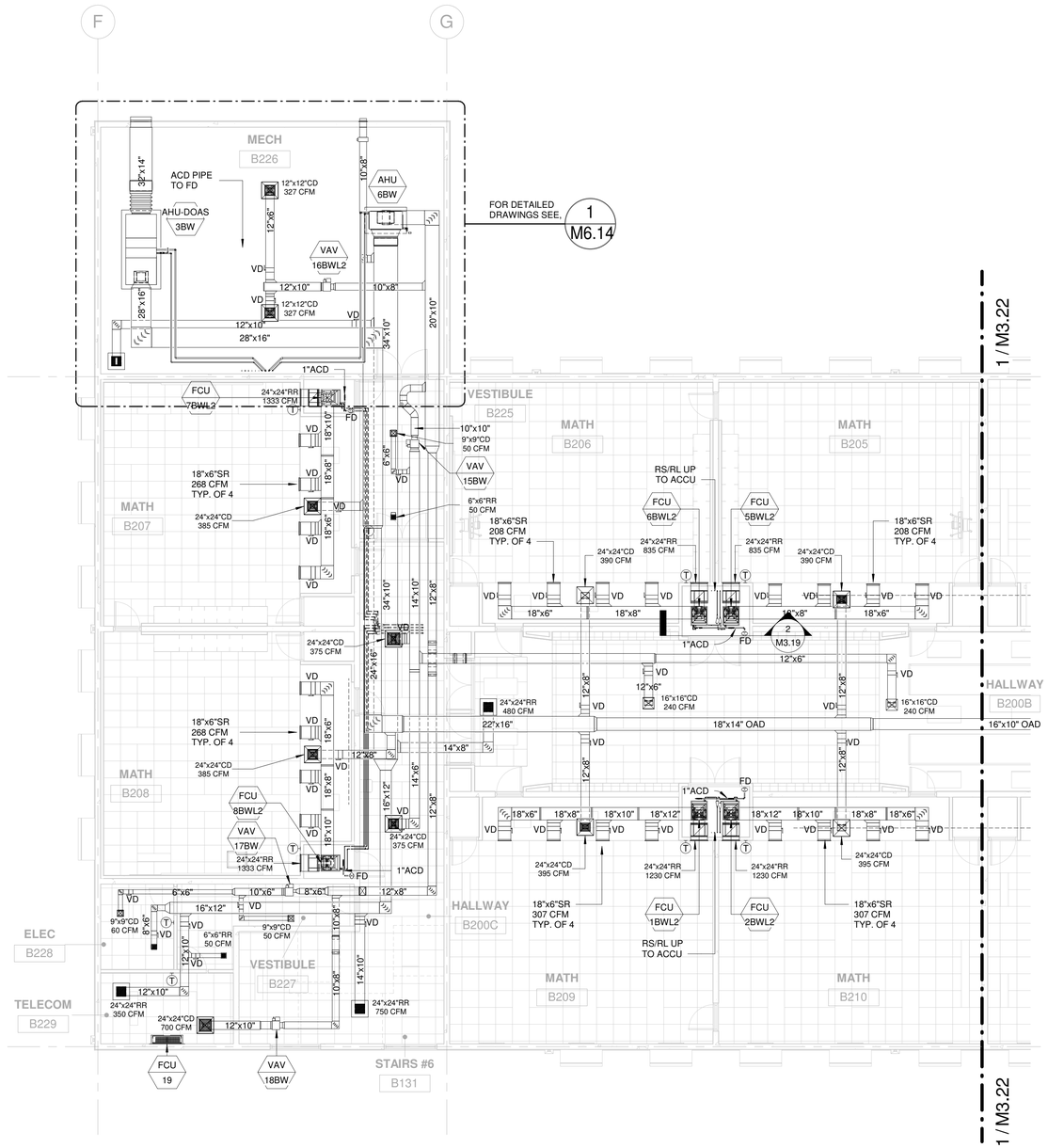
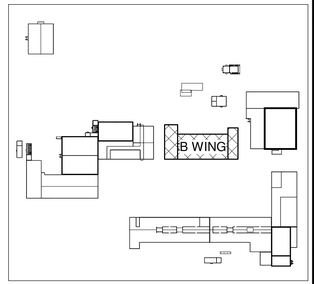


1 B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.

M3.21

Sheet No. _____ of _____

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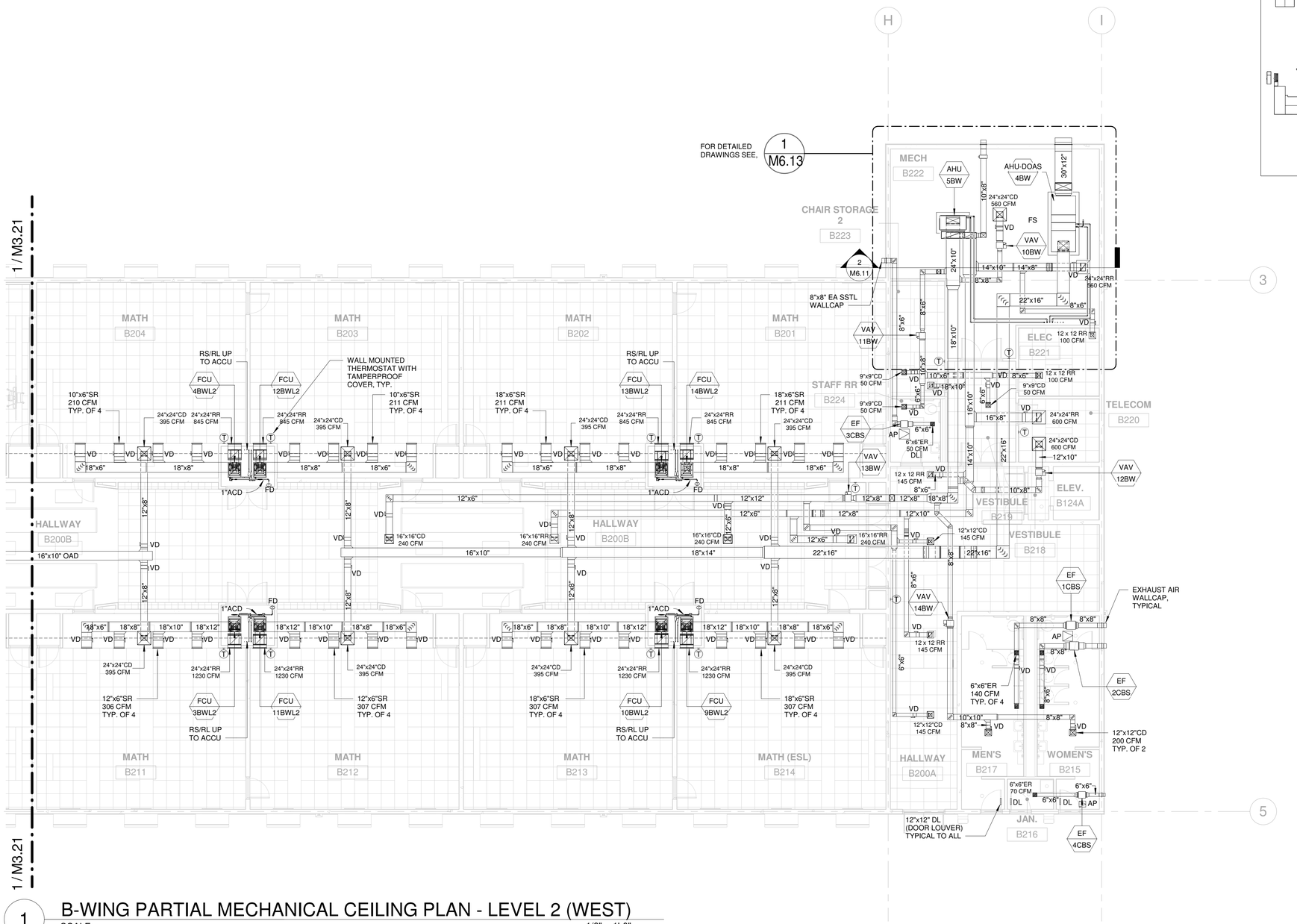
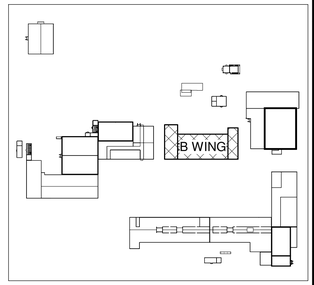


1 B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (WEST)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:
B-WING PARTIAL MECHANICAL CEILING PLAN - LEVEL 2 (EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
M3.22
Sheet No._____ of _____

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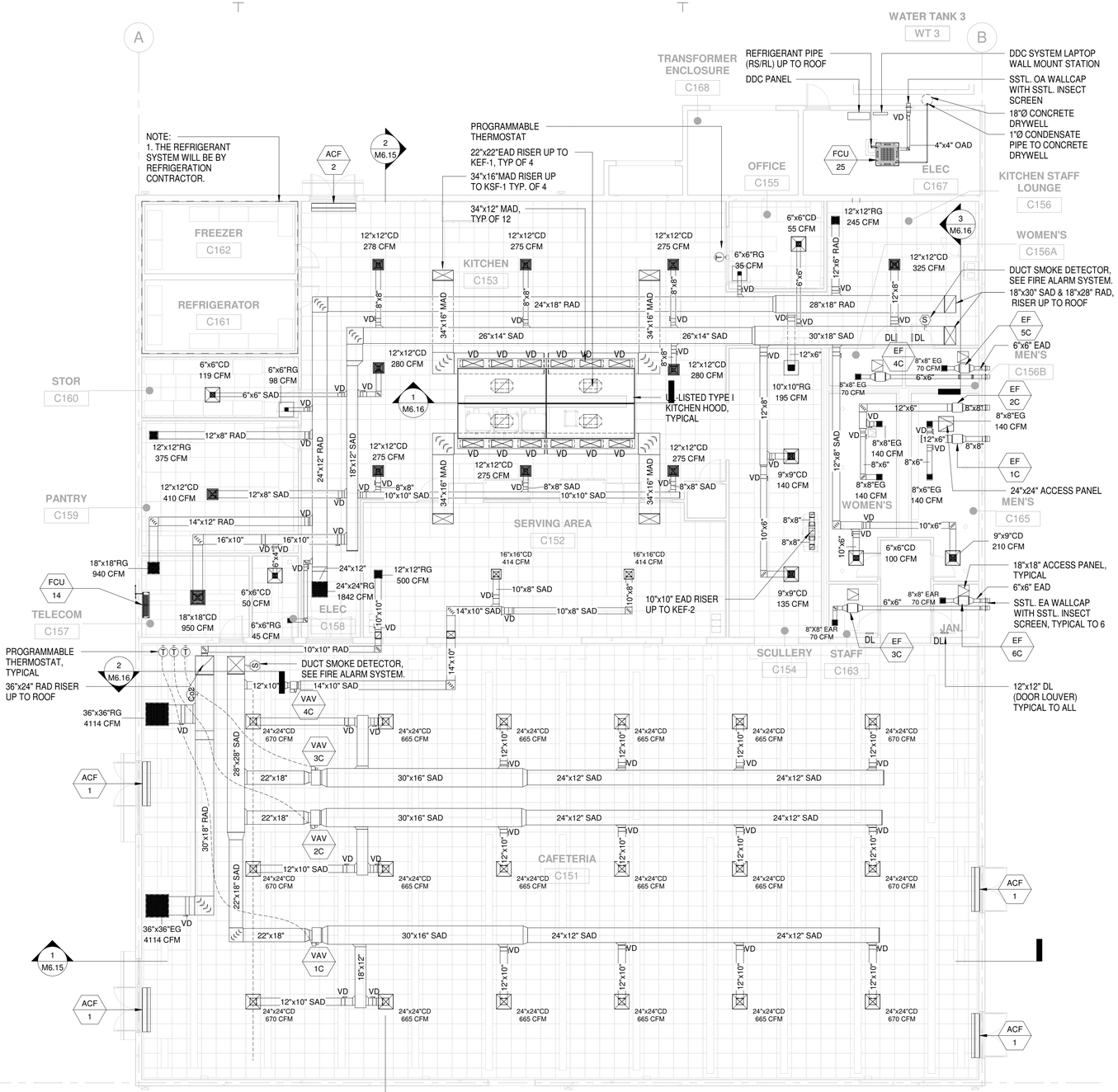
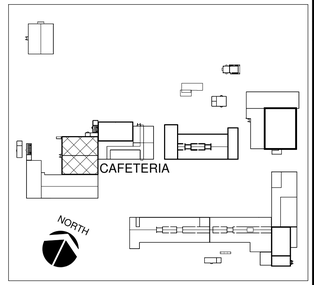
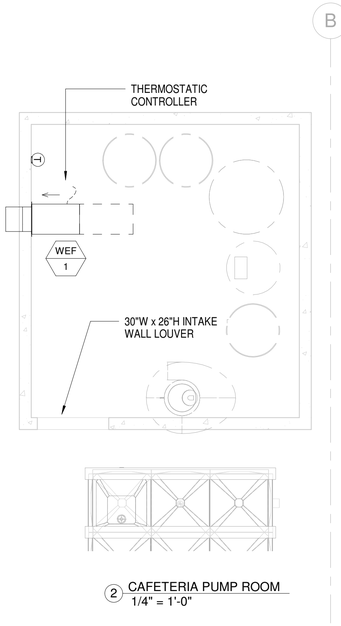


CAFETERIA/KITCHEN MECHANICAL CEILING PLAN

SCALE: 1/8" = 1'-0"



KEY PLAN



2 CAFETERIA PUMP ROOM
1/4" = 1'-0"

FOR REFERENCE ONLY

NORTH

0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:
CAFETERIA/KITCHEN MECHANICAL CEILING PLAN
PROGRAMMING DOCUMENT

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Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	As indicated
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.23
Sheet No. _____ of _____

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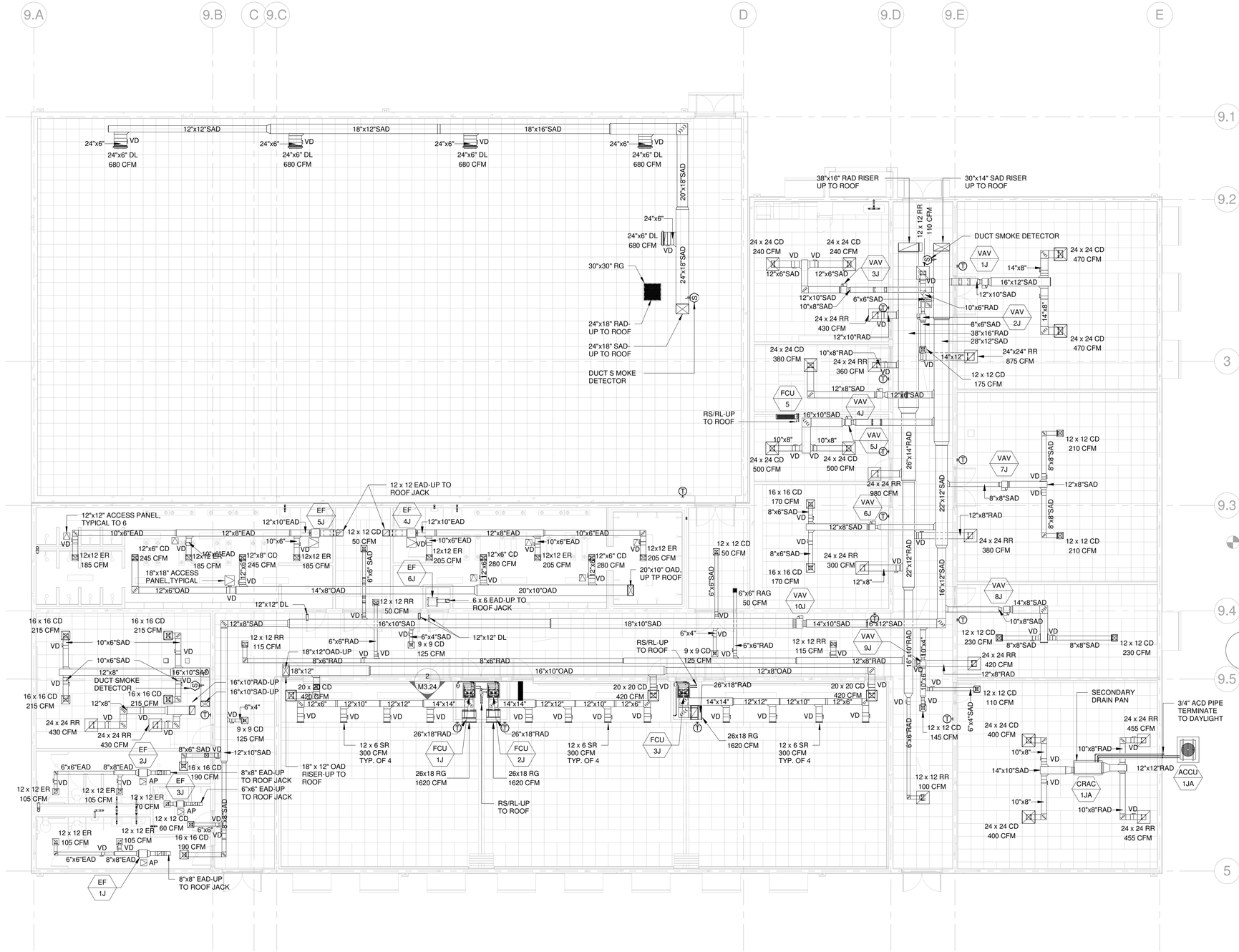

1 JROTC MECHANICAL CEILING PLAN
SCALE: 1/8" = 1'-0"

2 SECTION - FCU CLOSET
SCALE: 1/4" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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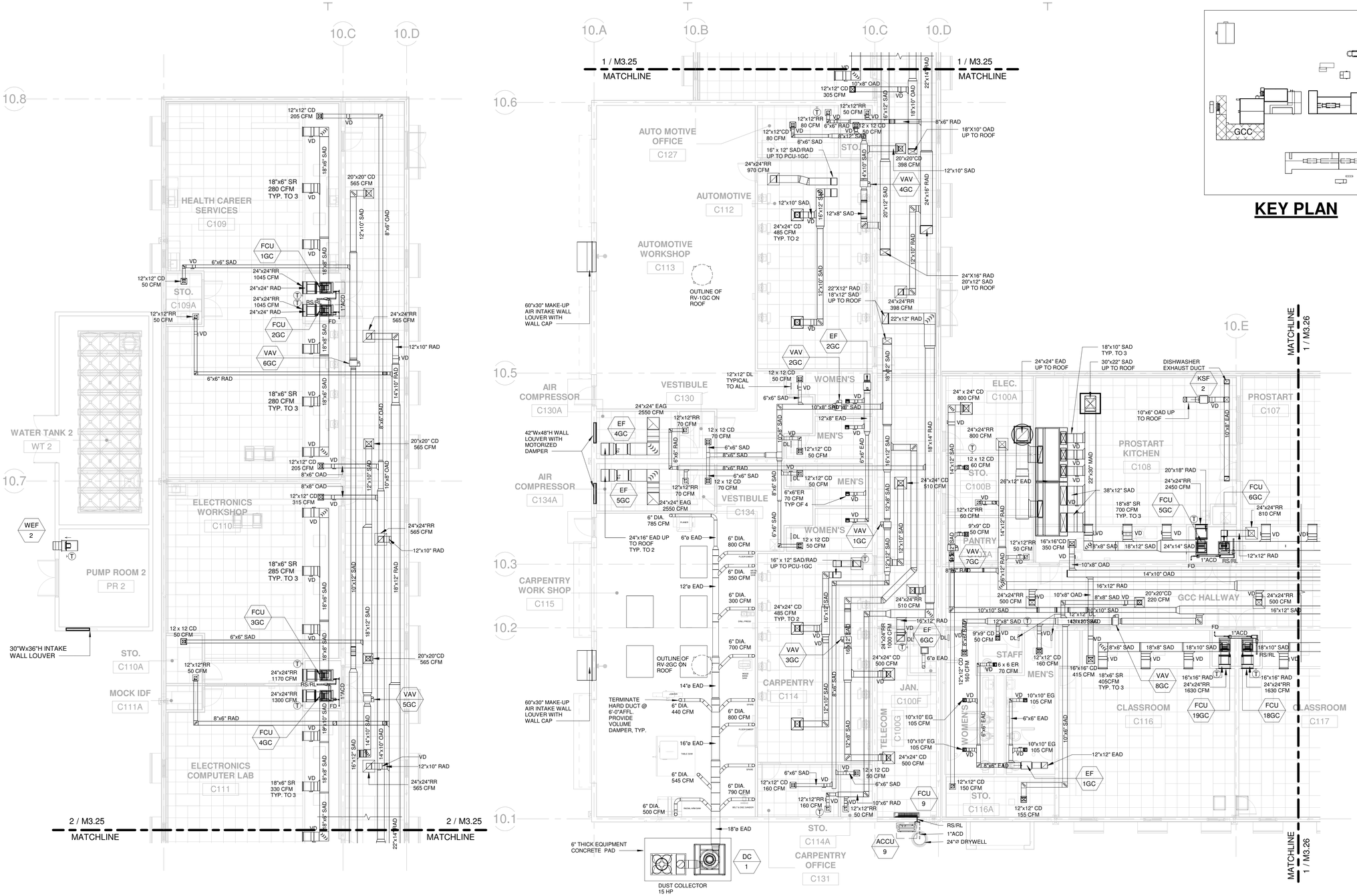
Title:
JROTC MECHANICAL CEILING PLAN & SECTION
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	As indicated
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M3.24
Sheet No. ____ of 0



1 GCC PARTIAL MECHANICAL PLAN - WEST
SCALE: 1/8" = 1'-0"

2 GCC PARTIAL MECHANICAL PLAN - MIDDLE
SCALE: 1/8" = 1'-0"

KEY PLAN

NORTH

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC PARTIAL MECHANICAL PLAN
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
M3.25
Sheet No._____ of _____

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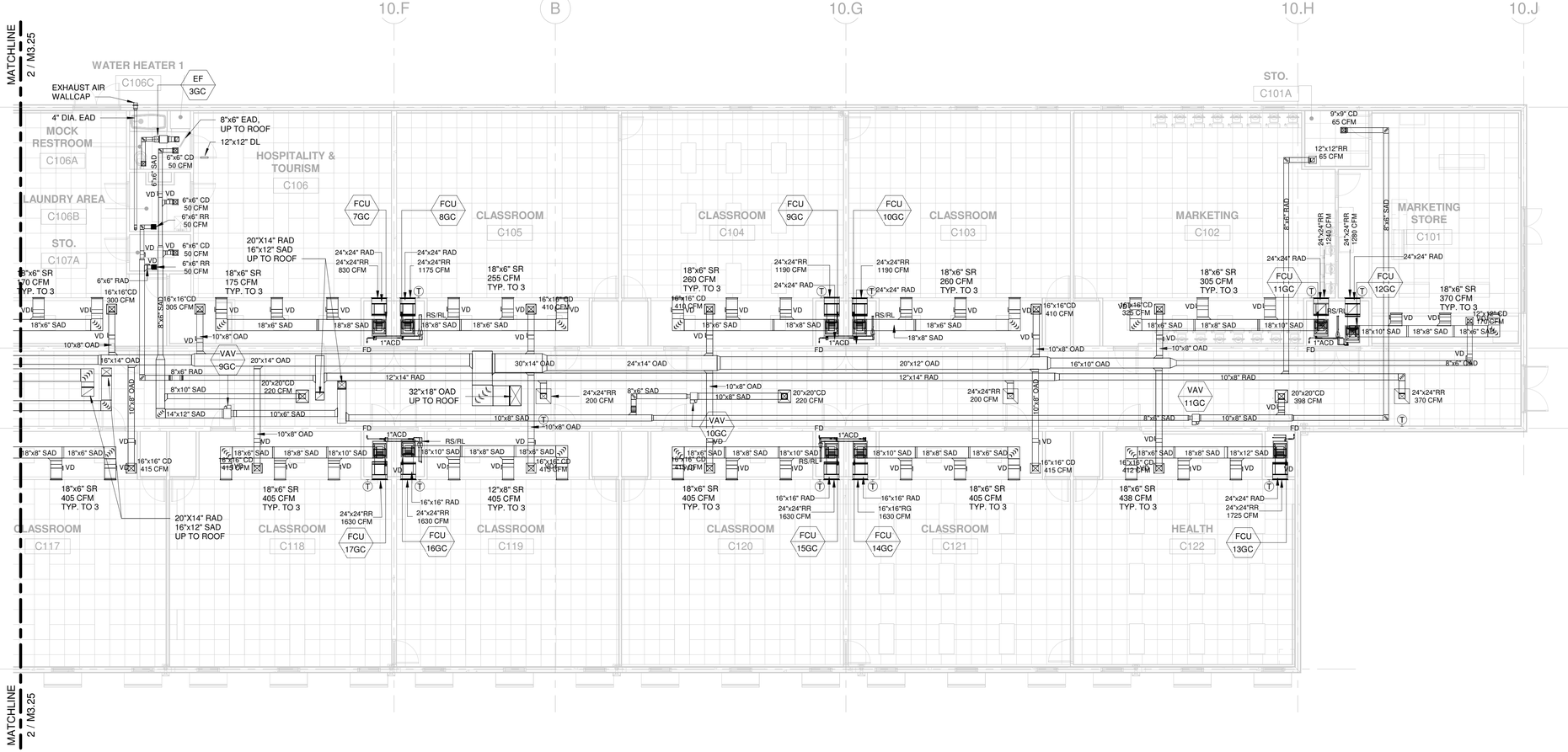
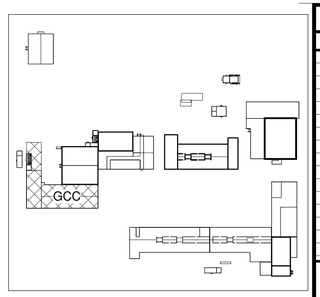


KEY PLAN



1 GCC PARTIAL MECHANICAL PLAN - EAST

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

GCC PARTIAL MECHANICAL PLAN

PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.

M3.26

Sheet No. _____ of _____

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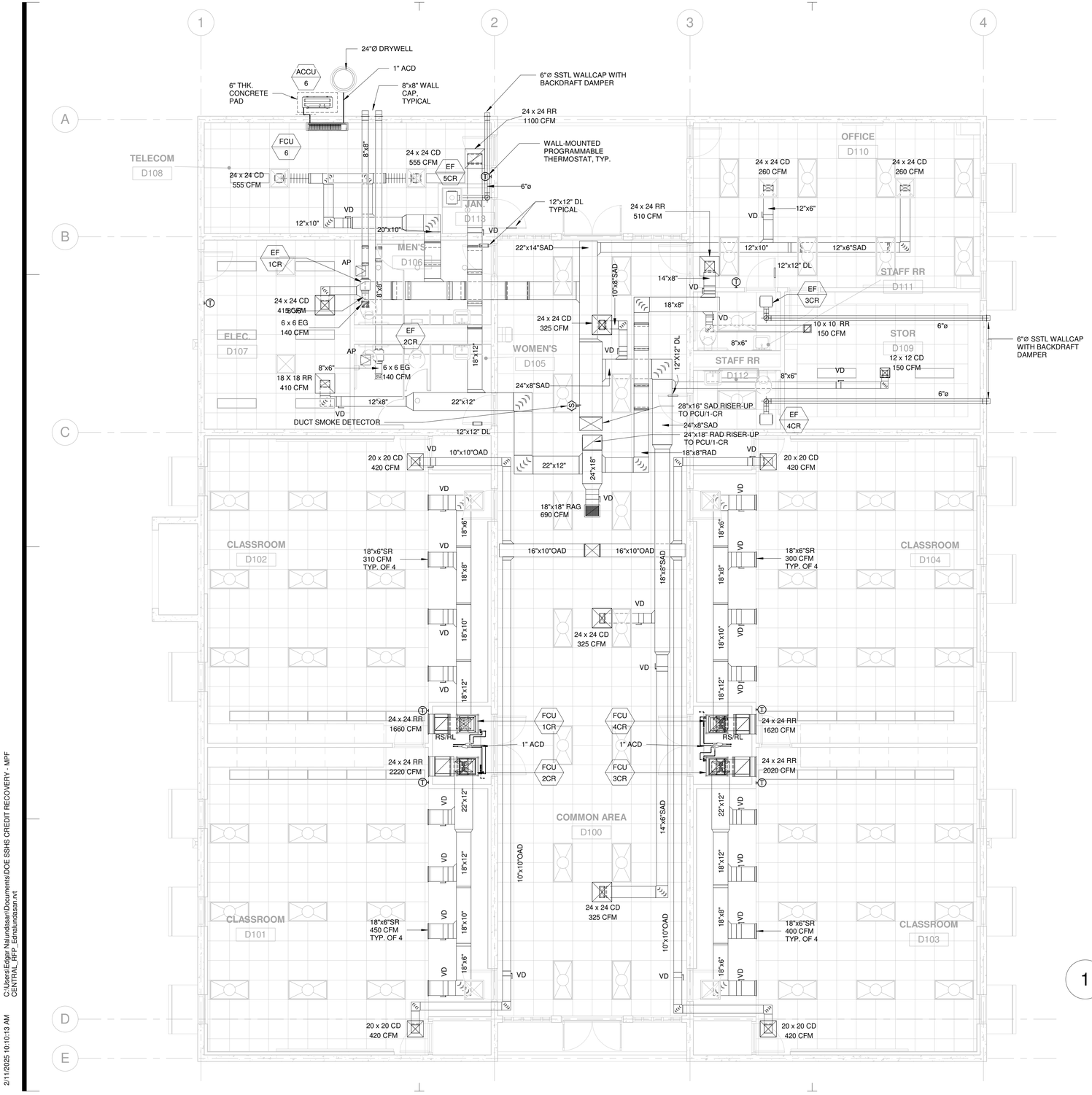

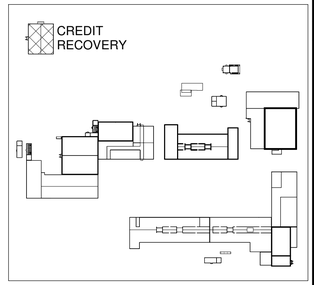

KEY PLAN

1 CREDIT RECOVERY MECHANICAL CEILING PLAN

SCALE: 3/16" = 1'-0"

NORTH

GRAPHIC SCALE

0 1' 2' 4' 8' 16'

SCALE: 3/16" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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Architecture
Planning
Interior Design

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CREDIT RECOVERY MECHANICAL CEILING PLAN
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/16" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.
M3.27
Sheet No._____ of 0

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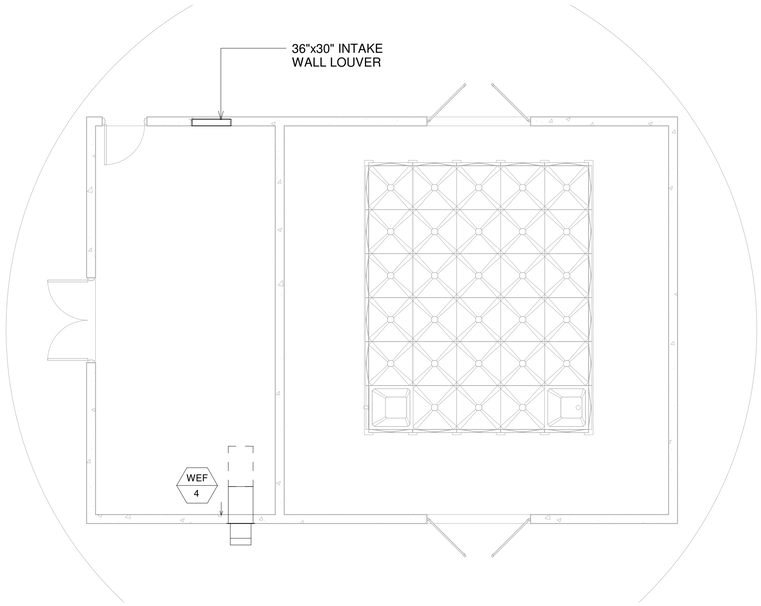
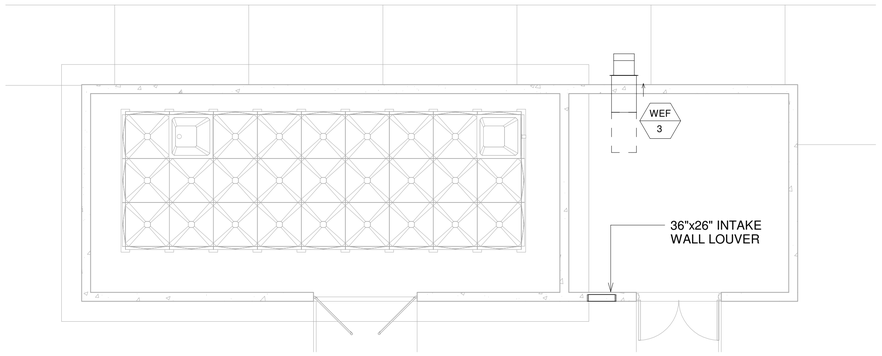
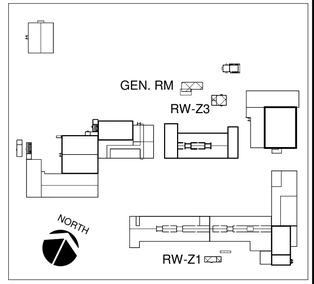


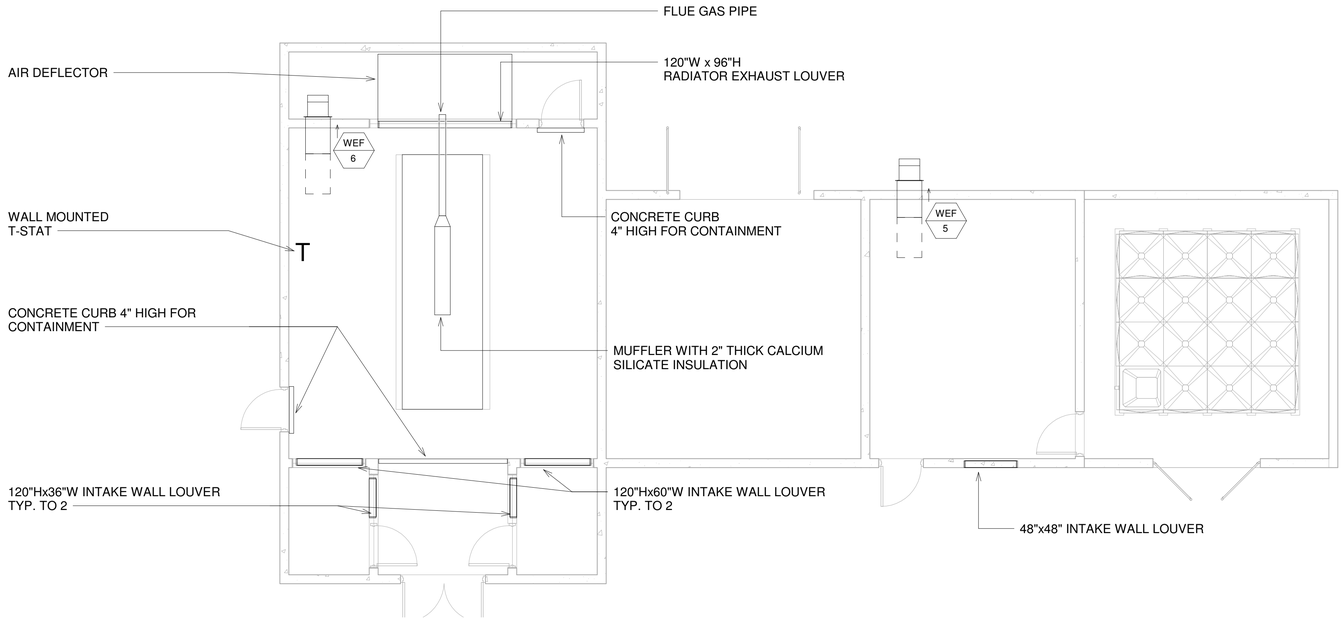
1 PUMP ROOM - UPPER EAST
SCALE: 3/16" = 1'-0"



2 PUMP ROOM - LOWER EAST
SCALE: 3/16" = 1'-0"



KEY PLAN



3 GENERATOR ROOM
SCALE: 3/16" = 1'-0"

FOR REFERENCE ONLY

GRAPHIC SCALE

0 1' 2' 4' 8' 16'
SCALE: 3/16" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Architecture
Planning
Interior Design

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GENERATOR AND PUMP ROOMS MECHANICAL PLAN
PROGRAMMING DOCUMENT

Designed:	MN/ES/SR
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	3/16" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
M3.28
Sheet No._____ of _____

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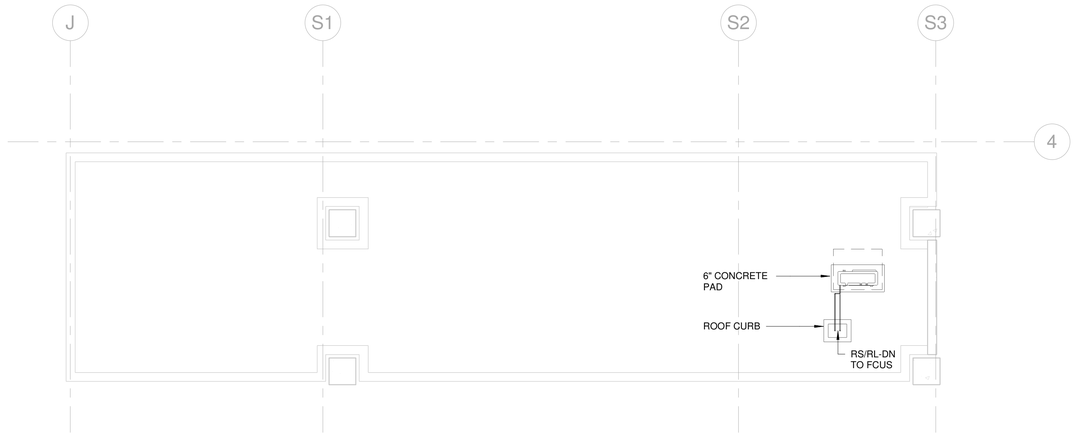
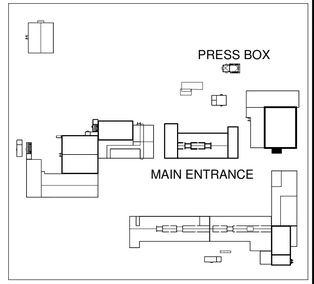


1 MECHANICAL ROOF PLAN - MAIN ENTRANCE

SCALE: 3/16" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 1' 2' 4' 8' 16'

SCALE: 3/16" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL ROOF PLAN - MAIN ENTRANCE
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/16" = 1'-0"
Date:	3/31/25
Project No.	File
-	

Drawing No.
M4.1
Sheet No._____ of 0

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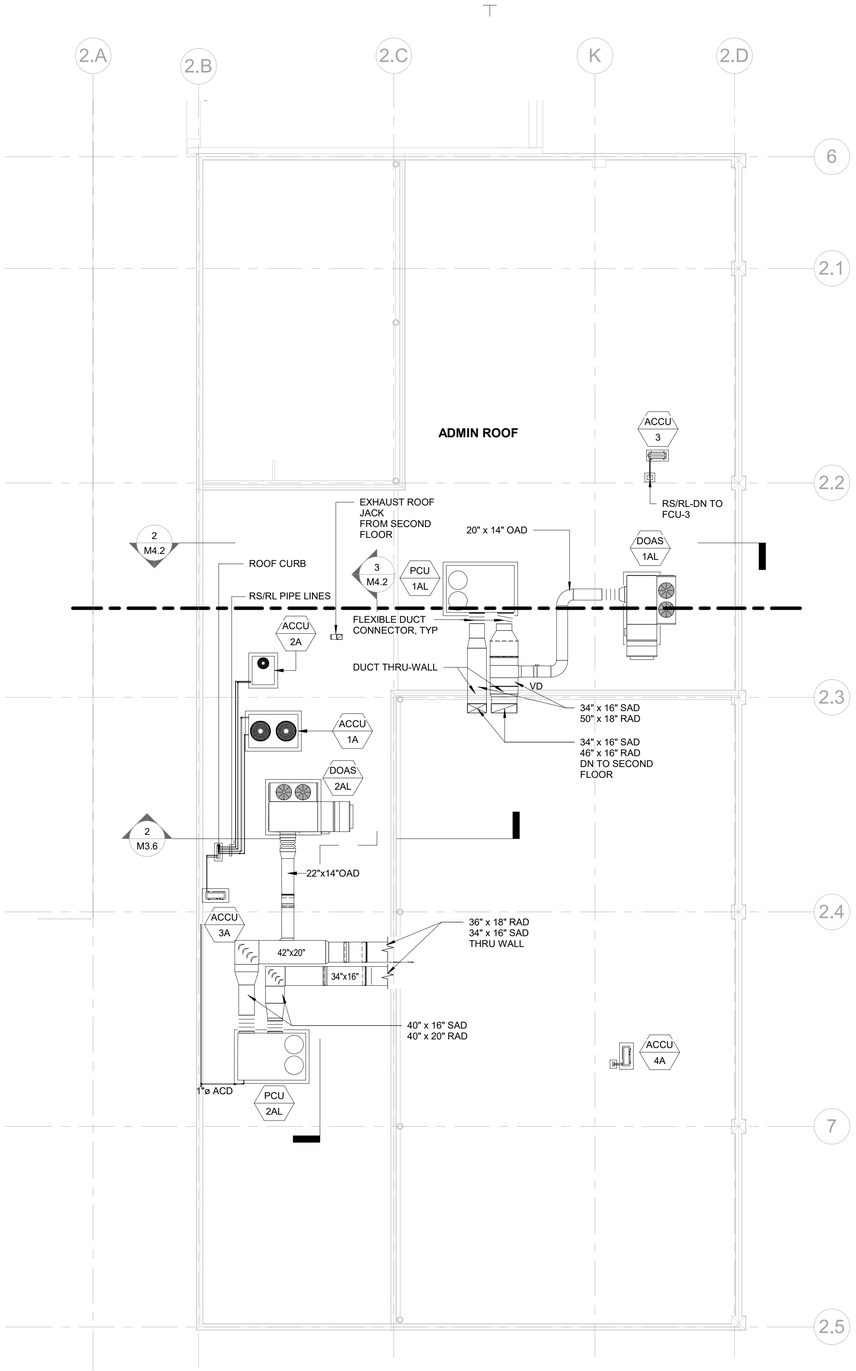
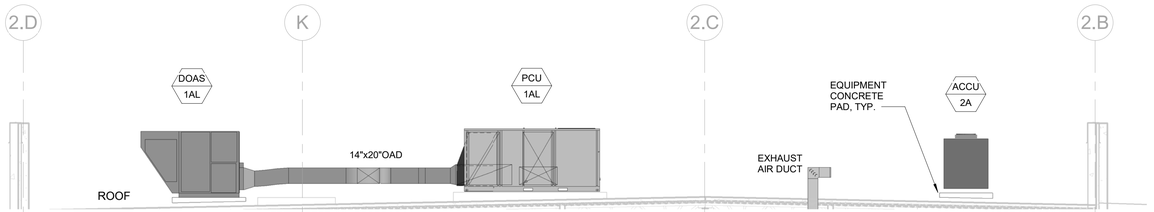
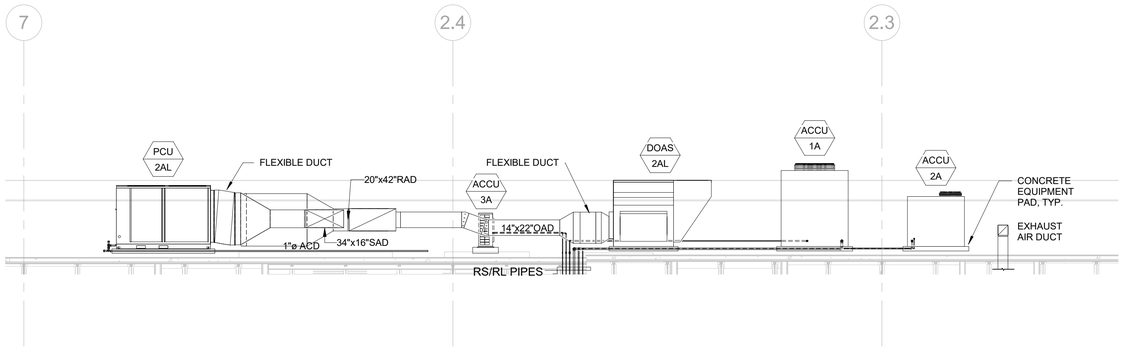


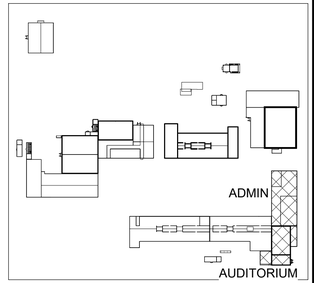
1 MECHANICAL ROOF PLAN - ADMIN BLDG
SCALE: 3/32" = 1'-0"



2 MECHANICAL SECTION 1
SCALE: 3/16" = 1'-0"



3 MECHANICAL SECTION 2
SCALE: 3/16" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE
0 2' 4' 8' 16' 32'
SCALE: 3/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL ROOF PLAN - ADMIN
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	As indicated
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M4.2
Sheet No. ____ of 0

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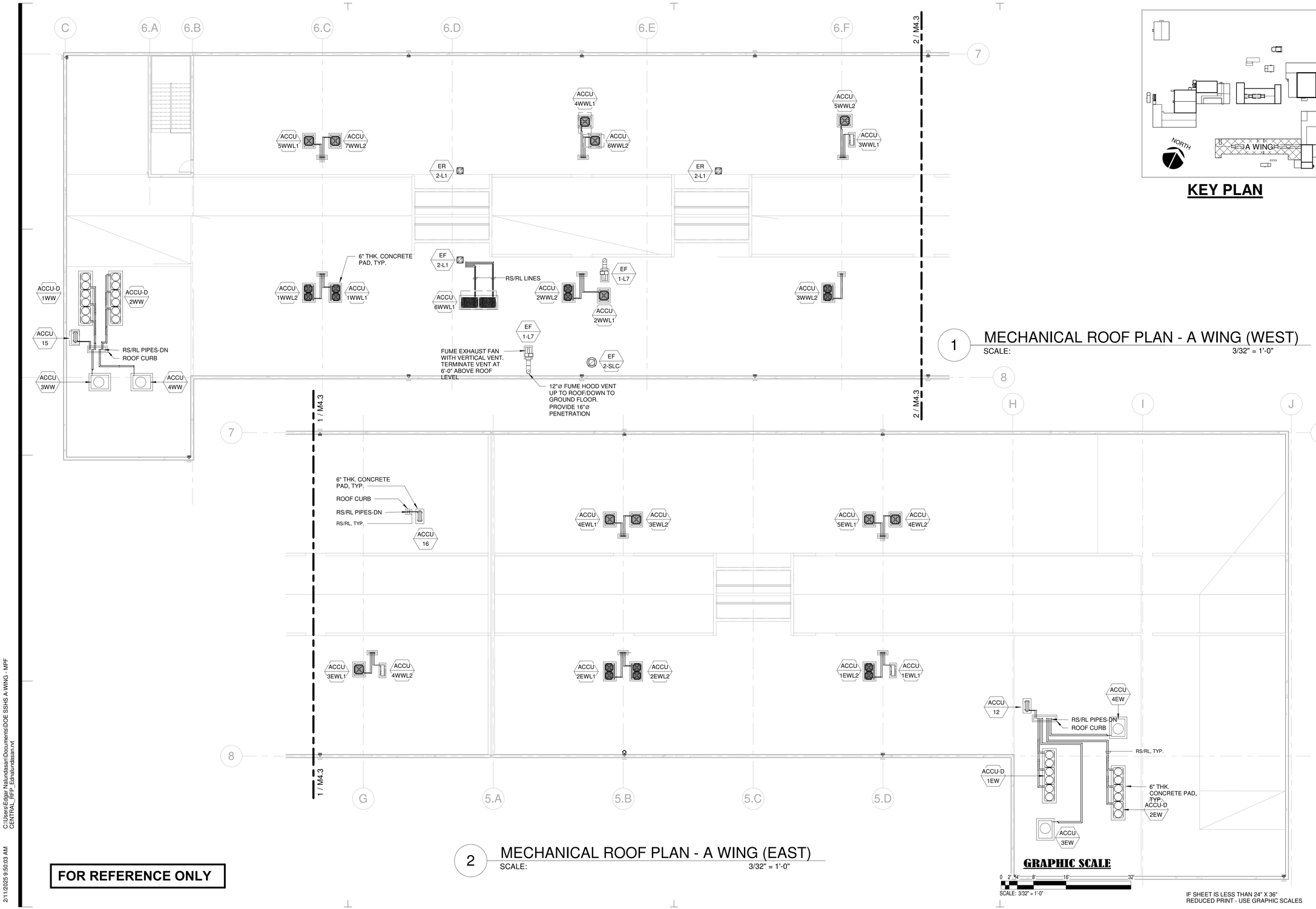

1 MECHANICAL ROOF PLAN - A WING (WEST)
SCALE: 3/32" = 1'-0"

2 MECHANICAL ROOF PLAN - A WING (EAST)
SCALE: 3/32" = 1'-0"

KEY PLAN

GRAPHIC SCALE

0 2' 4' 8' 16' 32'

SCALE: 3/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL ROOF PLAN - A-WING
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/32" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
M4.3
Sheet No._____ of _____

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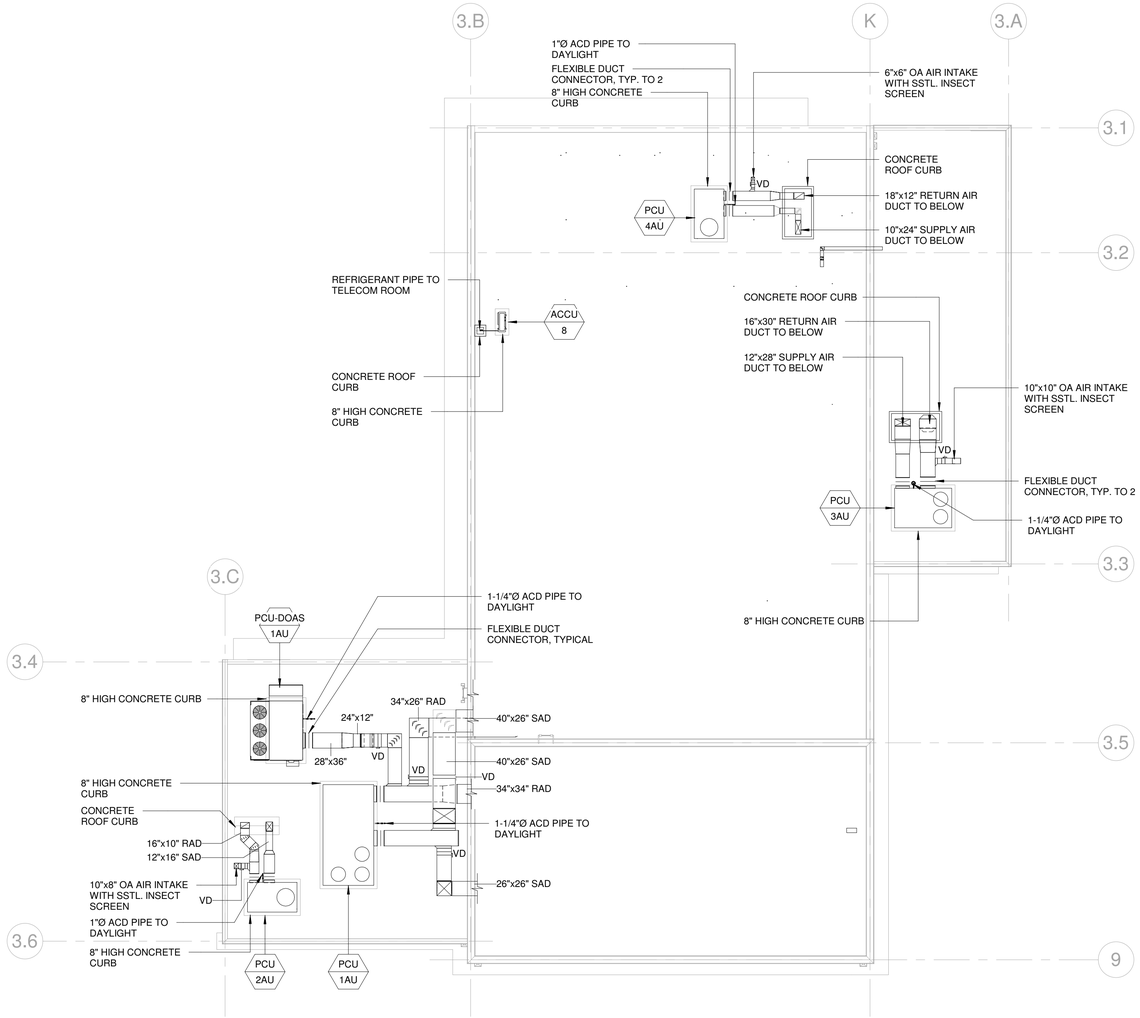
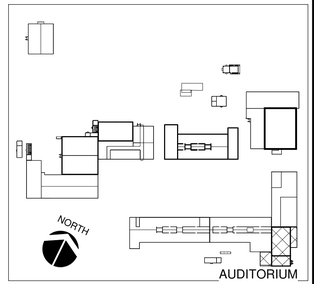


1 MECHANICAL ROOF PLAN - AUDITORIUM

SCALE: 3/32" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 8' 16' 32'

SCALE: 3/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS		
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Title:

MECHANICAL ROOF PLAN - AUDITORIUM

PROGRAMMING DOCUMENT

Designed:	MN/ES/JP
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	3/32" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.

M4.4

Sheet No._____ of 0

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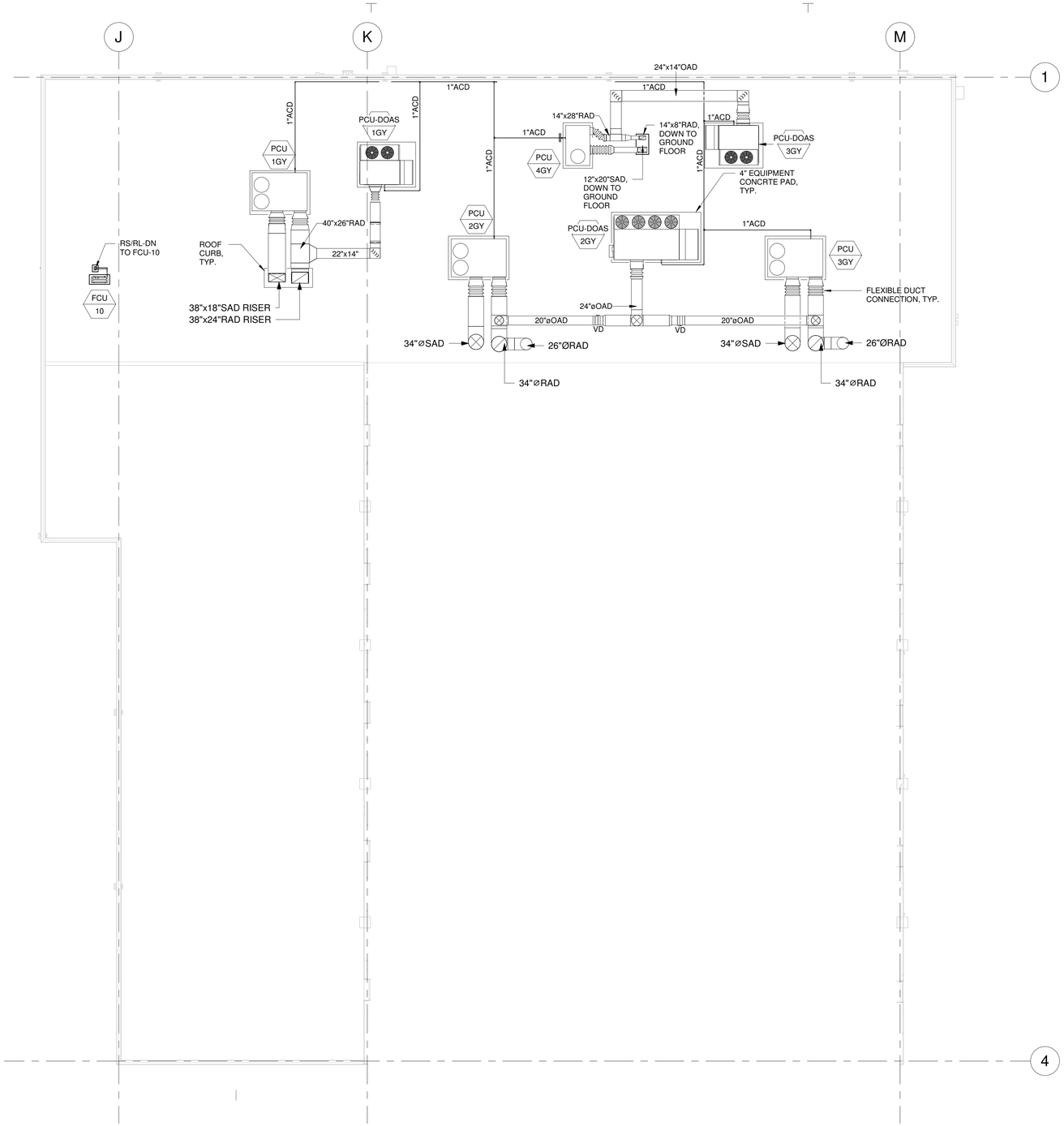
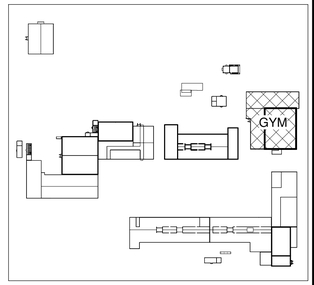


1 MECHANICAL ROOF PLAN - GYMNASIUM

SCALE: 3/32" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 8' 16' 32'

SCALE: 3/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Title:

MECHANICAL ROOF PLAN - GYMNASIUM

PROGRAMMING DOCUMENT

Designed:	MN/ES/SR
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	3/32" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.

M4.5

Sheet No._____ of 0

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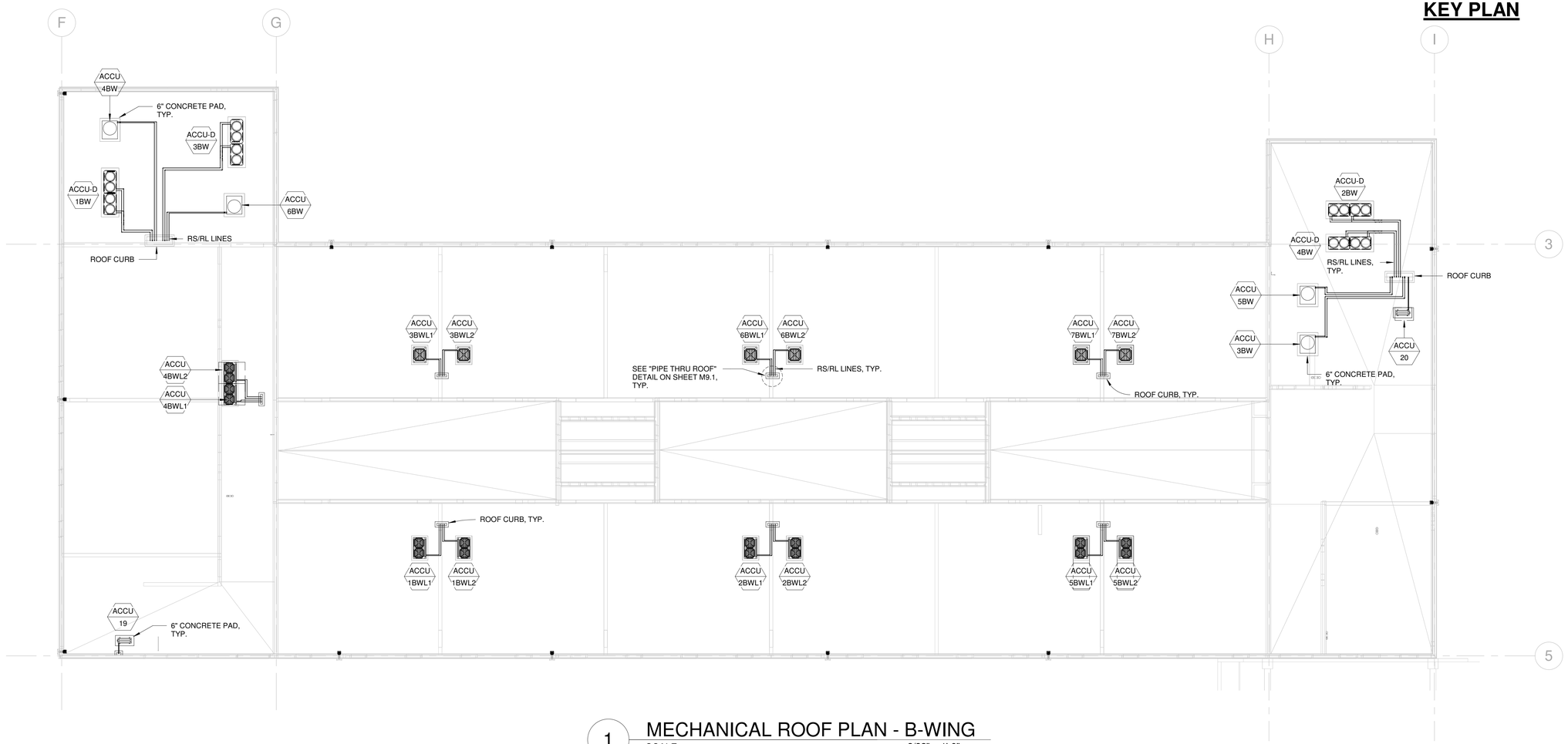
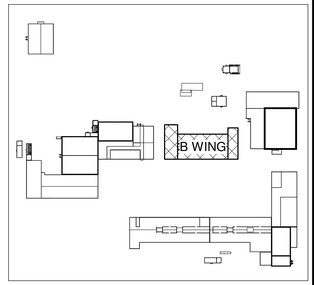


1 MECHANICAL ROOF PLAN - B-WING

SCALE: 3/32" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 8' 16' 32'

SCALE: 3/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISIONS		
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SIMON SANCHEZ HIGH SCHOOL

Title:

MECHANICAL ROOF PLAN - B-WING

PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/32" = 1'-0"
Date:	3/31/25
Project No. No.	File

Drawing No.

M4.6

Sheet No. _____ of _____

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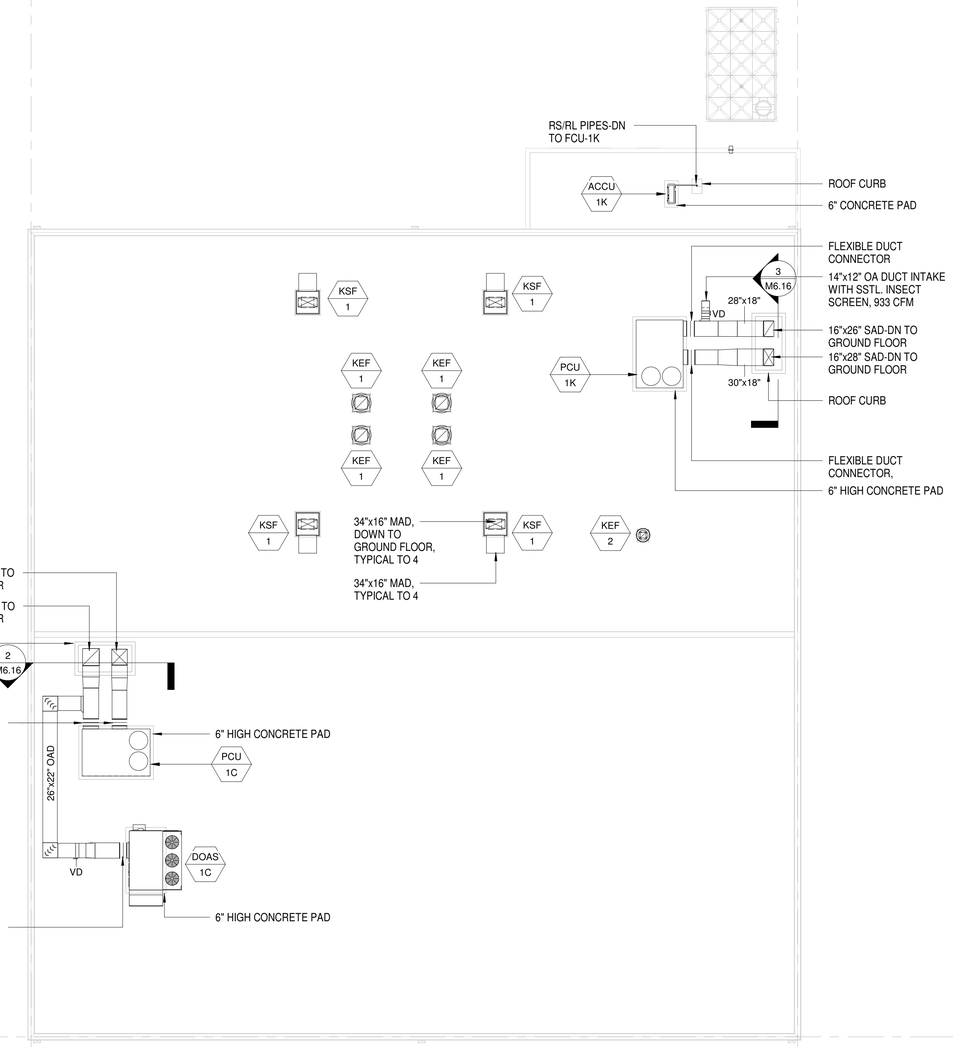
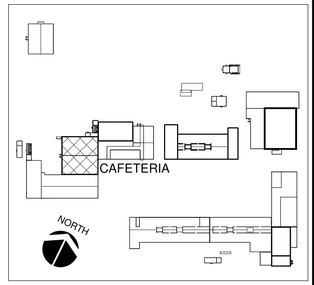


1 MECHANICAL ROOF PLAN - CAFETERIA AND KITCHEN

SCALE: 3/32" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

0 2' 4' 8' 16' 32'

SCALE: 3/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Planning
Interior Design

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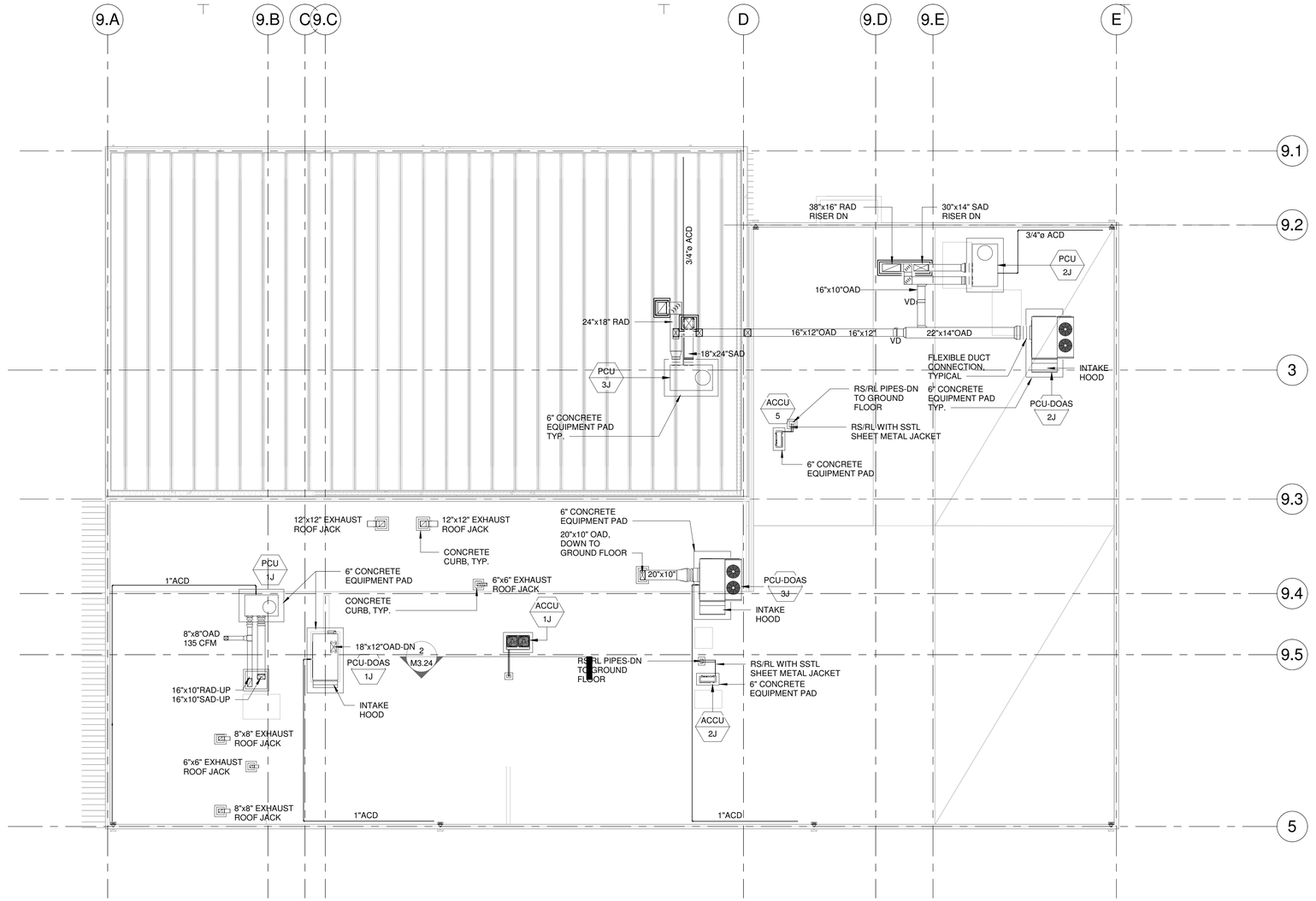
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL ROOF PLAN - CAFETERIA AND KITCHEN
PROGRAMMING DOCUMENT

Designed:	MN/ES/SR
Drawn:	SR/JP/EN
Checked:	MPN
Supv:	MPN
Scale:	3/32" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

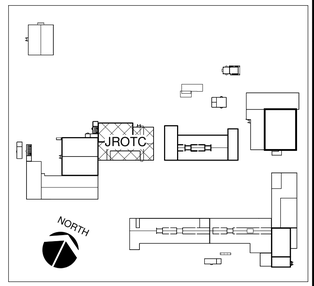
Drawing No.
M4.7
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 MECHANICAL ROOF PLAN - JROTC

SCALE: 3/32" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 8' 16' 32'

SCALE: 3/32" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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DATE: _____

Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

MECHANICAL ROOF PLAN - JROTC

PROGRAMMING DOCUMENT

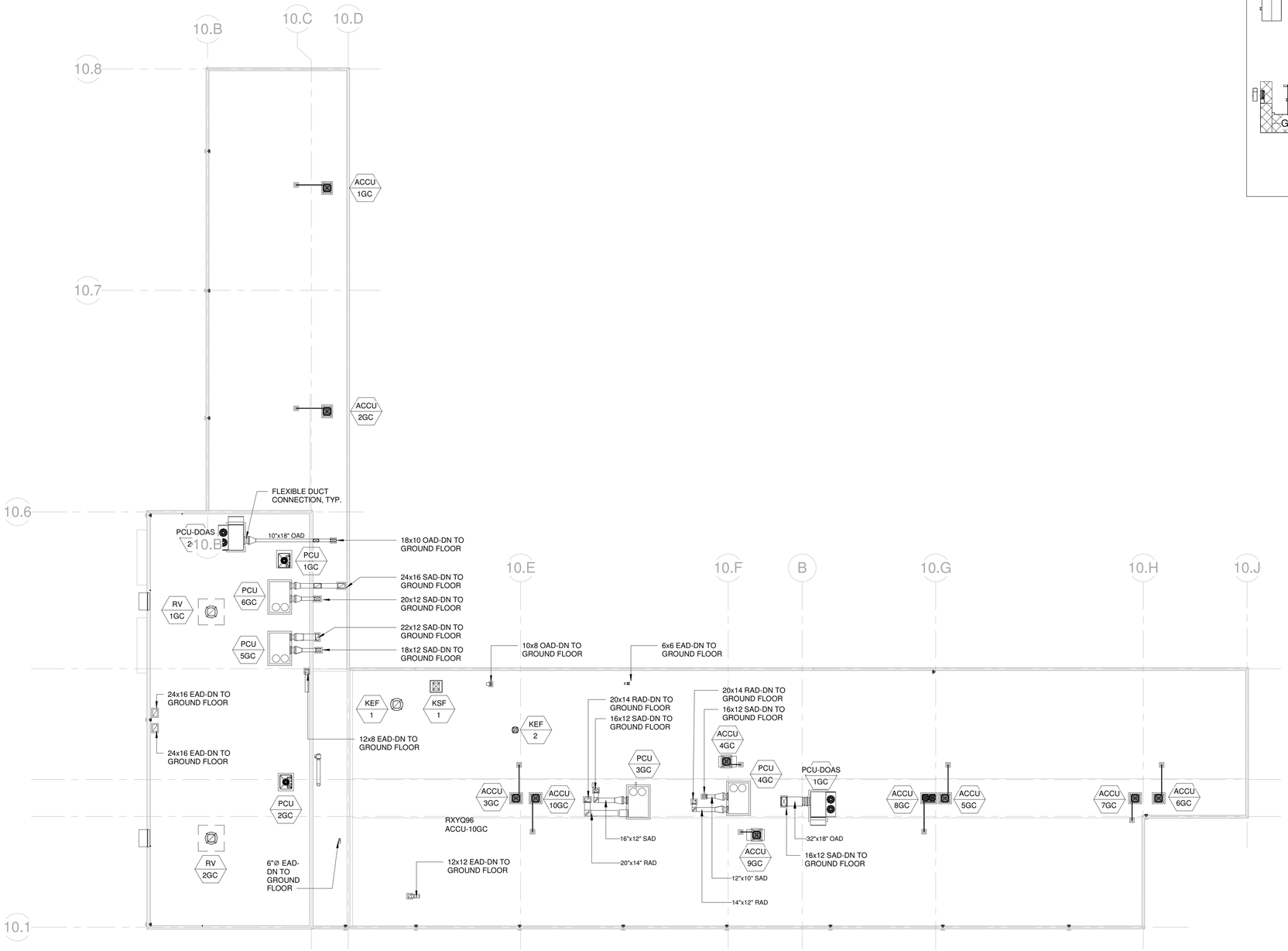
Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	3/32" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.

M4.8

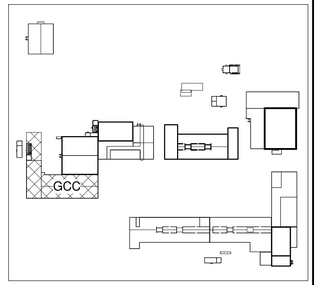
Sheet No._____ of 0

NOT FOR CONSTRUCTION



1 GCC MECHANICAL ROOF PLAN

SCALE: 1/16" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 4' 8' 16' 32' 48'

SCALE: 1/16" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GCC MECHANICAL ROOF PLAN
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/16" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.
M4.9
Sheet No._____ of _____

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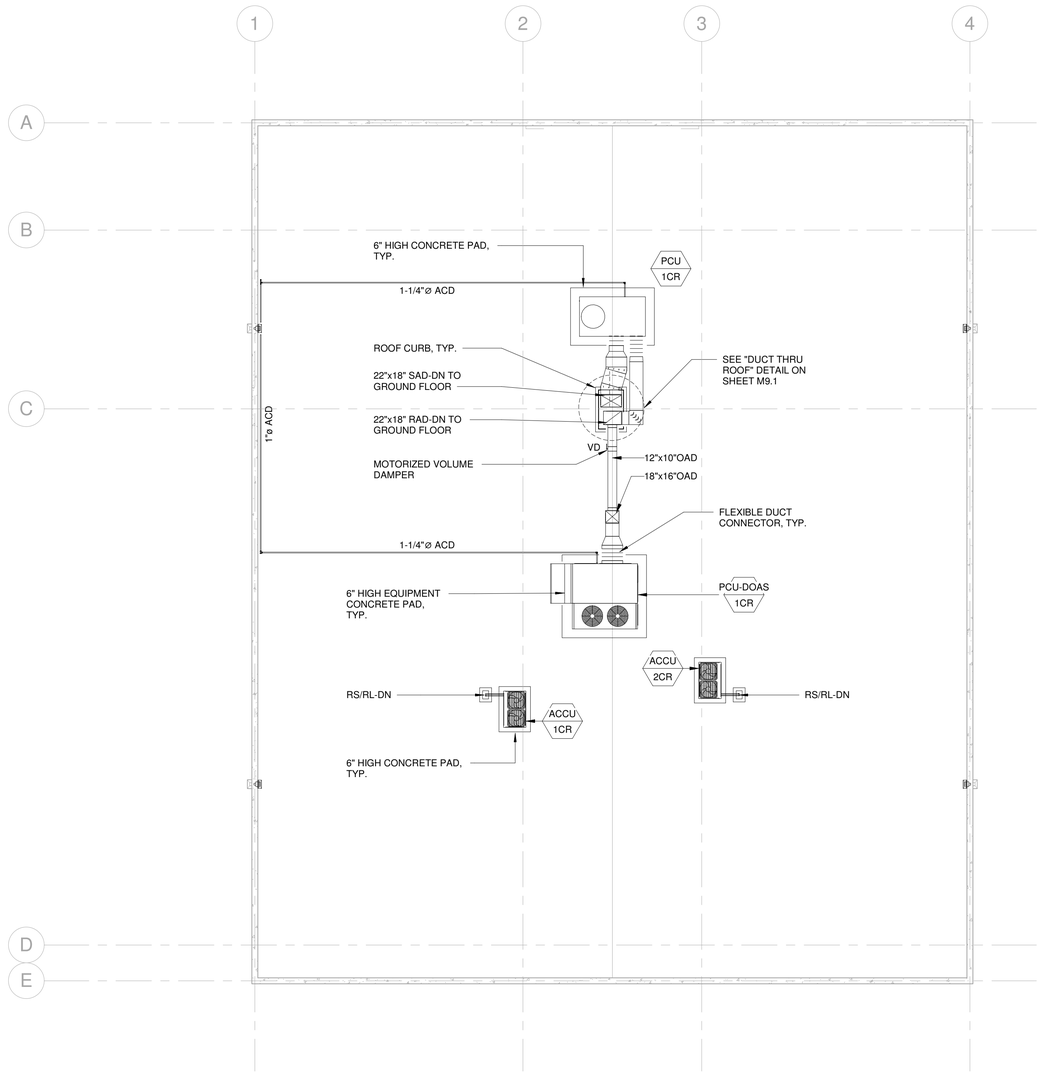

1 MECHANICAL ROOF PLAN - CREDIT RECOVERY

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Architecture
Planning
Interior Design

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL ROOF PLAN - CREDIT RECOVERY
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.
M4.10
Sheet No._____ of 0

NOT FOR CONSTRUCTION

EQUIPMENT SCHEDULE:

DX-SPLIT AIR HANDLING UNIT AND AIR-COOLED CONDENSING UNIT - ADMINISTRATION BUILDING FIRST FLOOR

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											INDOOR UNIT	OUTDOOR UNIT							
		TOTAL	SENSIBLE				DB	WB	DB	WB	FLA	MOP	MCA	VOLTS	PHASE	HERTZ			
AHU 1A / ACCU 1A	ADMIN BUILDING FIRST FLOOR	287,000	242,200	11,830	1,525	2.0	75.0	62.4	56.5	54.1	12.5	1 x 35.0 1 x 30.0 1 x 30.0	1 x 22.0 1 x 19.0 1 x 19.0	460	3	60	1	2,909 1,964	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE OR APPROVED EQUIVALENT

NOTE: UV LIGHT CIRCUIT ELECTRICAL CHARACTERISTICS: 115V/1PH/60HZ AT 1.54 FLA.

DX-SPLIT AIR HANDLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) AND AIR-COOLED CONDENSING UNIT - ADMINISTRATION BUILDING FIRST FLOOR

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											INDOOR UNIT	OUTDOOR UNIT							
		TOTAL	SENSIBLE				DB	WB	DB	WB	FLA	MOP	MCA	VOLTS	PHASE	HERTZ			
AHU-DOAS 2A / ACCU 2A	ADMIN BUILDING FIRST FLOOR	141,300	54,800	1,525	1,525	1.0	89.0	80.2	56.9	55.6	2.20	1 x 20.0 1 x 20.0	1 x 15.0 1 x 15.0	460	3	60	1	1,122 1,232	DOAS UNIT WITH UV LIGHT AND WRAP AROUND HEAT PIPE OR APPROVED EQUIVALENT

NOTE: UV LIGHT CIRCUIT ELECTRICAL CHARACTERISTICS: 115V/1PH/60HZ AT 1.54 FLA.

DX-SPLIT CEILING CASSETTE FAN COIL UNIT AND AIR-COOLED CONDENSING UNIT - ADMINISTRATION BUILDING FIRST FLOOR ELECTRICAL ROOM

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											QTY x COMP RLA	FAN MOTOR - FLA							
		TOTAL	SENSIBLE				DB	WB	DB	WB		COND	EVAP	VOLTS	PHASE	HERTZ			
FCU 3A / ACCU 3A	ADMIN BUILDING FIRST FLOOR ELECTRICAL ROOM	48,200	46,200	1,600	INFILTRATION	0 .25	80.1	61.3	53.9	50.5	23.1	1.0	1.3	208	1	60	1	59 207	CEILING CASSETTE FAN COIL UNIT OR APPROVED EQUIVALENT

PACKAGED COOLING UNIT - ADMINISTRATION BUILDING SECOND FLOOR

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											QTY x COMP RLA	FAN MOTOR - FLA							
		TOTAL	SENSIBLE				DB	WB	DB	WB		COND	EVAP	VOLTS	PHASE	HERTZ			
PCU 1AL	ADMIN BUILDING SECOND FLOOR LIBRARY	237,700	155,500	7,680	1,815	2.0	75.0	62.4	54.8	51.7	20.0 / 13.2	2 X 2.5	7.6	460	3	60	1	2,069	PACKAGE COOLING UNIT WITH UV LIGHTS,MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE OR APPROVED EQUIVALENT
PCU 2AL	DANCE, CHOIR AND BAND AREA	186,800	145,200	7,250	1,845	2.0	75.0	62.9	55.2	54.2	20.0 / 13.2	2 x 2.5	7.6	460	3	60	1	2,069	PACKAGE COOLING UNIT WITH UV LIGHTS,MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE OR APPROVED EQUIVALENT

PACKAGED COOLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) - ADMINISTRATION BUILDING SECOND FLOOR

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											QTY x COMP RLA	FAN MOTOR - FLA							
		TOTAL	SENSIBLE				DB	WB	DB	WB		COND	EVAP	VOLTS	PHASE	HERTZ			
PCU-DOAS 1AL	ADMIN BUILDING SECOND FLOOR LIBRARY	168,300	65,300	1,815	1,815	1.0	89.0	80.4	56.9	55.6	2 x 12.6	2 x 2.1	1 x 7.0	460	3	60	3/4	2,778	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT OR APPROVED EQUIVALENT
PCU-DOAS 2AL	DANCE, CHOIR AND BAND AREA	170,400	68,500	1,845	1,845	1.0	89.6	80.3	56.9	55.6	2 x 12.6	3 x 2.1	1 x 7.0	460	3	60	3/4	2,778	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT OR APPROVED EQUIVALENT

DX-SPLIT CEILING CASSETTE FAN COIL UNIT AND AIR-COOLED CONDENSING UNIT - ADMINISTRATION BUILDING SECOND FLOOR DANCE AREA STORAGE ROOM

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											QTY x COMP RLA	FAN MOTOR - FLA							
		TOTAL	SENSIBLE				DB	WB	DB	WB		COND	EVAP	VOLTS	PHASE	HERTZ			
FCU 4A / ACCU 4A	ADMIN BUILDING SECOND FLOOR STORAGE ROOM A233E	10,500	10,200	460	INFILTRATION	0 .25	75.3	59.3	55.0	50.9	8.50	0.47	0.36	208	1	60	1	27 71	CEILING CASSETTE TYPE FAN COIL UNIT OR APPROVED EQUIVALENT

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REVISIONS

No.	Description	Date

TRMA
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Planning
Interior Design

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 1
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
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Supv:	MPN
Scale:	
Date:	3/31/25
Project No.	NO.
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EQUIPMENT SCHEDULE:

PACKAGED COOLING UNITS - JROTC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU 1J	JROTC ROOM/ COMPUTER LAB	33,300	21,300	830	135	1.0	77.3	65.9	53.7	54.2	1 x 13.7	1.4	8.2	208	3	60	1-3/4	452	PACKAGE COOLING UNIT WITH HOT GAS REHEAT OR APPROVED EQUIVALENT
PCU 2J	BATT. HQ, F&DE STO., INSTRUCTOR OFFICES, HALLWAY, SUPPLY RM, TELCOM,ELEC RM, STAFF COLLAB, RR	113,600	96,800	5,380	1,095	2.0	75.3	62.6	57.4	55.5	2 x 10.6 / 9.0	2 x 1.6	1 x 4.8	460	3	60	1	1,508	PACKAGE COOLING UNIT WITH HOT GAS REHEAT OR APPROVED EQUIVALENT
PCU 3J	JROTC FIRING RANGE	85,200	67,000	3,395	1,090	1.0	75.0	62.5	54.2	54.2	2 x 9 / 6.22	1.5	3.1	460	3	60	1-3/4	937	PACKAGE COOLING UNIT WITH HOT GAS REHEAT OR APPROVED EQUIVALENT

NOTE 1: EVAPORATOR FULL LOAD AMPERE VALUE (FLA) FOR TS036G4 AND TS048G4 HAS A ELECTRICAL POWER REQUIREMENTS OF 208V/1PH/60 HZ.

VRF SYSTEM (FAN COIL UNIT) : JROTC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR FLA	V / PH / HZ						
FCU 1J	JROTC CLASSROOM C124	38,000	30,200	1,200	415	76.9	63.1	54.0	52.3	5.2	208-230/1/60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT
FCU 2J	JROTC CLASSROOM C125	38,000	30,100	1,200	415	76.9	63.1	54.0	52.3	5.2	208-230/1/60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT
FCU 3J	JROTC CLASSROOM C126	38,000	30,100	1,200	415	76.9	63.1	54.0	52.3	5.2	208-230/1/60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : JROTC BUILDING

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS
			MCA	MOP	RLA	V/PH/HZ	IEER		
ACCU 1J	JROTC CLASSROOMS C124 & C125	76,000	20.6	25	10.2	460/3/60	22.5	553	VRV OUTDOOR UNIT
ACCU 2J	JROTC CLASSROOMS C126	38,000	12.3	20	7.1	460/3/60	20.7	451	VRV OUTDOOR UNIT

COMPUTER ROOM AIR -CONDITIONING UNIT (CRAC) - JROTC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS							REF. TYPE	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	REHEAT SECTION (KW)	COMPRESSOR RLA	CONDENSER FAN FLA	SUPPLY FAN FLA	V	PH	HZ			
CRAC 1JA / ACCU 1JA	ARMS ROOM	31,900	16,200	800	0.5	75.3	59.7	46.2	44.4	6	10.3	3.6	3.0	208	3	60	R-410A	700 365	AIR-COOLED SPLIT CRAC UNITS WITH ELECTRIC REHEAT, SINGLE POWER SOURCE OR APPROVED EQUIVALENT

PACKAGED COOLING UNITS (DEDICATED OUTDOOR AIR SYSTEM) - JROTC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PC-DOAS 1J	JROTC CLASSROOMS	114,700	44,300	1,240	1,240	1.5	89.0	80.1	56.9	55.6	2 x 12.6	2 x 2.1	1 x 7.0	460	3	60	3/4	2,778	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT OR APPROVED EQUIVALENT
PC-DOAS 2J	INDOOR FIRING RANGE, STORAGES, OFFICES & HALLWAY	202,200	78,100	2,185	2,185	1.5	89.0	80.1	56.9	55.6	2 x 26.9	3 x 2.1	1 x 7.0	460	3	60	1-1/4	3,124	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT OR APPROVED EQUIVALENT
PC-DOAS 3J	MEN & WOMEN LOCKER ROOMS	97,800	39,700	1,050	1,050	1.5	89.0	80.1	56.9	55.6	2 x 12.6	2 x 2.1	1 x 7.0	460	3	60	3/4	2,778	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT OR APPROVED EQUIVALENT

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SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 2
PROGRAMMING DOCUMENT

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Date:	3/31/25
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EQUIPMENT SCHEDULE:

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PACKAGED COOLING UNIT - CREDIT RECOVERY BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU 1CR	ELEC RM, COMMON AREA, OFFICE, STO RM, TELECOM	80,600	71,400	3,170	305	1.5	76.4	61.8	55.0	53.0	12.2	1.5	1.6	460	3	60	1-3/4	751	PACKAGE COOLING UNIT WITH HOT GAS REHEAT OR APPROVED EQUIVALENT

NOTE 1: EVAPORATOR FULL LOAD AMPERE VALUE (FLA) FOR TS036G4 AND TS048G4 HAS A ELECTRICAL POWER REQUIREMENTS OF 208V/1PH/60 HZ.

VRF SYSTEM (FAN COIL UNIT): CREDIT RECOVERY BUILDNG

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR FLA	V / PS / HZ						
FCU 1CR	CREDIT RECOVERY CLASSROOM D102	50,800	43,400	1,305	390	76.7	63.1	55.0	49.5	6.9	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT
FCU 2CR	CREDIT RECOVERY CLASSROOM D101	47,000	39,700	1,305	390	76.8	63.2	55.0	50.7	6.9	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT
FCU 3CR	CREDIT RECOVERY CLASSROOM D103	47,200	39,800	1,315	395	76.7	63.2	55.0	50.8	6.9	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT
FCU 4CR	CREDIT RECOVERY CLASSROOM D104	50,000	42,500	1,315	395	76.7	63.2	55.0	49.9	6.9	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT OR APPROVED EQUIVALENT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : CREDIT RECOVERY BUILDING

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS
			MCA	MOP	RLA	V/PH/HZ	EER		
ACCU 1CR	CREDIT RECOVERY CLASSROOMS D101 & D102	97,800	20.6	25	11.7	460/3/60	22.0	556	VRV OUTDOOR UNIT
ACCU 2CR	CREDIT RECOVERY CLASSROOMS D103 & D104	97,200	20.6	25	11.7	460/3/60	22.0	556	VRV OUTDOOR UNIT

PACKAGED COOLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) - CREDIT RECOVERY BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY. x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU-DOAS 1CR	CREDIT RECOVERY CLASSROOMS & COMMON AREAS	173,700	67,000	1,875	1,875	1.5	89.0	80.1	56.9	55.6	2 x 12.8	3 x 2.1	1 x 7.0	460	3	60	3/4	3,048	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT OR APPROVED EQUIVALENT

PACKAGED COOLING UNITS: AUDITORIUM BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY. x COMP RLA	QTY. x FAN MOTOR - FLA COND	QTY. x FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU 1AU	AUDITORIUM SEATING AND STAGE AREA	360,300	317,800	12,000	2,056	2.0	73.6	62.0	57.4	55.2	3 x 15.8 / 23.7	3 x 2.2	1 x 18.0	460	3	60	1.25	3.665	PACKAGE COOLING UNIT WITH HOT GAS REHEAT SINGLE ZONE VAV SYSTEM OR APPROVED EQUIVALENT
PCU 2AU	BACKSTAGE	57,300	32,900	1,181	324	1.0	78.9	69.2	54.2	54.1	1 x 7.1	1 x 0.7	1 x 4.8	460	3	60	1.0	498	PACKAGE COOLING UNIT WITH HOT GAS REHEAT SINGLE ZONE VAV SYSTEM OR APPROVED EQUIVALENT
PCU 3AU	GROUND FLOOR COMMON AREA	124,700	91,900	3,775	494	2.0	75.7	60.7	54.2	48.6	2 x 12.2 / 6.2	2 x 1.1	1 x 4.8	460	3	60	1.0	2,390	PACKAGE COOLING UNIT WITH HOT GAS REHEAT SINGLE ZONE VAV SYSTEM OR APPROVED EQUIVALENT
PCU 4AU	SECOND FLOOR COMMON AREA	30,100	21,600	1,389	89	1.5	76.8	63.4	55.2	55.2	1 x 5.8	1 x 0.55	1 x 4.8	460	3	60	1.0	431	PACKAGE COOLING UNIT WITH HOT GAS REHEAT SINGLE ZONE VAV SYSTEM OR APPROVED EQUIVALENT

PACKAGED COOLING UNITS (DEDICATED OUTDOOR AIR SYSTEM) - AUDITORIUM BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	COIL ENTERING AIR TEMPERATURE (°F)		COIL LEAVING AIR TEMPERATURE (°F)		REHEAT AIR TEMP. (°F)	ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	DB	QTY. x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU-DOAS 1AU	AUDITORIUM	189,800	74,100	2,056	2,056	1.0	89.6	80.3	56.9	55.6	60.0	2 x 12.8	3 x 2.1	1 x 7.0	460	3	60	1-1/4	3,048	PACKAGE DOAS WITH UV LIGHTS, VFD, MODULATING OUTSIDE AIR DAMPER, HOT GAS REHEAT, MERV-13 FILTER AND AIR FLOW MONITORING OR APPROVED EQUIVALENT

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MECHANICAL EQUIPMENT SCHEDULE - 3
PROGRAMMING DOCUMENT

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Scale:	
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Sheet No. _____ of 0

EQUIPMENT SCHEDULE:

VRF SYSTEM (FAN COIL UNIT) : GCC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR MCA/MOP	V / PH / HZ						
FCU 1GC	GCC HCS C109	24,650	20,350	850	205	1.0	76.9	63.1	55.5	53.3	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 2GC	GCC HCS C109	24,650	20,350	850	205	1.0	76.9	63.1	55.5	53.3	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 3GC	GCC ELECTRONIC WORKSHOP C110	26,500	20,700	860	315	1.0	76.9	63.7	54.9	53.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 4GC	GCC ELECTRONICS COMPUTER LAB C111	30,000	23,800	995	305	1.0	76.9	63.1	54.5	52.9	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	140	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 5GC	GCC PROSTART KITCHEN C108	53,600	45,600	2,100	350	1.0	76.9	62.6	55.9	53.9	8.6 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 6GC	GCC PROSTART C107	17,100	12,600	525	305	1.0	76.9	65.0	54.9	54.2	4.9 / 15	208-230 / 1 / 60	R-410A	1/2	1/4	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 7GC	GCC HOSPITALITY & TOURISM C106	17,500	12,900	535	310	1.0	76.9	65.0	54.9	54.2	4.9 / 15	208-230 / 1 / 60	R-410A	1/2	1/4	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 8GC	GCC CLASSROOM C105	24,800	18,600	770	415	1.0	76.9	64.5	54.9	53.8	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 9GC	GCC CLASSROOM C104	25,600	19,300	795	415	1.0	76.9	64.4	54.9	53.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 10GC	GCC CLASSROOM C103	25,500	19,200	795	415	1.0	76.9	64.5	54.9	53.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 11GC	GCC MARKETING C102	28,900	22,400	920	330	1.0	76.9	63.8	54.9	53.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 12GC	GCC MARKETING STORE C101	34,500	31,300	1,120	170	1.0	76.1	61.8	55.9	50.9	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	140	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 13GC	GCC HEALTH C122	39,300	31,000	1,315	410	1.0	76.6	63.3	54.9	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 14GC	GCC CLASSROOM C121	36,100	28,300	1,220	415	1.0	76.6	63.3	54.9	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 15GC	GCC CLASSROOM C120	36,100	28,300	1,220	415	1.0	76.6	63.3	54.9	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 16GC	GCC CLASSROOM C119	36,100	28,300	1,220	415	1.0	76.6	63.3	54.9	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 17GC	GCC CLASSROOM C118	36,100	28,300	1,220	415	1.0	76.6	63.3	54.9	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 18GC	GCC CLASSROOM C117	36,100	28,300	1,220	415	1.0	76.6	63.3	54.9	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 19GC	GCC CLASSROOM C116	36,000	28,300	1,215	415	1.0	76.6	63.3	54.9	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 4
PROGRAMMING DOCUMENT

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Drawn:	SQR/JVP/EDN
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EQUIPMENT SCHEDULE:

VRF SYSTEM (AIR-COOLED CONDENSING UNIT): GCC BUILDING

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS
			MCA	MOP	RLA	V/PH/HZ	EER		
ACCU 1GC	GCC HCS C109	49,300	12.3	20	7.1	460	20.7	451	OUTDOOR UNIT
ACCU 2GC	GCC ELECTRONICS WORKSHOP C110 & COMPUTER LAB C111	56,500	12.3	20	7.1	460	20.7	451	OUTDOOR UNIT
ACCU 3GC	GCC PROSTART C107 & PROSTART KITCHEN C108	71,100	20.6	25	10.2	460	22.5	553	OUTDOOR UNIT
ACCU 4GC	GCC HOSPITALITY & TOURISM C106 & CLASSROOM C105	42,300	12.3	20	7.1	460	20.7	451	OUTDOOR UNIT
ACCU 5GC	GCC CLASSROOMS C104 & C103	51,100	12.3	20	7.1	460	20.7	451	OUTDOOR UNIT
ACCU 6GC	GCC MARKETING C102 & MARKETING STORE C101	63,400	12.3	20	7.1	460	20.7	451	OUTDOOR UNIT
ACCU 7GC	GCC HEALTH C122	39,300	12.3	20	7.1	460	20.7	451	OUTDOOR UNIT
ACCU 8GC	GCC CLASSROOMS C121 & C120	72,200	20.6	25	10.2	460	22.5	553	OUTDOOR UNIT
ACCU 9GC	GCC CLASSROOMS C119 & C118	72,200	20.6	25	10.2	460	22.5	553	OUTDOOR UNIT
ACCU 10GC	GCC CLASSROOMS C116 & C117	72,100	20.6	25	10.2	460	22.5	553	OUTDOOR UNIT

PACKAGED COOLING UNITS: GCC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY. x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU 1GC	GCC AUTO C112	44,500	23,200	970	290	0.5	78.4	69.4	56.0	55.3	1 x 19.2	1.4	2.5	460	3	60	3/4	395	PACKAGE COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 2GC	GCC CARPENTRY C114	44,100	23,200	970	290	0.5	78.4	69.3	56.0	55.3	1 x 19.2	1.4	2.5	460	3	60	3/4	395	PACKAGE COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 3GC	GCC COMMON AREA, H1	48,500	33,800	1,790	125	1.5	75.7	63.8	54.5	54.4	1 x 7.1	0.7	2.5	460	3	60	1-3/4	498	PACKAGE COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 4GC	GCC COMMON AREA H2	36,700	21,400	895	135	1.5	76.6	65.6	56.0	52.0	1 x 6.2	0.7	2.5	460	3	60	1-3/4	452	PACKAGE COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 5GC	GCC COMMON AREA, V1	53,600	39,900	2,025	95	1.5	75.4	63.3	54.5	54.4	1 x 10.6	1.5	1.6	460	3	60	1-3/4	667	PACKAGE COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 6GC	GCC COMMON AREA V2	77,800	55,300	2,490	150	1.5	75.4	63.6	54.5	53.0	1 x 12.2	1.5	1.6	460	3	60	1-3/4	751	PACKAGE COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT

PACKAGED COOLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) : GCC BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY. x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU-DOAS 1GC	GCC BUILDING H	497,200	174,000	5,605	5,605	2.0	86.3	80.1	57.9	55.6	4 X 14.7	4 X 2.7	1 X 6.3	460	3	60	3/4	6,726	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU-DOAS 2GC	GCC BUILDING V	94,500	33,200	1,035	1,035	1.5	86.3	80.1	56.9	55.6	2 X 8.1	2 X 2.1	1 X 7.0	460	3	60	3/4	2,778	PACKAGE DOAS UNIT WITH UV LIGHTS AND HOT GAS REHEAT

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 5
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
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Date:	3/31/25
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EQUIPMENT SCHEDULE:

VRF SYSTEM (FAN COIL UNIT): PRESS BOX

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR FLA	V / PH / HZ						
FCU 1PB	ELECTRICAL ROOM E102	10,500	9,800	350	INFILTRATION	0.125	75.1	62.6	49.7	49.6	0.4	208-230 / 1 / 60	R-410A	1/2	1/4	1	26	WALL-MOUNTED FAN COIL UNIT
FCU 2PB	PRESS BOX	21,400	18,000	635	INFILTRATION	0.125	75.1	62.6	49.3	49.3	0.5	208-230 / 1 / 60	R-410A	5/8	3/8	1	31	WALL-MOUNTED FAN COIL UNIT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT): PRESSBOX

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS
			MCA	FLA	RLA	V/PH/HZ	EER		
ACCU 1PB	PRESSBOX	31,200	27	0.3 + 0.3	23.3	208-230/1/60	9.0	283	VRV OUTDOOR UNIT

VRF SYSTEM (FAN COIL UNIT): MAIN ENTRANCE

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR FLA	V / PH / HZ						
FCU 1ME	ME TICKET BOOTH A152	6,200	4,500	165	INFILTRATION	0.125	75.1	62.6	50.7	49.4	0.3	208-230/1/60	R-410A	1/2	1/4	1	26	WALL-MOUNTED FAN COIL UNIT
FCU 2ME	ME HR A151B	4,500	3,000	135	INFILTRATION	0.125	75.1	65.2	55.0	54.1	0.3	208-230/1/60	R-410A	1/2	1/4	1	26	WALL-MOUNTED FAN COIL UNIT
FCU 3ME	ME SRO A151	4,600	3,000	135	INFILTRATION	0.125	75.1	65.1	55.0	54.1	0.3	208-230/1/60	R-410A	1/2	1/4	1	26	WALL-MOUNTED FAN COIL UNIT
FCU 4ME	ME HR A151A	5,000	3,300	150	INFILTRATION	0.125	75.1	65.0	55.0	54.0	0.3	208-230/1/60	R-410A	1/2	1/4	1	26	WALL-MOUNTED FAN COIL UNIT
FCU 5ME	ME STORAGE A150	8,500	5,500	165	INFILTRATION	0.125	75.1	62.6	44.7	43.6	0.3	208-230/1/60	R-410A	1/2	1/4	1	26	WALL-MOUNTED FAN COIL UNIT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT): MAIN ENTRANCE

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS
			MCA	FLA	RLA	V/PH/HZ	EER		
ACCU 1ME	MAIN ENTRANCE	28,700	27	0.3 + 0.3	23.3	208-230/1/60	9.0	283	VRV OUTDOOR UNIT

PACKAGED COOLING UNITS - CAFETERIA, KITCHEN

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU 1C	CAFETERIA	293,000	200,700	12,830	4,106	2.0	71.4	61.6	54.2	53.7	18.6 / 18.6	2 x 2.5	11.0	460	3	60	1	2,054	PACKAGE COOLING UNIT WITH UV LIGHTS,MERV 14 AIR FILTER AND HOT GAS REHEAT
PCU 1K	KITCHEN	174,600	113,100	4,710	933	2.0	77.3	65.8	55.8	53.6	15.6 / 9.6	2 x 1.6	4.8	460	3	60	1	1,925	PACKAGE COOLING UNIT WITH UV LIGHTS,MERV 14 AIR FILTER AND HOT GAS REHEAT

PACKAGED COOLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) - CAFETERIA

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU-DOAS 1C	CAFETERIA	379,000	147,900	4,106	4,106	0.8	89.6	80.3	56.9	55.6	3 x 16.0	4 x 2.1	1 x 4.0	460	3	60	1	5,160	PACKAGE DOAS UNIT WITH UV LIGHTS,MERV 14 AIR FILTER AND HOT GAS REHEAT

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MECHANICAL EQUIPMENT SCHEDULE - 6
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

DX-SPLIT CEILING CASSETTE FAN COIL UNIT AND AIR-COOLED CONDENSING UNIT - KITCHEN ELECTRICAL ROOM

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
FCU 1K / ACCU 1K	KITCHEN ELECTRICAL ROOM C167	41,600	39,500	1,430	INFILTRATION	0.25	80.1	61.9	55.0	51.7	23.1	1.0	1.3	208	1	60	1	59 207	CEILING CASSETTE TYPE INDOOR UNIT

VRF SYSTEM (FAN COIL UNIT): A-WING EAST GROUND FLOOR CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR MCA/MOP	V / PH / HZ						
FCU 1EWL1	ART A101	37,400	31,700	1,570	380	75.3	62.6	57.0	54.5	8.6 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 2EWL1	ART A102	37,400	31,700	1,565	380	75.3	62.6	57.0	54.5	8.6 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	167	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 3EWL1	SPED MATH A103	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 4EWL1	SPED A104	23,200	19,300	930	250	75.3	62.6	56.4	54.1	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 5EWL1	SPED A105	23,600	19,700	950	260	75.3	62.6	56.5	54.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 6EWL1	BIOLOGY A115	28,600	21,700	890	415	75.3	62.6	53.1	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 7EWL1	SCIENCE ESL A116	28,600	21,700	890	415	75.3	62.6	53.1	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 8EWL1	HEALTH A117	28,600	21,700	890	415	75.3	62.6	53.1	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 9EWL1	HEALTH A118	28,600	21,700	890	415	75.3	62.6	53.1	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT

VRF SYSTEM (FAN COIL UNIT) : A-WING EAST SECOND FLOOR CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR MCA/MOP	V / PH / HZ						
FCU 1EWL2	CHAMORU A201	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 2EWL2	CHAMORU A202	34,900	28,100	1,280	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 3EWL2	CHAMORU A203	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 4EWL2	SOCIAL STUDIES A204	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 5EWL2	SOCIAL STUDIES A218	28,700	21,900	895	415	75.3	62.6	53.2	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 6EWL2	SOCIAL STUDIES ESL A219	28,600	21,700	890	415	75.3	62.6	53.2	51.3	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 7EWL2	CHAMORU A220	28,600	21,700	890	415	75.3	62.6	53.2	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 8EWL2	ENGLISH ESL A221	27,700	21,200	885	395	75.3	62.6	53.5	51.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE MULTI-POSITION AIR HANDLING INDOOR UNIT

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Architecture
Planning
Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 7
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
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Date:	3/31/25
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Sheet No._____ of 0

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EQUIPMENT SCHEDULE:

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : A-WING EAST CLASSROOMS GROUND FLOOR

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOP	RLA	V/PH/HZ	IEER			
ACCU 1EWL1	A-EAST WING GF CLASSROOMS ART A101	37,400	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 2EWL1	A-EAST WING GF ART 102 & SPED MATH A103	72,200	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 3EWL1	A-EAST WING GF SPED A104 & SPED A105	46,800	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 4EWL1	A-EAST WING GF BIOLOGY A115 & SCIENCE ESL A116	57,200	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 5EWL1	A-EAST WING GF HEALTH A117 & HEALTH A118	57,200	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : A-WING EAST CLASSROOMS SECOND FLOOR

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOP	RLA	V/PH/HZ	IEER			
ACCU 1EWL2	A-EAST WING SF CHAMORU A201 & CHAMORU A202	69,700	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 2EWL2	A-EAST WING SF CHAMORU A203 & SOCIALSTUDIES A204	69,600	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 3EWL2	A-EAST WING SF SOCIAL STUDIES A218 & ESL A219	57,300	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 4EWL2	A-EAST WING SF CHAMORU A220 & ENGLISH ESL A221	56,300	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1

DX-SPLIT AIR HANDLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) AND AIR-COOLED CONDENSING UNIT: A-WING EAST CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR UNIT FLA	OUTDOOR UNIT MOP	OUTDOOR UNIT MCA	VOLTS	PHASE	HERTZ			
AHU-DOAS 1EW / ACCU-D 1EW	A-EAST WING CLASSROOM GROUND FLOOR	307,600	108,700	3,350	3,350	1.5	86.5	80.2	56.9	55.6	4.20	1 x 35 1 x 30 1 x 30	1 x 22.0 1 x 19.0 1 x 19.0	460	3	60	1	1,628 1,964	DOAS UNIT WITH UV LIGHT AND WRAP AROUND HEAT PIPE
AHU-DOAS 2EW / ACCU-D 2EW	A-EAST WING CLASSROOM SECOND FLOOR	303,600	107,300	3,305	3,305	1.5	86.5	80.2	56.9	55.6	4.20	1 x 35 1 x 30 1 x 30	1 x 22.0 1 x 19.0 1 x 19.0	460	3	60	1	1,628 1,964	DOAS UNIT WITH UV LIGHT AND WRAP AROUND HEAT PIPE

DX-SPLIT AIR HANDLING UNIT AND AIR-COOLED CONDENSING UNIT: A-WING EAST CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS				POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR UNIT HP	INDOOR UNIT FLA	OUTDOOR UNIT FAN FLA	OUTDOOR UNIT RLA/LRA	VOLTS	PHASE	HERTZ			
AHU 3EW / ACCU 3EW	GROUND FLOOR	155,100	88,000	5,065	765	1.75	76.4	63.0	54.5	52.4	3.0	4.6	2.5	2 x 12.9	460	3	60	1	675 691	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE
AHU 4EW / ACCU 4EW	SECOND FLOOR	124,500	74,300	3,860	690	1.75	76.4	63.0	54.5	51.8	2.0	2.8	2.5	2 x 11.4	460	3	60	1	676 447	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE

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REVISIONS

No.	Description	Date

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Title:
MECHANICAL EQUIPMENT SCHEDULE - 8
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

VRF SYSTEM (FAN COIL UNIT) : A-WING WEST GROUND FLOOR CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR MCA/MOP	V / PH / HZ						
FCU 1WWL1	PERMACULTURE A109	34,900	28,100	1,260	415	75.3	62.6	55.3	53.1	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 2WWL1	PHYSICS A108	34,000	27,600	1,255	395	75.3	62.6	55.6	53.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 3WWL1	CHEMISTRY A107	32,200	25,000	1,025	2,890	75.3	62.6	53.7	51.7	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 4WWL1	BIOLOGY A106	31,700	25,700	1,070	415	75.3	62.6	54.4	52.3	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 5WWL1	BIOLOGY A114	28,600	21,800	875	415	75.3	62.6	53.0	51.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 6WWL1	BIOLOGY A113	27,500	20,700	805	415	75.3	62.6	52.5	50.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 7WWL1	ANATOMY A112	26,400	20,000	790	395	75.3	62.6	52.8	50.9	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 8WWL1	MARINE BIO A111	27,500	21,100	860	390	75.3	62.6	53.4	51.5	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 9WWL1	MARINE BIOLOGY A110	27,400	21,000	860	390	75.3	62.6	53.3	51.5	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : A-WING WEST CLASSROOMS GROUND FLOOR

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOP	RLA	V/PH/HZ	IEER			
ACCU 1WWL1	A-WEST WING GF PERMACULTURE A109 & PHYSICS A108	68,900	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 2WWL1	A-WEST WING GF CHEMISTRY A107 & BIOLOGY A106	63,900	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 3WWL1	A-WEST WING GF BIOLOGY A114	28,600	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 4WWL1	A-WEST WING GF BIOLOGY A113 & ANATOMY 112	53,900	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 5WWL1	A-WEST WING GF MARINE BIO A111 & MARINE A110	54,900	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1

VRF SYSTEM - DEDICATED OUTDOOR AIR SYSTEM UNIT (INDOOR) : A-WING WEST CLASSROOMS (CHEMISTRY)

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	MCA / MOP	V / PH / HZ						
DOAS 3WW	A-WEST -WING GROUND FLOOR CHEMISTRY ROOM	146,000	51,600	1,590	1,590	1.0	86.5	80.2	56.9	55.6	7.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	1	390	DOAS UNIT WITH HOT GAS REHEAT
DOAS 4WW	A-WEST -WING GROUND FLOOR CHEMISTRY ROOM	119,400	42,200	1,300	1,300	1.0	86.5	80.2	56.9	55.6	7.3 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	1	390	DOAS UNIT WITH HOT GAS REHEAT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : A-WING WEST CLASSROOMS GROUND FLOOR (CHEMISTRY)

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOCP	RLA	V/PH/HZ	IEER			
ACCU 6WWL1	A-WEST WING GF CHEMISTRY DOAS	265,400	2 x 28.5 / 2 x 16.4	2 x 35 / 2 x 25	1 x 11.4 1 x 9.2 1 x 9.1	460 / 3 / 60	22.5	507 + 639	VRV OUTDOOR UNIT	1

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Title:
MECHANICAL EQUIPMENT SCHEDULE - 9
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

VRF SYSTEM (FAN COIL UNIT) : A-WING WEST SECOND FLOOR CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR MCA/MOP	V / PH / HZ						
FCU 1WWL2	BUSINESS A211	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 2WWL2	BUSINESS A210	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 3WWL2	BUSINESS A209	34,900	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 4WWL2	BUSINESS A208	34,900	28,200	1,280	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 5WWL2	SOCIAL STUDIES A207	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 6WWL2	SOCIAL STUDIES A206	34,800	28,100	1,275	415	75.3	62.6	55.4	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 7WWL2	SOCIAL STUDIES A205	34,500	27,800	1,260	410	75.3	62.6	55.3	53.2	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 8WWL2	SOCIAL STUDIES A217	28,600	21,700	890	415	75.3	62.6	53.2	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 9WWL2	SOCIAL STUDIES A216	28,600	21,800	890	415	75.3	62.6	53.2	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 10WWL2	BUSINESS A215	28,600	21,800	895	415	75.3	62.6	53.2	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 11WWL2	BUSINESS A214	27,500	21,100	875	390	75.3	62.6	53.5	51.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 12WWL2	WORLD LANGUAGE A213	27,400	21,000	870	390	75.3	62.6	53.4	51.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT
FCU 13WWL2	WORLD LANGUAGE A212	28,600	21,700	890	415	75.3	62.6	53.2	51.4	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI POSITION AIR HANDLING INDOOR UNIT

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : A-WING WEST CLASSROOMS SECOND FLOOR

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOP	RLA	V/PH/HZ	IEER			
ACCU 1WWL2	A-WEST WING SF BUSINESS A211 & A210	69,600	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 2WWL2	A-WEST WING SF BUSINESS A209 & A208	69,800	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 3WWL2	A-WEST WING SF SOCIAL STUDIES A207 & A206	69,600	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 4WWL2	A-WEST WING SF SOCIAL STUDIES A205	34,500	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 5WWL2	A-WEST WING SF SOCIAL STUDIES A216 & A217	57,200	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 6WWL2	A-WEST WING SF BUSINESS A215 & 214	56,100	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 7WWL2	A-WEST WING SF WORLD LANGUAGE A213 & 212	56,000	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1

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TRMA
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Architecture
Planning
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MECHANICAL EQUIPMENT SCHEDULE - 10
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

DX-SPLIT AIR HANDLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) AND AIR-COOLED CONDENSING UNIT: A-WING WEST CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											INDOOR UNIT	OUTDOOR UNIT		VOLTS	PHASE	HERTZ			
		TOTAL	SENSIBLE				DB	WB	DB	WB	FLA	MOP	MCA						
AHU-DOAS 1WW / ACCU-D 1WW	A-WEST -WING CLASSROOM GROUND FLOOR	365,700	129,200	3,985	3,985	2.0	86.5	80.2	56.9	55.6	8.20	1 x 35 1 x 30 1 x 30	1 x 22.0 1 x 19.0 1 x 19.0	460	3	60	1	1551 1,964	DOAS-AHU WITH UV LIGHT AND WRAP AROUND HEAT PIPE
AHU-DOAS 2WW / ACCU-D 2WW	A-WEST -WING CLASSROOM SECOND FLOOR	491,500	173,700	5,350	5,350	2.0	86.5	80.2	56.9	55.6	8.20	1 x 35 1 x 30 1 x 30 1 x 30	1 x 22.0 1 x 19.0 1 x 19.0 1 x 19.0	460	3	60	1	1727 2,604	DOAS-AHU WITH UV LIGHT AND WRAP AROUND HEAT PIPE

DX-SPLIT AIR HANDLING UNIT AND AIR-COOLED CONDENSING UNIT: A-WEST WING CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS				POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
											INDOOR UNIT		OUTDOOR UNIT		VOLTS	PHASE	HERTZ			
		TOTAL	SENSIBLE				DB	WB	DB	WB	HP	FLA	FAN FLA	RLA/LRA						
AHU 3WW / ACCU 3WW	GROUND FLOOR	126,200	87,400	4,100	470	1.5	75.8	64.3	55.0	54.1	2.0	2.8	2.5	2 x 11.4	460	3	60	1	676 447	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE
AHU 4WW / ACCU 4WW	SECOND FLOOR	124,400	86,600	3,850	435	1.5	75.9	64.3	54.0	53.5	2.0	2.8	2.5	2 x 11.4	460	3	60	1	676 447	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE

VRF SYSTEM (FAN COIL UNIT) : B-WING GROUND FLOOR CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
										INDOOR	V / PH / HZ						
		TOTAL	SENSIBLE			DB	WB	DB	WB	MCA/MOP							
FCU 1BWL1	ENGLISH B109	38,000	30,900	1,425	395	75.3	62.6	55.7	53.5	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 2BWL1	ENGLISH B111	38,000	30,900	1,425	395	75.3	62.6	55.7	53.5	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 3BWL1	ENGLISH B112	38,000	30,900	1,425	395	75.3	62.6	55.7	53.5	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 4BWL1	ENGLISH B104	29,900	22,700	920	395	75.3	62.6	53.0	51.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 5BWL1	ENGLISH B105	29,700	22,500	910	390	75.3	62.6	52.9	51.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 6BWL1	ENGLISH B106	29,800	22,600	915	390	75.3	62.6	52.9	51.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 7BWL1	ENGLISH B107	34,400	27,400	1,235	385	75.3	62.6	55.0	53.0	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 8BWL1	ENGLISH B108	34,400	27,400	1,235	385	75.3	62.6	55.0	53.0	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 9BWL1	ENGLISH ESL B115	38,000	30,900	1,430	395	75.3	62.6	55.7	53.5	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 10BWL1	ENGLISH B114	38,000	30,900	1,430	395	75.3	62.6	55.7	53.5	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 11BWL1	ENGLISH B113	38,000	30,900	1,430	395	75.3	62.6	55.7	53.5	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 12BWL1	ENGLISH B103	29,700	22,500	910	390	75.3	62.6	52.9	51.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 13BWL1	ENGLISH B102	29,700	22,500	910	390	75.3	62.6	52.9	51.2	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 14BWL1	ENGLISH B101	30,000	22,700	925	395	75.3	62.6	53.0	51.3	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 11
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	
Date:	3/31/25
Project No. NO.	File

Drawing No.
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Sheet No._____ of 0

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EQUIPMENT SCHEDULE:

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VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : B-WING CLASSROOMS GROUND FLOOR

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOP	RLA	V/PH/HZ	IEER			
ACCU 1BWL1	B-WING GF ENGLISH B109 & B111	76,000	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 2BWL1	B-WING GF ENGLISH B112 & B113	76,000	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 3BWL1	B-WING GF ENGLISH B105 & B106	59,500	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 4BWL1	A-WEST WING GF ENGLISH B108 & B107	68,800	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 5BWL1	A-WEST WING GF ENGLISH ESL B115 & ENGLISH B114	76,000	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 6BWL1	A-WEST WING GF ENGLISH B103 & B104	59,600	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 7BWL1	A-WEST WING GF ENGLISH B102 & B101	59,700	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1

VRF SYSTEM (FAN COIL UNIT) : B-WING SECOND FLOOR CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL INFORMATION		REF. TYPE	REFRIGERANT SUCTION (INCH)	REFRIGERANT LIQUID (INCH)	ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE			DB	WB	DB	WB	INDOOR MCA/MOP	V / PH / HZ						
FCU 1BWL2	MATH B209	34,700	27,700	1,230	395	75.3	62.6	55.0	52.9	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 2BWL2	MATH B210	34,700	27,700	1,230	395	75.3	62.6	55.0	52.9	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 3BWL2	MATH B211	34,700	27,700	1,230	395	75.3	62.6	55.0	52.9	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 4BWL2	MATH B204	28,700	21,400	845	395	75.3	62.6	52.3	50.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 5BWL2	MATH B205	28,400	21,200	835	390	75.3	62.6	52.3	50.6	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 6BWL2	MATH B206	28,500	21,300	835	390	75.3	62.6	52.3	50.6	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 7BWL2	MATH B207	31,700	24,600	1,075	385	75.3	62.6	54.3	52.4	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 8BWL2	MATH B208	31,700	24,600	1,075	385	75.3	62.6	54.3	52.4	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 9BWL2	MATH B214	34,700	27,700	1,230	395	75.3	62.6	54.9	52.9	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 10BWL2	MATH B213	34,700	27,700	1,230	395	75.3	62.6	55.0	52.9	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 11BWL2	MATH B212	34,700	27,700	1,230	395	75.3	62.6	55.0	52.9	6.5 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	150	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 12BWL2	MATH B203	28,700	21,400	845	395	75.3	62.6	52.3	50.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 13BWL2	MATH B202	28,700	21,400	845	395	75.3	62.6	52.3	50.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT
FCU 14BWL2	MATH B201	28,700	21,400	845	395	75.3	62.6	52.3	50.7	4.9 / 15	208-230 / 1 / 60	R-410A	5/8	3/8	3/4	115	DUCTED TYPE, MULTI-POSITION AIR HANDLING INDOOR UNIT

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 12
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
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EQUIPMENT SCHEDULE:

VRF SYSTEM (AIR-COOLED CONDENSING UNIT) : B-WING CLASSROOMS SECOND FLOOR

MARK NO.	AREA SERVED	TOTAL COOLING CAPACITY (BTUH)	ELECTRICAL CHARACTERISTICS					WEIGHT (LBS)	REMARKS	QTY. NO
			MCA	MOP	RLA	V/PH/HZ	IEER			
ACCU 1BWL2	B-WING SF MATH B209 & B210	69,400	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 2BWL2	B-WING SF MATH B211 & B212	69,400	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 3BWL2	B-WING SF MATH B205 & B206	56,900	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 4BWL2	B-WING SF MATH B208 & B207	63,400	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 5BWL2	B-WING SF MATH B214 & B213	69,400	20.6	25	10.2	460 / 3 / 60	22.5	553	VRV OUTDOOR UNIT	1
ACCU 6BWL2	B-WING SF MATH B204 & B203	57,400	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1
ACCU 7BWL2	B-WING SF MATH B201 & B202	57,400	12.3	20	7.1	460 / 3 / 60	20.7	451	VRV OUTDOOR UNIT	1

DX-SPLIT AIR HANDLING UNIT (DEDICATED OUTDOOR AIR SYSTEM) AND AIR-COOLED CONDENSING UNIT: B-WING CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR UNIT FLA	OUTDOOR UNIT MOP	OUTDOOR UNIT MCA	VOLTS	PHASE	HERTZ			
AHU-DOAS 1BW / ACCU-D 1BW	B-WING CLASSROOM GROUND FLOOR WEST	288,100	101,800	3,140	3,140	2.0	86.5	80.2	56.9	55.6	8.20	1 x 25.0 1 x 25.0 1 x 20.0	1 x 18.0 1 x 18.0 1 x 14.0	460	3	60	1	1,380 1,993	WITH UV LIGHT AND WRAP AROUND HEAT PIPE
AHU-DOAS 2BW / ACCU-D 2BW	B-WING CLASSROOM GROUND FLOOR EAST	217,100	76,700	2,365	2,365	2.0	86.5	80.2	56.9	55.6	8.20	1 x 30.0 1 x 30.0	1 x 19.0 1 x 19.0	460	3	60	1	1,159 1,280	WITH UV LIGHT AND WRAP AROUND HEAT PIPE
AHU-DOAS 3BW / ACCU-D 3BW	B-WING CLASSROOM SECOND FLOOR WEST	288,300	101,900	3,140	3,140	2.0	86.5	80.2	56.9	55.6	8.20	1 x 25.0 1 x 25.0 1 x 20.0	1 x 18.0 1 x 18.0 1 x 14.0	460	3	60	1	1,380 1,993	WITH UV LIGHT AND WRAP AROUND HEAT PIPE
AHU-DOAS 4BW / ACCU-D 4BW	B-WING CLASSROOM SECOND FLOOR EAST	217,900	77,000	2,375	2,375	2.0	86.5	80.2	56.9	55.6	8.20	1 x 30.0 1 x 30.0	1 x 19.0 1 x 19.0	460	3	60	1	1,159 1,280	WITH UV LIGHT AND WRAP AROUND HEAT PIPE

DX-SPLIT AIR HANDLING UNIT AND AIR-COOLED CONDENSING UNIT: B-WING CLASSROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS				POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	INDOOR UNIT HP	INDOOR UNIT FLA	OUTDOOR UNIT FAN FLA	OUTDOOR UNIT COMP. RLA	VOLTS	PHASE	HERTZ			
AHU 3BW / ACCU 3BW	GROUND FLOOR EAST	77,100	52,700	2,670	295	1.0	76.0	62.8	54.5	52.9	2.0	3.1	1.3	2 x 6.1	460	3	60	1	323 311	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE
AHU 4BW / ACCU 4BW	GROUND FLOOR WEST	72,900	49,100	2,180	305	1.0	76.2	64.6	56.0	54.3	2.0	3.1	1.3	2 x 6.1	460	3	60	1	323 311	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE
AHU 5BW / ACCU 5BW	SECOND FLOOR EAST	72,200	48,400	2,320	290	1.0	76.1	64.8	52.0	51.9	2.0	3.1	1.3	2 x 6.1	460	3	60	1	323 311	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE
AHU 6BW / ACCU 6BW	SECOND FLOOR WEST	83,800	60,700	2,665	305	1.0	76.1	65.1	58.3	56.4	2.0	3.1	1.3	2 x 6.1	460	3	60	1	323 311	AIR HANDLING UNIT WITH UV LIGHT, MERV 14 AIR FILTER AND WRAP AROUND HEAT PIPE

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REVISIONS

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TRMA
Taniguchi Ruth Makio Architects
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Architecture
Planning
Interior Design

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 13
PROGRAMMING DOCUMENT

Designed: MPN/EDS/SQR
Drawn: SQR/JVP/EDN
Checked: MPN
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Date: 3/31/25
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EQUIPMENT SCHEDULE:

DEDICATED FAN COIL UNIT - SSHS TELECOM ROOMS

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
FCU 1 / ACCU 1	ADMIN 1F TELECOM ROOM	21,200	20,400	700	20	0.25	75.0	61.3	52.4	50.5	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 2 / ACCU 2	ADMIN 1F TELECOM ROOM	21,200	20,400	700	20	0.25	75.0	61.3	52.4	50.5	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 3 / ACCU 3	ADMIN 2F TELECOM ROOM	22,600	18,600	840	10	0.25	75.0	62.5	54.8	53.4	16.25	0.62	0.37	208-230	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 4 / ACCU 4	CAFETERIA & KITCHEN TELECOM ROOM	21,100	20,600	915	10	0.25	75.1	59.8	55.8	51.8	16.25	0.83	0.37	208-230	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 5 / ACCU 5	JROTC TELECOM ROOM	20,000	19,400	915	15	0.25	75.0	62.7	54.0	54.0	16.25	0.83	0.37	208-230	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 6 / ACCU 6	CREDIT RECOVERY TELECOM ROOM	26,800	25,900	915	25	0.25	75.0	60.4	51.9	50.3	16.25	0.83	0.37	208-230	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 7 / ACCU 7	PRESSBOX TELECOM ROOM	15,400	14,800	550	10	0.25	75.1	62.6	50.6	50.6	16.0	0.99	0.5	208-230	1	60	3/4	31 101	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 8 / ACCU 8	AUDITORIUM GROUND FLOOR TELECOM A194	20,100	18,500	795	10	0.25	75.8	62.0	54.2	53.1	16.25	0.62	0.37	208-230	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 9 / ACCU 9	GCC-TELECOM C130	26,200	20,500	915	55	0.25	77.3	64.1	54.5	54.4	16.25	0.83	0.37	208	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 10 / ACCU 10	GYM-TELECOM B142	24,000	20,800	915	15	0.25	75.0	61.2	54.2	50.5	16.25	0.83	0.37	208-230	1	60	5/8	49 142	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 11 / ACCU 11	A-EAST WING GROUND FLOOR TELECOM A134	18,200	17,800	600	10	0.25	75.1	62.5	54.5	52.0	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 12 / ACCU 12	A-EAST WING SECOND FLOOR TELECOM 1 A247	18,200	17,800	600	10	0.25	75.1	62.5	54.5	52.0	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 13 / ACCU 13	A-WEST WING GROUND FLOOR TELECOM 1 A148	19,400	19,100	600	10	0.25	75.1	62.7	55.0	51.5	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 14 / ACCU 14	A-WEST WING GROUND FLOOR TELECOM 2 A136	18,400	17,900	600	10	0.25	75.2	62.8	55.0	52.2	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 15 / ACCU 15	A-WEST WING SECOND FLOOR TELECOM 1 A259	19,500	19,100	600	10	0.25	75.1	62.7	54.0	51.4	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 16 / ACCU 16	A-WEST WING SECOND FLOOR TELECOM 2 A248	18,300	17,900	600	10	0.25	75.1	62.8	54.0	52.2	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 17 / ACCU 17	B-WING GROUND FLOOR TELECOM 1 A199	21,300	20,900	600	10	0.25	75.1	62.7	54.0	50.2	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 18 / ACCU 18	B-WING GROUND FLOOR TELECOM 2 A135	19,400	19,100	600	10	0.25	75.1	62.7	55.0	51.5	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 19 / ACCU 19	B-WING SECOND FLOOR TELECOM 3 A202	21,400	21,000	700	10	0.25	75.1	62.7	54.0	52.1	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT
FCU 20 / ACCU 20	B-WING SECOND FLOOR TELECOM 4 A182	19,300	19,000	600	10	0.25	75.1	62.7	56.0	51.5	16.0	1.0	0.5	208-230	1	60	3/4	31 106	DX-SPLIT WALL MOUNTED FAN COIL UNIT

DUCT SILENCER (SOUND ATTENUATORS):

MARK NO.	LOCATION	QUANTITY	TYPE	INSERTION LOSS (dB)								FACE VELOCITY (FPM	PRESSURE DROP (IN.W.G.)	DIMENSION (LxWxH) IN.	REMARKS
				63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ				
DS 1	AUDITORIUM	2	RECTANGULAR	5	8	16	27	34	33	23	18	1,500	0.56	36 x 24 x 36	THE KTR SHALL PROVIDE SHOP DRAWING FROM MANUFACTURER FOR DUCT SILENCER SELECTION

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 14
PROGRAMMING DOCUMENT

Designed: MPN/EDS/SQR
Drawn: SQR/JVP/EDN
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Supv: MPN
Scale:
Date: 3/31/25
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EQUIPMENT SCHEDULE:

EXHAUST FAN SCHEDULE - CAFETERIA

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP/WATT	VOLTAGE	PHASE	HERTZ	
EF 1C	1	MEN'S TOILET C126	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	280	0.5	1,501	1/10	115	1	60	EXHAUST FAN WITH CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 2C	1	WOMEN'S TOILET C124	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	280	0.5	1,501	1/10	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 3C	1	STAFF RR	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4C	1	WOMEN'S C118	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 5C	1	MEN'S C117	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 6C	1	JANITOR C123	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH CONTINUOUS OPERATION WITH SEPARATE SWITCH

KITCHEN EXHAUST AND MAKE-UP FAN SCHEDULE (CAFETERIA)

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	FAN RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP	VOLTAGE	PHASE	HERTZ	
KEF 1	4	KITCHEN	BELT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FAN	4,800	1.75	1,150	3	460	3	60	USE FOR CONVEYING GREASE LADEN EXHAUST AIR
KEF 2	1	SCULLERY	BELT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FAN	500	0.75	1,405	1/4	115	1	60	KITCHEN EXHAUST FAN
KSF 1	4	KITCHEN	BELT DRIVE FILTERED CENTRIFUGAL ROOF EXHAUST FAN	3,840	0.75	842	2	460	3	60	KITCHEN SUPPLY FAN WITH WASHABLE ALUMINUM FILTERS; INTERLOCK WITH KEF-1

AIR CURTAIN FAN SCHEDULE - CAFETERIA/KITCHEN

MARK NO.	QTY.	LOCATION	WIDTH (INCHES)	AIR FLOW RATE HIGH /LOW (CFM)	MAX. VELOCITY HIGH /LOW (FPM)	ELECTRICAL CHARACTERISTICS				REMARKS	EQUIPMENT SELECTION
						HP	VOLTAGE	PHASE	HERTZ		
ACF 1	4	ENTRANCE DOOR/EXIT DOOR CAFETERIA	72	2000/1480	2800/1850	2 x 1/4	208	1	60	PROVIDE AUTOMACTIC DOOR SWITCH, WITH MANUAL OVERRIDE SWITCH, FOR ACTIVATION OR DE-ACTIVATION OF UNIT UPON DOOR OPENING OR CLOSING	AIR CURTAIN FAN
ACF 2	1	ENTRANCE DOOR/EXIT DOOR KITCHEN	72	2000/1480	2800/1850	2 x 1/4	208	1	60	PROVIDE AUTOMACTIC DOOR SWITCH, WITH MANUAL OVERRIDE SWITCH, FOR ACTIVATION OR DE-ACTIVATION OF UNIT UPON DOOR OPENING OR CLOSING	AIR CURTAIN FAN

EXHAUST FAN SCHEDULE - ADMINISTRATION BUILDING

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (W)	VOLTAGE	PHASE	HERTZ	
EF 1A	1	LOBBY TOILET LEVEL 1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	70	0.7	825	(114 WATTS)	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 2A	1	WOMEN'S TOILET LEVEL1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	70	0.7	900	(46 WATTS)	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 3A	1	MEN'S TOILET LEVEL1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	70	0.7	900	(46 WATTS)	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 4A	1	ISOLATION TOILET LEVEL1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	70	0.7	900	(46 WATTS)	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 5A	1	ISOLATION TOILET WITH SHOWER LEVEL1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	120	0.6	900	(48 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 6A	1	JAN. CLOSET LEVEL 1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	70	0.7	900	(46 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 7A	1	STAFF RR LEVEL 2	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/15	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 8A	1	BED AREA A176 LEVEL 1	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	370	0.5	1,210	(90 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH

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Planning
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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 15
PROGRAMMING DOCUMENT

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Supv:	MPN
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Date:	3/31/25
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EQUIPMENT SCHEDULE:

EXHAUST FAN SCHEDULE - AUDITORIUM

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (WATTS)	VOLTAGE	PHASE	HERTZ	
EF 1AU	1	MEN'S TOILET LEVEL 1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	210	1.3	2,173	1/2	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 2AU	1	WOMEN'S TOILET LEVEL 1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	210	1.3	2,173	1/2	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 3AU	1	FAMILY RR LEVEL 1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4AU	1	DRESSING ROOM LEVEL 1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	140	0.7	1,560	1/15	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 5AU	1	JANITOR CLOSET	DIRECT DRIVE CENTRIFUGAL CEILING MOUNTED EXHAUST FAN	50	0.6	808	(6)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH

EXHAUST FAN SCHEDULE - GYMNASIUM

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP	VOLTAGE	PHASE	HERTZ	
EF 1GY	1	MEN'S TOILET AND LOCKER ROOM	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	1,300	1.0	1,510	3/4	115	1	60	EXHAUST FAN WITH VFD CONTINUOUS OPERATION WITH SEPARATE SWITCH.
EF 2GY	1	FAMILY RR	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	100	1.0	1,716	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 3GY	1	STAFF RR	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	100	1.0	1,716	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4GY	1	WOMEN'S TOILET AND LOCKER ROOM	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	1,250	1.0	1,491	3/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 5GY	1	FAMILY RR	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	100	1.0	1,716	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 6GY	1	STAFF RR	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	100	1.0	1,716	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 7GY	1	SOLAR WATER HEATER STORAGE ROOM B145	DIRECT DRIVE SIDEWALL EXHAUST FAN	210	0.5	1,094	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 8GY	1	SOLAR WATER HEATER STORAGE ROOM B146	DIRECT DRIVE SIDEWALL EXHAUST FAN	210	0.5	1,094	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 9GY	1	JANITOR CLOSET	DIRECT DRIVE CENTRIGUFAL INLINE EXHAUST FAN	50	0.6	1,320	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH

EXHAUST FAN SCHEDULE - PUMP ROOMS & GENERATOR ROOM

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP	VOLTAGE	PHASE	HERTZ	
WEF 1	1	PUMP ROOM NEAR CAFETERIA	SIDE WALL DIRECT DRIVE EXHAUST FAN	1,000	0.5	1,444	1/2	115	1	60	EXHAUST FAN WITH THERMOSTATIC CONTROLLER
WEF 2	1	PUMP ROOM NEAR GCC	SIDE WALL DIRECT DRIVE EXHAUST FAN	1,700	0.5	1,722	1/2	115	1	60	EXHAUST FAN WITH THERMOSTATIC CONTROLLER
WEF 3	1	PUMP ROOM LOWER EAST	SIDE WALL DIRECT DRIVE EXHAUST FAN	1,300	0.5	1,653	1/2	115	1	60	EXHAUST FAN WITH THERMOSTATIC CONTROLLER
WEF 4	1	PUMP ROOM UPPER EAST	SIDE WALL DIRECT DRIVE EXHAUST FAN	1,350	0.5	1,670	1/2	115	1	60	EXHAUST FAN WITH THERMOSTATIC CONTROLLER
WEF 5	1	FIRE PUMP ROOM	SIDE WALL DIRECT DRIVE EXHAUST FAN	3,950	0.5	1,750	1	115	1	60	EXHAUST FAN WITH THERMOSTATIC CONTROLLER
WEF 6	1	GENERATOR ROOM	SIDE WALL DIRECT DRIVE EXHAUST FAN	2,250	0.5	1,580	3/4	115	1	60	EXHAUST FAN WITH THERMOSTATIC CONTROLLER

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Title:
MECHANICAL EQUIPMENT SCHEDULE - 16
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

EXHAUST FAN SCHEDULE - B-WING CLASSROOMS

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP	VOLTAGE	PHASE	HERTZ	
EF 1CBF	1	MEN'S TOILET LEVEL1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	560	0.7	1,573	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 2CBF	1	WOMEN'S TOILET LEVEL1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	280	0.7	1,725	1/10	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 3CBF	1	STAFF RR LEVEL1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.6	1,320	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4CBF	1	JANITOR LEVEL1	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 1CBS	1	MEN'S TOILET LEVEL2	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	280	0.7	1,725	1/10	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 2CBS	1	WOMEN'S TOILET LEVEL2	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	280	0.7	1,725	1/10	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 3CBS	1	STAFF RR LEVEL2	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.6	1,320	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4CBS	1	JANITOR LEVEL2	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH

EXHAUST FAN SCHEDULE - A-WING CLASSROOMS

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (WATTS)	VOLTAGE	PHASE	HERTZ	
EF 1CAF	1	LEVEL 1: MEN'S & WOMEN'S TOILET EAST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	840	0.6	1,503	1/4	115	1	60	EXHAUST FAN WITH VFD CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 2CAF	1	LEVEL 1: MEN'S & WOMEN'S TOILET WEST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	840	0.6	1,503	1/4	115	1	60	EXHAUST FAN WITH VFD CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 3CAF	1	LEVEL 1: STAFF RR EAST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	100	1.0	1,716	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4CAF	1	LEVEL 1: STAFF RR WEST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.6	1,320	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 5CAF	1	LEVEL 1: JANITOR CLOSET EAST	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN	70	0.7	887	(12 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 6CAF	1	LEVEL 1: JANITOR CLOSET WEST	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN	70	0.7	887	(12 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 7CAF	1	LEVEL 1: SPED TOILET WEST	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN	210	0.7	1,403	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 8CAF	1	LEVEL 1: SOLAR WATER HEATER STORAGE WEST	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN	150	0.7	1,403	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 1CAS	1	LEVEL 2: MEN'S & WOMEN'S TOILET EAST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	630	0.75	1,675	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 2CAS	1	LEVEL 2: MEN'S & WOMEN'S TOILET WEST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	630	0.75	1,675	1/4	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 3CAS	1	LEVEL 2: STAFF RR EAST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4CAS	1	LEVEL 2: STAFF RR WEST	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 5CAS	1	LEVEL 2: JANITOR CLOSET EAST	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN	70	0.5	887	(12 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH
EF 6CAS	1	LEVEL 2: JANITOR CLOSET WEST	DIRECT DRIVE CENTRIFUGAL EXHAUST FAN	70	0.5	887	(12 WATTS)	115	1	60	EXHAUST FAN WITH CONTINOUS OPERATION WITH SEPARATE SWITCH

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No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 17

PROGRAMMING DOCUMENT

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Drawn:	SQR/JVP/EDN
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Supv:	MPN
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Date:	3/31/25
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EQUIPMENT SCHEDULE:

EXHAUST FAN SCHEDULE - SCIENCE AND SCIENCE PREP CLASSROOMS

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP	VOLTAGE	PHASE	HERTZ	
EF 2-L1	3	SCIENCE PREPARATIONS	DIRECT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FAN	280	1.0	1,672	1/4	115	1	60	EXHAUST FAN WITH SPARK RESISTANT
EF 1-L1	6	BIOLOGY A113, A114, PHYSICS, ANATOMY, MARINE BIO & MARINE BIOLOGY A110	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	1,150	1.0	1,725	1/2	115	1	60	EXHAUST FAN WITH SPARK RESISTANT
EF 2-SLC	1	CHEMISTRY ROOM	DIRECT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FAN	1,765	1.5	1,725	1	208	1	60	EXHAUST FAN WITH SPARK RESISTANT
EF 1-L7	2	CHEMISTRY ROOM FUME HOOD	TUBULAR CENTRIFUGAL BELT DRIVE EXHAUST FAN	720	1.0	2,679	1	460	3	60	EXHAUST FAN WITH SPARK RESISTANT

EXHAUST FAN SCHEDULE - GCC

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (WATTS)	VOLTAGE	PHASE	HERTZ	
EF 1GC	1	MENS C100C, WOMENS C100E TOILET & STAFF RESTROOM	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	490	0.7	1,510	1/4	115	1	60	EXHAUST FAN WITH VFD CONTINUOUS OPERATION WITH SEPARATE SWITCH.
EF 2GC	1	MENS C107-108, & WOMENS C107-108 TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	280	0.5	1,501	1/10	115	1	60	EXHAUST FAN WITH CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 3GC	1	MOCK RESTROOM	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,213	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH
EF 4GC	1	AIR COMPRESSOR ROOM A130A	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	2,550	1.0	1,273	1	115	1	60	EXHAUST FAN WITH THERMOSTATIC SWITCH.
EF 5GC	1	AIR COMPRESSOR ROOM A134A	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	2,550	1.0	1,273	1	115	1	60	EXHAUST FAN WITH THERMOSTATIC SWITCH.
EF 6GC	1	JANITOR CLOSET	DIRECT DRIVE CENTRIFUGAL CEILING MOUNTED EXHAUST FAN	50	0.3	950	(16)	115	1	60	EXHAUST FAN WITH VFD CONTINUOUS OPERATION WITH SEPARATE SWITCH.
RV 1GC	1	GCC AUTO	PROPELLER HOODED ROOF DIRECT DRIVE EXHAUST FAN	2,300	0.5	1,140	1/2	115	1	60	EXHAUST FAN WITH THERMOSTATIC SWITCH.
RV 2GC	1	CARPENTRY WORKSHOP	PROPELLER HOODED ROOF DIRECT DRIVE EXHAUST FAN	2,300	0.5	1,140	1/2	115	1	60	EXHAUST FAN WITH THERMOSTATIC SWITCH.

KITCHEN EXHAUST AND MAKE-UP FAN SCHEDULE (GCC)

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP	VOLTAGE	PHASE	HERTZ	
KEF 1	1	PROSTART KITCHEN	BELT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FAN	7,200	1.5	1,084	5	208	3	60	EXHAUST FAN USED FOR CONVEYING GREASE LADEN EXHAUST AIR
KEF 2	1	PROSTART KITCHEN (DISHWASHER)	BELT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FAN	320	0.7	1,550	1/15	115	1	60	KITCHEN EXHAUST FAN
KSF 1	1	PROSTART KITCHEN	BELT DRIVE FILTERED CENTRIFUGAL ROOF SUPPLY FAN	6,205	1.4	857	5	208	3	60	KITCHEN SUPPLY FAN WITH WASHABLE ALUMINUM FILTERS; INTERLOCK WITH KEF-1
KSF 2	1	PROSTART KITCHEN	DIRECT DRIVE CENTRIFUGAL INLINE SUPPLY FAN	285	0.6	1,557	1/10	208	1	60	KITCHEN SUPPLY FAN INTERLOCK WITH KEF 2

DUST COLLECTOR - GCC BUILDING

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN W.G)	RPM	SOUND LEVEL (AT 10')	FAN MOTOR ELECTRICAL CHARACTERISTICS				WEIGHT (LBS)	REMARKS
								AMPERE	VOLTAGE	PHASE	HERTZ		
DC 1	1	CARPENTRY WORK SHOP	DIRECT DRIVE CYCLONE DUST COLLECTOR	6,010	8.0	-	85 dBA	37.5	208	3	60	60	DIRECT DRIVE DUST COLLECTOR

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SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 18
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

VAV BOX SCHEDULE (GYMNASIUM)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1GY	MAT ROOM B148	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1605	435	12	0.01	DDC ZONE SENSOR	120	24
VAV 2GY	HALLWAY B137, LAUNDRY & STO B152	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	405	370	8	0.02	DDC ZONE SENSOR	120	24
VAV 3GY	TELECOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	915	95	10	0.01	DDC ZONE SENSOR	120	24
VAV 4GY	WEIGHT ROOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1580	1580	12	0.01	DDC ZONE SENSOR	120	24
VAV 5GY	MAIN ELEC B156	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	2050	195	12	0.01	DDC ZONE SENSOR	120	24
VAV 6GY	TABLE TENNIS B139	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1340	1340	10	0.01	DDC ZONE SENSOR	120	24
VAV 7GY	CLASSROOM B138	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1415	1335	12	0.01	DDC ZONE SENSOR	120	24
VAV 8GY	HALLWAY B137	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	495	490	8	0.02	DDC ZONE SENSOR	120	24
VAV 9GY	HALLWAY B154	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	250	250	6	0.05	DDC ZONE SENSOR	120	24
VAV 10GY	M. LOCKER ROOM B154	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1040	670	10	0.01	DDC ZONE SENSOR	120	24
VAV 11GY	W. LOCKER ROOM B154	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1000	665	10	0.01	DDC ZONE SENSOR	120	24
VAV 12GY	M. PE'S OFFICE	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	120	100	4	0.01	DDC ZONE SENSOR	120	24
VAV 13GY	W. PE'S OFFICE	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	120	100	4	0.01	DDC ZONE SENSOR	120	24
VAV 14GY	AEROBICS	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	345	345	6	0.14	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (DANCE/MUSIC AREA) SECOND FLOOR ADMIN BUILDING

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1D	DANCE A222, ELEC, VESTIBULE A222A, STOR A257,A259 & A261	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1,905	1,780	12	0.01	DDC ZONE SENSOR	120	24
VAV 2D	CHOIR A227, STOR A223C, A223D & VESTIBULE A263	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1,750	1,595	12	0.01	DDC ZONE SENSOR	120	24
VAV 3D	PRACTICE ROOMS A224B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	235	50	6	0.05	DDC ZONE SENSOR	120	24
VAV 4D	OFFICE A223A	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	50	4	0.01	DDC ZONE SENSOR	120	24
VAV 5D	OFFICE A224A	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	50	4	0.01	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (AUDITORIUM)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1AU	OFFICE - A192 VESTIBULE - A193	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	147	44	4	0.01	DDC ZONE SENSOR	120	24
VAV 2AU	LOBBY - A185	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	925	278	10	0.01	DDC ZONE SENSOR	120	24
VAV 3AU	STORAGE - A187	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	700	210	8	0.05	DDC ZONE SENSOR	120	24
VAV 4AU	RESTROM, VESTIBULE & LOBBY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	603	489	8	0.05	DDC ZONE SENSOR	120	24
VAV 5AU	TELECOM - A186B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	796	239	8	0.05	DDC ZONE SENSOR	120	24
VAV 6AU	ELEC - A186A	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	603	181	8	0.05	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (DANCE/MUSIC AREA) SECOND FLOOR ADMIN BUILDING

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 6D	RECORDING ROOM A262	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	285	190	6	0.05	DDC ZONE SENSOR	120	24
VAV 7D	VESTIBULE A185	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	270	110	6	0.05	DDC ZONE SENSOR	120	24
VAV 8D	PRACTICE ROOMS A224C	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	235	95	6	0.05	DDC ZONE SENSOR	120	24
VAV 9D	PRACTICE ROOMS A224E	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	235	95	6	0.05	DDC ZONE SENSOR	120	24
VAV 10D	BAND A224,STOR A184 & STOR A224D	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1,080	1,050	10	0.01	DDC ZONE SENSOR	120	24
VAV 11D	BAND A224	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	720	700	8	0.05	DDC ZONE SENSOR	120	24
VAV 12D	MECH ROOM A260	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	265	240	6	0.05	DDC ZONE SENSOR	120	24
VAV 13D	STOR A223E	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	100	50	4	0.01	DDC ZONE SENSOR	120	24

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GDOE
SIMON SANCHEZ HIGH SCHOOL

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MECHANICAL EQUIPMENT SCHEDULE - 19
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

VAV BOX SCHEDULE (WEST WING GROUND FLOOR CLASSROOM)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1WWL1	MECH A146 ELEC A147 CORRIDOR, STAFF RR STO A145	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	715	215	8	0.05	DDC ZONE SENSOR	120	24
VAV 2WWL1	TELECOM A148	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24
VAV 3WWL1	HALLWAY SCIENCE STO MEN'S A153 WOMEN'S A151	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1175	275	10	0.01	DDC ZONE SENSOR	120	24
VAV 4WWL1	HALLWAY A100B ELEC A133, STO. A136 STAIRS A131	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	875	260	8	0.05	DDC ZONE SENSOR	120	24
VAV 5WWL1	TELECOM A148	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (WEST WING SECOND FLOOR CLASSROOM)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1WWL2	MECH A241, ELEC A242 CORRIDOR, STAFF RR STO A240	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	710	215	8	0.05	DDC ZONE SENSOR	120	24
VAV 2WWL2	TELECOM A247	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24
VAV 3WWL2	HALLWAY A200 MEN'S A247 WOMEN'S A245	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	900	270	8	0.05	DDC ZONE SENSOR	120	24
VAV 4WWL2	HALLWAY A200 ELEC A237 STAIRS A135	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	805	240	8	0.05	DDC ZONE SENSOR	120	24
VAV 5WWL2	TELECOM A236	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (GCC)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1GC	CARPENTRY OFFICE, CARP., HALLWAY & STO.	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	725	395	8	0.05	DDC ZONE SENSOR	120	24
VAV 2GC	VESTIBULES & TOILETS	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	340	105	8	0.02	DDC ZONE SENSOR	120	24
VAV 3GC	TELECOM C100F	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1000	165	10	0.01	DDC ZONE SENSOR	120	24
VAV 4GC	AUTOMOTIVE OFFICE HALLWAY & STORAGES	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	530	180	8	0.02	DDC ZONE SENSOR	120	24
VAV 5GC	STORAGE & HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1180	315	10	0.01	DDC ZONE SENSOR	120	24
VAV 6GC	STORAGE & HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	615	165	8	0.05	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (EAST WING GROUND FLOOR CLASSROOM)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1EWL1	CONFERENCE RM/ LOUNGE A180	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	400	120	6	0.14	DDC ZONE SENSOR	120	24
VAV 2EWL1	CRT OFFICE A181A	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	25	4	0.01	DDC ZONE SENSOR	120	24
VAV 3EWL1	CRT OFFICE A181B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	100	30	4	0.01	DDC ZONE SENSOR	120	24
VAV 4EWL1	TESTING ROOM A183A & ESL A183	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	180	55	4	0.01	DDC ZONE SENSOR	120	24
VAV 5EWL1	CRT OFFICE A181D	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	100	30	4	0.01	DDC ZONE SENSOR	120	24
VAV 6EWL1	CRT OFFICE A181E	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	25	4	0.01	DDC ZONE SENSOR	120	24
VAV 7EWL1	WAITING A178 STAIRS A123	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	730	165	8	0.05	DDC ZONE SENSOR	120	24
VAV 8EWL1	MEN'S A128 WOMEN'SA126 VESTIBULE A125	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	650	195	8	0.05	DDC ZONE SENSOR	120	24
VAV 9EWL1	TELECOM A134	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24
VAV 10EWL1	HALLWAY A100 ART STO. A101A & A101B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1000	360	10	0.01	DDC ZONE SENSOR	120	24
VAV 11EWL1	MECH, ELEC CORRIDOR, STAFF RR STO 131	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	625	195	8	0.05	DDC ZONE SENSOR	120	24
VAV 12EWL1	HALLWAY STO A182 VESTIBULE A183	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	400	135	8	0.02	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (GCC)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 7GC	ELEC, PANTRY & STORAGE C100B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	910	150	10	0.01	DDC ZONE SENSOR	120	24
VAV 8GC	HALWAY, MENS & WOMENS TOILET C100E	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	880	580	8	0.05	DDC ZONE SENSOR	120	24
VAV 9GC	LAUNDRY AREA, MOCK & STO. ROOM, HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	370	290	6	0.14	DDC ZONE SENSOR	120	24
VAV 10GC	HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	220	220	6	0.05	DDC ZONE SENSOR	120	24
VAV 11GC	STORAGE & HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	465	425	6	0.14	DDC ZONE SENSOR	120	24

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MECHANICAL EQUIPMENT SCHEDULE - 20
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EQUIPMENT SCHEDULE:

VAV BOX SCHEDULE (EAST WING SECOND FLOOR CLASSROOM)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1EWL2	MECH A233, ELEC A234 VESTIBULE A231 STAFF RR & STO A236	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	675	200	8	0.05	DDC ZONE SENSOR	120	24
VAV 2EWL2	TELECOM A235	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24
VAV 3EWL2	HALLWAY A200	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	550	160	8	0.02	DDC ZONE SENSOR	120	24
VAV 4EWL2	MEN'S A230 WOMEN'S A228 VESTIBULE A227	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	450	135	6	0.14	DDC ZONE SENSOR	120	24
VAV 5EWL2	STAIRS BAND STORAGE A262 VESTIBULE A183	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	640	192	8	0.05	DDC ZONE SENSOR	120	24
VAV 6EWL2	HALLWAY, BOOK STORAGE A263-A263 STORAGE A265, A266, A267	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	950	290	10	0.01	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (B-WING CLASSROOM BUILDING -GROUND FLOOR)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1BW	VESTIBULE B128 HALLWAY B100	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	550	165	8	0.02	DDC ZONE SENSOR	120	24
VAV 2BW	TELECOM B132	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24
VAV 3BW	ELEC B132	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	60	25	6	0.01	DDC ZONE SENSOR	120	24
VAV 4BW	MECH B129	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	635	190	8	0.05	DDC ZONE SENSOR	120	24
VAV 5BW	VESTIBULE, STO. B124 & STAFF RR	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	150	45	4	0.01	DDC ZONE SENSOR	120	24
VAV 6BW	TELECOM B127 & ELEC	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	670	200	8	0.05	DDC ZONE SENSOR	120	24
VAV 7BW	MEN'S B119 WOMEN'S B117 & HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	740	230	8	0.05	DDC ZONE SENSOR	120	24
VAV 8BW	HALLWAY B100	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	640	190	8	0.05	DDC ZONE SENSOR	120	24
VAV 9BW	MECH B125	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	470	140	8	0.02	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (B-WING CLASSROOM BUILDING -SECOND FLOOR)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 10BW	MECH B222	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	530	160	8	0.02	DDC ZONE SENSOR	120	24
VAV 11BW	VESTIBULE ELEC B221 STAFF RR B224 CHAIR STORAGE B223	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	225	70	6	0.05	DDC ZONE SENSOR	120	24
VAV 12BW	TELECOM B226	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	600	180	8	0.05	DDC ZONE SENSOR	120	24
VAV 13BW	STAIRS & HALLWAY 200	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	830	250	8	0.05	DDC ZONE SENSOR	120	24
VAV 14BW	MEN'S B219 WOMEN'S B217	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	400	120	8	0.02	DDC ZONE SENSOR	120	24
VAV 15BW	VESTIBULE B225 HALLWAY B200B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	530	160	8	0.02	DDC ZONE SENSOR	120	24
VAV 16BW	MECH B226	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	655	195	8	0.05	DDC ZONE SENSOR	120	24
VAV B17W	VESTIBULE & ELEC B228	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	110	35	4	0.01	DDC ZONE SENSOR	120	24
VAV B18W	TELECOM B229	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	700	210	8	0.05	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (JROTC BUILDING)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1J	FIELD AND DRILL EQUIP. STORAGE	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	940	285	10	0.01	DDC ZONE SENSOR	120	24
VAV 2J	HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	175	85	4	0.01	DDC ZONE SENSOR	120	24
VAV 3J	STAFF COLLABORATION	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	480	145	6	0.14	DDC ZONE SENSOR	120	24
VAV 4J	ELEC ROOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	380	115	6	0.14	DDC ZONE SENSOR	120	24
VAV 5J	TELECOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1000	300	10	0.01	DDC ZONE SENSOR	120	24
VAV 6J	BATTALION HQ	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	340	170	6	0.05	DDC ZONE SENSOR	120	24
VAV 7J	JROTC SUPPLY ROOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	420	335	6	0.14	DDC ZONE SENSOR	120	24
VAV 8J	INSTRUCTOR OFFICES	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	460	140	6	0.14	DDC ZONE SENSOR	120	24
VAV 9J	ARMS ROOM & HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	145	70	4	0.01	DDC ZONE SENSOR	120	24
VAV 10J	HALLWAY, LOCKER ROOMS, VESTIBULE AND RESTROOMS	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	915	390	10	0.01	DDC ZONE SENSOR	120	24

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REVISIONS

No.	Description	Date

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Planning
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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 21
PROGRAMMING DOCUMENT

Designed:	MPN/EDS/SQR
Drawn:	SQR/JVP/EDN
Checked:	MPN
Supv:	MPN
Scale:	
Date:	3/31/25
Project No.	NO.
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EQUIPMENT SCHEDULE:

VAV BOX SCHEDULE (ADMIN SECOND FLOOR - LIBRARY)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1AL	BOOK ROOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	260	80	6	0.05	DDC ZONE SENSOR	120	24
VAV 2AL	COMPUTER LAB	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	2030	605	14	0.01	DDC ZONE SENSOR	120	24
VAV 3AL	TECH	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	235	70	6	0.05	DDC ZONE SENSOR	120	24
VAV 4AL	LIBRARIAN	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	110	25	4	0.01	DDC ZONE SENSOR	120	24
VAV 5AL	TELECOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	840	250	8	0.05	DDC ZONE SENSOR	120	24
VAV 6AL	MEDIA CENTER	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	235	70	6	0.05	DDC ZONE SENSOR	120	24
VAV 7AL	LIBRARY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	990	295	10	0.01	DDC ZONE SENSOR	120	24
VAV 8AL	LIBRARY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	990	295	10	0.01	DDC ZONE SENSOR	120	24
VAV 9AL	LIBRARY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1300	390	10	0.01	DDC ZONE SENSOR	120	24
VAV 10AL	LIBRARY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	650	195	8	0.05	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (ADMINISTRATION BUILDING FIRST FLOOR)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1A	LOBBY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1,794	538	12	0.01	DDC ZONE SENSOR	120	24
VAV 2A	CONFERENCE ROOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1,061	565	10	0.01	DDC ZONE SENSOR	120	24
VAV 3A	PRINCIPAL	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	303	91	6	0.05	DDC ZONE SENSOR	120	24
VAV 4A	TELECOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1400	420	12	0.01	DDC ZONE SENSOR	120	24
VAV 5A	OFFICE A165	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	36	4	0.01	DDC ZONE SENSOR	120	24
VAV 6A	WORKROOM AND RESOURCE CENTER	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	916	275	10	0.01	DDC ZONE SENSOR	120	24
VAV 7A	FACULTY & STAFF LOUNGE	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	1,280	713	10	0.01	DDC ZONE SENSOR	120	24
VAV 8A	AP A156	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	242	73	6	0.05	DDC ZONE SENSOR	120	24
VAV 9A	AP A157	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	242	73	6	0.05	DDC ZONE SENSOR	120	24
VAV 10A	AP A158	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	242	73	6	0.05	DDC ZONE SENSOR	120	24
VAV 11A	AP A159	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	242	73	6	0.05	DDC ZONE SENSOR	120	24
VAV 12A	SPED A160	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	242	73	6	0.05	DDC ZONE SENSOR	120	24
VAV 13A	HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	173	127	4	0.01	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (ADMINISTRATION BUILDING FIRST FLOOR)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 14A	BUSINESS A161 & STORAGE	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	258	89	6	0.05	DDC ZONE SENSOR	120	24
VAV 15A	VESTIBULE A173	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	72	22	4	0.01	DDC ZONE SENSOR	120	24
VAV 16A	WAITING AREA & NURSE A174	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	304	164	6	0.05	DDC ZONE SENSOR	120	24
VAV 17A	BED AREA A175	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	333	333	6	0.05	DDC ZONE SENSOR	120	24
VAV 18A	CUMULATIVE FOLDER STORAGE	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	619	405	8	0.05	DDC ZONE SENSOR	120	24
VAV 19A	COUNSELOR'S HALLWAY	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	140	67	4	0.01	DDC ZONE SENSOR	120	24
VAV 20A	COUNSELOR'S OFFICES A180F,A180G & A180H	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	703	211	8	0.05	DDC ZONE SENSOR	120	24
VAV 21A	COUNSELOR OFFICE A180B	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	52	4	0.01	DDC ZONE SENSOR	120	24
VAV 22A	COUNSELOR'S OFFICE A180E	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	255	76	6	0.05	DDC ZONE SENSOR	120	24
VAV 23A	COUNSELOR'S OFFICE A180D	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	256	77	6	0.05	DDC ZONE SENSOR	120	24
VAV 24A	COUNSELOR'S OFFICE A180A	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	80	52	4	0.01	DDC ZONE SENSOR	120	24
VAV 25A	COUNSELOR'S OFFICE A180C	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	254	76	6	0.05	DDC ZONE SENSOR	120	24
VAV 26A	ISOLATION ROOM & ANTE ROOM	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	177	106	4	0.01	DDC ZONE SENSOR	120	24
VAV 27A	STORAGE A167	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	82	82	4	0.01	DDC ZONE SENSOR	120	24

VAV BOX SCHEDULE (CAFETERIA & KITCHEN)

MARK NO.	AREA SERVED	TYPE	CAPACITY (CFM)		INLET SIZE DIAMETER (IN.)	PRESSURE DROP (IN.W.G.)	THERMOSTAT CONTROL	LINE VOLTAGE (V)	CONTROL VOLTAGE (V)
			MAX	MIN					
VAV 1C	CAFETERIA	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	4000	1280	16	0.01	DDC ZONE SENSOR	120	24
VAV 2C	CAFETERIA	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	4000	1280	16	0.01	DDC ZONE SENSOR	120	24
VAV 3C	CAFETERIA	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	4000	1280	16	0.01	DDC ZONE SENSOR	120	24
VAV 4C	SERVING AREA	SINGLE DUCT COOLING ONLY VAV TERMINAL UNIT	828	265	8	0.05	DDC ZONE SENSOR	120	24

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MECHANICAL EQUIPMENT SCHEDULE - 22
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Date:	3/31/25
Project No.	NO.
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EQUIPMENT SCHEDULE:

RANGEHOOD - A-WING CLASSROOM

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. WG)	FAN MOTOR ELECTRICAL CHARACTERISTICS					REMARKS
						OPERATING CURRENT (AMPS)	FAN OPERATING CURRENT (AMPS)	VOLTAGE	PHASE	HERTZ	
RH 1	1	SPED 105	WALL MOUNT INLINE DUCTED TYPE	400-280	0.5	3.1	2.5	120	1	60	PRE-ENGINEERED RANGE HOOD MULTI-SPEED

EXHAUST FAN SCHEDULE - JROTC BUILDING

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (WATTS)	VOLTAGE	PHASE	HERTZ	
EF 1J	1	MEN'S TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	210	0.5	1,567	1/10	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 2J	1	WOMEN'S TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	210	0.5	1,567	1/10	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 3J	1	STAFF RR	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	70	0.5	1,320	1/4	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 4J	1	MEN'S LOCKER ROOM	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	620	0.65	1,591	1/4	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 5J	1	WOMEN'S LOCKER ROOM	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	550	0.6	1,485	1/4	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 6J	1	JANITOR CLOSET	DIRECT DRIVE CENTRIFUGAL CEILING EXHAUST FAN	50	0.3	950	(16)	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH

EXHAUST FAN SCHEDULE - CREDIT RECOVERY

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (WATTS)	VOLTAGE	PHASE	HERTZ	
EF 1CR	1	MEN'S TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	140	0.5	1,372	1/4	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 2CR	1	WOMEN'S TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	140	0.5	1,372	1/4	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 3CR	1	STAFF RESTROOM D111	DIRECT DRIVE CEILING EXHAUST FAN	70	0.5	838	(6 WATTS)	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 4CR	1	STAFF RESTROOM D112	DIRECT DRIVE CEILING EXHAUST FAN	70	0.5	838	(6 WATTS)	115	1	60	EXHAUST FAN WITH SEPARATE SWITCH.
EF 5CR	1	JANITOR CLOSET	DIRECT DRIVE CEILING EXHAUST FAN	70	0.5	838	(6 WATTS)	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH

EXHAUST FAN SCHEDULE - PRESS BOX

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							HP (WATTS)	VOLTAGE	PHASE	HERTZ	
EF 1PB	1	MEN'S TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	700	0.75	1,238	1/2	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 2PB	1	WOMEN'S TOILET	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	700	0.75	1,238	1/2	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 3PB	1	STORAGE	DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN	160	0.5	1,502	1/10	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH
EF 4PB	1	JANITOR CLOSET	DIRECT DRIVE CEILING EXHAUST FAN	50	0.3	900	(15 WATTS)	115	1	60	EXHAUST FAN CONTINUOUS OPERATION WITH SEPARATE SWITCH

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REVISIONS

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MECHANICAL EQUIPMENT SCHEDULE - 23
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE:

PACKAGED COOLING UNITS: GYM BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY. x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU 1GY	GYM CLASSROOMS	279,500	206,400	10,285	1,980	2.0	74.3	60.8	54.2	51.1	2 x 18.6	2 x 2.5	1 x 11	460	3	60	1	2,054	PACKAGED COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 2GY	GYMNASIUM	291,900	185,300	9,075	1,870	1.5	75.8	64.8	54.0	54.0	2 x 18.6	2 x 2.5	1 x 11	460	3	60	1	2,054	PACKAGED COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 3GY	GYMNASIUM	291,900	185,300	9,075	1,870	1.5	75.8	64.8	54.0	54.0	2 x 18.6	2 x 2.5	1 x 11	460	3	60	1	2,054	PACKAGED COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT
PCU 4GY	LOCKER ROOMS, OFFICES, HALLWAY AND STORAGE	82,900	47,800	2,525	115	1.5	75.4	63.0	54.2	51.7	1 x 12.2	1 x 1.5	1 x 1.6	460	3	60	3/4	751	PACKAGED COOLING UNIT WITH UV LIGHTS AND HOT GAS REHEAT

PACKAGED COOLING UNITS (DEDICATED OUTDOOR AIR SYSTEM) : GYM BUILDING

MARK NO.	AREA SERVED	COOLING CAPACITY (BTUH)		SA (CFM)	OA (CFM)	EXT S.P. (IN W.G.)	ENTERING AIR TEMPERATURE (°F)		LEAVING AIR TEMPERATURE (°F)		ELECTRICAL CHARACTERISTICS			POWER SUPPLY			ACD PIPE (IN. DIA.)	WEIGHT (LBS)	REMARKS
		TOTAL	SENSIBLE				DB	WB	DB	WB	QTY. x COMP RLA	FAN MOTOR - FLA COND	FAN MOTOR - FLA EVAP	VOLTS	PHASE	HERTZ			
PCU-DOAS 1GY	GYM CLASSROOM, HALLWAYS, OFFICES	181,800	64,200	1,980	1,980	1.0	86.5	80.2	56.9	55.6	2 x 12.6	2 x 2.1	1 x 7.0	460	3	60	3/4	2,778	PACKAGED COOLING UNIT (DOAS) WITH UV LIGHTS AND HOT GAS REHEAT
PCU-DOAS 2GY	GYMNASIUM	343,300	121,300	3,740	3,740	1.0	86.5	80.2	57.9	56.6	2 x 26.9	3 x 2.1	1 x 7.0	460	3	60	3/4	3,124	PACKAGED COOLING UNIT (DOAS) WITH UV LIGHTS AND HOT GAS REHEAT
PCU-DOAS 3GY	LOCKER ROOMS, OFFICES, HALLWAY	201,100	73,800	2,155	2,155	1.0	86.3	80.1	55.0	55.0	2 x 14.7	3 x 2.1	1 x 7.0	460	3	60	3/4	3,076	PACKAGED COOLING UNIT (DOAS) WITH UV LIGHTS AND HOT GAS REHEAT

DRYER EXHAUST BOOSTER FAN SCHEDULE - GYMNASIUM LAUNDRY ROOM

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (CFM)	ESP (IN. W.G.)	MOTOR RPM	FAN MOTOR ELECTRICAL CHARACTERISTICS				REMARKS
							INPUT POWER (WATTS)	VOLTAGE	PHASE	HERTZ	
DEBF 1GY	1	LAUNDRY AREA	INLINE BOOSTER EXHAUST FAN	105	0.6	2,900	82	120	1	60	INTERLOCK WITH DRYER UNIT

NOTES:
1. BOOSTER FAN CAPACITY SHALL MATCH THE EXHAUST CAPACITY OF THE DRYER UNIT.
2. INSTALLATION OF BOOSTER FAN SHALL BE AS PER MANUFACTURERS INSTALLATION MANUAL.
3. SECONDARY LINT TRAP SHALL BE CONSIDERED WHEN INSTALLING A BOOSTER FAN. REFER TO BOOSTER FAN MANUFACTURER REQUIREMENTS.

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SIMON SANCHEZ HIGH SCHOOL

Title:
MECHANICAL EQUIPMENT SCHEDULE - 24
PROGRAMMING DOCUMENT

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Drawing No.
M7.24
Sheet No. ____ of 0

LEGEND AND ABBREVIATIONS

SYMBOL	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION
	S,W	WASTE / SEWAGE LINE		MIN	MINIMUM
	V	VENT LINE		MISC	MISCELLANEOUS
	CW	COLD WATER LINE		MS	MOP SINK
	HW	HOT WATER LINE		N.C.	NORMALLY CLOSED VALVE
	LPG	LIQUIFIED PETROLUEM GAS LINE		NTS	NOT TO SCALE
	SD / RW	STORM DRAIN/ RAINWATER COLLECTION LINE		O.C.	ON CENTER
	NPW	NONPOTABLE WATER LINE		OD	OVERFLOW DRAIN
	GV	GATE VALVE / GLOBE VALVE		PH	PHASE
	Ø	DIAMETER		PSI	POUNDS PER SQUARE INCH
	AFF	ABOVE FINISH FLOOR		PG	PRESSURE GAUGE
	CA	COMPRESSED AIR LINE		QTY	QUANTITY
	CON'T.	CONTINUATION/ CONTINUED		RW	RAIN WATER
	CO	CLEAN-OUT		RD	ROOF DRAIN
	COTG	CLEAN-OUT TO GRADE		SD	SCUPPER DRAIN
	DW	DISHWASHER		SHO	SHOWER
	DN	DOWN		SHD	SHOWER DRAIN
	DS	DOWNSPOUT		SOV	SHUT OFF VALVE
	DWG	DRAWING		SS	SOIL STACK
	DF	DRINKING FOUNTAIN		SQ.FT.	SQUARE FEET
	DT	DILUTION TANK		SSTL	STAINLESS STEEL
	EA	EACH		ST	STRAINER
	ET	EXPANSION TANK		SPECS	SPECIFICATIONS
	FT	FEET		T&P	TEMPERATURE AND PRESSURE RELIEF VALVE
	FFL	FINISH FLOOR LINE		THK	THICK (-NESS)
	FCO	FLOOR CLEAN-OUT		TDH	TOTAL DYNAMIC HEAD
	FD	FLOOR DRAIN		TYP	TYPICAL
	FS	FLOOR SINK		UV	ULTRAVIOLET LIGHT
	FWD	FOOD WASTE DISPOSER		U/G	UNDERGROUND
	FND	FUNNEL DRAIN		U/S	UNDER SLAB
	GAL	GALLONS		V	VENT
	GPM	GALLONS PER MINUTE		VTR	VENT THRU ROOF
	GEPA	GUAM ENVIRONMENTAL PROTECTION AGENCY		W	WASTE
	HB	HOSE BIBB		WM	WASHING MACHINE
	HZ	HERTZ		WMB	WASHING MACHINE UTILITY BOX
	HP	HORSEPOWER		WCO	WALL CLEAN OUT
	I/C	IN CEILING		WS	WASTE STACK
	IN	INCHES		WC	WATER CLOSET
	KS	KITCHEN SINK		WF	WATER FILTER
	KW	KILOWATT		WHA-X	WATER HAMMER ARRESTOR, X - PLUMBING AND DRAINAGE INSTITUTE RATING
	LAV	LAVATORY		Z	ZONE
	LFD	LINEAR FLOOR DRAIN			

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PLUMBING LEGEND AND ABBREVIATIONS
PROGRAMMING DOCUMENT

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Project No.	File
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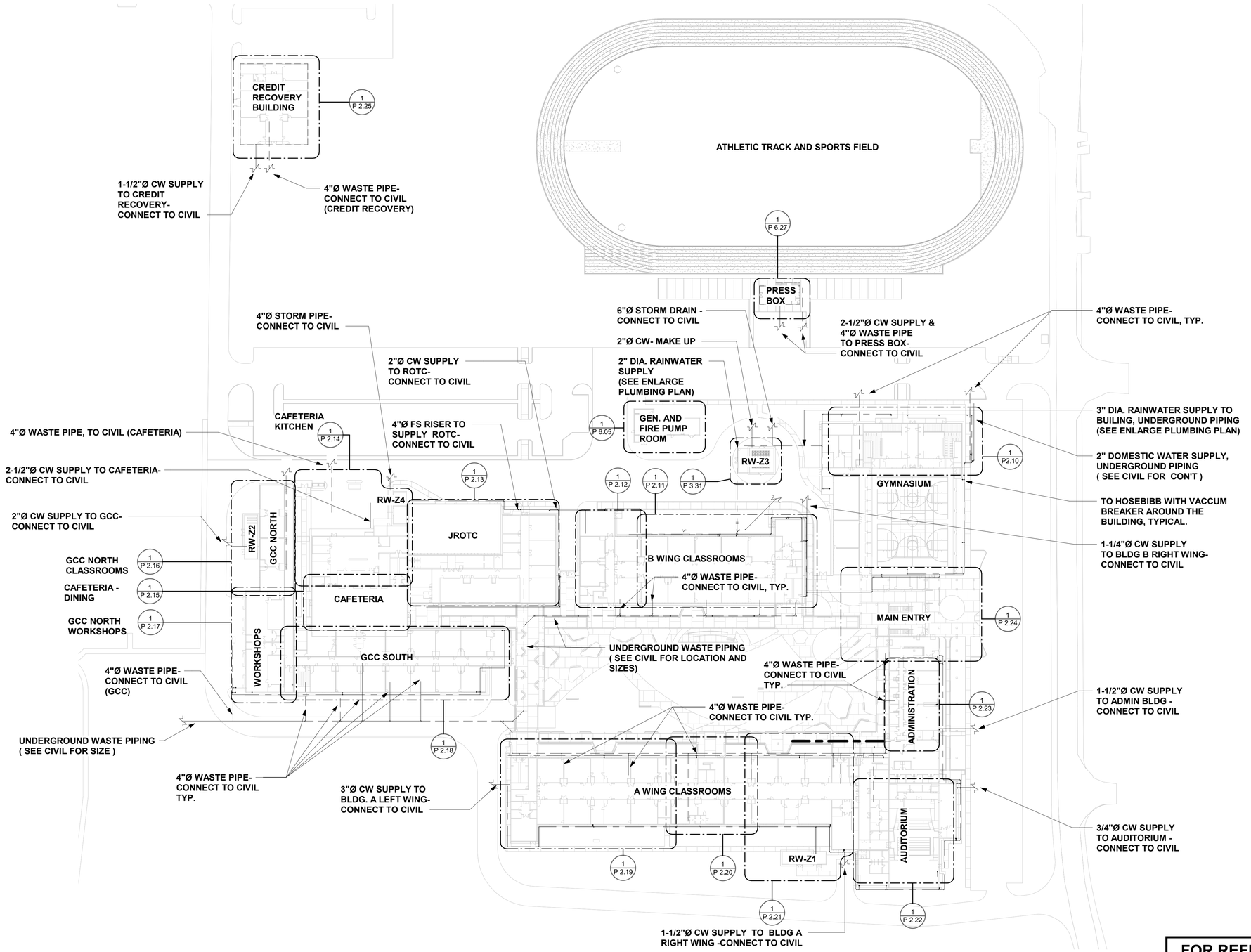

1 OVERALL PLUMBING SITE PLAN LEVEL 1

SCALE: 1" = 60'-0"

NORTH

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

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OVERALL PLUMBING SITE PLAN LEVEL 1
PROGRAMMING DOCUMENTS

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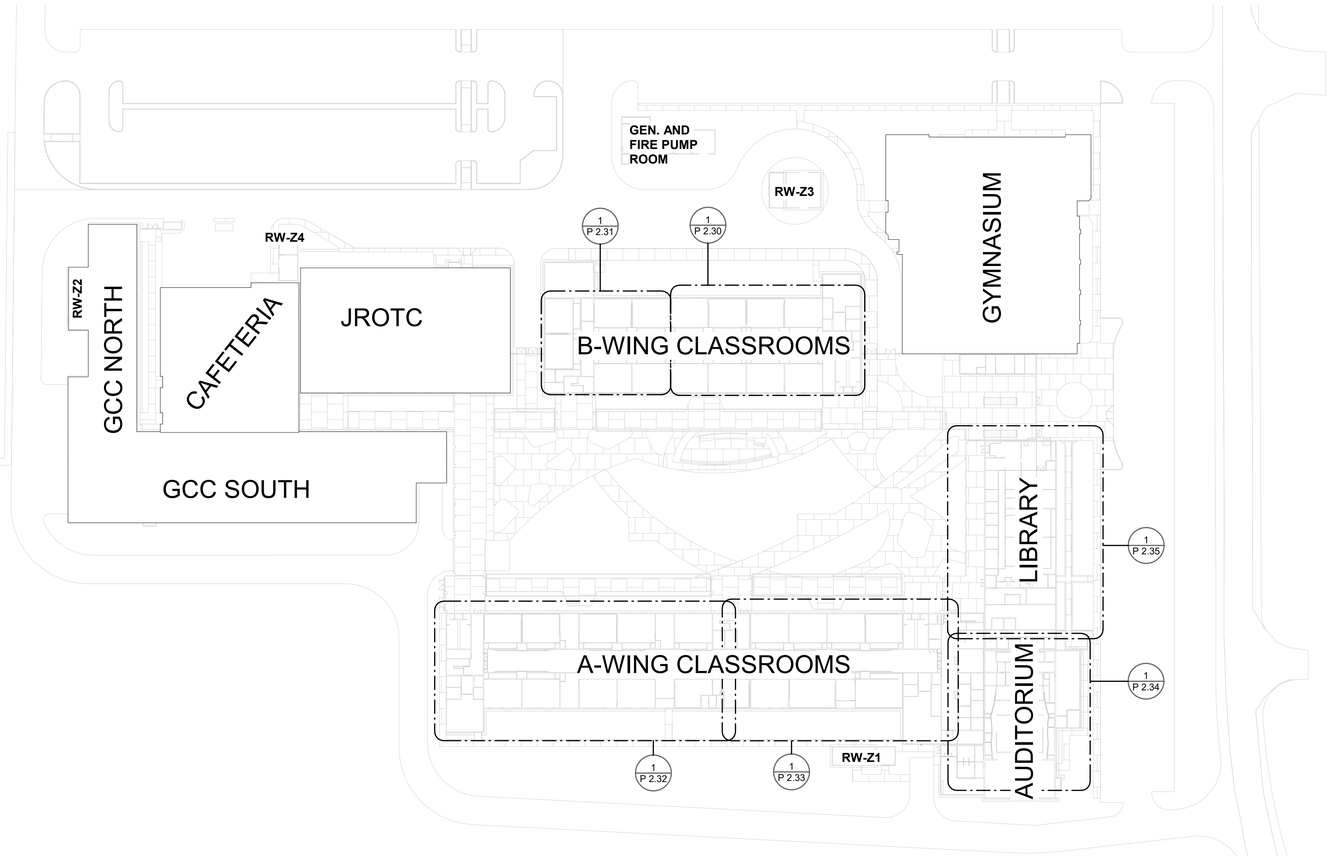
Sheet No. of



1 OVERALL PLUMBING SITE PLAN LEVEL 2

SCALE: 1" = 60'-0"

NORTH

GRAPHIC SCALE

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

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Title:
OVERALL PLUMBING PLAN LEVEL 2

PROGRAMMING DOCUMENTS

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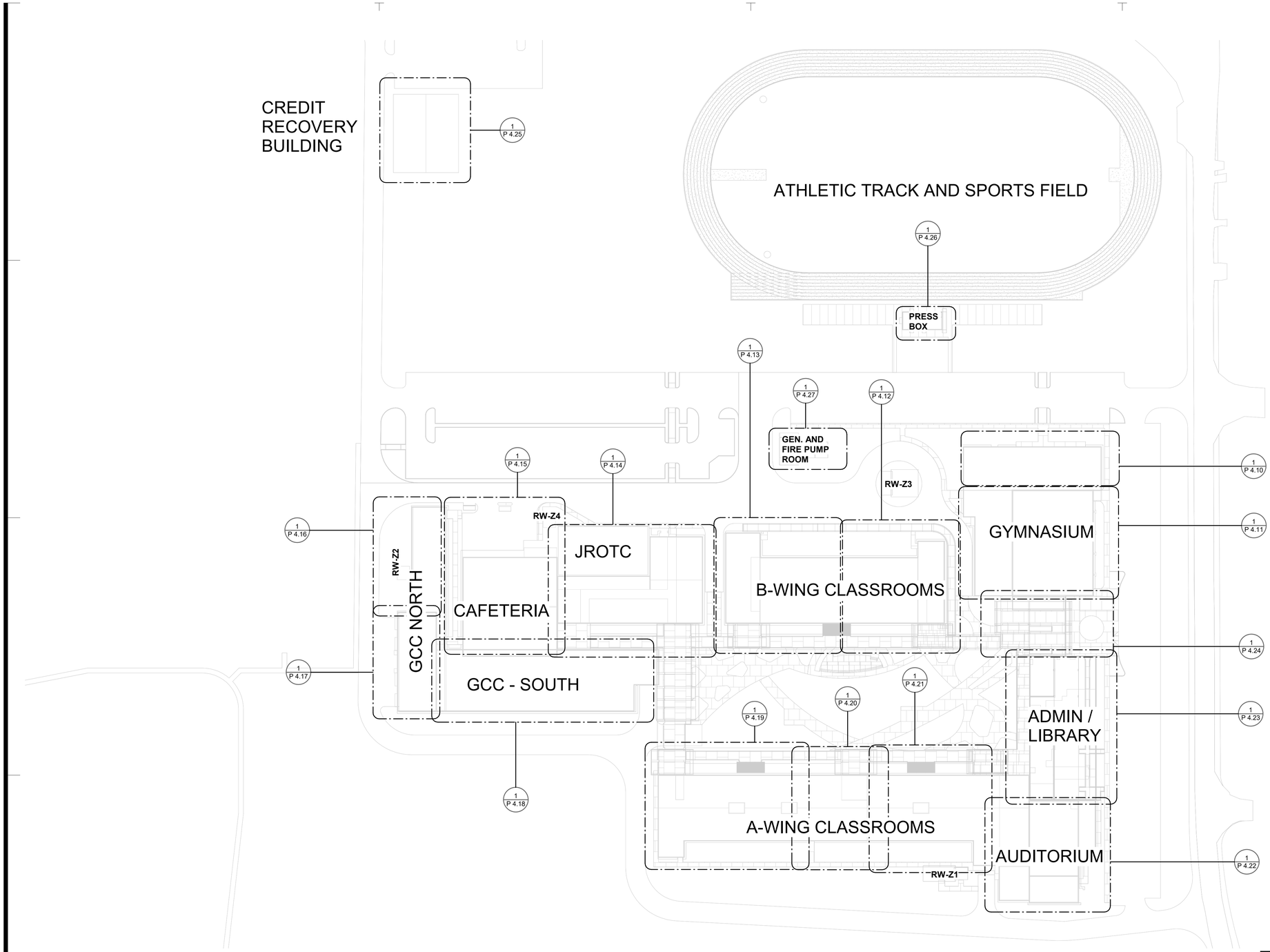
Sheet No._____ of _____



1 OVERALL ROOF PLUMBING PLAN

SCALE: 1" = 60'-0"

NORTH

GRAPHIC SCALE

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

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OVERALL ROOF PLUMBING PLAN

PROGRAMMING DOCUMENTS

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Drawing No.

P1.3

Sheet No._____ of _____

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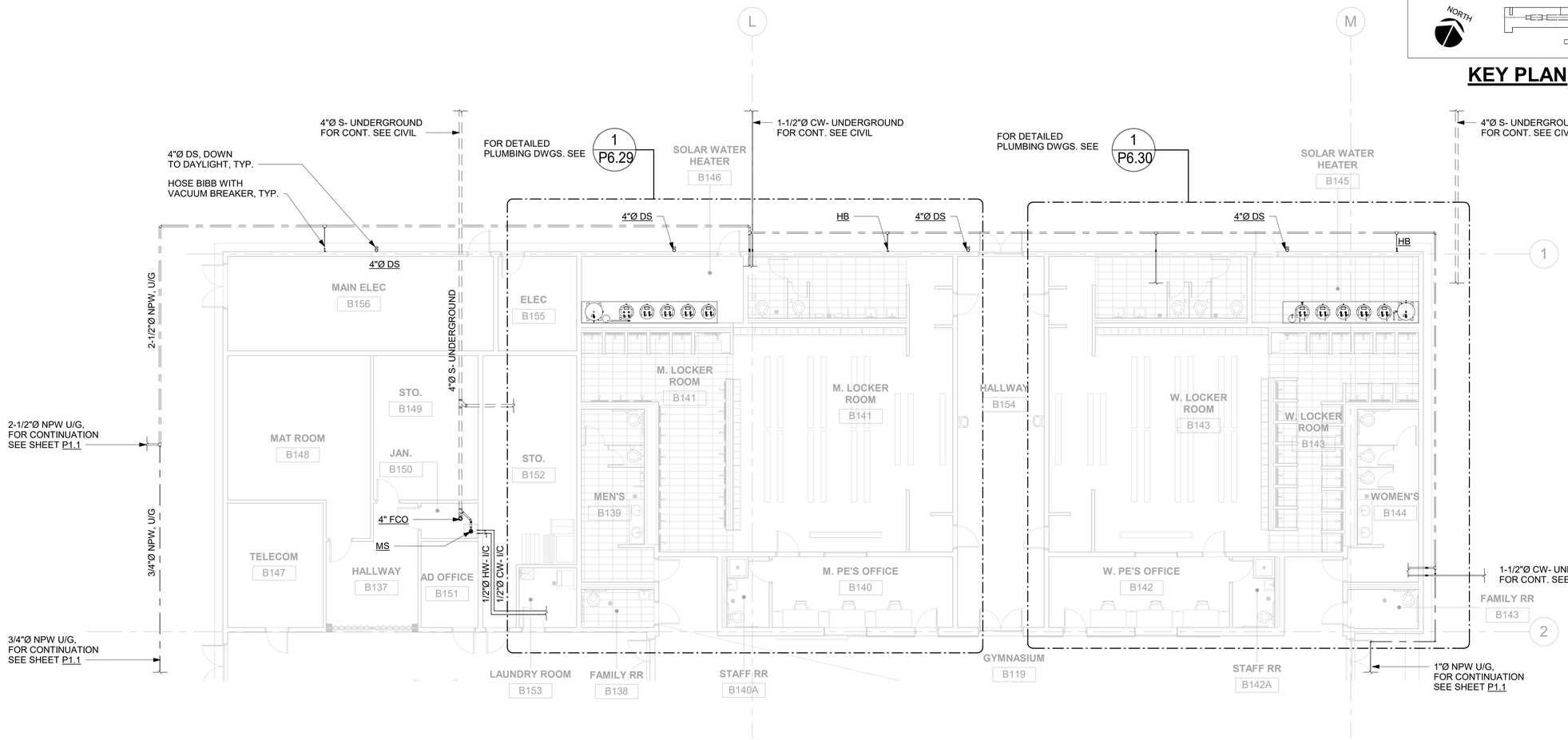
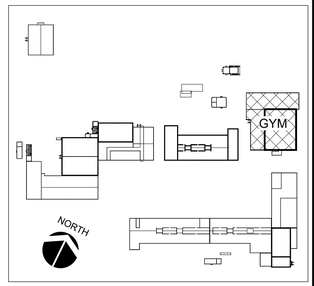


1 PLUMBING PLAN - GYMNASIUM LEVEL 1

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Title:

PLUMBING PLAN - GYMNASIUM LEVEL 1

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
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Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.

P2.10

Sheet No. 6 of 0

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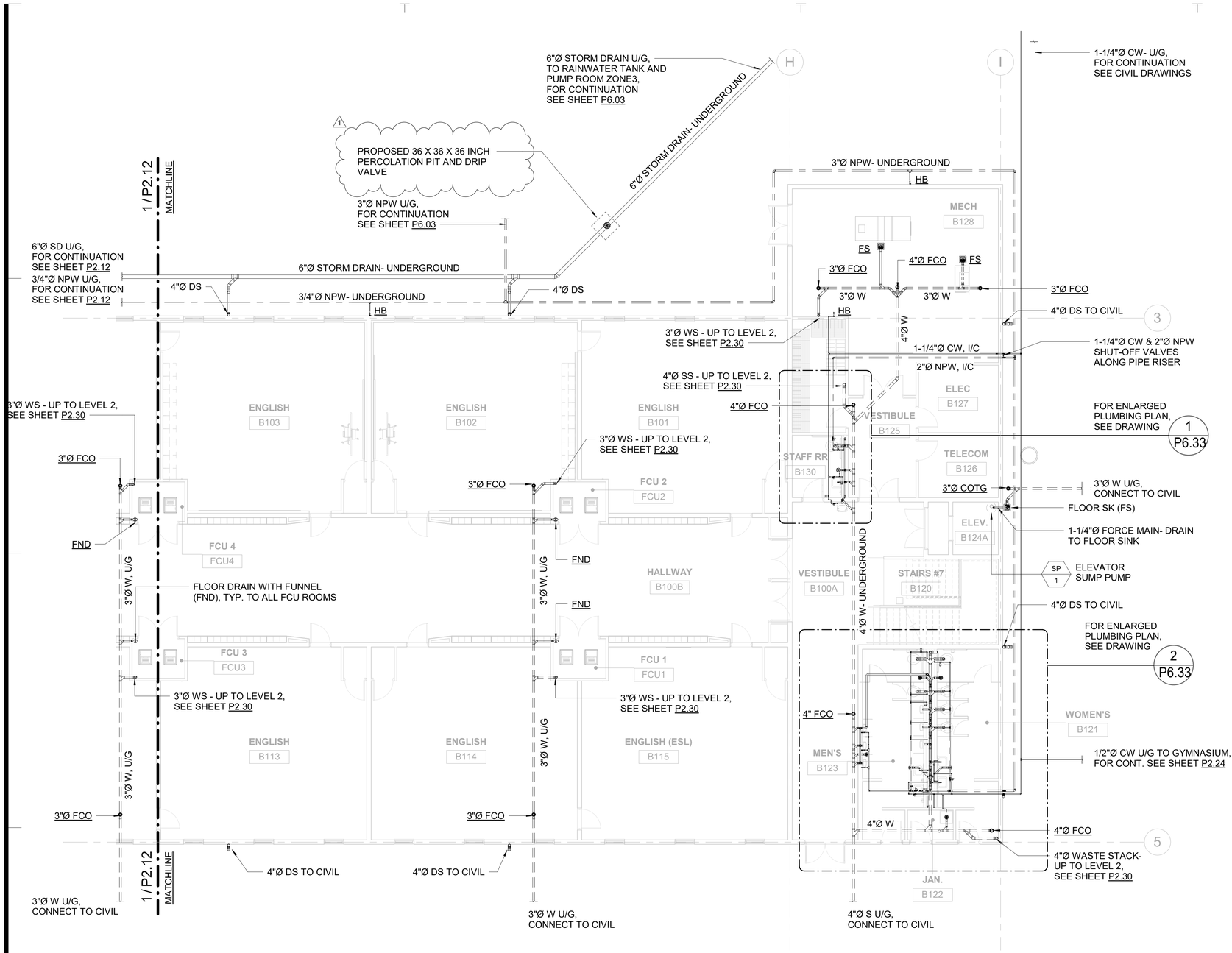
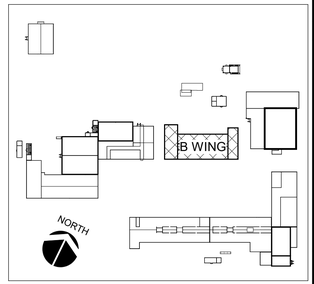


1 PLUMBING PLAN - B-WING LEVEL 1 (EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

REVISIONS

No.	Description	Date
1	ADDENDUM	10.26.2022

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Title:
PLUMBING PLAN - CLASSROOM LEVEL 1 (B-WING EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
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Date:	3/31/25
Project No.	File
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Drawing No.
P2.11
Sheet No. _____ of _____

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FOR REFERENCE ONLY

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

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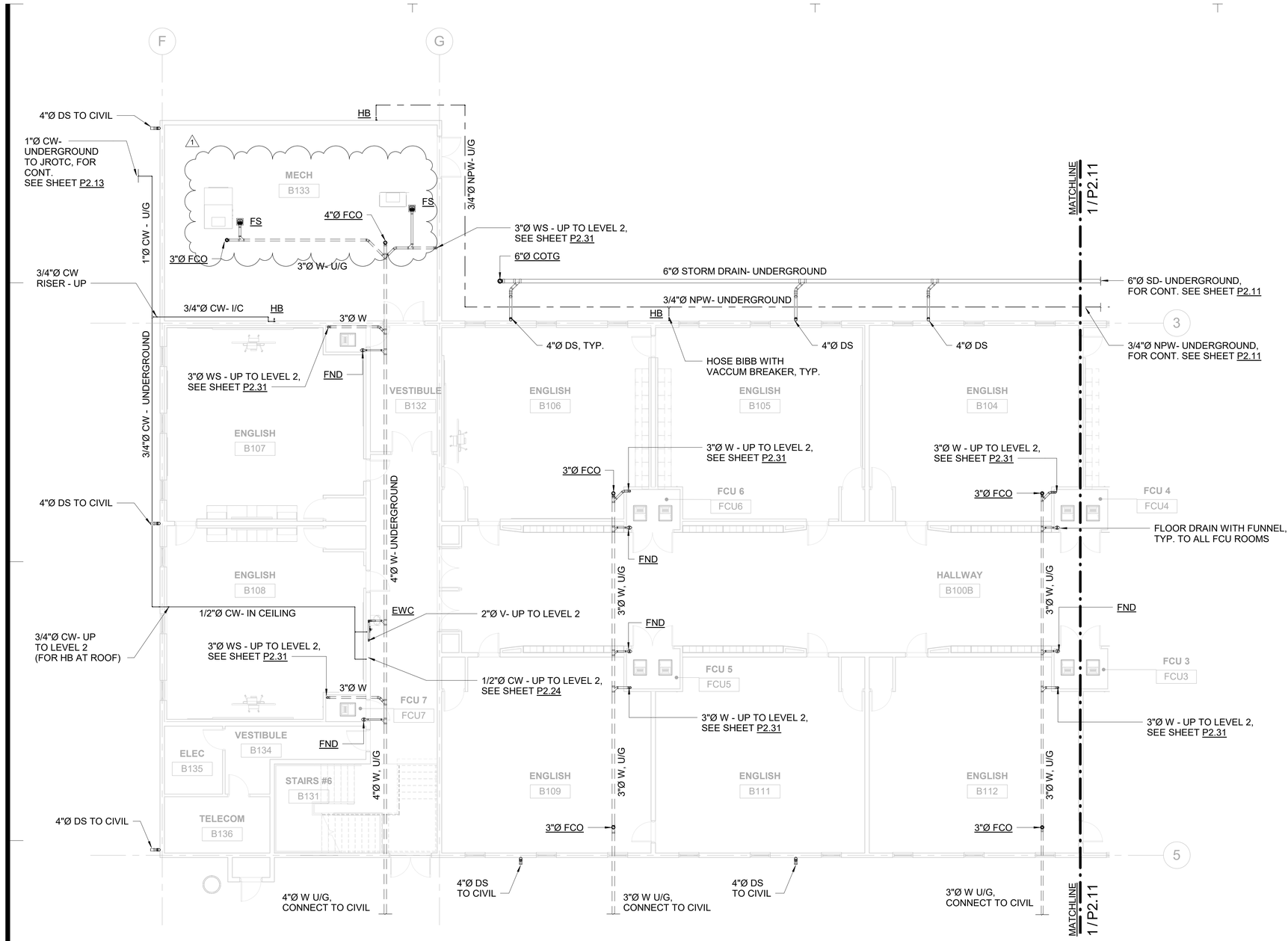

1 PLUMBING PLAN - B-WING LEVEL 1 (WEST)

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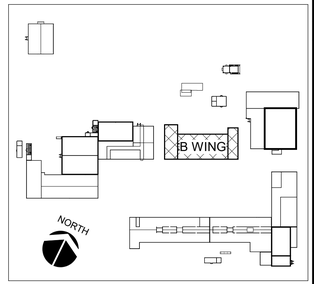

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1	ADDENDUM	10.26.2022

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Title:
PLUMBING PLAN - CLASSROOM LEVEL 1 (B-WING WEST)
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Sheet No. _____ of _____

GRAPHIC SCALE
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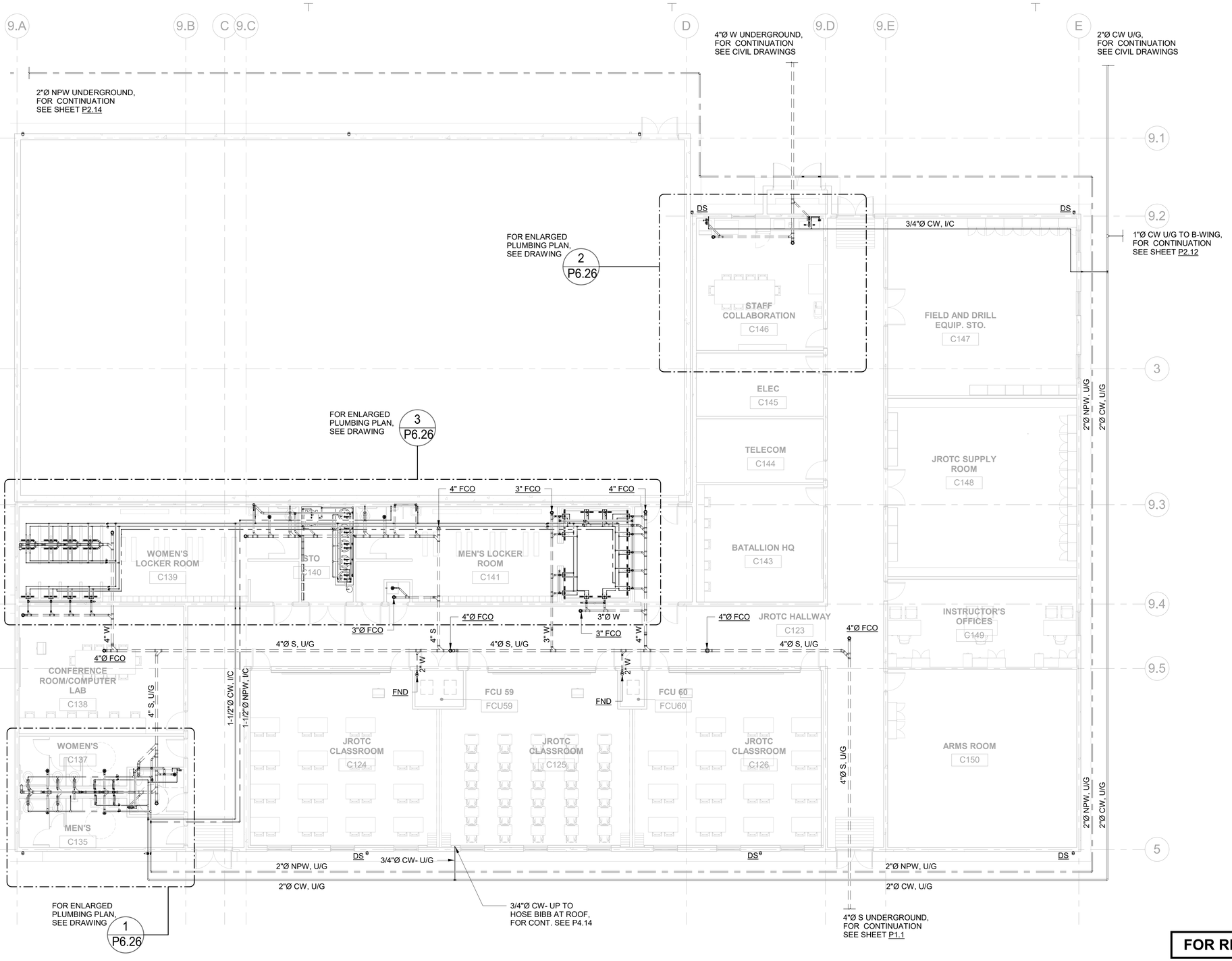

1 PLUMBING PLAN - ROTC LEVEL 1

SCALE: 1/8" = 1'-0"

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PLUMBING PLAN - ROTC LEVEL 1

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Drawing No.

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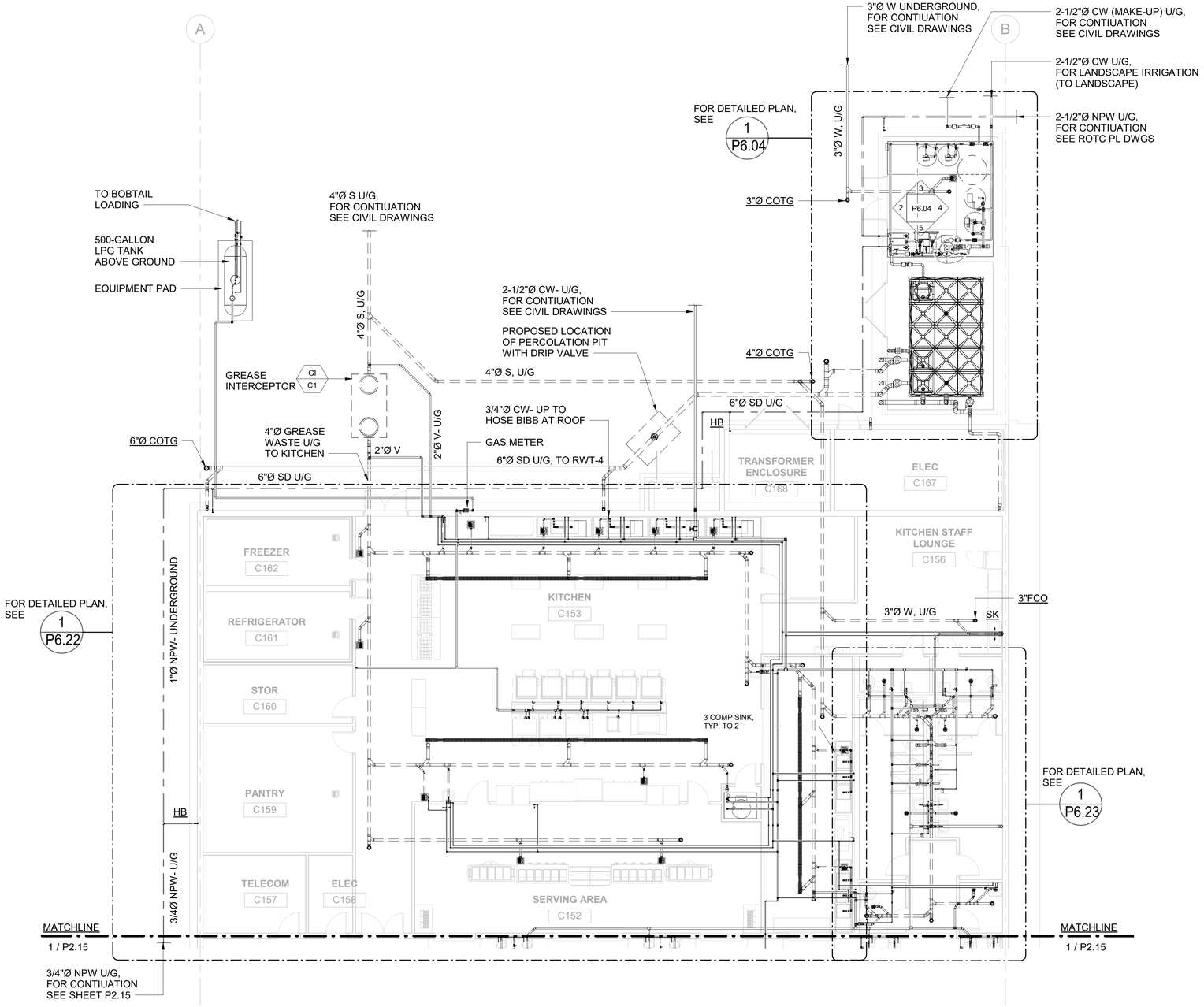
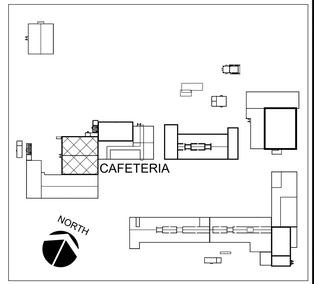


1 PLUMBING PLAN - CAFETERIA KITCHEN LEVEL 1

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Title:
PLUMBING PLAN - CAFETERIA KITCHEN LEVEL 1
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Supv:	MPN
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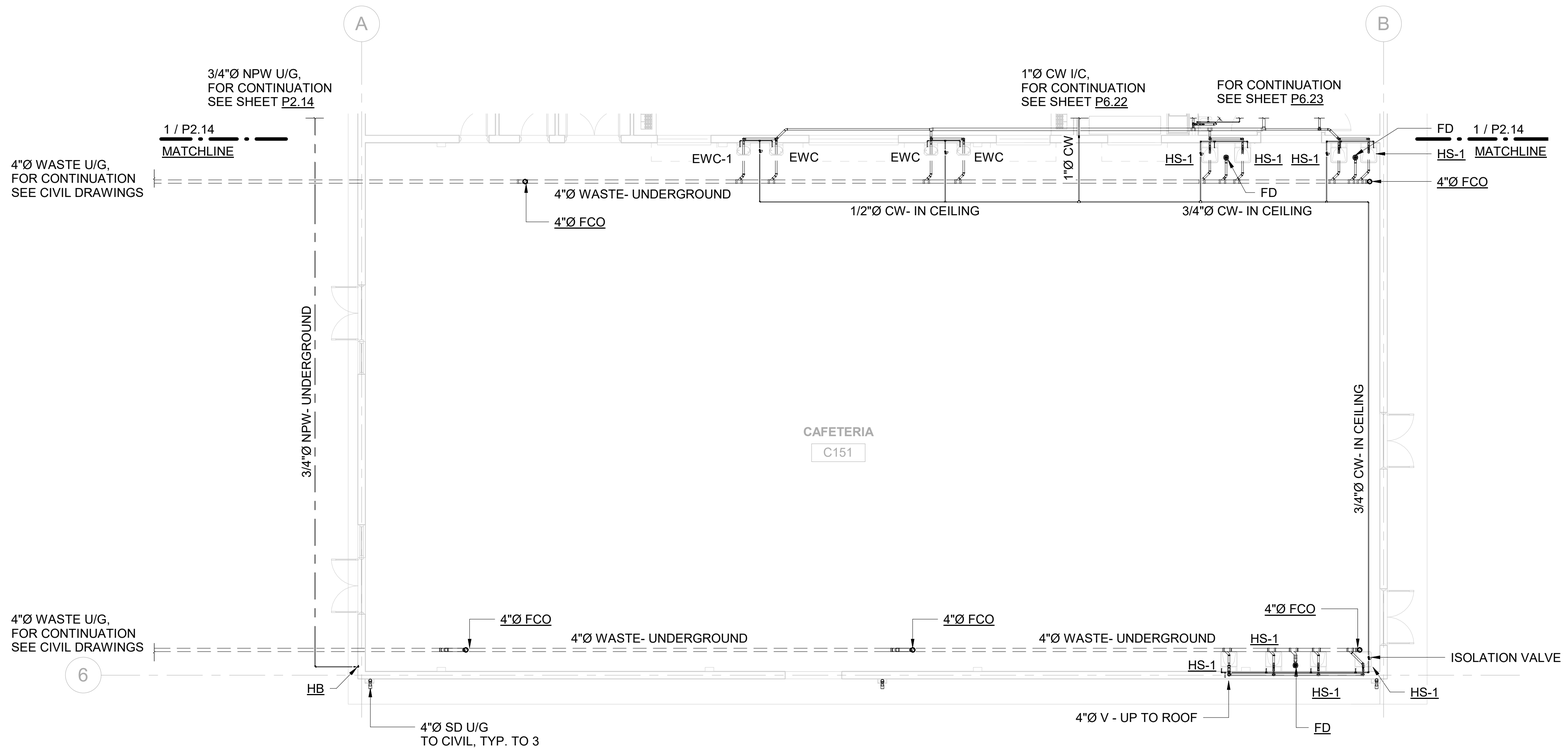
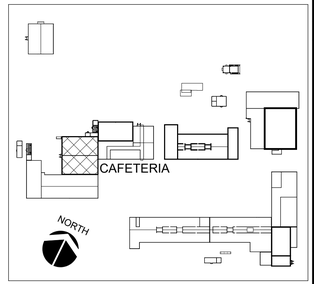


1 PLUMBING PLAN - CAFETERIA DINING LEVEL 1

SCALE: 1/8" = 1'-0"



KEY PLAN

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GRAPHIC SCALE

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Project:
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Title:
PLUMBING PLAN - CAFETERIA DINING LEVEL 1
PROGRAMMING DOCUMENT

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Drawn:	AT/RV/CA/JB
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
P2.15
Sheet No.____ of ____

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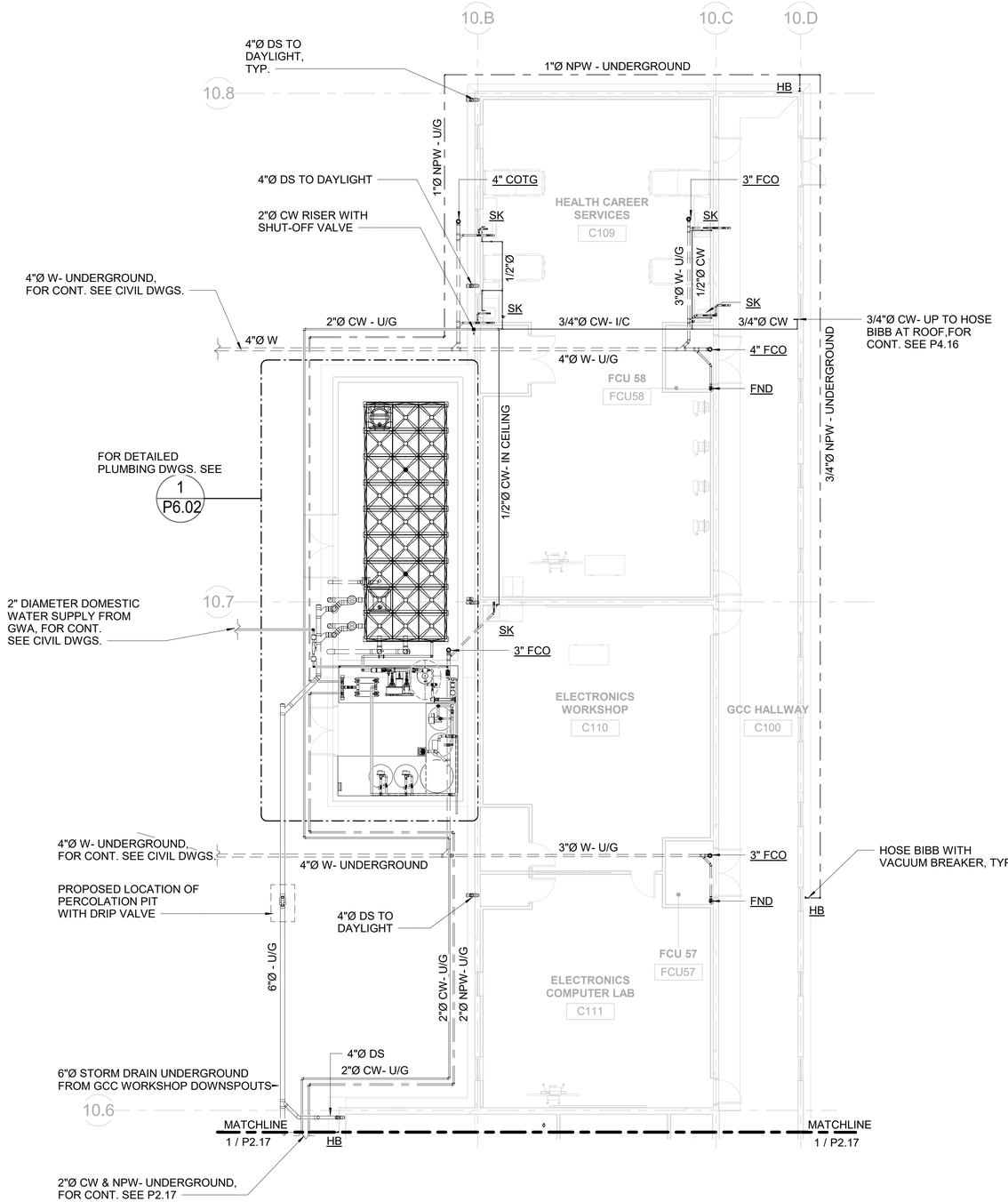
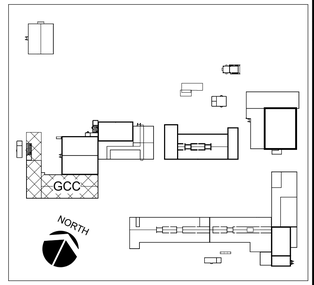


1 PLUMBING PLAN - GCC-NORTH CLASSROOM LEVEL 1

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING PLAN - GCC NORTH CLASSROOM LEVEL 1
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P2.16
Sheet No. _____ of _____

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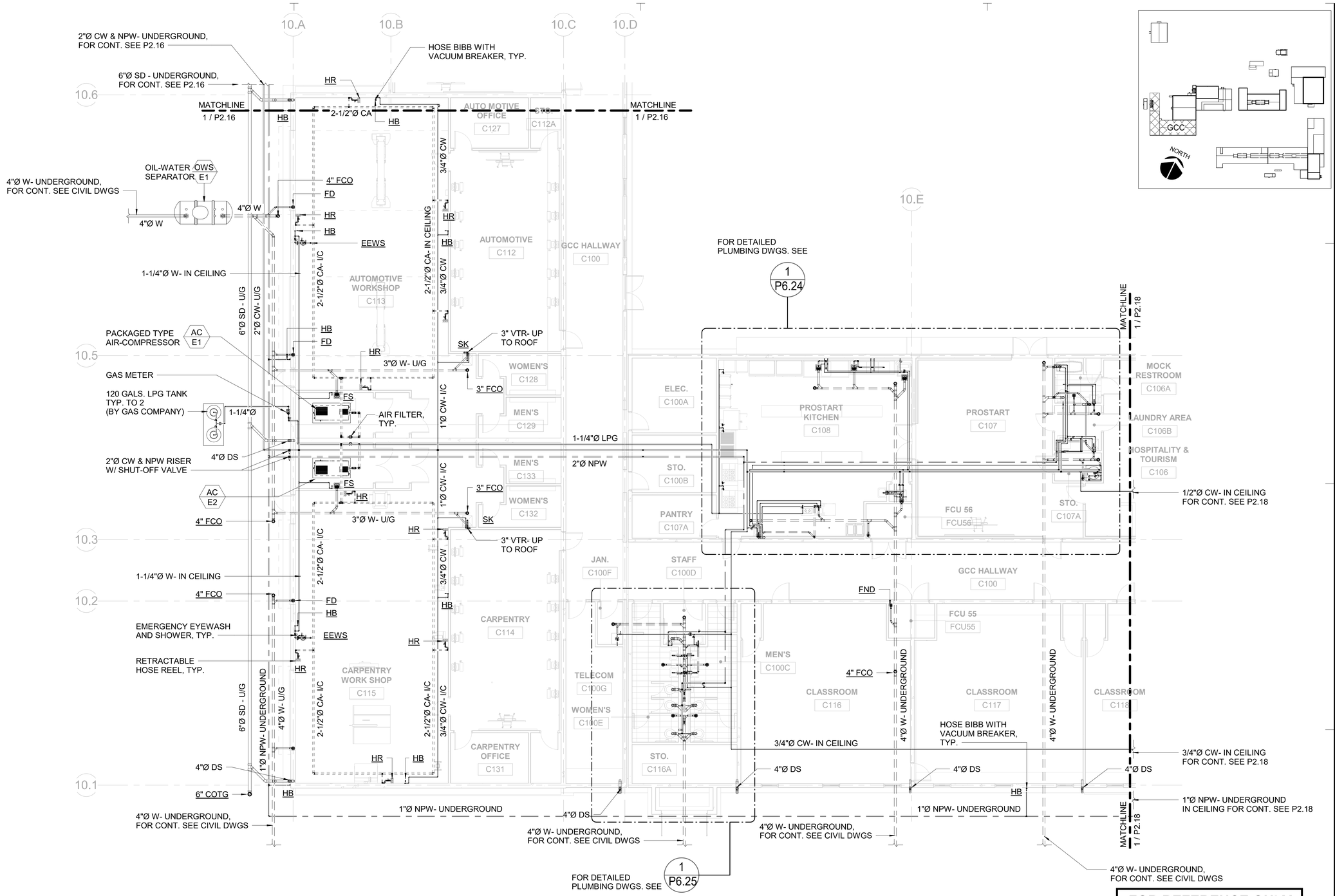

1 PLUMBING PLAN - GCC-NORTH WORKSHOP LEVEL 1

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Project:
GDOE
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Title:
PLUMBING PLAN - GCC-NORTH WORKSHOP LEVEL 1
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	WGM
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
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Drawing No.
P2.17
Sheet No. _____ of _____

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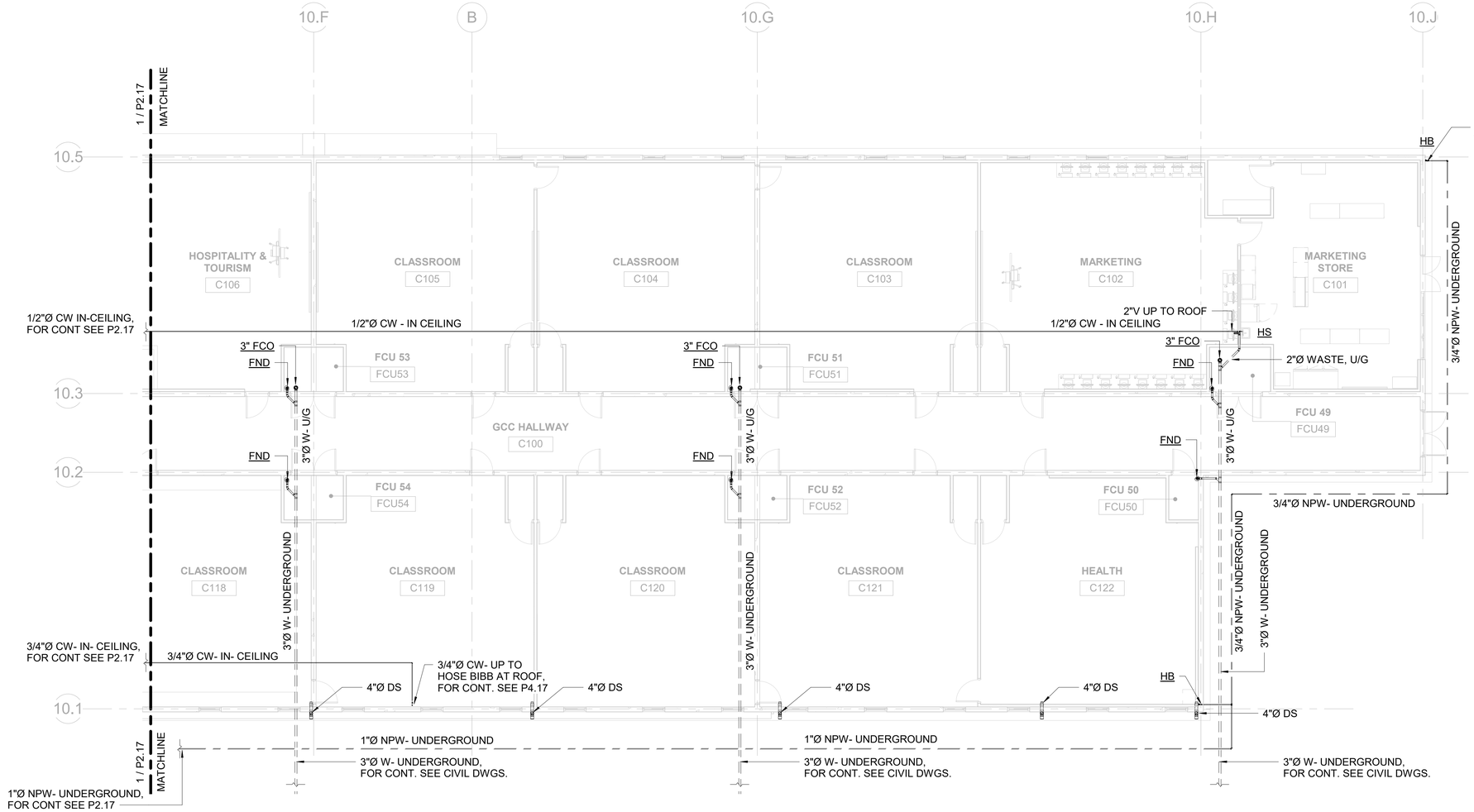
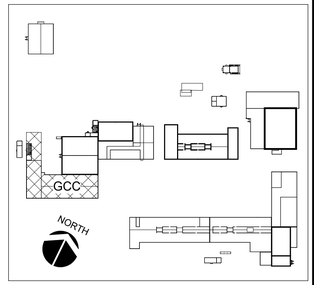


1 PLUMBING PLAN - GCC-SOUTH CLASSROOM LEVEL 1

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Title:
PLUMBING PLAN - GCC CLASSROOM LEVEL 1

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P2.18
Sheet No._____ of _____

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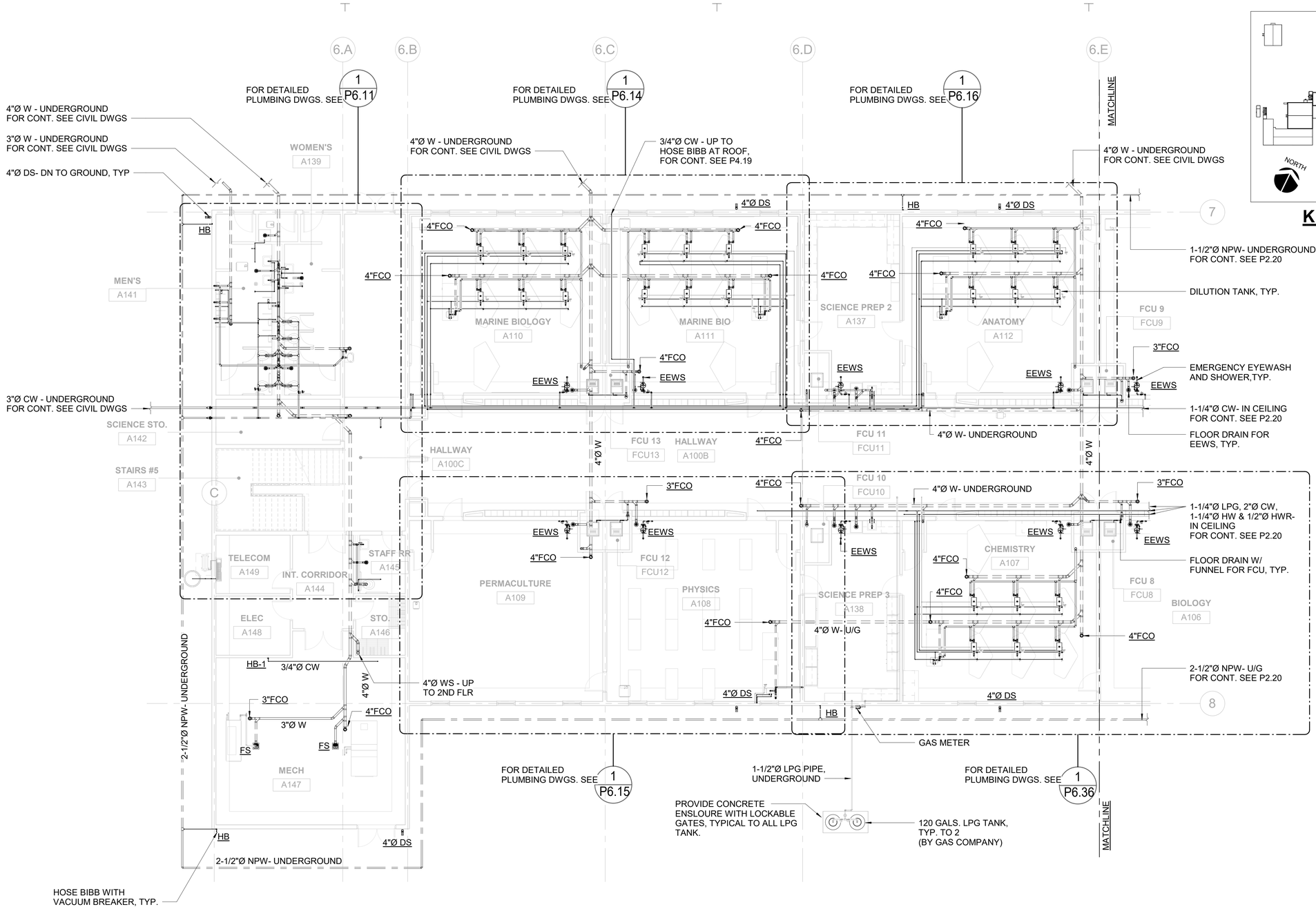

KEY PLAN

1 PLUMBING PLAN - SCIENCE LAB LEVEL 1 (A-WING WEST)

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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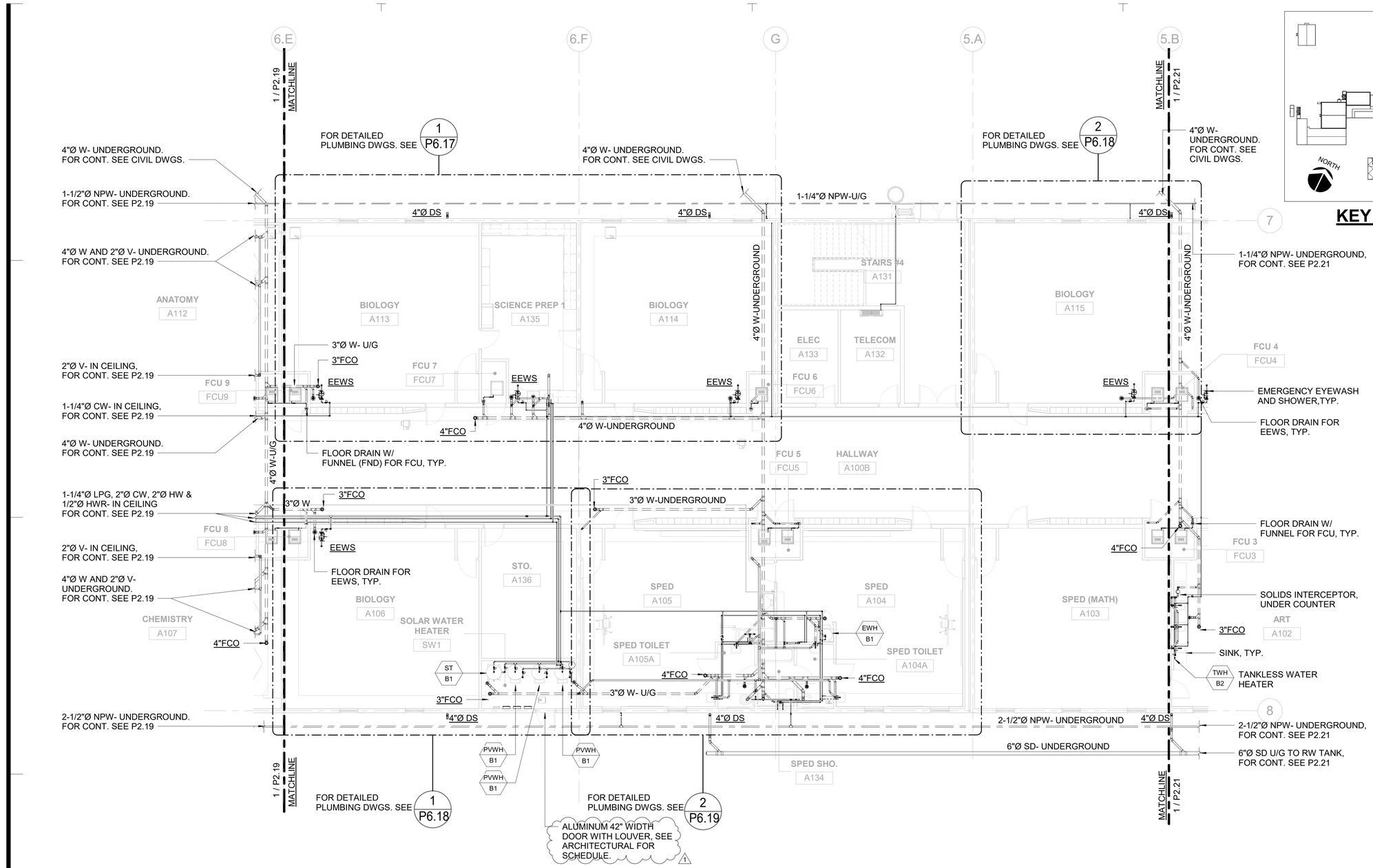
PLUMBING PLAN - SCIENCE LAB LEVEL 1 (A-WING EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CC/JB
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P2.19
Sheet No._____ of _____



KEY PLAN

1 PLUMBING PLAN - CLASSROOM/ SPED LEVEL 1 (A-WING)

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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1	ADDENDUM	10/27/2022

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Title:
PLUMBING PLAN - CLASSROOM / SPED LEVEL 1 (A-WING)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CC
Checked:	MPN
Supv:	MPN
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Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P2.20
Sheet No._____ of _____

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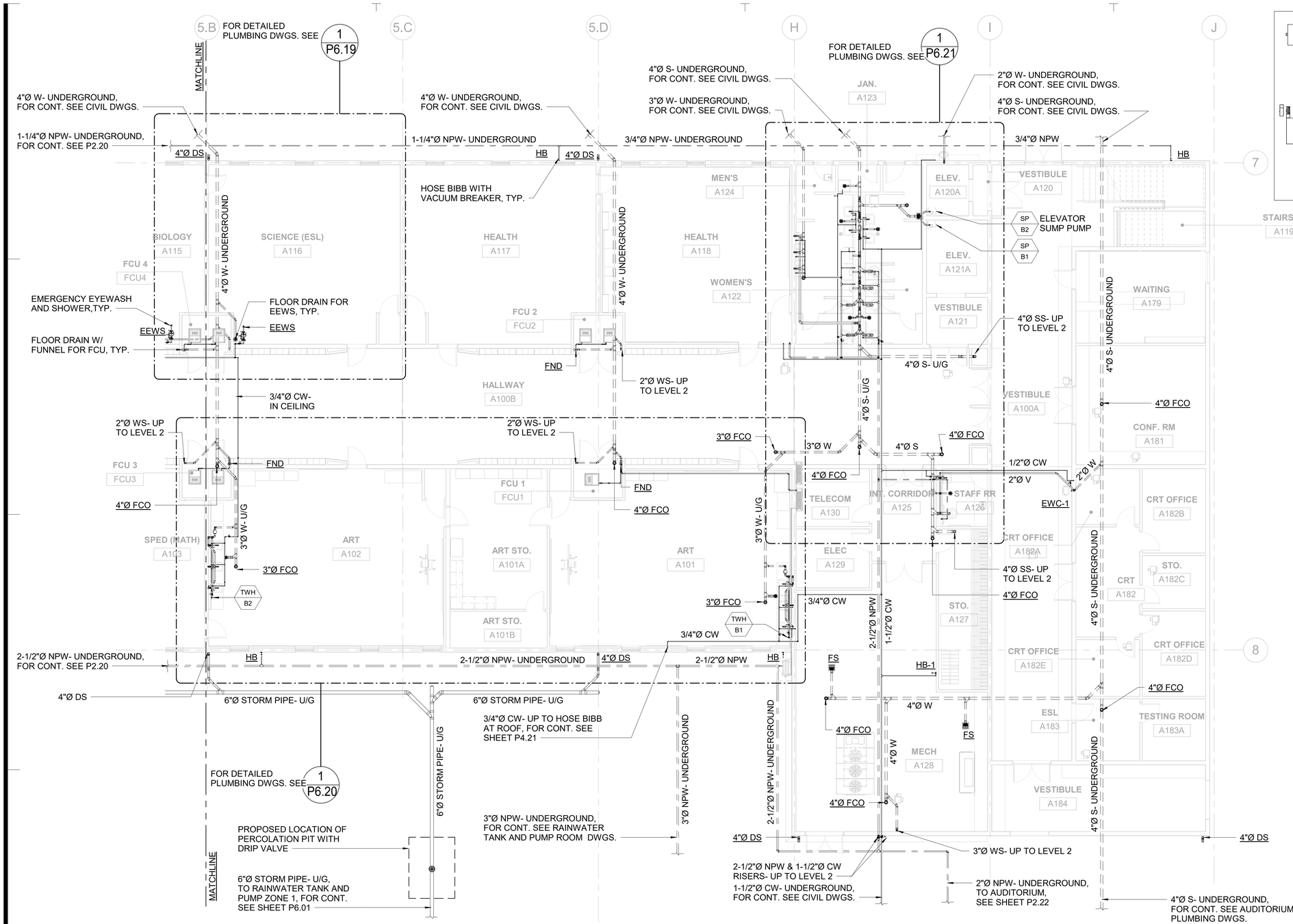

KEY PLAN

1 PLUMBING PLAN - HEALTH AND ART CLASSROOM LEVEL 1 (A-WING EAST)

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Title:
PLUMBING PLAN - HEALTH AND ART CLASSROOM LEVEL 1 (A-WING EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CC
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
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Drawing No.
P2.21
Sheet No._____ of _____

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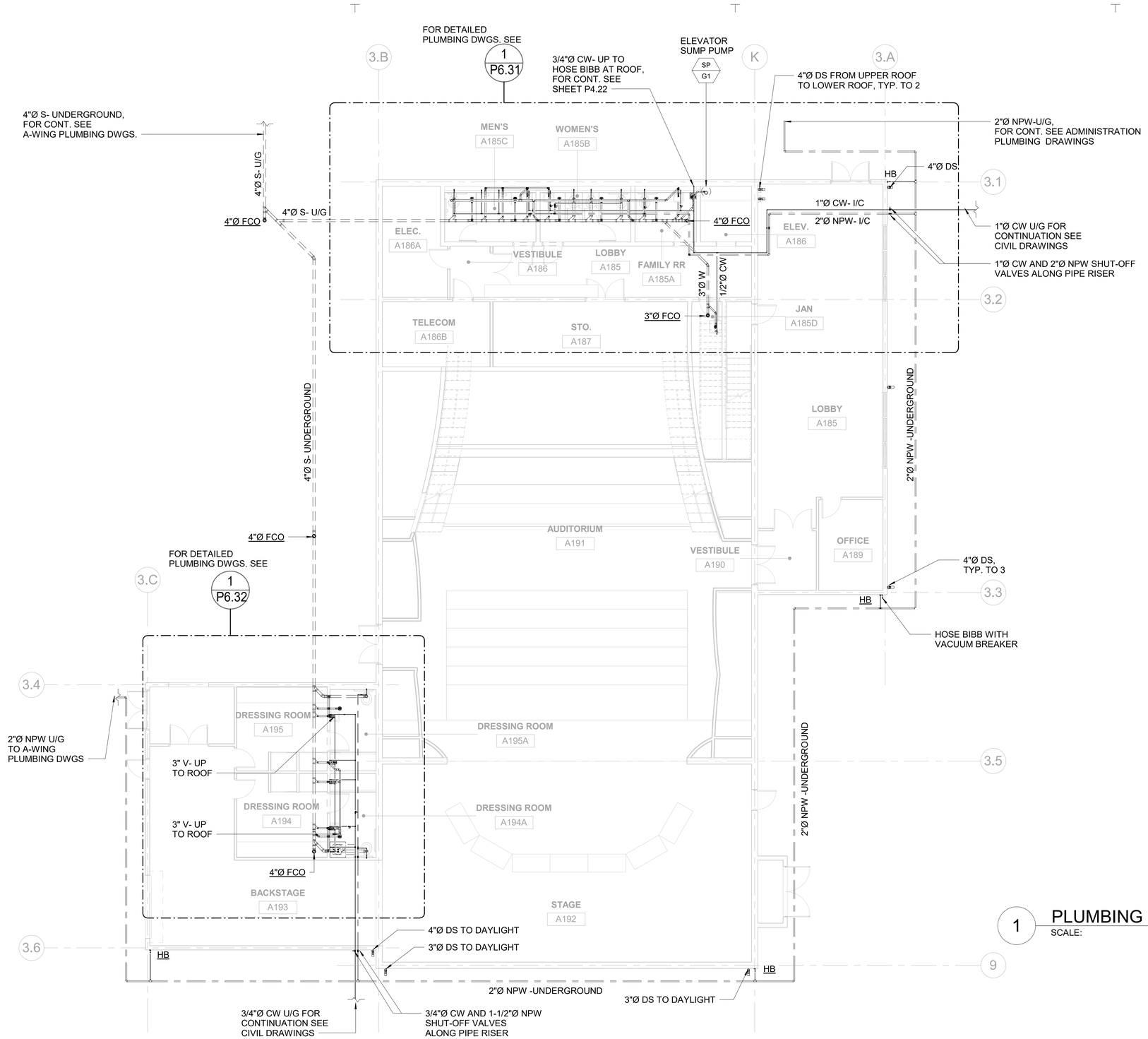

1 PLUMBING PLAN - AUDITORIUM

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Title:

PLUMBING PLAN- AUDITORIUM LEVEL 1

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
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Date:	3/31/25
Project No. XX-XXX	File

Drawing No.

P2.22

Sheet No. _____ of 0

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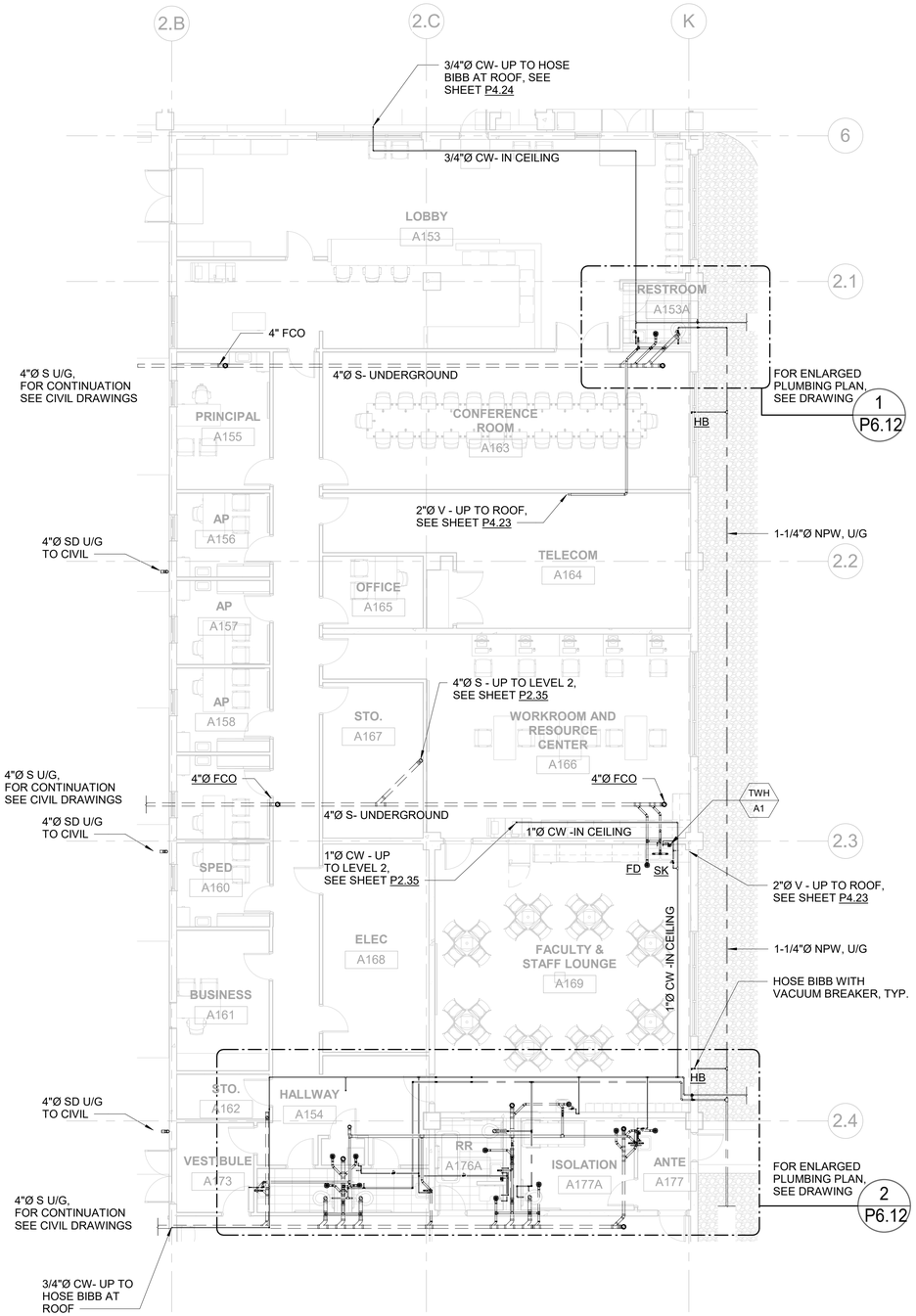

1 PLUMBING PLAN - ADMINISTRATION BUILDING LEVEL 1

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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PLUMBING PLAN - ADMINISTRATION BUILDING LEVEL 1

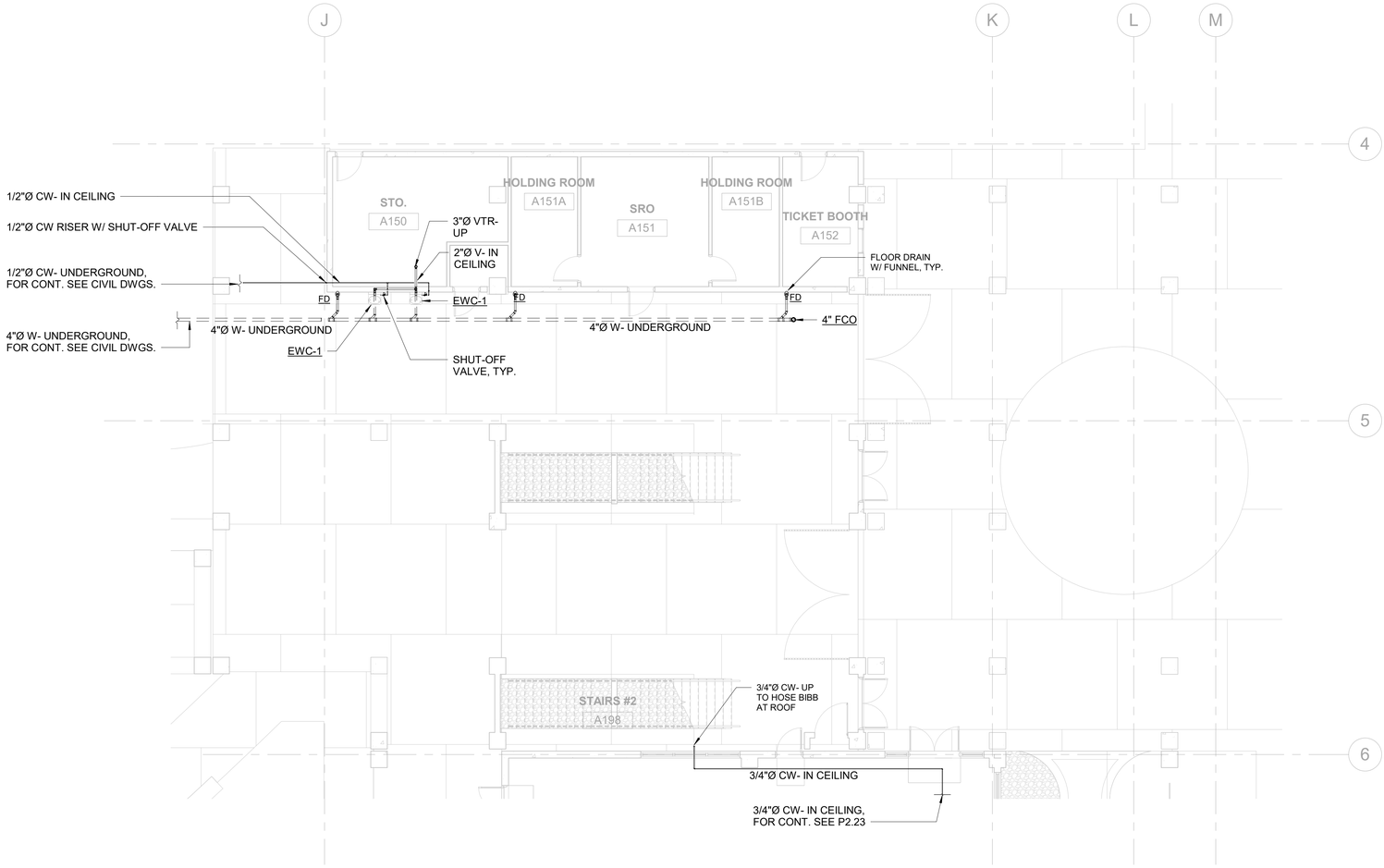
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.

P2.23

Sheet No._____ of ____0



1 PLUMBING PLAN - MAIN ENTRY LEVEL 1

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Title:
PLUMBING PLAN - MAIN ENTRY LEVEL 1

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
P2.24
Sheet No. _____ of 0

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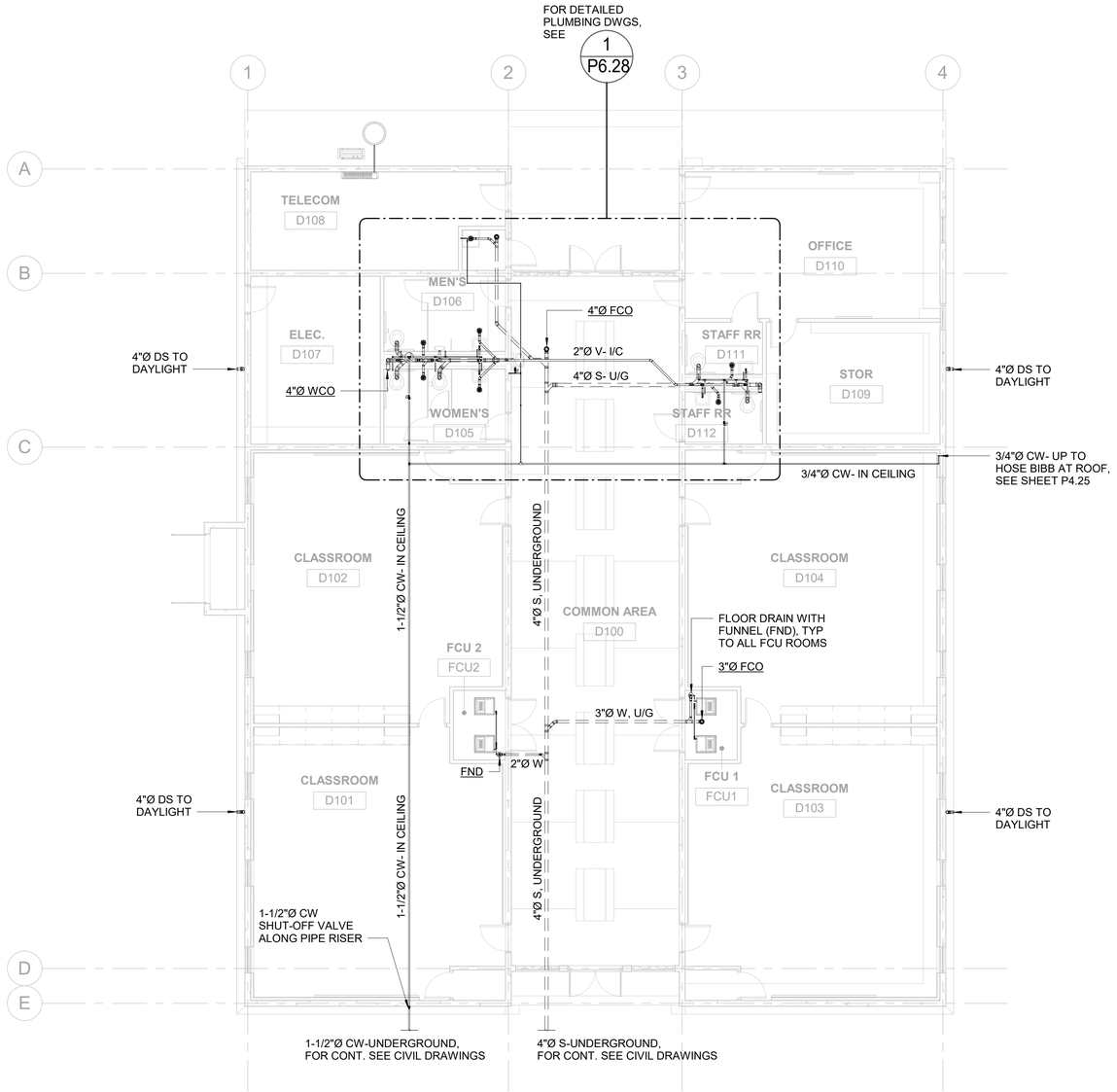
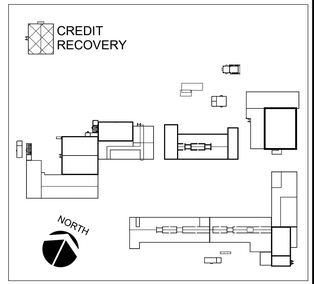


1 PLUMBING PLAN - CREDIT RECOVERY BUILDING

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Title:
PLUMBING PLAN - CREDIT RECOVERY BUILDING
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
P2.25
Sheet No. ____ of 0

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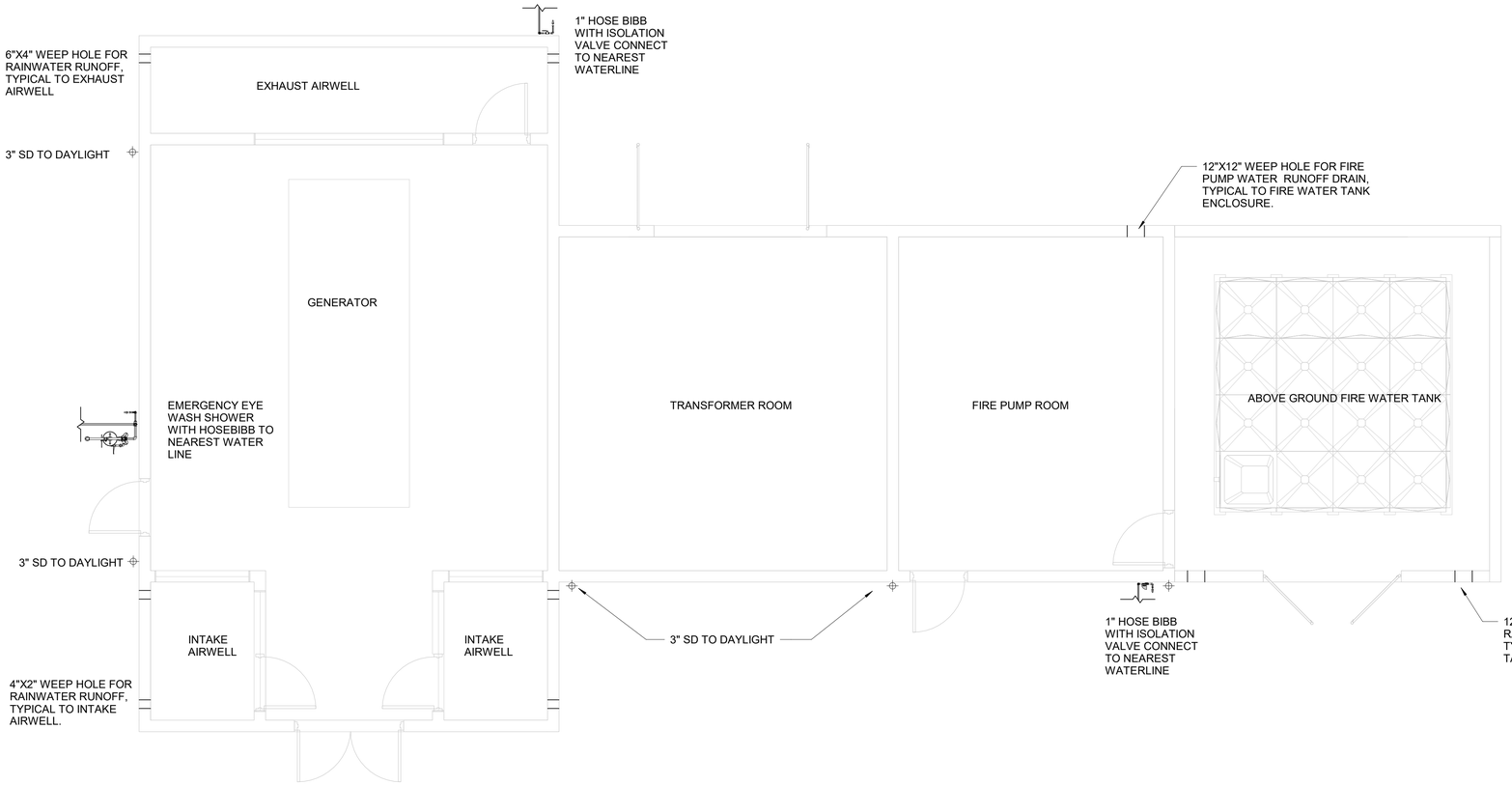
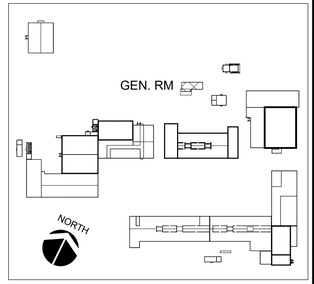


1 GENERATOR AND FIRE PUMP BUILDING PLUMBING PLAN

SCALE: 1/4" = 1'-0"



KEY PLAN

GRAPHIC SCALE

0 1' 2' 3' 4' 8' 12'

SCALE: 1/4" = 1'-0"

FOR REFERENCE ONLY

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Title:
DETAILED PLAN - GENERATOR AND FIRE PUMP BUILDING
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	RV
Checked:	MPN
Supv:	MPN
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
P2.26
Sheet No._____ of 0

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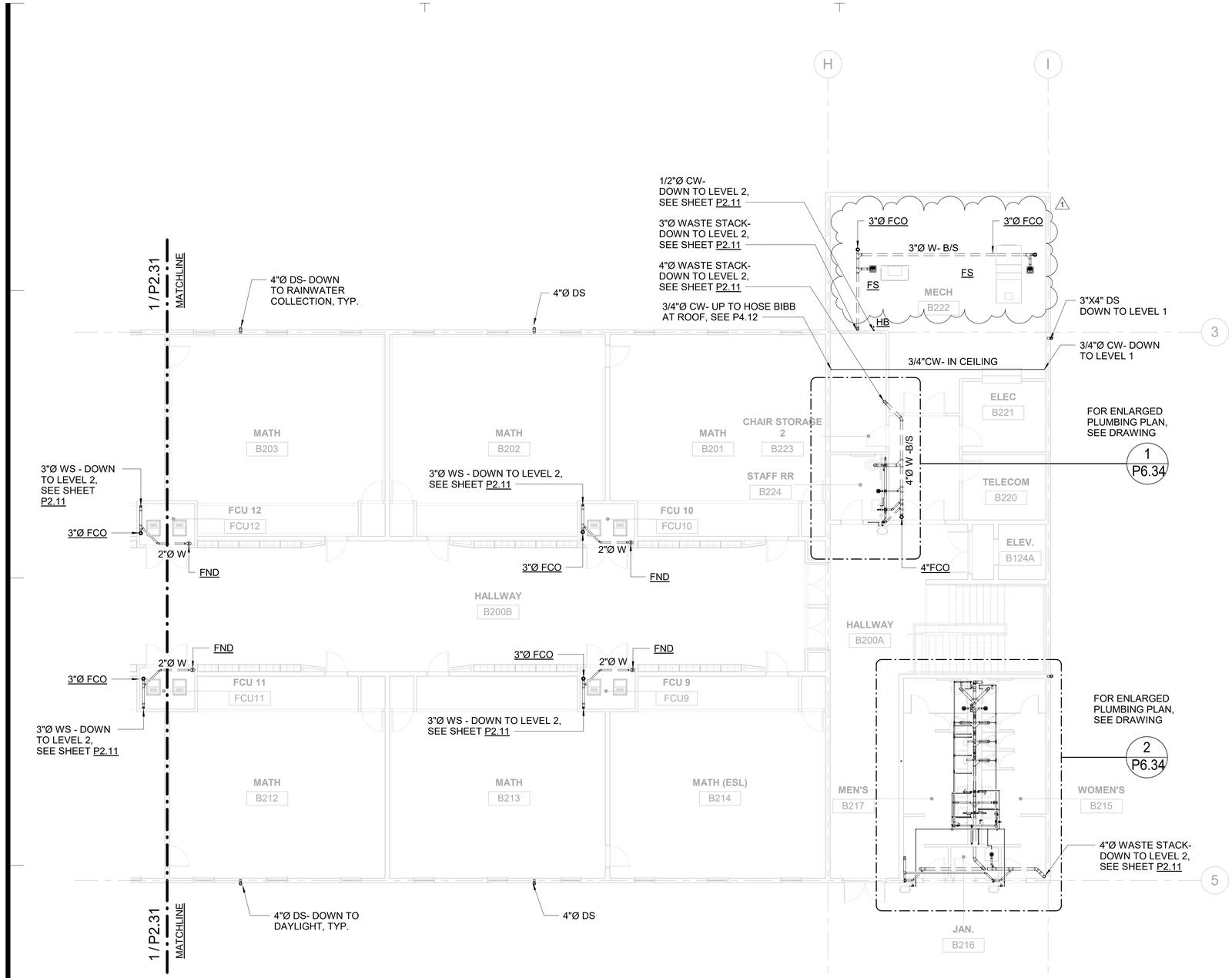
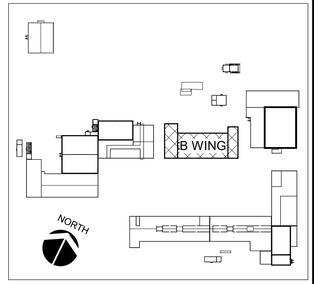


1 PLUMBING PLAN - CLASSROOM LEVEL 2 (B-WING EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

REVISIONS

No.	Description	Date
1	ADDENDUM	10.26.2022

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Title:

PLUMBING PLAN - CLASSROOM LEVEL 2 (B-WING EAST)

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.

P2.30

Sheet No._____ of _____

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NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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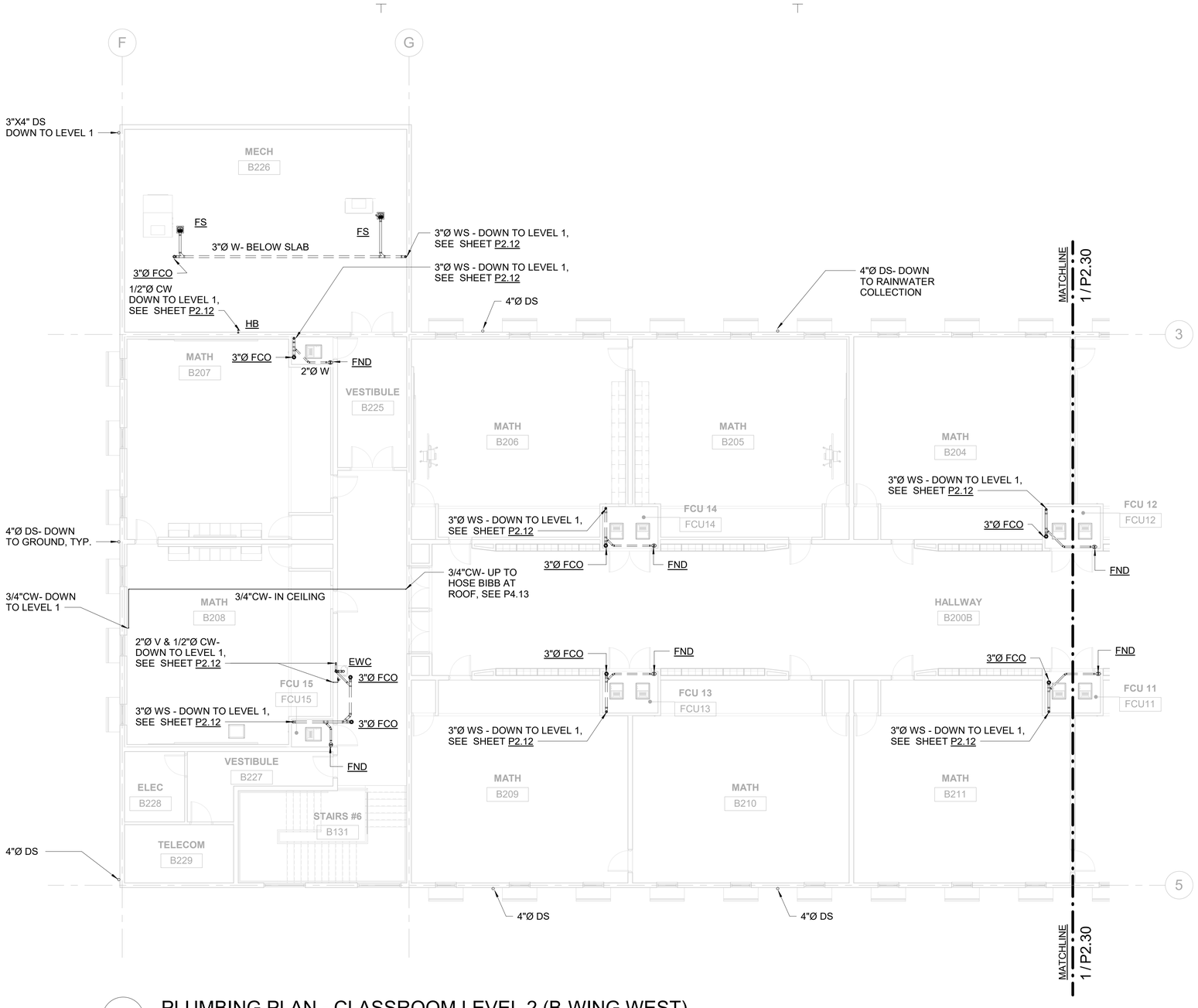
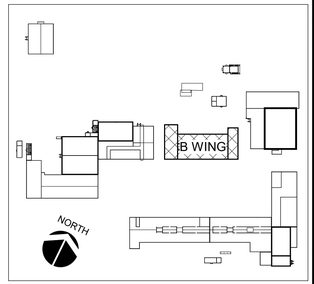


1 PLUMBING PLAN - CLASSROOM LEVEL 2 (B-WING WEST)

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

PLUMBING PLAN - CLASSROOM LEVEL 2 (B-WING WEST)

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.

P2.31

Sheet No._____ of _____

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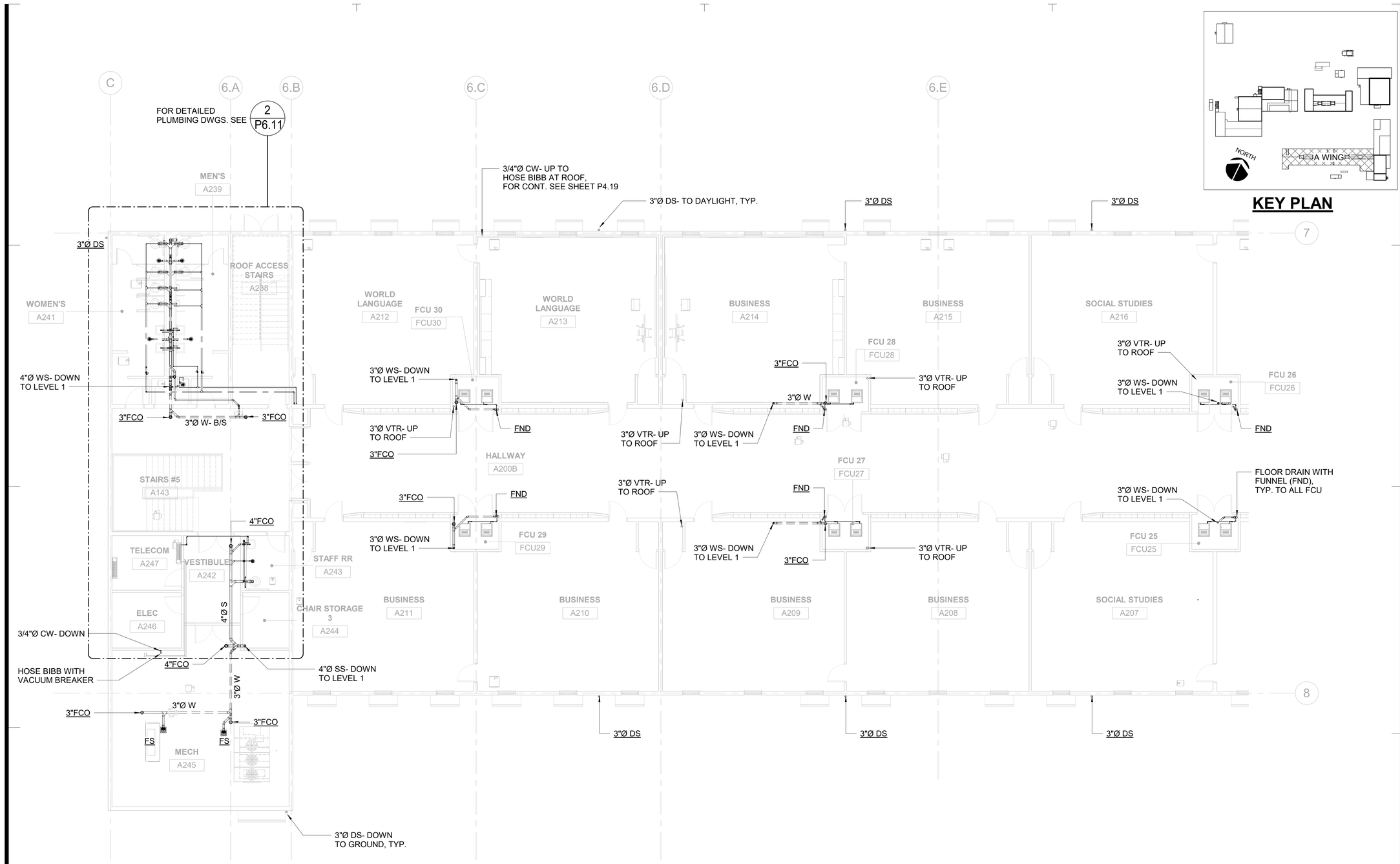

KEY PLAN

1 PLUMBING PLAN - CLASSROOM LEVEL 2 (A-WING WEST)

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
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Interior Design

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING PLAN - CLASSROOM LEVEL 2 (A-WING WEST)
PROGRAMMING DOCUMENT

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Project No.	File
XX-XXX	

Drawing No.
P2.32
Sheet No._____ of _____

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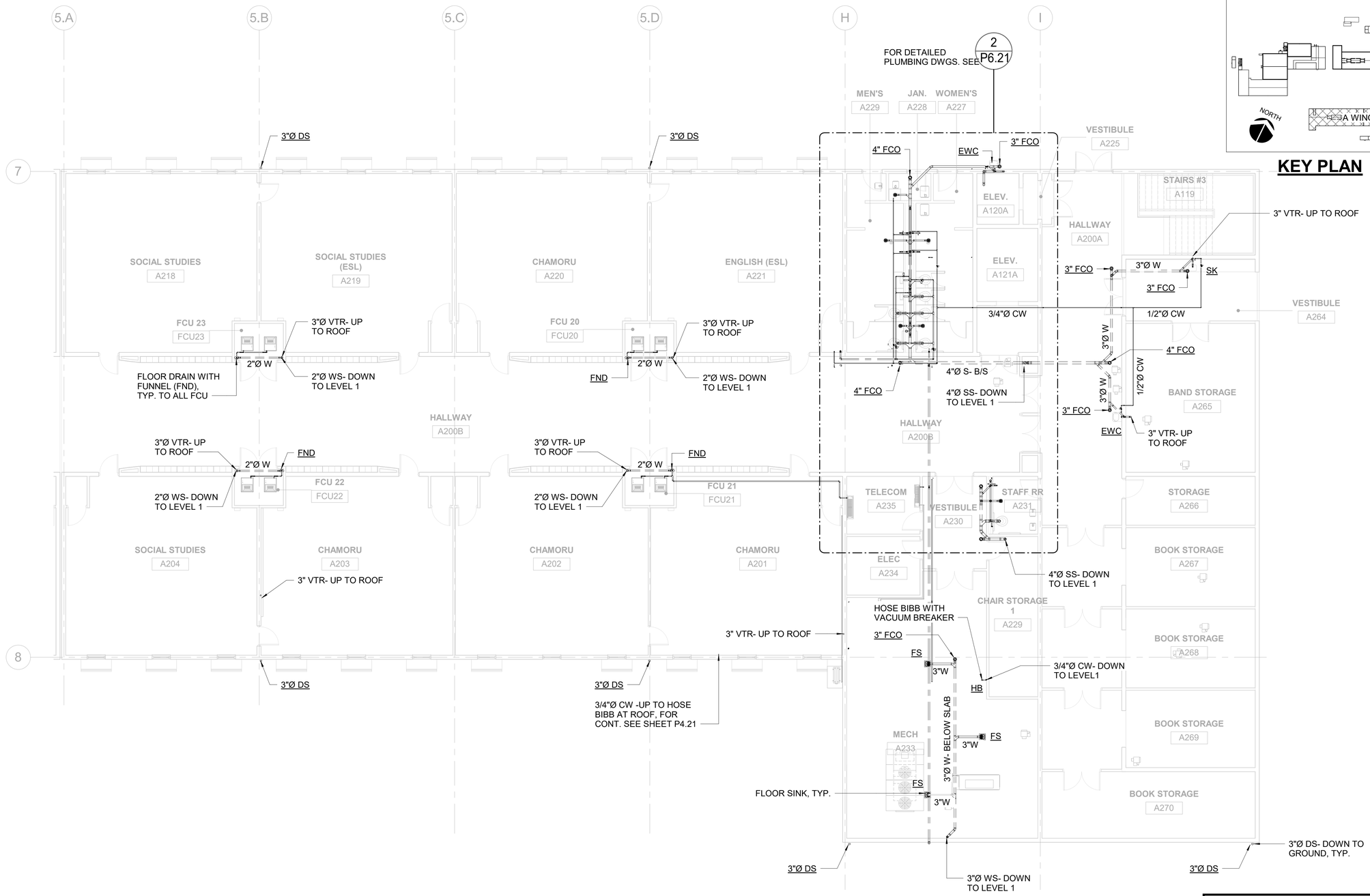

1 PLUMBING PLAN - CLASSROOM LEVEL 2 (A-WING EAST)

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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SIMON SANCHEZ HIGH SCHOOL

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PLUMBING PLAN - CLASSROOM LEVEL 2 (A-WING EAST)
PROGRAMMING DOCUMENT

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Drawing No.
P2.33
Sheet No._____ of _____

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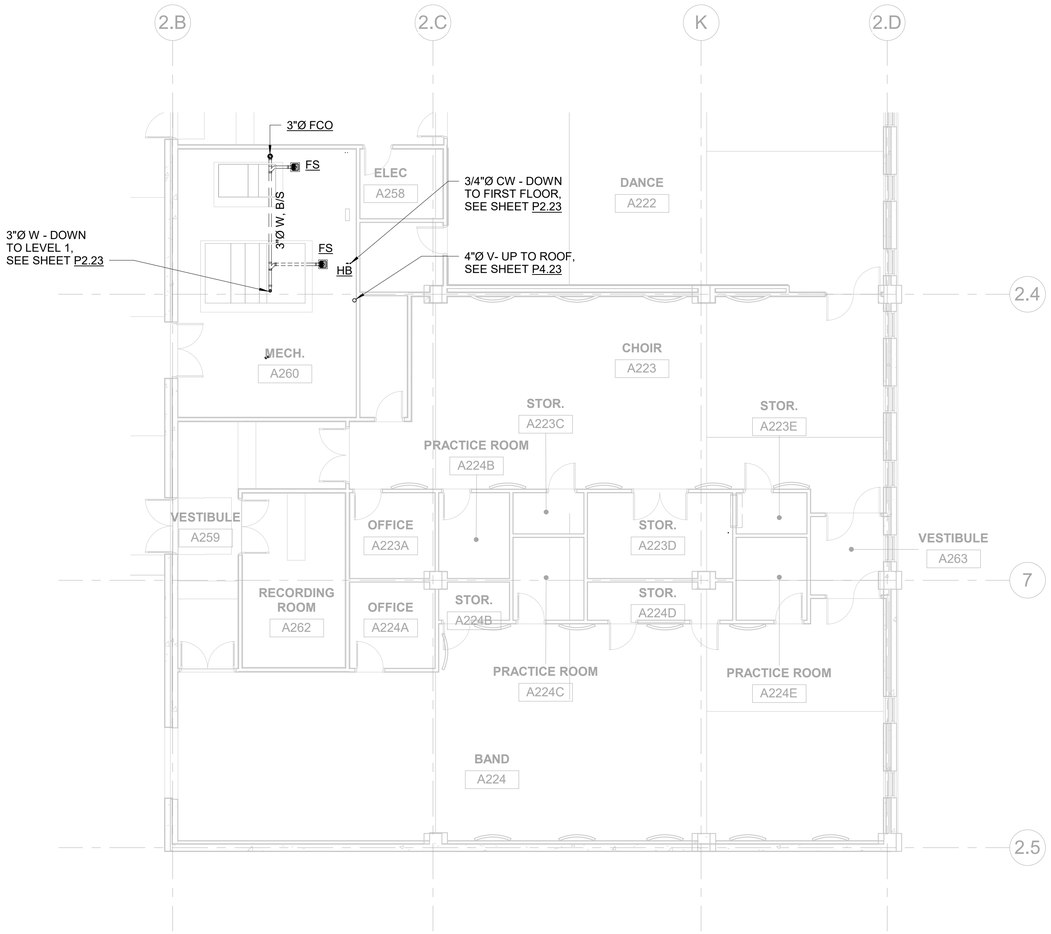

1 PLUMBING PLAN - CHOIR AND BAND LEVEL 2

SCALE: 1/8" = 1'-0"

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SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING PLAN - CHOIR AND BAND LEVEL 2

PROGRAMMING DOCUMENT

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Supv:	MPN
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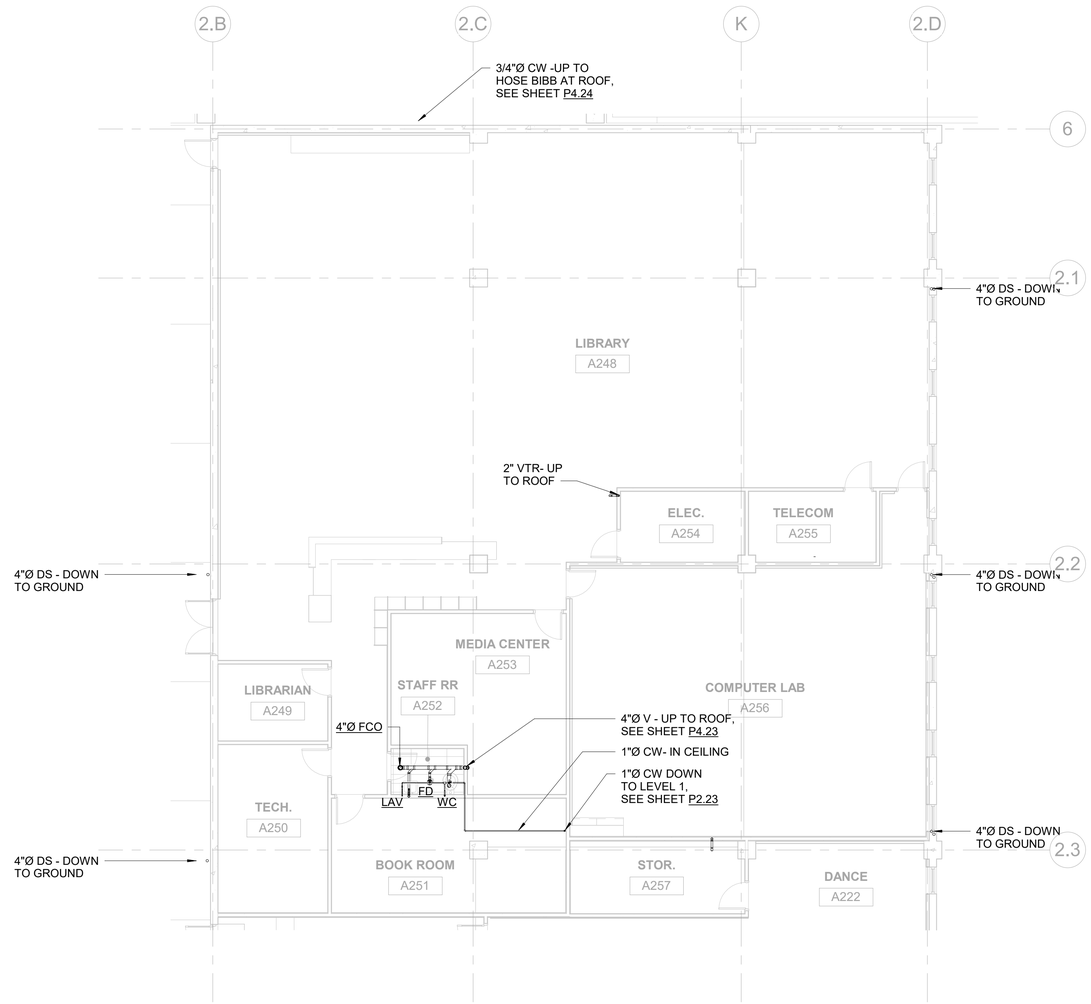
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P2.34
Sheet No._____ of 0



1 PLUMBING PLAN - LIBRARY LEVEL 2

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING PLAN - LIBRARY LEVEL 2

PROGRAMMING DOCUMENT

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Project No.	File
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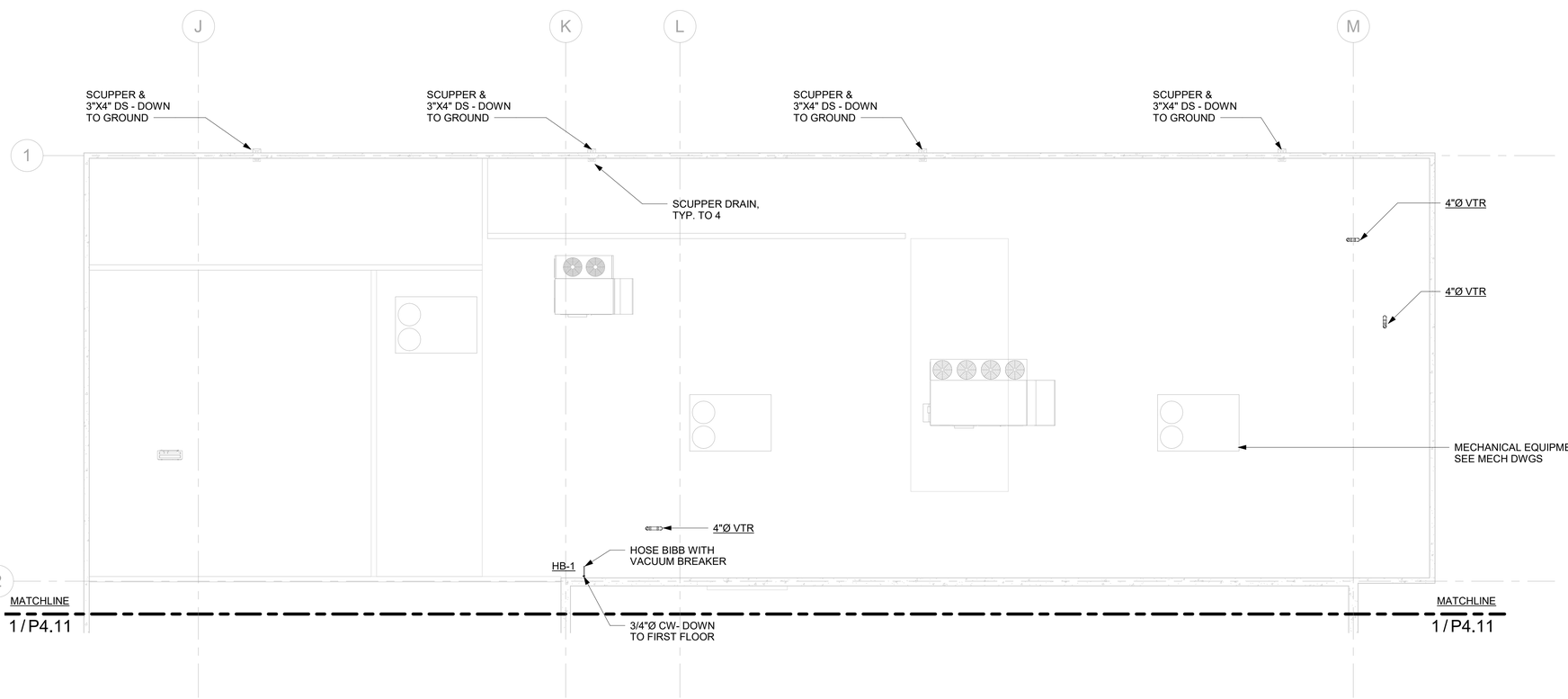
Drawing No.

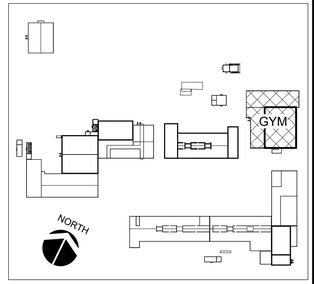
P2.35

Sheet No. _____ of 0



1 PLUMBING ROOF PLAN - GYM LOCKER ROOMS

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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PLUMBING ROOF PLAN - GYM LOCKER ROOM

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
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Project No. XX-XXX	File

Drawing No.

P4.10

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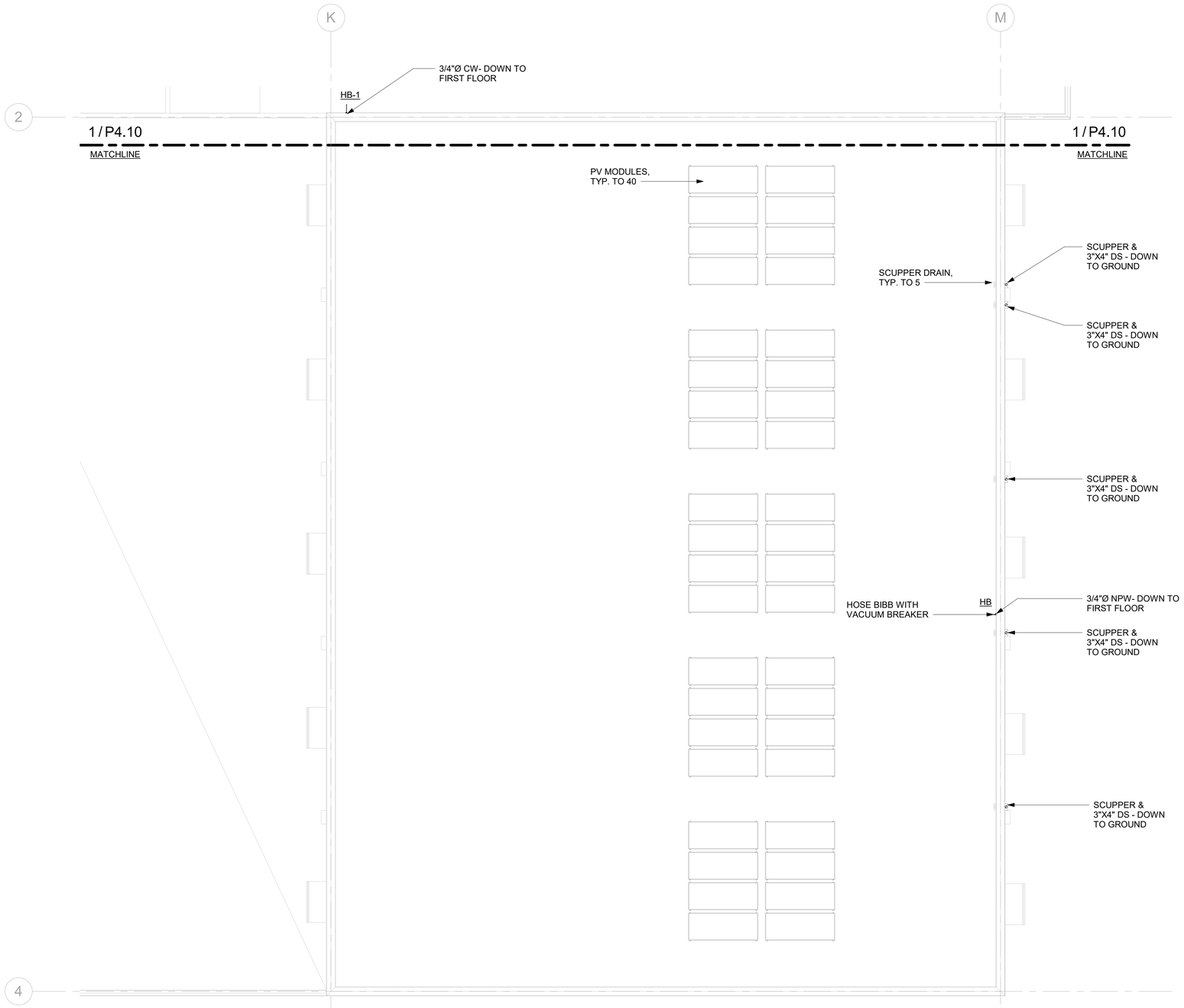
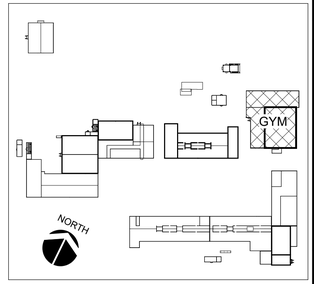


1 PLUMBING ROOF PLAN - GYMNASIUM
SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:
PLUMBING ROOF PLAN - GYMNASIUM
PROGRAMMING DOCUMENT

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Supv:	MPN
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Project No. XX-XXX	File

Drawing No.
P4.11
Sheet No. _____ of 0

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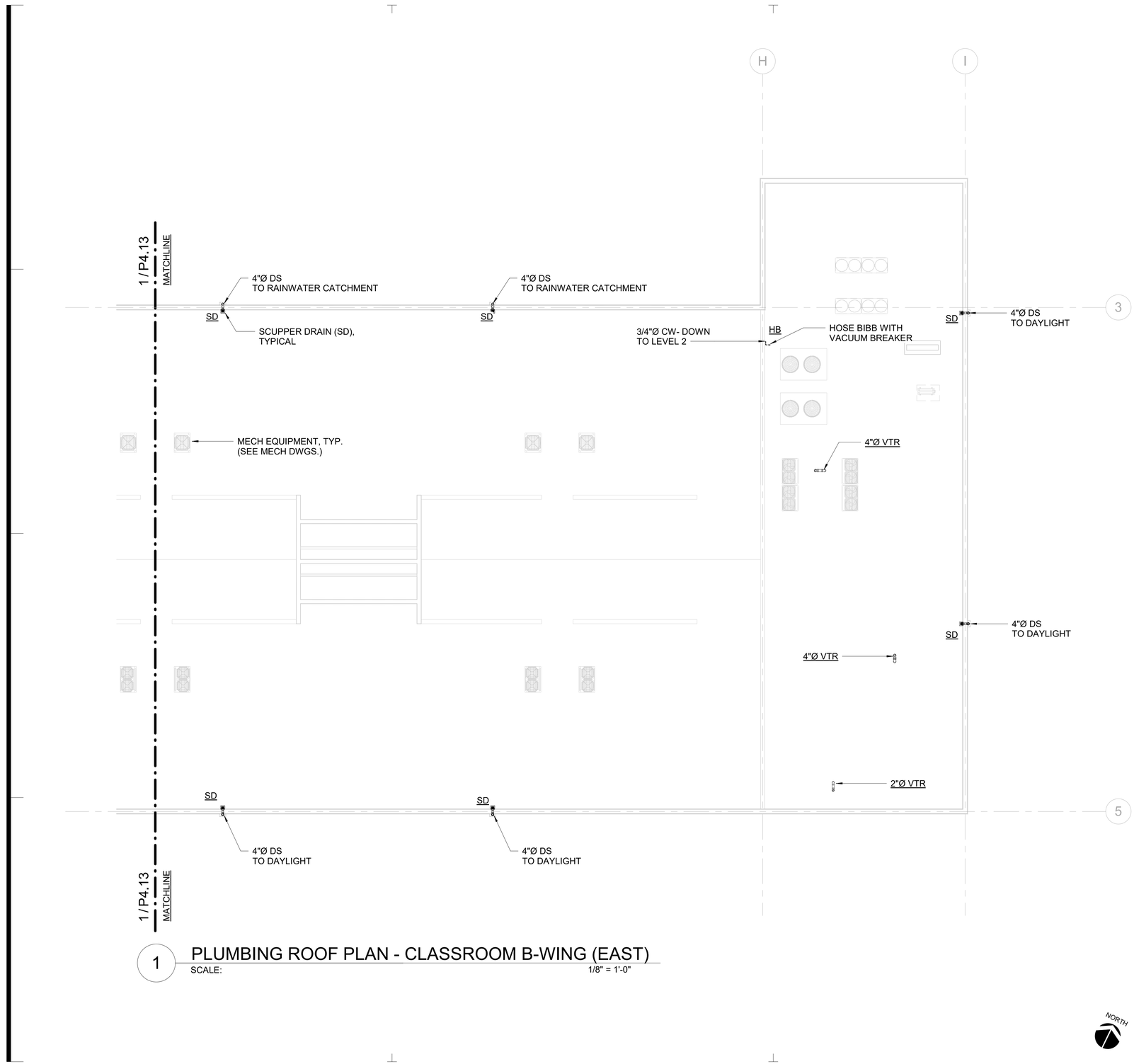
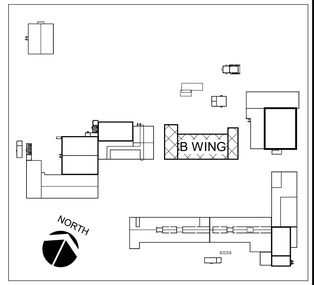


1 PLUMBING ROOF PLAN - CLASSROOM B-WING (EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - CLASSROOM B-WING (EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
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Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
P4.12
Sheet No. of

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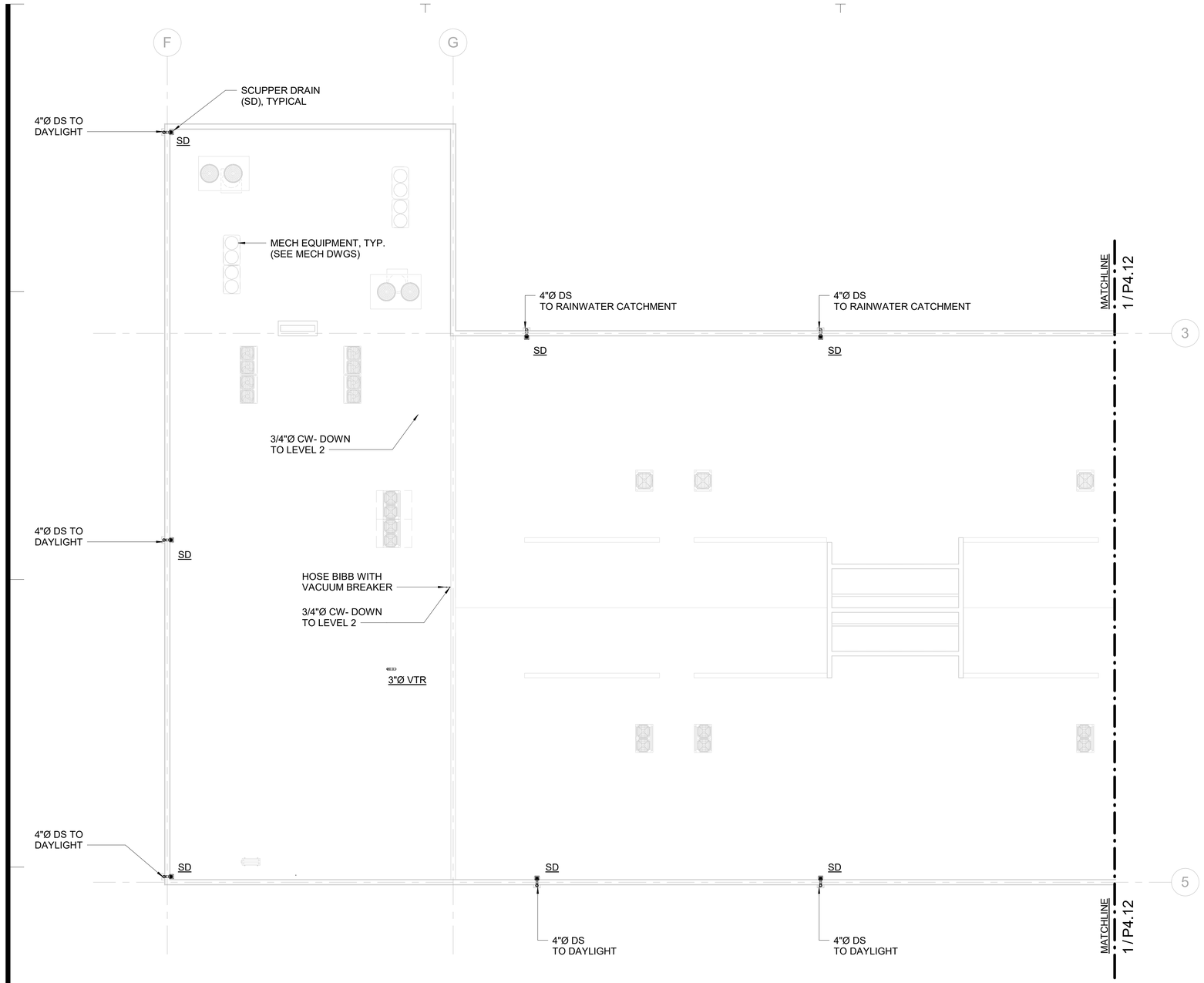
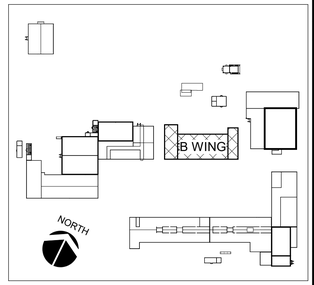


1 PLUMBING ROOF PLAN - CLASSROOM B-WING (WEST)

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - CLASSROOM B-WING (WEST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
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Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
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Drawing No.
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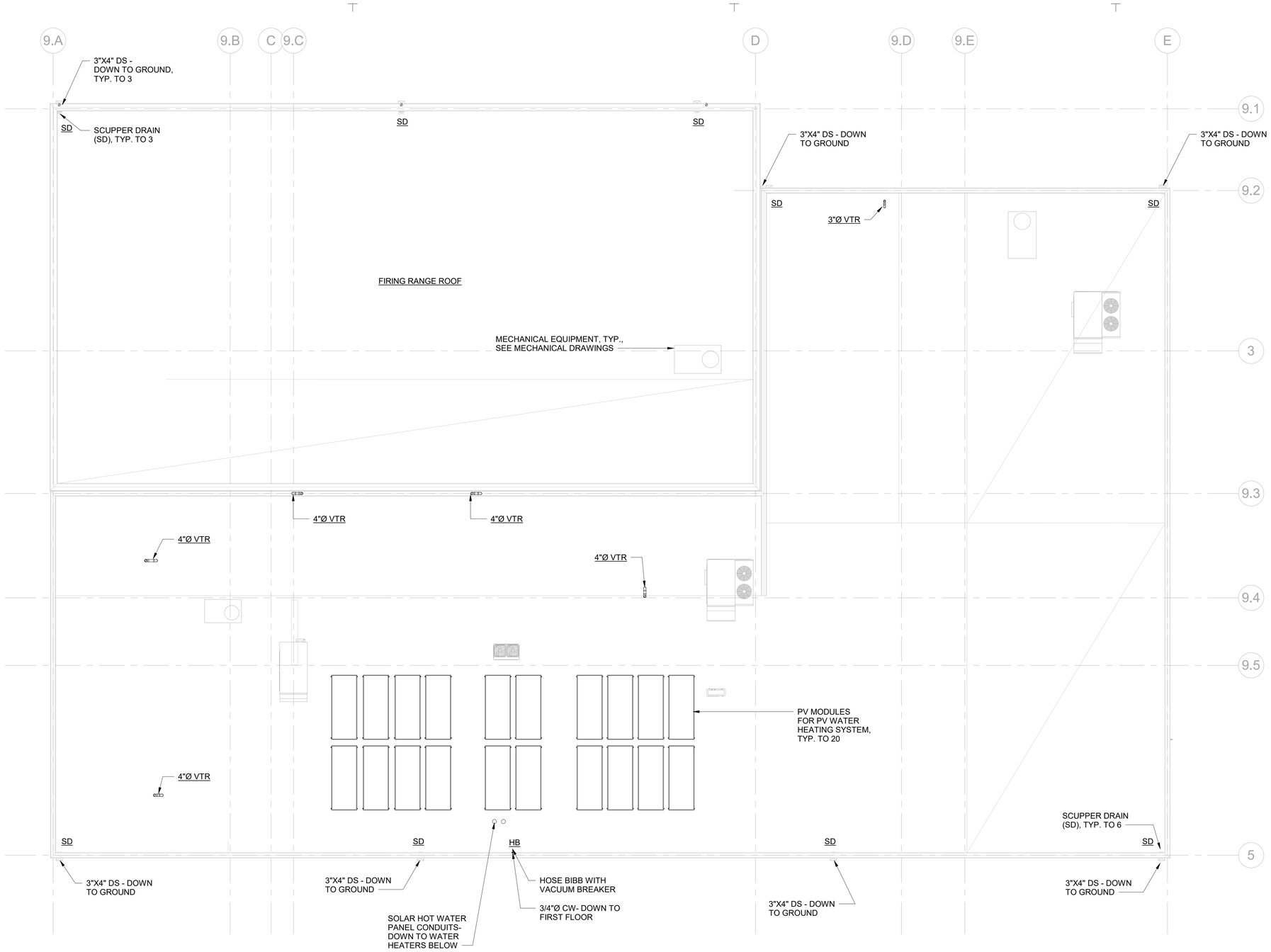

1 PLUMBING ROOF PLAN - ROTC

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - JROTC
PROGRAMMING DOCUMENT

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Drawn:	AT/RV/CA
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Supv:	MPN
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Project No.	XX-XXX
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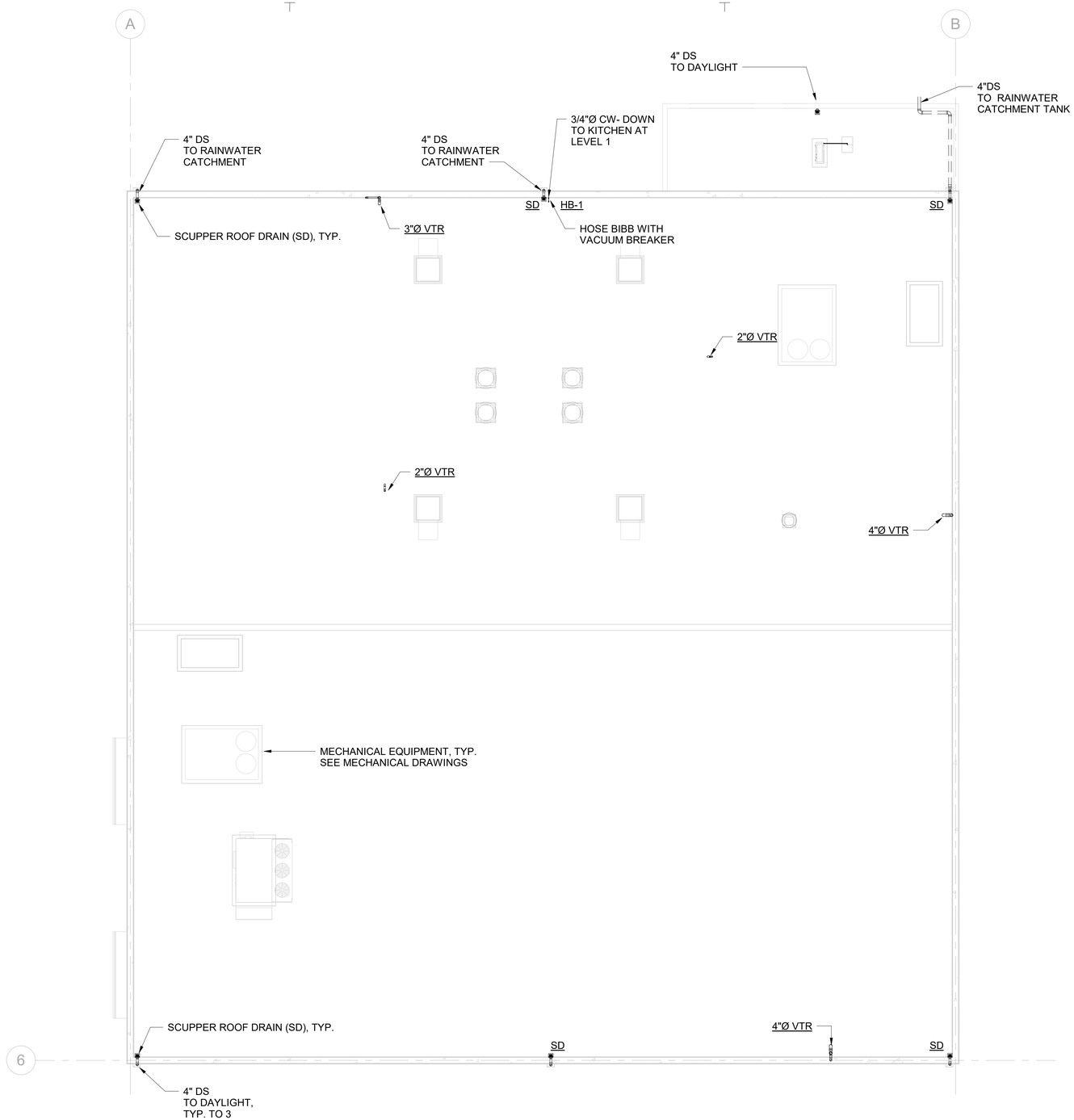

1 PLUMBING ROOF PLAN - CAFETERIA

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - CAFETERIA

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA/JB
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Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

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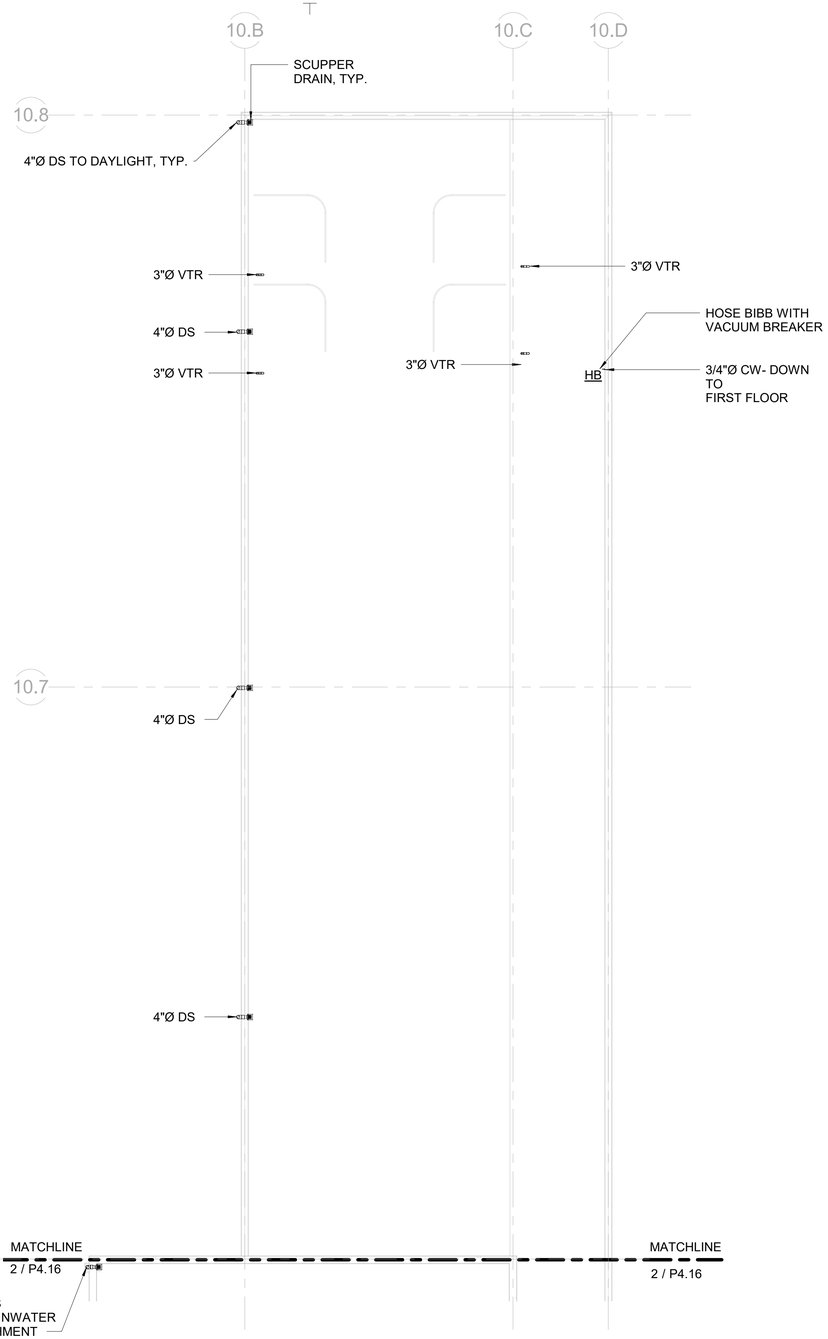
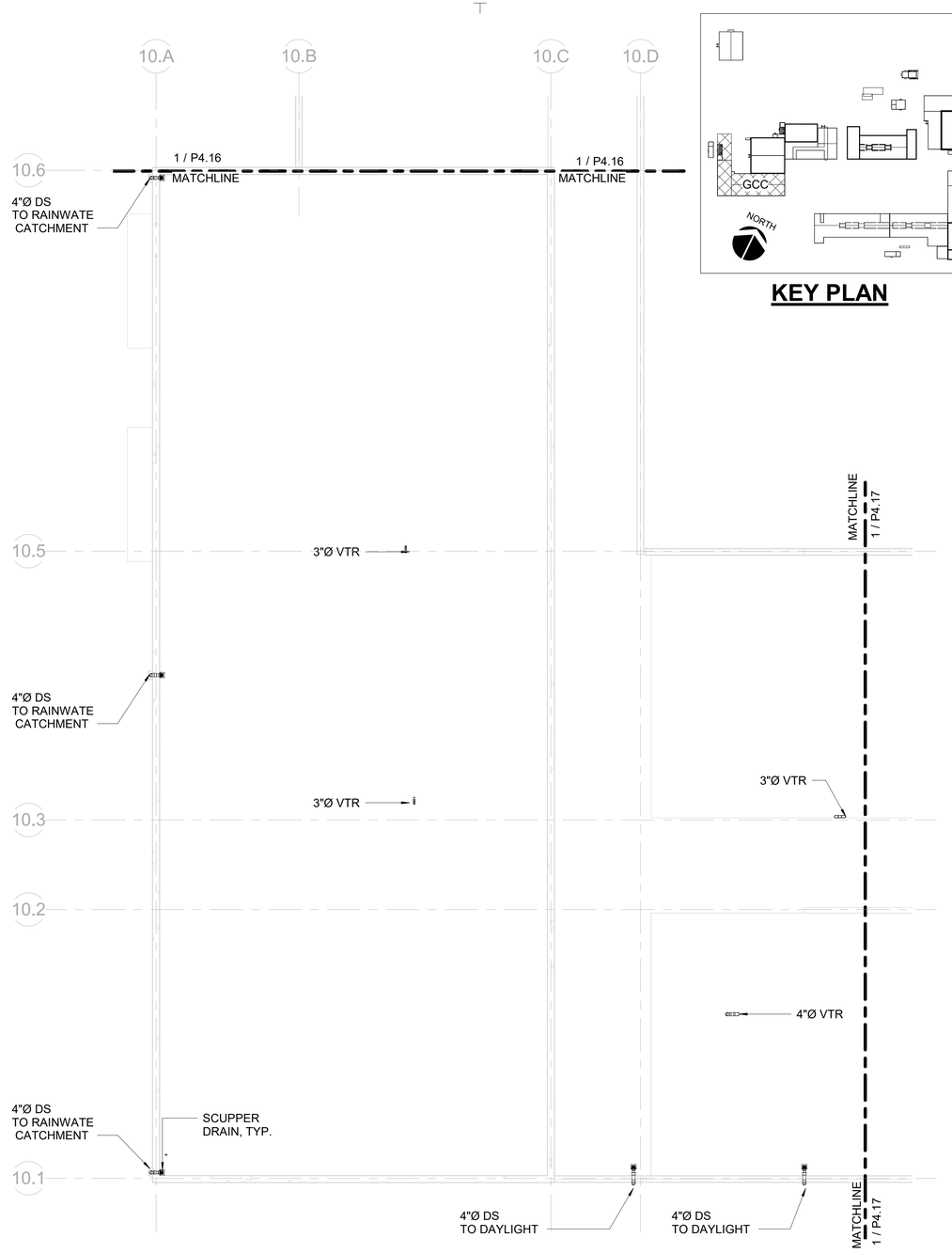


1 PLUMBING ROOF PLAN - GCC (NORTH)

SCALE: 1/8" = 1'-0"



2 PLUMBING ROOF PLAN - GCC (UPPER ROOF)

SCALE: 1/8" = 1'-0"

KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - GCC BUILDING
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
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Date:	3/31/25
Project No. XX-XXX	File

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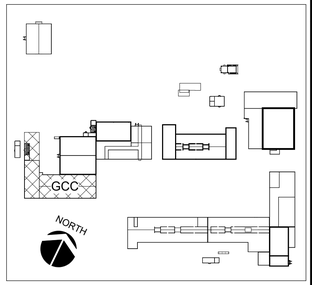

KEY PLAN

10.E 10.F B 10.G 10.H 10.J

10.5 10.3 10.2 10.1

2 / P4.16 MATCHLINE

2 / P4.16 MATCHLINE

4" VTR

4" VTR

2"Ø VTR

SCUPPER DRAIN, TYP..

4"Ø DS TO DAYLIGHT, TYP.

4"Ø DS

4"Ø DS

HB

HOSE BIBB WITH VACUUM BREAKER

3/4"Ø CW-DOWN TO FIRST FLOOR

4"Ø DS

4"Ø DS

4"Ø DS

4"Ø DS

1 PLUMBING ROOF PLAN - GCC (LOWER ROOF)

SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - GCC BUILDING (LOWER ROOF)
PROGRAMMING DOCUMENT

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Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
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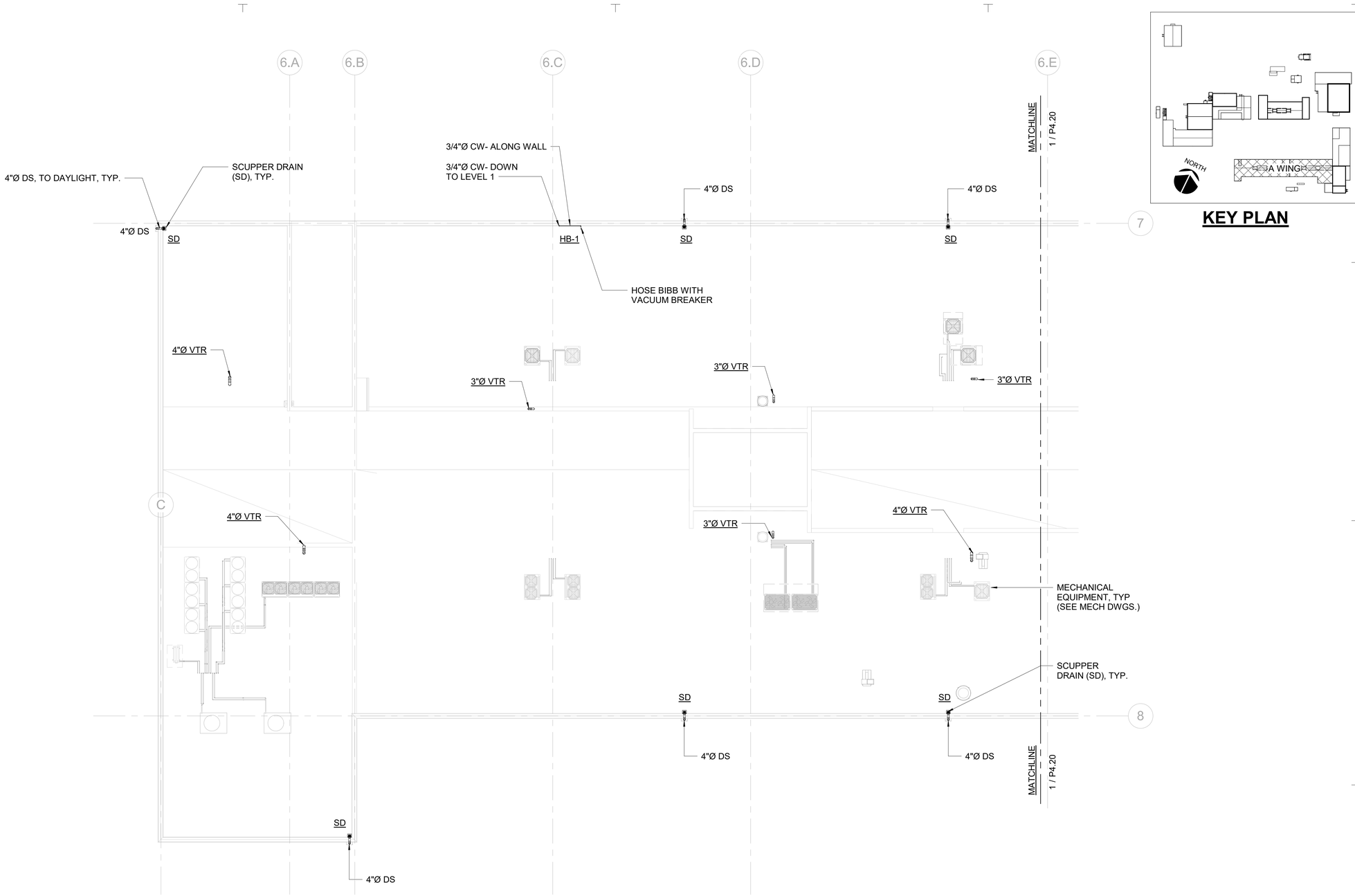

KEY PLAN

1 PLUMBING ROOF PLAN - CLASSROOM (A-WING WEST)
SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS

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TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - CLASSROOM (A-WING WEST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AQT/ RMV
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P4.19
Sheet No._____ of _____

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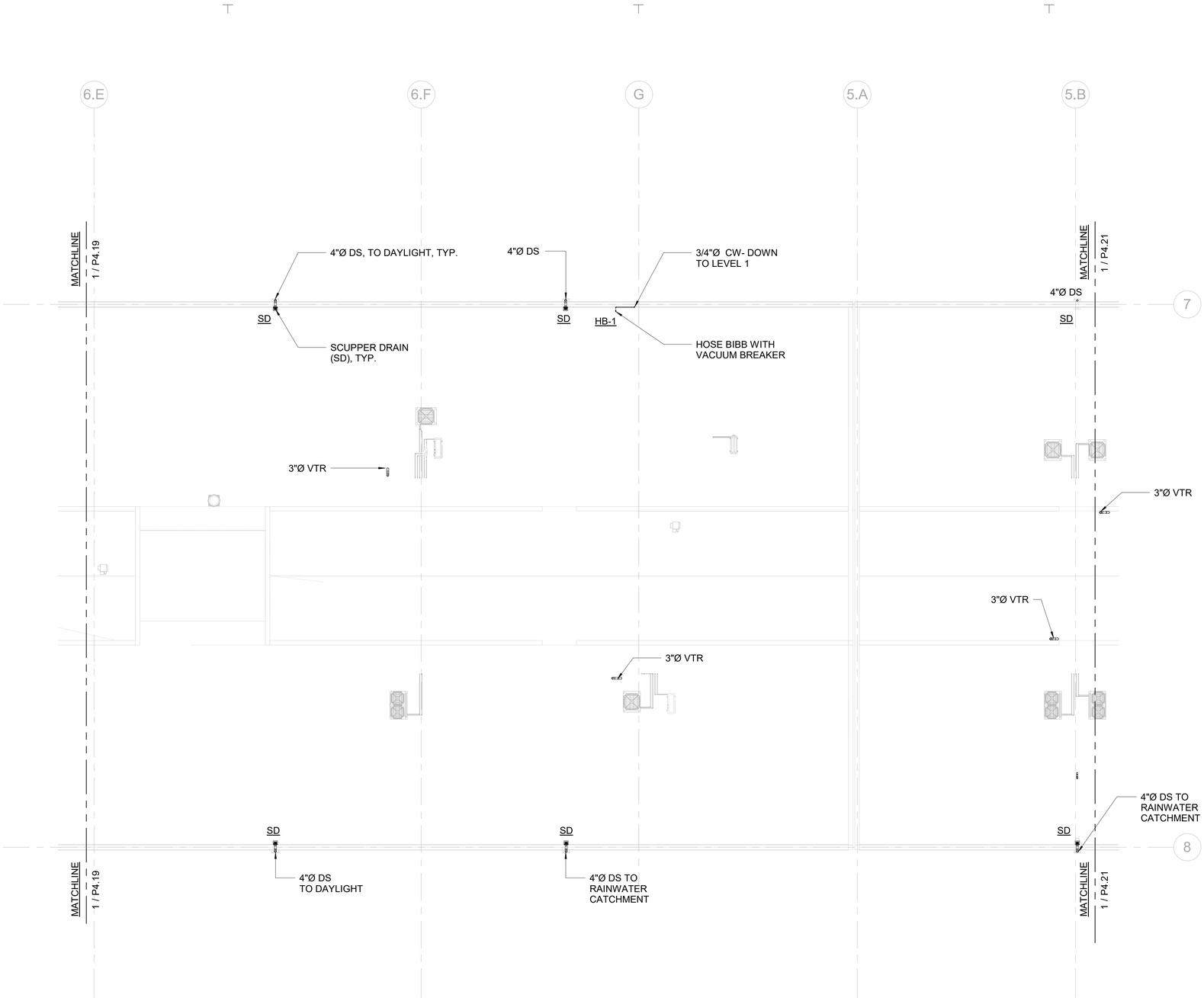
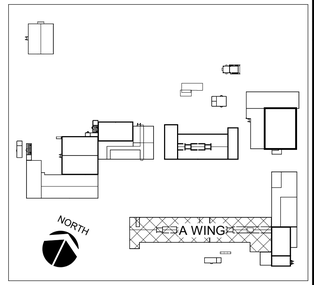


1 PLUMBING ROOF PLAN - CLASSROOM (A-WING)

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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PLUMBING ROOF PLAN - A-WING
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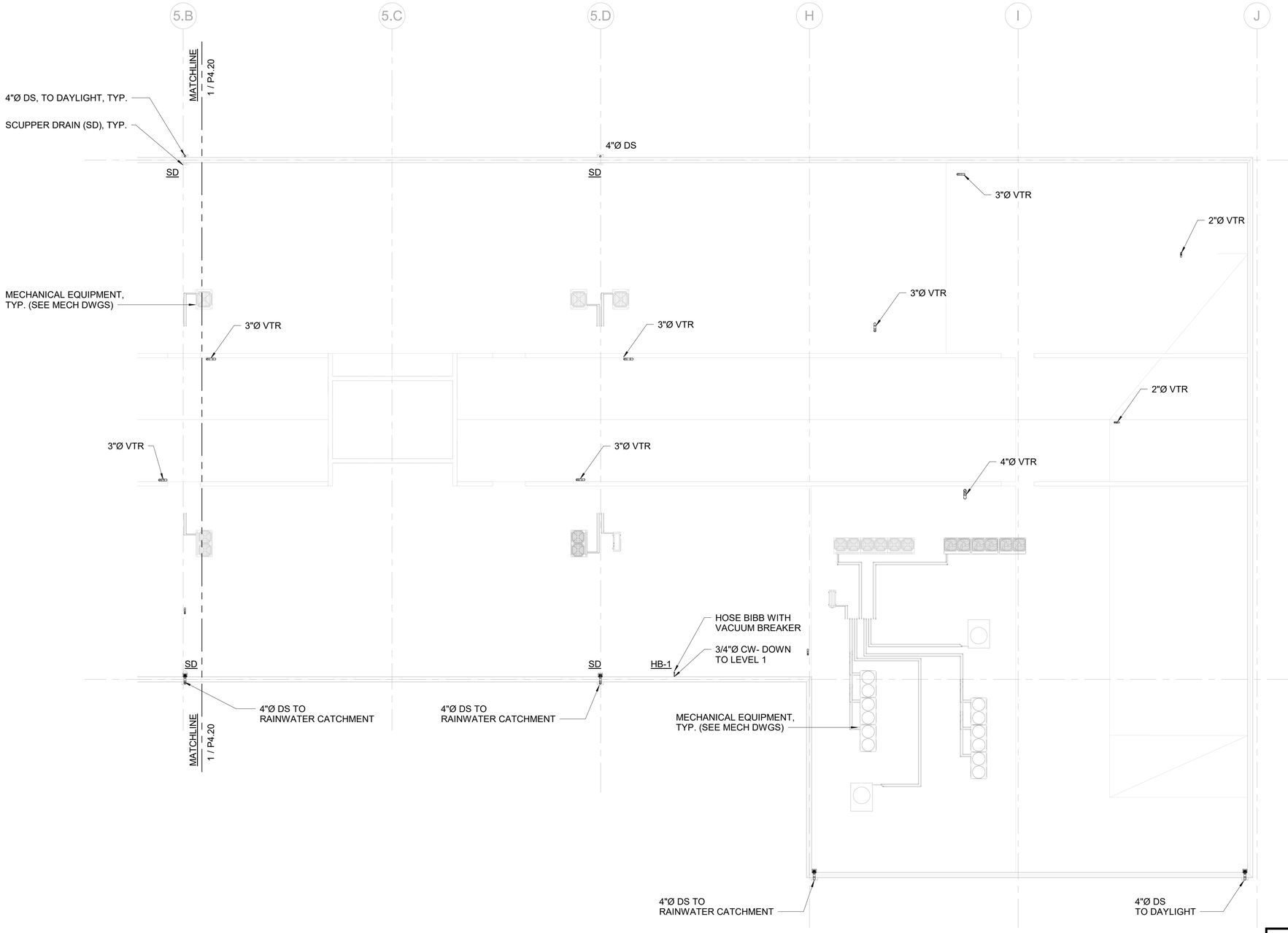
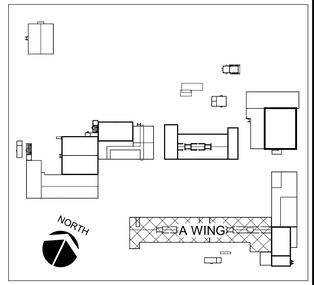


1 PLUMBING ROOF PLAN - CLASSROOM (A-WING EAST)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Title:
PLUMBING ROOF PLAN - CLASSROOM (A-WING EAST)
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
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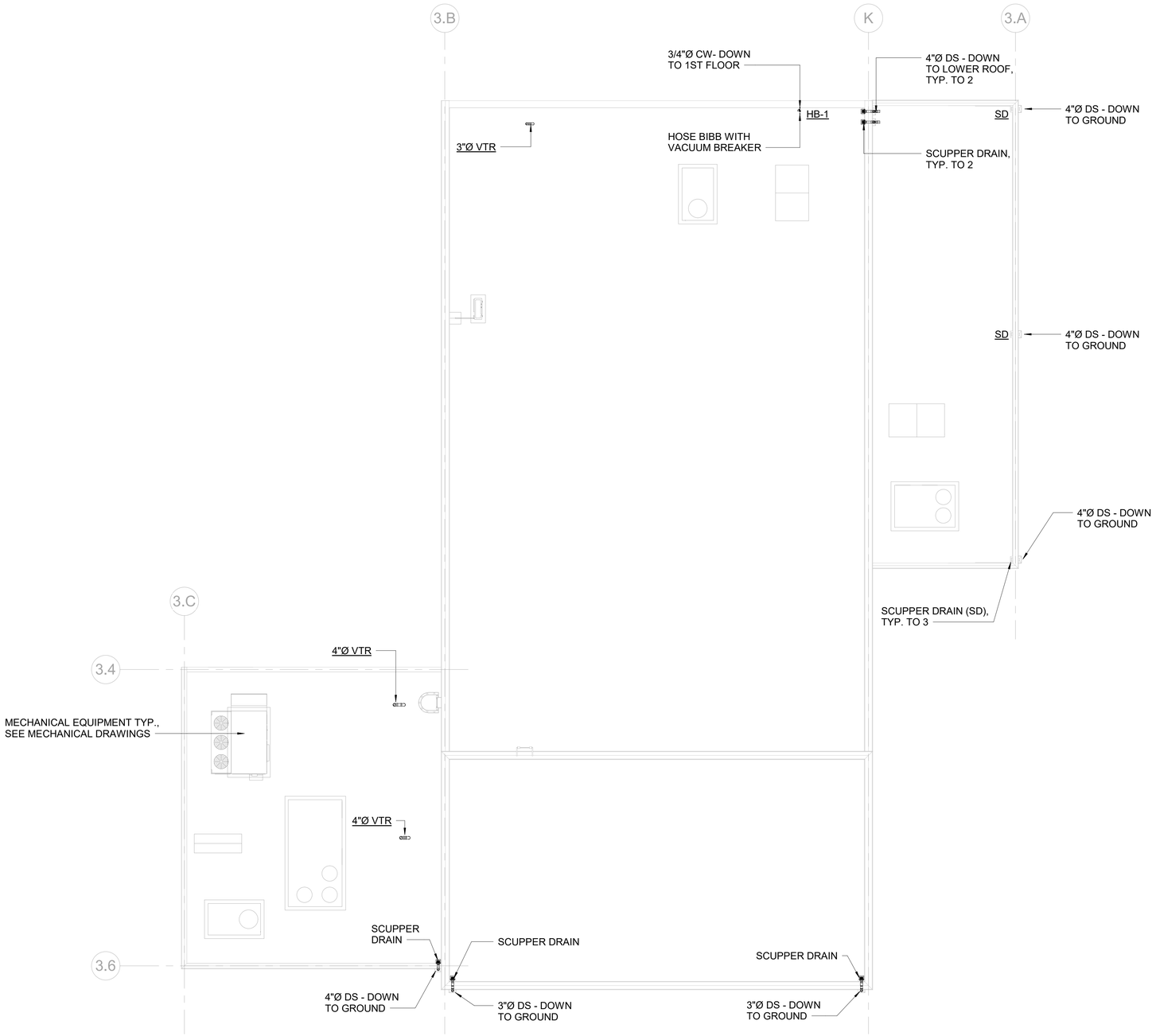
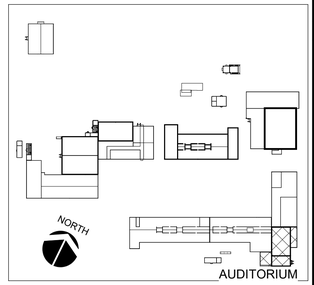


1 PLUMBING ROOF PLAN - AUDITORIUM

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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GDOE

SIMON SANCHEZ HIGH SCHOOL

Title:

PLUMBING ROOF PLAN- AUDITORIUM

PROGRAMMING DOCUMENT

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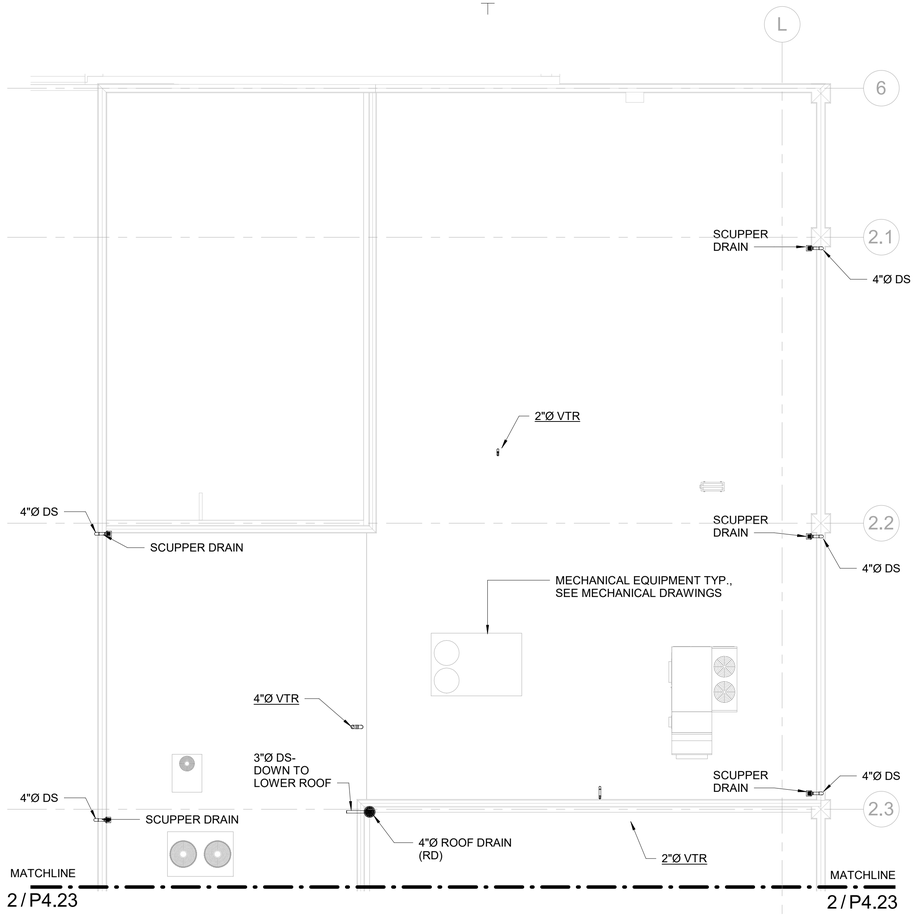
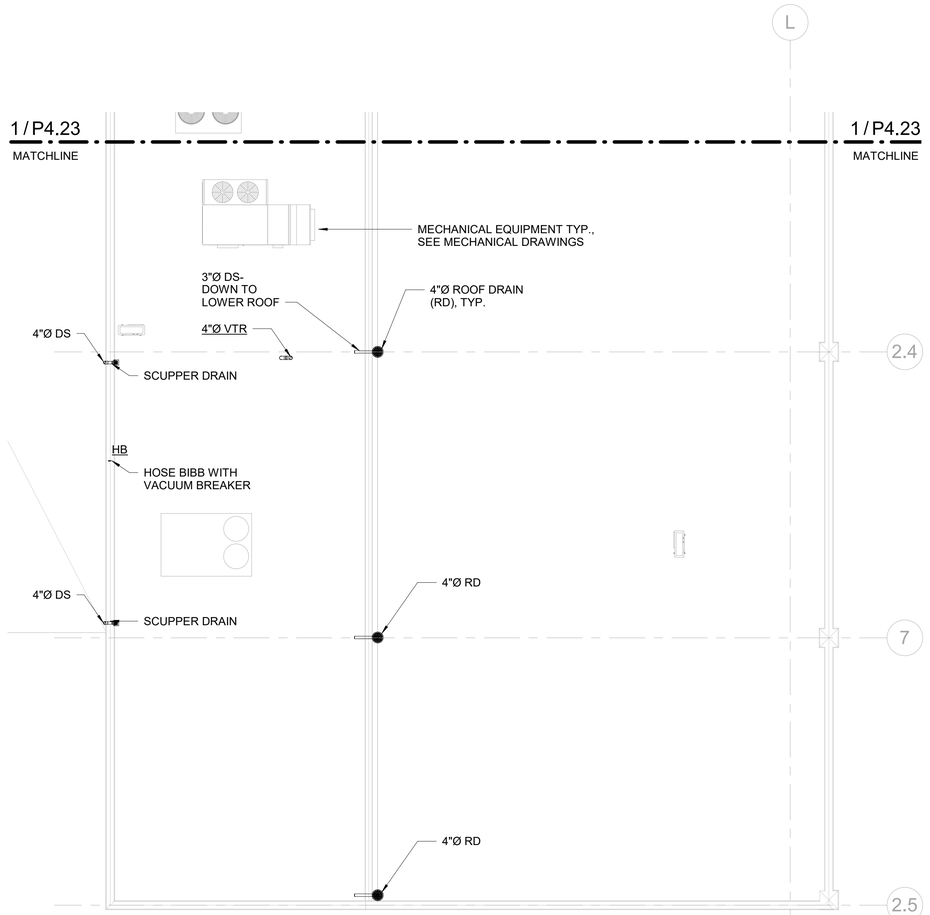


1 PLUMBING ROOF PLAN- ADMIN/ LIBRARY NORTH

SCALE: 1/8" = 1'-0"



2 PLUMBING ROOF PLAN- ADMIN/ LIBRARY SOUTH

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SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING ROOF PLAN - ADMIN/ LIBRARY

PROGRAMMING DOCUMENT

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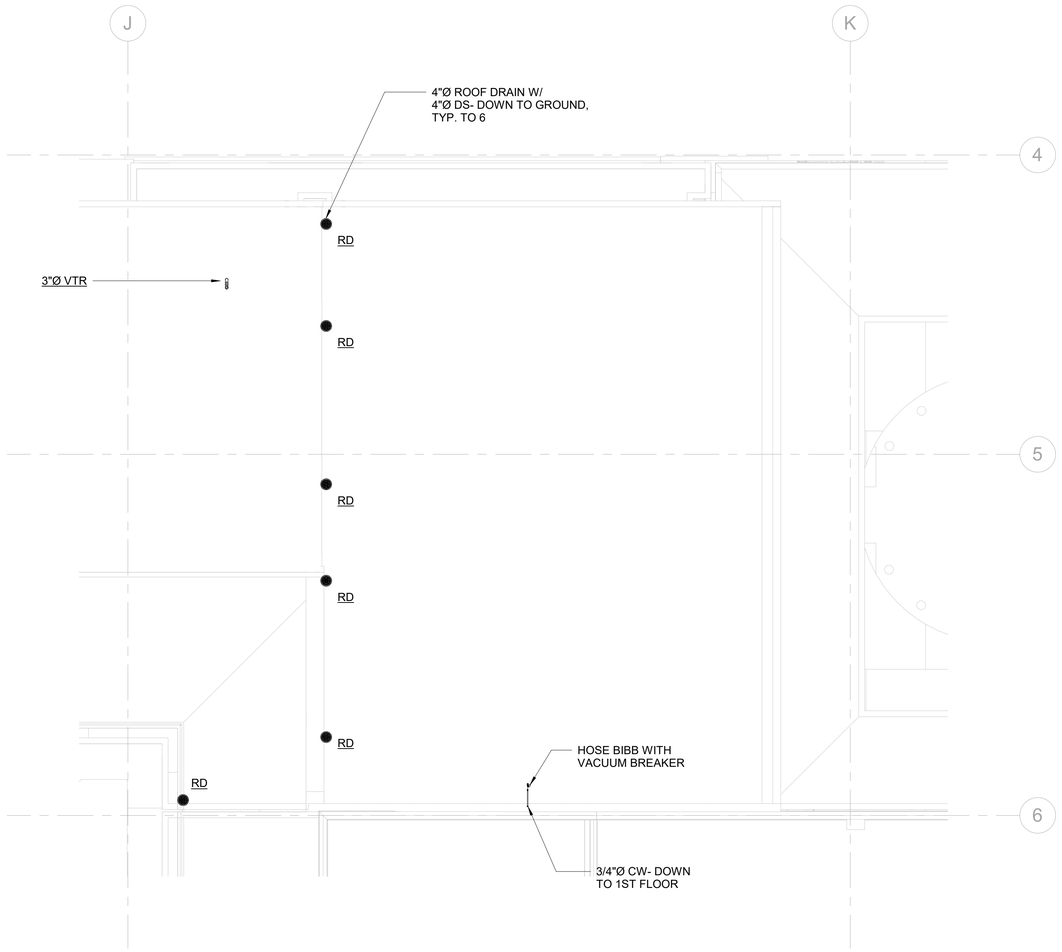
Sheet No. _____ of 0



1 PLUMBING ROOF PLAN - MAIN ENTRY

SCALE: 1/8" = 1'-0"

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PLUMBING ROOF PLAN - MAIN ENTRY

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
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Project No.	File
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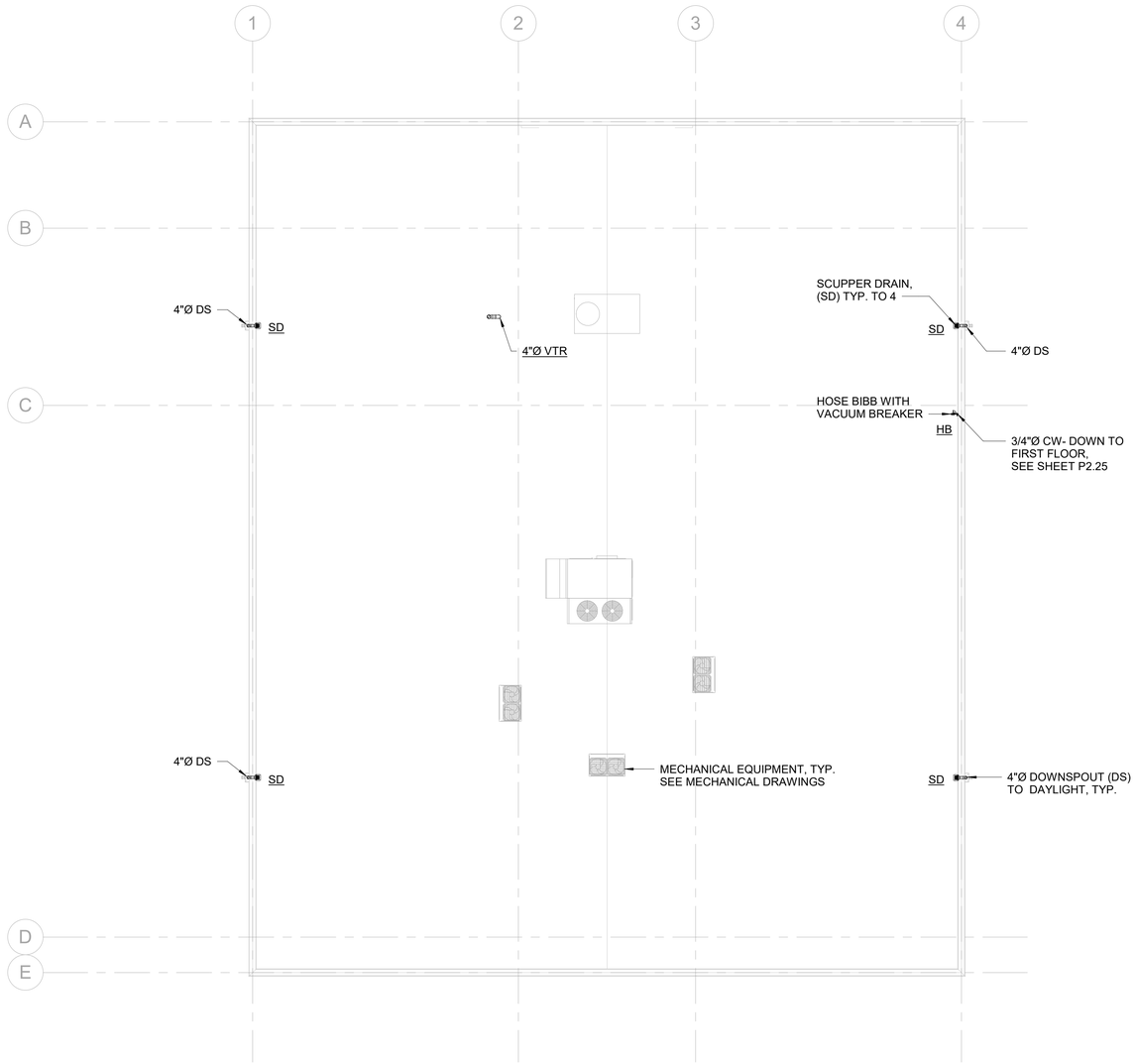
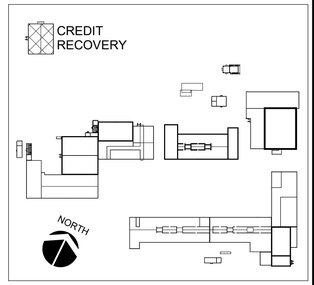
Drawing No.
P4.24
Sheet No._____ of 0



1 PLUMBING ROOF PLAN - CREDIT RECOVERY

SCALE: 1/8" = 1'-0"



KEY PLAN

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SIMON SANCHEZ HIGH SCHOOL

Title:

PLUMBING ROOF PLAN - CREDIT RECOVERY

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
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Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25

Project No.	File
XX-XXX	

Drawing No.

P4.25

Sheet No. _____ of 0

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NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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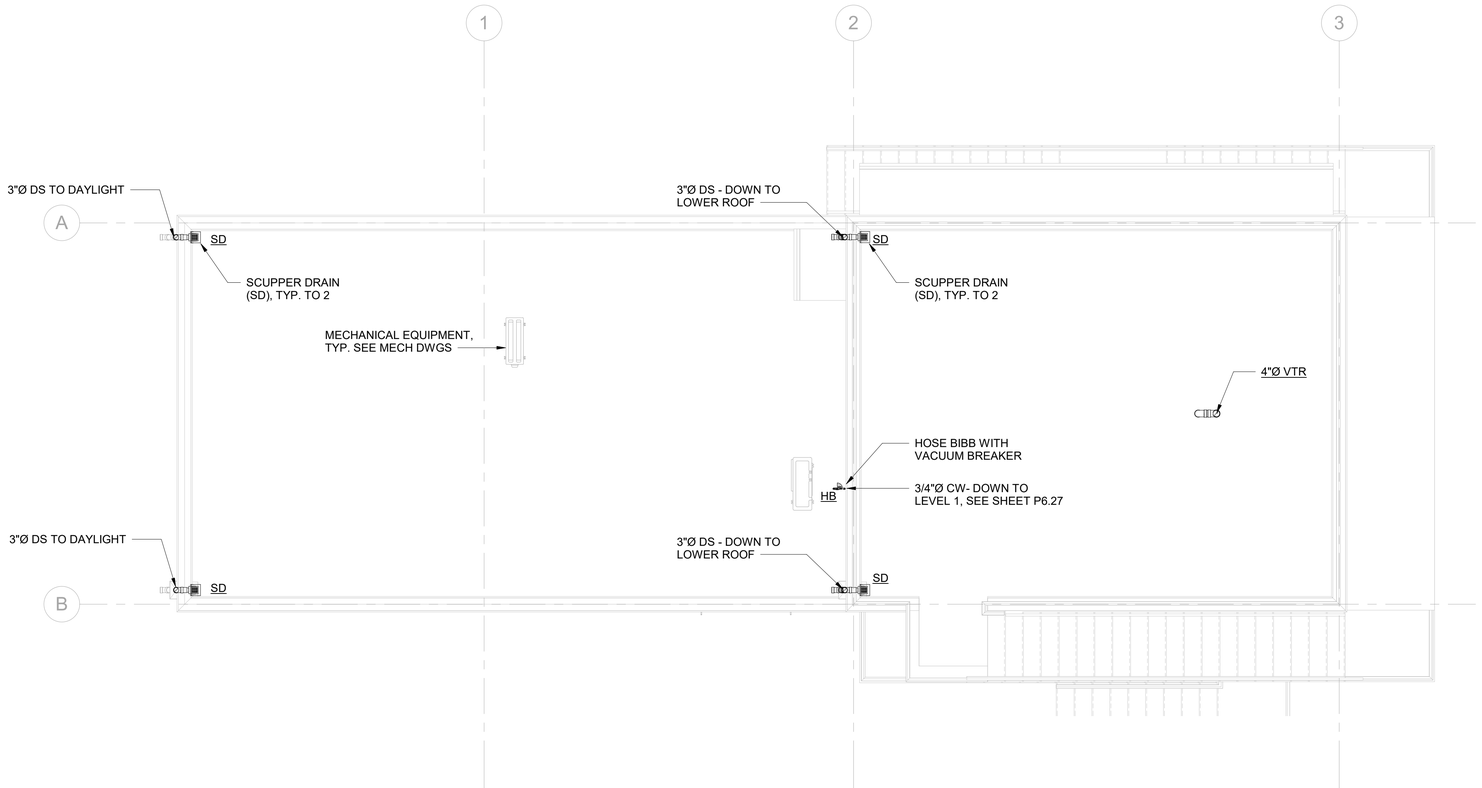
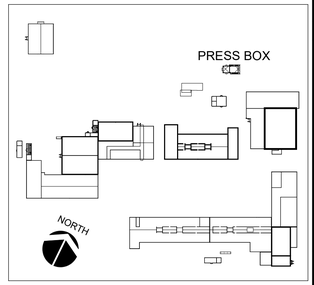


1 PLUMBING ROOF PLAN - PRESSBOX

SCALE: 1/4" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 1' 2' 3' 4' 8' 12'

SCALE: 1/4" = 1'-0"

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Title:
PLUMBING ROOF PLAN - PRESSBOX

PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
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Supv:	MPN
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	File
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Drawing No.
P4.26
Sheet No._____ of 0

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EQUIPMENT SCHEDULE

ADMINISTRATION BUILDING

TANKLESS WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	MAX. FLOW GPM	TEMP. RISE (°F)	ELECTRICAL DATA				REMARKS
					KW	VOLTAGE	PHASE	HERTZ	
TWH A1	LEVEL 1 A169 FACULTY & STAFF LOUNGE	PANTRY SINK	1.5	30	5.0	208	1	60	
TWH A2	LEVEL 1 A176A RESTROOM	SHOWER, LAVATORY	1.5	30	5.0	208	1	60	
TWH A3	LEVEL 1 A177 ANTE & A177A ISOLATION	LAVATORIES	1.0	25	3.0	208	1	60	

BUILDING A-WING

SOLAR PHOTOVOLTAIC WATER HEATER

MARK NO.	QTY	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	PV MODULE - SOLAR ELECTRICAL				GRID BACK-UP HEATING ELEMENT				DIMENSIONS (DIAMETER X HEIGHT, IN)	UNIT WEIGHT (LBS)	REMARKS
						QTY	WATTS	VOLTAGE	INVERTER	KW	VOLTAGE	PHASE	HERTZ			
PVWH B1	3	LEVEL 1 SCIENCE & SCIENCE PREP ROOMS	WORKSTATION SINKS (FORWARD VISION II), SCIENCE DEMONSTRATION TABLE SINKS, PREP SINKS	45	60	12	290	32	3	3.38	208	1	60	24 X 60	130	

HOT WATER RECIRCULATING PUMP

MARK NO.	AREA SERVED	TYPE	FLOW (GPM)	TDH (FT)	ELECTRICAL CHARACTERISTICS				REMARKS
					HP	VOLTAGE	PHASE	HERTZ	
HWRP B1	LEVEL 1 SCIENCE & SCIENCE PREP ROOMS	IN-LINE, RECIRCULATING	4	7	1/8	115	1	60	

HOT WATER STORAGE TANK

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (GAL)	DIMENSIONS (DIAMETER X HEIGHT, IN)	WEIGHT (LBS)	REMARKS
ST B1	1	LEVEL 1 SCIENCE & SCIENCE PREP ROOMS	HOT WATER STORAGE TANK	175	36" X 71"	855	

EXPANSION TANK

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (GAL)	DIMENSIONS (DIAMETER X HEIGHT, IN)	SYSTEM CONNECTION (INCHES)	WEIGHT (LBS)	REMARKS
ET B1	1	LEVEL 1 SCIENCE & SCIENCE PREP ROOMS	THERMAL EXPANSION TANK	6.4	12" X 18"	3/4	26	

DILUTION TANK

MARK NO.	QTY	AREA SERVED	CAPACITY (GALLONS)	DISCHARGE pH	INLET / OUTET	DIMENSIONS (LENGTH X WIDTH X HEIGHT, IN)	REMARKS
DT B1	32	LEVEL 1 SCIENCE CLASSROOMS & SCIENCE PREP ROOMS	1.5	5.5-5.8	1-1/2" FEMALE	12.5 X 8.5 X 9	

TANKLESS WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	MAX. FLOW GPM	TEMP. RISE (°F)	ELECTRICAL DATA				REMARKS
					KW	VOLTAGE	PHASE	HERTZ	
TWH B1	LEVEL 1 A101 ART	SINKS	1.0	25	3.6	208	1	60	
TWH B2	LEVEL 1 A102 ART	SINKS	1.0	25	3.6	208	1	60	

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
EQUIPMENT SCHEDULE - ADMIN A-WING
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
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Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
P7.10
Sheet No. _____ of 0

EQUIPMENT SCHEDULE

A-WING (CONTINUATION)

ELECTRIC WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	RECOVERY @60°F (GPH)	ELECTRICAL DATA				DIMENSIONS (DIAMETER X HEIGHT, IN)	UNIT WEIGHT (LBS)	REMARKS
						KW	VOLTAGE	PHASE	HERTZ			
EWH B1	LEVEL 1 SPED A104 & A105	PANTRY SINK, CLOTHES WASHER, SHOWER, LAVATORIES	30	60	34	5	208	1	60	17-3/4 X 45-1/2	90	

SOLID INTERCEPTOR

MARK NO.	AREA SERVED	FIXTURES	FLOW RATE (GPM)	PIPE CONNECTIONS		REMARKS
				INLET	OUTLET	
SI B1	LEVEL 1 ART A101	HAND SINKS	15	2	2	
SI B2	LEVEL 1 ART A102	HAND SINKS	15	2	2	

ELEVATOR SUMP PUMP

MARK NO.	SERVICE	ELECTRICAL CHARACTERISTICS				REMARKS
		HP	V	PH	CYCLE	
SP B1	ELEVATOR SUMP PUMP	1/2	115	1	60	
SP B2	ELEVATOR SUMP PUMP	1/2	115	1	60	

B-WING

ELEVATOR SUMP PUMP

MARK NO.	SERVICE	ELECTRICAL CHARACTERISTICS				REMARKS
		HP	V	PH	CYCLE	
SP 1	ELEVATOR SUMP PUMP	1/2	115	1	60	:

CAFETERIA

ELECTRIC WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	RECOVERY @60°F (GPH)	ELECTRICAL DATA				UNIT WEIGHT (LBS)	DIMENSIONS (DIAMETER X HEIGHT, IN)	REMARKS
						KW	VOLTAGE	PHASE	HERTZ			
EWH C1	KITCHEN C153 SCULLERY C154	KITCHEN WAREWASHING UNITS	175	60	103	15	480	3	60	700	32-1/4 X 69-1/2	

HOT WATER RECIRCULATING PUMP

MARK NO.	AREA SERVED	TYPE	FLOW (GPM)	TDH (FT)	ELECTRICAL CHARACTERISTICS				REMARKS
					HP	VOLTAGE	PHASE	HERTZ	
HWRP C1	KITCHEN C153 SCULLERY C154	IN-LINE, RECIRCULATING	2	18	1/8	115	1	60	

GREASE INTERCEPTOR

MARK NO.	AREA SERVED	FIXTURES	CAPACITY (GALLONS)	APPROX. DIMENSIONS (L x W x H)	PIPE CONNECTIONS		REMARKS
					INLET	OUTLET	
GI C1	KITCHEN C153 SCULLERY C154	KITCHEN WAREWASHING UNITS	1,000	9'-0" x 5'-0" x 7'-2"	4"⌀	4"⌀	

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
EQUIPMENT SCHEDULE - A-WING (CONT.) CAFE GYMNASIUM
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
xx-xxx	

Drawing No.
P7.11
Sheet No._____ of ____0

EQUIPMENT SCHEDULE

GYMNASIUM

SOLAR PHOTOVOLTAIC WATER HEATER

MARK NO.	QTY	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	PV MODULE - SOLAR ELECTRICAL				GRID BACK-UP HEATING ELEMENT				DIMENSIONS (DIAMETER X HEIGHT, IN)	UNIT WEIGHT (LBS)	REMARKS
						QTY	WATTS	VOLTAGE	INVERTER	KW	VOLTAGE	PHASE	HERTZ			
PVWH D1	5	LEVEL 1 M.LOCKER ROOM B141	SHOWERS, LAVATORIES, CLOTHES WASHER, UTILITY SINK	45	60	20	295	32	5	3.38	208	1	60	24 X 60	130	
PVWH D2	5	LEVEL 1 W.LOCKER ROOM B143	SHOWERS, LAVATORIES	45	60	20	295	32	5	3.38	208	1	60	24 X 60	130	

HOT WATER RECIRCULATING PUMP

MARK NO.	AREA SERVED	TYPE	FLOW (GPM)	TDH (FT)	ELECTRICAL CHARACTERISTICS				REMARKS
					HP	VOLTAGE	PHASE	HERTZ	
HWRP D1	FIRST FLOOR M.LOCKER ROOM B141	IN-LINE, RECIRCULATING	2	8	1/8	115	1	60	
HWRP D2	FIRST FLOOR W.LOCKER ROOM B143	IN-LINE, RECIRCULATING	2	5	1/8	115	1	60	

HOT WATER STORAGE TANK

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (GAL)	DIMENSIONS (DIAMETER X HEIGHT, IN)	WEIGHT (LBS)	REMARKS
ST D1	1	FIRST FLOOR M.LOCKER ROOM B141	HOT WATER STORAGE TANK	175	36" X 71"	855	
ST D2	1	FIRST FLOOR W.LOCKER ROOM B143	HOT WATER STORAGE TANK	175	36" X 71"	855	

EXPANSION TANK

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (GAL)	DIMENSIONS (DIAMETER X HEIGHT, IN)	SYSTEM CONNECTION (INCHES)	WEIGHT (LBS)	REMARKS
ET D1	1	FIRST FLOOR M.LOCKER ROOM B141	THERMAL EXPANSION TANK	6.4	12" X 18"	3/4	26	
ET D2	1	FIRST FLOOR W.LOCKER ROOM B143	THERMAL EXPANSION TANK	6.4	12" X 18"	3/4	26	

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EQUIPMENT SCHEDULE - GYMNASIUM (CONT.)
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE

GCC BUILDING

ELECTRIC WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	RECOVERY @60°F (GPH)	ELECTRICAL DATA				UNIT WEIGHT (LBS)	DIMENSIONS (DIAMETER X HEIGHT, IN)	REMARKS
						KW	VOLTAGE	PHASE	HERTZ			
EWH E1	PROSTART KITCHEN C108, LAUNDRY AREA C106B, MOCK RESTROOM C106A	WAREWASHING UNITS, DISHWASHER, CLOTHES WASHER, BATHTUB, LAVATORY, SINKS	120	60	103	15	480	3	60	430	30-1/4 X 67-5/8	

HOT WATER RECIRCULATING PUMP

MARK NO.	AREA SERVED	TYPE	FLOW (GPM)	TDH (FT)	ELECTRICAL CHARACTERISTICS				REMARKS
					HP	VOLTAGE	PHASE	HERTZ	
HWRP E1	PROSTART KITCHEN C108	IN-LINE, RECIRCULATING	2	14	1/8	115	1	60	

GREASE INTERCEPTOR

MARK NO.	AREA SERVED	FIXTURES	FLOW RATE (GPM)	GREASE CAPACITY (LBS)	APPROX. DIMENSIONS (L x W x H)	PIPE CONNECTIONS		REMARKS
						INLET	OUTLET	
GI E1	PROSTART KITCHEN C108	KITCHEN WAREWASHING UNITS	75	150	4' 2" x 2' 6-1/2" x 3' 1"	4	4	

AIR COMPRESSOR

MARK NO.	LOCATION	AREA SERVED	TANK SIZE (GALLON)	ELECTRICAL DATA				REMARKS
				HP	VOLTAGE	PHASE	HERTZ	
AC E1	AIR COMPRESSOR ROOM C130A	AUTOMOTIVE WORKSHOP C113	80	10	460	3	60	
AC E2	AIR COMPRESSOR ROOM C134A	CARPENTRY WORK SHOP C115	80	10	460	3	60	

OIL WATER SEPARATOR

MARK NO.	AREA SERVED	NOMINAL VOLUME (GALLONS)	NOMINAL DIAMETER (FT)	DOUBLE WALL TANK LENGTH (FT)	INLET/OUTLET NOZZLE SIZE (INCHES)	FLOW RATE (GPM)	OIL STORAGE CAPACITY (GAL)	OIL SPILL CAPACITY (GAL)	DOUBLE WALL TANK WEIGHT (LBS)	REMARKS
OWS E1	AUTOMOTIVE WORKSHOP C113	550	4	9'-9"	4	55	110	440	900	

COMPRESSED AIR SYSTEM
SEQUENCE OF OPERATION:

1. CHECK OIL LEVEL. OIL SHOULD BE HALF UP, OR AT THE BOTTOM OF THE THREADS ON THE FILL SPOUT, OR 1/2 FULL IN THE SIGHT GLASS.
2. AT STARTUP, NORMALLY CLOSED INLET VALVE REMAINS CLOSED WHILE THE AIR COMPRESSOR BUILDS UP PRESSURE BY MEANS OF A BYPASS LINE. AFTER STARTUP, THE INLET VALVE IS CONTROLLED BY A SIMPLE ON/OFF ACTION OF A PRESSURE SWITCH AT THE MINIMUM AND MAXIMUM DESIRED AIR RECEIVER PRESSURE.
3. INLET AIR PASSES THRU AIR FILTER AND ENTERS THE COMPRESSOR. DURING COMPRESSION CYCLE, OIL IS INJECTED INTO THE COMPRESSOR. AS COMPRESSED AIR LEAVES THE COMPRESSOR AT THE DISCHARGE END, IT GOES THROUGH A MINIMUM PRESSURE VALVE SET TO MAINTAIN AT LEAST 85 PSIG IN THE SUMP WHEN THE COMPRESSOR IS RUNNING. THE VALVE ACTS AS CHECK VALVE TO PREVENT BACK FLOW INTO THE COMPRESSOR.
4. THE OIL COOLS THE INTERNAL OF THE COMPRESSOR AND PICKS UP THE HEAT GENERATED BY THE COMPRESSION PROCESS. THE OIL MUST BE COOLED IN THE OIL COOLER TO WITHIN 60°F OF THE AMBIENT TEMPERATURE.
5. AFTER OPERATION, TURN OFF THE POWER TO THE COMPRESSOR AND DRAIN ALL THE MOISTURE FROM THE BOTTOM OF THE TANK.
6. AIR/OIL SEPARATOR SHOULD BE CHANGED EVERY 2000 HOURS, OR WHEN THERE IS EXCESSIVE OIL VAPOR IN THE DISCHARGE AIR.

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1	ADDENDUM	10/27/2022

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SIMON SANCHEZ HIGH SCHOOL

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EQUIPMENT SCHEDULE - GCC

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EQUIPMENT SCHEDULE

JROTC BUILDING

TANKLESS WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	MAX. FLOW GPM	TEMP. RISE (°F)	ELECTRICAL DATA				REMARKS
					KW	VOLTAGE	PHASE	HERTZ	
TWH F1	STAFF C136	SHOWER	1.5	30	5.0	208	1	60	
TWH F2	STAFF COLLABORATION C146	PANTRY SINK	1.5	30	5.0	208	1	60	

SOLAR PHOTOVOLTAIC WATER HEATER

MARK NO.	QTY	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	PV MODULE - SOLAR ELECTRICAL				GRID BACK-UP HEATING ELEMENT				DIMENSIONS (DIAMETER X HEIGHT, IN)	UNIT WEIGHT (LBS)	REMARKS
						QTY	WATTS	VOLTAGE	INVERTER	KW	VOLTAGE	PHASE	HERTZ			
PVWH F1	5	WOMEN'S LOCKER ROOM C139, MEN'S LOCKER ROOM C141	SHOWERS, LAVATORIES	45	60	20	290	32	5	3.38	208	1	60	24 X 60	130	

HOT WATER RECIRCULATING PUMP

MARK NO.	AREA SERVED	TYPE	FLOW (GPM)	TDH (FT)	ELECTRICAL CHARACTERISTICS				REMARKS
					HP	VOLTAGE	PHASE	HERTZ	
HWRP F1	WOMEN'S LOCKER ROOM C139, MEN'S LOCKER ROOM C141	IN-LINE, RECIRCULATING	3	23	1/8	115	1	60	

HOT WATER STORAGE TANK

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (GAL)	DIMENSIONS (DIAMETER X HEIGHT, IN)	WEIGHT (LBS)	REMARKS
ST F1	1	WOMEN'S LOCKER ROOM C139, MEN'S LOCKER ROOM C141	HOT WATER STORAGE TANK	175	36" X 71"	855	

EXPANSION TANK

MARK NO.	QTY	AREA SERVED	TYPE	CAPACITY (GAL)	DIMENSIONS (DIAMETER X HEIGHT, IN)	SYSTEM CONNECTION (INCHES)	WEIGHT (LBS)	REMARKS
ET F1	1	WOMEN'S LOCKER ROOM C139, MEN'S LOCKER ROOM C141	THERMAL EXPANSION TANK	6.4	12" X 18"	3/4	26	

AUDITORIUM

ELECTRIC WATER HEATER

MARK NO.	AREA SERVED	FIXTURES	STORAGE (GAL)	TEMP. RISE (°F)	RECOVERY @60°F (GPH)	ELECTRICAL DATA				DIMENSIONS (DIAMETER X HEIGHT, IN)	UNIT WEIGHT (LBS)	REMARKS
						KW	VOLTAGE	PHASE	HERTZ			
EWH G1	DRESSING ROOM A194A & A195A	SHOWERS & LAVATORIES	30	60	34	5	208	1	60	17-3/4 X 45-1/2	90	

ELEVATOR SUMP PUMP

MARK NO.	SERVICE	ELECTRICAL CHARACTERISTICS				REMARKS
		HP	V	PH	CYCLE	
SP G1	ELEVATOR SUMP PUMP	1/2	115	1	60	

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SIMON SANCHEZ HIGH SCHOOL

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EQUIPMENT SCHEDULE - JROTC
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EQUIPMENT SCHEDULE - RAINWATER HARVESTING SYSTEM

RAINWATER TANK

MARK NO.	QTY	AREA SERVED	CAPACITY (GALLONS)	LENGTH x WIDTH (FEET)	HEIGHT (FEET)	INLET (INCHES)	OUTLET (INCHES)	DRAIN (INCHES)	OVERFLOW (INCHES)	REMARKS
RWT 1	1	ADMIN. BUILDING, AUDITORIUM, A-WING (EAST), A-WING (WEST) AND LANDSCAPE IRRIGATION	21,400	29.5 x 9.8	9.8	4	6	4	4	
RWT 2	1	GCC BUILDING AND COURTYARD & LANDSCAPE IRRIGATION	21,400	29.5 x 9.8	9.8	4	6	4	4	
RWT 3	1	B-WING & GYMNASIUM AND LANDSCAPE IRRIGATION	28,500	19.7 x 19.7	9.8	4	6	4	4	
RWT 4	1	JROTC, CAFETERIA BUILDING AND LANDSCAPE IRRIGATION	11,900	16.4 x 9.8	9.8	4	6	4	4	

RAINWATER BOOSTER PUMP

MARK NO.	AREA SERVED	TYPE	FLOW (GPM)	TDH (FT)	ELECTRICAL CHARACTERISTICS				REMARKS
					HP	VOLTAGE	PHASE	HERTZ	
RWP 1	ADMINISTRATION BUILDING, AUDITORIUM, A-WING (EAST), A-WING (WEST)	DUPLEX PACKAGE PUMP ASSEMBLY	P1 - 150 P2 - 150	185	P1 - 5 P2 - 5	460	3	60	
RWP 2	GCC BUILDING	DUPLEX PACKAGE PUMP ASSEMBLY	P1 - 115 P2 - 115	245	P1 - 7.5 P2 - 7.5	460	3	60	
RWP 3	B-WING & GYMNASIUM	DUPLEX PACKAGE PUMP ASSEMBLY	P1 - 115 P2 - 115	145	P1 - 5 P2 - 5	460	3	60	
RWP 4	JROTC & CAFETERIA BUILDING	DUPLEX PACKAGE PUMP ASSEMBLY	P1 - 65 P2 - 65	175	P1 - 3 P2 - 3	460	3	60	

NOTE:
1. RWP-3 SHALL BE CONNECTED TO EMERGENCY POWER SERVICE FOR TYPHOON SHELTER FACILITY USE.

RAINWATER FILTRATION SYSTEM - SEDIMENT FILTER

MARK NO.	AREA SERVED	TYPE	UNIT DATA PER TANK		ELECTRICAL CHARACTERISTICS			DIAMETER (INCHES)	HEIGHT (INCHES)	WEIGHT (LBS)	REMARKS
			PEAK FLOW RATE (GPM)	BACKWASH FLOW RATE (GPM)	VOLTAGE	PHASE	HERTZ				
WF A1	ADMINISTRATION BUILDING, AUDITORIUM, A-WING (EAST), A-WING (WEST)	SIMPLEX SEDIMENT FILTER	125	85	115	1	60	36	72	1,950	
WF A2	GCC BUILDING	SIMPLEX SEDIMENT FILTER	125	85	115	1	60	36	72	1,950	
WF A3	B-WING & GYMNASIUM	SIMPLEX SEDIMENT FILTER	125	85	115	1	60	36	72	1,950	
WF A4	JROTC & CAFETERIA BUILDING	SIMPLEX SEDIMENT FILTER	75	50	115	1	60	30	72	1,475	

NOTE:
1. WF-A3 SHALL BE CONNECTED TO EMERGENCY POWER SERVICE FOR TYPHOON SHELTER FACILITY USE.

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Title:
EQUIPMENT SCHEDULE - RAINWATER HARVESTING SYSTEM
PROGRAMMING DOCUMENT

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EQUIPMENT SCHEDULE - RAINWATER HARVESTING SYSTEM

RAINWATER FILTRATION SYSTEM - CARBON FILTER

MARK NO.	AREA SERVED	TYPE	UNIT DATA PER TANK		ELECTRICAL CHARACTERISTICS			DIAMETER (INCHES)	HEIGHT (INCHES)	WEIGHT (LBS)	REMARKS
			SERVICE FLOW RATE (GPM)	BACKWASH FLOW RATE (GPM)	VOLTAGE	PHASE	HERTZ				
WF B1	ADMINISTRATION BUILDING, AUDITORIUM, A-WING (EAST), A-WING (WEST)	SIMPLEX CARBON FILTER	130	100	120	1	60	48	72	3,645	
WF B2	GCC BUILDING	SIMPLEX CARBON FILTER	130	100	120	1	60	48	72	3,645	
WF B3	B-WING & GYMNASIUM	SIMPLEX CARBON FILTER	130	100	120	1	60	48	72	3,645	
WF B4	JROTC & CAFETERIA BUILDING	SIMPLEX CARBON FILTER	74	70	120	1	60	36	72	1,965	

NOTE:
1. WF-B3 SHALL BE CONNECTED TO EMERGENCY POWER SERVICE FOR TYPHOON SHELTER FACILITY USE.

RAINWATER FILTRATION SYSTEM - WATER SOFTENER

MARK NO.	AREA SERVED	TYPE	UNIT DATA PER TANK			ELECTRICAL DATA			DIAMETER (INCHES)	HEIGHT (INCHES)	BRINE TANK (DIAMETER x HEIGHT)	WEIGHT (LBS)	REMARKS
			NORMAL FLOW RATE (GPM)	PEAK FLOW RATE (GPM)	BACKWASH FLOW RATE (GPM)	VOLTAGE	PHASE	HERTZ					
WS 1	ADMINISTRATION BUILDING, AUDITORIUM, A-WING (EAST), A-WING (WEST)	DUPLEX SOFTENER	100	140	35	110	1	60	36	72	50" X 60"	4,130	
WS 2	GCC BUILDING	DUPLEX SOFTENER	100	140	35	110	1	60	36	72	50" X 60"	4,130	
WS 3	B-WING & GYMNASIUM	DUPLEX SOFTENER	100	140	35	110	1	60	36	72	50" X 60"	4,130	
WS 4	JROTC & CAFETERIA BUILDING	DUPLEX SOFTENER	75	140	25	110	1	60	30	72	39" X 48"	3,085	

NOTE:
1. WS-3 SHALL BE CONNECTED TO EMERGENCY POWER SERVICE FOR TYPHOON SHELTER FACILITY USE.

RAINWATER DISINFECTION SYSTEM

MARK NO.	QTY	AREA SERVED	FLOW RATE (GPM)	TYPE	POWER SUPPLY AND ELECTRICAL DATA			REMARKS
					VOLTAGE	PHASE	HERTZ	
UV 1	2	ADMINISTRATION BUILDING, AUDITORIUM, A-WING (EAST), A-WING (WEST)	100	UV LIGHT	110	1	60	
UV 2	2	GCC BUILDING	100	UV LIGHT	110	1	60	
UV 3	2	B-WING & GYMNASIUM	100	UV LIGHT	110	1	60	
UV 4	2	JROTC & CAFETERIA BUILDING	100	UV LIGHT	110	1	60	

NOTE:
1. UV-3 SHALL BE CONNECTED TO EMERGENCY POWER SERVICE FOR TYPHOON SHELTER FACILITY USE.

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EQUIPMENT SCHEDULE - RAINWATER HARVESTING SYSTEM
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PLUMBING FIXTURE SCHEDULE - ADMINISTRATION BUILDING

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	1"	-	1"	4"	2"	FLUSH VALVE, FLOOR MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV	LAVATORY	0.5 GPM	1/2"	1/2"	-	2"	2"	WALL HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	1/2"	-	2"	2"	WALL HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
SK	PANTRY SINK	1.5 GPM	1/2"	1/2"	-	2"	2"	TWO COMPARTMENT, COUNTERTOP, PROVIDE WASTE DISPOSER IN RIGHT COMPARTMENT
EWC-1	DRINKING FOUNTAIN	-	1/2"	-	-	2"	2"	ADA COMPLIANT, BI-LEVEL (HIGH AND LOW), SEE SPECIFICATIONS FOR DETAILS
MS	MOP SINK	2.0 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
SHO-1	SHOWER - ADA TYPE	1.5 GPM	1/2"	1/2"	-	-	-	PROVIDE WITH THERMOSTATIC MIXING VALVE, ADA COMPLIANT
SHD	SHOWER DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FS	FLOOR SINK	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	3/4"	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER

PLUMBING FIXTURE SCHEDULE - CLASSROOM A-WING

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR-1	URINAL - ADA TYPE	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV	LAVATORY	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
SHO-1	SHOWER - ADA TYPE	1.5 GPM	1/2"	1/2"	-	-	-	PROVIDE WITH THERMOSTATIC MIXING VALVE
MS	MOP SINK	2.0 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
MS-2	MOP SINK	-	-	-	-	2"	2"	FLOOR-MOUNTED ACID RESISTANCE CAST IRON SINK
SK	WORKSTATION SINK	0.5 GPM	1/2"	1/2"	-	2"	2"	FORWARD VISION I 4-STUDENT WORKSTATION W/ SINK, SEE SPECIFICATIONS FOR DETAILS
SK-1	TEACHER'S DEMO TABLE WITH SINK - ADA TYPE	0.5 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
SK-2	PREP SINK	0.5 GPM	1/2"	1/2"	-	2"	2"	ONE COMPARTMENT, COUNTERTOP
SK-3	ART SINK	0.5 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
HS	HAND SINK	0.5 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
KS	PANTRY SINK	1.5 GPM	1/2"	1/2"	-	2"	2"	TWO COMPARTMENT, COUNTERTOP, PROVIDE WASTE DISPOSER IN RIGHT COMPARTMENT
EWC	DRINKING FOUNTAIN	-	1/2"	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
WM	WASHING MACHINE	-	1/2"	1/2"	-	2"	2"	PROVIDE UTILITY CONNECTION BOX WITH BALL VALVES & WATER HAMMER ARRESTORS
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS
SHD	SHOWER DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FS	FLOOR SINK	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	-	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER, FILTERED NONPOTABLE WATER
HB-1	HOSE BIBB	-	3/4"	-	-	-	-	INSTALL WITH VACUUM BREAKER, DOMESTIC COLD WATER
EEWS	EMERGENCY SHOWER & EYE/FACE WASH STATION	-	1-1/4"	-	-	-	-	INSTALL WITH FLOW SWITCH AND ALARM; INDIRECT WASTE TO FLOOR DRAIN

FOR REFERENCE ONLY

PLUMBING FIXTURE SCHEDULE - CLASSROOM B-WING

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV	LAVATORY	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
MS	MOP SINK	2.0 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
EWC	DRINKING FOUNTAIN	-	1/2"	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS
FS	FLOOR SINK	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	3/4"	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER

PLUMBING FIXTURE SCHEDULE - CAFETERIA

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WITH WATERSENSE LABELED FAUCET
MS	MOP SINK	2.0 GPM	1/2"	-	-	2"	2"	FLOOR-MOUNTED, SEE SPECIFICATIONS FOR DETAILS
HS-1	HAND SINK - ADA TYPE	-	1/2"	-	-	2"	2"	ADA COMPLIANT, SEE SPECIFICATIONS FOR DETAILS
SK	PANTRY SINK	1.5 GPM	1/2"	1/2"	-	2"	2"	TWO COMPARTMENT, COUNTERTOP, PROVIDE WASTE DISPOSER IN RIGHT COMPARTMENT
2-KS	2-COMPARTMENT SINK	-	1/2"	1/2"	-	2"	2"	SSTL TWO COMPARTMENT SINKS W/ TWO DRAINBOARDS, SEE SPECIFICATIONS FOR DETAILS
3-KS	3-COMPARTMENT SINK	-	1/2"	1/2"	-	2"	2"	SSTL THREE COMPARTMENT SINKS W/ TWO DRAINBOARDS, SEE SPECIFICATIONS FOR DETAILS
EWC	DRINKING FOUNTAIN	-	1/2"	-	-	2"	2"	REFRIGERATED TYPE WITH BOTTLE FILLER, 115V/1PH/60HZ
EWC-1	DRINKING FOUNTAIN - ADA	-	1/2"	-	-	2"	2"	REFRIGERATED TYPE W/ BOTTLE FILLER, ADA COMPLIANT, 115V/1PH/60HZ
DW	DISHWASHER	-	-	1/2"	-	2"	-	"CMA" DISHMACHINES MODEL NO. EST-44, INDIRECT WASTE TO FLOOR SINK
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS
FS	FLOOR SINK	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	-	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER, FILTERED NON-POTABLE WATER SUPPLY
HB-1	HOSE BIBB	-	3/4"	-	-	-	-	INSTALL WITH VACUUM BREAKER, DOMESTIC COLD WATER SUPPLY

PLUMBING FIXTURE SCHEDULE - AUDITORIUM

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV	LAVATORY	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WATERSENSE LABELED FAUCET
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WATERSENSE LABELED FAUCET
SHO/SHD	SHOWER/ SHOWER DRAIN	1.5 GPM	1/2"	1/2"	-	2"	2"	PROVIDE WITH THERMOSTATIC MIXING VALVE
MS	MOP SINK	2.0 GPM	1/2"	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	-	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER, FILTERED NON-POTABLE WATER SUPPLY
HB-1	HOSE BIBB	-	3/4"	-	-	-	-	INSTALL WITH VACUUM BREAKER, DOMESTIC COLD WATER SUPPLY
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FS	FLOOR SINK	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS

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REVISIONS

No.	Description	Date

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Architecture
Planning
Interior Design

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING FIXTURE SCHEDULE
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
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PLUMBING FIXTURE SCHEDULE - GYMNASIUM

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV	LAVATORY	0.5 GPM	1/2"	-	-	2"	2"	COUNTERTOP OR WALL-HUNG, WHITE VITREOUS CHINA, WATERSENSE LABELED FAUCET
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	1/2"	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WATERSENSE LABELED FAUCET
EWC	DRINKING FOUNTAIN	-	1/2"	-	-	2"	2"	REFRIGERATED TYPE WITH BOTTLE FILLER, SEE SPECIFICATIONS FOR DETAILS
LT	LAUNDRY TUB	2.0 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
MS	MOP SINK	2.0 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
WM	WASHING MACHINE	-	1/2"	1/2"	-	2"	2"	PROVIDE UTILITY CONNECTION BOX WITH BALL VALVES & WATER HAMMER ARRESTORS
-	ICE MAKER	-	3/4"	-	-	-	-	INDIRECT WASTE TO FLOOR DRAIN, SEE SPECIFICATIONS FOR DETAILS
SHO	SHOWER	1.5 GPM	1/2"	1/2"	-	-	-	PROVIDE WITH THERMOSTATIC MIXING VALVE
SHO-1	SHOWER - ADA TYPE	1.5 GPM	1/2"	1/2"	-	-	-	PROVIDE WITH THERMOSTATIC MIXING VALVE
SHD	SHOWER DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	-	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER, FILTERED NONPOTABLE WATER SUPPLY
HB-1	HOSE BIBB	-	3/4"	-	-	-	-	INSTALL WITH VACUUM BREAKER, DOMESTIC COLD WATER SUPPLY

PLUMBING FIXTURE SCHEDULE - GCC BUILDING

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV	LAVATORY	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, WATERSENSE LABELED FAUCET
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	WALL-HUNG, WHITE VITREOUS CHINA, PROVIDE WATERSENSE LABELED FAUCET
SHO/BT	SHOWER & BATHTUB	-	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
1-SK	1-COMPARTMENT SINK	-	1/2"	1/2"	-	2"	2"	SSTL WORK TABLE W/ SINK & UNDERSHELF, SEE SPECIFICATIONS FOR DETAILS
3-SK	3-COMPARTMENT SINK	-	1/2"	1/2"	-	2"	2"	SSTL THREE COMPARTMENT SINK W/ TWO DRAINBOARDS, SEE SPECIFICATIONS FOR DETAILS
DW	DISHWASHER	-	-	1/2"	-	2"	-	INDIRECT WASTE TO FLOOR SINK, SEE SPECIFICATIONS FOR DETAILS
HS	HAND SINK	0.5 GPM	1/2"	1/2"	-	2"	2"	COUNTERTOP OR WALL-HUNG, WHITE VITREOUS CHINA
SK	KITCHEN SINK	1.5 GPM	1/2"	1/2"	-	2"	2"	COUNTERTOP OR WALL-HUNG, SEE SPECIFICATIONS FOR DETAILS
SS	SERVICE/UTILITY SINK	2.0 GPM	1/2"	1/2"	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
MS	MOP SINK	2.0 GPM	1/2"	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
WM	WASHING MACHINE	-	1/2"	1/2"	-	2"	2"	PROVIDE UTILITY CONNECTION BOX WITH BALL VALVES & WATER HAMMER ARRESTORS
FS	FLOOR SINK	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FD	FLOOR DRAIN	-	-	-	-	2"	2"	PROVIDE WITH TRAP PRIMER, SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	3/4"	-	3/4"	-	-	INSTALL WITH VACUUM BREAKER
ES/EWS	EMERGENCY SHOWER & EYE/FACE WASH STATION	-	1-1/4"	-	-	-	-	INSTALL WITH FLOW SWITCH AND ALARM; INDIRECT WASTE TO FLOOR DRAIN

PLUMBING FIXTURE SCHEDULE - JROTC

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1"	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-2	WATER CLOSET - ADA TYPE	1.28 GPF	-	-	1/2"	4"	2"	FLUSH TANK, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	-	-	3/4"	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	ADA COMPLIANT, WALL-HUNG, WHITE VITREOUS CHINA, WITH WATERSENSE LABELED FAUCET
SK	PANTRY SINK	1.5 GPM	1/2"	1/2"	-	2"	2"	TWO COMPARTMENT, COUNTERTOP, PROVIDE WASTE DISPOSER IN RIGHT COMPARTMENT
-	ICE MAKER	-	3/4"	-	-	-	-	INDIRECT WASTE TO FLOOR DRAIN, 115V/1PH/60HZ, SEE SPECIFICATIONS FOR DETAILS
SH/SHD	SHOWER / SHOWER DRAIN	1.5 GPM	1/2"	1/2"	-	2"	2"	PROVIDE WITH THERMOSTATIC MIXING VALVE
MS	MOP SINK	2.0 GPM	1/2"	-	-	2"	2"	FLOOR-MOUNTED, SEE SPECIFICATIONS FOR DETAILS
LFD	LINEAR FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS

PLUMBING FIXTURE SCHEDULE - PRESS BOX

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	1"	-	-	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	1"	-	-	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	3/4"	-	-	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV-1	LAVATORY	0.5 GPM	1/2"	-	-	2"	2"	ADA COMPLIANT, WALL-HUNG, WHITE VITREOUS CHINA, WITH WATERSENSE LABELED FAUCET
SHO/SHD	SHOWER / SHOWER DRAIN	1.5 GPM	1/2"	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
MS	MOP SINK	2.0 GPM	1/2"	-	-	2"	2"	FLOOR-MOUNTED, SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	3/4"	-	-	-	-	INSTALL WITH VACUUM BREAKER
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS

PLUMBING FIXTURE SCHEDULE - CREDIT RECOVERY

SYMBOL	FIXTURE DESCRIPTION	GPM/GPF	CW	HW	NPW	W	V	REMARKS
WC	WATER CLOSET	1.28 GPF	1"	-	-	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
WC-1	WATER CLOSET - ADA TYPE	1.28 GPF	1"	-	-	4"	2"	FLUSH VALVE, FLOOR-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
UR	URINAL	0.125 GPF	3/4"	-	-	2"	2"	WALL-MOUNTED, WHITE VITREOUS CHINA, SIPHON JET, WATERSENSE LABELED
LAV-1	LAVATORY - ADA TYPE	0.5 GPM	1/2"	-	-	2"	2"	ADA COMPLIANT, WALL-HUNG, WHITE VITREOUS CHINA, WITH WATERSENSE LABELED FAUCET
MS	MOP SINK	2.0 GPM	1/2"	-	-	2"	2"	FLOOR-MOUNTED, SEE SPECIFICATIONS FOR DETAILS
EWC-1	DRINKING FOUNTAIN	-	1/2"	-	-	2"	2"	ADA COMPLIANT, BI-LEVEL (HIGH AND LOW), SEE SPECIFICATIONS FOR DETAILS
HB	HOSE BIBB	-	3/4"	-	-	-	-	INSTALL WITH VACUUM BREAKER
FD	FLOOR DRAIN	-	-	-	-	2"	2"	SEE SPECIFICATIONS FOR DETAILS
FND	FUNNEL DRAIN	-	-	-	-	2"	2"	"MIFAB" MODEL NO. F1100-EG, SEE SPECIFICATIONS FOR DETAILS

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REVISIONS

No.	Description	Date

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Planning
Interior Design

NOT FOR CONSTRUCTION

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PLUMBING FIXTURE SCHEDULE
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
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Supv:	MPN
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KITCHEN EQUIPMENT SCHEDULE - CAFETERIA

NO.	DESCRIPTION	PLUMBING				GAS	
		C.W	H.W	WASTE	TYPE	GAS	BTU/HR
1	DOUBLE DECK GAS CONVECTION OVEN	-	-	-	-	3/4"	100,000
2	GAS GRIDDLES	-	-	-	-	3/4"	81,000
3	BRAISING PAN	-	-	-	-	3/4"	90,000
4	EST-44 CONVEYOR DISHWASHER	-	1/2"	2"	INDIRECT	-	-
5	2-COMPARTMENT SINK	1/2"	1/2"	2"	INDIRECT	-	-
6	3-COMPARTMENT SINK	1/2"	1/2"	2"	INDIRECT	-	-
7	WALL-HUNG SINK	1/2"	1/2"	2"	DIRECT	-	-
8	WALL-HUNG SINK	1/2"	1/2"	2"	DIRECT	-	-
9	WALL-HUNG SINK	1/2"	1/2"	2"	DIRECT	-	-
10	ELECTRIC SEALED WELL TABLES	-	-	1"	INDIRECT	-	-

KITCHEN EQUIPMENT SCHEDULE - GCC PROSTART KITCHEN

NO.	DESCRIPTION	PLUMBING				GAS	
		C.W	H.W	WASTE	TYPE	GAS	BTU/HR
1	DOUBLE DECK CONVECTION OVEN	-	-	-	-	3/4"	108,000
2	CHARBROILER (GRILL)	-	-	-	-	3/4"	60,000
3	4 BURNER RANGE W/ GRIDDLE AND STANDARD OVEN	-	-	-	-	3/4"	170,000
4	DISHWASHER	-	1/2"	2"	INDIRECT	-	-
5	SSTL 3-COMPARTMENT SINK	1/2"	1/2"	2"	INDIRECT	-	-
6	SSTL WORK TABLE W/ SINK	1/2"	1/2"	2"	INDIRECT	-	-
7	HANDWASHING SINK	1/2"	1/2"	2"	DIRECT	-	-
8	HANDWASHING SINK	1/2"	1/2"	2"	DIRECT	-	-

THERMOSTATIC MIXING VALVE SCHEDULE

UNIT	LOCATION	SYSTEM SERVICE / FIXTURE	MAX OPERATING PRESSURE (PSI)	MIN FLOW CAPACITY(GPM)	DESIGN FLOW CAPACITY (GPM)	TEMPERATURE SETPOINT (°F)	INLET / OUTLET DIAMETER (IN)	REMARKS
TMV-B1	A-WING SOLAR WATER HEATER ROOM (SW1)	SCIENCE LABORATORY & PREP SINK DOMESTIC HOT WATER	125	4	30	120	1-1/4 x 1-1/4	POINT-OF-SOURCE, ASSE 1017 CERTIFIED
TMV-B2	A-WING SCIENCE LABORATORY & SCIENCE PREP RM	SCIENCE LABORATORY SINK & PREP SINK	150	0.5	0.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-B3	A-WING SPED (A104, A105)	LAVATORIES	150	0.5	0.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-B4	A-WING SPED (A104, A105)	KITCHEN SINK, SHOWER	150	0.5	1.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-C1	CAFETERIA KITCHEN (C153)	2-COMP & 3-COMP SINK, MOP SINK	150	0.5	1.5 - 2.0	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-C2	CAFETERIA KITCHEN (C153)	HAND SINKS	150	0.5	0.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-D1	GYM SOLAR WATER HEATER ROOM (B146)	M. LOCKER ROOM B141 DOMESTIC HOT WATER	125	4	40	120	1-1/2 x 1-1/2	POINT-OF-SOURCE, ASSE 1017 CERTIFIED
TMV-D2	GYM SOLAR WATER HEATER ROOM (B145)	W. LOCKER ROOM B143 DOMESTIC HOT WATER	125	4	40	120	1-1/2 x 1-1/2	POINT-OF-SOURCE, ASSE 1017 CERTIFIED
TMV-D3	GYM LOCKER ROOMS, STAFF RR, JAN RM	SHOWERS, MOP SINK	150	0.5	1.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-D4	GYMNASIUM RESTROOMS	LAVATORIES	150	0.5	0.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-E1	GCC MOCK RR, PROSTART KITCHEN	SHOWER/BATH TUB COMBINATION, SERVICE/UTILITY/KITCHEN SINKS	150	0.5	1.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-E2	GCC MOCK RR, PROSTART KITCHEN	LAVATORIES, HAND SINKS	150	0.5	0.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-F1	JROTC STO (C140)	JROTC LOCKER ROOMS DOMESTIC HOT WATER	125	4	40	120	1-1/2 x 1-1/2	POINT-OF-SOURCE, ASSE 1017 CERTIFIED
TMV-F2	JROTC LOCKER ROOMS	SHOWERS	150	0.5	1.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-G1	AUDITORIUM DRESSING ROOMS	LAVATORIES	150	0.5	0.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED
TMV-G2	AUDITORIUM DRESSING ROOMS	KITCHEN SINK, SHOWER	150	0.5	1.5	105	1/2 x 1/2	POINT-OF-USE, ASSE 1070 CERTIFIED

ADJUSTABLE FLOW CIRCUIT SETTER SCHEDULE

UNIT	QTY	LOCATION	SYSTEM SERVICE	SERVICE LINE	DESIGN FLOW (GPM)	INLET / OUTLET DIAMETER (IN)
FCS-B1	1	A-WING SOLAR WATER HEATER ROOM (SW1)	A-WING SCIENCE ROOMS DOMESTIC HOT WATER	HOT WATER RETURN LINE	4.0	3/4 x 3/4
FCS-B2	1	A-WING SOLAR WATER HEATER ROOM (SW1)	A-WING SCIENCE ROOMS DOMESTIC HOT WATER	INCOMING COLD WATER SUPPLY LINE	30.0	1 1/2 x 1 1/2
FCS-B3	1	A-WING SOLAR WATER HEATER ROOM (SW1)	A-WING SCIENCE ROOMS DOMESTIC HOT WATER	COLD WATER TO TMV-B1	3.5	1/2 x 1/2
FCS-B4	3	A-WING SOLAR WATER HEATER ROOM (SW1)	A-WING SCIENCE ROOMS DOMESTIC HOT WATER	TO PV WATER HEATERS	10.0	3/4 x 3/4
FCS-D1	1	GYM SOLAR WATER HEATER ROOM (B146)	M. LOCKER ROOM B141 DOMESTIC HOT WATER	HOT WATER RETURN LINE	2.0	1/2 x 1/2
FCS-D2	1	GYM SOLAR WATER HEATER ROOM (B146)	M. LOCKER ROOM B141 DOMESTIC HOT WATER	INCOMING COLD WATER SUPPLY LINE	37.0	1 1/2 x 1 1/2
FCS-D3	1	GYM SOLAR WATER HEATER ROOM (B146)	M. LOCKER ROOM B141 DOMESTIC HOT WATER	COLD WATER TO TMV-D1	11.0	3/4 x 3/4
FCS-D4	5	GYM SOLAR WATER HEATER ROOM (B146)	M. LOCKER ROOM B141 DOMESTIC HOT WATER	TO PV WATER HEATERS	6.0	3/4 x 3/4

ADJUSTABLE FLOW CIRCUIT SETTER SCHEDULE

UNIT	QTY	LOCATION	SYSTEM SERVICE	SERVICE LINE	DESIGN FLOW (GPM)	INLET / OUTLET DIAMETER (IN)
FCS-D5	1	GYM SOLAR WATER HEATER ROOM (B145)	W. LOCKER ROOM B143 DOMESTIC HOT WATER	HOT WATER RETURN LINE	2.0	1/2 x 1/2
FCS-D6	1	GYM SOLAR WATER HEATER ROOM (B145)	W. LOCKER ROOM B143 DOMESTIC HOT WATER	INCOMING COLD WATER SUPPLY LINE	36.0	1 1/2 x 1 1/2
FCS-D7	1	GYM SOLAR WATER HEATER ROOM (B145)	W. LOCKER ROOM B143 DOMESTIC HOT WATER	COLD WATER TO TMV-D2	9.0	3/4 x 3/4
FCS-D8	5	GYM SOLAR WATER HEATER ROOM (B145)	W. LOCKER ROOM B143 DOMESTIC HOT WATER	TO PV WATER HEATERS	6.0	3/4 x 3/4
FCS-F1	2	JROTC STO (C140)	JROTC M. & W. LOCKER ROOMS DOMESTIC HOT WATER	HOT WATER RETURN LINE	1.5	1/2 x 1/2
FCS-F2	1	JROTC STO (C140)	JROTC M. & W. LOCKER ROOMS DOMESTIC HOT WATER	INCOMING COLD WATER SUPPLY LINE	37.0	1 1/2 x 1 1/2
FCS-F3	1	JROTC STO (C140)	JROTC M. & W. LOCKER ROOMS DOMESTIC HOT WATER	COLD WATER TO TMV-F1	11.0	3/4 x 3/4
FCS-F4	5	JROTC STO (C140)	JROTC M. & W. LOCKER ROOMS DOMESTIC HOT WATER	TO PV WATER HEATERS	5.5	3/4 x 3/4

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

2/11/2025 3:05:59 PM W:\WMES PROJECTS_2020\TRMA\SSHS_GDOE\REVIT SEPARATE CENTRALS - RFP\DOE SSHS PL_SCHED_DIAG_DET_NOTES R1_ADDENDUM.rvt

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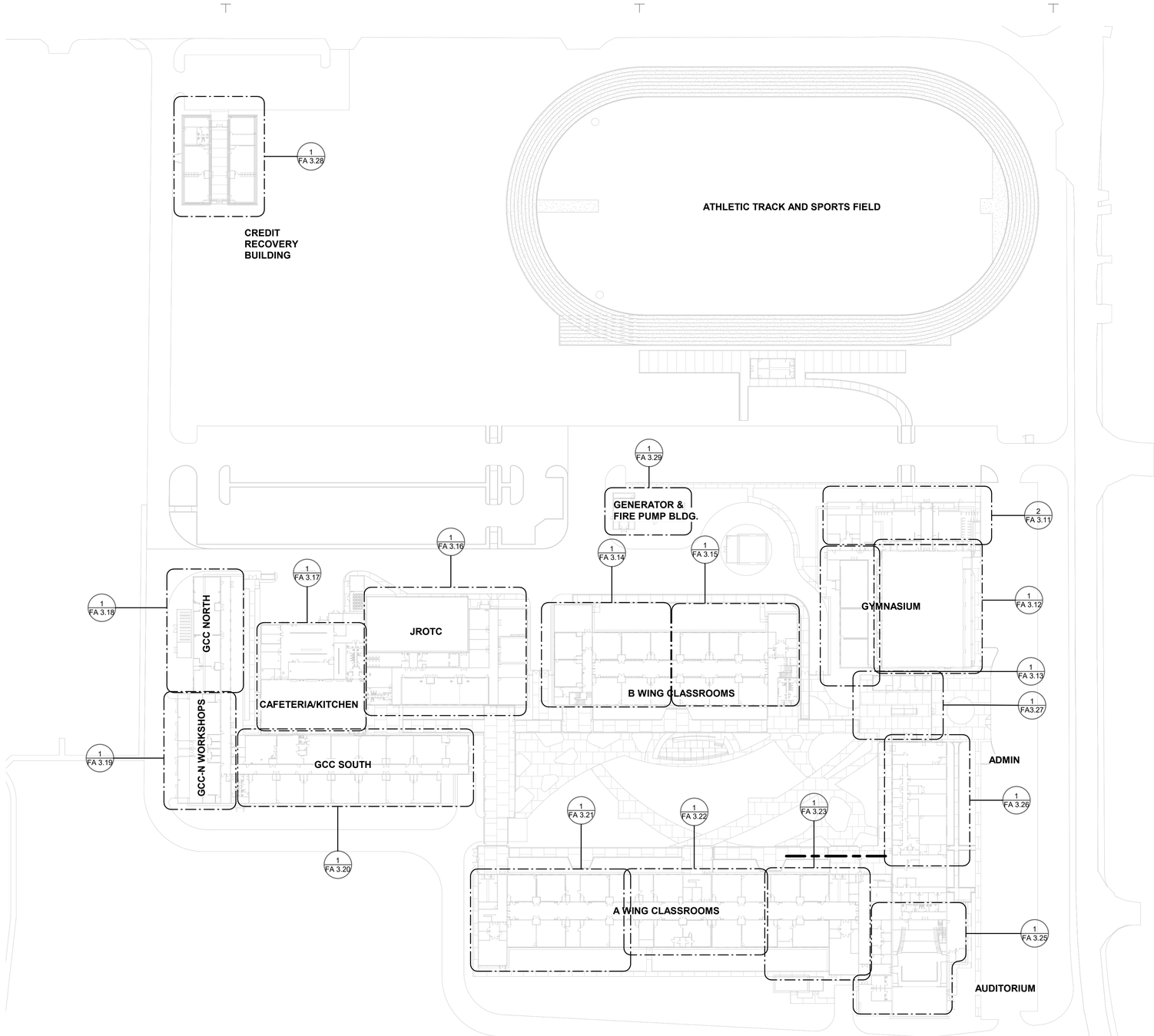
DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
KITCHEN EQUIPMENT SCHEDULE
PROGRAMMING DOCUMENT

Designed:	MPN/RMV
Drawn:	AT/RV/CA
Checked:	MPN
Supv:	MPN
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
P7.19
Sheet No._____ of 0



1 OVERALL FIRE ALARM PLAN LEVEL 1
SCALE: 1" = 60'-0"

NORTH

GRAPHIC SCALE
0 10' 20' 30' 60' 120' 180'
SCALE: 1" = 60'-0"

IF SHEET IS LESS THAN 24" X 36"
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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL FIRE ALARM PLAN LEVEL 1

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/JB
Checked:	WGM
Supv:	WGM
Scale:	1" = 60'-0"
Date:	8/26/22
Project No. XX-XXXX	File

Drawing No.
FA 1.1
Sheet No._____ of _____

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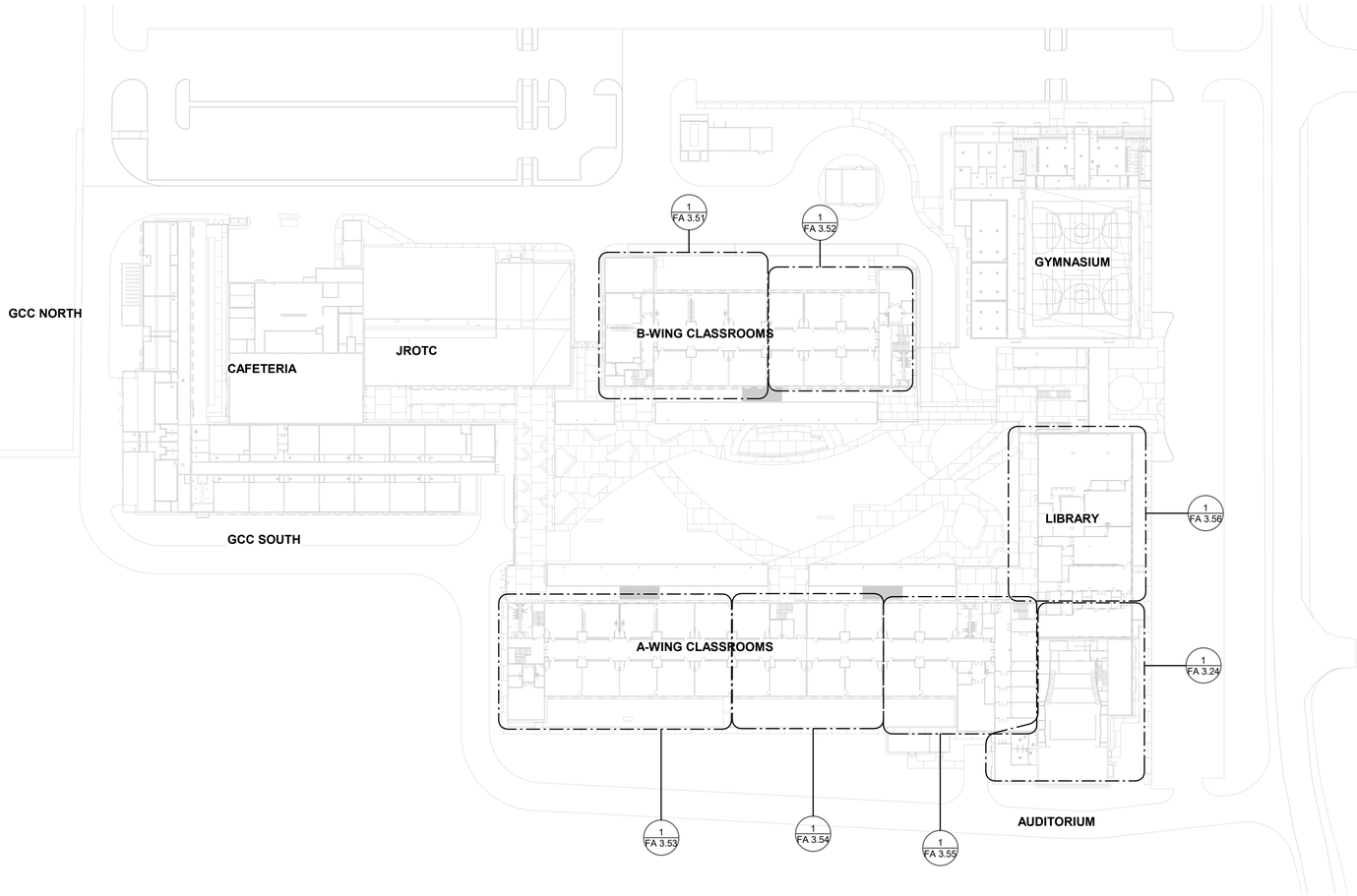

1 OVERALL FIRE ALARM PLAN LEVEL 2

SCALE: 1" = 60'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Title:
OVERALL FIRE ALARM PLAN LEVEL 2

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/JB
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Project No.	File
XX-XXXX	

Drawing No.
FA 1.2
Sheet No._____ of _____

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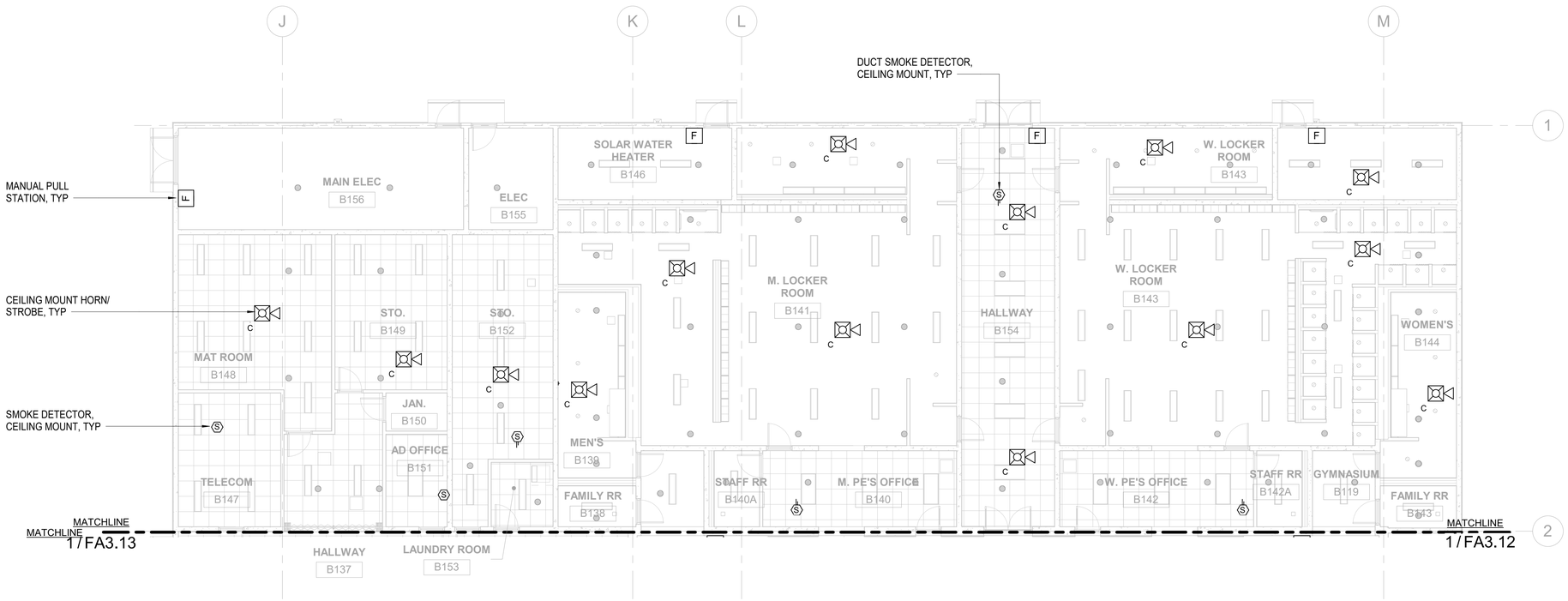

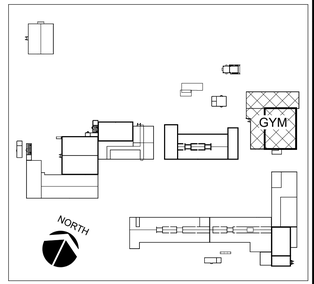

KEY PLAN

1 FIRE ALARM PLAN - GYMNASIUM LOCKER ROOM

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:
FIRE ALARM PLAN - GYM LOCKER ROOM
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
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Project No.	XX-XXX
File	

Drawing No.
FA3.11
Sheet No. of 0

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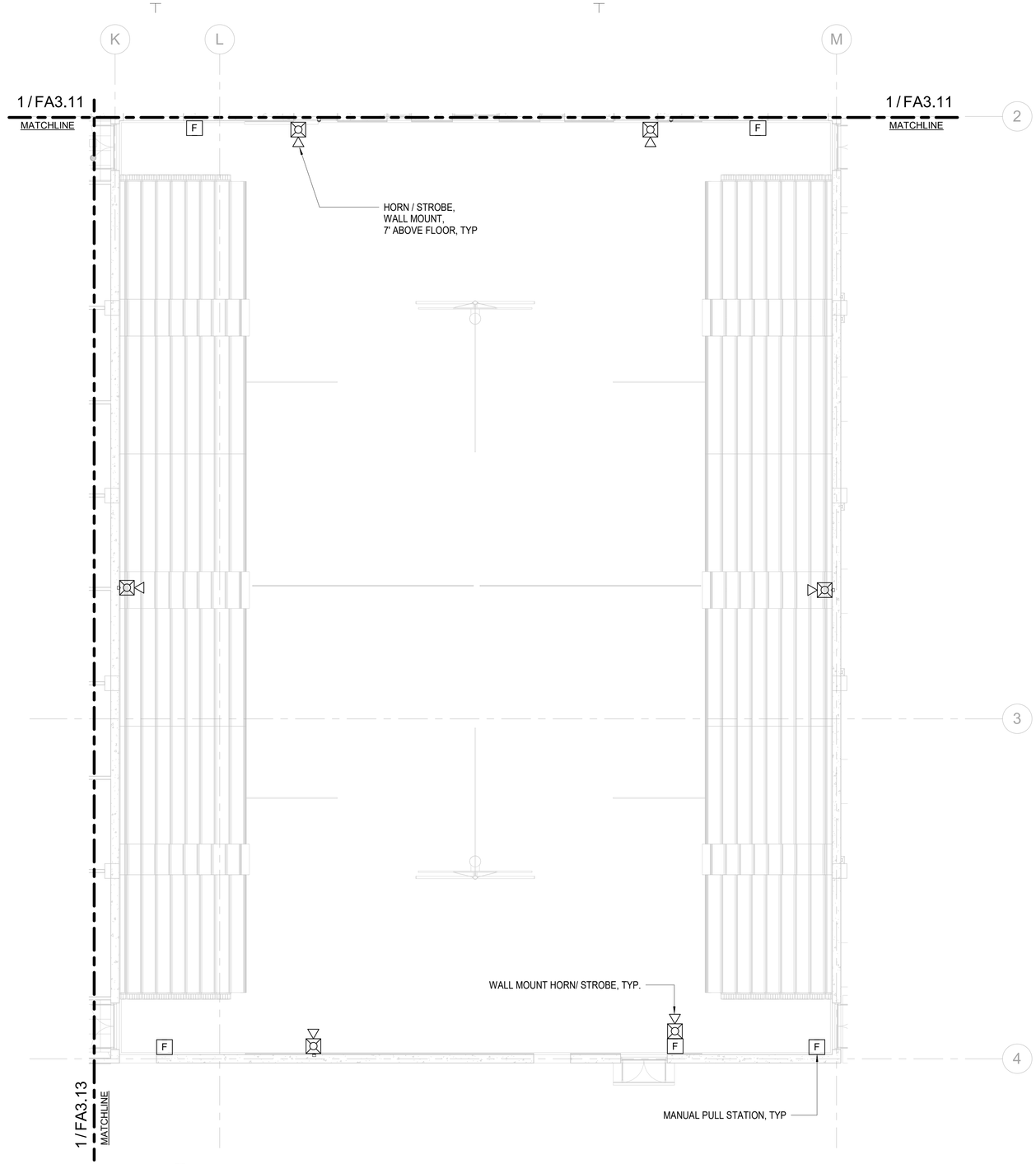
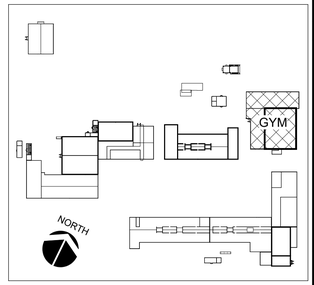


1 FIRE ALARM PLAN - GYMNASIUM - COURT/ASSEMBLY

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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DATE:

Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE ALARM PLAN - GYM COURT/ASSEMBLY

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
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Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.

FA3.12

Sheet No. _____ of 0

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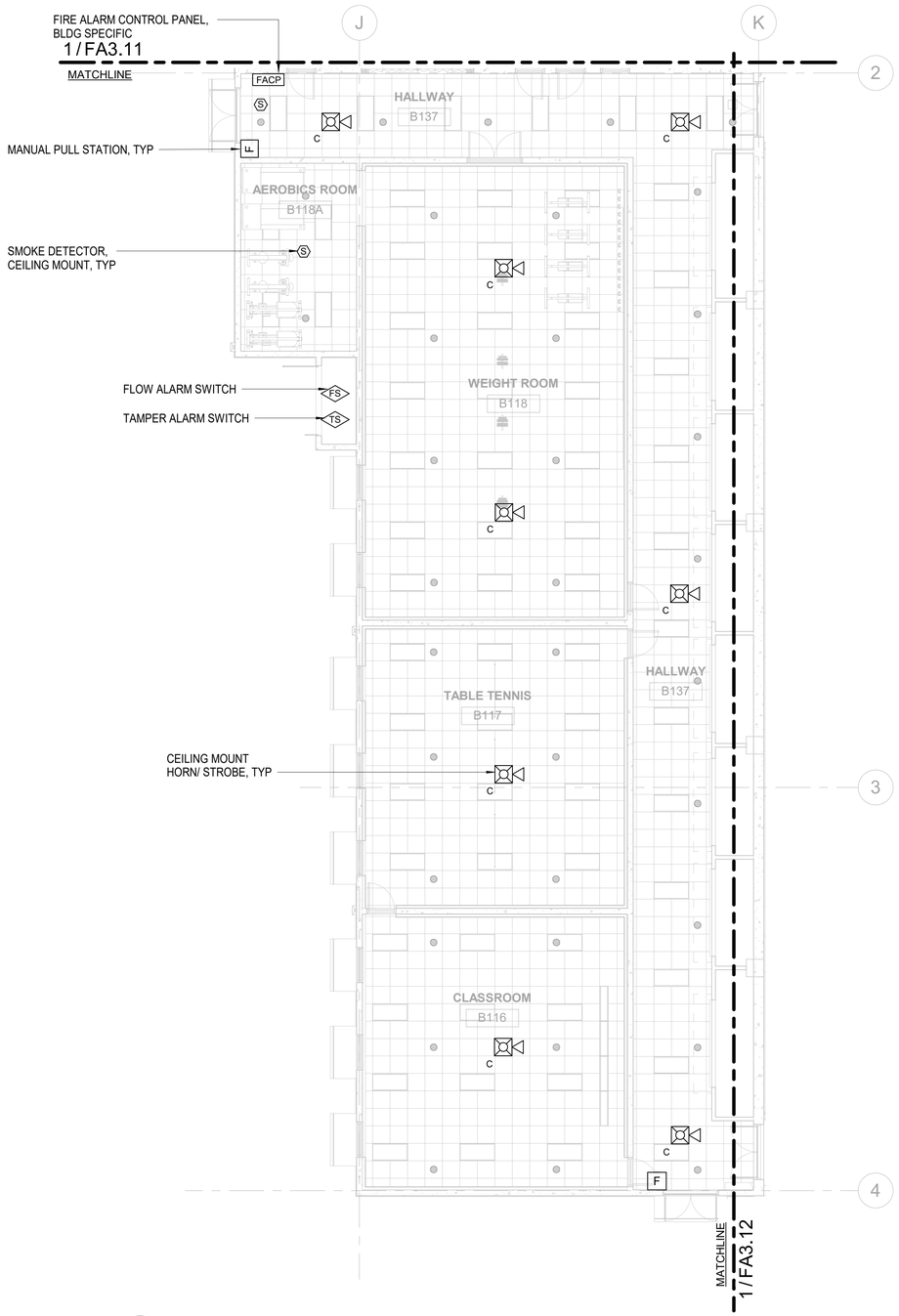
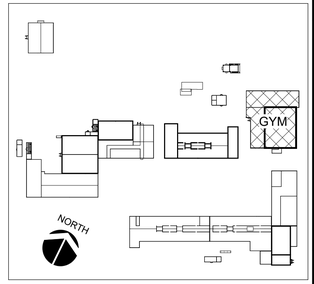


1 FIRE ALARM PLAN - GYMNASIUM WEIGHT ROOM/ CLASSROOM

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - GYM WEIGHT ROOM/CLASSROOM
PROGRAMMING DOCUMENT

Designed:	WGM/CG
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Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
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Sheet No._____ of 0

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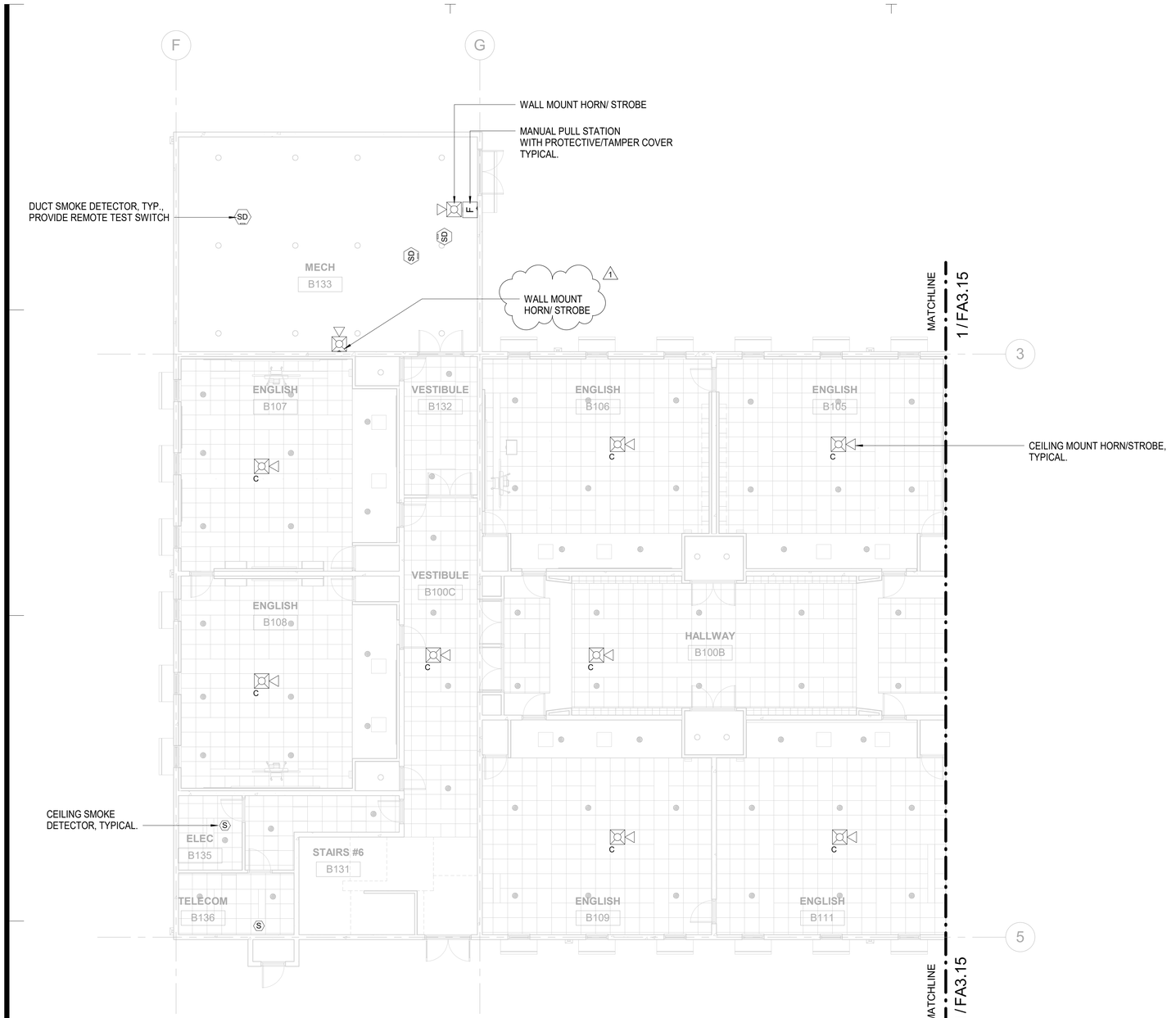
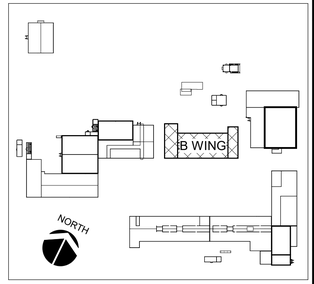


1 FIRE ALARM PLAN - B-WING LEVEL 1 WEST

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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No.	Description	Date
1	ADDENDUM	10.26.2022

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Project:
GDOE
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Title:
FIRE ALARM PLAN - B-WING LEVEL 1 WEST

PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG
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Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
FA3.14

Sheet No._____ of _____

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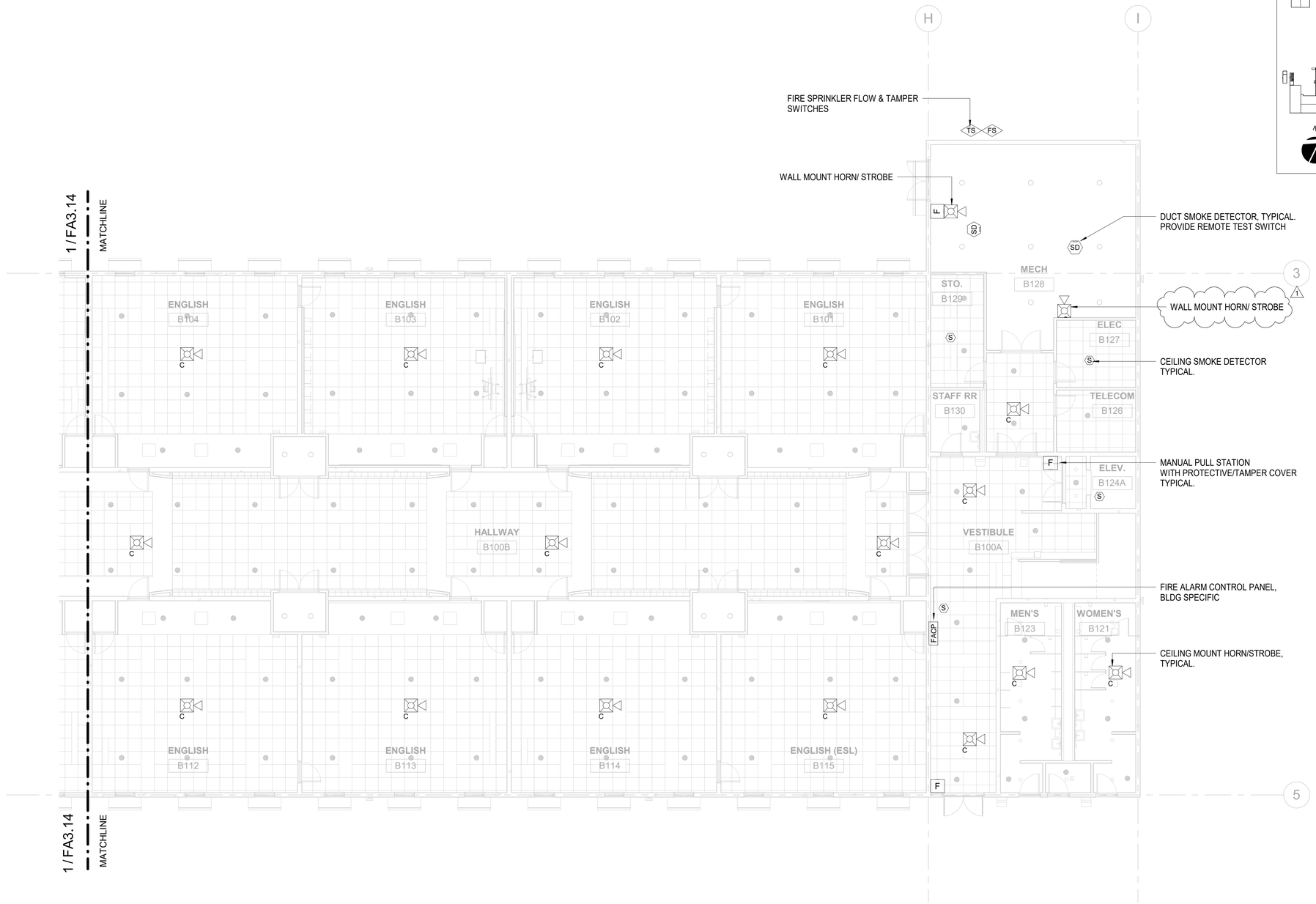

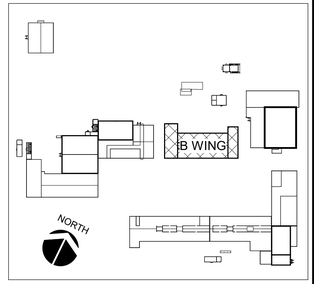

KEY PLAN

1 FIRE ALARM PLAN - B-WING LEVEL 1 EAST
SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE
0 2' 4' 8' 16' 24'
SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS		
No.	Description	Date
1	ADDENDUM	10.26.2022

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - B-WING LEVEL 1 EAST
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
FA3.15
Sheet No._____ of _____

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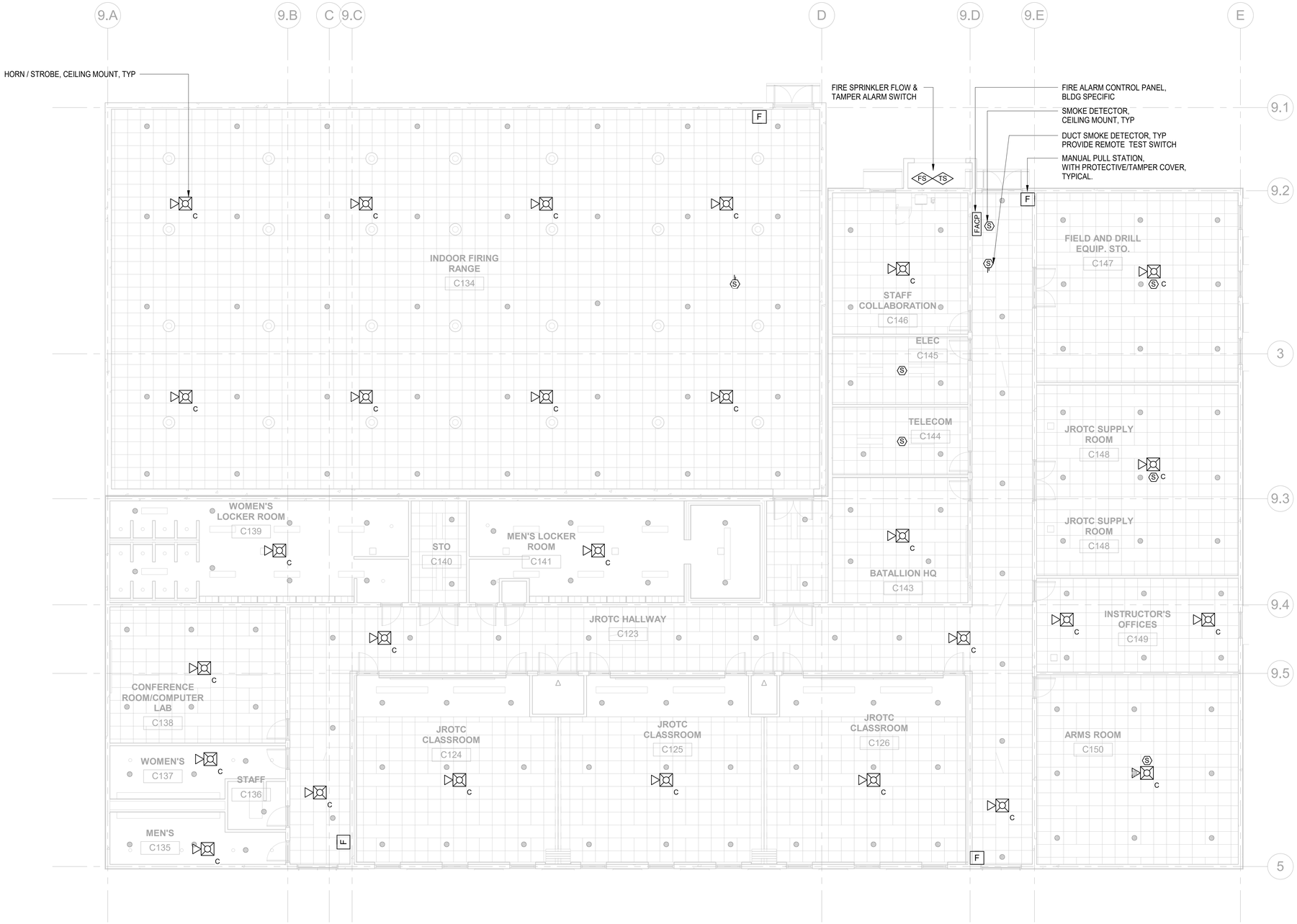

1 FIRE ALARM PLAN - JROTC

SCALE: 1/8" = 1'-0"

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - JROTC

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
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Sheet No._____ of 0

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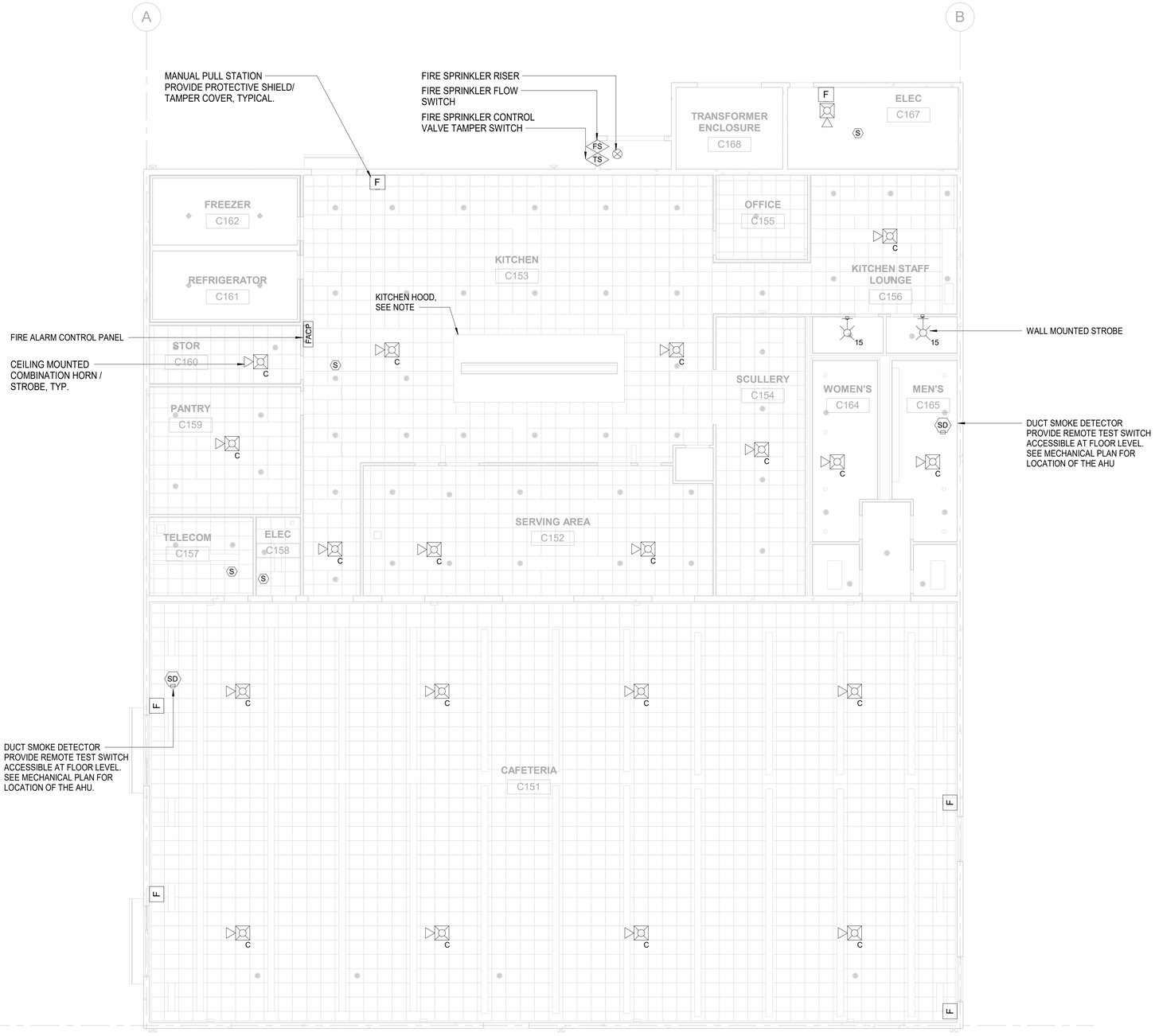
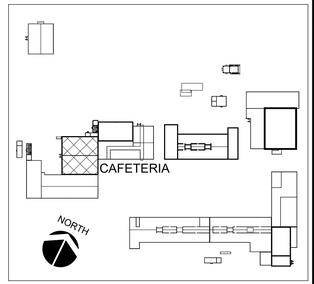


1 FIRE ALARM PLAN - CAFETERIA

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTE:
1. INTERLOCK THE KITCHEN HOOD FIRE SUPPRESSION SYSTEM TO THE BUIDLING FIRE ALARLM SYSTEM.

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - CAFETERIA

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
FA3.17
Sheet No.____ of ____

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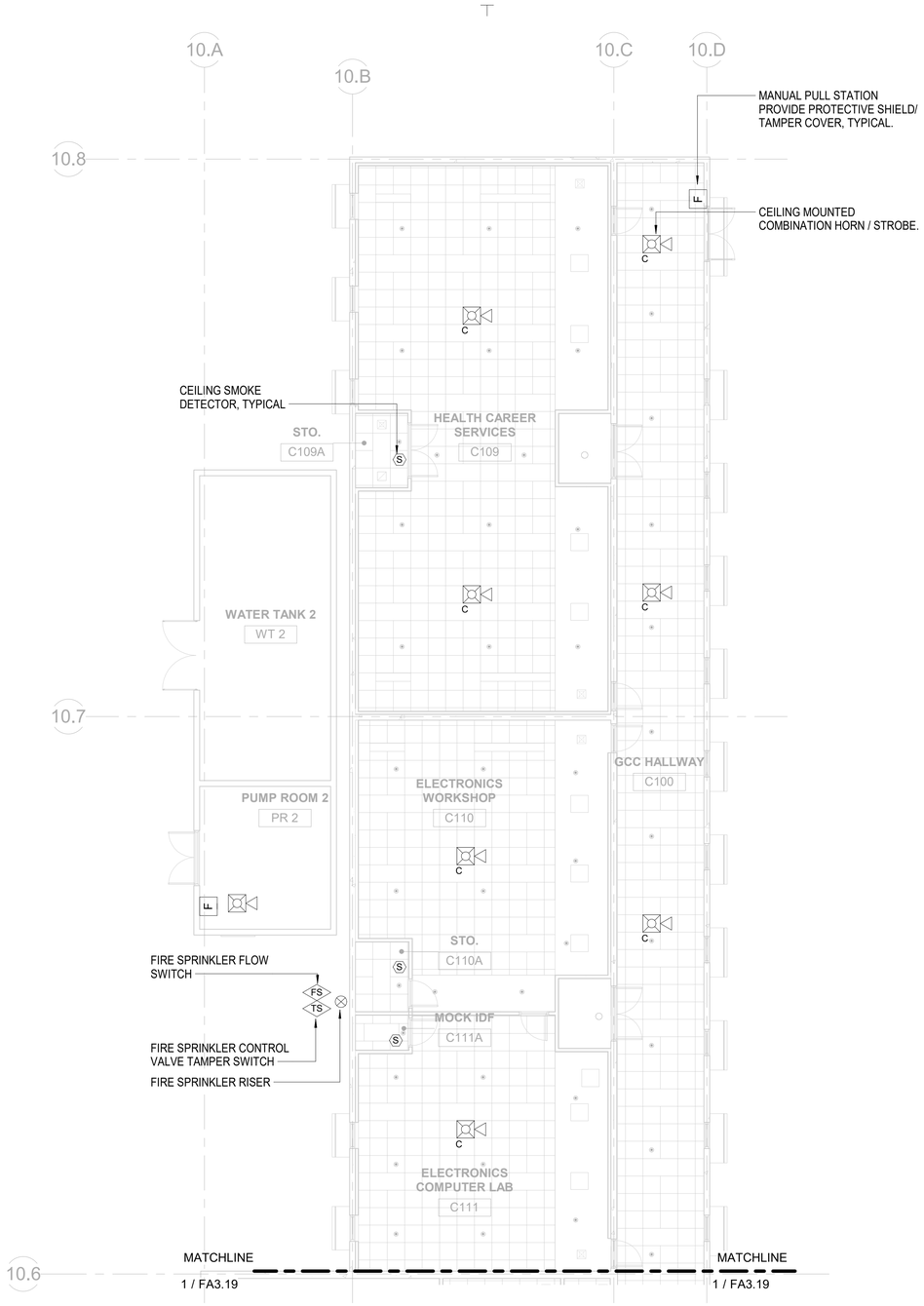
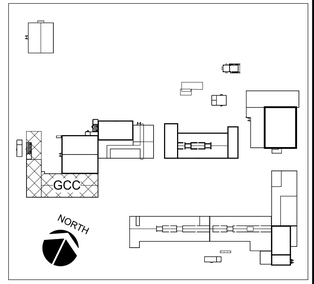


1 FIRE ALARM PLAN - GCC-NORTH CLASSROOMS

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - GCC-NORTH CLASSROOMS
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.18
Sheet No._____ of _____

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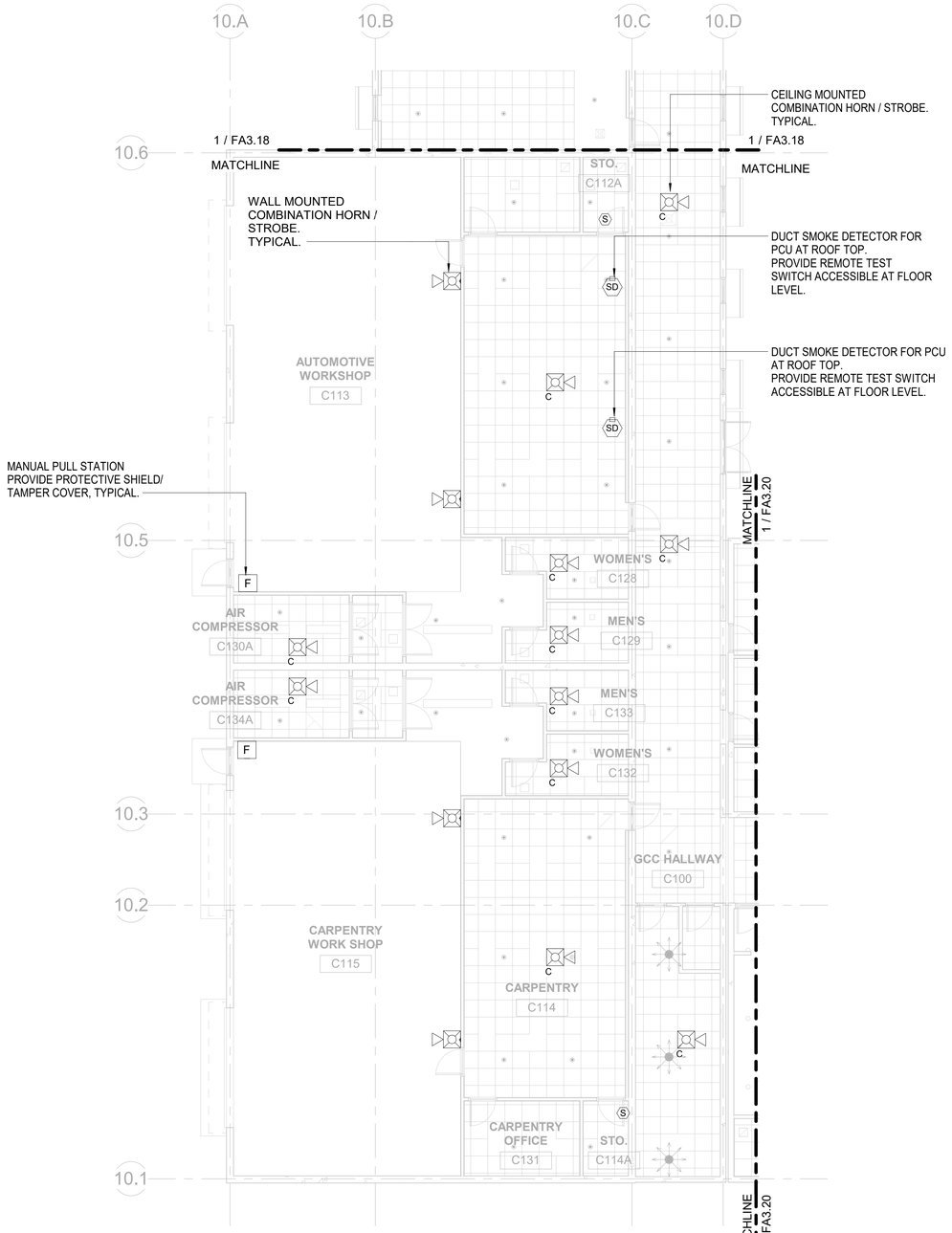
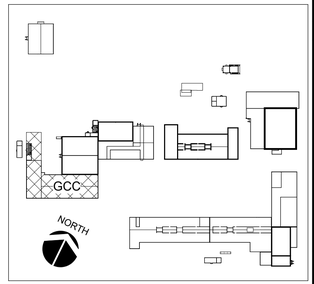


1 FIRE ALARM PLAN - GCC-NORTH SHOPS

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - GCC-NORTH SHOPS
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.19
Sheet No. of

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1 FIRE ALARM PLAN - GCC-SOUTH CLASSROOMS WEST
SCALE: 1/8" = 1'-0"

2 FIRE ALARM PLAN - GCC-SOUTH CLASSROOMS EAST
SCALE: 1/8" = 1'-0"

KEY PLAN

FOR REFERENCE ONLY

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - GCC-SOUTH CLASSROOMS
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.20
Sheet No._____ of _____

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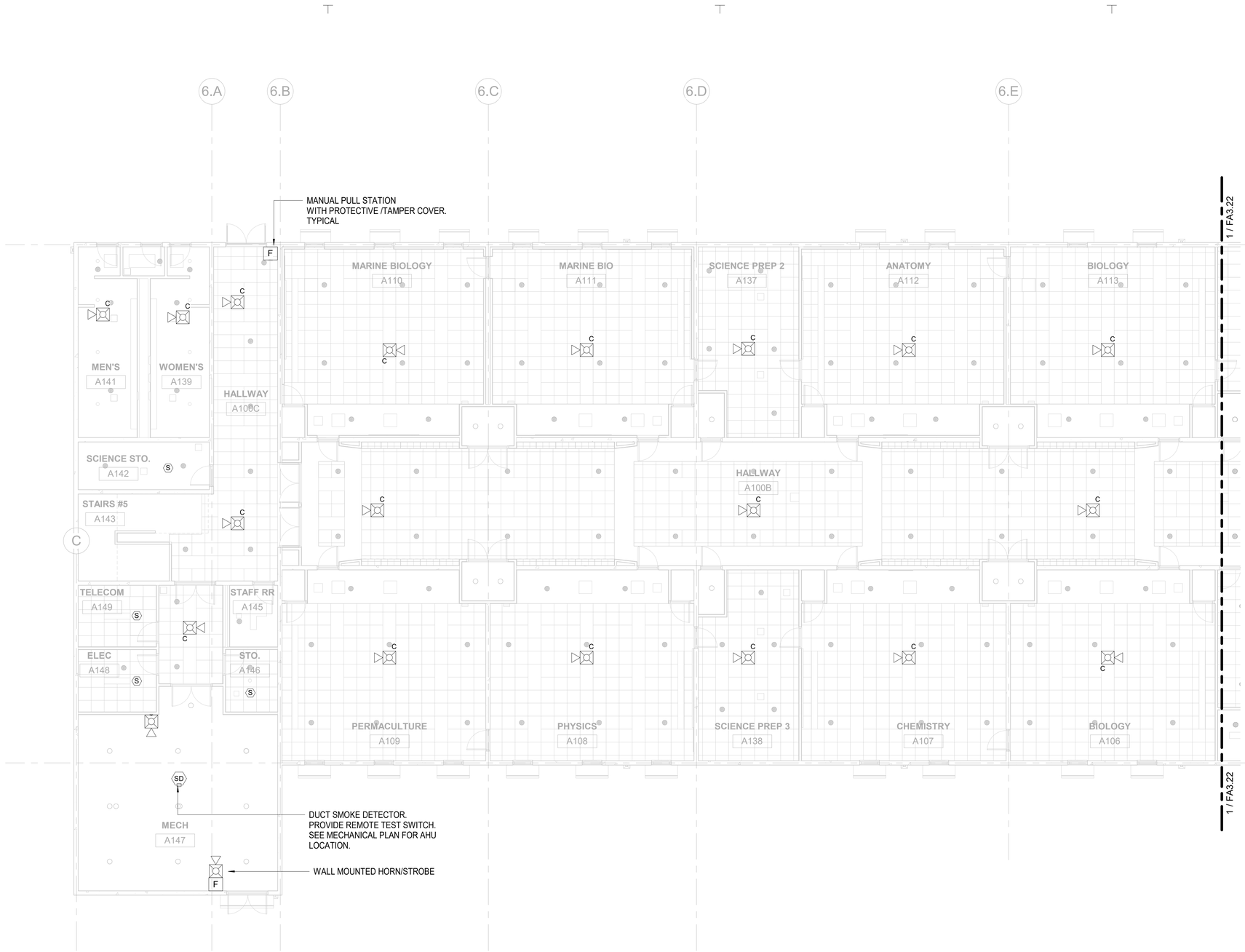

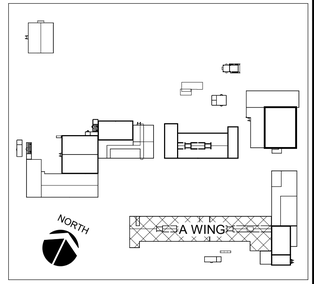

KEY PLAN

1 FIRE ALARM PLAN - A-WING LEVEL 1 WEST
SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

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SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - A-WING LEVEL 1 WEST
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.21
Sheet No. ____ of ____

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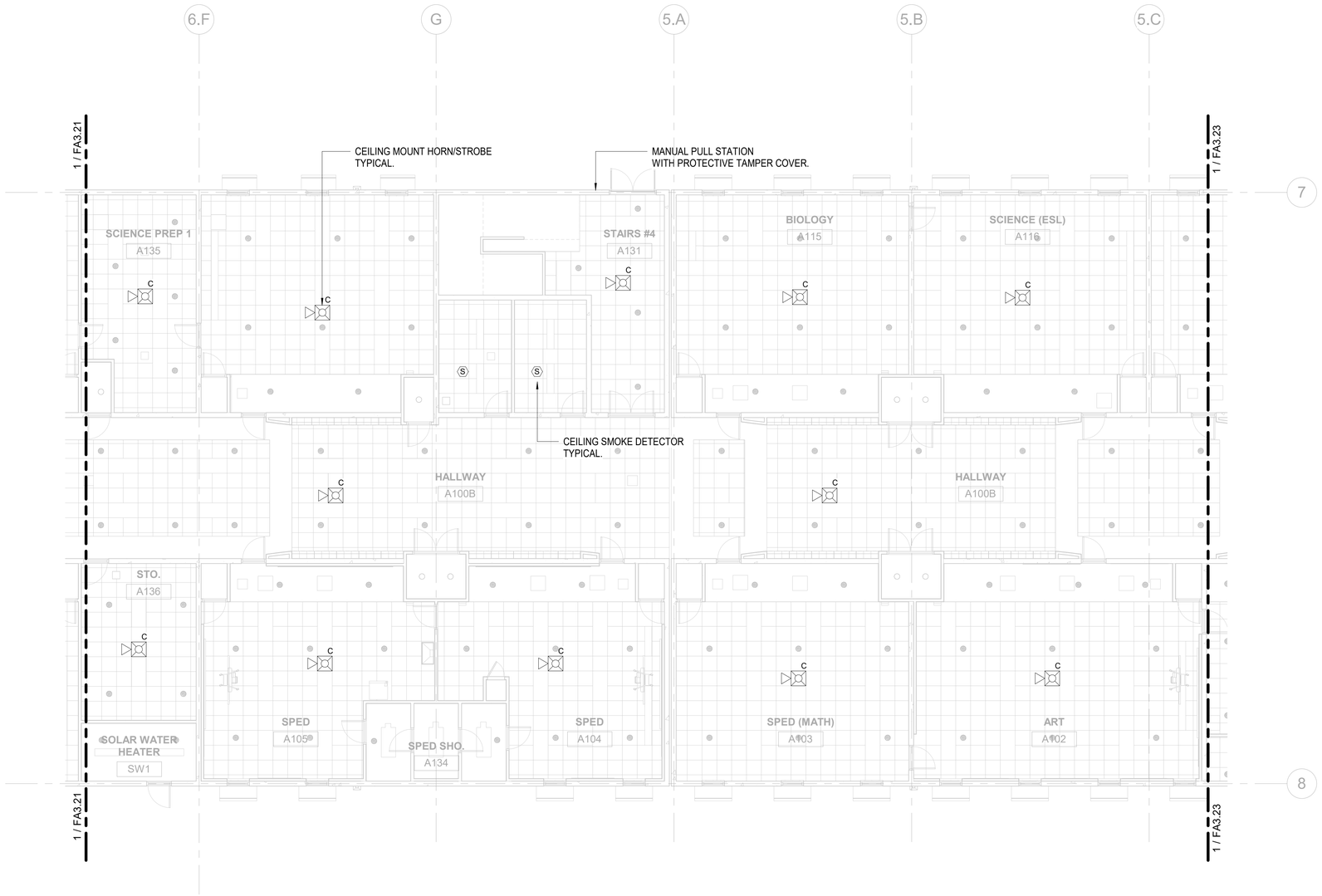
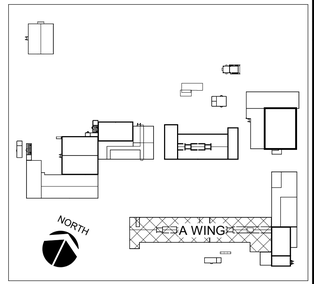


1 FIRE ALARM PLAN - A-WING LEVEL 1 CENTER

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:
FIRE ALARM PLAN - A-WING LEVEL 1 CENTER
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
FA3.22
Sheet No._____ of _____

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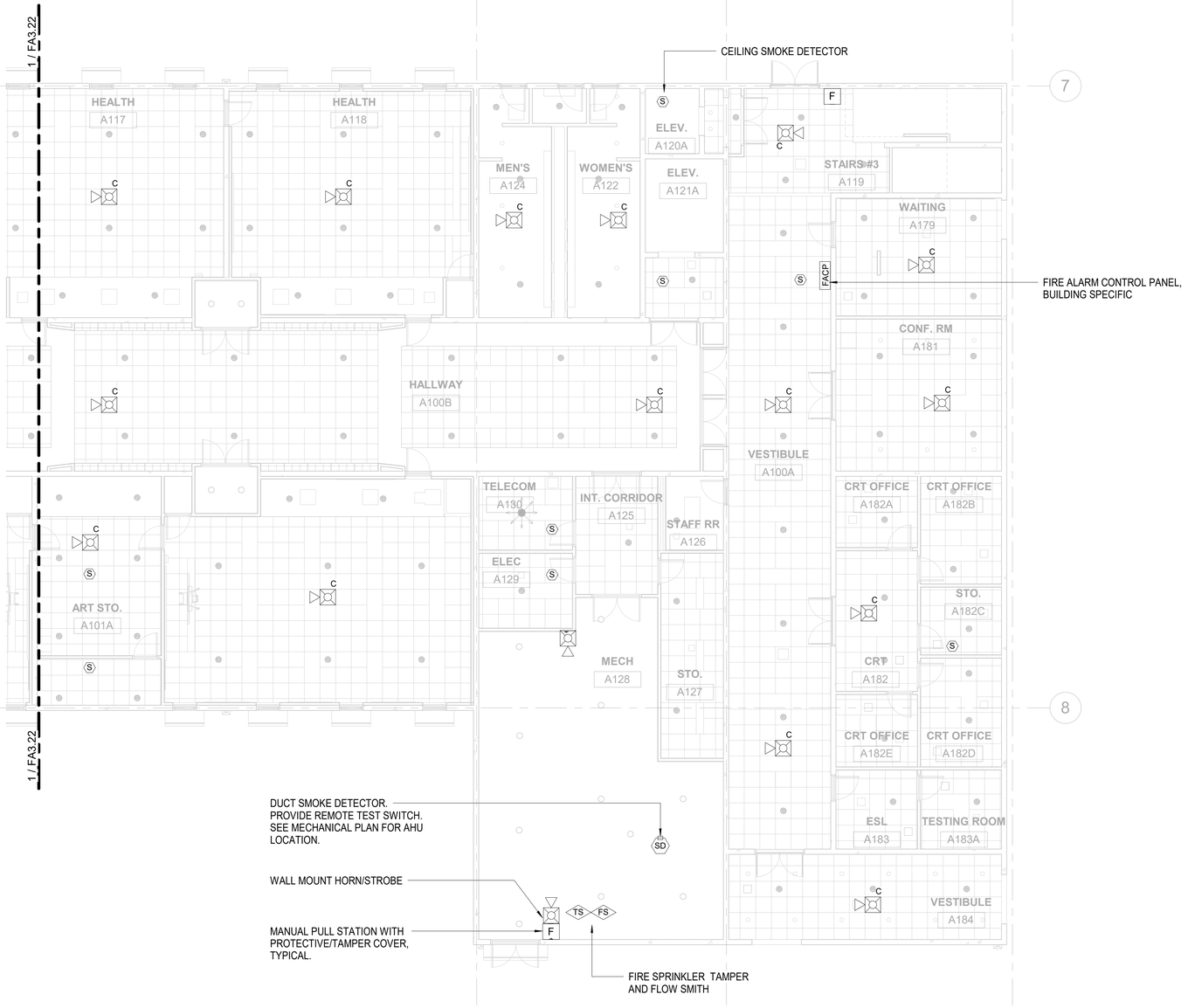
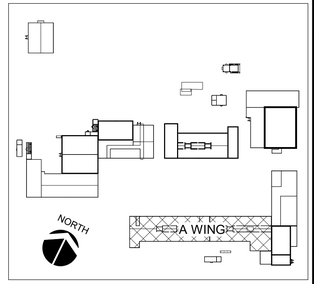


1 FIRE ALARM PLAN - A-WING LEVEL 1 EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - A-WING LEVEL 1 EAST

PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.23

Sheet No._____ of _____

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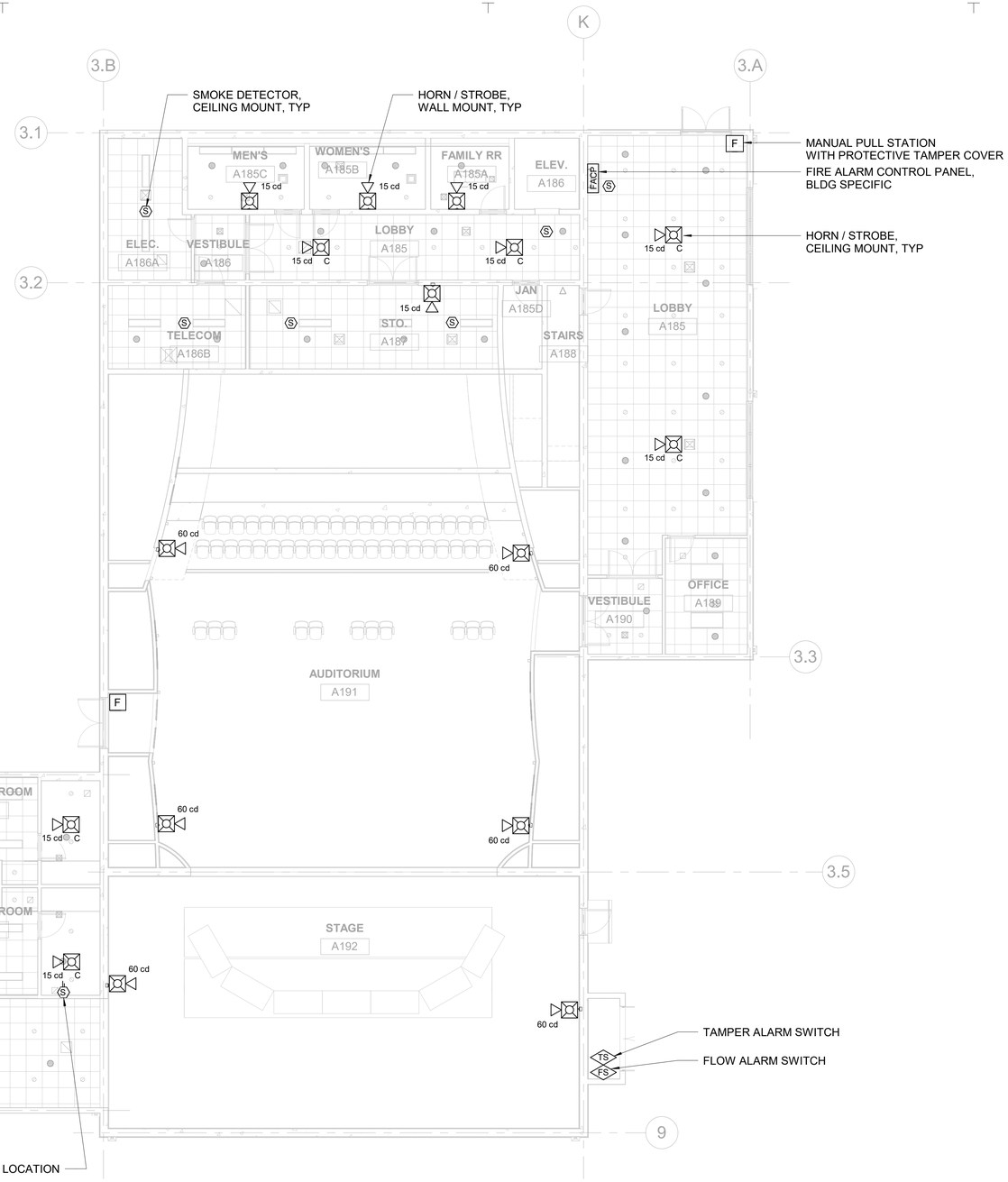
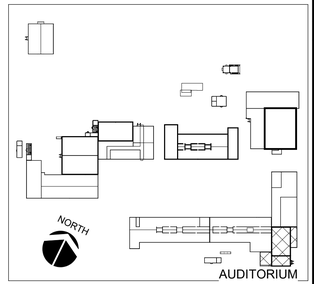


1 FIRE ALARM PLAN - AUDITORIUM (LOW CEILINGS)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE ALARM PLAN - AUDITORIUM (LOW CEILINGS)

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT/CA
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.

FA3.24

Sheet No._____ of 0

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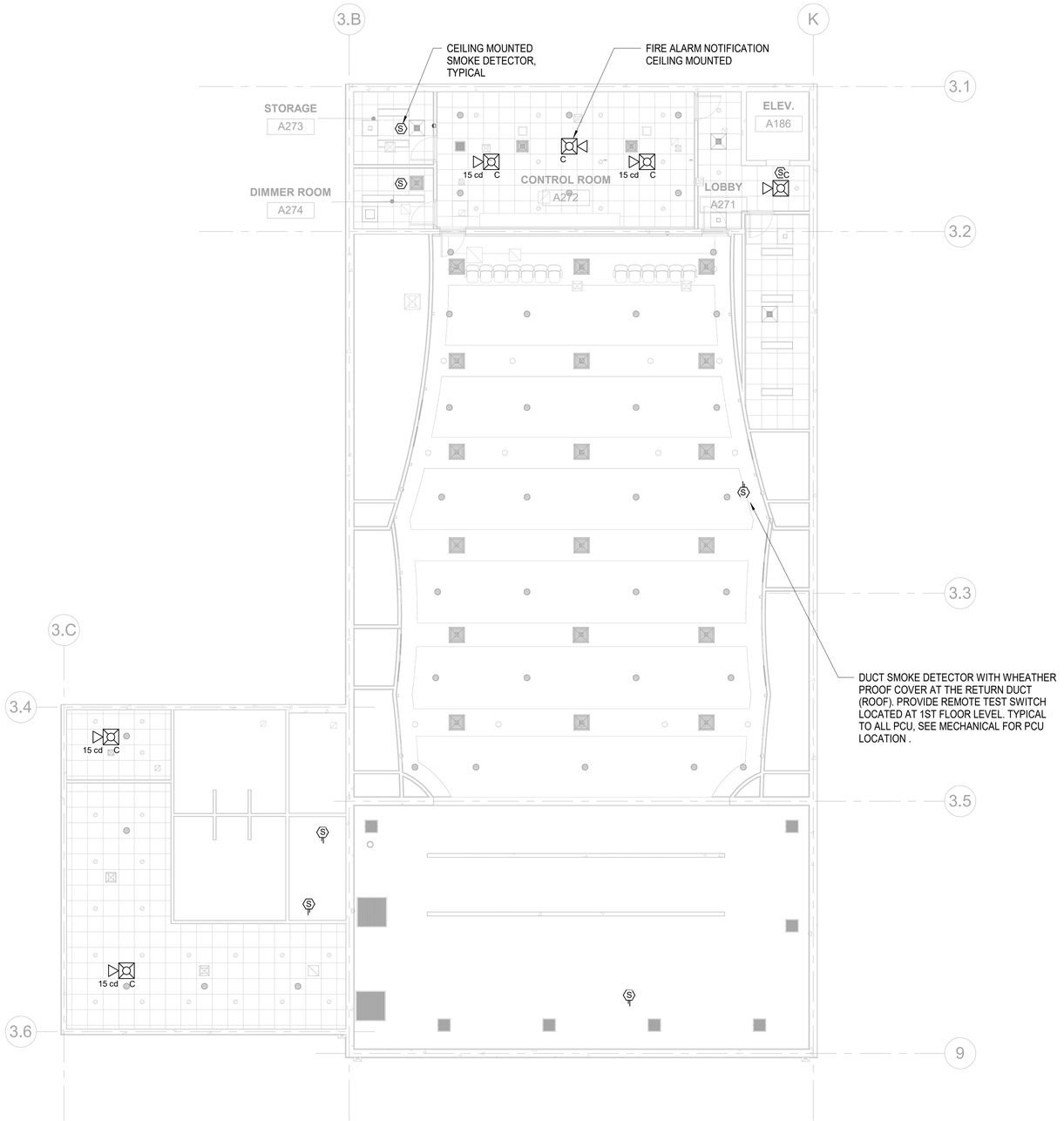
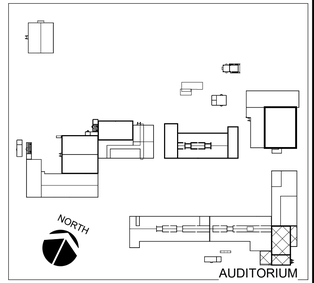


1 FIRE ALARM PLAN - AUDITORIUM (HIGH CEILINGS)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Project:
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Title:
FIRE ALARM PLAN - AUDITORIUM (HIGH CEILINGS)
PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT/CA
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.25
Sheet No._____ of 0

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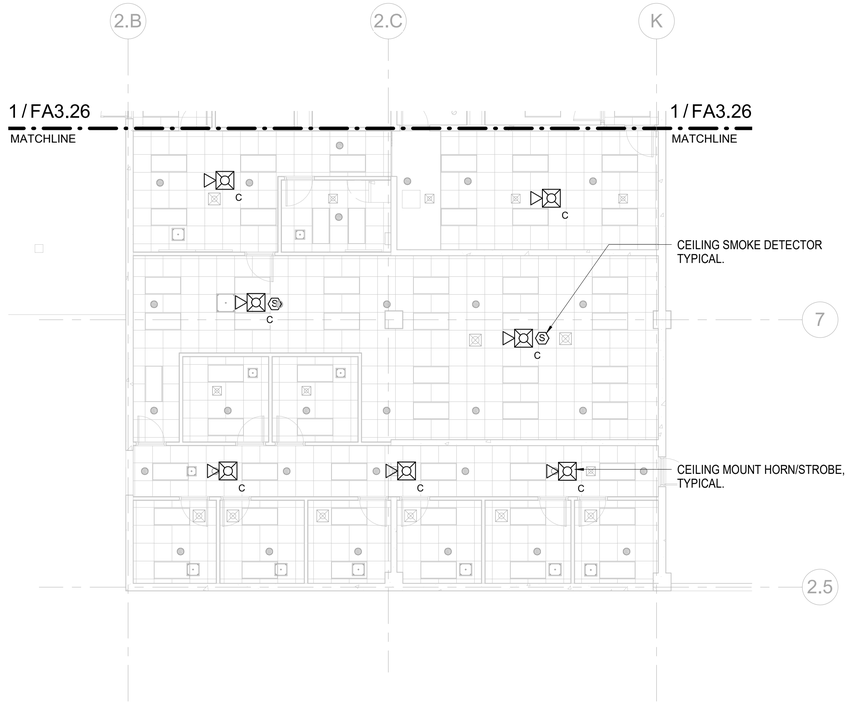
1 FIRE ALARM PLAN - ADMINISTRATION LEVEL 1 NORTH
SCALE: 1/8" = 1'-0"



2 FIRE ALARM PLAN - ADMINISTRATION LEVEL 1 SOUTH
SCALE: 1/8" = 1'-0"

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - ADMINISTRATION LEVEL 1

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT/CA
Checked:	WGM
Supv:	WGM
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Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.26
Sheet No. _____ of 0

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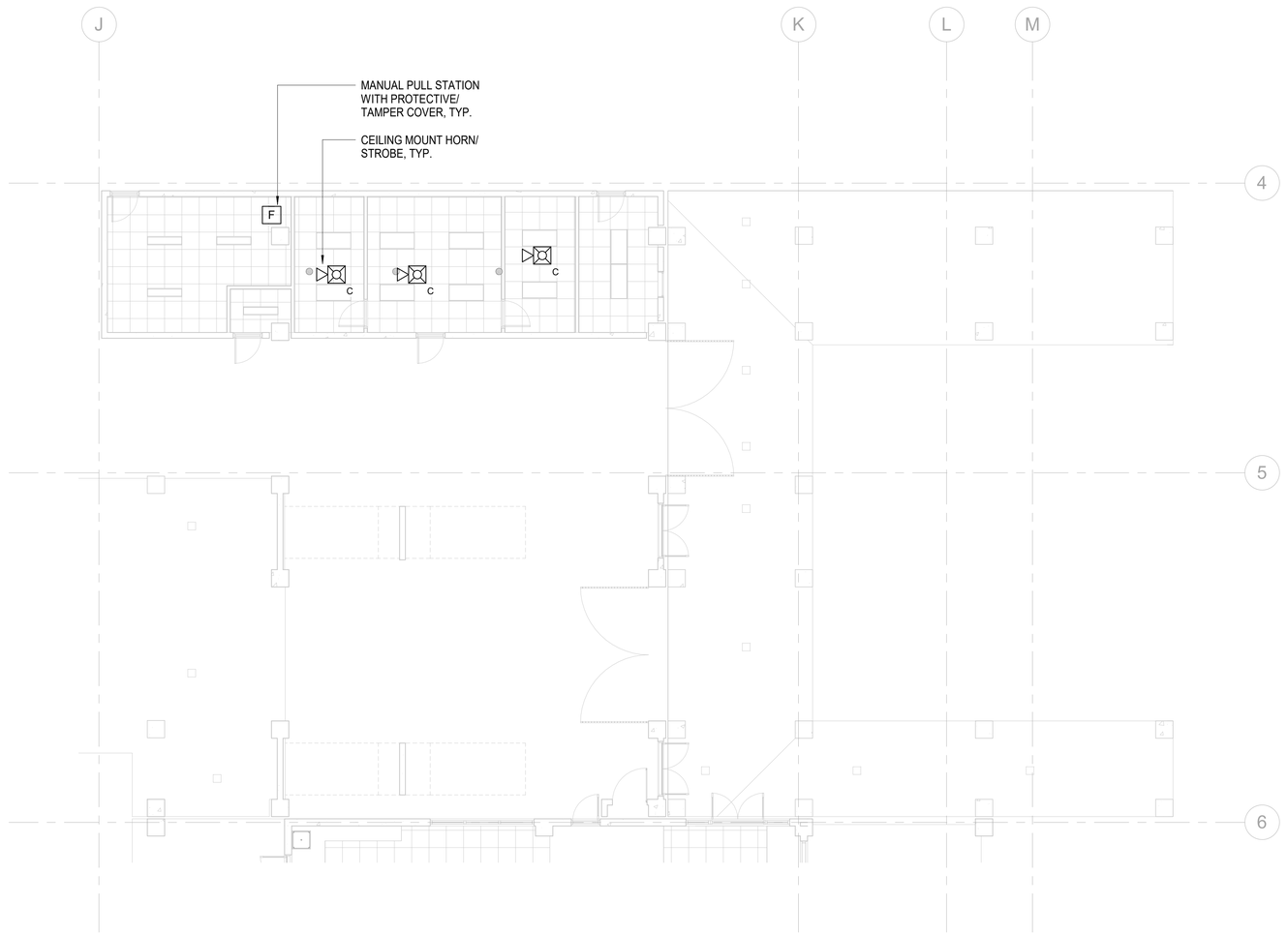

1 FIRE ALARM PLAN- ADMINISTRATION MAIN ENTRY

SCALE: 1/8" = 1'-0"

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - ADMINISTRATION MAIN ENTRY

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT/CA
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
FA3.27
Sheet No._____ of 0

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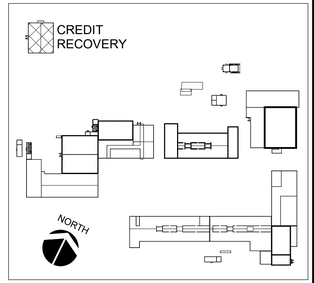
1 FIRE ALARM PLAN - CREDIT RECOVERY

SCALE: 1/8" = 1'-0"



KEY PLAN

REVISIONS

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - CREDIT RECOVERY

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.28
Sheet No._____ of 0

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NORTH

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

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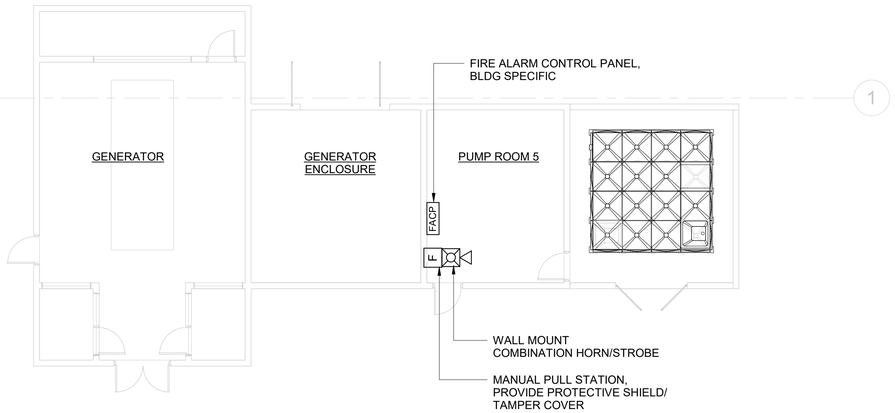
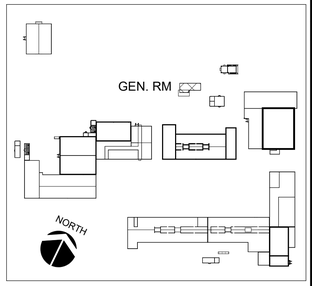


1 FIRE ALARM PLAN - GENERATOR AND FIRE PUMP ROOM

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - GENERATOR AND FIRE PUMP ROOM
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
FA3.29
Sheet No._____ of 0

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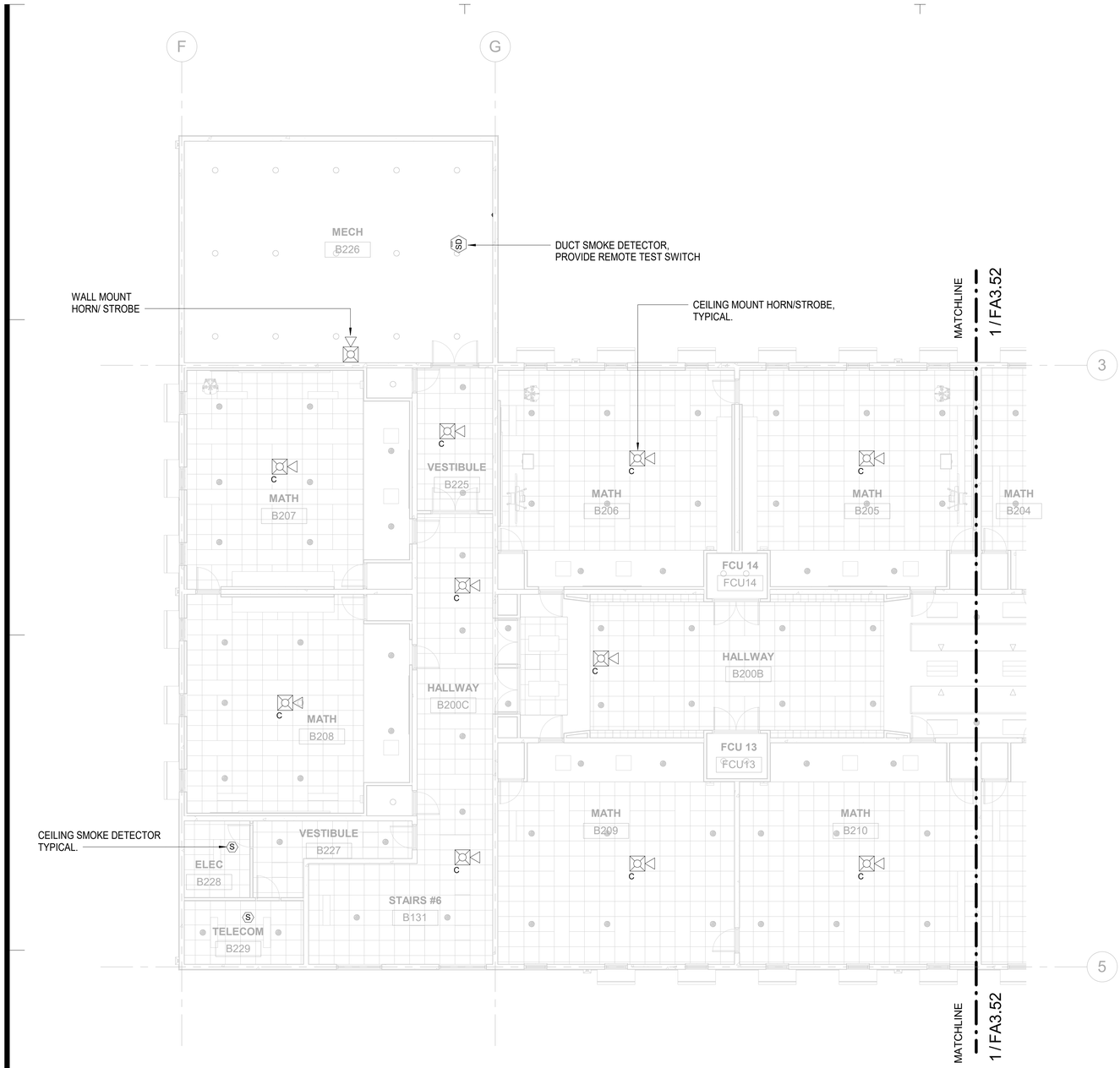
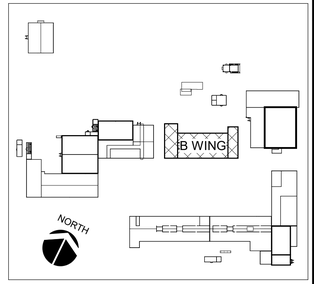


1 FIRE ALARM PLAN - B-WING LEVEL 2 WEST

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - B-WING LEVEL 2 WEST

PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG
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Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25

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File:

Drawing No.
FA3.51

Sheet No._____ of _____

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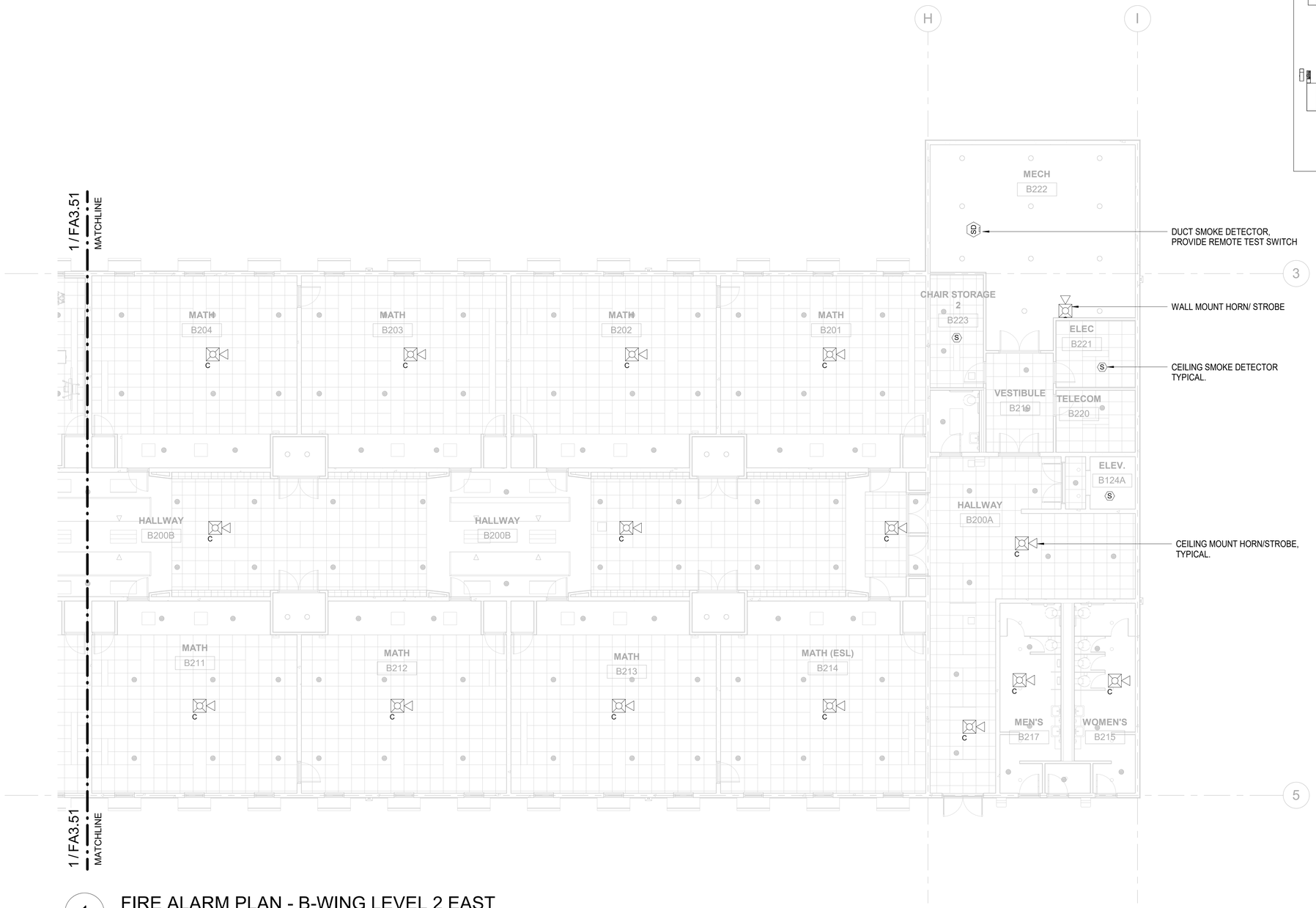
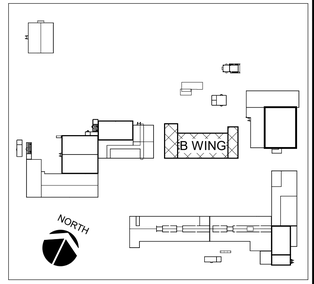


1 FIRE ALARM PLAN - B-WING LEVEL 2 EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - B-WING LEVEL 2 EAST

PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG
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Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
FA3.52
Sheet No._____ of _____

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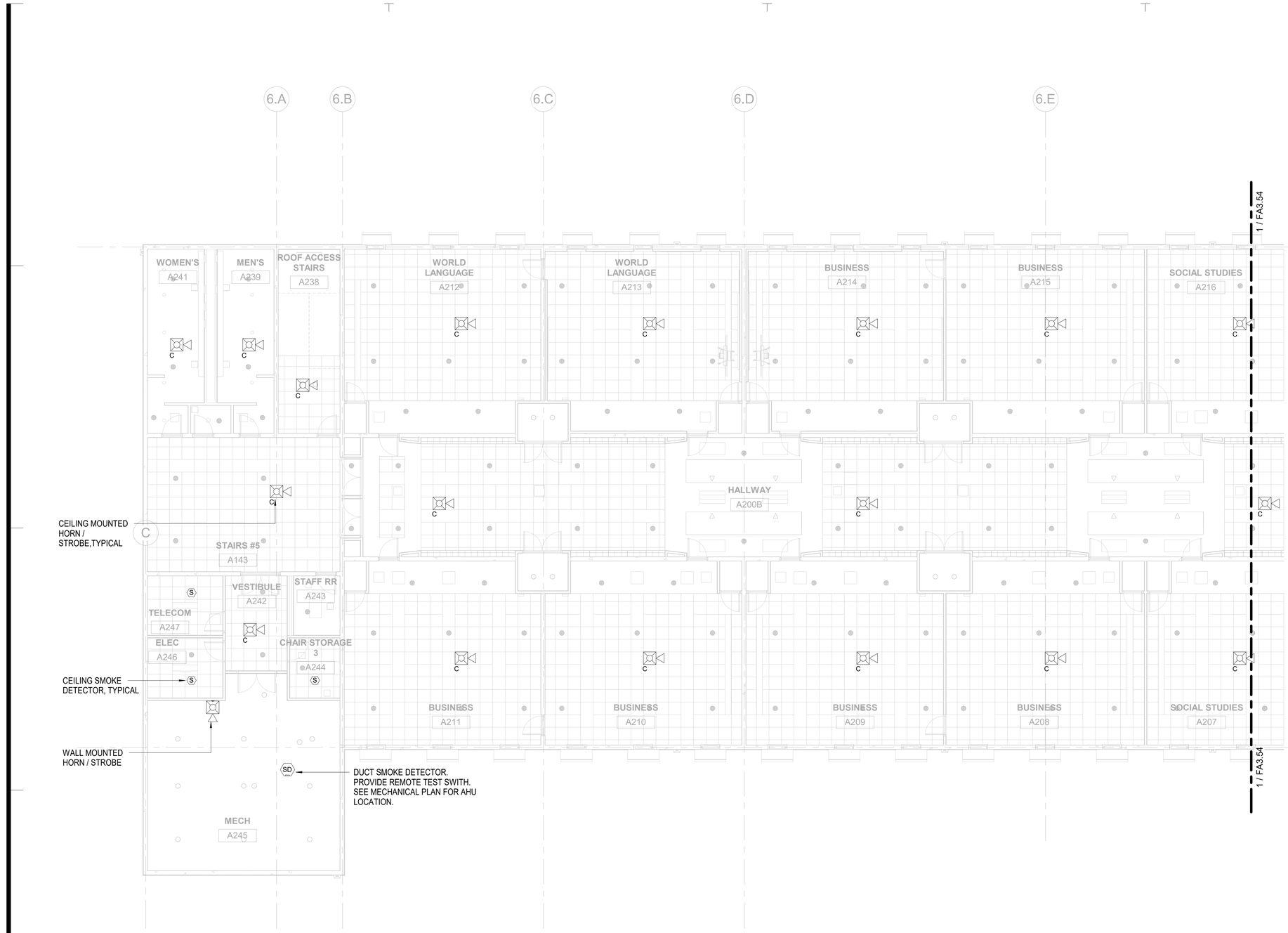

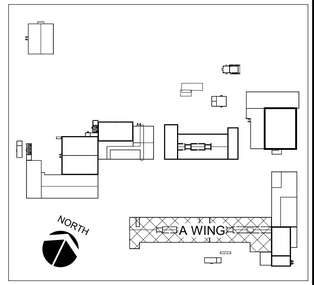

KEY PLAN

1 FIRE ALARM PLAN - LEVEL 2 WEST

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE ALARM PLAN - LEVEL 2 WEST
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FA3.53
Sheet No._____ of _____

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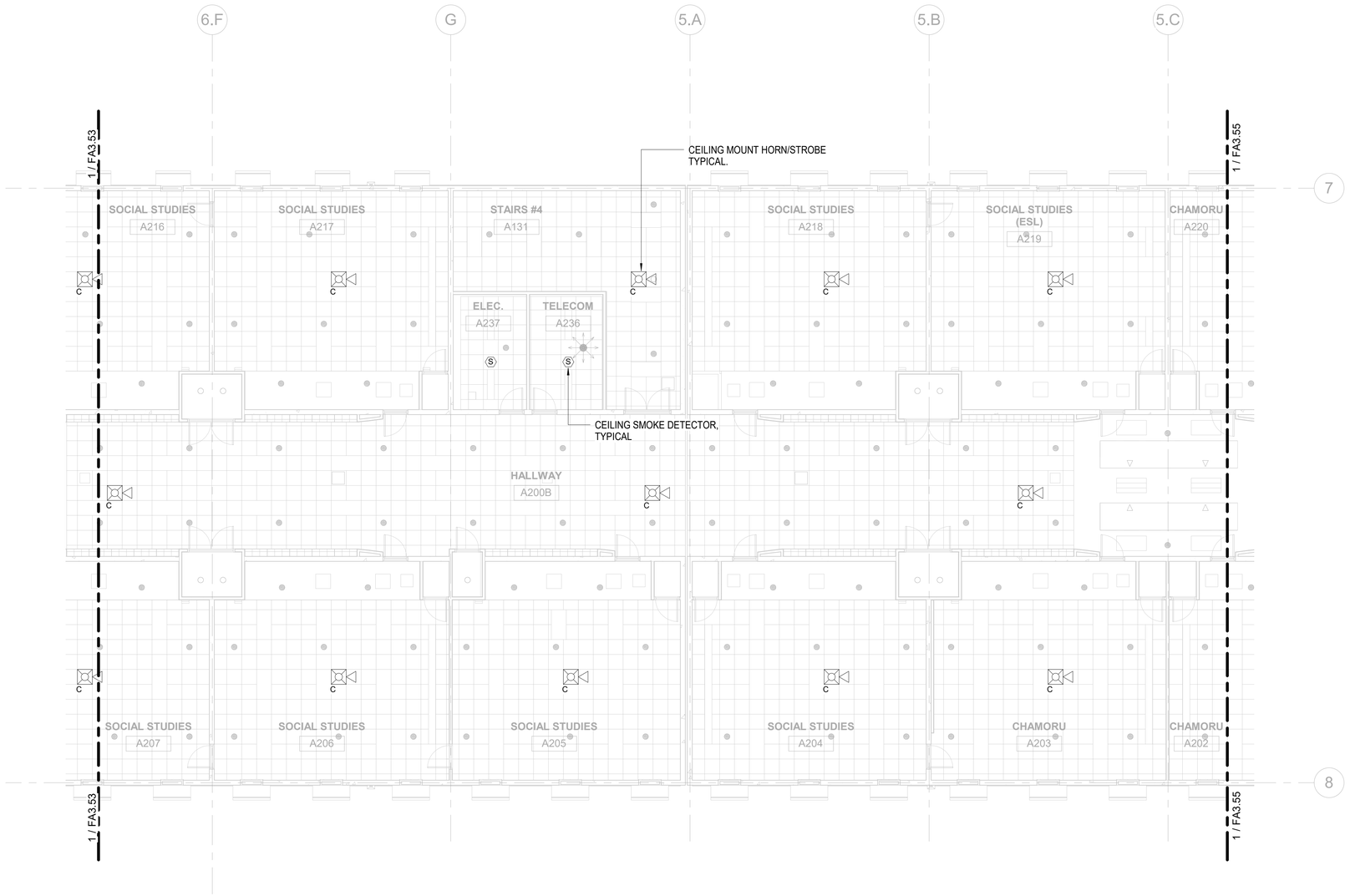
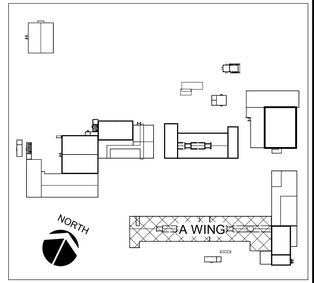


1 FIRE ALARM PLAN - A-WING LEVEL 2 CENTER

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

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SCALE: 1/8" = 1'-0"

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Project:

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SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE ALARM A WING LEVEL 2 CENTER/SPED

PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.

FA3.54

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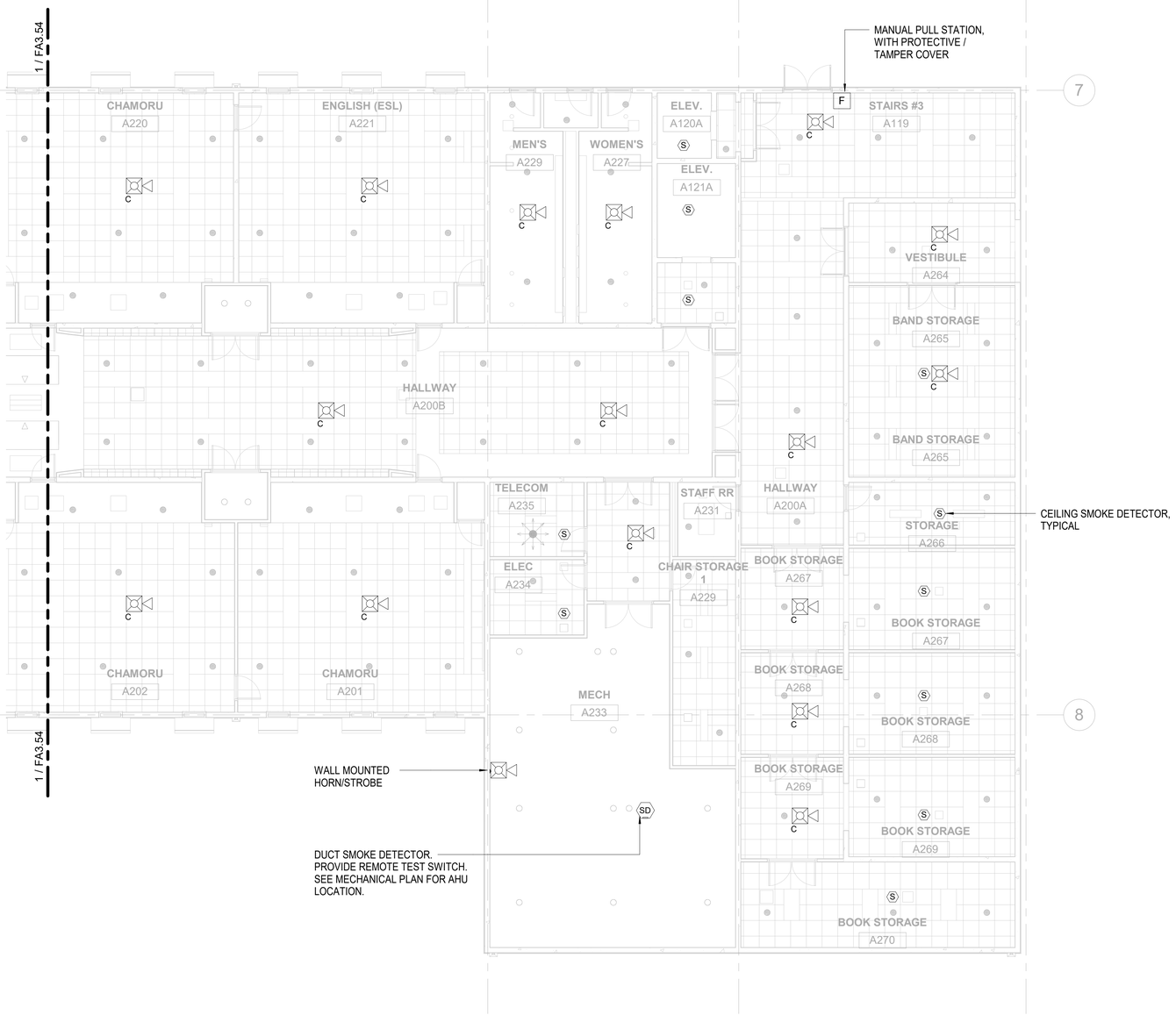
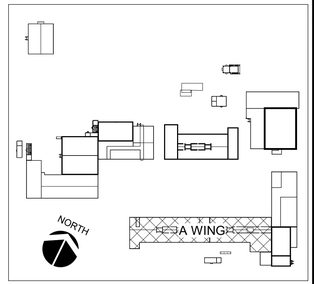


1 FIRE ALARM PLAN - A-WING LEVEL 2 EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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Title:

FIRE ALARM PLAN - A-WING LEVEL 2 EAST

PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
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Drawing No.

FA3.55

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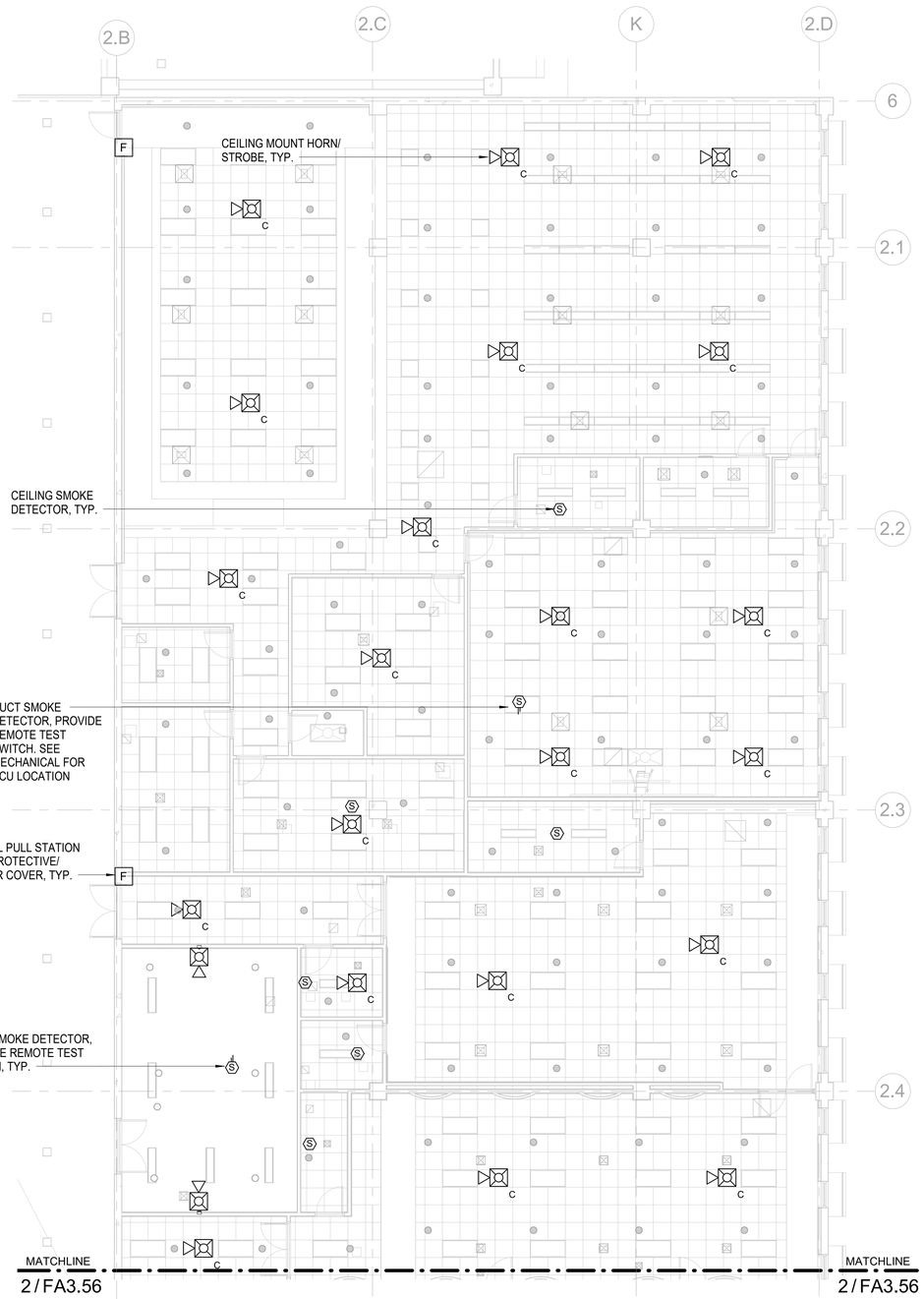
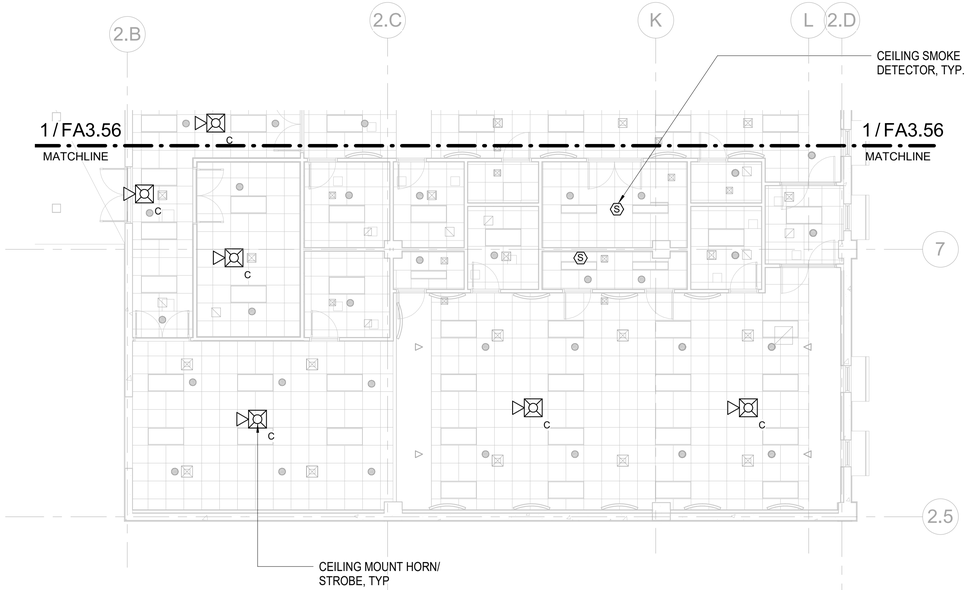


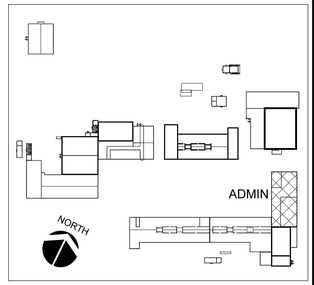
1 FIRE ALARM PLAN - LIBRARY LEVEL 2 NORTH

SCALE: 1/8" = 1'-0"



2 FIRE ALARM PLAN - LIBRARY LEVEL 2 SOUTH

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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FIRE ALARM PLAN - LIBRARY LEVEL 2

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT/CA
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FIRE SPRINKLER LEGEND AND ABBREVIATIONS

SYMBOL	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION
		WET FIRE SPRINKLER RISER		FS	FIRE SPRINKLER SYSTEM
FACP	FACP	FIRE ALARM CONTROL PANEL		FT	FEET
		FIRE SPRINKLER, PENDENT, QUICK RESPONSE		GA	GAUGE
		FIRE SPRINKLER, UPRIGHT, QUICK RESPONSE		GPM	GALLONS PER MINUTE
		FIRE SPRINKLER, HORIZONTAL, QUICK RESPONSE		GALV	GALVANIZED
		FIRE SPRINKLER, DRY BARRELL PENDENT, QR		GFD	GUAM FIRE DEPARTMENT
F		MANUAL PULL STATION		GRP	GLASS (FIBERGLASS) REINFORCED PLASTIC
	FDC	FIRE DEPARTMENT CONNECTION, FREESTANDING		HP	HORSEPOWER
	BFP	BACKFLOW PREVENTER ASSEMBLY		HZ	HERTZ
C xx		HORN AND STROBE ASSY, CEILING MOUNT		IBC	INTERNATIONAL BUILDING CODE
xx		HORN AND STROBE ASSY, WALL MOUNT		IFC	INTERNATIONAL FIRE CODE
H F		HORN ASSY, WALL MOUNT		IN	INCHES
xx		STROBE ASSY, WALL MOUNT		KW	KILOWATT
S	SD	SMOKE DETECTOR, CEILING MOUNT		LBS	POUNDS
D S		SMOKE DETECTOR, DUCT		MISC	MISCELLANEOUS
FS	FS	WATER FLOW ALARM SWITCH		NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
TS	TS	TAMPER ALARM SWITCH		NTS	NOT TO SCALE
	°F	DEGREES FAHRENHEIT		OS & Y	OUTSIDE SCREW AND YOKE
	Ø	DIAMETER		OD	OUTSIDE DIAMETER
	AHJ	AUTHORITY HAVING JURISDICTION		PSI	POUNDS PER SQUARE INCH
	AMP	AMPERE/AMPERES		PH	PHASE
	ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE		QR	QUICK RESPONSE
	APPROX	APPROXIMATE		SF	SQUARE FOOT
	ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS		SPECS	SPECIFICATIONS
	AVG	AVERAGE		SP	STATIC PRESSURE
	BTU	BRITISH THERMAL UNIT		SSTL	STAINLESS STEEL
	CAP	CAPACITY		STD	STANDARD
	CON'T	CONTINUATION/CONTINUED		SW	SWITCH
	DOE	DEPARTMENT OF EDUCATION		TEMP	TEMPERATURE
	DPW	DEPARTMENT OF PUBLIC WORKS		TYP	TYPICAL
	FA	FIRE ALARM		UG	UNDERGROUND
	FFL	FINISH FLOOR LINE/LEVEL		UL	UNDERWRITERS LABORATORIES, INC.
	FM	FACTORY MUTUAL		V	VOLTAGE/VOLTS
	FPE	FIRE PROTECTION ENGINEER		WT	WEIGHT

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Title:
FIRE PROTECTION LEGEND AND ABBREVIATIONS
PROGRAMMING DOCUMENT

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Project No.	File
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Drawing No.
FP0.1
Sheet No._____ of 0

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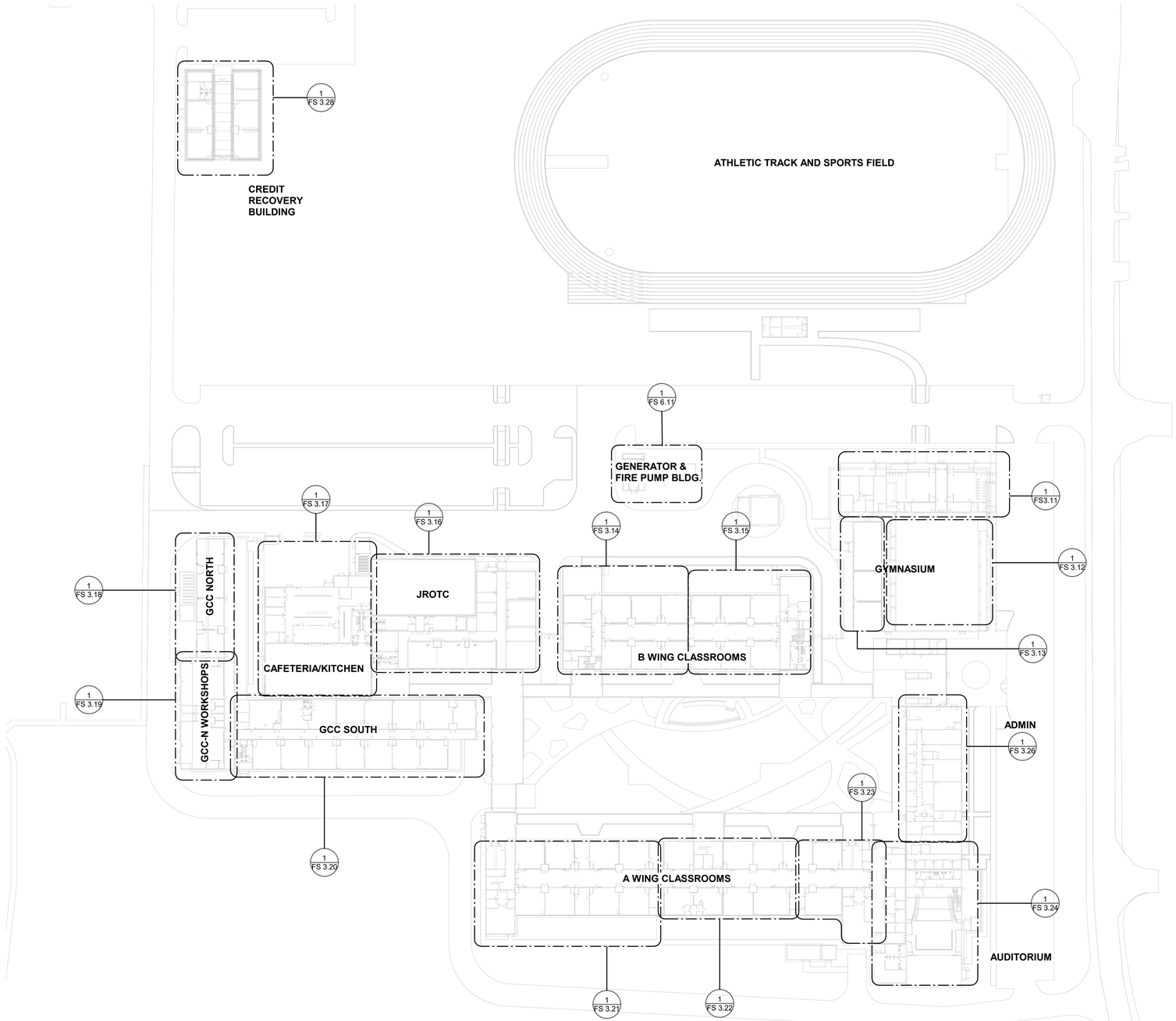

1 OVERALL FIRE SPRINKLER PLAN LEVEL 1

SCALE: 1" = 60'-0"

NORTH

GRAPHIC SCALE

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

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Title:

OVERALL FIRE SPRINKLER SITE PLAN LEVEL 1

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/JB
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Supv:	WGM
Scale:	1" = 60'-0"
Date:	8/26/22
Project No. XX-XXXX	File

Drawing No.

FS1.1

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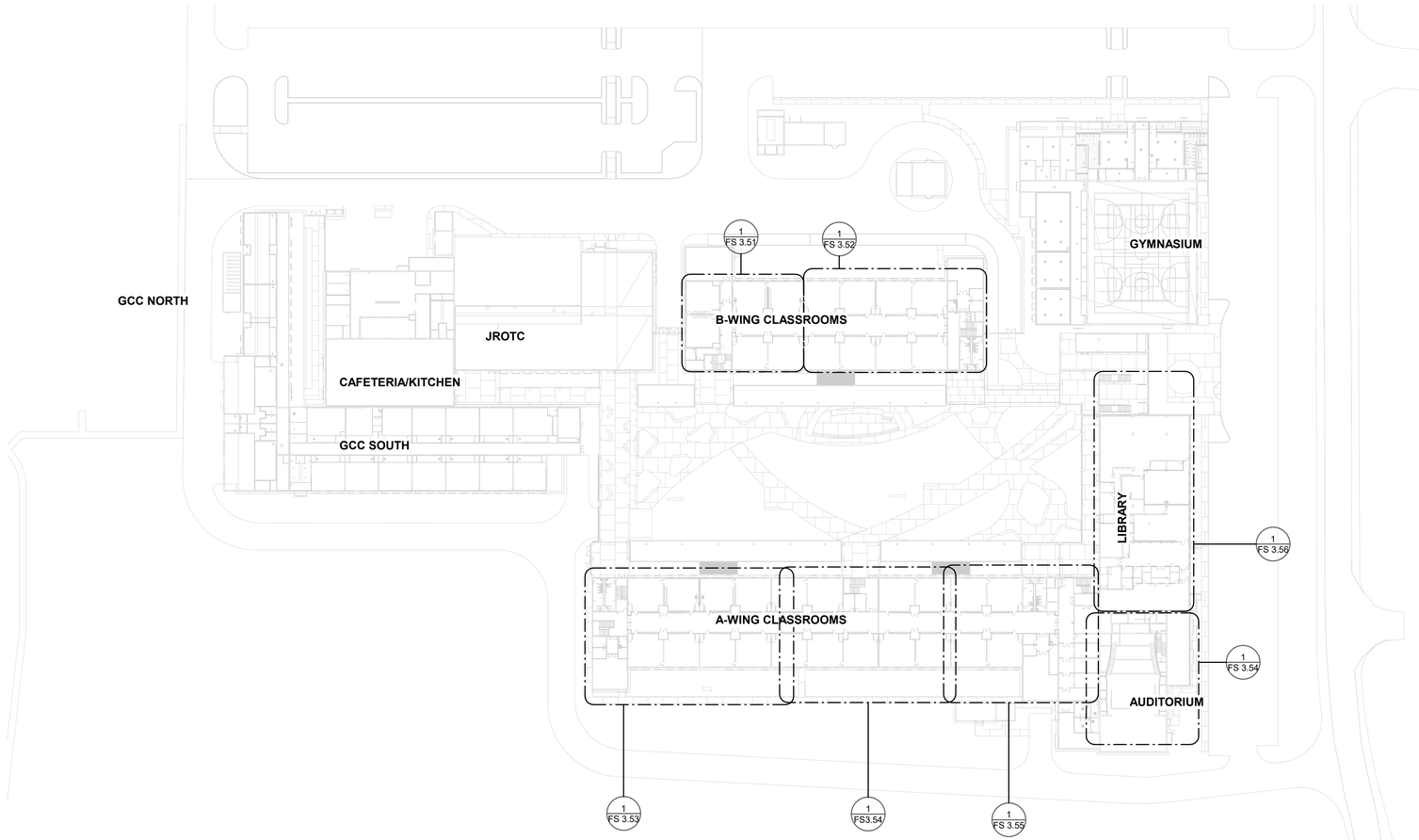

1 OVERALL FIRE SPRINKLER PLAN LEVEL 2

SCALE: 1" = 60'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 10' 20' 30' 60' 120' 180'

SCALE: 1" = 60'-0"

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Project:

GDOE

SIMON SANCHEZ HIGH SCHOOL

Title:

OVERALL FIRE SPRINKLER PLAN LEVEL 2

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/JB
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Scale:	1" = 60'-0"
Date:	8/26/22
Project No. XX-XXXX	File

Drawing No.

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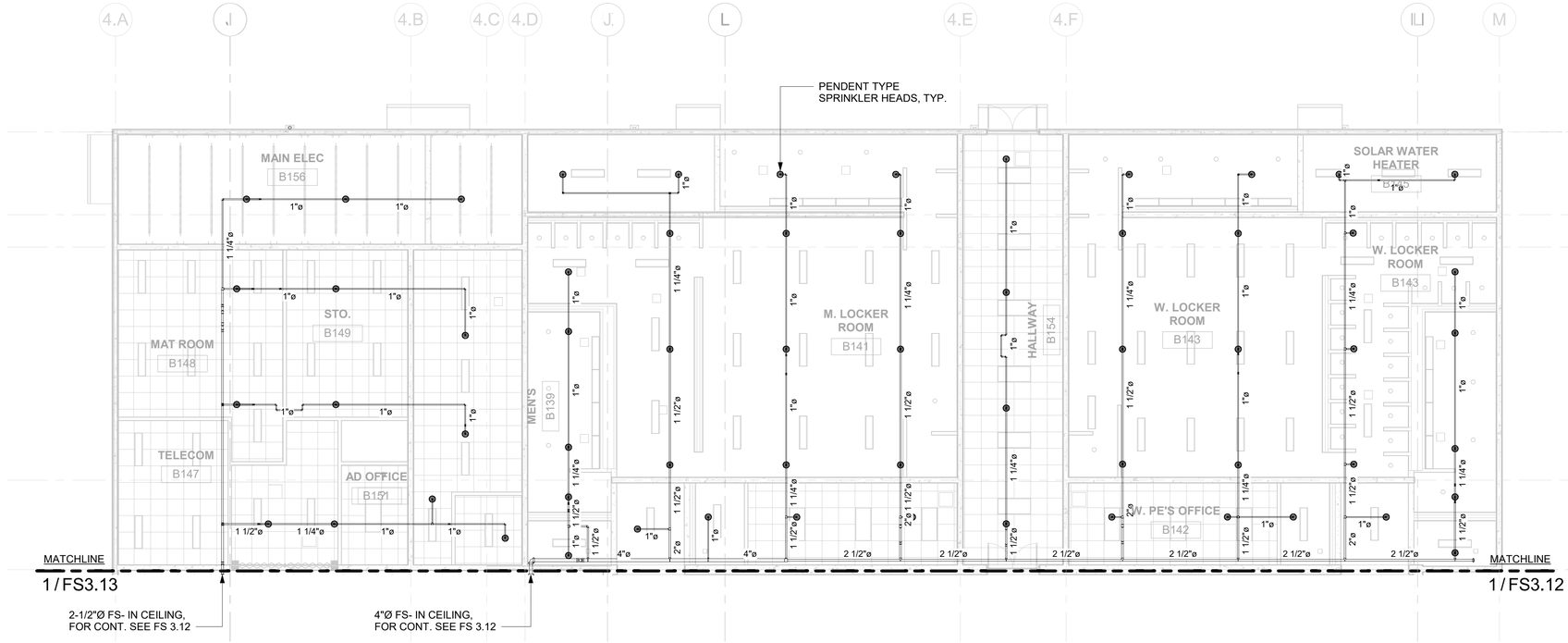

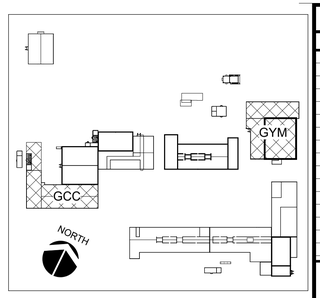

KEY PLAN

1 FIRE SPRINKLER PLAN - GYM LOCKER ROOM

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Project:

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SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE SPRINKLER PLAN - GYM LOCKER ROOM

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
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Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.

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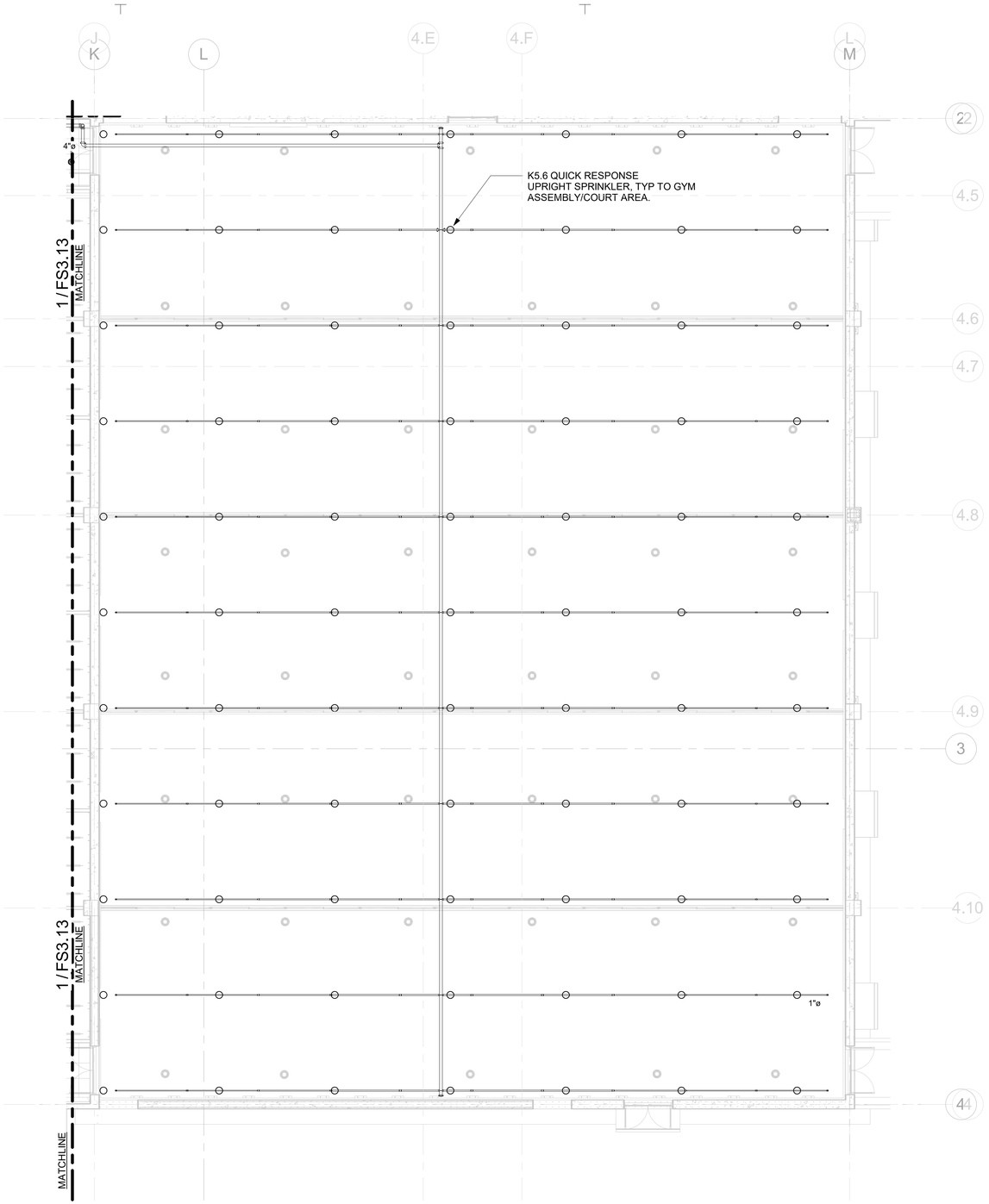
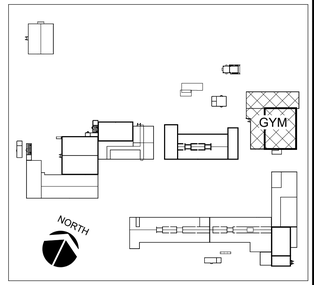


1 FIRE SPRINKLER PLAN - GYMNASIUM (ASSEMBLY/COURT)

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

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SCALE: 1/8" = 1'-0"

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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE SPRINKLER PLAN - GYMNASIUM (ASSEMBLY/COURT)

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
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Scale:	1/8" = 1'-0"
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Project No.	XX-XXX
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Drawing No.

FS3.12

Sheet No._____ of 0

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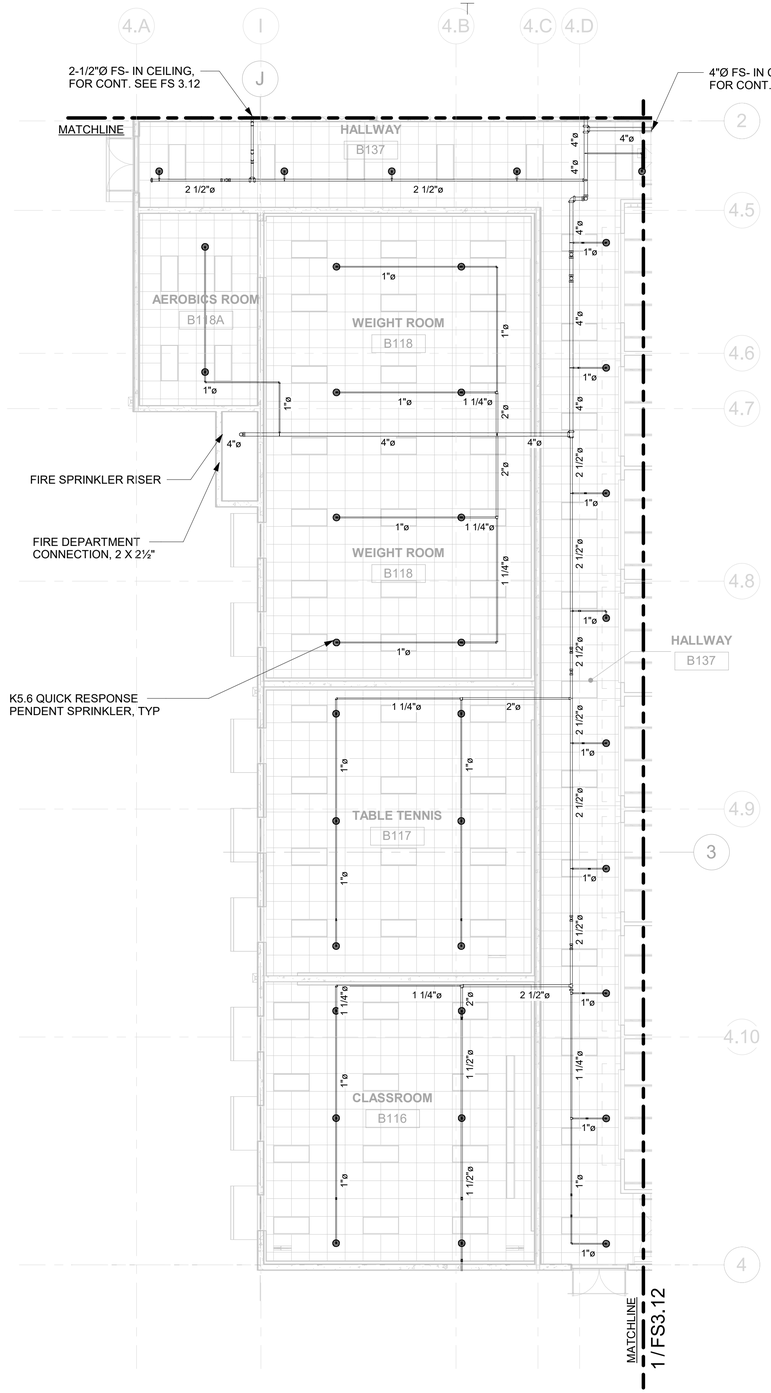
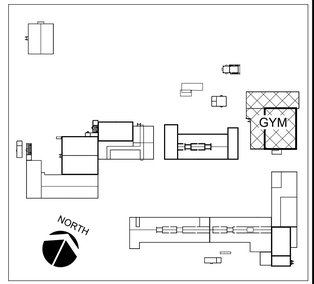


1 FIRE SPRINKLER PLAN - GYM WEIGHT ROOM/ CLASSROOM

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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No.	Description	Date

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Architecture
Planning
Interior Design

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - GYM WEIGHT ROOM/CLASSROOM
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.13
Sheet No. of 0

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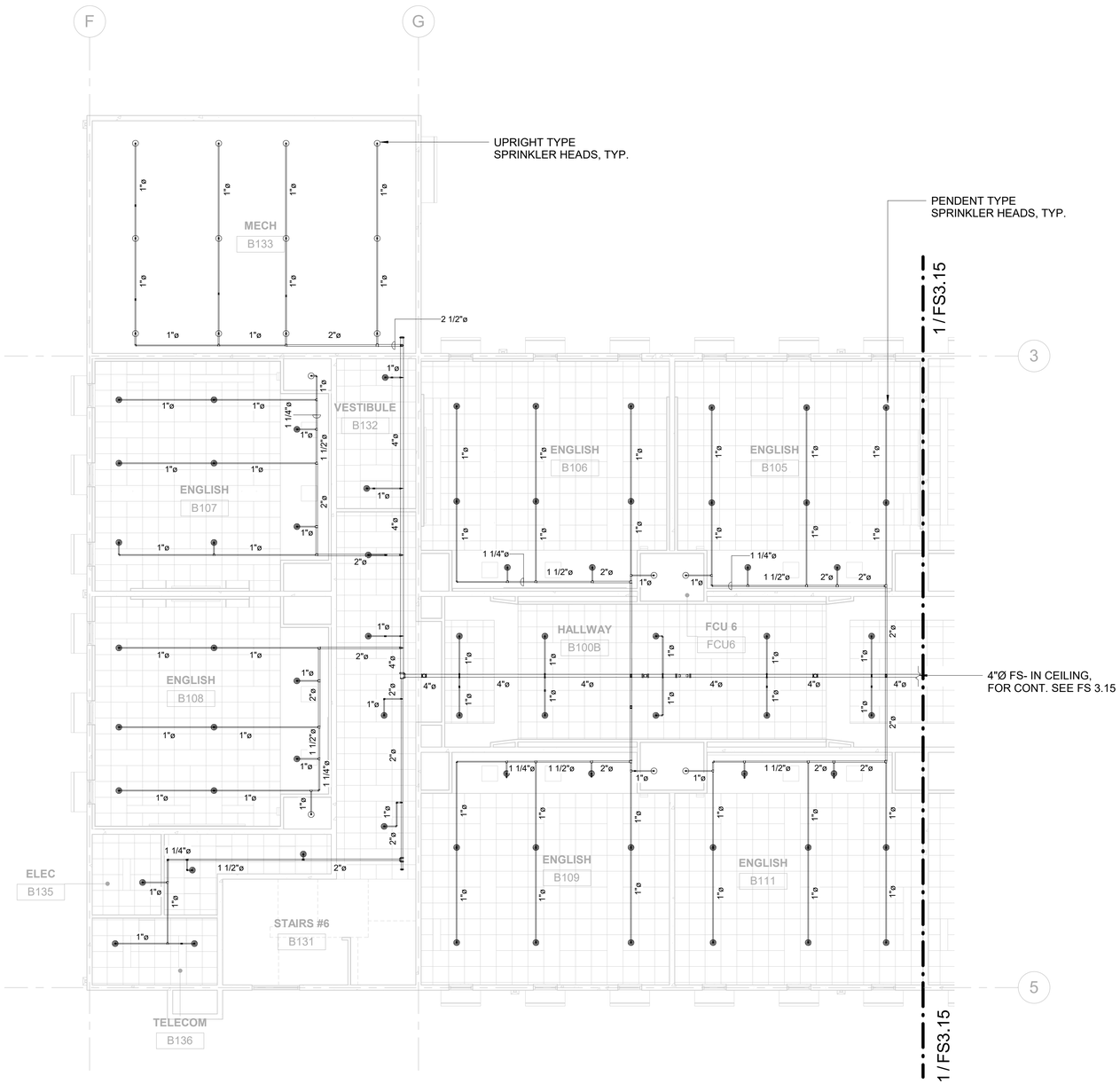
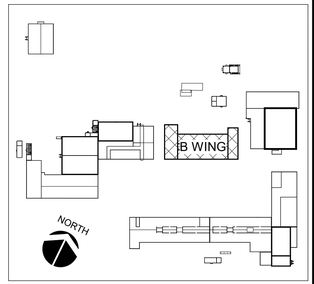


1 FIRE SPRINKLER PLAN - B-WING LEVEL 1 WEST

SCALE: 1/8" = 1'-0"



KEY PLAN

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Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE SPRINKLER PLAN - B-WING LEVEL 1 WEST

PROGRAMMING DOCUMENT

Designed:	WM
Drawn:	CA
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.

FS3.14

Sheet No._____ of _____

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FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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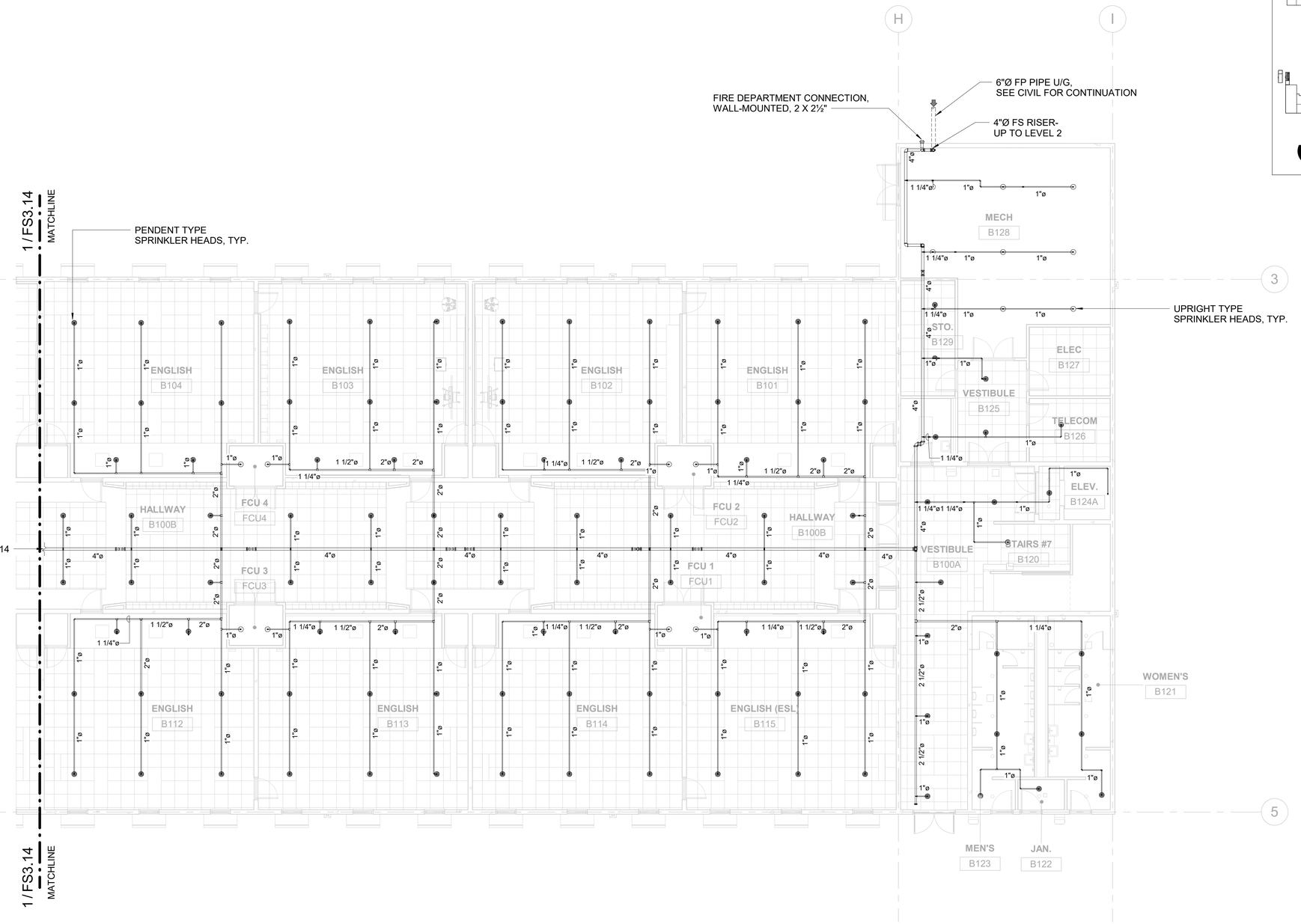
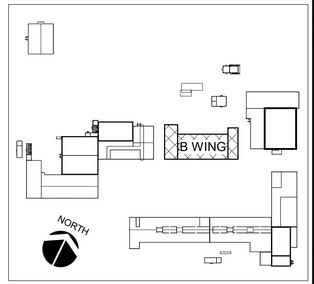


1 FIRE SPRINKLER PLAN - B-WING LEVEL 1 EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - B-WING LEVEL 1 EAST
PROGRAMMING DOCUMENT

Designed:	WM
Drawn:	CA
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
FS3.15
Sheet No._____ of _____

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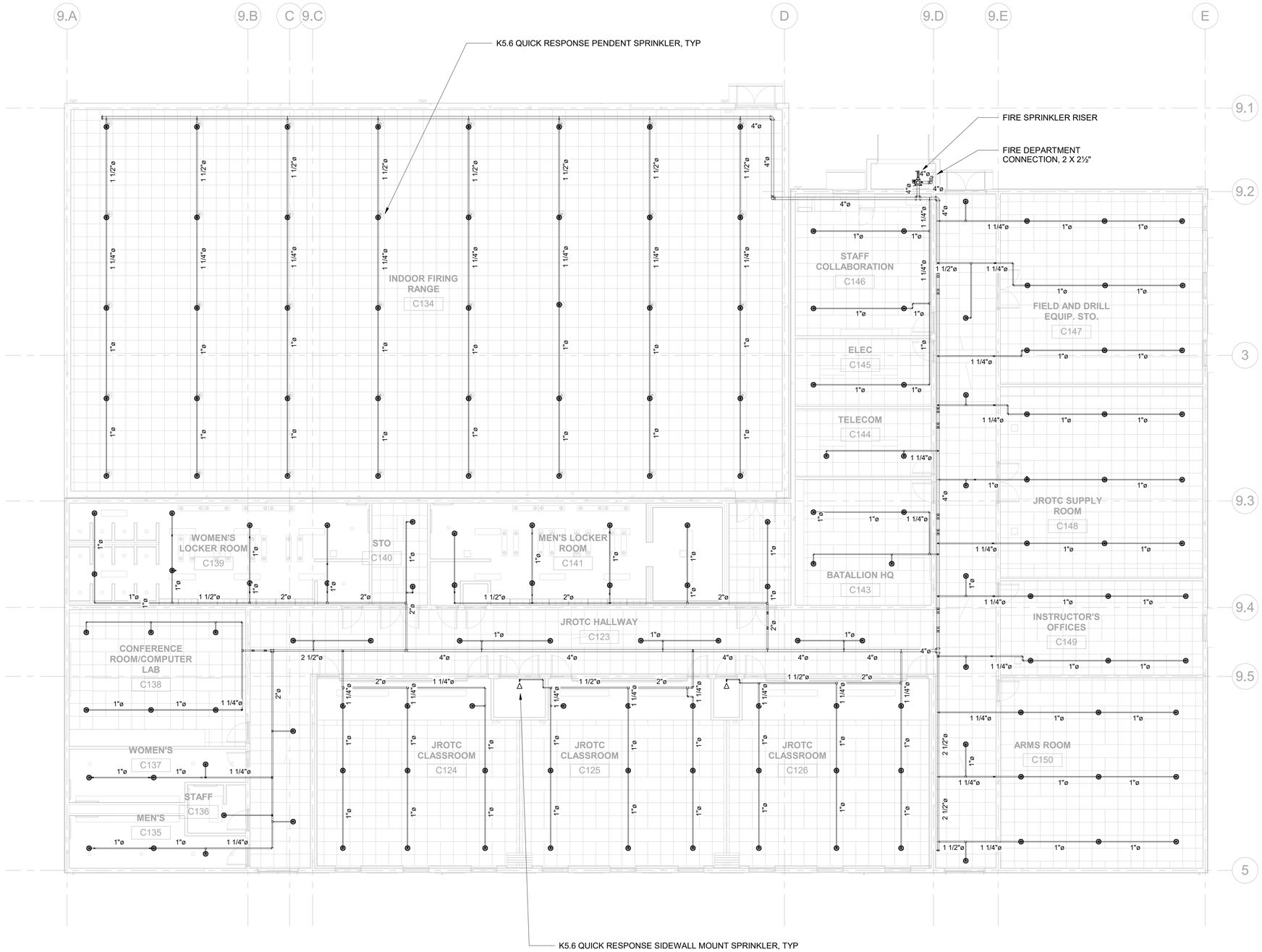

1 FIRE SPRINKLER PLAN - JROTC
SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - JROTC
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
XX-XXX	

Drawing No.
FS3.16
Sheet No. ____ of 0

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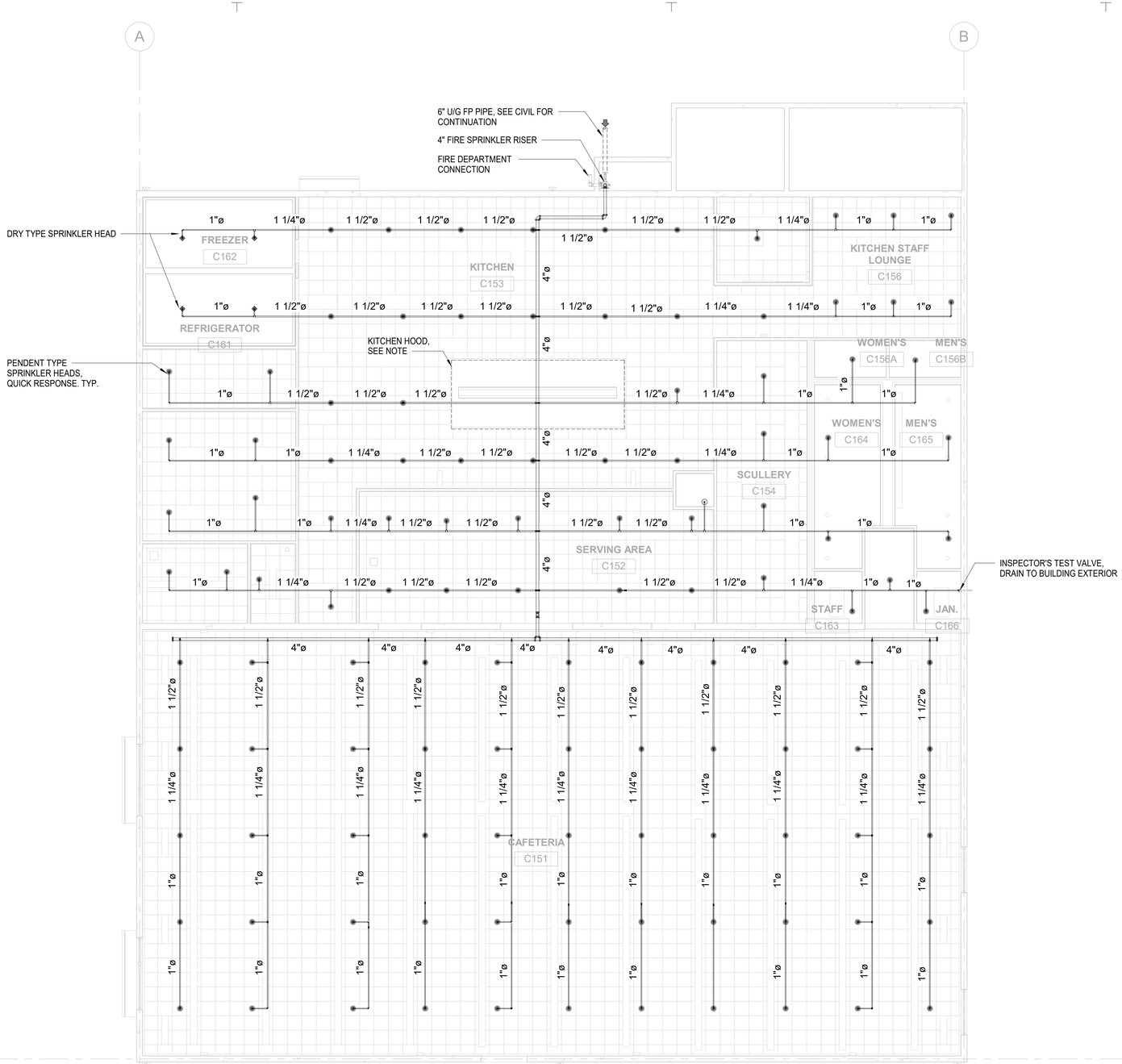
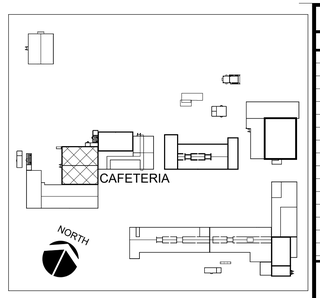


FIRE SPRINKLER PLAN - CAFETERIA

SCALE: 1/8" = 1'-0"



KEY PLAN

NOTE:

1. PROVIDE PRE ENGINEERED KITCHEN HOOD FIRE SUPPRESSION SYSTEM. PROVIDE COMPLETE SYSTEM INCLUDING AGENT CYLINDERS, RELEASING PANEL, DETECTION AND INITIATION DEVICES. CONNECT KITCHEN HOOD FIRE SUPPRESION SYSTEM TO THE BUILDING FIRE ALARM SYSTEM.
2. SPRINKLER HEAD WITHIN 18" OF THE HOOD SHALL BE INTERMEDIATE OR HIGH TEMP.

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS

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1	ADDENDUM	10/27/2022

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - CAFETERIA
PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.17
Sheet No._____ of _____

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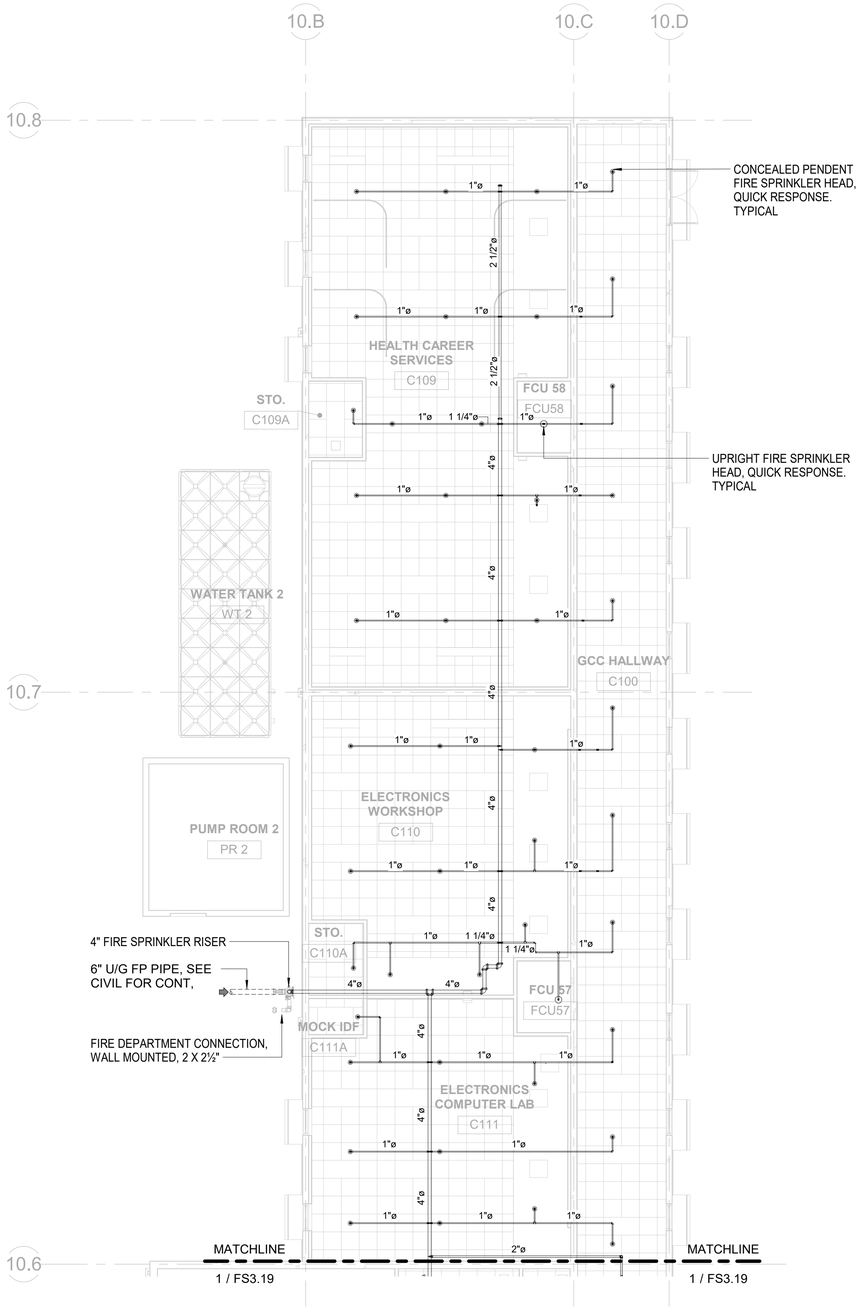
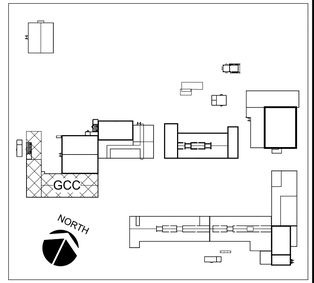


1 FIRE SPRINKLER PLAN - GCC-NORTH CLASSROOMS

SCALE: 1/8" = 1'-0"



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Planning
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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - GCC-NORTH CLASSROOMS
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.18
Sheet No._____ of _____

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FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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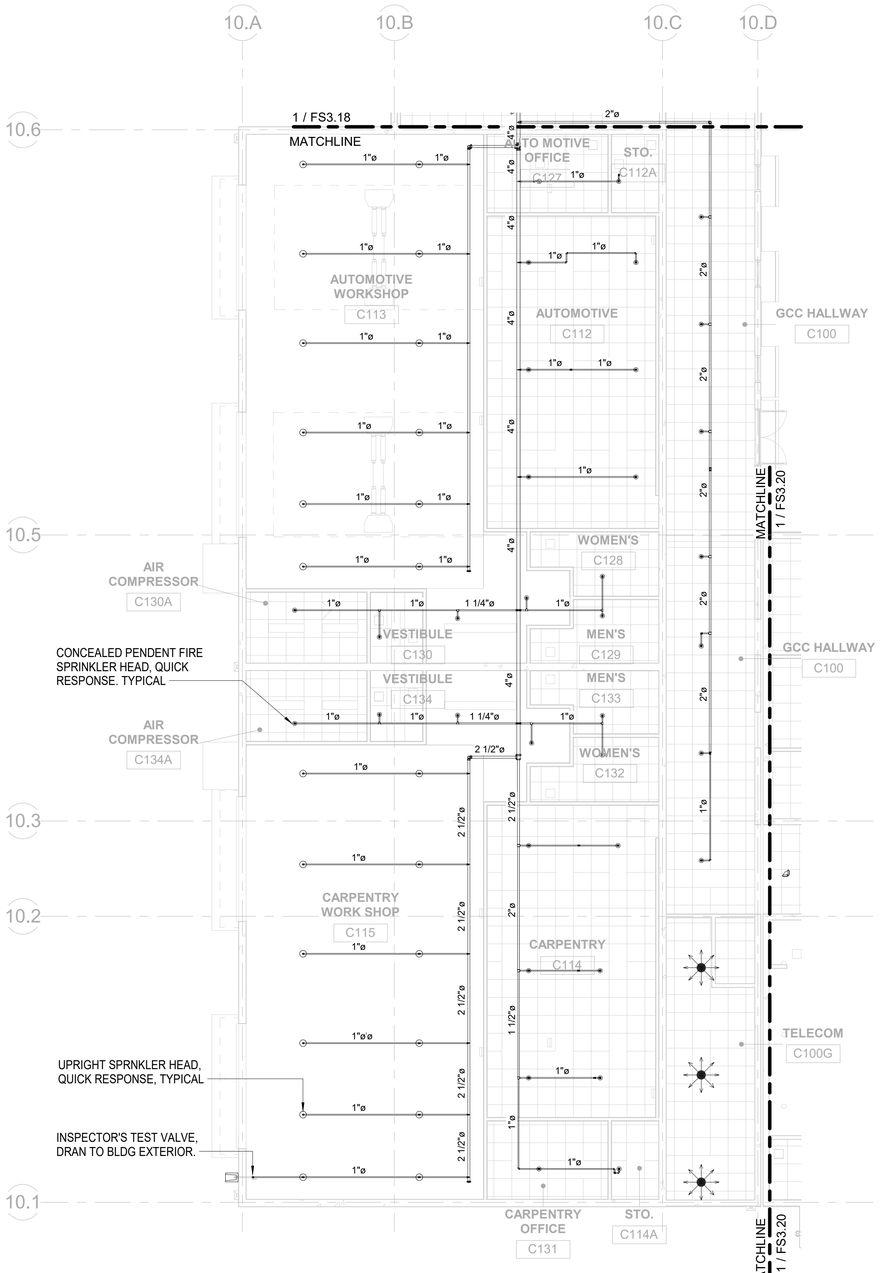
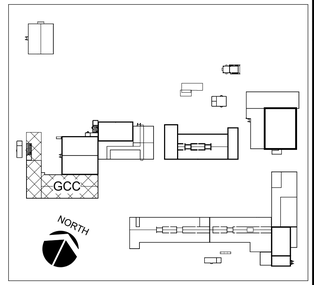


1 FIRE SPRINKLER PLAN - GCC-NORTH SHOPS

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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DATE: _____

Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE SPRINKLER PLAN - GCC-NORTH SHOPS

PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.

FS3.19

Sheet No._____ of _____

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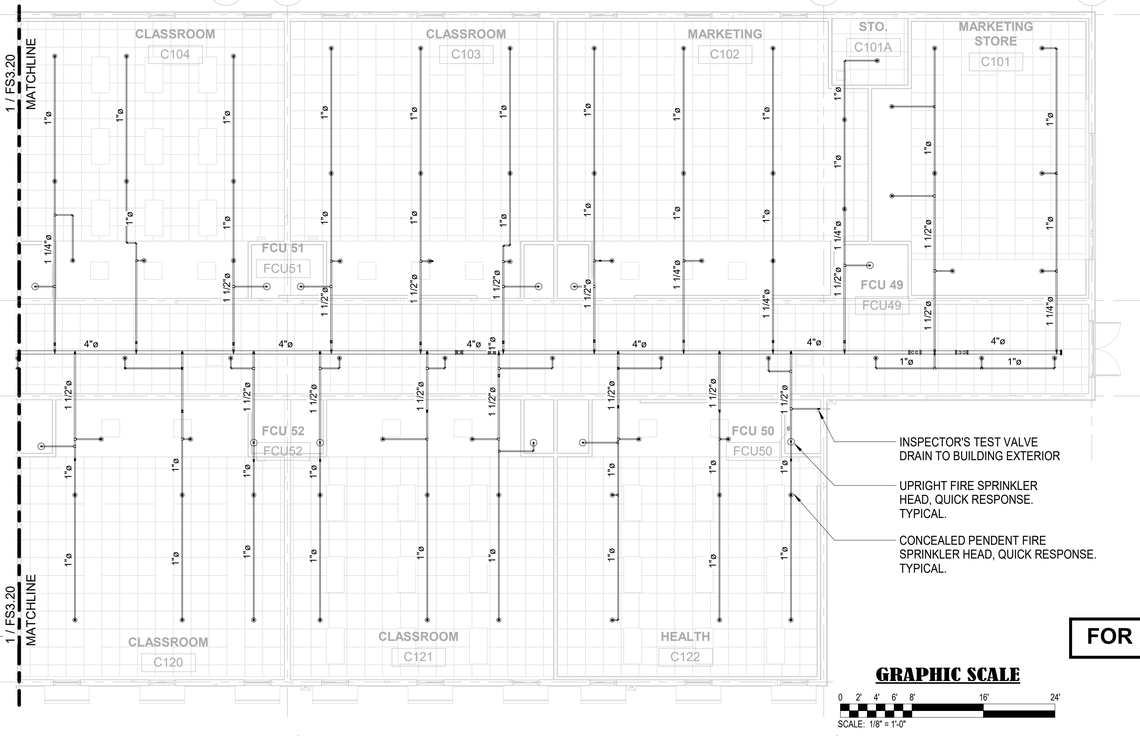
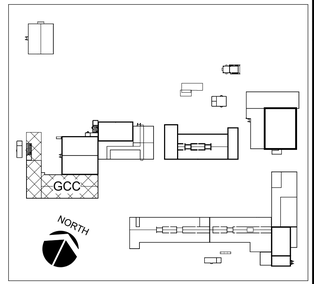
1 FIRE SPRINKLER PLAN -GCC-SOUTH CLASSROOMS WEST

SCALE: 1/8" = 1'-0"



2 FIRE SPRINKLER PLAN -GCC-SOUTH CLASSROOMS EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

1 NOTE:
1. PROVIDE PRE ENGINEERED KITCHEN HOOD FIRE SUPPRESSION SYSTEM. PROVIDE COMPLETE SYSTEM INCLUDING AGENT CYLINDERS, RELEASING PANEL, DETECTION AND INITIATION DEVICES. CONNECT KITCHEN HOOD FIRE SUPPRESION SYSTEM TO THE BUILDING FIRE ALARM SYSTEM.
2. SPRINKLER HEAD WITHIN 18" OF THE HOOD SHALL BE INTERMEDIATE OR HIGH TEMP.

GRAPHIC SCALE

0 2' 4' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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No.	Description	Date
1	ADDENDUM	10/27/2022

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DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN -GCC-SOUTH CLASSROOMS
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	CG/AT/CC
Checked:	WGM
Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.20
Sheet No._____ of _____

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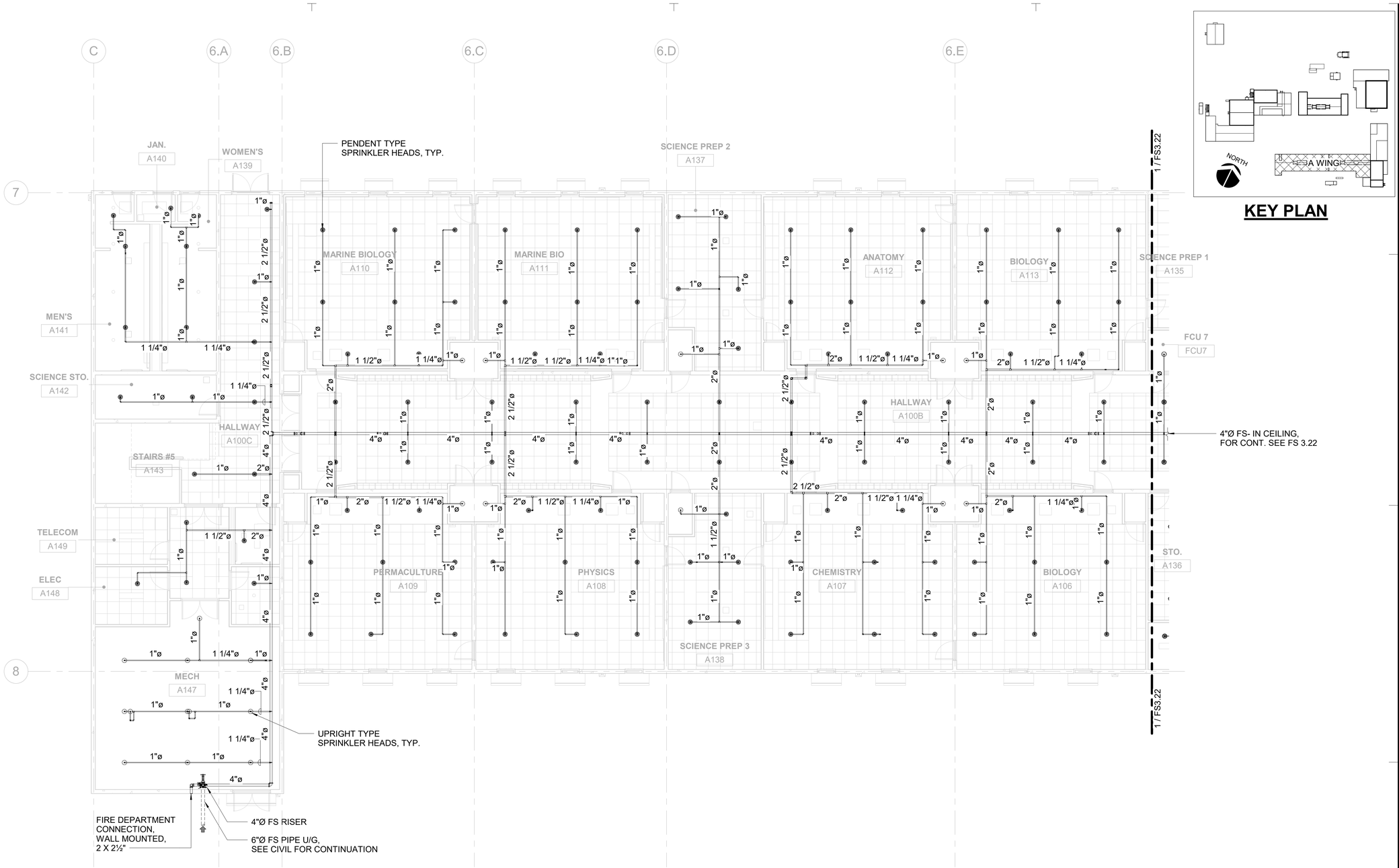

1 FIRE SPRINKLER PLAN - A-WING LEVEL 1 WEST

SCALE: 1/8" = 1'-0"

KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - A-WING LEVEL 1 WEST
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WM
Supv:	WM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.21
Sheet No. of

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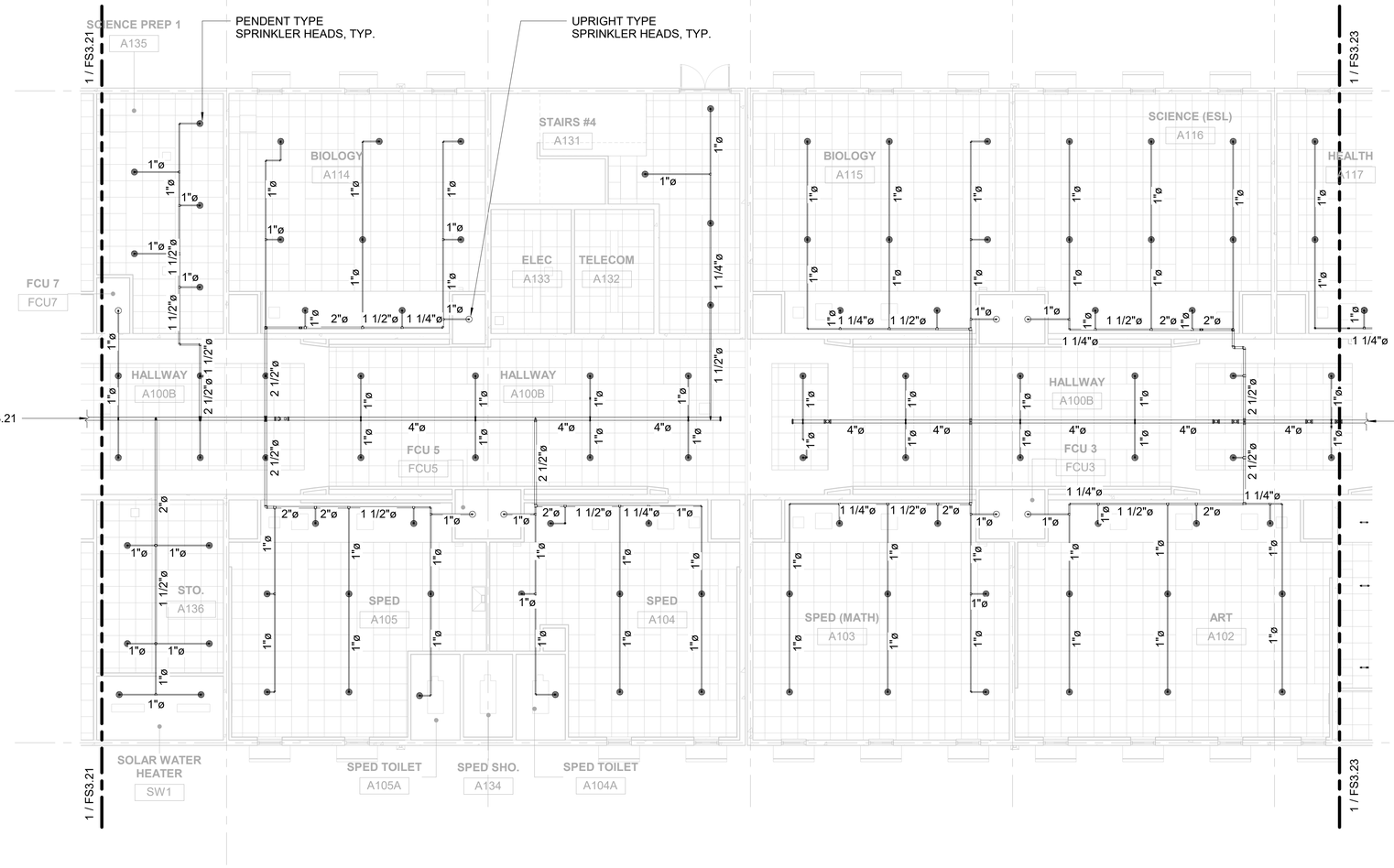
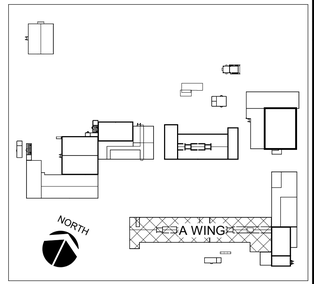


1 FIRE SPRINKLER PLAN - A-WING LEVEL 1 CENTER/SPED

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
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DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - A WING LEVEL 1 CENTER/SPED
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WM
Supv:	WM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
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Drawing No.
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Sheet No._____ of _____

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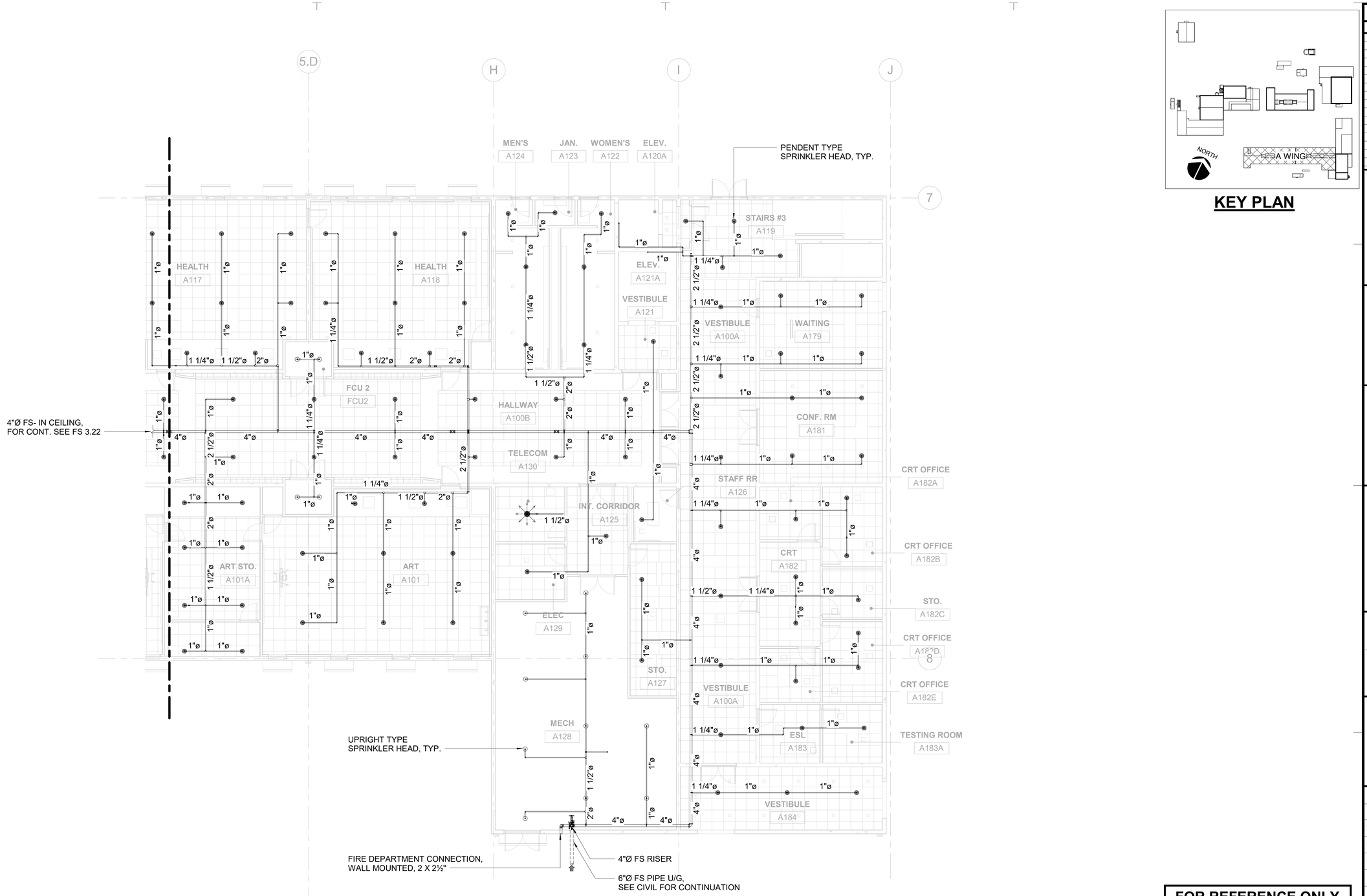

1 FIRE SPRINKLER PLAN - A-WING LEVEL 1 EAST HEALTH AND ART

SCALE: 1/8" = 1'-0"

KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - A-WING LEVEL 1 EAST HEALTH AND ART
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
Checked:	WM
Supv:	WM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.23
Sheet No._____ of _____

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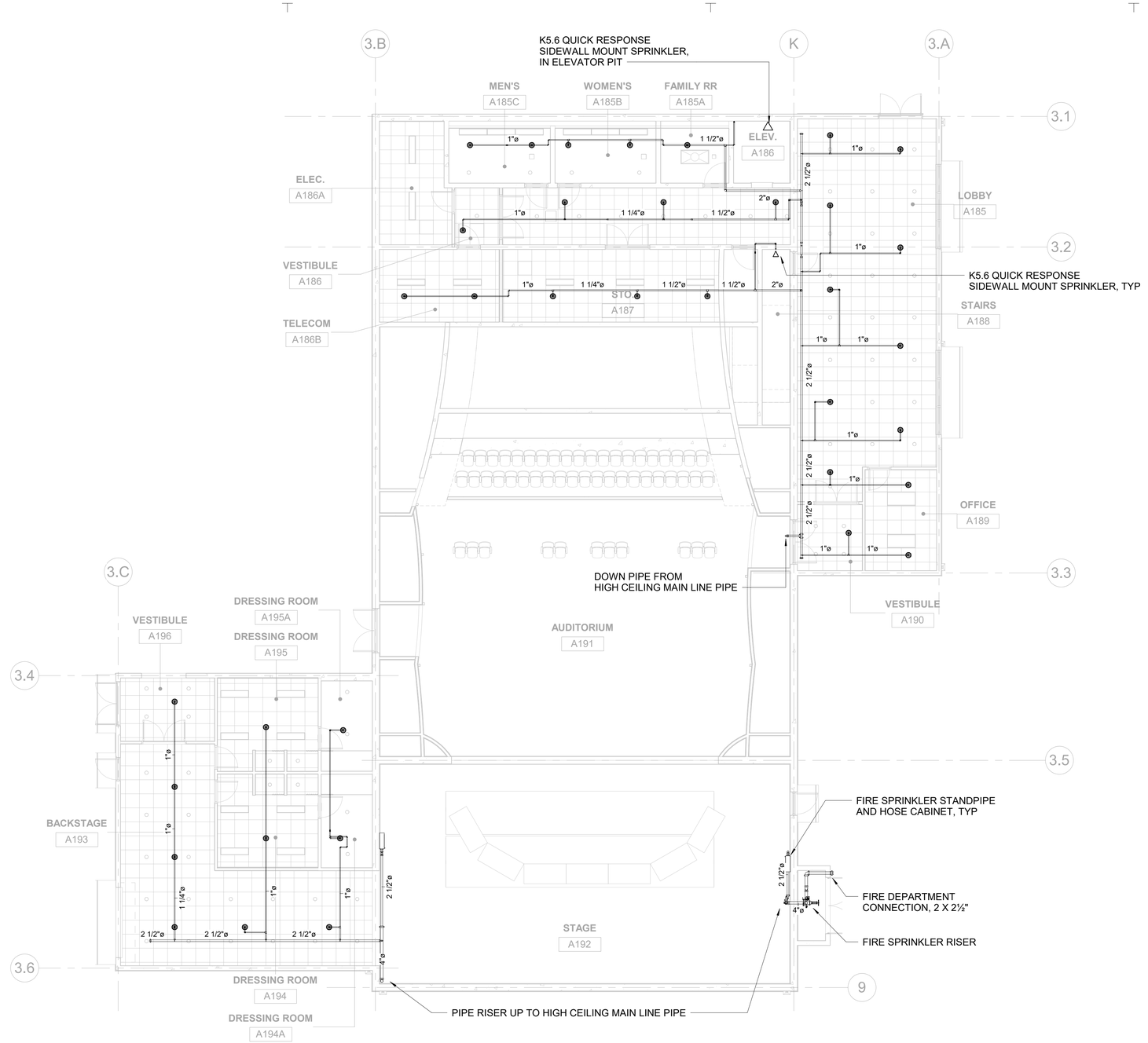
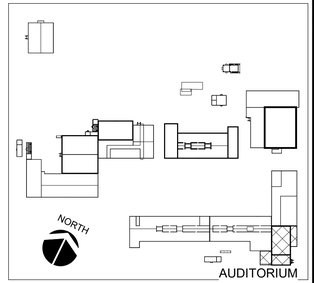


1 FIRE SPRINKLER PLAN - AUDITORIUM (LOW CEILINGS)

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

FOR REFERENCE ONLY

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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REVISIONS

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

DATE: _____

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - AUDITORIUM (LOW CEILINGS)
PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT/CA
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Supv:	WGM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS3.24
Sheet No._____ of 0

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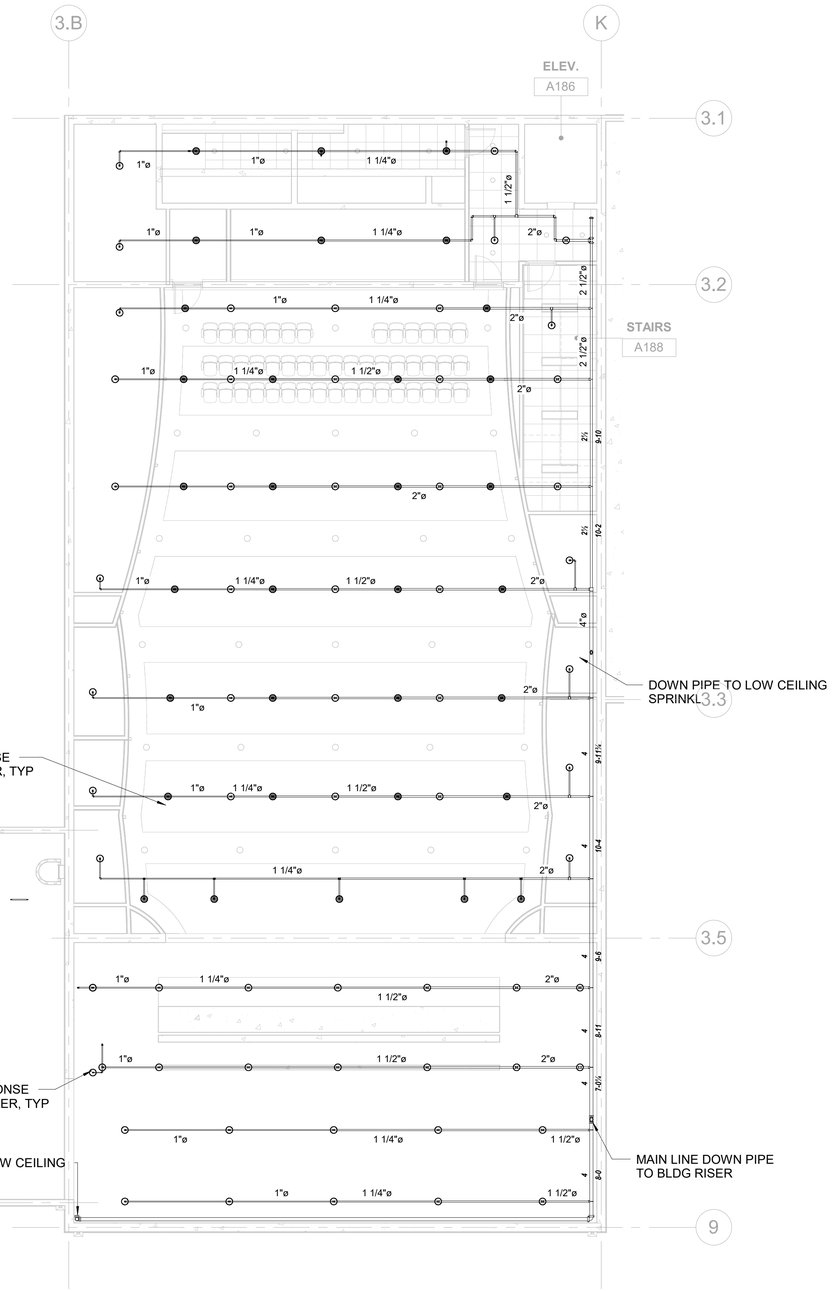
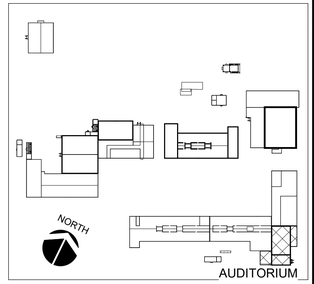


1 FIRE SPRINKLER PLAN - AUDITORIUM (HIGH CEILINGS)

SCALE: 1/8" = 1'-0"



KEY PLAN

FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
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FIRE SPRINKLER PLAN - AUDITORIUM (HIGH CEILINGS)
PROGRAMMING DOCUMENT

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XX-XXX	

Drawing No.
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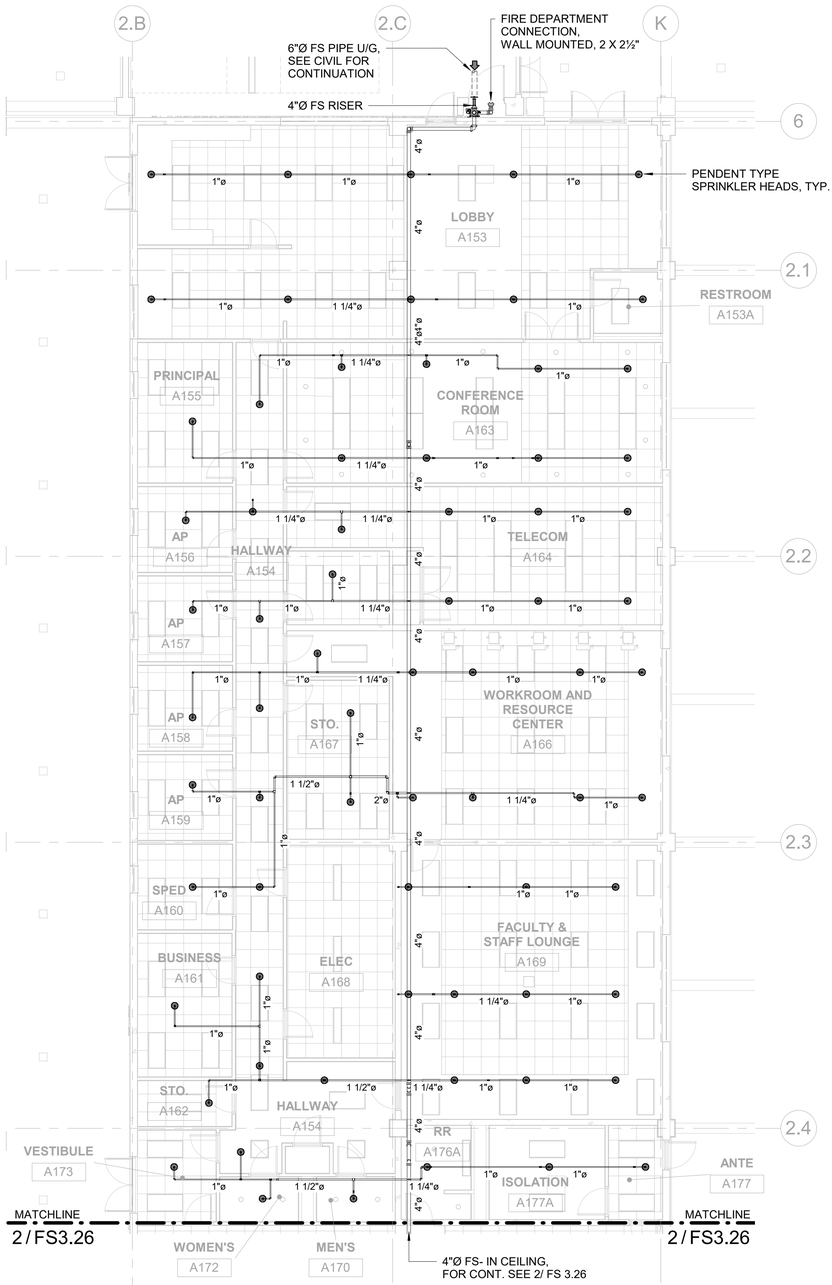
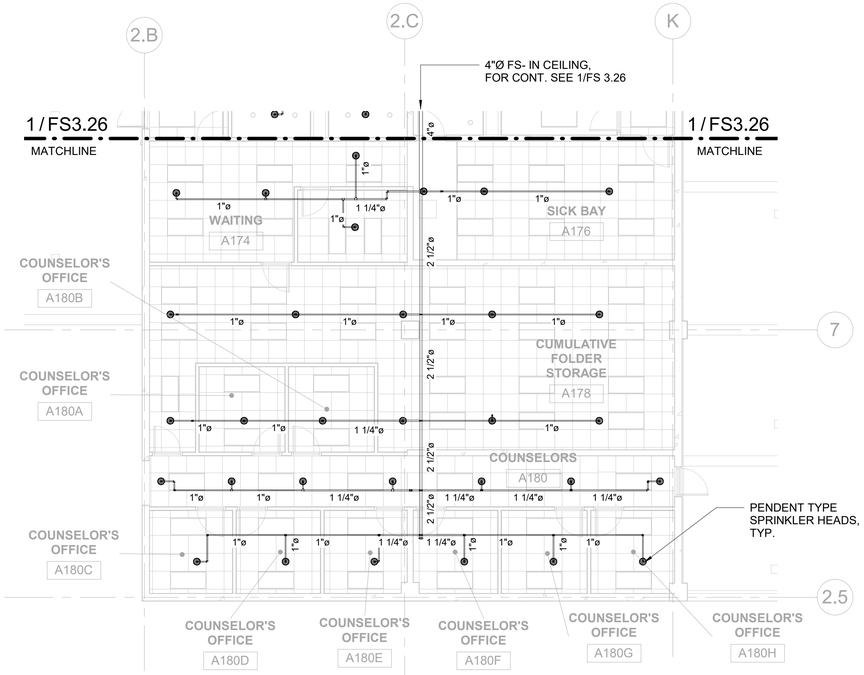


1 FIRE SPIRNKLER PLAN - ADMINISTRATION LEVEL 1 NORTH
SCALE: 1/8" = 1'-0"



2 FIRE SPRINKLER PLAN - ADMINISTRATION LEVEL 1 SOUTH
SCALE: 1/8" = 1'-0"

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Title:
FIRE SPRINKLER PLAN - ADMINISTRATION LEVEL 1

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
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Date:	3/31/25
Project No. XX-XXX	File

Drawing No.
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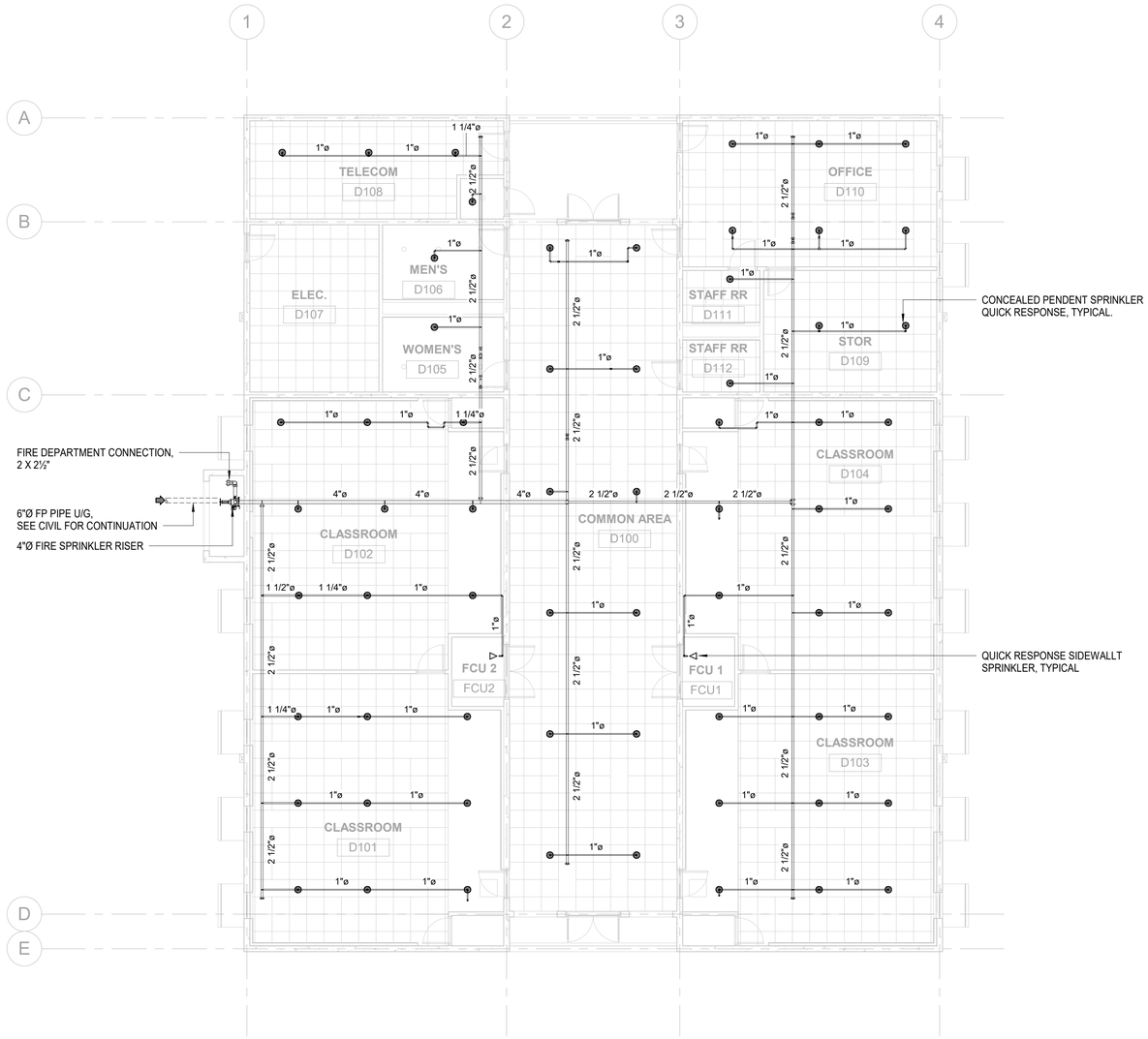
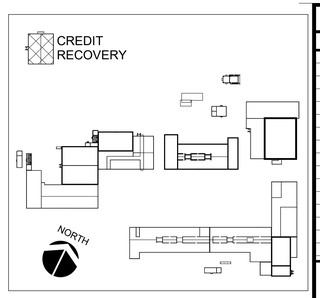
Sheet No. _____ of 0



1 FIRE SPRINKLER PLAN - CREDIT RECOVERY

SCALE: 1/8" = 1'-0"



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SIMON SANCHEZ HIGH SCHOOL

Title:

FIRE SPRINKLER PLAN - CREDIT RECOVERY

PROGRAMMING DOCUMENT

Designed:	WGM/CPG
Drawn:	CG/AT
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Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. XX-XXX	File

Drawing No.

FS3.28

Sheet No. _____ of 0

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FOR REFERENCE ONLY

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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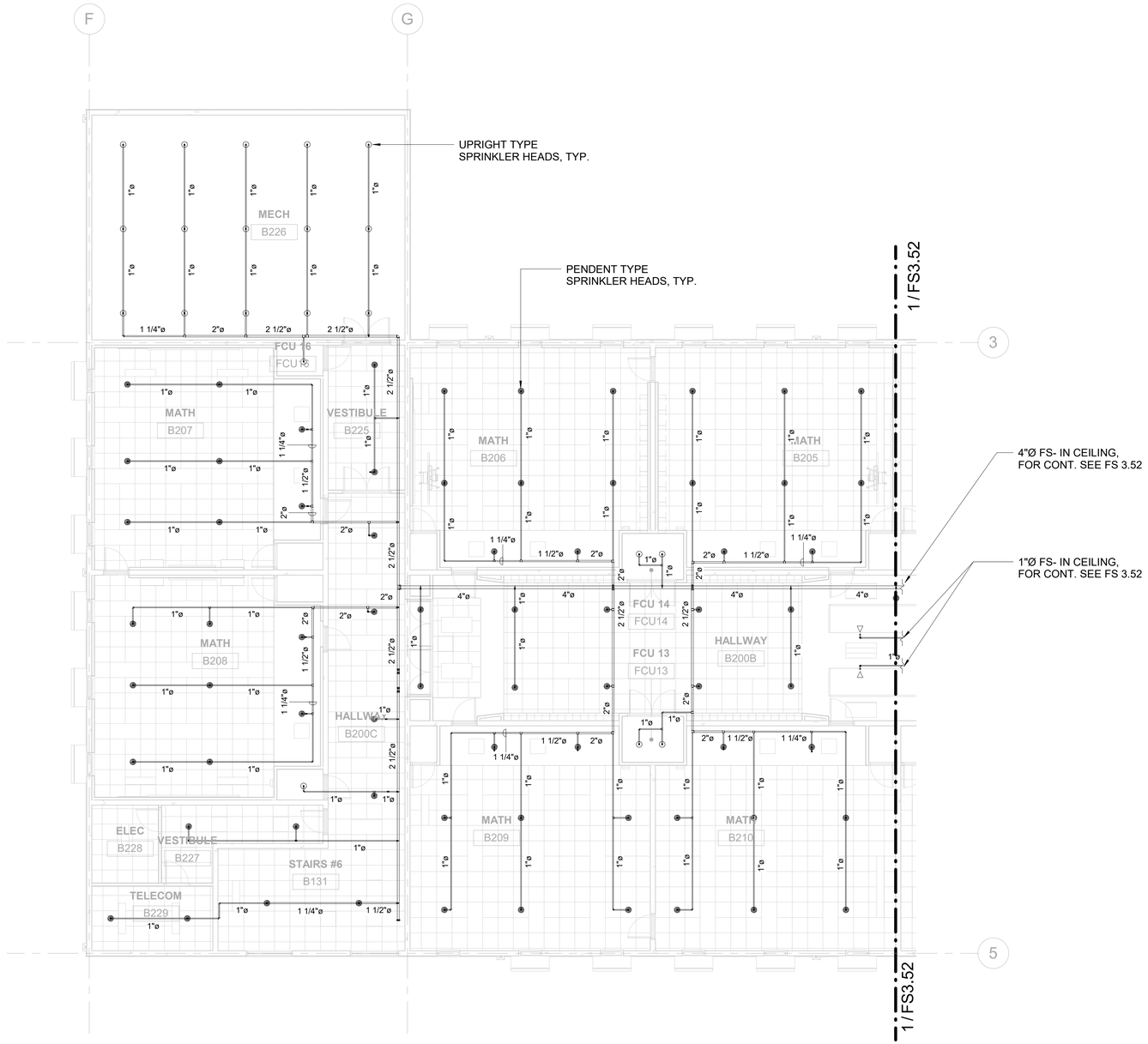
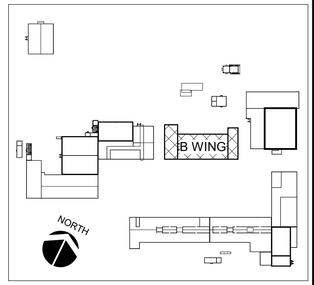


1 FIRE SPRINKLER PLAN - B-WING LEVEL 2 WEST

SCALE: 1/8" = 1'-0"



KEY PLAN

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - B-WING LEVEL 2 WEST
PROGRAMMING DOCUMENT

Designed:	WM
Drawn:	CA
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Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
No.	

Drawing No.
FS3.51
Sheet No._____ of _____

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NORTH

GRAPHIC SCALE
0 2' 4' 8' 16' 24'
SCALE: 1/8" = 1'-0"

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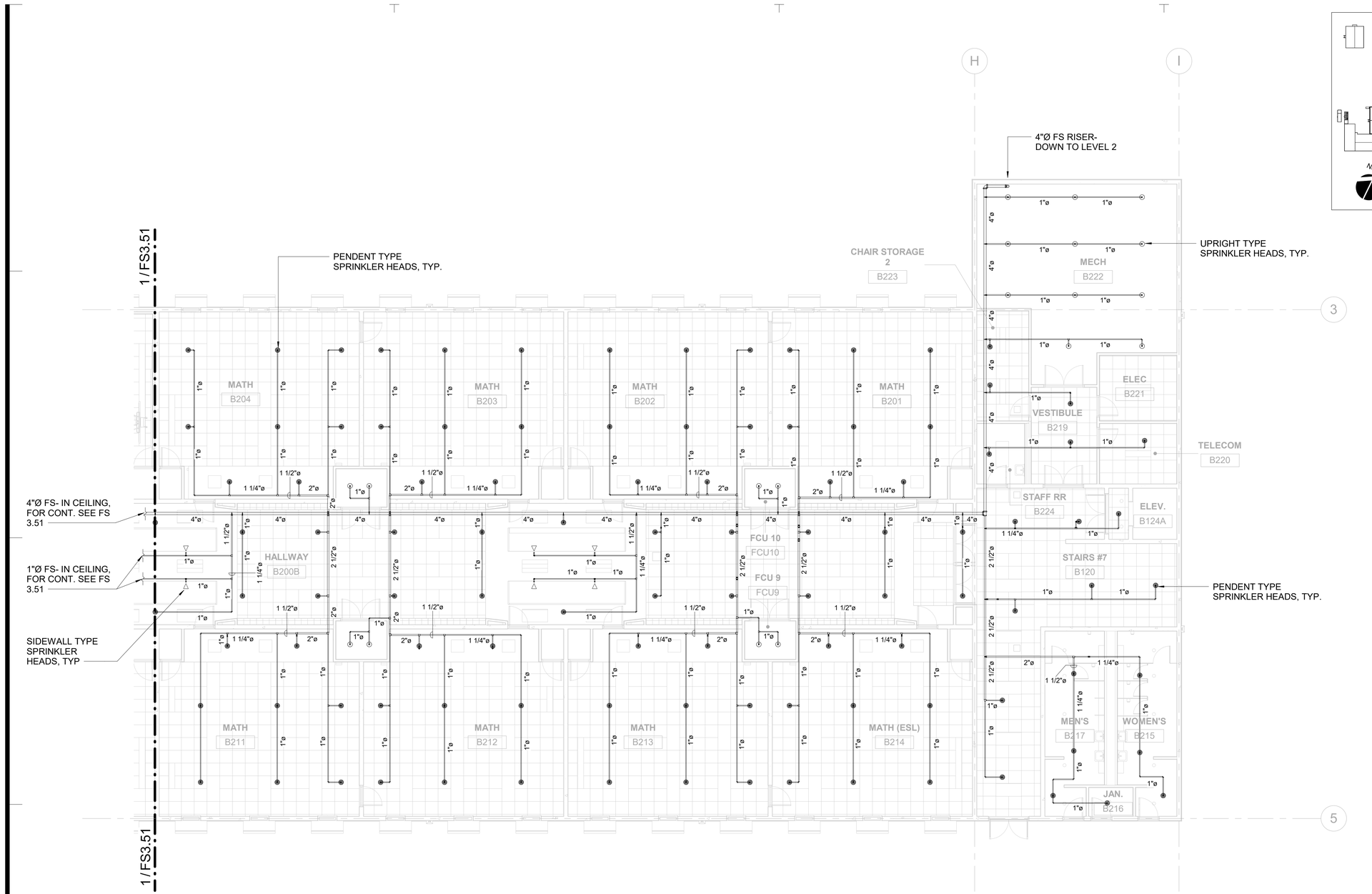
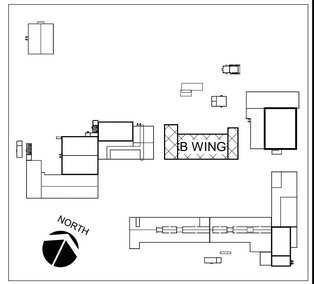


1 FIRE SPRINKLER PLAN - B-WING LEVEL 2 EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

NORTH

GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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FIRE SPRINKLER PLAN - B-WING LEVEL 2 EAST
PROGRAMMING DOCUMENT

Designed:	WM
Drawn:	CA
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Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
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Drawing No.
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Sheet No._____ of _____

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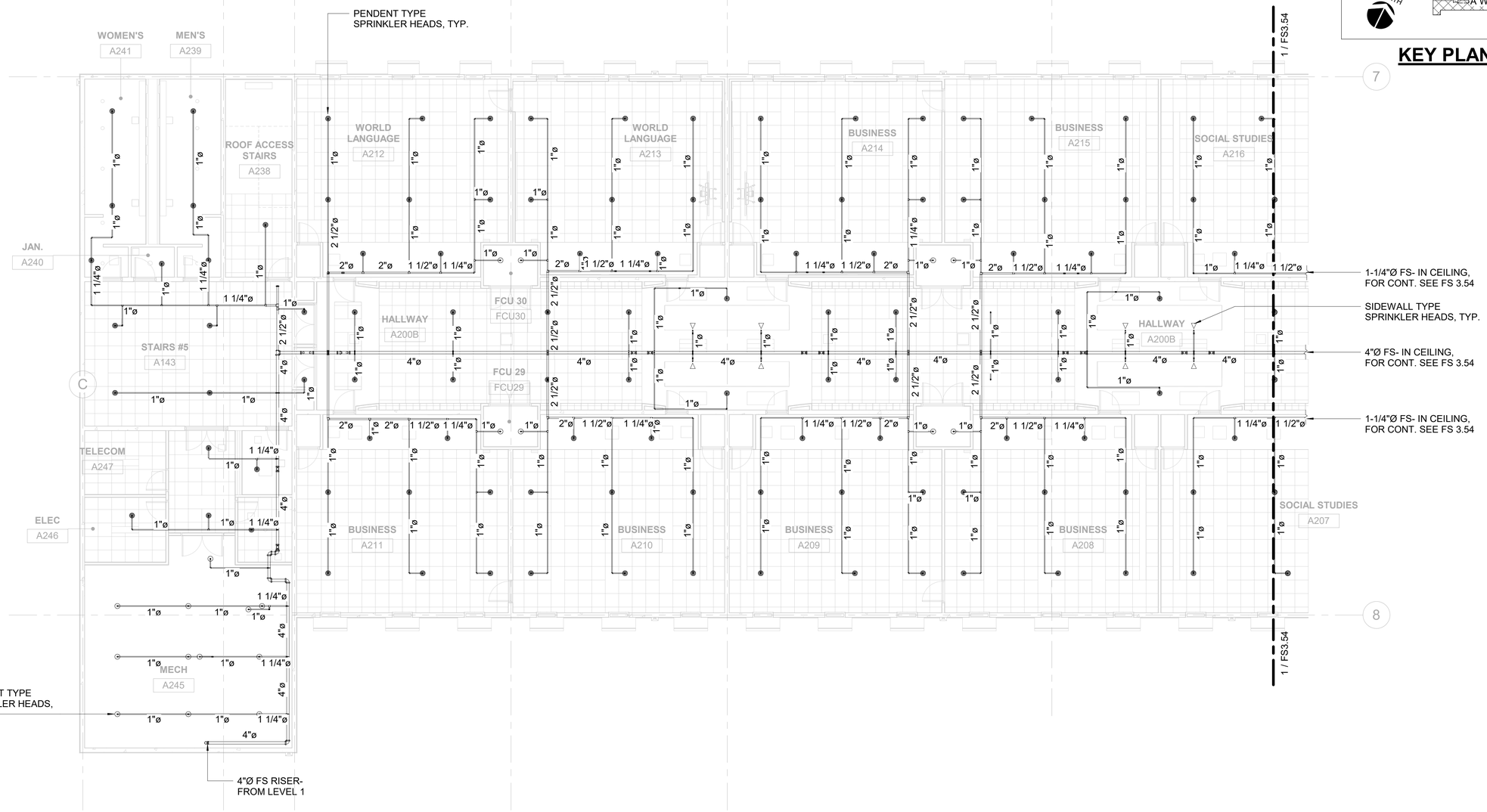

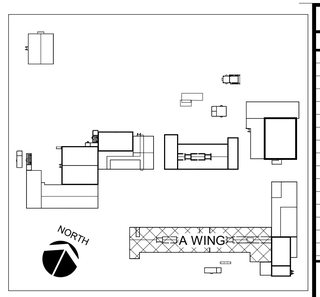

KEY PLAN

1 FIRE SPRINKLER PLAN - A-WING LEVEL 2 WEST
SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

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Title:
FIRE SPRINKLER PLAN - A-WING LEVEL 2 WEST
PROGRAMMING DOCUMENT

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Drawn:	CG/AT/CC
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Project No.	File
XX-XXX	

Drawing No.
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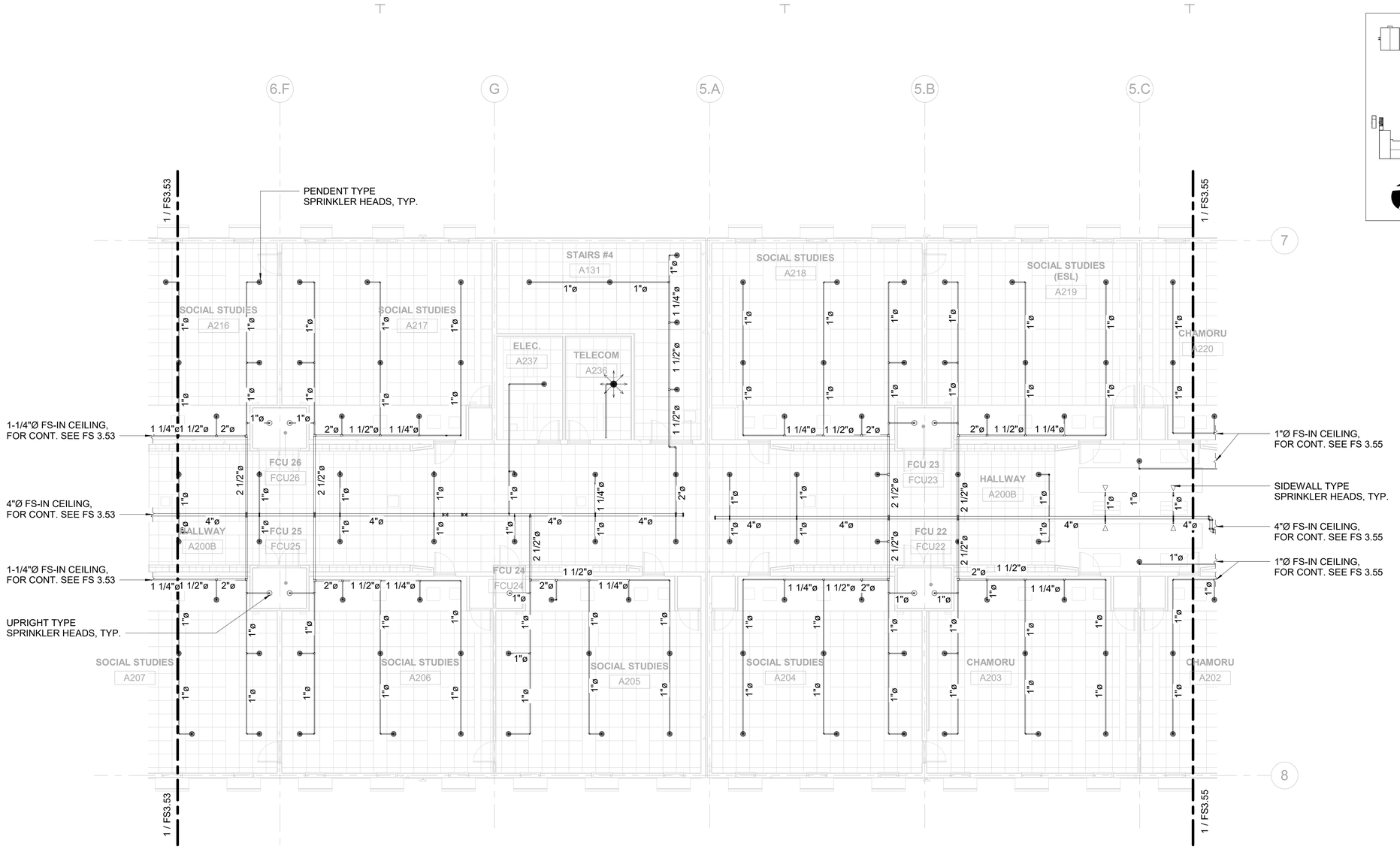
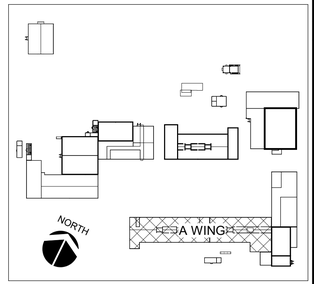
Sheet No. of

NOT FOR CONSTRUCTION



1 FIRE SPRINKLER PLAN - A-WING LEVEL 2 CENTER

SCALE: 1/8" = 1'-0"



KEY PLAN

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GRAPHIC SCALE

0 2' 4' 6' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
FIRE SPRINKLER PLAN - A-WING LEVEL 2 CENTER
PROGRAMMING DOCUMENT

Designed:	CG
Drawn:	CG/AT/CC
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Supv:	WM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	XX-XXX
File	

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FS3.54
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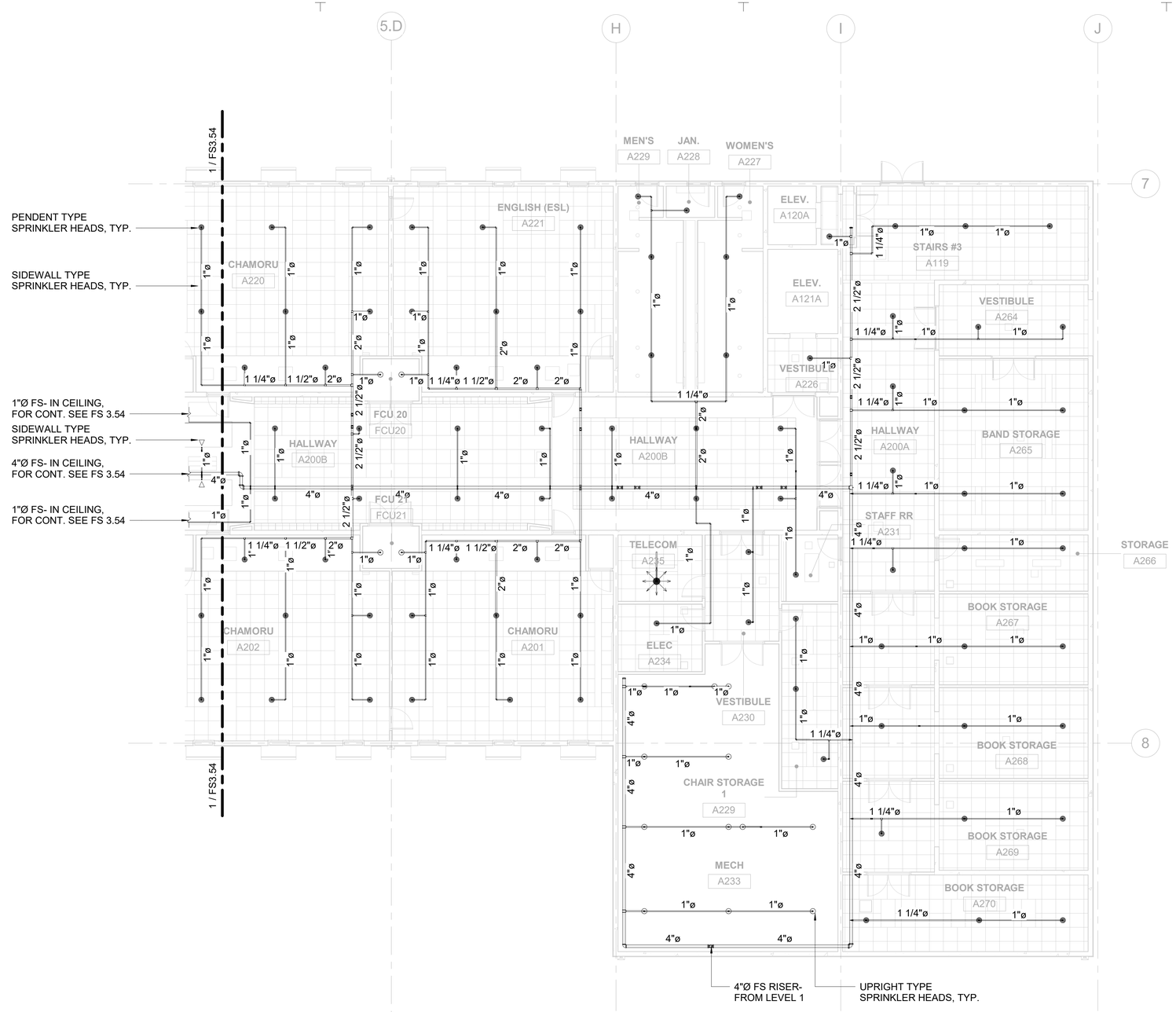
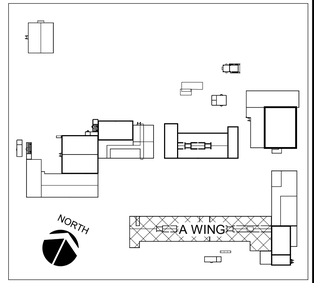


1 FIRE SPRINKLER PLAN - A-WING LEVEL 2 EAST

SCALE: 1/8" = 1'-0"



KEY PLAN

GRAPHIC SCALE

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SCALE: 1/8" = 1'-0"

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Title:

FIRE SPRINKLER PLAN - A-WING LEVEL 2 EAST

PROGRAMMING DOCUMENT

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Checked:	WM
Supv:	WM
Scale:	1/8" = 1'-0"
Date:	3/31/25

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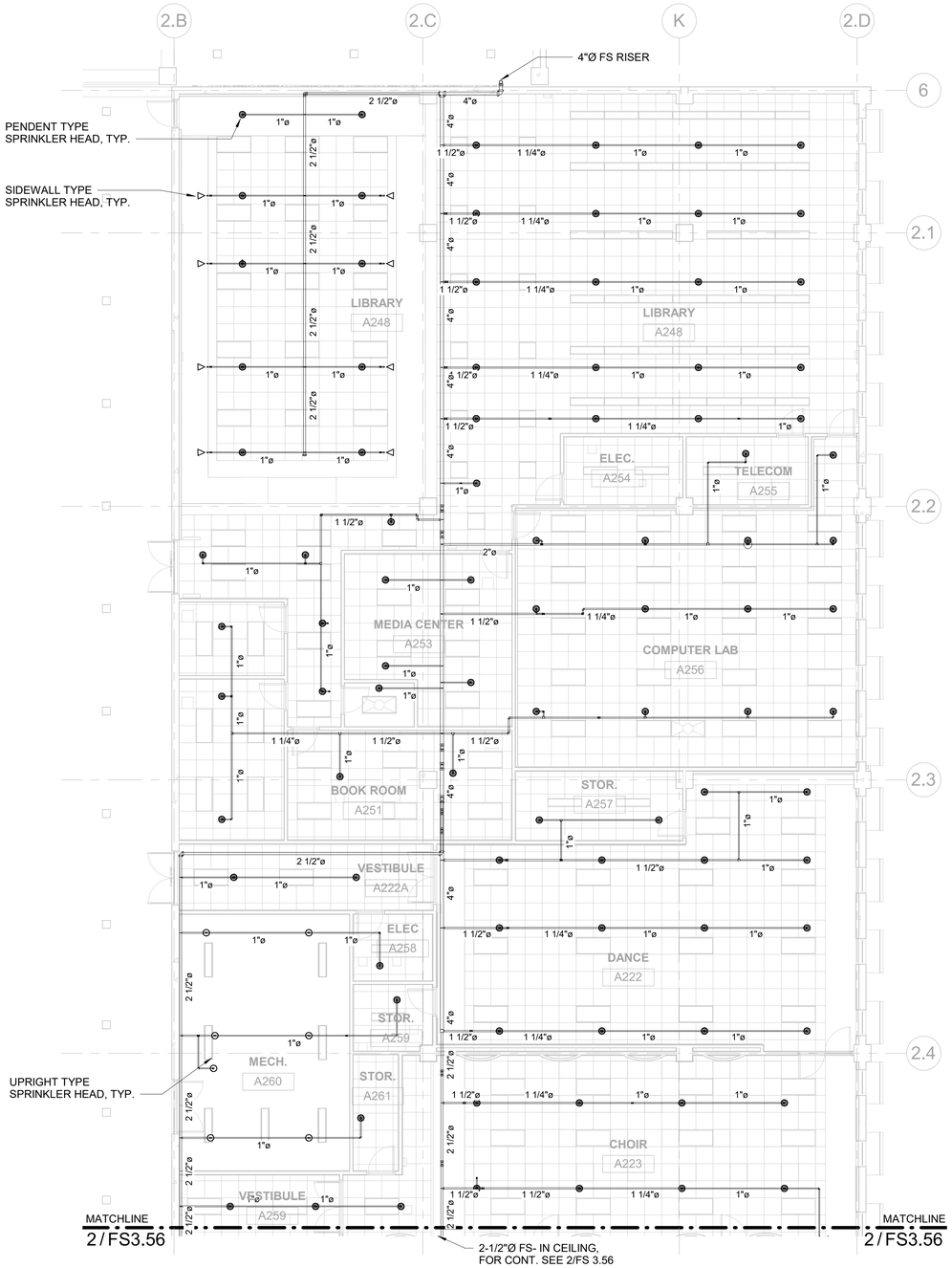
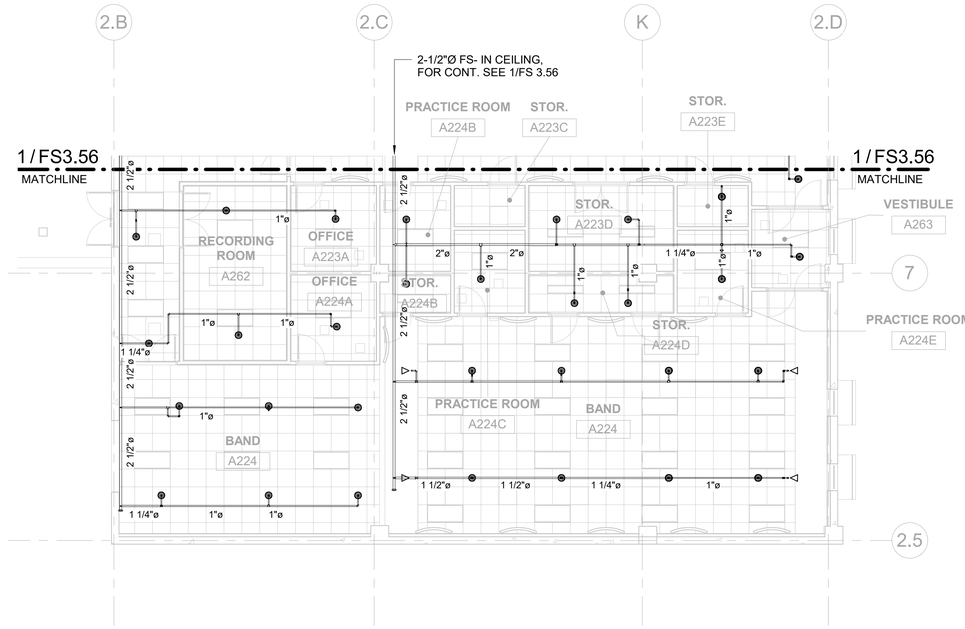


1 FIRE SPRINKLER PLAN - LIBRARY LEVEL 2 NORTH

SCALE: 1/8" = 1'-0"



2 FIRE SPRINKLER PLAN - LIBRARY LEVEL 2 SOUTH

SCALE: 1/8" = 1'-0"

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Title:
FIRE SPRINKLER PLAN - LIBRARY LEVEL 2

PROGRAMMING DOCUMENT

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Drawing No.
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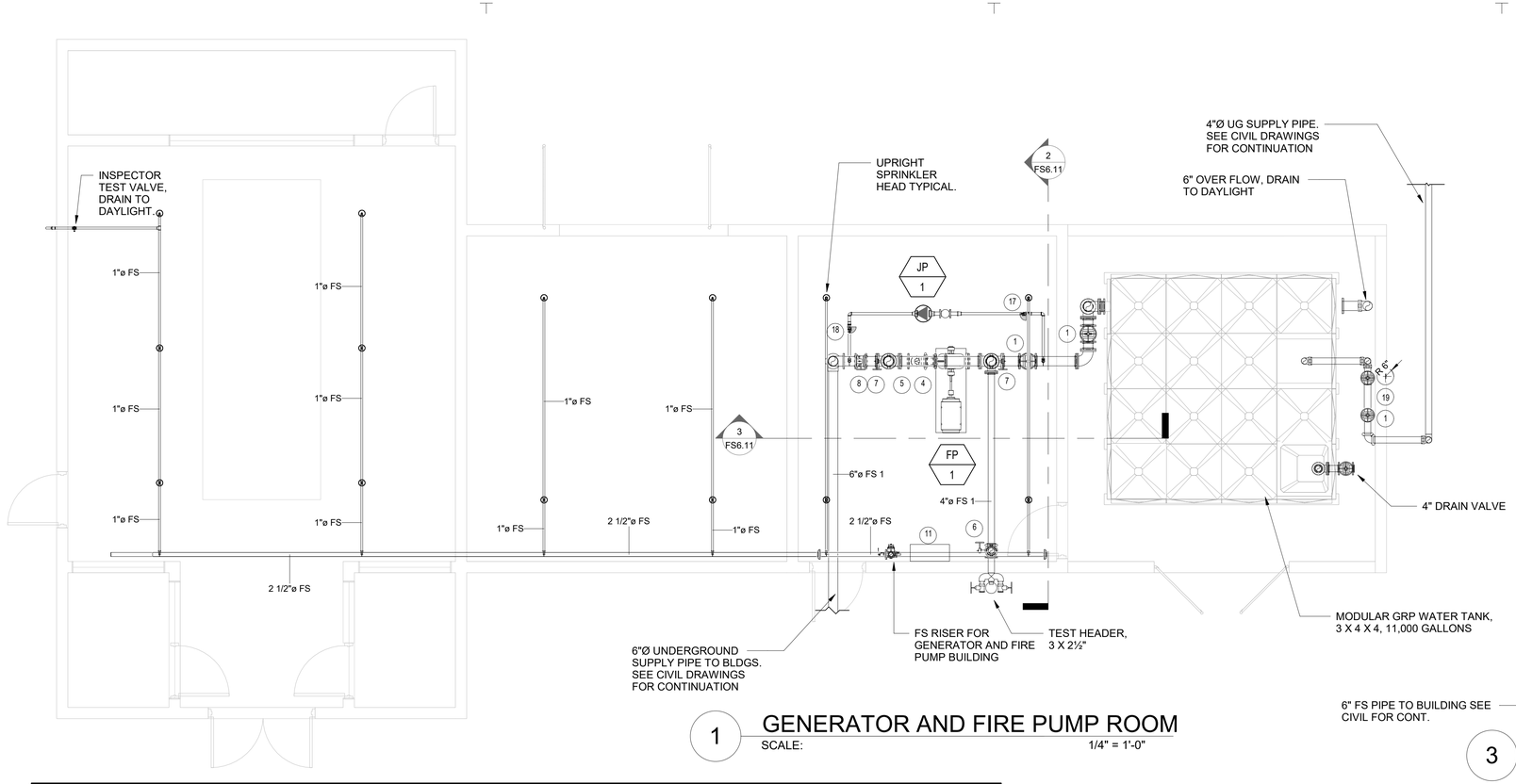
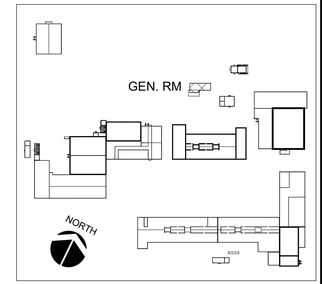
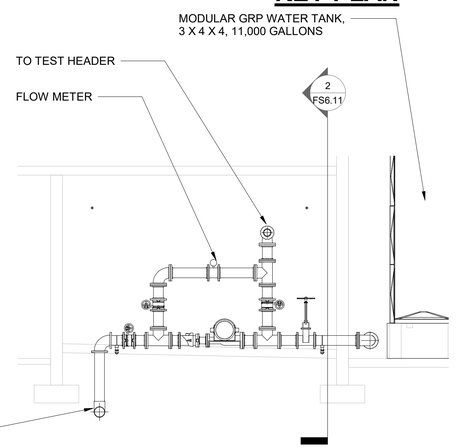
Sheet No. ____ of 0



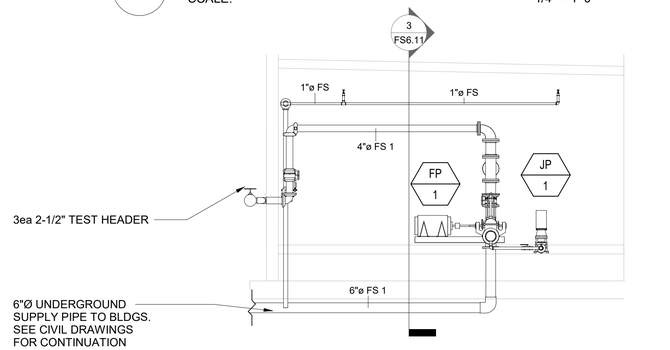
1 GENERATOR AND FIRE PUMP ROOM
SCALE: 1/4" = 1'-0"



KEY PLAN



3 FIRE PUMP INLINE LAYOUT SECTION
SCALE: 1/4" = 1'-0"



2 FIRE PUMP LATERAL LAYOUT SECTION
SCALE: 1/4" = 1'-0"

FIRE PUMP ASSEMBLY COMPONENTS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
1	6" OS&Y GATE VALVE	11	FIRE PUMP CONTROLLER
2	1/2" AUTOMATIC AIR RELEASE	12	PRESSURE MAINTENANCE PUMP CONTROLLER (JOCKEY PUMP)
3	6"X"4 ECCENTRIC REDUCER	13	1/2"Ø PRESSURE SENSING LINE (FIRE PUMP)
4	6"X"4 CONCENTRIC REDUCER	14	1/2"Ø PRESSURE SENSING LINE (JOCKEY PUMP)
5	6" CHECK VALVE (PUMP DISCHARGE)	15	PRESSURE MAINTENANCE PUMP (JOCKEY PUMP)
6	4" INDICATING GATE VALVE OR BUTTERFLY VALVE (TEST HEADER)	16	1-1/4" ISOLATION VALVE (JOCKEY PUMP SUCTION)
7	6" INDICATING GATE VALVE OR BUTTERFLY VALVE (TEST LOOP)	17	1-1/4" CHECK VALVE (JOCKEY PUMP SUCTION)
8	6" INDICATING GATE VALVE OR BUTTERFLY VALVE (DISCHARGE CONTROL VALVE)	18	1-1/4" ISOLATION VALVE (JOCKEY PUMP DISCHARGE)
9	TEST HEADER (TWO 2-1/2" HOSE CONNECTION)	19	STRAINER
10	4" FLOW METER	20	4" FILL VALVE (ALTITUDE VALVE WITH FLOAT MECHANISM)

FIRE PUMP SCHEDULE

	AREA SERVED	TYPE	RATED FLOW (GPM)	TDH (PSI)	ELECTRICAL CHARACTERISTICS					REMARKS
					HP	V	RPM	PH	HZ	
FP 1	SIMON SANCHEZ HS SPRINKLER SYSTEM ALL BUILDINGS	HORIZONTAL SPLIT CASE ELECTRIC MOTOR DRIVEN	500	96	40	480	3555	3	60	"AC FIRE PUMP 8100 6x4x9F" ELECTRIC DRIVEN HORIZONTAL SPLIT CASE CENTRIFUGAL PUMP MODEL OR APPROVED EQUAL
JP 1	SIMON SANCHEZ HS SPRINKLER SYSTEM ALL BUILDINGS	JOCKEY PUMP	15	470	2	480	3600	3	60	VERTICAL MULTI-STAGE JOCKEY PUMP "AC-FIRE PUMP" 3SV MODEL OR APPROVED EQUAL

FOR REFERENCE ONLY

GRAPHIC SCALE
0 2' 4' 6' 8' 16' 24'
SCALE: 1/8" = 1'-0"

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION
DATE:

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
DETAILED FIRE SPRINKLER PLAN - PUMP ROOM
PROGRAMMING DOCUMENT

Designed:	WGM/CG
Drawn:	AT/CG/RV
Checked:	WGM
Supv:	WGM
Scale:	As indicated
Date:	3/31/25
Project No.	XX-XXX
File	

Drawing No.
FS6.11
Sheet No. ____ of 0

NOT FOR CONSTRUCTION

2/11/2025 2:17:24 PM W:\WMES PROJECTS_2020\TRMA\SSHS_GDOE\REVIT SEPARATE CENTRALS - RFP\DOE SSHS FP_SCHED_DIAG_DET_NOTES R1_ADDENDUM.rvt

GENERAL NOTES AND SPECIFICATIONS

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE NATIONAL ELECTRICAL CODE (NEC), 2023 EDITION; RULES AND REGULATIONS OF THE DEPARTMENT OF PUBLIC WORKS, AND GOVERNMENT OF GUAM.
2. ALL EQUIPMENT AND MATERIALS SHALL BE UL LISTED WHERE LISTING IS AVAILABLE FOR THAT TYPE OF EQUIPMENT OR CONFORM TO ANSI OR NEMA STANDARDS. SUBMIT SHOP DRAWINGS AND PRODUCT INFORMATION CATALOG FOR APPROVAL.
3. WORKMANSHIP SHALL CONFORM TO CONSTRUCTION PRACTICES RECOMMENDED BY THE AMERICAN ELECTRICIANS HANDBOOK BY CROFT (LATEST EDITION) AND SHALL BE SUBJECT TO THE APPROVAL OF THE AGENCY WHO HAS JURISDICTION AND THE ENGINEER.
4. ANY DEVICE MAY BE RELOCATED FROM THE LOCATION SHOWN ON DRAWINGS PRIOR TO INSTALLATION AT THE DIRECTION OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE GOVERNMENT.
5. METALLIC ENCLOSURES, RACEWAYS, AND ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH REQUIREMENTS OF NEC ARTICLE 250. PROVIDE GROUND WIRE IN EVERY RACEWAY. SIZE IN ACCORDANCE WITH NEC TABLE.
6. CONDUIT SHALL BE PVC (ENCASED IN CONCRETE AND BELOW GRADE), ALUMINUM (EXPOSED INSTALLATION), EMT (DRY LOCATIONS, CONCEALED ABOVE GRADE). 3/4" MINIMUM DIAMETER UNLESS OTHERWISE NOTED.
7. TEST: TESTING IN PRESENCE OF ENGINEER. RESULTS SUBMITTED FOR APPROVAL TO ENGINEER.
   A. MEASUREMENT OF VOLTAGES AT SERVICE EQUIPMENT.
   B. OPERATION TEST.
   C. INSULATION RESISTANCE.
   D. GROUNDING TEST.
8. ELECTRICAL WORK SHALL BE UNDER FULL SUPERVISION OF A PROFESSIONAL ELECTRICAL ENGINEER OR A MASTER ELECTRICIAN REGISTERED TO PRACTICE IN GUAM. SUBMIT QUALIFICATIONS PRIOR TO START OF ANY WORK REVIEW AND APPROVAL.
9. INSTALLATION AND WORKMANSHIP:
   A. ALL WORK SHALL BE NEATLY EXECUTED, WORKMANLIKE IN APPEARANCE, SYMMETRICAL, PLUMB, UNIFORM, PROPERLY ALIGNED AND SECURED IN PLACE.
   B. WIRING METHODS:
      (1) USE SEALTITE FLEX FOR CONNECTION TO EQUIPMENT.
      (2) ATTACH TO CONCRETE AND MASONRY WITH EXPANSION ANCHORS AND TO WOOD WITH WOOD SCREWS.
      (3) SUPPORT RACEWAYS PER NEC.
      (4) DO NOT SUPPORT RACEWAYS AND BOXES FROM AND ON MECHANICAL SYSTEMS.
      (5) CABLES WILL NOT BE PERMITTED.
   C. CONDUCTORS:
      (1) MAKE SPLICES IN ACCESSIBLE LOCATIONS. MAKE SPLICES IN CONDUCTORS No. 10 AWG & SMALLER DIAMETER WITH INSULATED, PRESSURE-TYPE CONNECTOR. MAKE SPLICES IN CONDUCTORS No.8 AWG AND LARGER DIAMETER WITH SOLDERLESS CONNECTOR, AND COVER WITH INSULATION MATERIAL EQUIVALENT TO CONDUCTOR INSULATION.
      (2) FORM WIRE NEATLY IN ENCLOSURES.
      (3) IDENTIFY CONDUCTORS BY COLOR CODE – NEUTRAL WIRE TO BE WHITE AND GROUND WIRE TO BE GREEN.
   D. CUT, DRILL AND PATCH AS REQUIRED. REPAIR ANY SURFACES DAMAGED OR MARRED. CUTTING, REPAIRS AND REFINISHING SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT.
   E. CLEAN ALL SURFACES TO RECEIVE PAINT. PAINT ANY SURFACE DAMAGED DURING INSTALLATION.
   F. REPAIR ALL SURFACES DAMAGED DURING THE INSTALLATION OF THE WORK SUBJECT TO THE APPROVAL OF THE ARCHITECT.
   G. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE SEALED WITH APPROVED FIRESTOPPING MATERIAL.
   H. PROVIDE EXPANSION/DEFLECTION FITTING FOR CONDUITS PASSING THROUGH SEISMIC JOINTS.
   I. PROVIDE CONDUIT SEAL FOR CONDUITS PASSING THROUGH AIR CONDITIONED AND NON-AIR CONDITIONED AREAS.
   J. SUPPORTING STRUCTURES SHALL BE IN ACCORDANCE WITH SEISMIC ZONE 4 REQUIREMENTS.
10. AT THE CONCLUSION OF THE WORK, THE CONTRACTOR SHALL INCORPORATE ALL CHANGES MADE, AND RECORDED, INTO THE SET OF REPRODUCIBLES IN A CLEAR, LEGIBLE AND REPRODUCIBLE MANNER. ALL STUB-OUTS SHALL BE DIMENSIONALLY LOCATED WITHIN THE BUILDING STRUCTURE. AS A CONDITION FOR ACCEPTANCE OF WORK, "AS-BUILT" REPRODUCIBLE SHALL BE SIGNED BY CONTRACTOR ATTESTING THAT ALL CHANGES HAVE BEEN INCORPORATED, DATED AND DELIVERED TO THE CONTRACTING OFFICER.
11. THE CONTRACTOR SHALL DETERMINE AND VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO START OF WORK. OBTAIN WORK CLEARANCES FROM USING AGENCIES PRIOR TO ANY EXCAVATION/TRENCHING WORK. DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE GOVERNMENT.
12. EQUIPMENT POWER POINT OF CONNECTIONS ARE APPROXIMATE. COORDINATE EXACT REQUIREMENT WITH SUPPLIED EQUIPMENT.
13. PROVIDE PULLBOX(ES)/HANDHOLES AS REQUIRED TO MEET NEC PULLING REQUIREMENTS.
14. WHERE CONDUIT CROSSES BUILDING EXPANSION JOINTS, PROVIDE SUITABLE WATERTIGHT EXPANSION FITTING THAT MAINTAIN CONDUIT ELECTRICAL CONTINUITY BY BONDING JUMPERS, OR DEFLECTION COUPLINGS THAT PROTECT CONDUIT WIRING SYSTEM FROM DAMAGE CAUSE BY MOVEMENT WITHOUT ADDITIONAL COST TO THE GOVERNMENT. FURNISH SHOP DRAWING FOR REVIEW AND APPROVAL.
15. CONTRACTOR SHALL COORDINATE WORK WITH GUAM POWER AUTHORITY, GPA.
   a) COORDINATE WITH GPA ENGINEERING 48 HOURS IN ADVANCE FOR INSPECTION OF HANDHOLE, CONDUIT INSTALLATION, TRANSFORMER PAD AND CONDUIT/DUCT MANDRELLING.
   b) OWNER SHALL GRANT A UTILITY EASEMENT TO GPA FOR POWER LINE AND HANDHOLE PRIOR TO FINAL CONNECTION. CONTRACTOR SHALL COORDINATE AND PREPARE THE REQUIRED PAPER WORKS FOR THE GOVERNMENT.
   c) APPLICATION FOR POWER SERVICE MUST BE SUBMITTED 8 MONTHS IN ADVANCE BEFORE FINAL CONNECTION/ENERGIZATION TO ALLOW FOR DELIVERY OF GPA MATERIALS AND EQUIPMENT.
   d) ALL CONDUITS MUST BE CLEANED AND MANDRELLED IN THE PRESENCE OF A GPA INSPECTOR. ALL CONDUITS MUST BE PROVIDED WITH NYLON PULL ROPE OF 200 LBS. MINIMUM PULL STRENGTH.
   e) ALL GPA CONDUITS/DUCTS, BENDS AND ELBOWS SHALL BE CONCRETE ENCASED THROUGHOUT THE WHOLE ROUTE.
   f) CONTRACTOR SHALL OBTAIN A REGISTERED LAND SURVEYOR TO PROVIDE NEW POLE STAKEOUT AND DOWN-GUY LOCATIONS. COORDINATE WITH GPA ENGINEERING FOR SPECIFIC REQUIREMENTS.
   g) CONTRACTOR SHALL OBTAIN A REGISTERED LAND SURVEYOR TO PREPARE EASEMENT EXHIBITS FOR GPA POLES, HANDHOLES, TRANSFORMERS, OVERHEAD/UNDERGROUND POWER LINES AND OTHER ASSOCIATED POWER FACILITIES. COORDINATE WITH GPA ENGINEERING FOR SPECIFIC REQUIREMENTS.
   h) ALL SURVEY STAKEOUTS, MAPS, AND EASEMENT DOCUMENTS SHALL BE FIELD VERIFIED BY GPA.
   i) SHOULD ARCHAEOLOGICAL MONITORING AND MITIGATION BE REQUIRED BY THE DEPARTMENT OF PARKS AND RECREATION STATE HISTORIC PRESERVATION OFFICE (SHPO), THE GOVERNMENT SHALL BE RESPONSIBLE FOR OBTAINING AN ARCHAEOLOGIST TO PERFORM MONITORING AND MITIGATION SERVICES SATISFACTORY TO SHPO. ALL COST FOR SUCH SERVICES SHALL BE THE RESPONSIBILITY OF THE GOVERNMENT.

ELECTRICAL SYMBOL LIST

	LIGHT, LED, CEILING RECESS MOUNTED WITH J-BOX AND FLEXIBLE CONDUIT CONNECTION
/	LIGHT, CEILING SURFACE MOUNTED SHADE INDICATES WITH INTEGRAL BATTERY PACK
/	LIGHT, WALL MOUNTED, SHADE INDICATES WITH INTEGRAL BATTERY PACK
	LIGHT, OPEN STRIP, CEILING PENDANT MOUNTED
	LIGHT, WALL / CEILING MOUNTED, SHADE INDICATES WITH INTEGRAL BATTERY PACK
	LIGHT, CEILING SURFACE MOUNTED, SHADE INDICATES WITH INTEGRAL BATTERY PACK
	LIGHT, CEILING RECESS MOUNTED, SHADE INDICATES WITH INTEGRAL BATTERY PACK
/	LIGHT, LED, CONNECTED TO GENERATOR POWER, CEILING RECESS MOUNTED WITH J-BOX AND FLEXIBLE CONDUIT CONNECTION
	LIGHT, CONNECTED TO GENERATOR POWER, CEILING SURFACE MOUNTED.
	LIGHT, WALL MOUNTED
/ / /	EXIT SIGN LIGHT, SHADED QUADRANT INDICATES SIGN LETTERED FACE, CEILING/WALL MTD.
	EMERGENCY LIGHT, W/ SELF CONTAINED BATTERY, STAND-BY FLOODLIGHT
	POSTLIGHT, LED, POLE BRACKET MOUNTED
	SPOTLIGHT, YOKE MOUNTED
$a	SWITCH, FLUSH TUMBLER, WALL MOUNTED
$3	SWITCH, FLUSH TUMBLER, 3 WAY, WALL MOUNTED, 20A, 120/277 VOLTS
$M	MOTOR RATED TOGGLE SWITCH
$D	DIMMER SWITCH, FLUSH, WALL MOUNTED, RATING AS INDICATED
"a"	LETTER INDICATES FIXTURE OR DEVICE CONTROLLED BY SWITCH "a", OTHER LETTERS SAME
	RECEPTACLE, DUPLEX, WALL MOUNTED, 20A, 125 VOLTS, NEMA 5-20R
/	SINGLE RECEPTACLE, WALL/FLOOR MOUNTED, 20A, 125 VOLTS, NEMA 5-20R
	RECEPTACLE, WALL MOUNTED, 50A, 125/250 VOLTS, 1ø, 3 WIRES, NEMA 10-50R
/	FOURPLEX RECEPTACLE, WALL/FLOOR MOUNTED, 4 WAY, 20A, 120 VOLTS, 1ø, 3W
J/HJ	JUNCTION BOX, CEILING/WALL MOUNTED
OS/HOS	OCCUPANCY SENSOR, WALL/CEILING MOUNTED
/	RECEPTACLE, WALL/FLOOR MOUNTED, 1ø, 3 WIRE, 208 VOLTS, NEMA 6-20R
M	MOTOR CONNECTION
E	EQUIPMENT CONNECTION
	PHOTOCELL
-----	PLUG STRIP WITH DUPLEX OUTLET @ 24" O.C.
	LAN RACEWAY WITH OUTLET @ 24" O.C.
	EQUIPMENT DISCONNECT SWITCH, HP RATED
	ELECTRIC PANELBOARD
	SWITCHBOARD OR DISTRIBUTION CABINET
	FLEXIBLE CONDUIT
	RACEWAY, CONCEALED BELOW FIN. FLOOR OR GROUND, NUMBER OF WIRES WITHIN INCLUDING GROUND AS REQUIRED
	RACEWAY, CONCEALED IN CEILING OR WALL, NUMBER OF WIRES WITHIN INCLUDING GROUND AS REQUIRED
	ARROW, HOMERUN TO CABINET OR PANEL AS INDICATED, NUMBER OF WIRES WITHIN INCLUDING GROUND AS REQUIRED
	RACEWAY, STUBBED AND CAPPED
1 / E2.5	INDICATOR, DETAIL: TOP HALF-DETAIL NUMBER BOTTOM HALF-SHEET NUMBER(DETAIL LOCATION)
A	INDICATOR, LIGHT FIXTURE TYPE
4 / E2.5	INDICATOR, RACEWAY SECTION
1	NOTE INDICATOR
AF/AT	AMPERE FRAME/AMPERE TRIP
AFF/AFG	ABOVE FINISH FLOOR/GRADE
GFI	GROUND FAULT INTERRUPTER
NFS	NON-FUSIBLE SWITCH
NL/CL	NIGHT LIGHT/CURFEW LIGHT
NO/NC	NORMALLY OPEN/NORMALLY CLOSED
PFB	PROVISION FOR FUTURE BREAKER

IF SHEET IS LESS THAN 24" X 36"
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REVISION

No.	Description	Date

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Interior Design

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

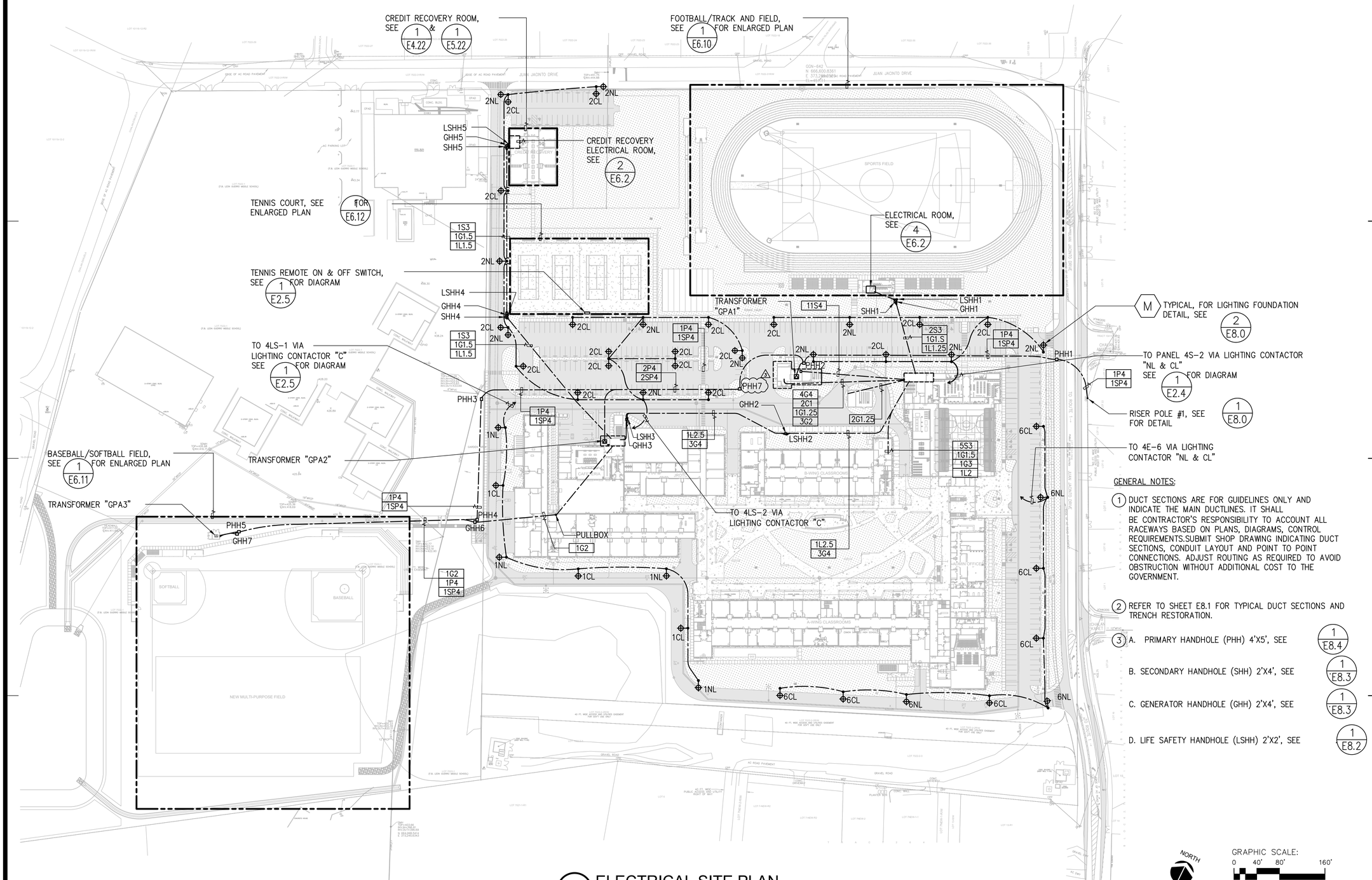
Title:
ELECTRICAL SYMBOL LIST AND GENERAL NOTES

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25

Project No.: 24-20-486
Title:

Drawing No.:
E1.0

Sheet No. ____ of ____



GENERAL NOTES:

1. DUCT SECTIONS ARE FOR GUIDELINES ONLY AND INDICATE THE MAIN DUCTLINES. IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO ACCOUNT ALL RACEWAYS BASED ON PLANS, DIAGRAMS, CONTROL REQUIREMENTS.SUBMIT SHOP DRAWING INDICATING DUCT SECTIONS, CONDUIT LAYOUT AND POINT TO POINT CONNECTIONS. ADJUST ROUTING AS REQUIRED TO AVOID OBSTRUCTION WITHOUT ADDITIONAL COST TO THE GOVERNMENT.
2. REFER TO SHEET E8.1 FOR TYPICAL DUCT SECTIONS AND TRENCH RESTORATION.
3. A. PRIMARY HANDHOLE (PHH) 4'X5', SEE 1/E8.4
   B. SECONDARY HANDHOLE (SHH) 2'X4', SEE 1/E8.3
   C. GENERATOR HANDHOLE (GHH) 2'X4', SEE 1/E8.3
   D. LIFE SAFETY HANDHOLE (LSHH) 2'X2', SEE 1/E8.2

1 ELECTRICAL SITE PLAN
SCALE: 1"=80'-0"

NORTH

GRAPHIC SCALE: 0 40' 80' 160'
SCALE: 1"=80'-0"

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ELECTRICAL SITE PLAN

Designed:	RB/RR
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Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E1.1

Sheet No. _____ of _____

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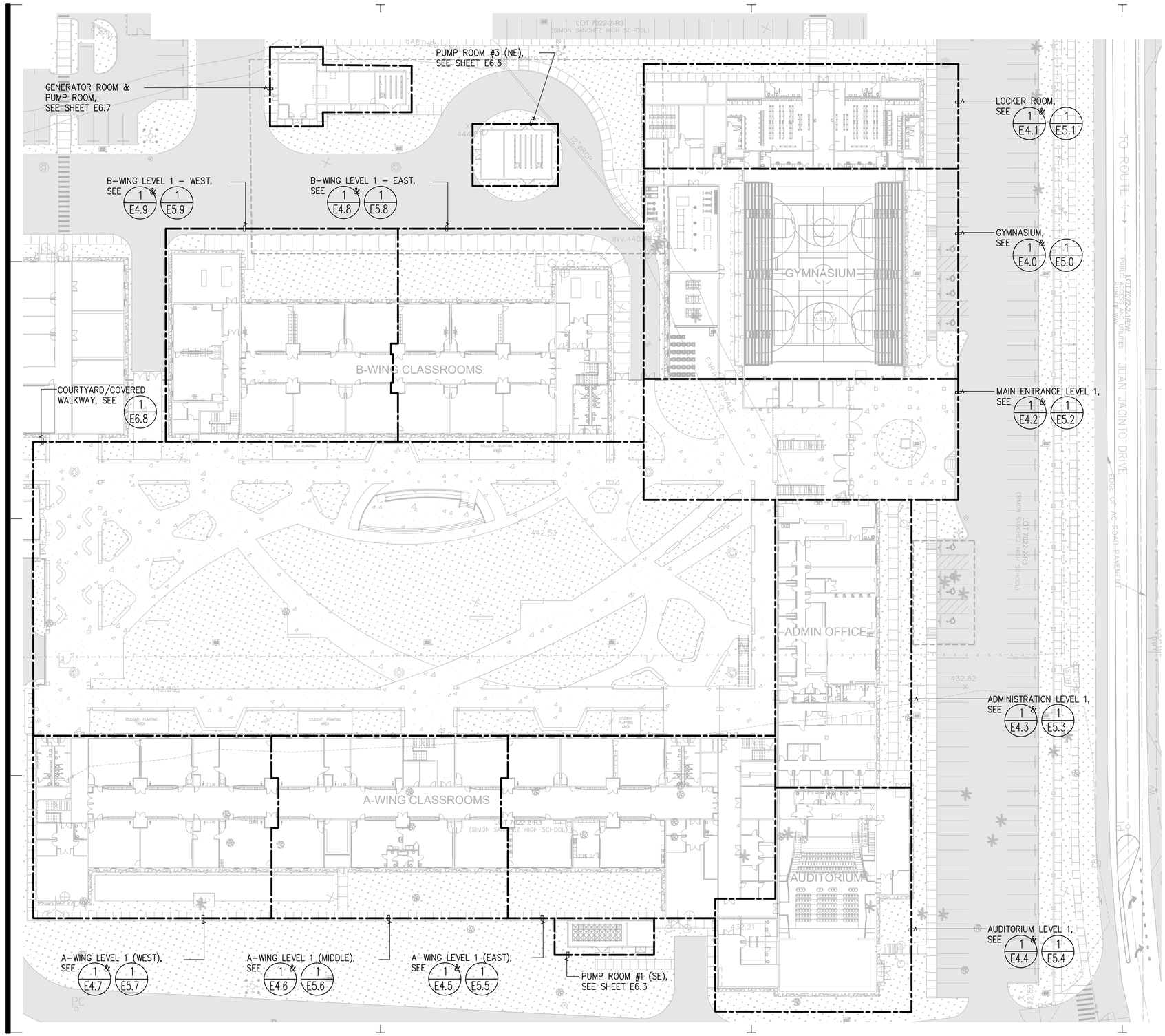

OVERALL KEY PLAN
LEVEL 1 - EAST (1 OF 3)

1 SCALE: 1"=30'-0"

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'-0"

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL KEY PLAN
LEVEL 1 - EAST (1 OF 3)

Designed:	RB/RR
Drawn:	FC/JB
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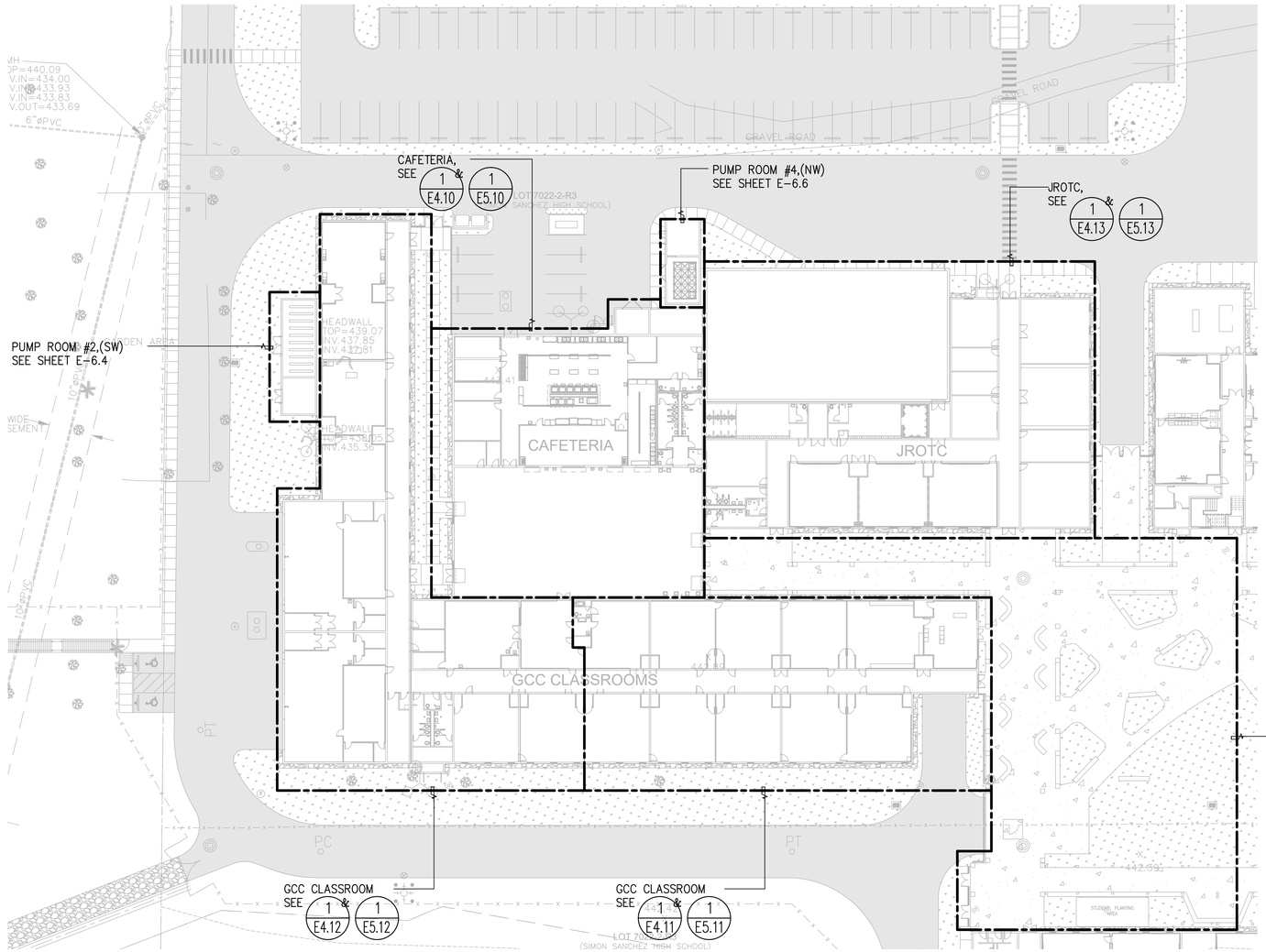
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No.
E1.2

Sheet No. ____ of ____



1 OVERALL KEY PLAN LEVEL 1 - WEST (2 OF 3)
SCALE: 1"=30'-0"

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'-0"

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: OVERALL KEY PLAN LEVEL 1 - WEST (2 OF 3)

Designed:	RB/RR
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Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
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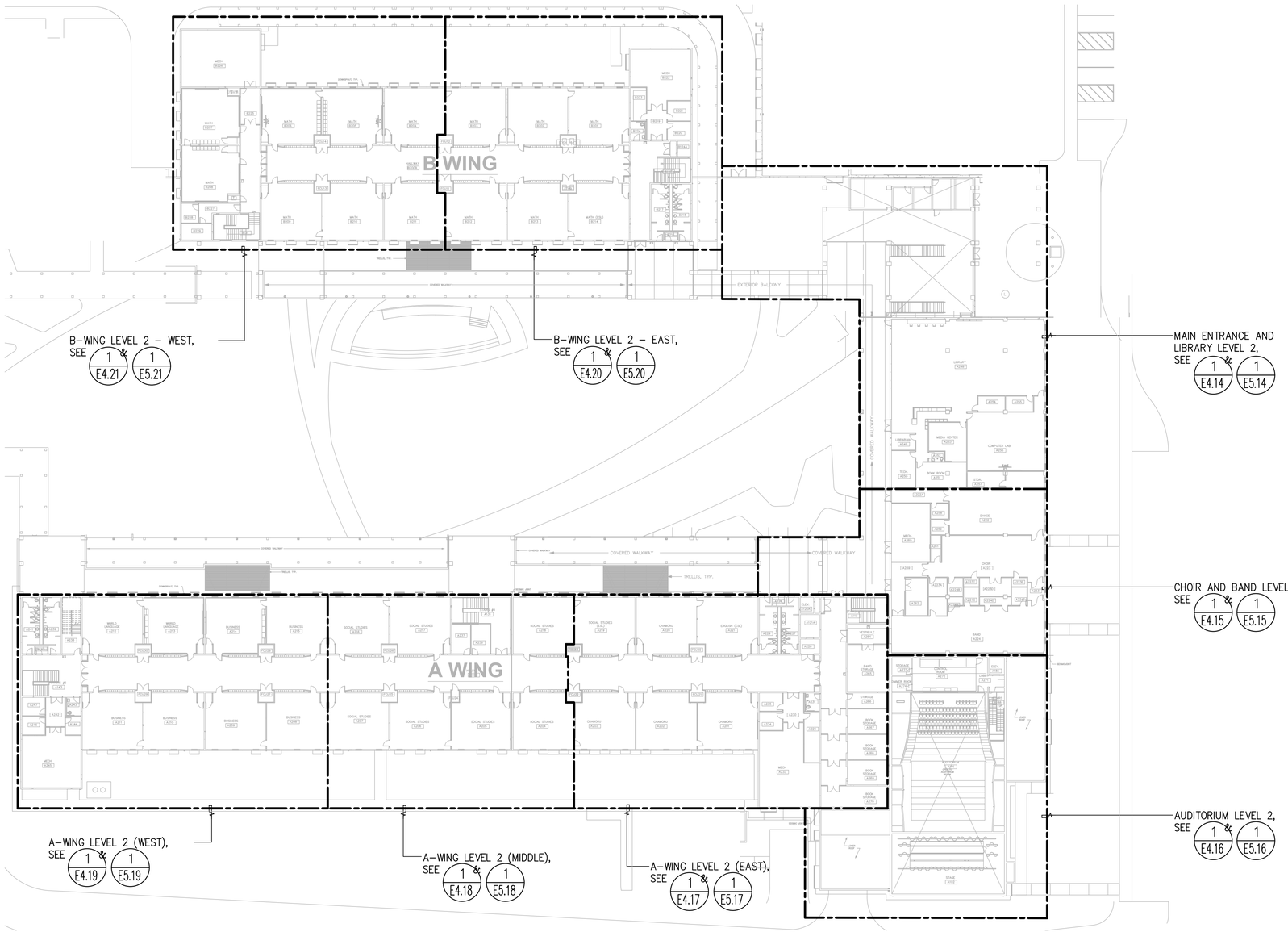
File:	

Drawing No. E1.3

Sheet No. of



1 OVERALL KEY PLAN LEVEL 2 (3 OF 3)

SCALE: 1"=30'–0"

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'–0"

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: OVERALL KEY PLAN LEVEL 2 (3 OF 3)

Designed:	RB/RR
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Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E1.4

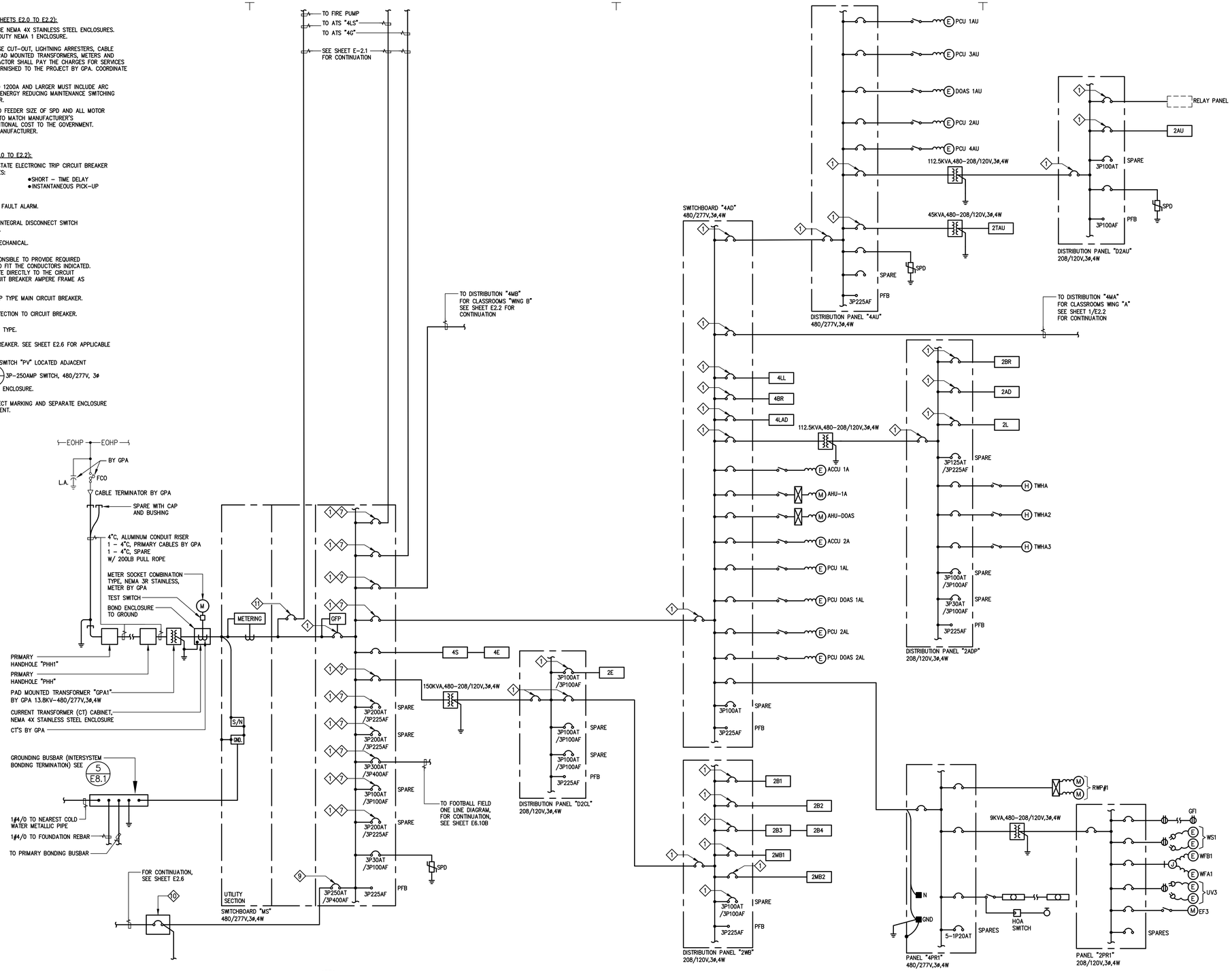
Sheet No. ____ of ____

GENERAL NOTES (APPLICABLE TO SHEETS E2.0 TO E2.2):

1. EXTERIOR EQUIPMENT SHALL BE NEMA 4X STAINLESS STEEL ENCLOSURES. INTERIOR EQUIPMENT, HEAVY DUTY NEMA 1 ENCLOSURE.
2. CROSSARM, ACCESSORIES, FUSE CUT-OUT, LIGHTNING ARRESTERS, CABLE TERMINATORS, SPLICING KIT, PAD MOUNTED TRANSFORMERS, METERS AND TERMINATION BY GPA. CONTRACTOR SHALL PAY THE CHARGES FOR SERVICES RENDERED AND MATERIALS FURNISHED TO THE PROJECT BY GPA. COORDINATE WORK WITH GPA.
3. ALL CIRCUIT BREAKERS RATED 1200A AND LARGER MUST INCLUDE ARC ENERGY REDUCTION. PROVIDE ENERGY REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS INDICATOR.
4. ADJUST CIRCUIT BREAKER AND FEEDER SIZE OF SPD AND ALL MOTOR LOADS (HVAC, PUMPS, ETC.) TO MATCH MANUFACTURER'S RECOMMENDATION AT NO ADDITIONAL COST TO THE GOVERNMENT. VERIFY REQUIREMENTS WITH MANUFACTURER.

NOTES (APPLICABLE TO SHEETS E2.0 TO E2.2):

1. PROVIDE ADJUSTABLE SOLID STATE ELECTRONIC TRIP CIRCUIT BREAKER WITH THE FOLLOWING FEATURES:
   - LONG – TIME PICKUP
   - LONG – TIME DELAY
   - SHORT – TIME PICKUP
   - SHORT – TIME DELAY
   - INSTANTANEOUS PICK-UP
2. PROVIDE GENERATOR GROUND FAULT ALARM.
3. ELEVATOR CONTROLLER WITH INTEGRAL DISCONNECT SWITCH BY ELEVATOR MANUFACTURER.
4. STARTER, PROVIDED UNDER MECHANICAL.
5. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE REQUIRED EQUIPMENT TERMINAL LUGS TO FIT THE CONDUCTORS INDICATED. CONDUCTORS SHALL TERMINATE DIRECTLY TO THE CIRCUIT BREAKER LUGS. ADJUST CIRCUIT BREAKER AMPERE FRAME AS REQUIRED.
6. PANELBOARD WITH SHUNT TRIP TYPE MAIN CIRCUIT BREAKER.
7. PROVIDE GROUND FAULT PROTECTION TO CIRCUIT BREAKER.
8. CIRCUIT BREAKER SHUNT TRIP TYPE.
9. SOLAR PV SYSTEM CIRCUIT BREAKER. SEE SHEET E2.6 FOR APPLICABLE NOTES.
10. SOLAR PV MAIN DISCONNECT SWITCH "PV" LOCATED ADJACENT TO UTILITY METER. SEE (2/E6.7) 3P-250AMP SWITCH, 480/277V, 3# IN NEMA 4X STAINLESS STEEL ENCLOSURE.
11. PROVIDE FIRE PUMP DISCONNECT MARKING AND SEPARATE ENCLOSURE COMPLYING TO NEC REQUIREMENT.



1 ONE LINE DIAGRAM (MAIN BUILDING)
NOT TO SCALE

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No.	Description	Date
1	ADDENDUM	12/16/24
2	ADDENDUM	9/16/24

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ONE LINE DIAGRAM (MAIN BUILDING)

Designed:	RB/RR
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Drawing No. E2.0

Sheet No. ____ of ____

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STAND-BY GENSET 700KW, 480/277V, 3ø, 4W, 0.8PF

ELECTRICAL COPPER BUSSED GUTTER, 1000AMPS, 36"H x 60"W x 6"D

BOND TO BUILDING STRUCTURAL REBAR

FIRE PUMP 40HP,460V,3ø

SEE SHEET E-2.0 FOR CONTINUATION

ATS "4LS" 4P-200AMPS, 480V, 3ø

DISTRIBUTION PANEL "4LSM", 480/277V, 3ø, 4W, 35 KAIC

PANEL "4LSFB", SEE SCHEDULE 480/277V, 3ø, 14 KAIC

4LSGY

MINI-POWER CENTER, 2LSGY 7.5KVA,480-240/120V (SEE PANEL SCHEDULE)

4LSB1 — 4LSB2

4LSBR

4LSL

ECB 2AU 3P50AT — TLSU — 2LSAU

3P150AT 225AF

4LSA1 — 4LSA2

2LSAD — TLSA — 4LSE

SPARE

3P50AT 100AF

3P100AF PFB SPD

PANEL "4LSAD" 480/277V, 3ø, 4W, 14 KAIC

MINI-POWER CENTER, 2LSB 7.5KVA,480-240/120V (SEE PANEL SCHEDULE)

MINI-POWER CENTER, 2LSA 7.5KVA,480-240/120V (SEE PANEL SCHEDULE)

MINI-POWER CENTER, 2LSGC 7.5KVA,480-240/120V (SEE PANEL SCHEDULE)

MINI-POWER CENTER, 2LSJR 7.5KVA,480-240/120V (SEE PANEL SCHEDULE)

MINI-POWER CENTER, 2LSCR 7.5KVA,480-240/120V (SEE PANEL SCHEDULE)

4LSGC — 4LSJR — 4LSCR — 2LSCA — TLSC

3P100AF PFB SPD

PANEL "4LSCA" 480/277V, 3ø, 4W, 14 KAIC

2PR — 2GG

3P100AT 100AF SPARE

3P150AT SPARE

3P40AT SPARE

3P100AF PFB

DIST. PANEL "2GMS" 208/120V, 3ø, 4W, 22 KAIC

GFI GFI

WS3

WFB3

WFA3

UV-3

EF-4

7-1P20AT SPARES

PANEL "2PR4" 208/120V, 3ø, 4W, 10 KAIC

BUILDING "A" MACHINE ROOMLESS ELEVATOR

BUILDING "A" MACHINE ROOMLESS ELEVATOR

TGA

MACHINE ROOMLESS ELEVATOR (AUDITORIUM)

3P100AT SPARE

3P225AF PFB

DISTRIBUTION PANEL "4GAD" 480/277V, 3ø, 4W, 18 KAIC

ADTR — AUTR — LTR — SPD

3P225AF PFB

DISTRIBUTION PANEL "2GAD" 208/120V, 3ø, 4W, 22 KAIC

B1TR — B2TR — B3TR — B4TR — SPD

3P50AT 100AF SPARE

3P100AF PFB

PANEL "2GBW" 208/120V, 3ø, 4W, 10 KAIC

125AT ECB "4GA" TGAW

A1TR — A4TR — A2TR — A5TR — A3TR — A6TR — 2AC1 — SPD

3P100AT 100AF SPARE

3P100AF PFB

PANEL "2GAW" 208/120V, 3ø, 4W, 22 KAIC

ATS "4G" 4P800AT, 480V, 3ø

3P50AT 100AF SPARE

3P225AF PFB

DISTRIBUTION PANEL "4GM" 480/277V, 3ø, 4W, 65 KAIC

MACHINE ROOMLESS ELEVATOR (BUILDING B)

TGM

4GPR

RWP#3, P1-5HP, P2-5HP

1P20AT SPARE

1P20AT SPARE

N GND

6-3P20AF PFB

HOA SWITCH

PANEL "4PR4" 480/277V, 3ø, 4W, 14 KAIC

PANEL "4GFB" 480/277V, 3ø, 14 KAIC

4LGY

PCU 1GY

PCU 2GY

PCU 3GY

PCU 4GY

PCU DOAS 1GY

PCU DOAS 2GY

PCU DOAS 3GY

3P50AT SPARE

3P100AT SPARE

TGY

3P225AT PFB

DISTRIBUTION PANEL "4GY" 480/277V, 3ø, 4W, 35 KAIC

DISTRIBUTION PANEL "4GCA" 480/277V, 3ø, 4W, 18 KAIC SEE PANELBOARD SCHEDULE

TCC

GBS

TGR

ECB "4GCR" 3P40A,480V,3ø

2GCR

ECB "2GCR" 3P80A,208/120V,3ø

3P175AT SPARE

3P50AT SPARE

3P225AF PFB

2GCK — 2GGC — GCTR — 2GJR — JRTR — CTR — SPD

3P50AT SPARE

3P50AT SPARE

3P100AF PFB

DISTRIBUTION PANEL "2GCA" 208/120V, 3ø, 4W, 22 KAIC

2GY1

2GTR — SPD

HWRP

PV WATER HEATER

PANEL "PVSH", 6

2GY2

3P100AT SPARE

3P225AF PFB

DIST. PANEL "D2GY" 400A,208/120V,3ø,4W, 22 KAIC

PANEL "PVSH", 6

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1 ONE LINE DIAGRAM (LIFE SAFETY, GEN SYSTEM)
NOT TO SCALE

NOT FOR CONSTRUCTION

REVISION

No.	Description	Date
2	ADDENDUM	12/16/25

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Taniguchi Ruth Makio Architects
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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

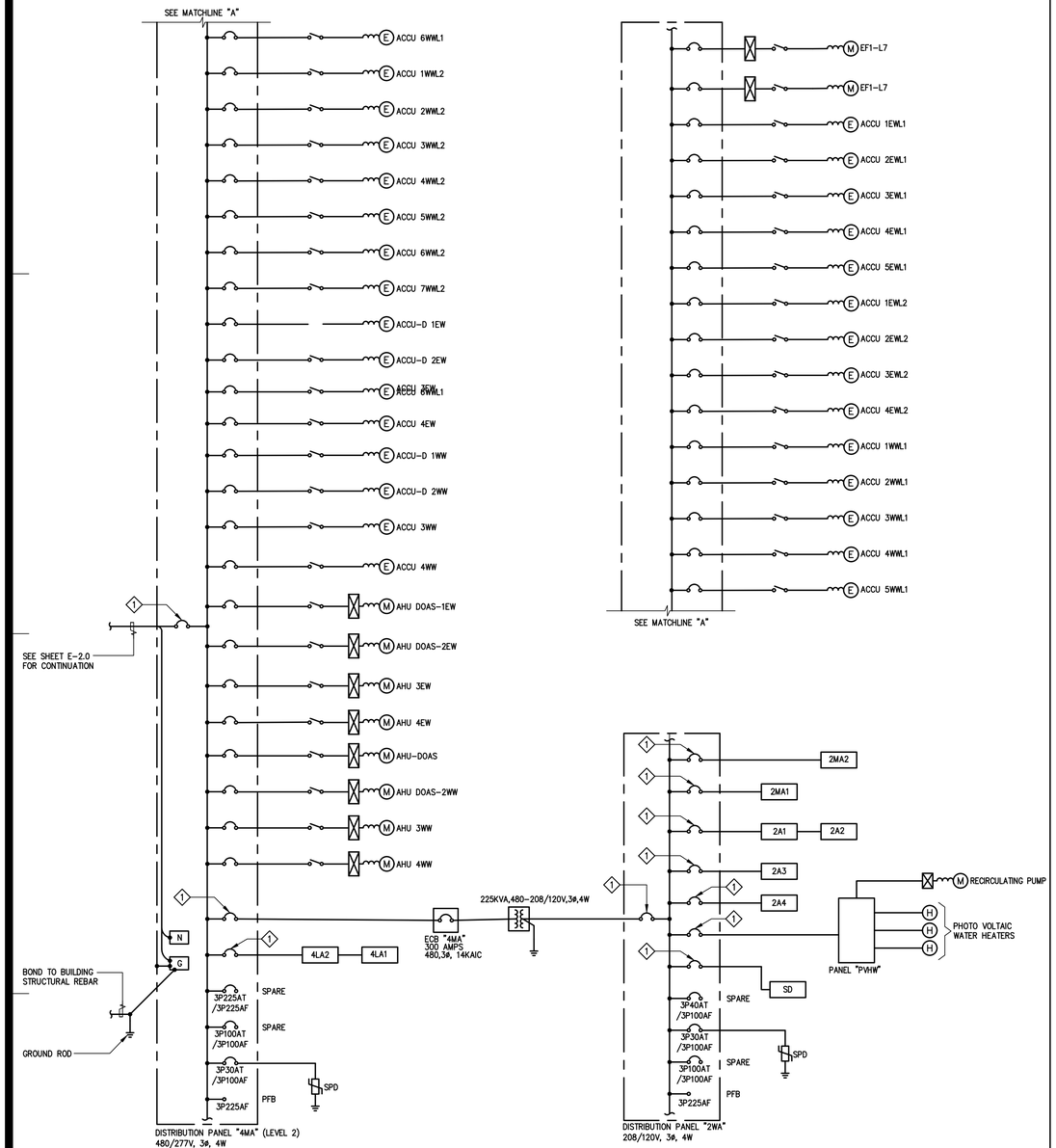
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ONE LINE DIAGRAM (LIFE SAFETY, EM SYSTEM)

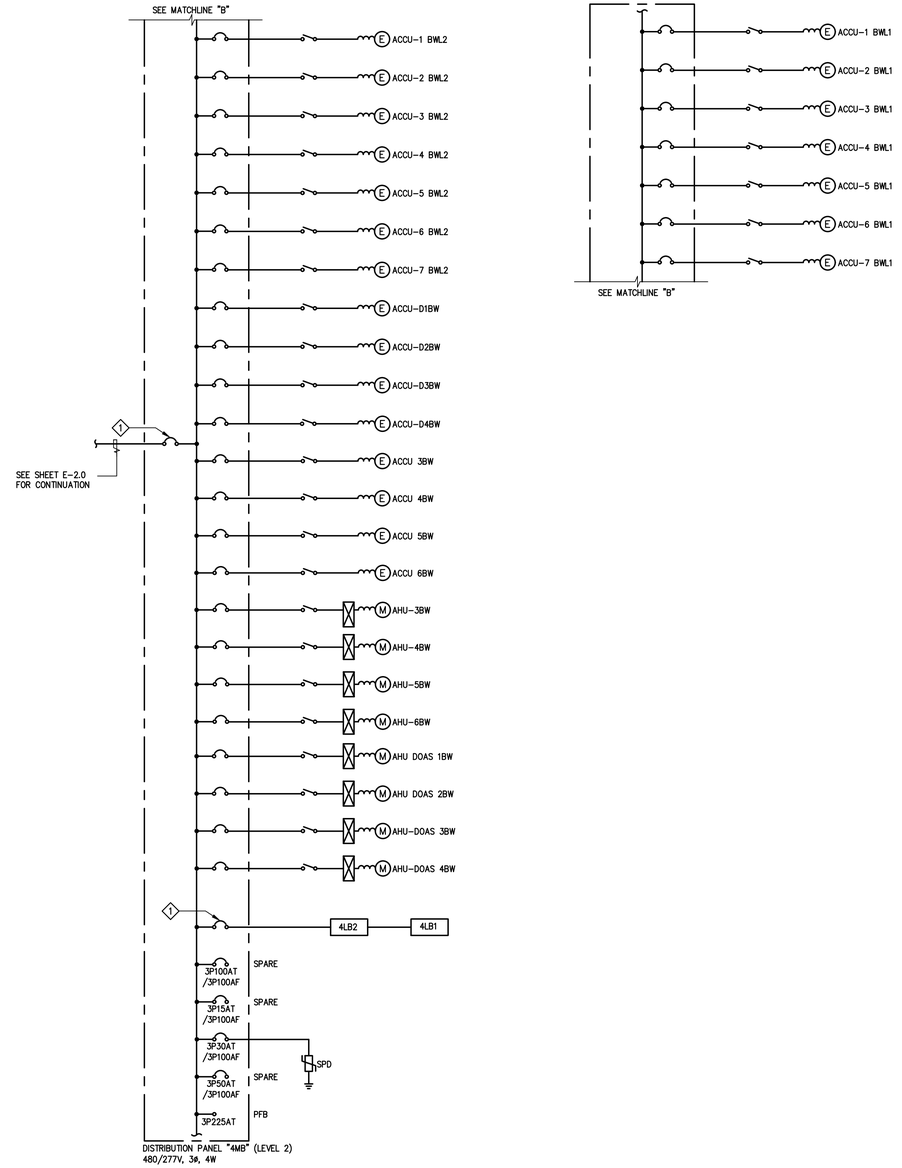
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	

Drawing No. E2.1

Sheet No. ____ of ____



1 PARTIAL ONE LINE DIAGRAM, A-WING CLASSROOMS
NOT TO SCALE



2 PARTIAL ONE LINE DIAGRAM, B-WING CLASSROOMS
NOT TO SCALE

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REVISION		
No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

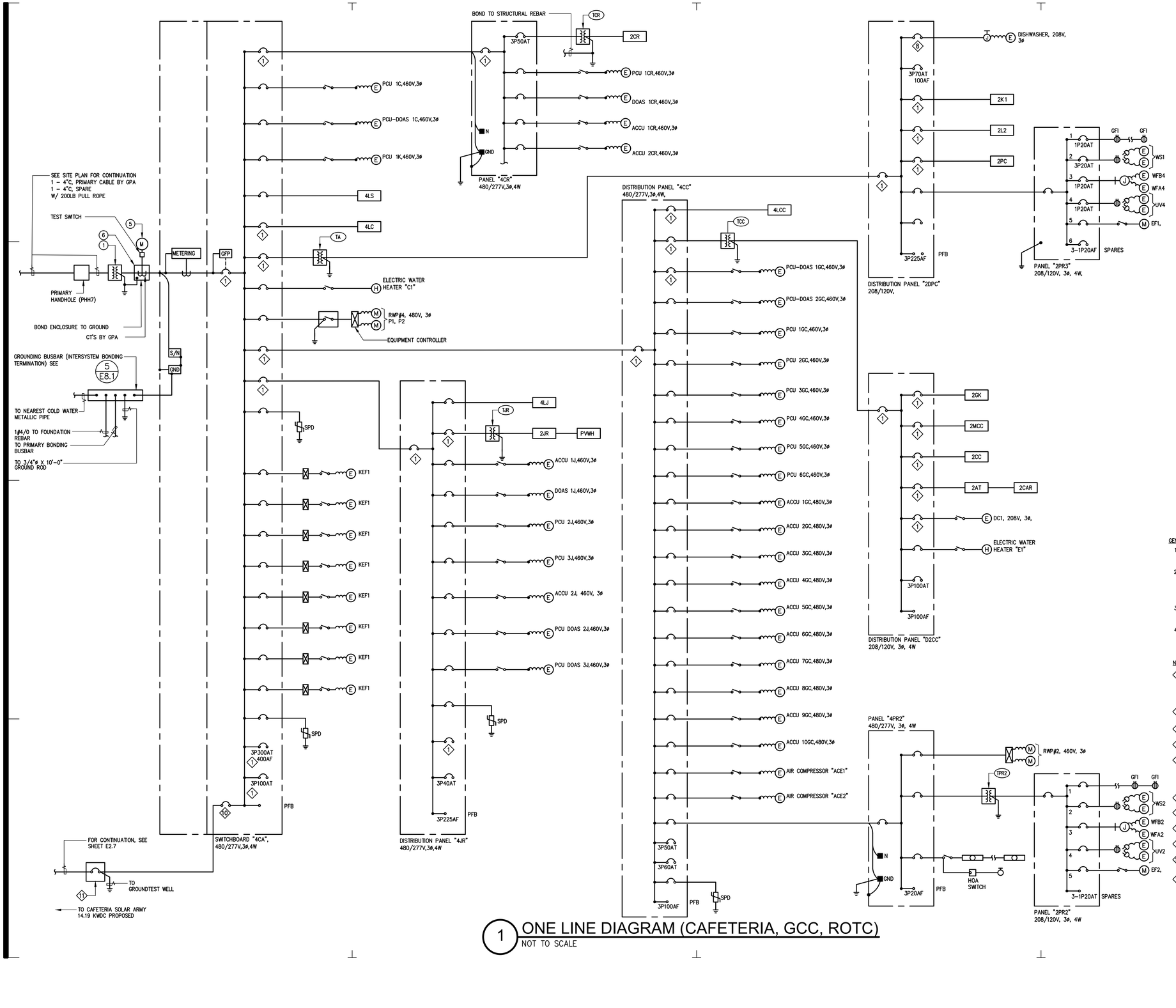
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
PARTIAL ONE LINE DIAGRAM, A-WING AND B-WING CLASSROOMS

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	

Drawing No.
E2.2

Sheet No. _____ of _____



DRY TYPE TRANSFORMER SCHEDULE

TA	112.5 KVA, 480–208V/120V, 3ø, 4W
TJR	75 KVA, 480–208V/120V, 3ø, 4W
TCC	150 KVA, 480–208V/120V, 3ø, 4W
TPR2	9 KVA, 480–208V/120V, 3ø, 4W
TCR	30 KVA, 480–208V/120V, 3ø, 4W

GENERAL NOTES:

1. EXTERIOR EQUIPMENT SHALL BE NEMA 4X STAINLESS STEEL ENCLOSURES. INTERIOR EQUIPMENT, HEAVY DUTY NEMA 1 ENCLOSURE. UNLESS OTHERWISE NOTED.
2. CROSSARM, ACCESSORIES, FUSE CUT-OUT, LIGHTNING ARRESTERS, CABLE TERMINATORS, SPLICING KIT, PAD MOUNTED TRANSFORMERS, METERS AND TERMINATION BY GPA. CONTRACTOR SHALL PAY THE CHARGES FOR SERVICE RENDERED AND MATERIALS FURNISHED TO THE PROJECT BY GPA. COORDINATE WORK WITH GPA.
3. ALL CIRCUIT BREAKERS RATED 1200A AND LARGER MUST INCLUDE ARC ENERGY REDUCTION. PROVIDE ENERGY REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS INDICATOR.
4. ADJUST CIRCUIT BREAKER AND FEEDER SIZE OF SPD AND ALL MOTOR LOADS (HVAC, PUMPS, ETC.) TO MATCH MANUFACTURER'S RECOMMENDATION AT NO ADDITIONAL COST TO THE GOVERNMENT. VERIFY REQUIREMENTS WITH MANUFACTURER.

NOTES:

1. PROVIDE ADJUSTABLE SOLID STATE ELECTRONIC TRIP CIRCUIT BREAKER WITH THE FOLLOWING FEATURES:
   - LONG – TIME PICKUP
   - LONG – TIME DELAY
   - SHORT – TIME PICKUP
   - SHORT – TIME DELAY
   - INSTANTANEOUS PICK-UP
2. NON–FUSIBLE DISCONNECT SWITCH, 3P–30AMPS, NEMA 4X 304 SST 600V.
3. NON–FUSIBLE DISCONNECT SWITCH, 3P–60AMPS, NEMA 4X 304 SST 600V.
4. STARTER, PROVIDED UNDER MECHANICAL SECTION.
5. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE REQUIRED EQUIPMENT TERMINAL LUGS TO FIT THE CONDUCTORS INDICATED. CONDUCTORS SHALL TERMINATE DIRECTLY TO THE CIRCUIT BREAKER LUGS. ADJUST CIRCUIT BREAKER AMPERE FRAME AS REQUIRED.
6. NON–FUSIBLE DISCONNECT SWITCH, 3P–100AMPS, 600V.
7. UTILITY BOX, 8"X8"X6"D, NEMA 4X STAINLESS STEEL ENCLOSURE.
8. LOCKABLE TYPE CIRCUIT BREAKER IN OPEN POSITION.
9. NON FUSIBLE SWITCH, 3P–60A, 240V.
10. SOLAR PB SYSTEM MAIN CIRCUIT BREAKER(GCC/CAFERIA) SEE SHEET E2.7 FOR APPLICABLE NOTES.
11. PV SOLAR MAIN DISCONNECT SWITCH "PVC" LOCATED ADJACENT TO UTILITY METER: SEE 1/E6.2

3P–70 AMPS SWITCH, 225AF, 480/277V,3ø,4W IN NEMA 4 STAINLESS STEEL.

1 ONE LINE DIAGRAM (CAFETERIA, GCC, ROTC)

NOT TO SCALE

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Architecture
Planning
Interior Design

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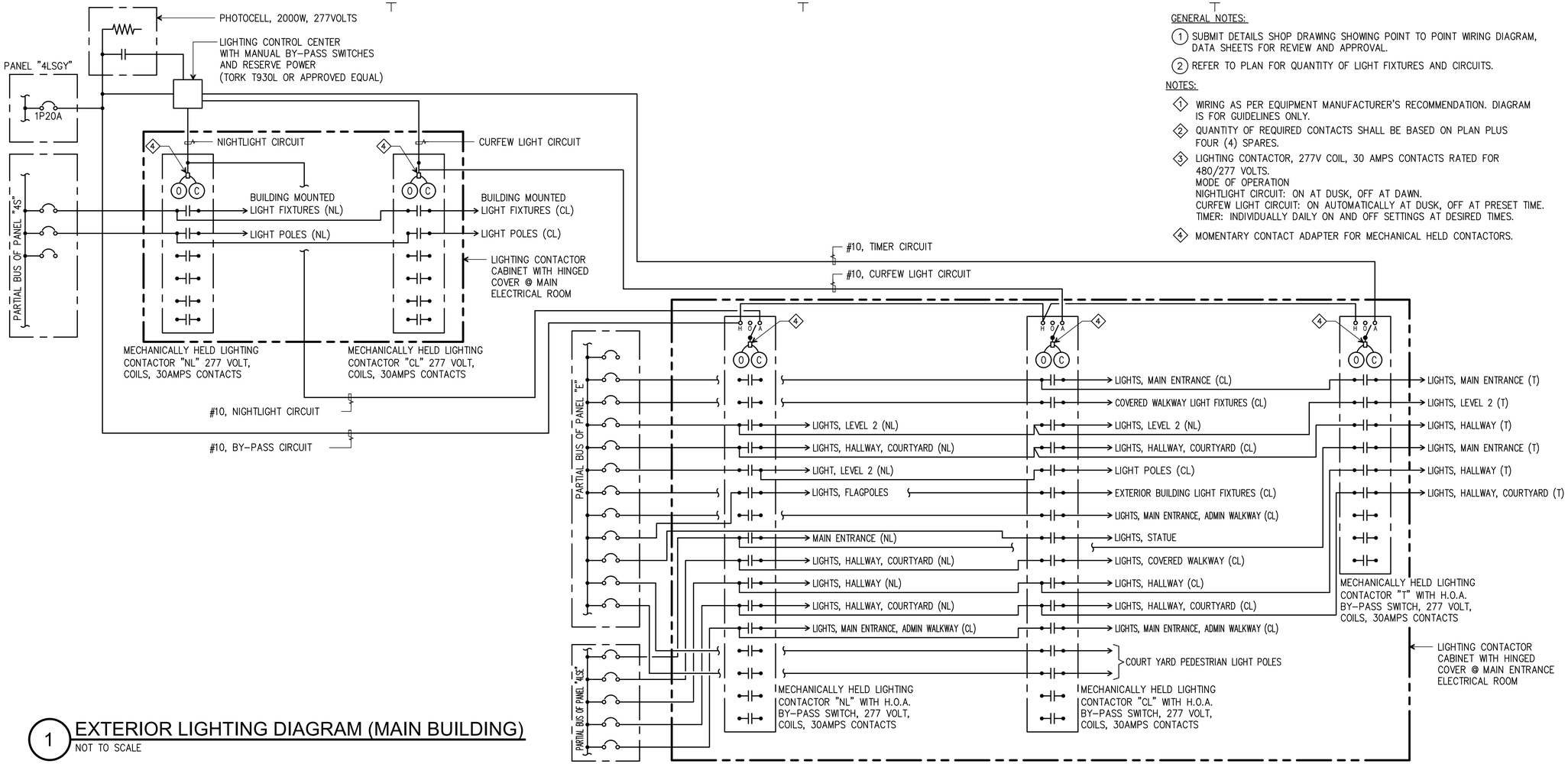
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ONE LINE DIAGRAM (CAFETERIA, GCC, ROTC)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E2.3

Sheet No. of



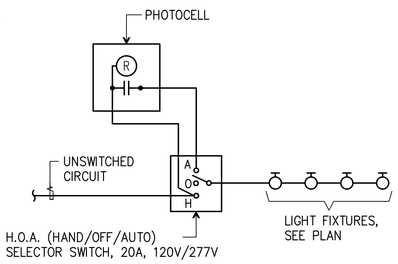
1 EXTERIOR LIGHTING DIAGRAM (MAIN BUILDING)
NOT TO SCALE

GENERAL NOTES:

1. SUBMIT DETAILS SHOP DRAWING SHOWING POINT TO POINT WIRING DIAGRAM, DATA SHEETS FOR REVIEW AND APPROVAL.
2. REFER TO PLAN FOR QUANTITY OF LIGHT FIXTURES AND CIRCUITS.

NOTES:

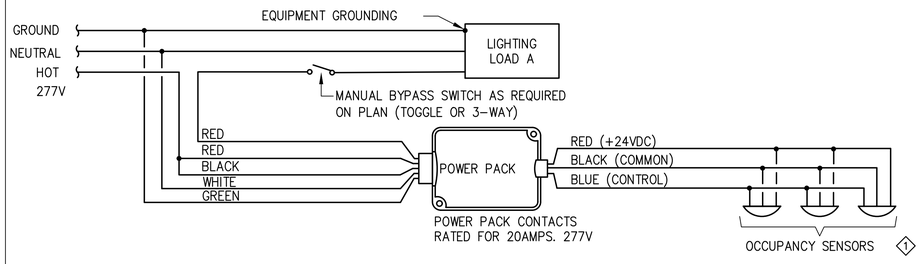
1. WIRING AS PER EQUIPMENT MANUFACTURER'S RECOMMENDATION. DIAGRAM IS FOR GUIDELINES ONLY.
2. QUANTITY OF REQUIRED CONTACTS SHALL BE BASED ON PLAN PLUS FOUR (4) SPARES.
3. LIGHTING CONTACTOR, 277V COIL, 30 AMPS CONTACTS RATED FOR 480/277 VOLTS.
   MODE OF OPERATION
   NIGHTLIGHT CIRCUIT: ON AT DUSK, OFF AT DAWN.
   CURFEW LIGHT CIRCUIT: ON AUTOMATICALLY AT DUSK, OFF AT PRESET TIME.
   TIMER: INDIVIDUALLY DAILY ON AND OFF SETTINGS AT DESIRED TIMES.
4. MOMENTARY CONTACT ADAPTER FOR MECHANICAL HELD CONTACTORS.



2 EXTERIOR HOA SWITCH
NOT TO SCALE



3 WALL MOUNTED SERSOR/ EXHAUST FAN INTERLOCK DIAGRAM
NOT TO SCALE



SEQUENCE OF OPERATION:

1. SYSTEM TURNS "ON" AUTOMATICALLY WHEN ANY SENSOR DETECTS OCCUPANCY.
2. ENTIRE SYSTEM TURNS "OFF" WHEN SENSORS NO LONGER DETECT THAT THE ROOM IS OCCUPIED AND THE PROGRAMMED TIME DELAY HAS ELAPSED.

GENERAL NOTE:

1. VERIFY WIRING REQUIREMENTS WITH MANUFACTURER. WIRING MAY DIFFER BETWEEN MANUFACTURERS.

NOTE:

1. SEE PLAN FOR QUANTITY AND LOCATION DEVICES.

4 DUAL TECHNOLOGY CEILING MOUNTED OCCUPANCY SENSOR WITH 3-WAY (OFF) BYPASS OFF SWITCH
NOT TO SCALE

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: EXTERIOR LIGHTING DIAGRAM, EXTERIOR HOA SWITCH AND PV SYSTEM CONDUIT DIAGRAM

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E2.4

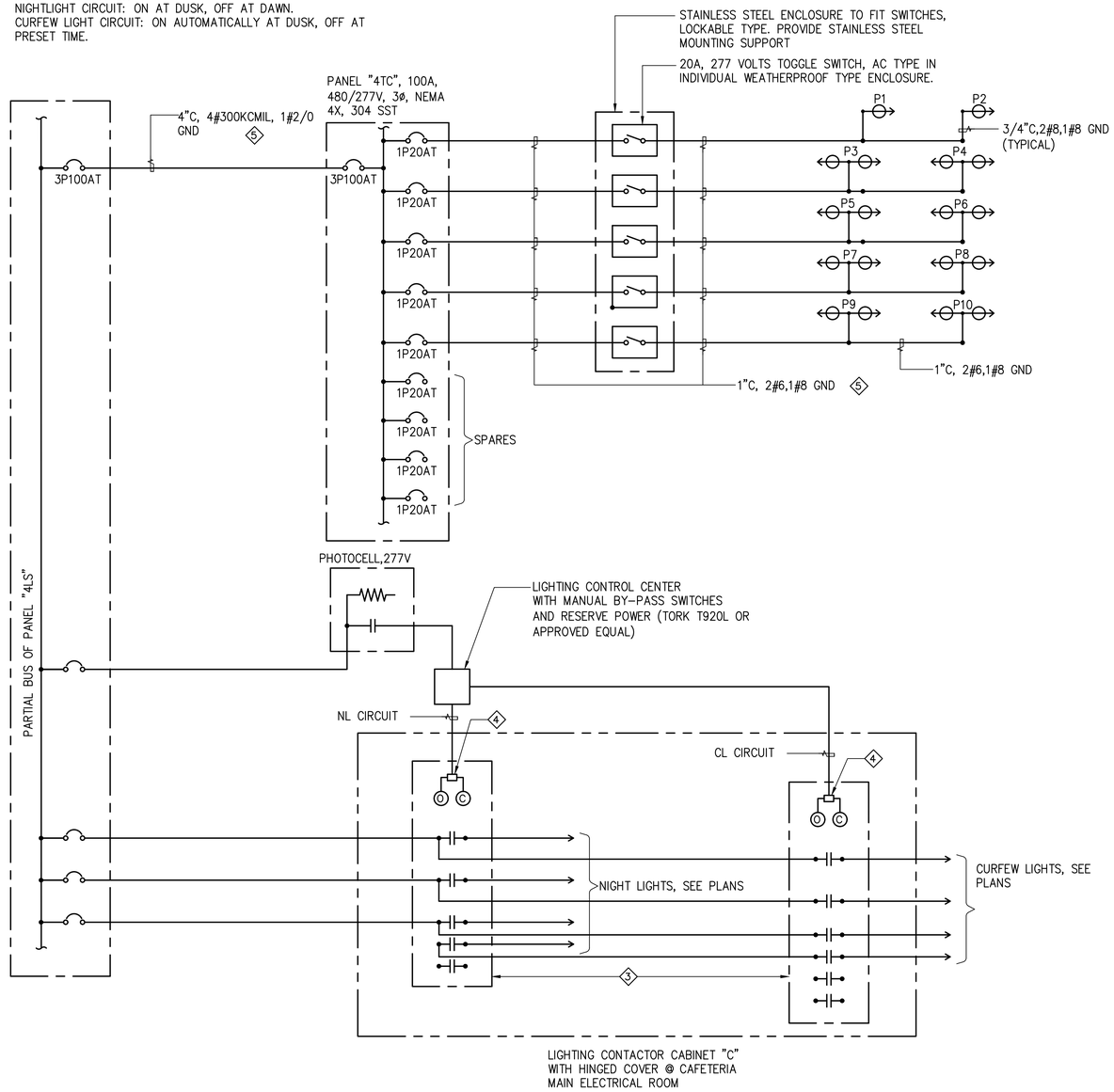
Sheet No. _____ of _____

GENERAL NOTE:

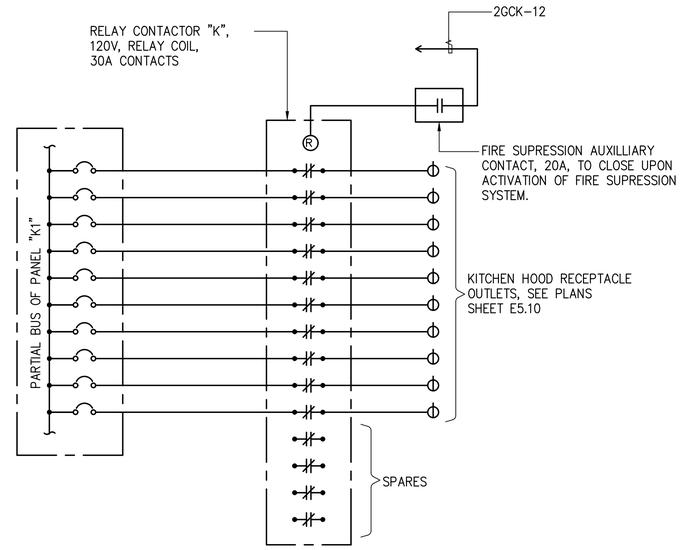
(1) SUBMIT DETAILS SHOP DRAWING SHOWING POINT TO POINT WIRING DIAGRAM, DATA SHEETS FOR REVIEW AND APPROVAL.

NOTES:

1. WIRING AS PER EQUIPMENT MANUFACTURER'S RECOMMENDATION. DIAGRAM IS FOR GUIDELINES ONLY.
2. QUANTITY OF REQUIRED CONTACTS SHALL BE BASED ON PLAN PLUS FOUR (4) SPARES.
3. MECHANICALLY HELD LIGHTING CONTACTOR, 277V COIL, 30 AMPS CONTACTS RATED FOR 480/277 VOLTS.
   MODE OF OPERATION
   NIGHTLIGHT CIRCUIT: ON AT DUSK, OFF AT DAWN.
   CURFEW LIGHT CIRCUIT: ON AUTOMATICALLY AT DUSK, OFF AT PRESET TIME.
4. MOMENTARY CONTACT ADAPTER FOR MECHANICAL HELD CONTACTORS.
5. PROVIDE CABLE ADAPTOR TO FIT CABLE TO CIRCUIT BREAKER.



1 TENNIS AND EXTERIOR LIGHTING DIAGRAM
NOT TO SCALE



2 RELAY CONTACTOR "K" INTELOCK SCHEMATIC DIAGRAM
NOT TO SCALE

REVISION		
No.	Description	Date

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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: TENNIS AND EXTERIOR LIGHTING DIAGRAM, RELAY CONTACTOR "K" INTERLOCK SCHEMATIC DIAGRAM

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E2.5

Sheet No. ____ of ____

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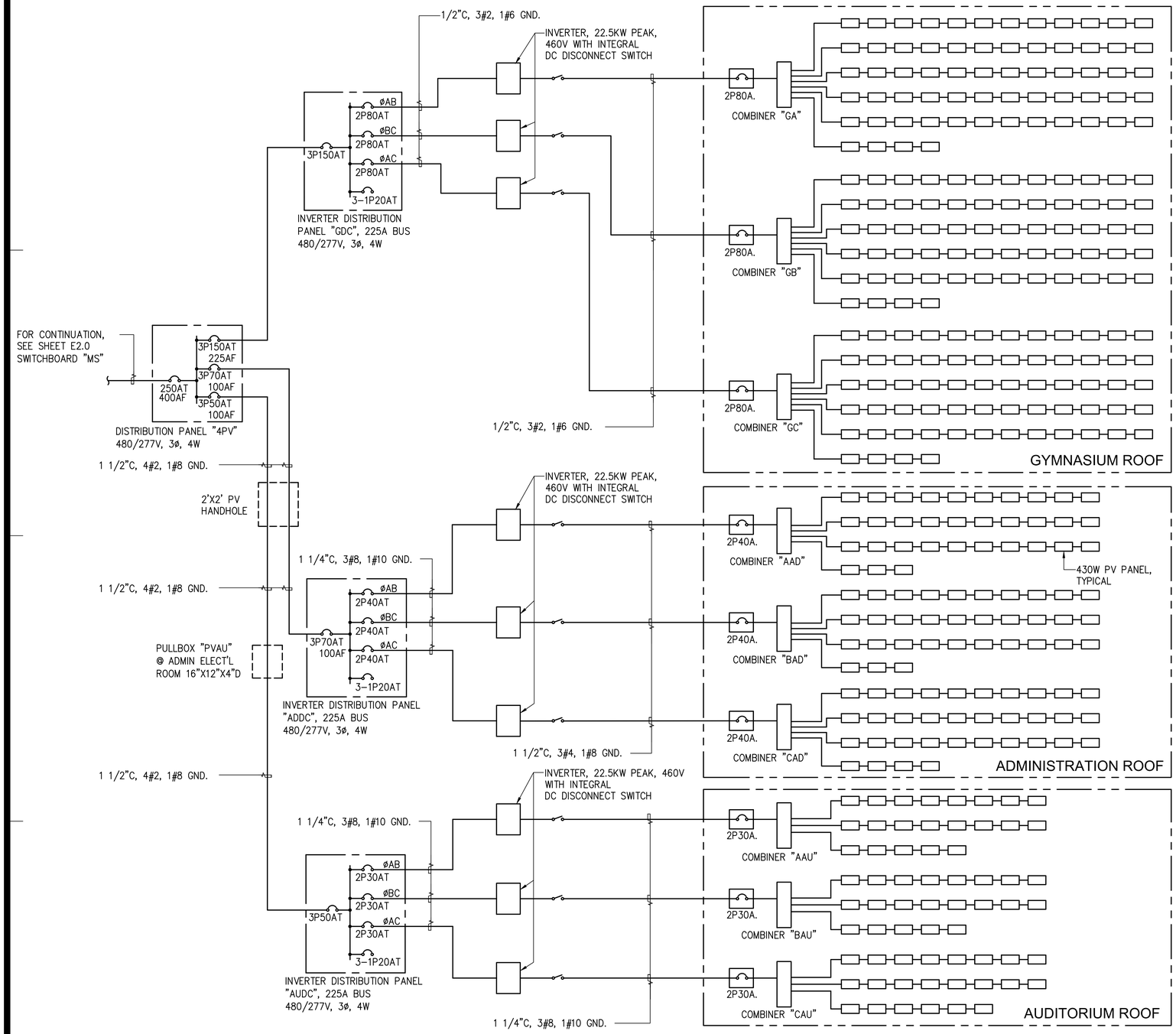

1 SOLAR PV SCHEMATIC DIAGRAM
NOT TO SCALE

GENERAL NOTES:

1. THE PV SYSTEM INVERTER OUTPUT SHALL CONNECT TO THE BUILDING ELECTRICAL SYSTEM. POWER GENERATED BY THE PV SYSTEM SHALL BECOME AVAILABLE FOR UTILIZATION BY THE BUILDING LOAD. PROVIDE SURGE PROTECTION AND INTEGRAL GROUND FAULT PROTECTION. PROVIDE ANTI–ISLANDING, OVER AND UNDER VOLTAGE TRIP FUNCTION, OVER AND UNDER FREQUENCY TRIP FUNCTION, VOLTAGE AND FREQUENCY SENSING AND TIME DELAY FUNCTIONS PER IEEE STD 929–2000. PROVIDE WEB BOX CONNECTION FOR REMOTE MONITORING. LOCATION TO BE DETERMINED BY THE OWNER.
2. PV MODULES SHALL BE MOUNTED ON THE ROOF USING MANUFACTURER STANDARD CORROSION RESISTANT CHANNELS. PANEL SHALL BE ORIENTED AND TILTED PER MANUFACTURER'S RECOMMENDATION FOR GUAM. INSTALLATION SHALL BE RATED TO WITHSTAND LATEST WINDLOAD REQUIREMENT BY 1BC LATEST EDITION EXPOSURE C AND ASCE 7–05.
3. PROVIDE NAMEPLATE INDICATING "PHOTOVOLTAIC INVERTER PANELBOARD: DO NOT CONNECT ADDITIONAL LOAD TO THIS PANEL".
4. PROVIDE MARKING "PHOTOVOLTAIC POWER SOURCE" ON RACEWAYS NO LESS THAN EVERY 10 FEET, AT EVERY TURN, ABOVE AND BELOW PENETRATIONS AND ON ALL EXPOSED RACEWAYS. MINIMUM TEXT HEIGHT SHALL BE 3/8" USING WHITE LETTERING ON A RED BACKGROUND. LABELS MUST HAVE REFLECTIVE PROPERTIES AND SHALL MEET UL969 REQUIREMENTS. PROVIDE OTHER LABELS AS REQUIRED BY NEC 2020 SECTION 690.
5. ALL CIRCUIT BREAKERS, REVERSIBLE TYPE 600V, 3ø COMPLETE WITH GROUND AND NEUTRAL BARS BY PV EQUIPMENT SUPPLIER.
6. DISCONNECT SWITCH BY PV EQUIPMENT SUPPLIER.
7. WIRINGS BY PV EQUIPMENT SUPPLIER, CONDUIT BY CONTRACTOR. SIZES AND QTY. PER PV EQUIPMENT SUPPLIER RECOMMENDATION.
8. PROVIDE PERMANENT PLAQUE AT EACH MAIN DISCONNECT SWITCH IN CONFORMANCE WITH NEC REQUIREMENT NEC 230.2(E).
   1. INDICATE LOCATION OF OTHER MAIN DISCONNECTS THAT SERVE THE BUILDING.
   2. INDICATE INFORMATION OF AREA/LOAD SERVE (e.g. DISTRIBUTION PANEL, PV'S, ETC.)
   3. INDICATE MAIN DISCONNECT NUMBER DESIGNATION IN REFERENCE TO THE TOTAL QUANTITIES OF DISCONNECT SWITCHES. (e.g. 1 OF 4, 2 OF 4, ETC.)
9. WHERE TWO SOURCES, ONE A UTILITY AND THE OTHER AN FOR PV BREAKER, LOCATE CIRCUIT BREAKERS AT OPPOSITE END OF THE BUS BAR.

   A PERMANENT WARNING LABEL SHALL BE PROVIDED TO THE DISTRIBUTION EQUIPMENT ADJACENT TO THE PV CIRCUIT BREAKER THAT DISPLAY THE FOLLOWING WORDING "WARNING" INVERTER OUTPUT CONNECTION;
   DO NOT RELOCATE THIS OVERCURRENT DEVICE.
10. AFTER PV CIRCUIT BREAKER IS INSTALLED, PROVIDE WARNING LABEL TO THE EQUIPMENT INDICATING "WARNING", THIS EQUIPMENT IS FED BY MULTIPLE SOURCES.
11. CONTRACTOR SHALL OBTAIN BUILDING PERMIT AND GPA APPROVAL ON BEHALF OF THE OWNER.
12. PROVIDE CONDUIT AND WIRING, PER MANUFACTURER'S RECOMMENDATION.
13. INVERTER SHALL HAVE INTEGRAL GROUND FAULT DETECTION, INTERRUPTION AND ARRAY DISCONNECT (GFPD) DEVICES.

REVISION

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: SOLAR PV SCHEMATIC DIAGRAM

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E2.6

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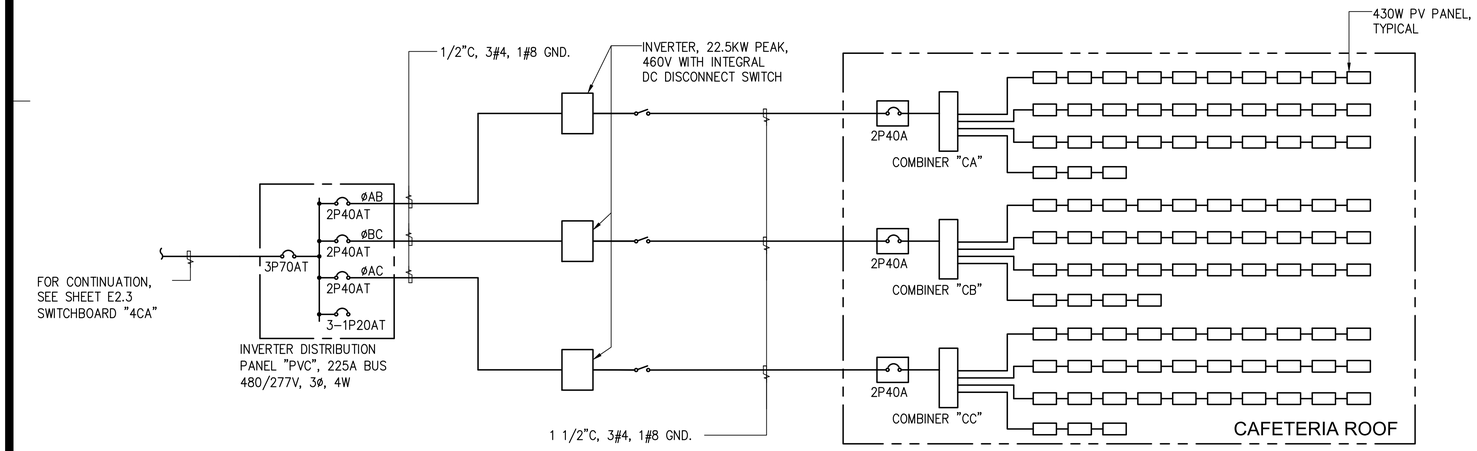

1 CAFETERIA/GCC SOLAR PV SCHEMATIC DIAGRAM
NOT TO SCALE

GENERAL NOTES:

1. THE PV SYSTEM INVERTER OUTPUT SHALL CONNECT TO THE BUILDING ELECTRICAL SYSTEM. POWER GENERATED BY THE PV SYSTEM SHALL BECOME AVAILABLE FOR UTILIZATION BY THE BUILDING LOAD. PROVIDE SURGE PROTECTION AND INTEGRAL GROUND FAULT PROTECTION. PROVIDE ANTI-ISLANDING, OVER AND UNDER VOLTAGE TRIP FUNCTION, OVER AND UNDER FREQUENCY TRIP FUNCTION, VOLTAGE AND FREQUENCY SENSING AND TIME DELAY FUNCTIONS PER IEEE STD 929-2000. PROVIDE WEB BOX CONNECTION FOR REMOTE MONITORING. LOCATION TO BE DETERMINED BY THE OWNER.

2. PV MODULES SHALL BE MOUNTED ON THE ROOF USING MANUFACTURER STANDARD CORROSION RESISTANT CHANNELS. PANEL SHALL BE ORIENTED AND TILTED PER MANUFACTURER'S RECOMMENDATION FOR GUAM. INSTALLATION SHALL BE RATED TO WITHSTAND LATEST WINDLOAD REQUIREMENT BY 1BC LATEST EDITION EXPOSURE C AND ASCE 7-05.

3. PROVIDE NAMEPLATE INDICATING "PHOTOVOLTAIC INVERTER PANELBOARD: DO NOT CONNECT ADDITIONAL LOAD TO THIS PANEL".

4. PROVIDE MARKING "PHOTOVOLTAIC POWER SOURCE" ON RACEWAYS NO LESS THAN EVERY 10 FEET, AT EVERY TURN, ABOVE AND BELOW PENETRATIONS AND ON ALL EXPOSED RACEWAYS. MINIMUM TEXT HEIGHT SHALL BE 3/8" USING WHITE LETTERING ON A RED BACKGROUND. LABELS MUST HAVE REFLECTIVE PROPERTIES AND SHALL MEET UL969 REQUIREMENTS. PROVIDE OTHER LABELS AS REQUIRED BY NEC 2020 SECTION 690.

5. ALL CIRCUIT BREAKERS, REVERSIBLE TYPE 600V, 3ø COMPLETE WITH GROUND AND NEUTRAL BARS BY PV EQUIPMENT SUPPLIER.

6. DISCONNECT SWITCH BY PV EQUIPMENT SUPPLIER.

7. WIRINGS BY PV EQUIPMENT SUPPLIER, CONDUIT BY CONTRACTOR. SIZES AND QTY. PER PV EQUIPMENT SUPPLIER RECOMMENDATION.

8. PROVIDE PERMANENT PLAQUE AT EACH MAIN DISCONNECT SWITCH IN CONFORMANCE WITH NEC REQUIREMENT NEC 230.2(E).
   1. INDICATE LOCATION OF OTHER MAIN DISCONNECTS THAT SERVE THE BUILDING.
   2. INDICATE INFORMATION OF AREA/LOAD SERVE (e.g. DISTRIBUTION PANEL, PV'S, ETC.)
   3. INDICATE MAIN DISCONNECT NUMBER DESIGNATION IN REFERENCE TO THE TOTAL QUANTITIES OF DISCONNECT SWITCHES. (e.g. 1 OF 4, 2 OF 4, ETC.)

9. WHERE TWO SOURCES, ONE A UTILITY AND THE OTHER AN FOR PV BREAKER, LOCATE CIRCUIT BREAKERS AT OPPOSITE END OF THE BUS BAR.

   A PERMANENT WARNING LABEL SHALL BE PROVIDED TO THE DISTRIBUTION EQUIPMENT ADJACENT TO THE PV CIRCUIT BREAKER THAT DISPLAY THE FOLLOWING WORDING "WARNING" INVERTER OUTPUT CONNECTION;
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10. AFTER PV CIRCUIT BREAKER IS INSTALLED, PROVIDE WARNING LABEL TO THE EQUIPMENT INDICATING "WARNING", THIS EQUIPMENT IS FED BY MULTIPLE SOURCES.

11. CONTRACTOR SHALL OBTAIN BUILDING PERMIT AND GPA APPROVAL ON BEHALF OF THE OWNER.

12. PROVIDE CONDUIT AND WIRING, PER MANUFACTURER'S RECOMMENDATION.

13. INVERTER SHALL HAVE INTEGRAL GROUND FAULT DETECTION, INTERRUPTION AND ARRAY DISCONNECT (GFPD) DEVICES.

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Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CAFETERIA/GCC SOLAR PV SCHEMATIC DIAGRAM

Designed:	RB/RR
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Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25

Project No. 24-20-486 | File

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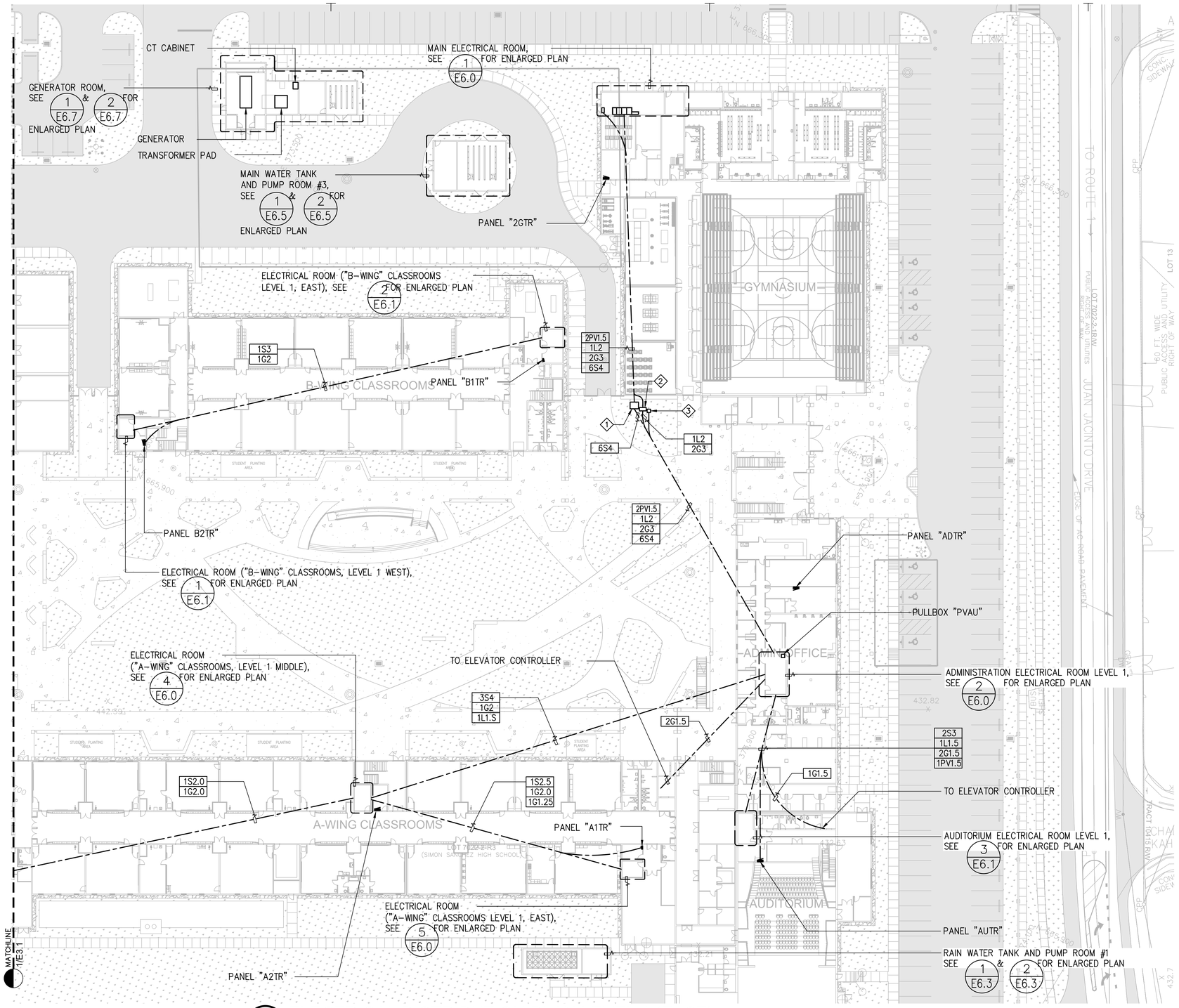

NOTES:

1. 4'X5' HANDHOLE, SIMILAR TO 1 E8.4 EXCEPT LETTERING SHALL INDICATE POWER ON HANDHOLE COVER WITH LETTER "S" FOR SECONDARY IN LIEU OF "P".
2. 2'X4' HANDHOLE, SEE 1 E8.3
3. 2'X2' HANDHOLE, SEE 1 E8.2

1 ELECTRICAL DISTRIBUTION PLAN LEVEL 1 (EAST)

SCALE: 1"=30'-0"

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'-0"

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Architecture
Planning
Interior Design

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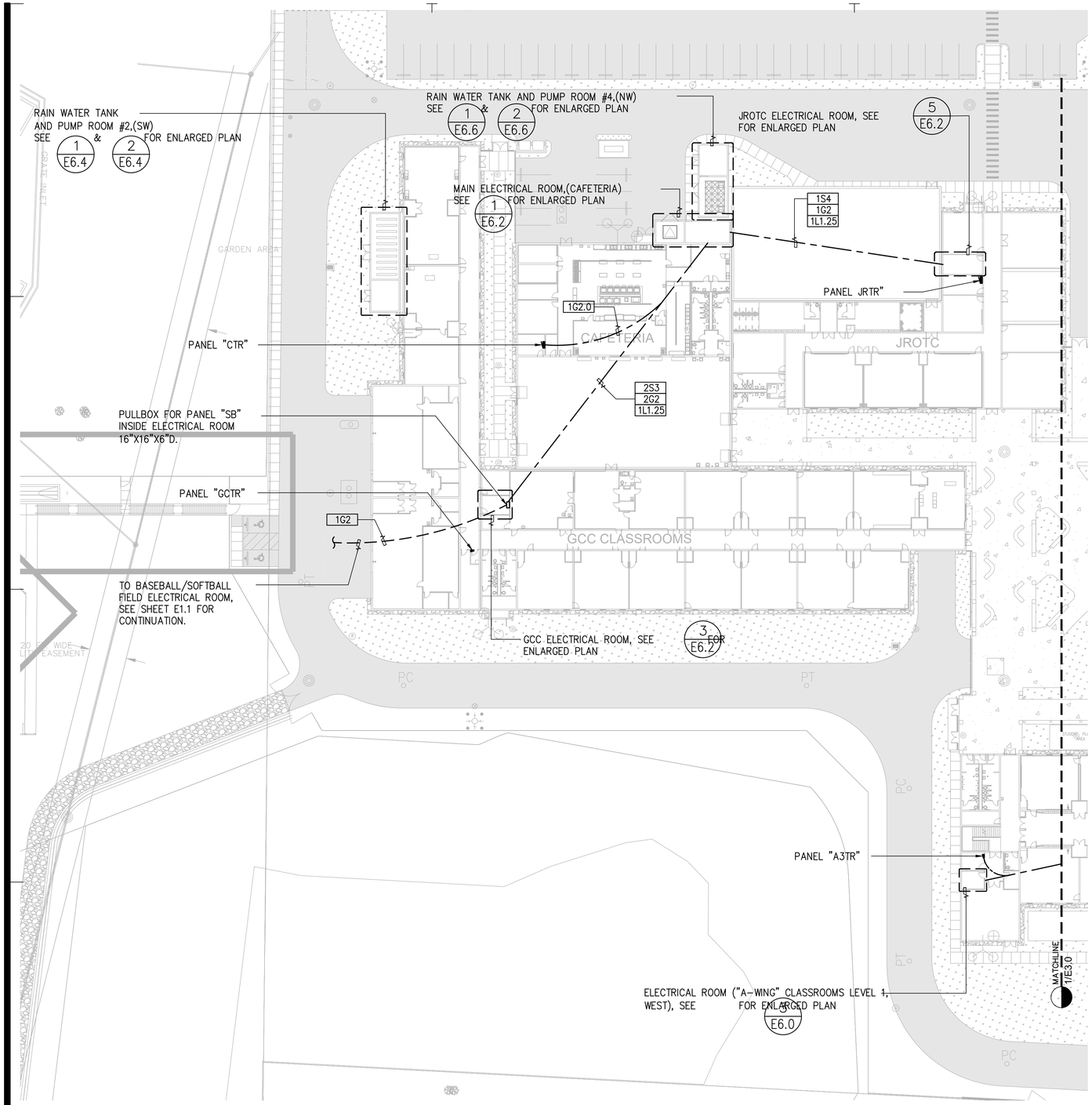
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ELECTRICAL DISTRIBUTION PLAN LEVEL 1 (EAST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	Title
24-20-486	

Drawing No. E3.0

Sheet No. _____ of _____



1 ELECTRICAL DISTRIBUTION PLAN - LEVEL 1 (WEST)
SCALE: 1"=30'-0"

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

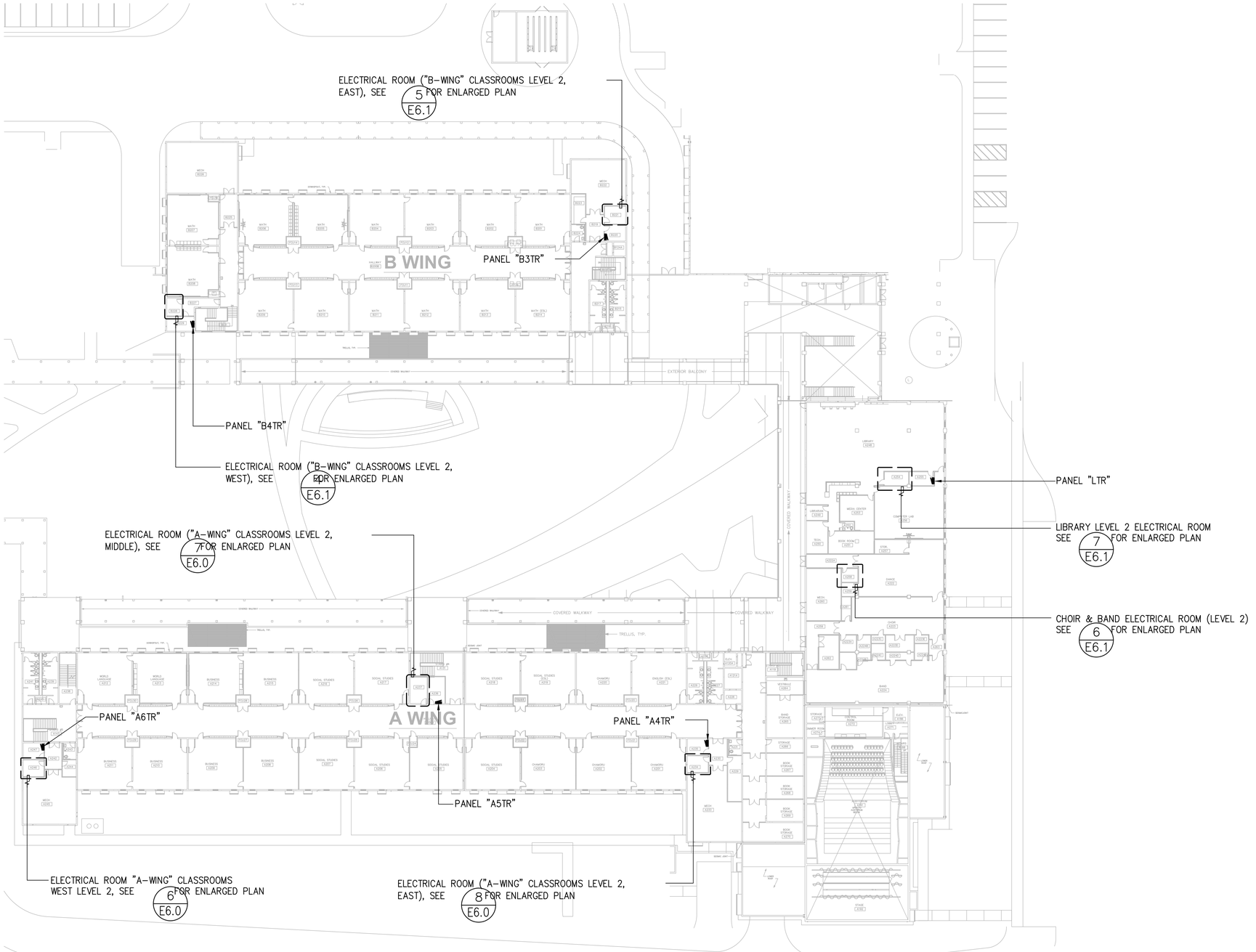
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ELECTRICAL DISTRIBUTION PLAN - LEVEL 1 (WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	File

Drawing No. E3.1

Sheet No. of



1 ELECTRICAL DISTRIBUTION PLAN - LEVEL 2
SCALE: 1"=30'-0"

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Architecture
Planning
Interior Design

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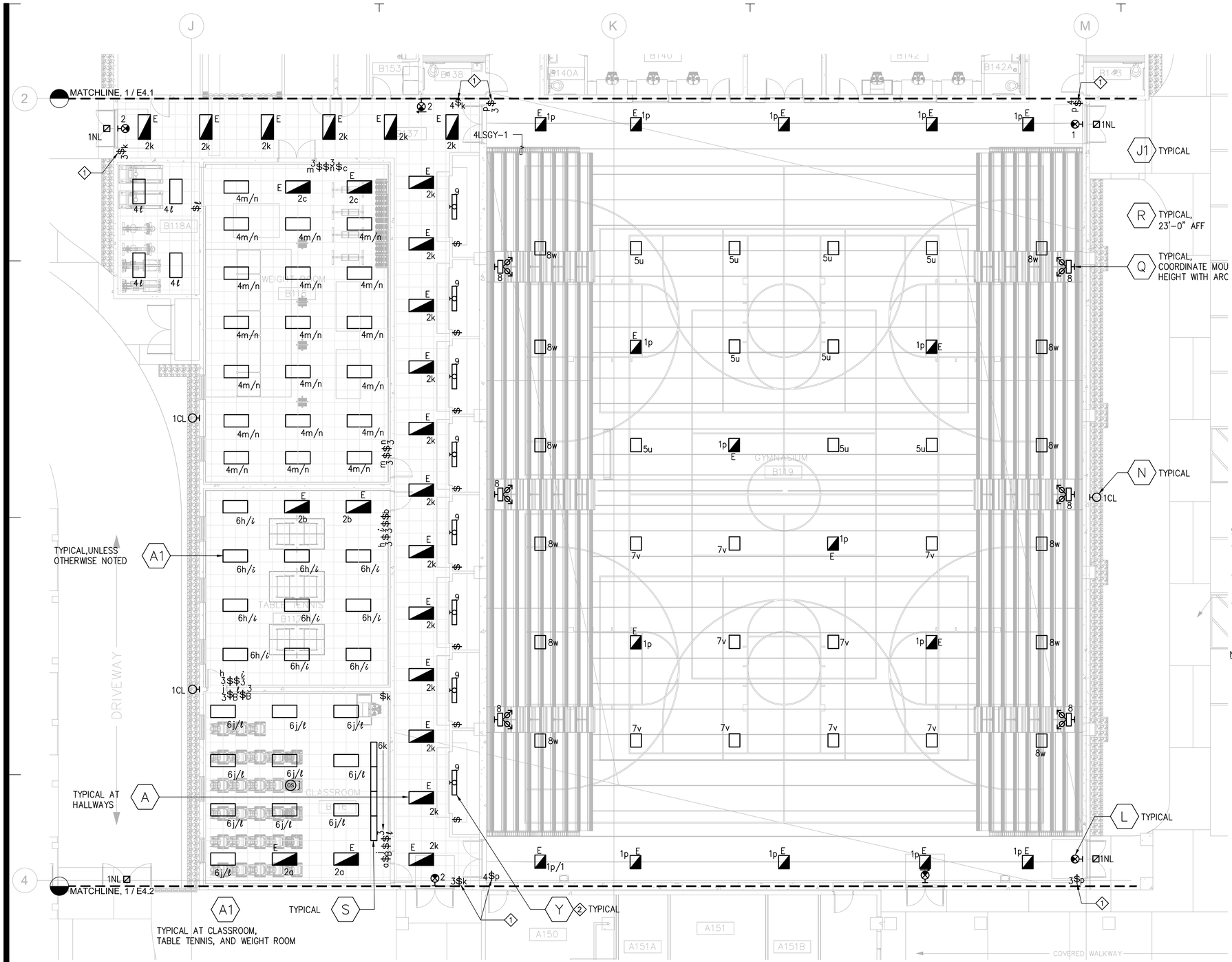
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ELECTRICAL DISTRIBUTION PLAN - LEVEL 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.
E3.2

Sheet No. ____ of ____



GENERAL NOTES:

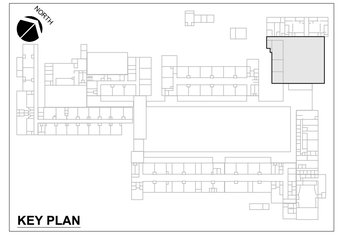
1. PROVIDE SEPERATE UTILITY BOX TO EACH LIGHT CIRCUIT. DO NOT USE GANG TYPE BOX.
2. CONNECT EMERGENCY PACK/EXIT LIGHT TO UNSWITCH CIRCUIT.
3. CONTRACTOR TO SUBMIT ILLUMINATION CALCULATION OF GYMNASIUM BASED IN IES MAINTAINED ILLUMINATION FOR HIGH SCHOOL FOR REVIEW AND APPROVAL.

NOTES:

1. KEY SWITCH.
2. MOUNTED 6" ABOVE ROLL-UP DOOR.

1 GYMNASIUM LIGHTING PLAN - LEVEL 1

SCALE: 1/18"=1'-0"



GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GYMNASIUM LIGHTING PLAN - LEVEL 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E4.0

Sheet No. ____ of ____

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KEY PLAN

GENERAL NOTES:

1. PROVIDE SEPARATE UTILITY BOX TO EACH LIGHT CIRCUIT. DO NOT USE GANG TYPE BOX.
2. CONNECT EMERGENCY PACK/EXIT LIGHT TO UNSWITCHED CIRCUIT.

NOTES:

1. SWITCHBANK "u,v,w"
2. KEY SWITCH.

1 LOCKER ROOM LIGHTING PLAN - LEVEL 1

SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: LOCKER ROOM LIGHTING PLAN - LEVEL 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	
Drawing No.	E4.1
Sheet No.	of

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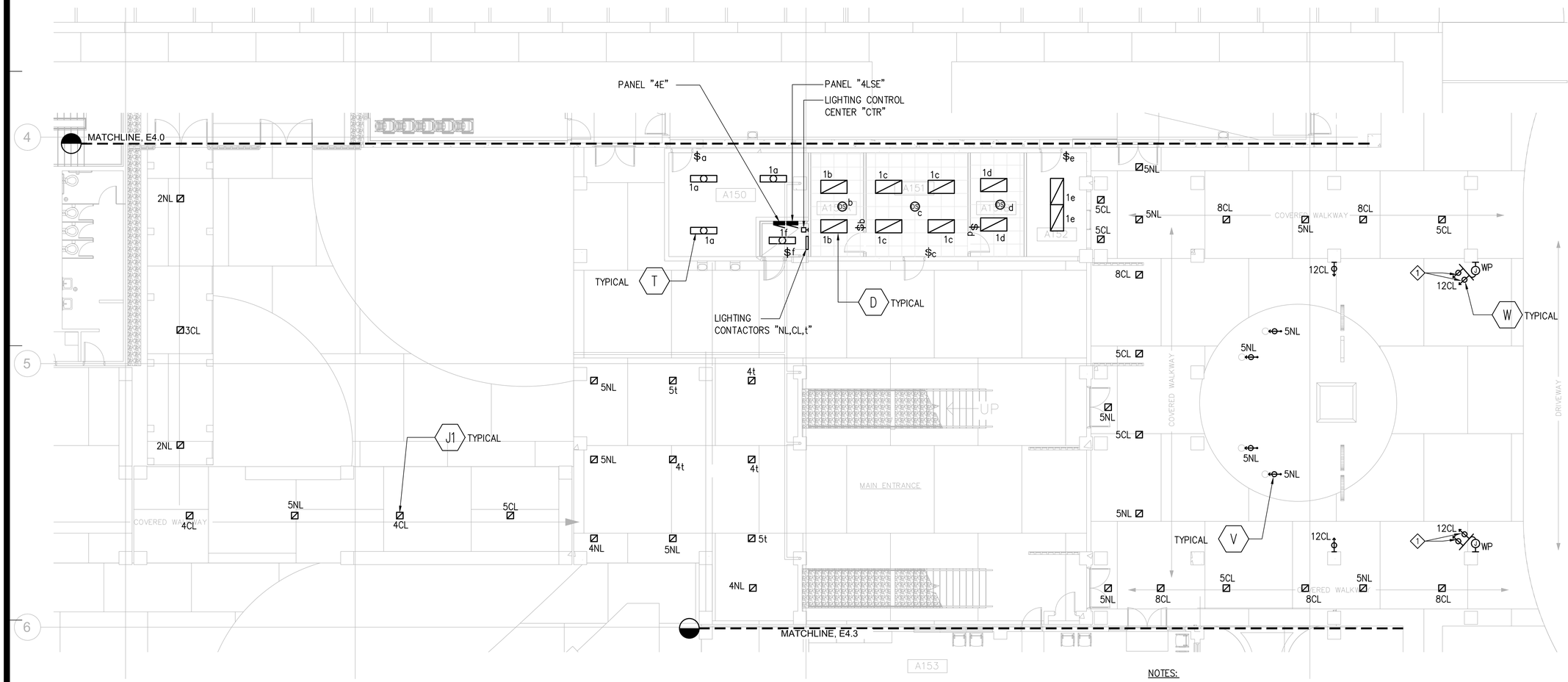


NOTES:

1. PROVIDE COMPUTERIZED FOOT CANDLE DATA. CONTRACTOR MUST PERFORM COMPUTERIZED POINT TO POINT LIGHTING CALCULATIONS TO PROVE THE FINAL LIGHT FIXTURE SELECTED WILL MEET THE REQUIREMENTS 75FC LIGHTING TO THE STATUE. ADD LIGHT FIXTURES AND ADJUST BRANCH CIRCUITING IF NECESSARY, TO THE REQUIREMENT WITHOUT ADDITIONAL COST.

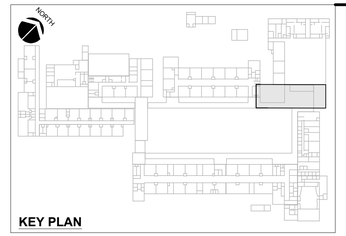
1 MAIN ENTRANCE LIGHTING PLAN - LEVEL 1

SCALE: 1/8"=1'-0"

GRAPHIC SCALE: 0 4' 8' 16'

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



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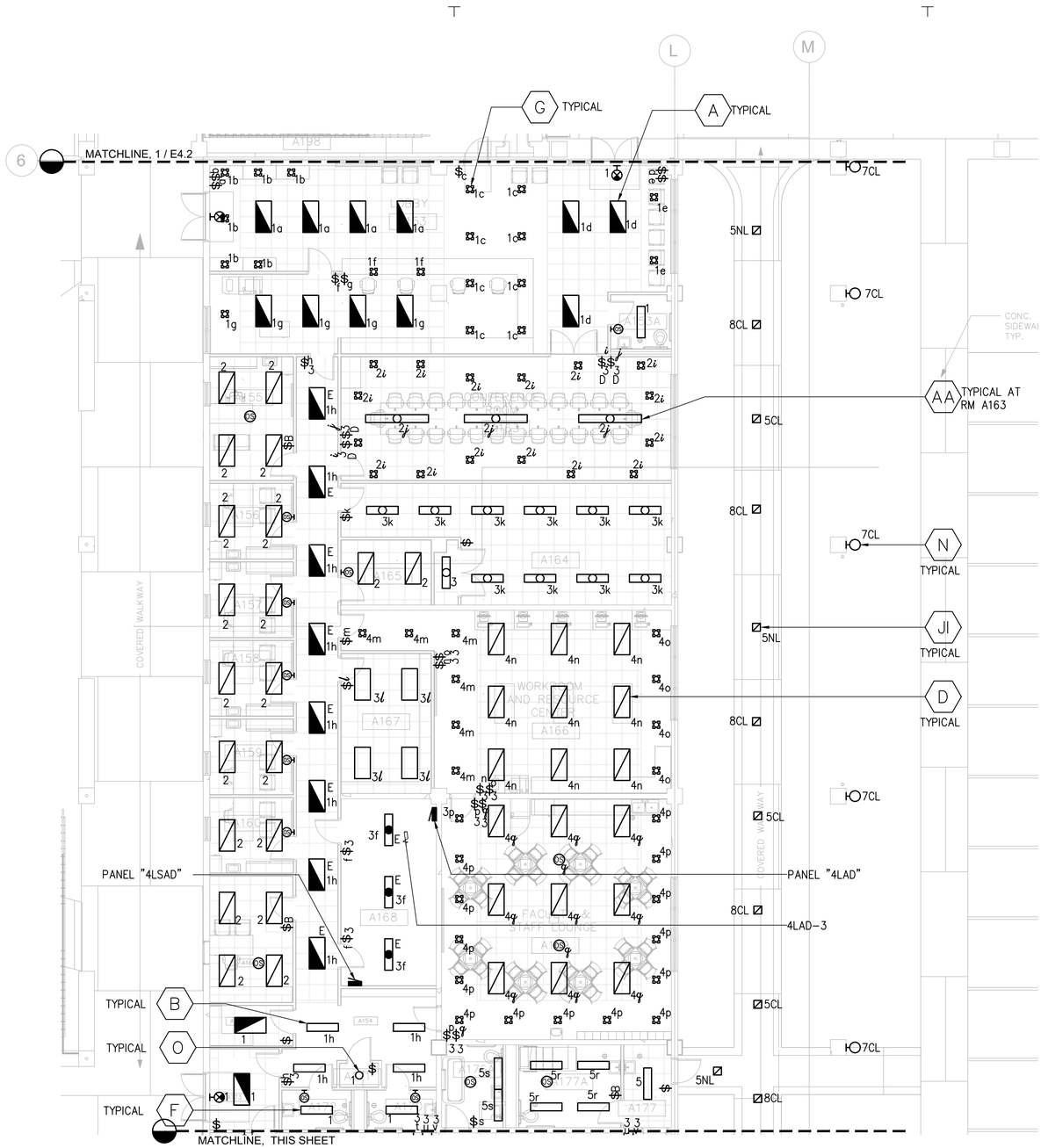
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

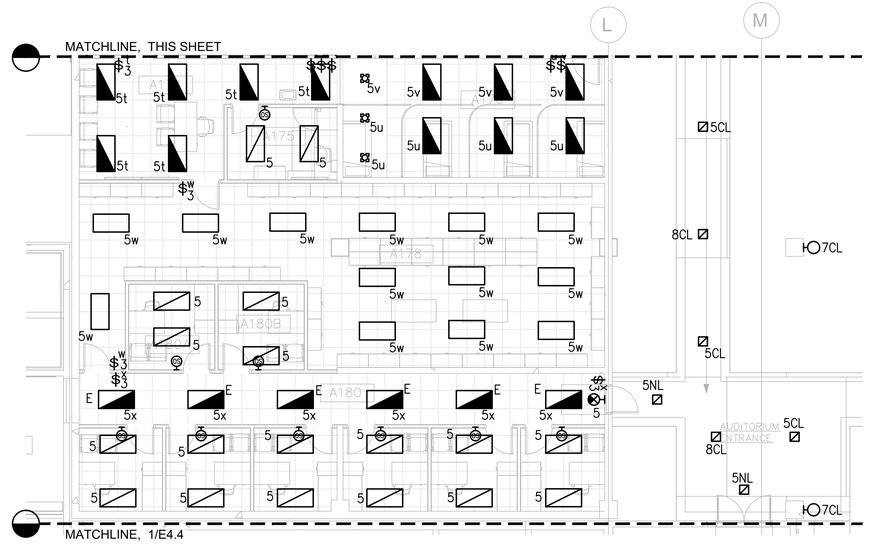
Title: MAIN ENTRANCE LIGHTING PLAN - LEVEL 1

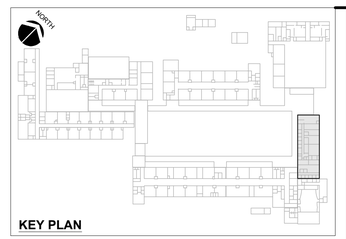
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E4.2

Sheet No. _____ of _____







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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ADMIN. LIGHTING PLAN - LEVEL 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486

Drawing No. E4.3

Sheet No. ____ of ____

1 ADMIN. LIGHTING PLAN - LEVEL 1
SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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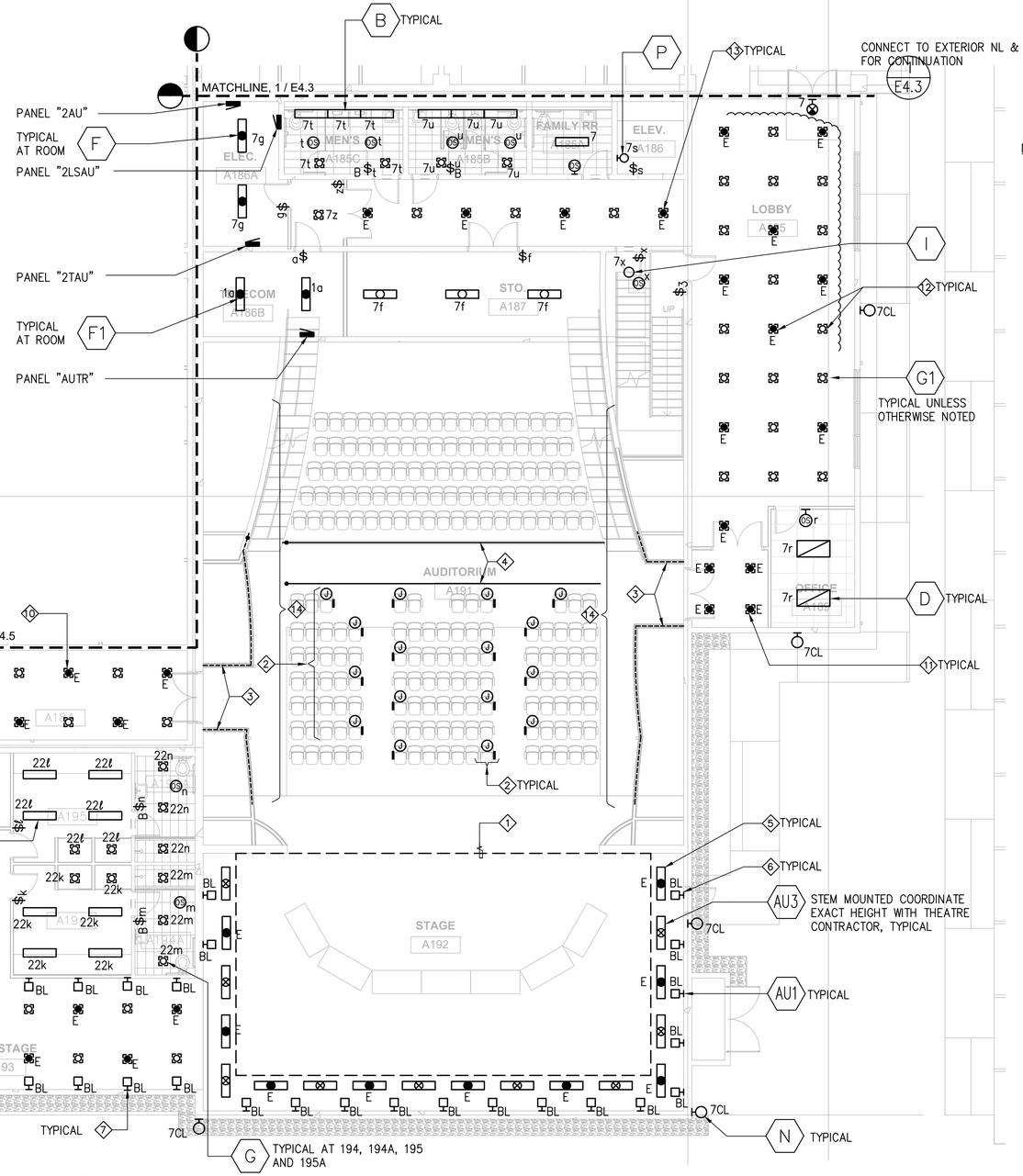
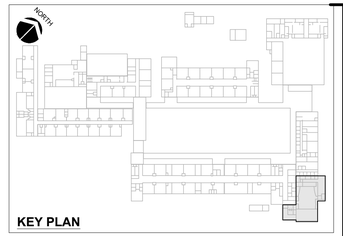


1 AUDITORIUM LIGHTING PLAN - LEVEL 1
SCALE: 1/8"=1'-0"



NOTES:

1. WORK LIGHTS HUNG FROM BATTENS WILL ILLUMINATE CENTER STAGE AND WILL BE PART OF THEATRE SYSTEMS WORK SHOWN ON DLAA DRAWINGS AND SPECS.
2. SEAT MOUNTED AISLE LIGHTING, REFER TO SEATING SPECIFICATION. SEE AU6, SHEET E9.12 FOR MOUNTING. SUBMIT SHOP DRAWING SHOWING LAYOUT, MOUNTING DETAIL, LIGHT FIXTURE DATA SHEET, POINT TO POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL. ELECTRICAL CONTRACTOR TO COORDINATE WITH THEATRE CONTRACTOR. AISLE LIGHTING CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE C.
3. RECESSED STEP LIGHT, SEE AU2, SHEET E9.12. SUBMIT SHOP DRAWING LAYOUT, MOUNTING DETAIL, LIGHT FIXTURE DATA SHEET, POINT TO POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL. ELECTRICAL CONTRACTOR TO COORDINATE WITH THEATRE CONTRACTOR. STEP LIGHTS SHALL BE 3'-0" ON CENTER. RECESSED STEP LIGHT CIRCUITS WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 6A.
4. LIGHTING FOR EGRESS AT FLOOR LEVEL, INCORPORATED INTO CARPET EDGES, SEE AU7, SHEET E9.12. SUBMIT SHOP DRAWING SHOWING LAYOUT, MOUNTING DETAIL, LIGHT FIXTURE DATA, POINT TO POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL. ELECTRICAL CONTRACTOR TO COORDINATE WITH THEATRE CONTRACTOR. CARPET LIGHTS CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 6.
5. PERIMETER LIGHTS CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 14. LIGHT FIXTURES WITH LETTER "E" DESIGNATION WILL BE UNDER EMERGENCY CIRCUIT.
6. STAGE BLUE LIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 18.
7. SHOP BLUE (BACKSTAGE) LIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 17.
8. SHOP (BACKSTAGE) DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 11. LIGHT FIXTURE WITH LETTER "E" DESIGNATION WILL BE UNDER EMERGENCY CIRCUIT.
9. VESTIBULE A196 DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 10. LIGHT FIXTURE WILL BE UNDER EMERGENCY CIRCUIT.
10. VESTIBULE A184 DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 9. LIGHT FIXTURE WITH LETTER "E" DESIGNATION WILL BE UNDER EMERGENCY CIRCUIT.
11. VESTIBULE A190 DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 8. LIGHT FIXTURE WILL BE UNDER EMERGENCY CIRCUIT.
12. LOBBY DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 15. LIGHT FIXTURE WITH LETTER "E" DESIGNATION WILL BE UNDER EMERGENCY CIRCUIT.
13. DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 19. LIGHT FIXTURE WILL BE UNDER EMERGENCY CIRCUIT.
14. WALL ACCENT FIXTURES, SEE 1/E9.13

GRAPHIC SCALE: 0 4' 8' 16'
SCALE: 1/8"=1'-0"

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No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

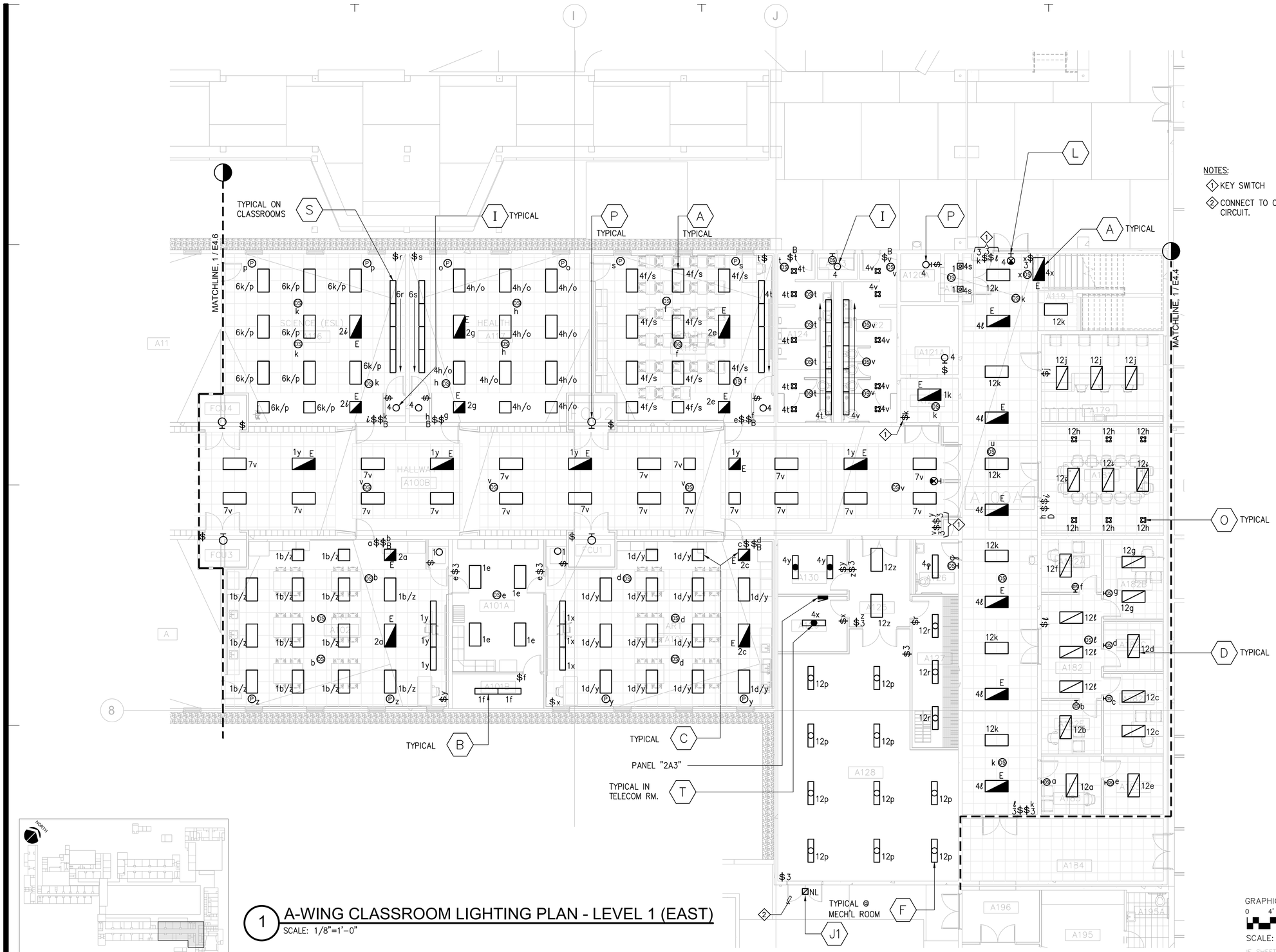
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM LIGHTING PLAN - LEVEL 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No.: E4.4

Sheet No: _____ of _____



NOTES:

1. KEY SWITCH
2. CONNECT TO COURTYARD NIGHTLIGHT CIRCUIT.

1 A-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (EAST)

SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8'
SCALE: 1/8"=1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (EAST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	
Drawing No.	E4.5
Sheet No.	of

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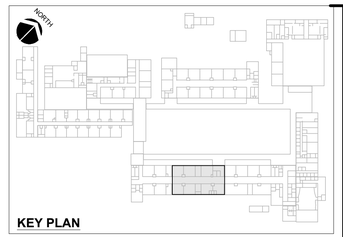
NOTES:

1. KEY SWITCH
2. CONNECT TO EXTERIOR CURFEW LIGHT CIRCUIT @ MECH A147.



1 A-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (MIDDLE)
SCALE: 1/8"=1'-0"

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

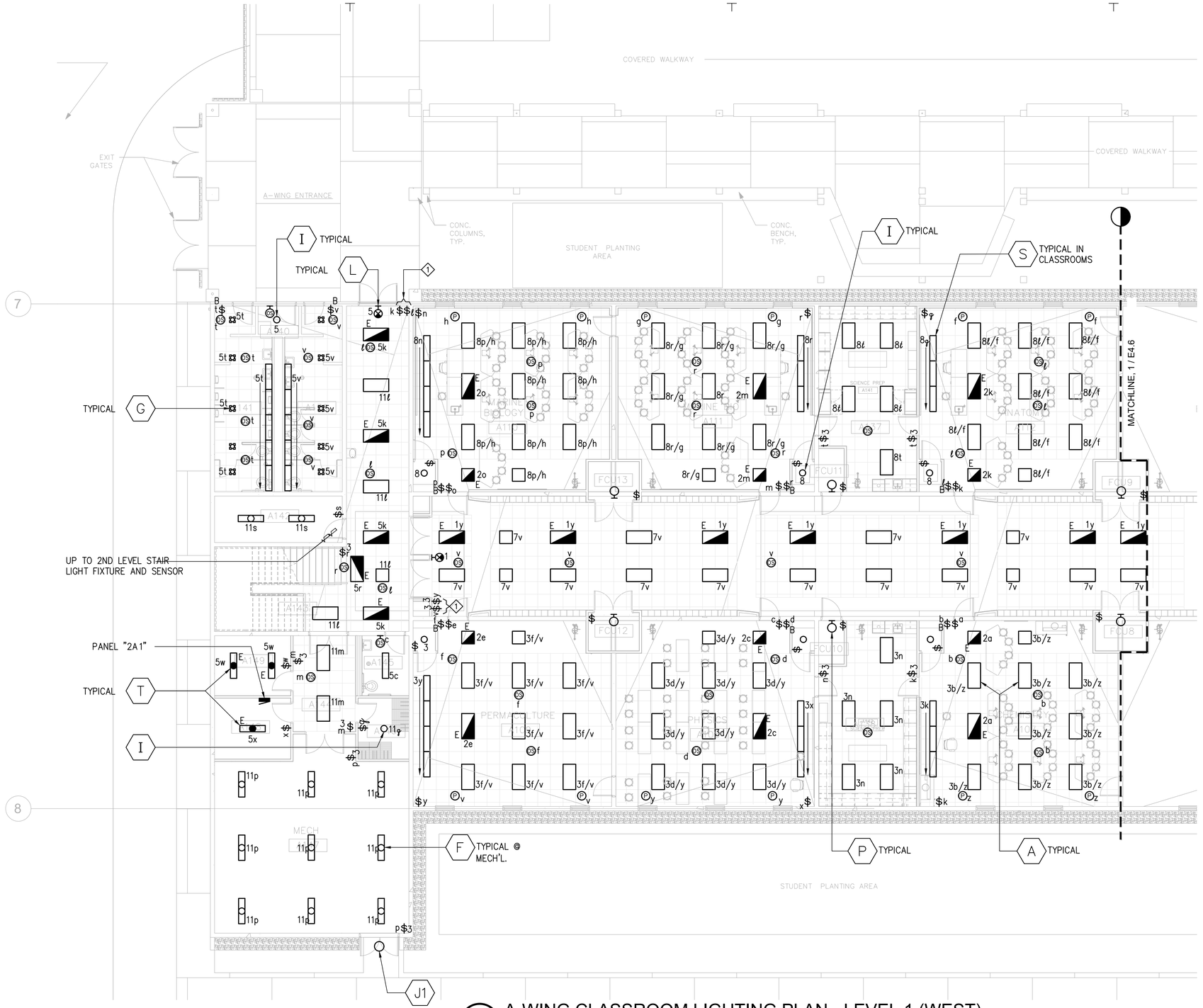
Title:
A-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (MIDDLE)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	

Drawing No.
E4.6

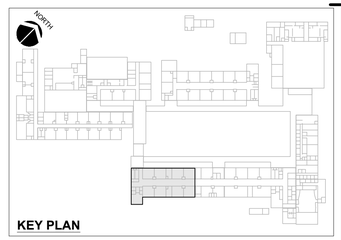
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

Sheet No. ____ of ____



1 A-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (WEST)

SCALE: 1/8"=1'-0"



NOTES:

1. KEY SWITCH

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Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	
Drawing No.	E4.7
Sheet No.	of

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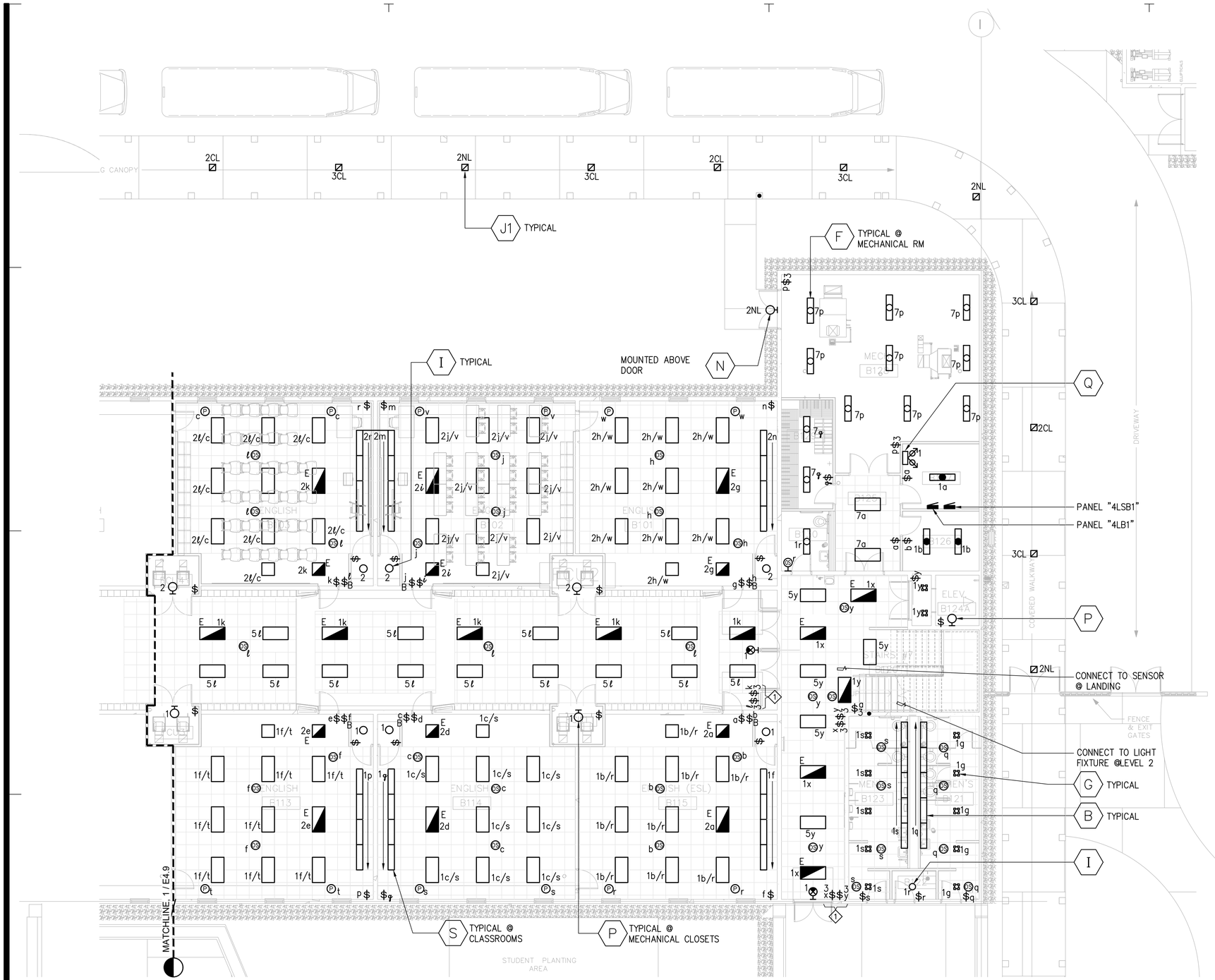
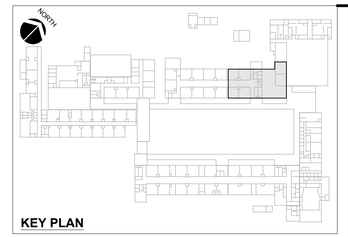


NOTE:
1 KEY SWITCH.

1 B-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (EAST)
SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



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Architecture
Planning
Interior Design

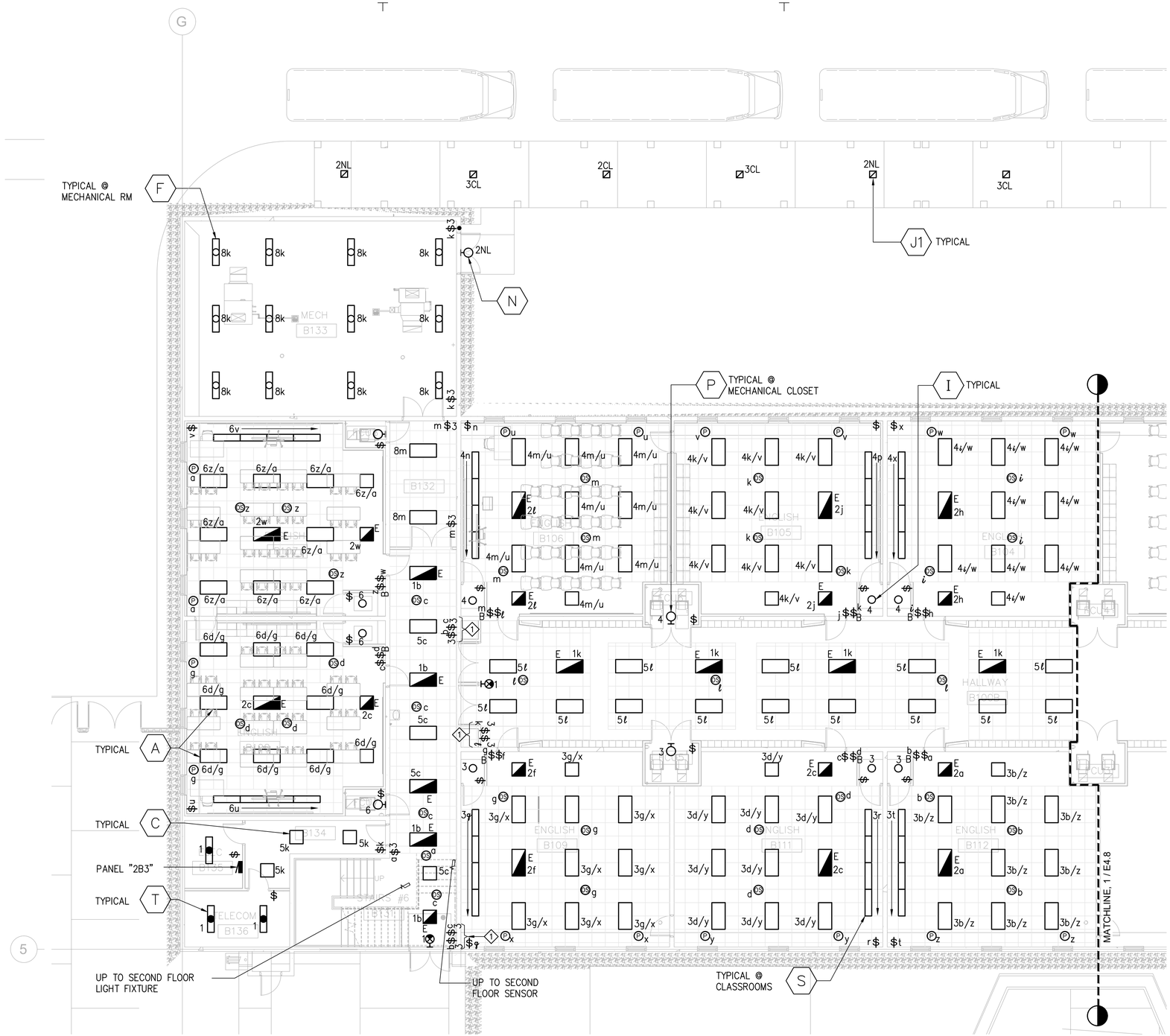
NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

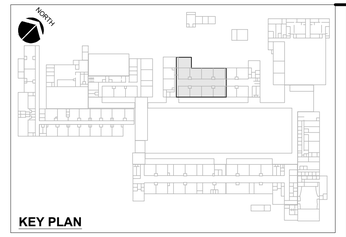
Title: B-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (EAST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E4.8
Sheet No. ____ of ____



1 B-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (WEST)
SCALE: 1/8"=1'-0"



NOTE:
1 KEY SWITCH.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Architecture
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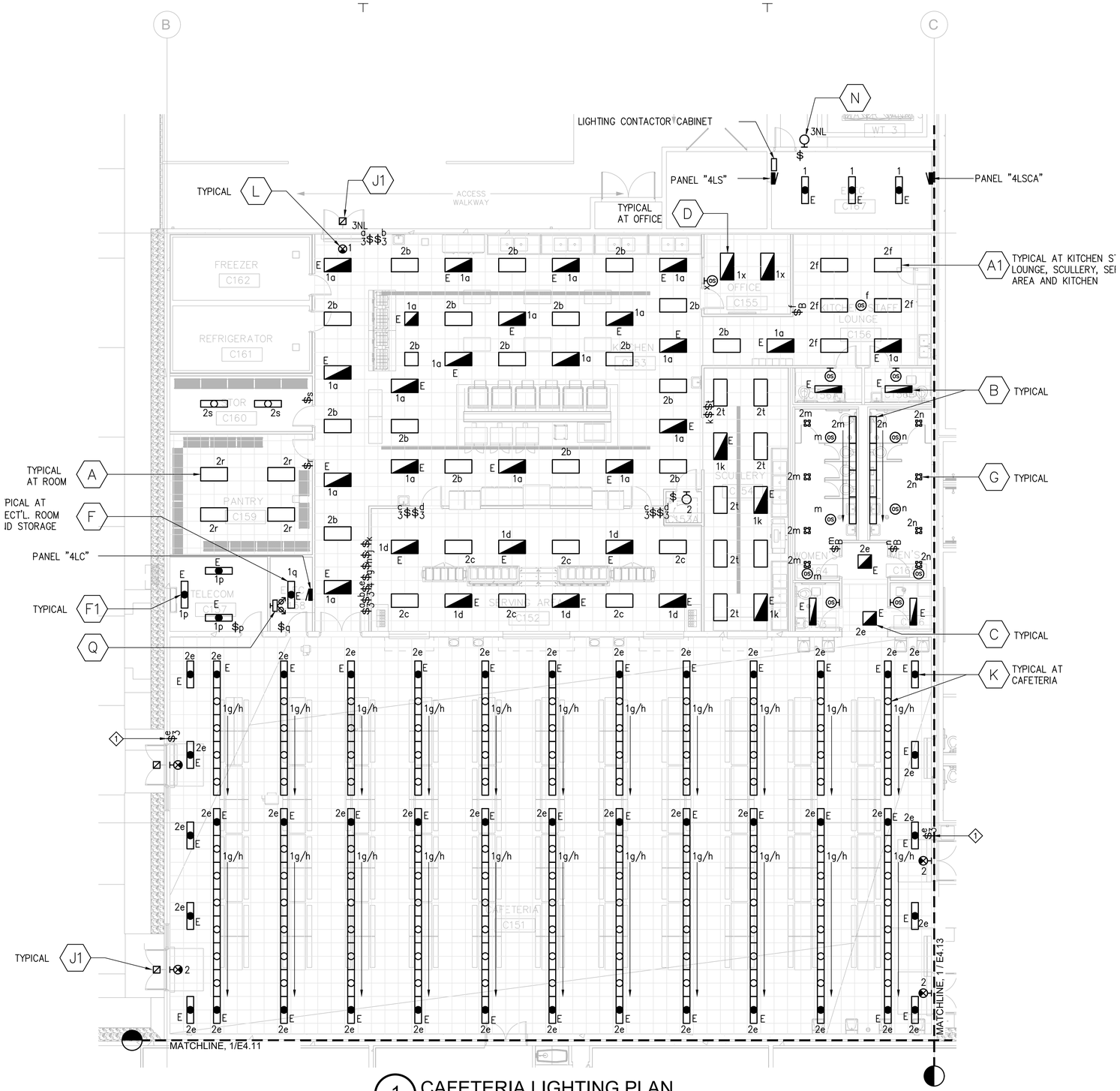
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING CLASSROOM LIGHTING PLAN - LEVEL 1 (WEST)

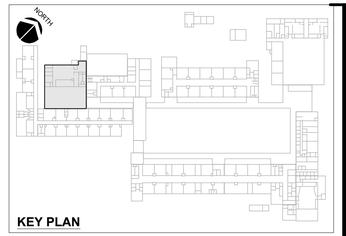
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	File

Drawing No.
E4.9

Sheet No. of



1 CAFETERIA LIGHTING PLAN
SCALE: 1/8"=1'-0"



NOTE:
1 KEY SWITCH.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

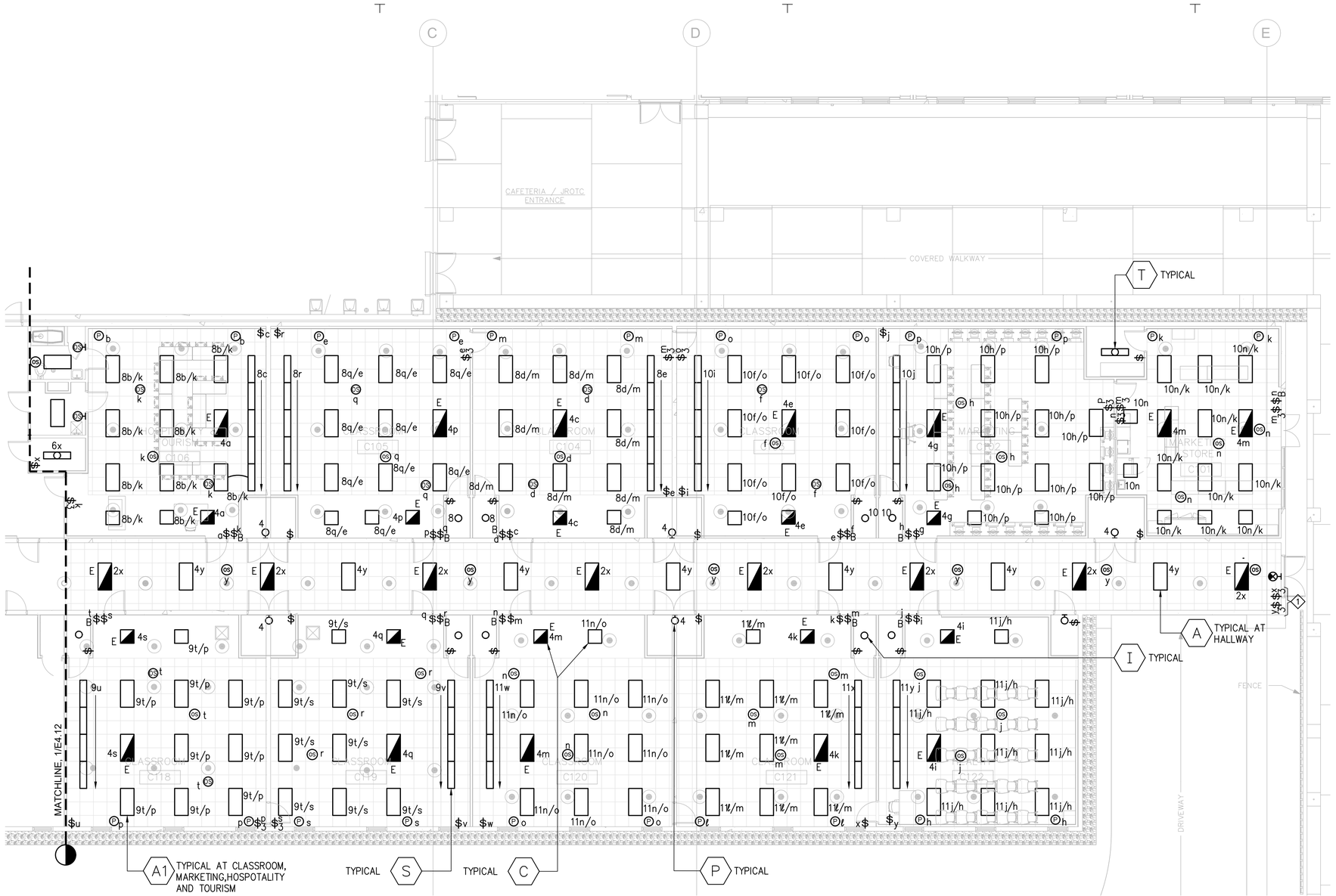
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CAFETERIA LIGHTING PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	

Drawing No. E4.10

Sheet No. ____ of ____

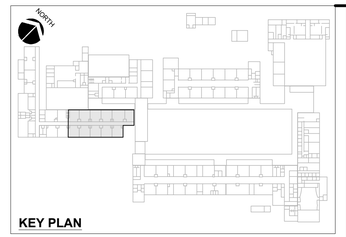


NOTE:

1 KEY SWITCH.

1 GCC CLASSROOM LIGHTING PLAN - (1 OF 2)

SCALE: 1/8"=1'-0"



KEY PLAN

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

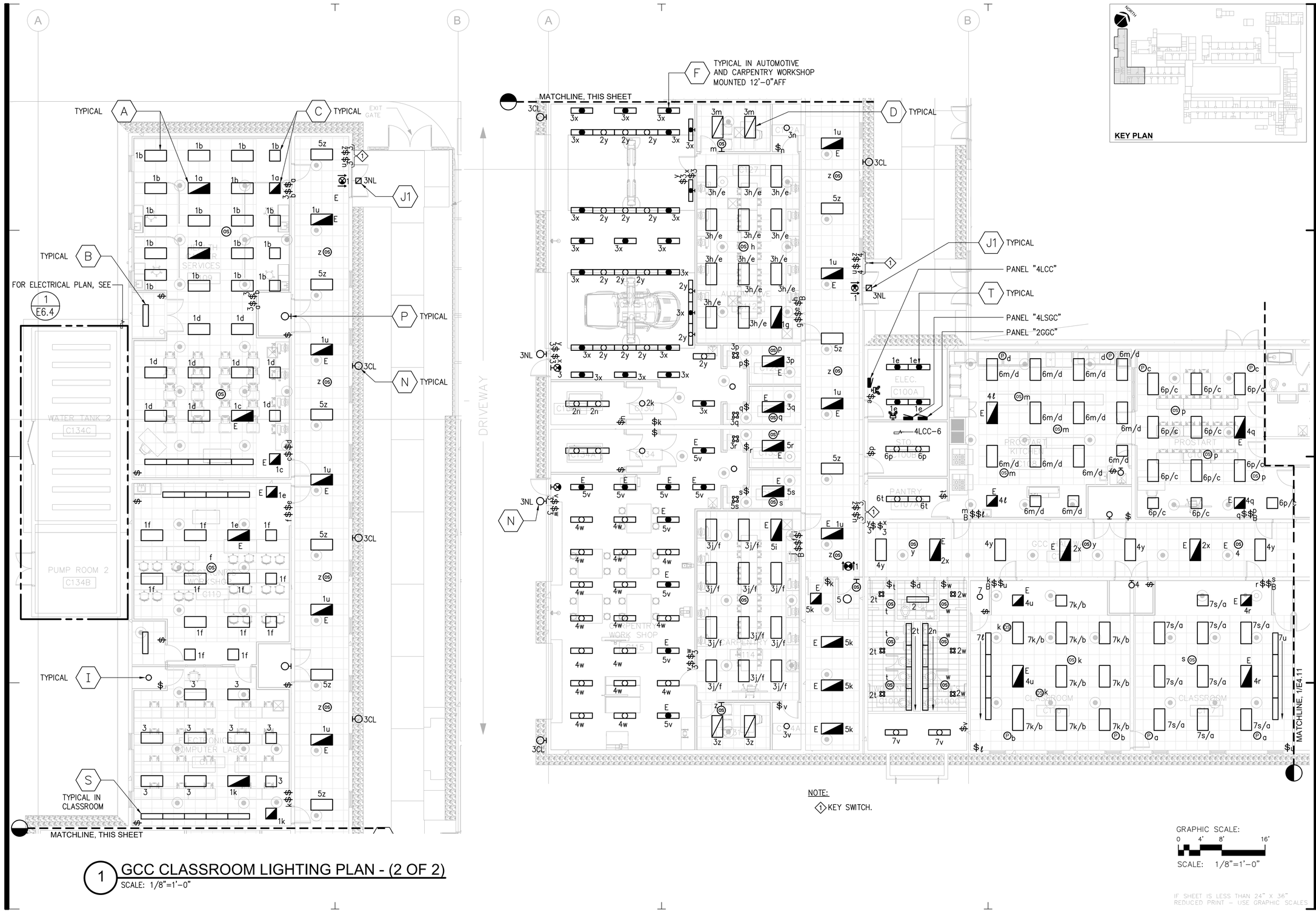
Title: GCC CLASSROOM LIGHTING PLAN - (1 OF 2)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E4.11

Sheet No. ____ of ____

NOT FOR CONSTRUCTION



NOTE:

1 KEY SWITCH.

KEY PLAN

GRAPHIC SCALE: 0 4' 8' 16'

SCALE: 1/8"=1'-0"

1 GCC CLASSROOM LIGHTING PLAN - (2 OF 2)

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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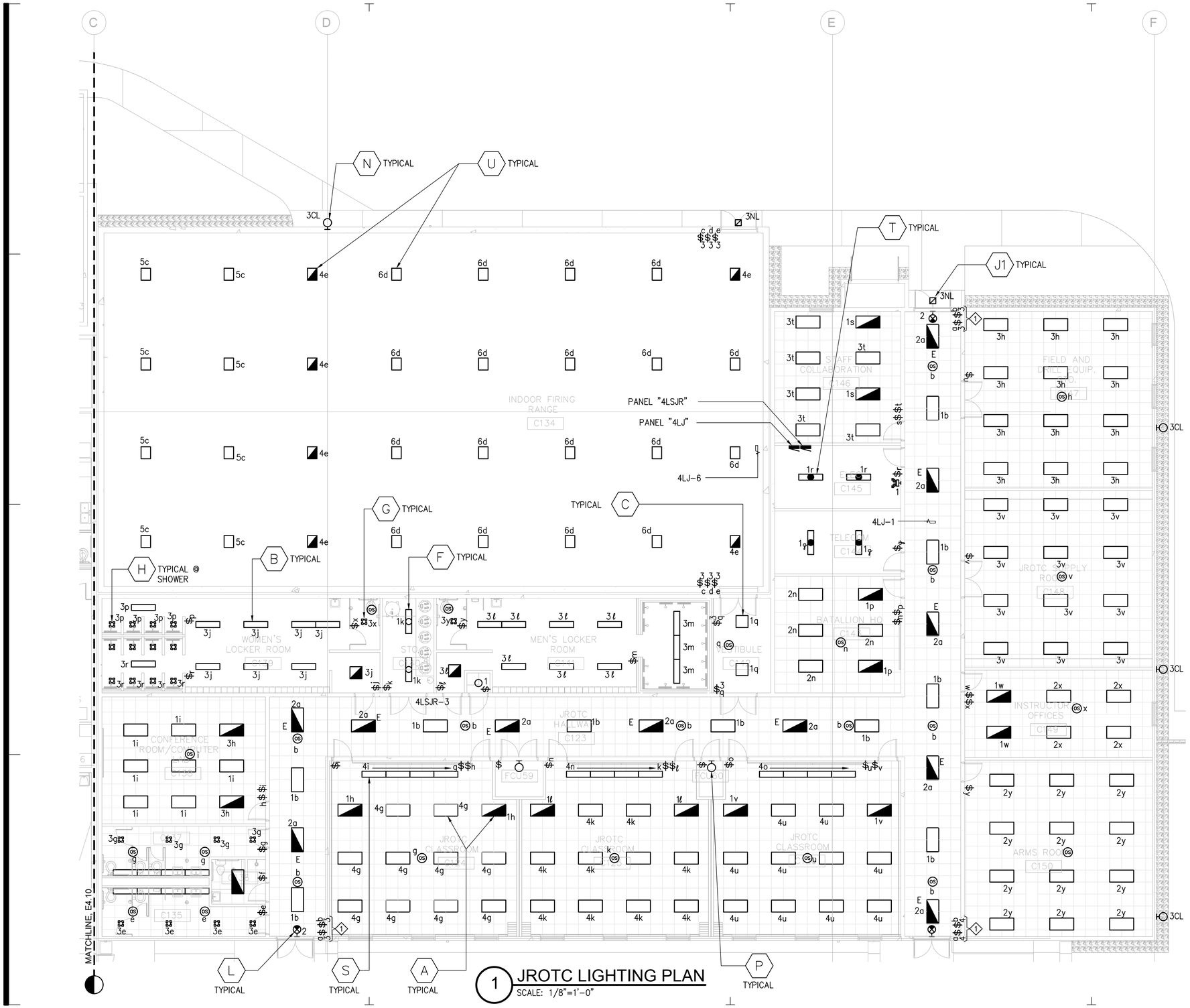
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: GCC CLASSROOM LIGHTING PLAN - (2 OF 2)

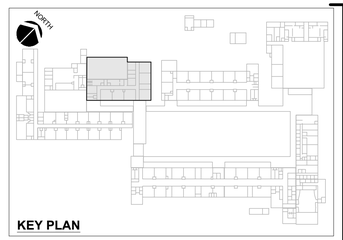
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486

Drawing No.: E4.12

Sheet No. ____ of ____



1 JROTC LIGHTING PLAN
SCALE: 1/8"=1'-0"



NOTE:
1 KEY SWITCH.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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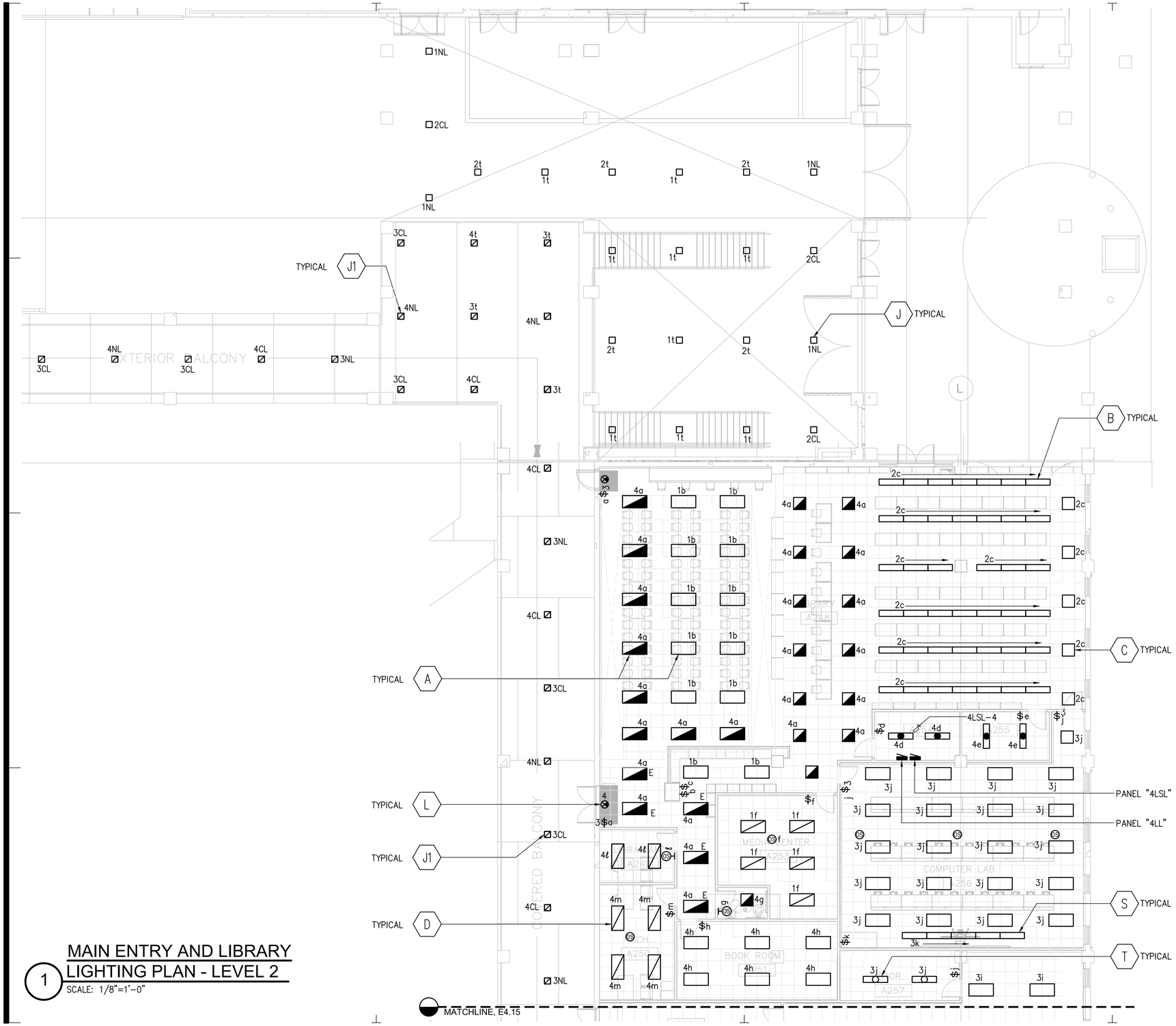
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: JROTC LIGHTING PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	

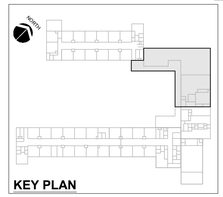
Drawing No. E4.13

Sheet No. _____ of _____



MAIN ENTRY AND LIBRARY LIGHTING PLAN - LEVEL 2

1 SCALE: 1/8"=1'-0"



GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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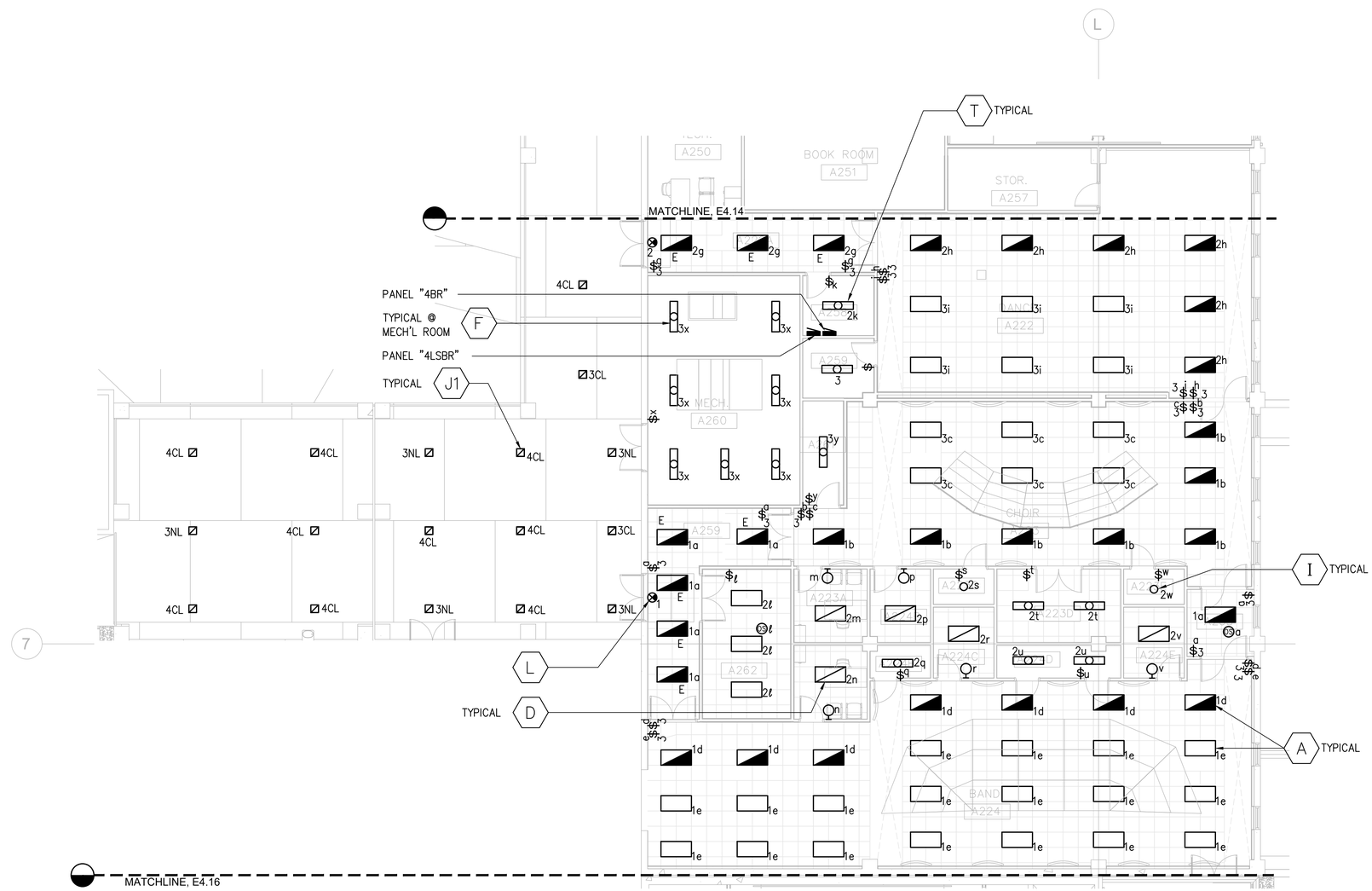
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: MAIN ENTRY AND LIBRARY LIGHTING PLAN - LEVEL 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

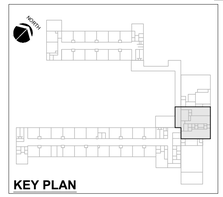
Drawing No. E4.14

Sheet No. ____ of ____



1 CHOIR & BAND LIGHTING PLAN - LEVEL 2

SCALE: 1/8"=1'-0"



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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: CHOIR & BAND LIGHTING PLAN - LEVEL 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
Title:	
Drawing No.:	E4.15
Sheet No.	of

GRAPHIC SCALE: 0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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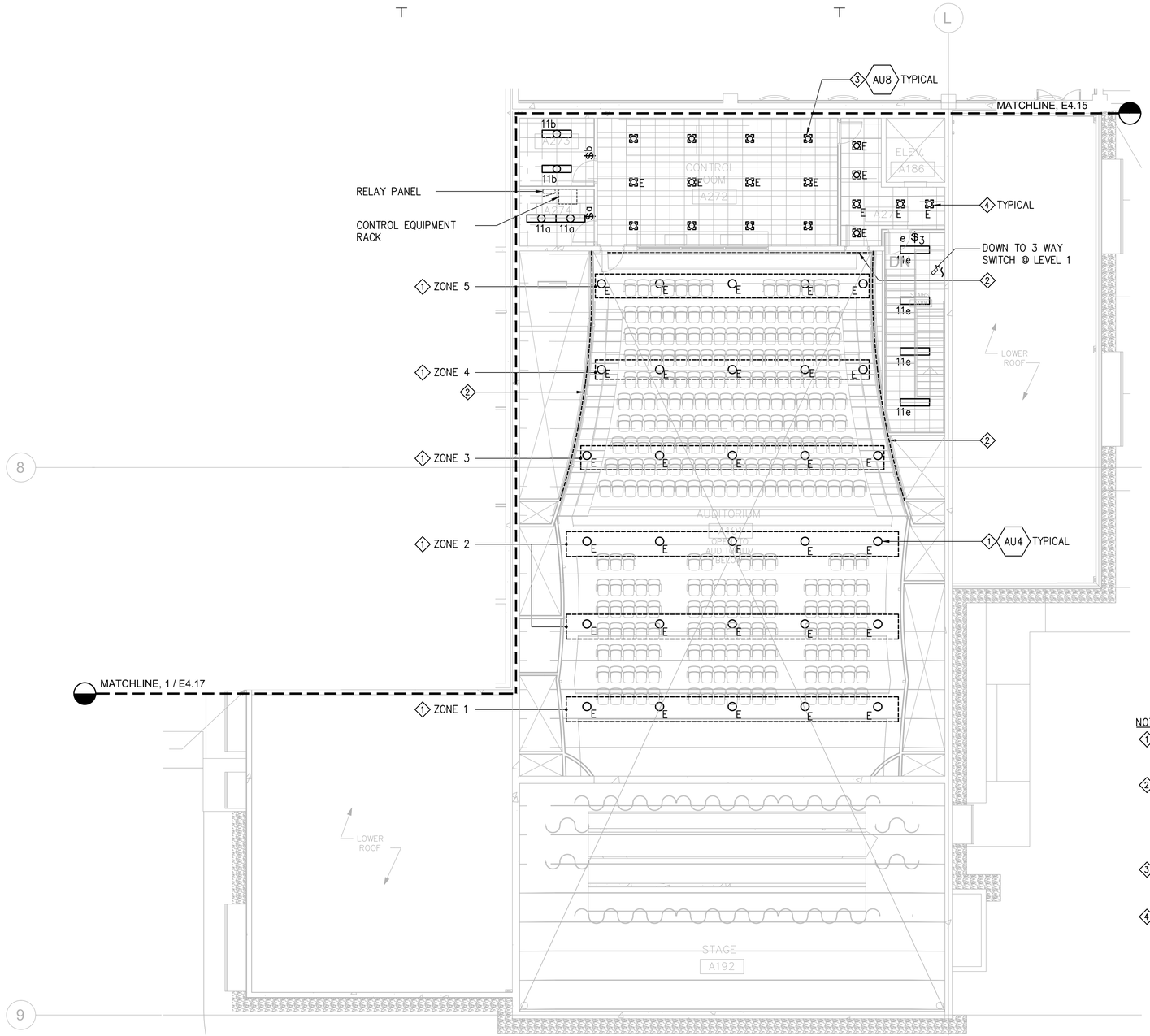


NOTES:

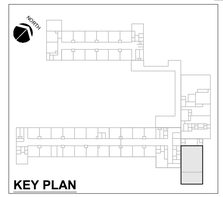
1. AUDIENCE DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE AS INDICATED. LIGHT FIXTURES WILL BE UNDER EMERGENCY CIRCUIT.
2. RECESSED STEP LIGHT, SEE AU–2, SHEET E9.13. SUBMIT SHOP DRAWING LAYOUT, SHOWING LAYOUT, MOUNTING DETAIL, LIGHT FIXTURE DATA SHEET, POINT TO POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL. ELECTRICAL CONTRACTOR TO COORDINATE WITH THEATRE CONTRACTOR. STEP LIGHTING CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM, DRAWINGS AND SPECIFICATIONS, ZONE 6A. STEP LIGHTING SHALL BE 3'–0" ON CENTER.
3. CONTROL ROOM A269 DOWNLIGHT CIRCUIT BE UNDER PERFORMANCE LIGHTING CONTROL SYSTEM DRAWINGS AND SPECIFICATIONS, ZONE 13. LIGHT FIXTURES WITH LETTER "E" DESIGNATION WILL BE UNDER EMERGENCY CIRCUIT.
4. LOBBY DOWNLIGHT CIRCUIT WILL BE UNDER PERFORMANCE LIGHTING DRAWINGS AND SPECIFICATIONS, ZONE 11. LIGHT FIXTURES WILL BE UNDER EMERGENCY CIRCUIT.

1 AUDITORIUM LIGHTING PLAN - LEVEL 2

SCALE: 1/8"=1'–0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'–0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES



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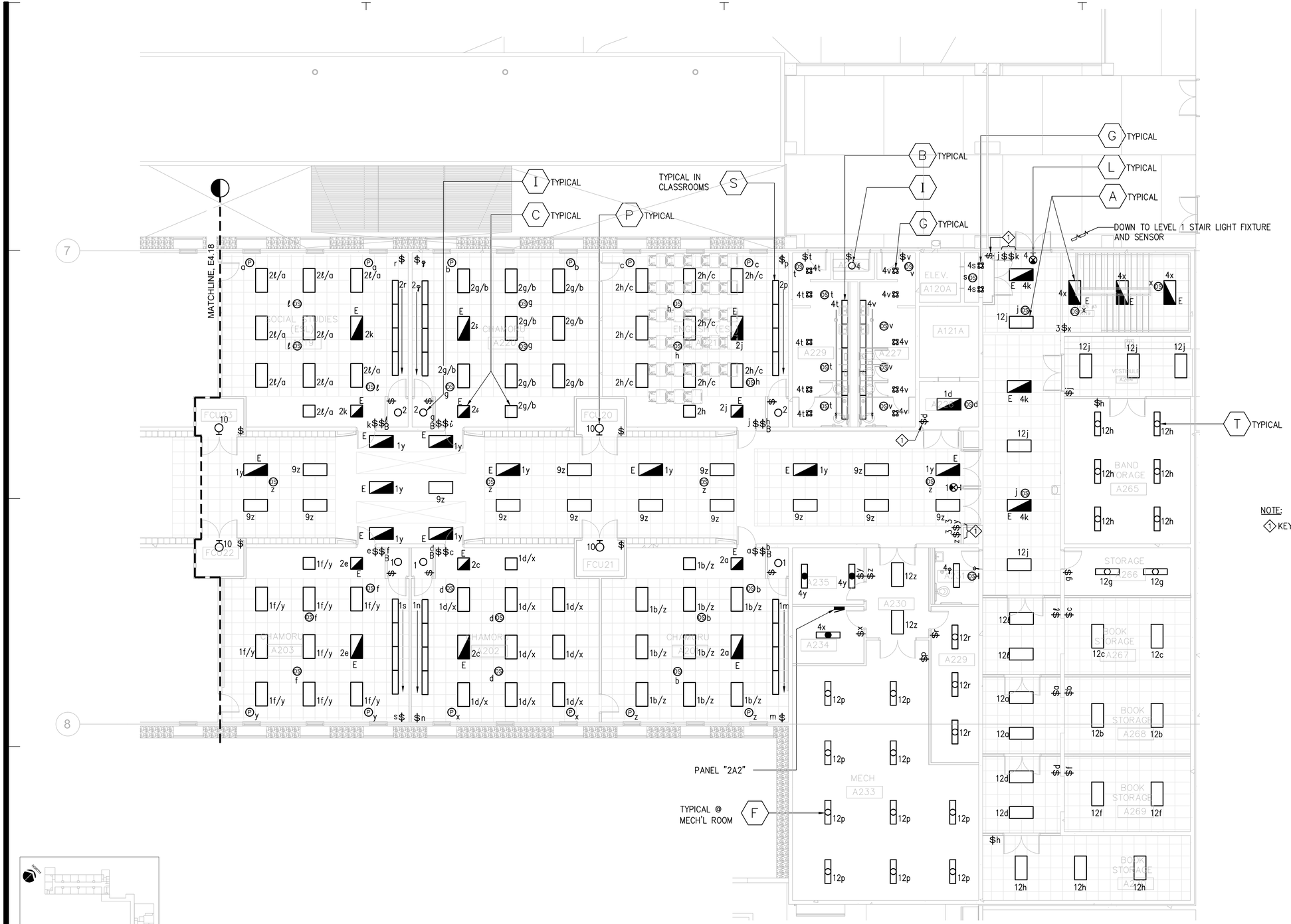
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM LIGHTING PLAN - LEVEL 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E4.16

Sheet No. _____ of _____



NOTE:
1 KEY SWITCH.

KEY PLAN

1 A-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (EAST)
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Planning
Interior Design

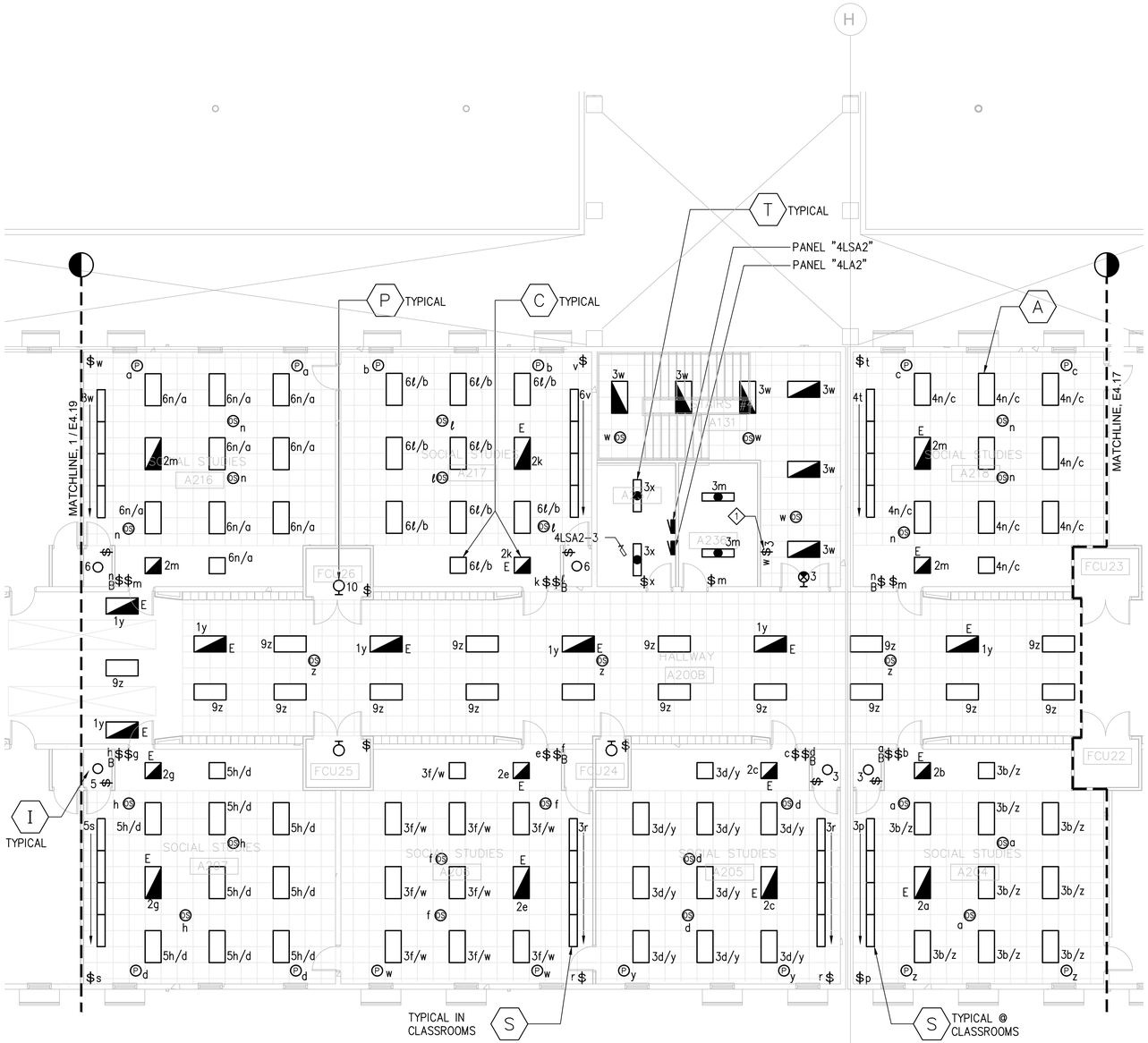
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (EAST)

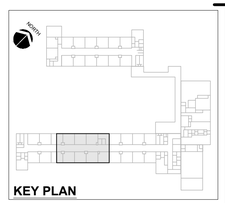
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File:	

Drawing No.:
E4.17

Sheet No. _____ of _____



1 A-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (MIDDLE)
SCALE: 1/8"=1'-0"



NOTE:
1 KEY SWITCH.

GRAPHIC SCALE:
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SCALE: 1/8"=1'-0"

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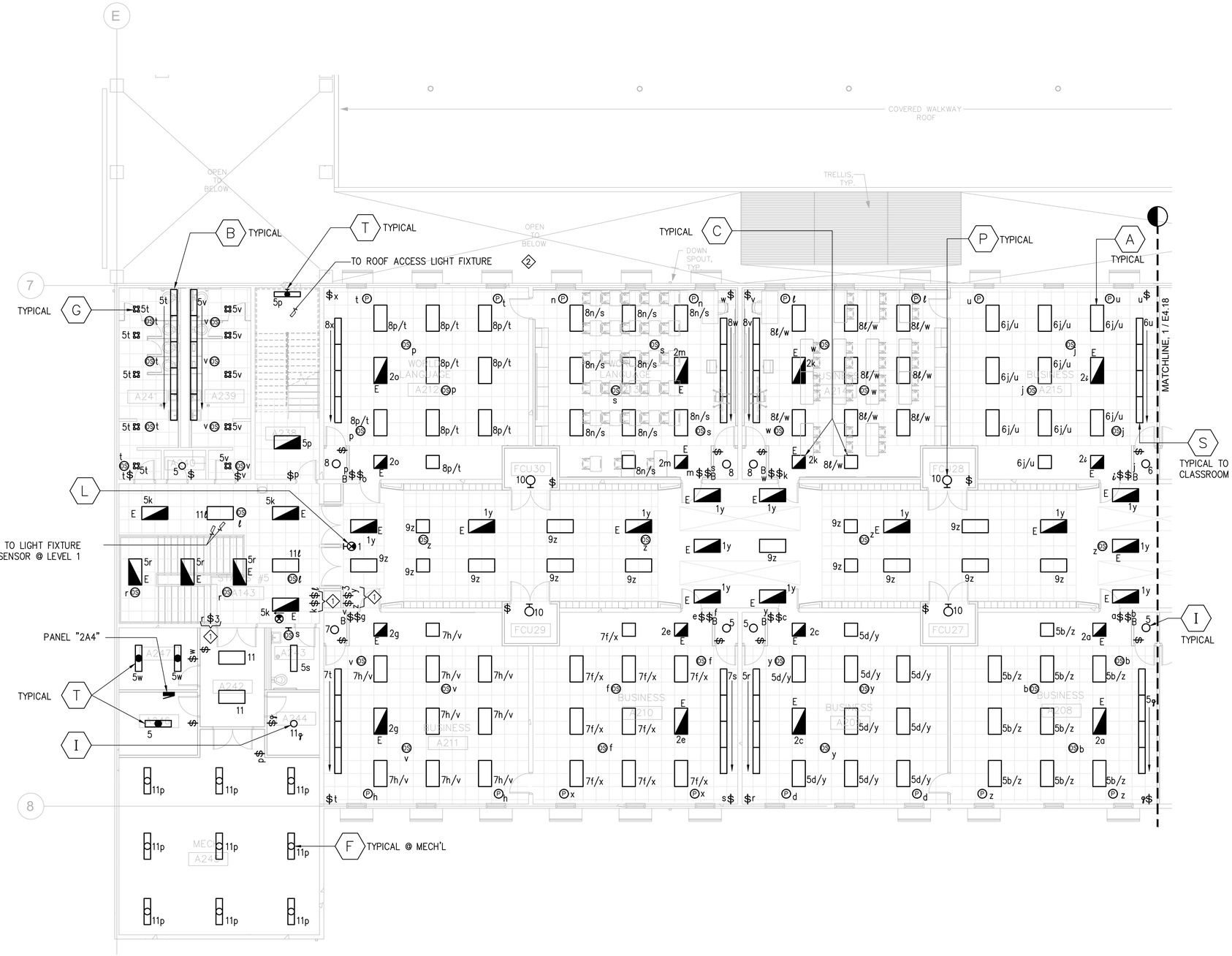
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (MIDDLE)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	
Drawing No.	E4.18
Sheet No.	of

NOT FOR CONSTRUCTION


COVERED WALKWAY ROOF
OPEN TO BELOW
TRELLIS, TYP.
DOWN SPOUT, TYP.
TYPICAL
B TYPICAL
T TYPICAL
C TYPICAL
P TYPICAL
A TYPICAL
TO ROOF ACCESS LIGHT FIXTURE
MATCHLINE, 1 / E4.18
S TYPICAL TO CLASSROOM
L
DOWN TO LIGHT FIXTURE AND SENSOR @ LEVEL 1
PANEL "2A4"
I TYPICAL
F TYPICAL @ MECH'L
A211 WORLD LANGUAGE
A212 BUSINESS
A213 BUSINESS
A214 BUSINESS
A215 BUSINESS
A216 BUSINESS
A217 BUSINESS
A218 BUSINESS
A219 BUSINESS
A220 BUSINESS
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A222 BUSINESS
A223 BUSINESS
A224 BUSINESS
A225 BUSINESS
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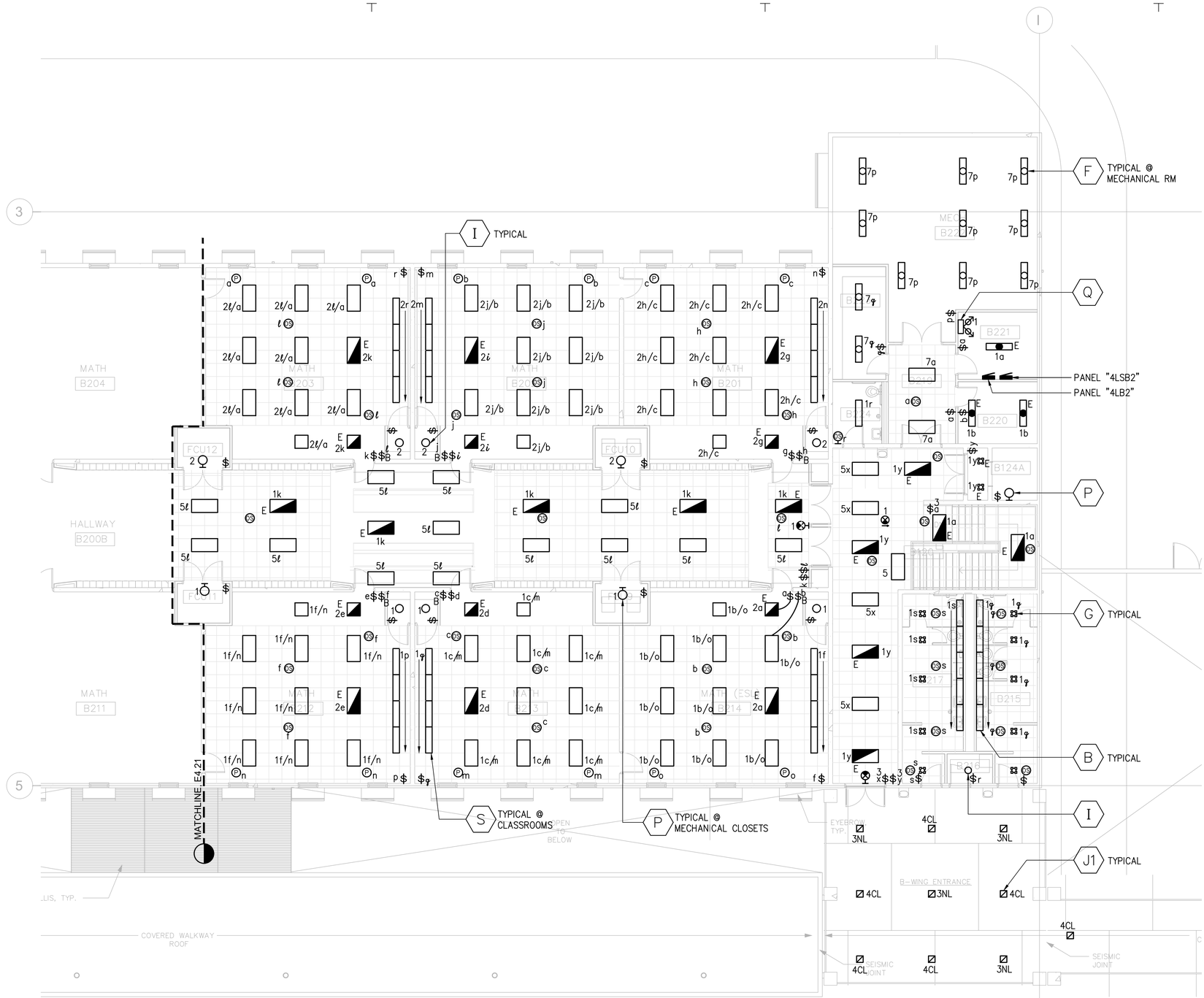
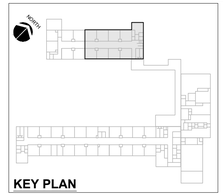
A227 BUSINESS
A228 BUSINESS
A229 BUSINESS
A230 BUSINESS
A231 BUSINESS



1 B-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (EAST)
SCALE: 1/8"=1'-0"



NOTE:
1 KEY SWITCH

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: B-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (EAST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File:	

Drawing No.: E4.20
Sheet No. ____ of ____

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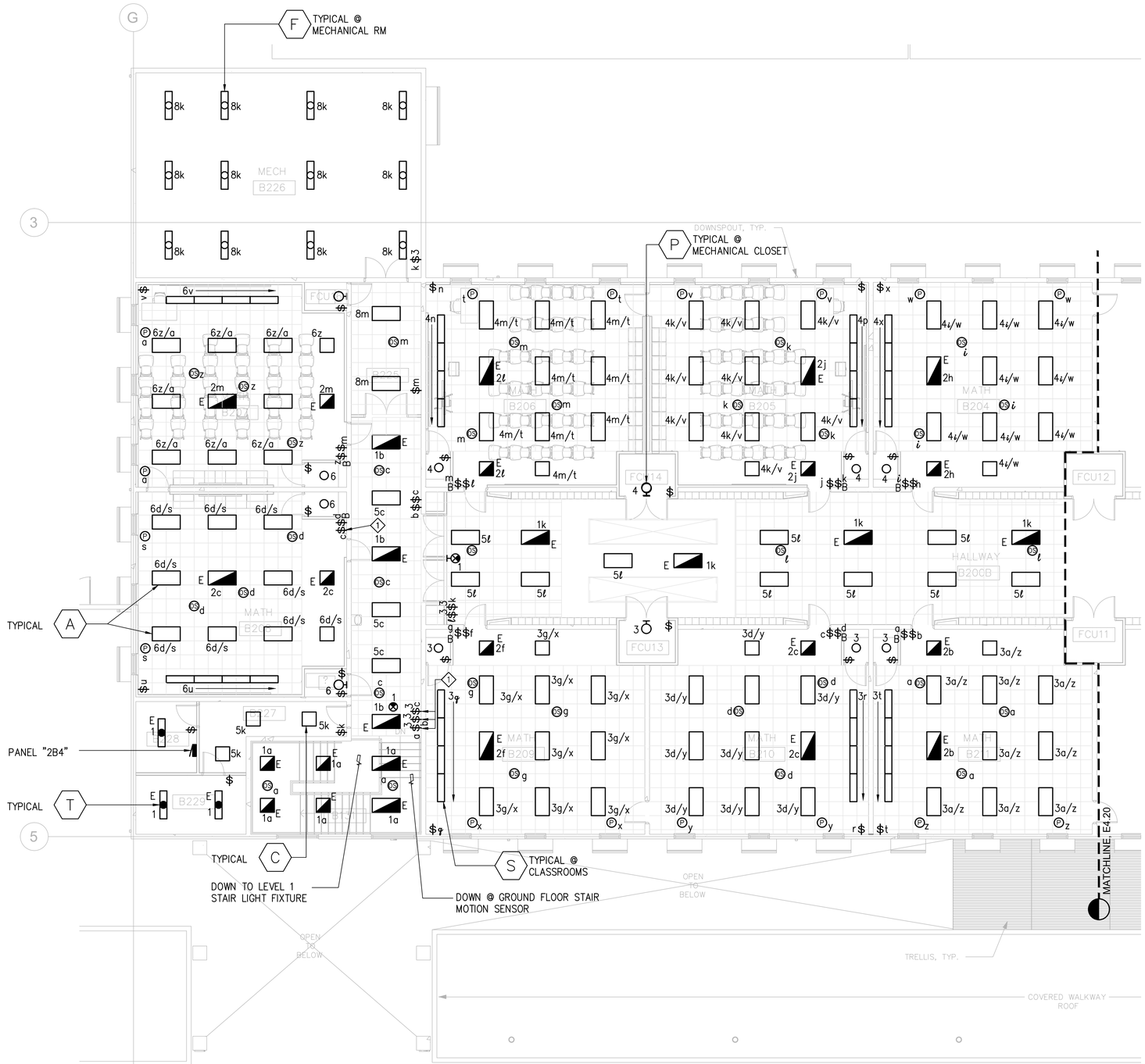
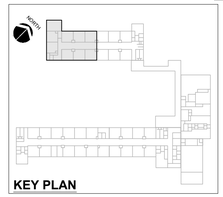


1 B-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (WEST)
SCALE: 1/8"=1'-0"



NOTE:
1 KEY SWITCH

GRAPHIC SCALE:
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

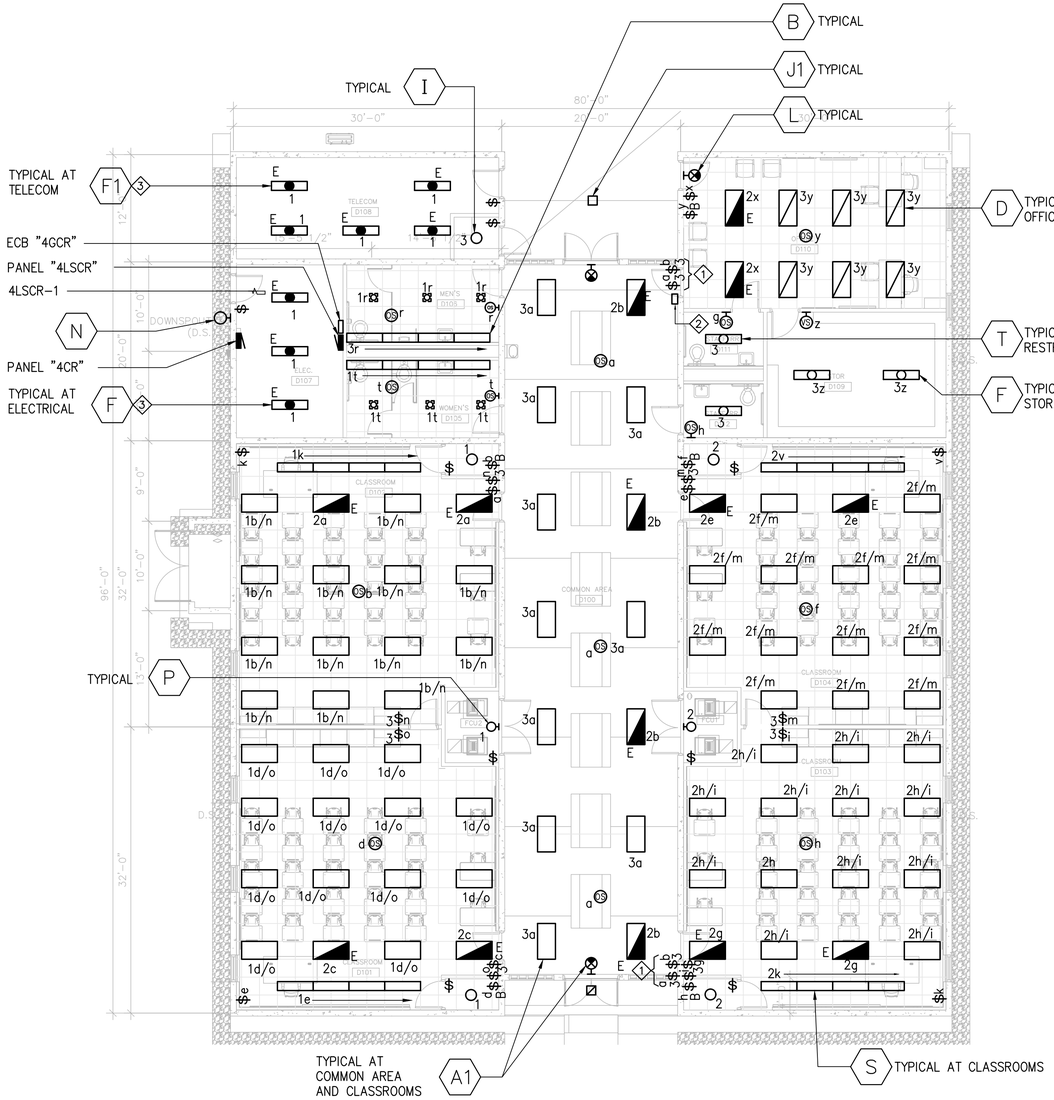
Title:
B-WING CLASSROOM LIGHTING PLAN - LEVEL 2 (WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	Title

Drawing No.
E4.21

Sheet No. of

NOT FOR CONSTRUCTION



NOTES:

1. KEY SWITCH
2. HOA SWITCH
3. PENDANT MOUNT AT 11'-0" AFF.

1 CREDIT RECOVERY LIGHTING PLAN

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

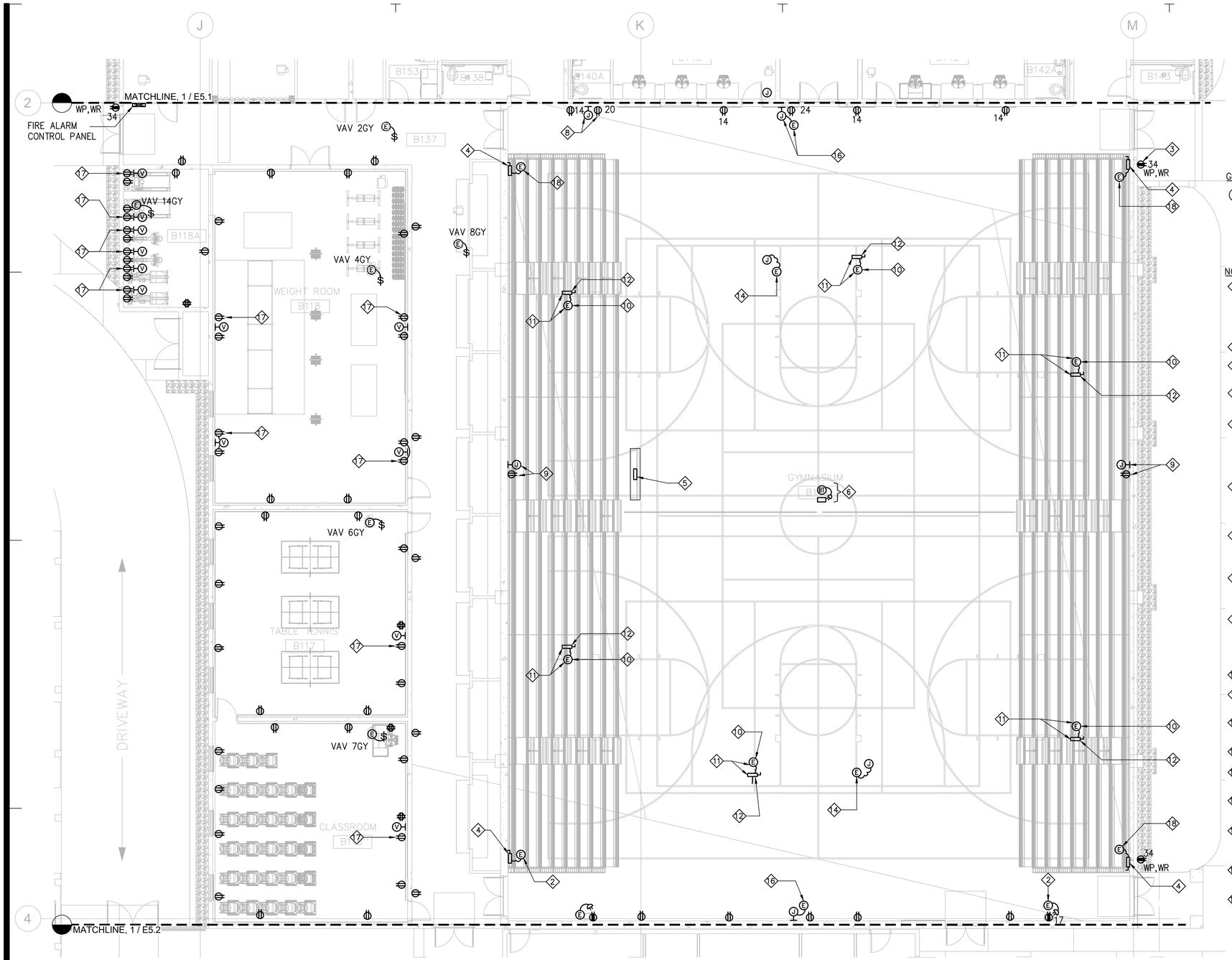
Title: CREDIT RECOVERY LIGHTING PLAN AND SCHEDULES

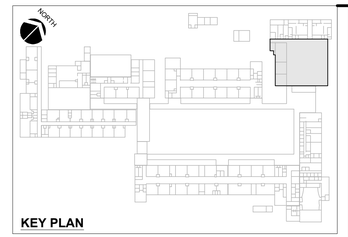
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25

Project No.: 24-20-486
File:

Drawing No.: E4.22

Sheet No. _____ of _____





GENERAL NOTE:

(1) LAYOUT OF DEVICES AND EQUIPMENT IN THE GYMNASIUM IS FOR GUIDELINES ONLY, CONTRACTOR TO SUBMIT SHOP DRAWING LAYOUT, DETAIL POINT TO POINT WIRING. DIAGRAM AND MATERIAL/EQUIPMENT DATA SHEETS FOR APPROVAL.

NOTES:

(1) VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.

(2) DRINKING FOUNTAIN.

(3) WEATHERPROOF, GFI TYPE RECEPTACLE OUTLET, SUITABLE IN WET LOCATION WHILE IN USE.

(4) 3P–30AMPS, 240V, HEAVY DUTY TYPE, NEMA 1 ENCLOSURE. LOCATE SWITCH IN ACCESSIBLE LOCATION.

(5) FLOOR MOUNTED BOX, COORDINATE LOCATION WITH THE ARCHITECT FOR APPROVAL. AS A MINIMUM PROVIDE SCOREBOARD AND SHOT CLOCK PROVISION, 2–20AMP, 120 VOLT FLOOR OUTLETS, COMBINATION TELEPHONE/DATA OUTLET AND MICROPHONE PROVISION.

(6) BLUETOOTH RECEIVER BOX, COORDINATE WITH AUDIO VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE ONE(1) 20A, 120V DUPLEX RECEPTACLE OUTLET ADJACENT TO BOX.

(7) 1 1/4" CONDUIT TO AV–RX7 @ TELECOM ROOM VIA WIREWAY ABOVE EQUIPMENT RACK (MIC) AND GYM SPEAKER CONTROLS.

(8) GYMNASIUM AV INPUT BOX, REFER TO AV DRAWING FOR REQUIREMENTS. PROVIDE ONE(1) 20A, 120V, RECEPTACLE OUTLET, LOCATE ADJACENT TO AV INPUT BOX.

(9) BLEACHER AV JUNCTION BOX, REFER TO AV DRAWING FOR REQUIREMENT. PROVIDE ONE(1) 20A, 120V RECEPTACLE OUTLET, LOCATE RECEPTACLE OUTLET ADJACENT TO BLEACHER JUNCTION BOX.

(10) MOTORIZED WINCH, 3/4HP, 115V.

(11) COORDINATE MOUNTING AND LOCATION WITH EQUIPMENT SUPPLIER.

(12) NON–FUSIBLE SWITCH, 240V, HEAVY DUTY, NEMA–1 ENCLOSURE.

(13) VIA MOTORIZED WINCH KEY SWITCH @ P.E. OFFICE.

(14) SHOT CLOCK PROVISION, COORDINATE LOCATION AND REQUIREMENT.

(15) 1"CONTROL CONDUIT COORDINATE CABLE REQUIREMENT WITH EQUIPMENT SUPPLIER.

(16) SCOREBOARD, 120 VOLTS, COORDINATE EXACT LOCATION WITH THE ARCHITECT, PROVIDE RECEPTACLE OUTLET ADJACENT TO SCOREBOARD.

(17) LOCATE RECEPTACLE OUTLET ADJACENT TO TELEVISION OUTLET.

(18) BLEACHER MOTORIZED CONTROLLER, 208V,3ø, MOTOR HP SHALL BE PER EQUIPMENT MANUFACTURER'S RECOMMENDATION.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'–0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

1 GYMNASIUM POWER PLAN - LEVEL 1
SCALE: 1/8"=1'–0"

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

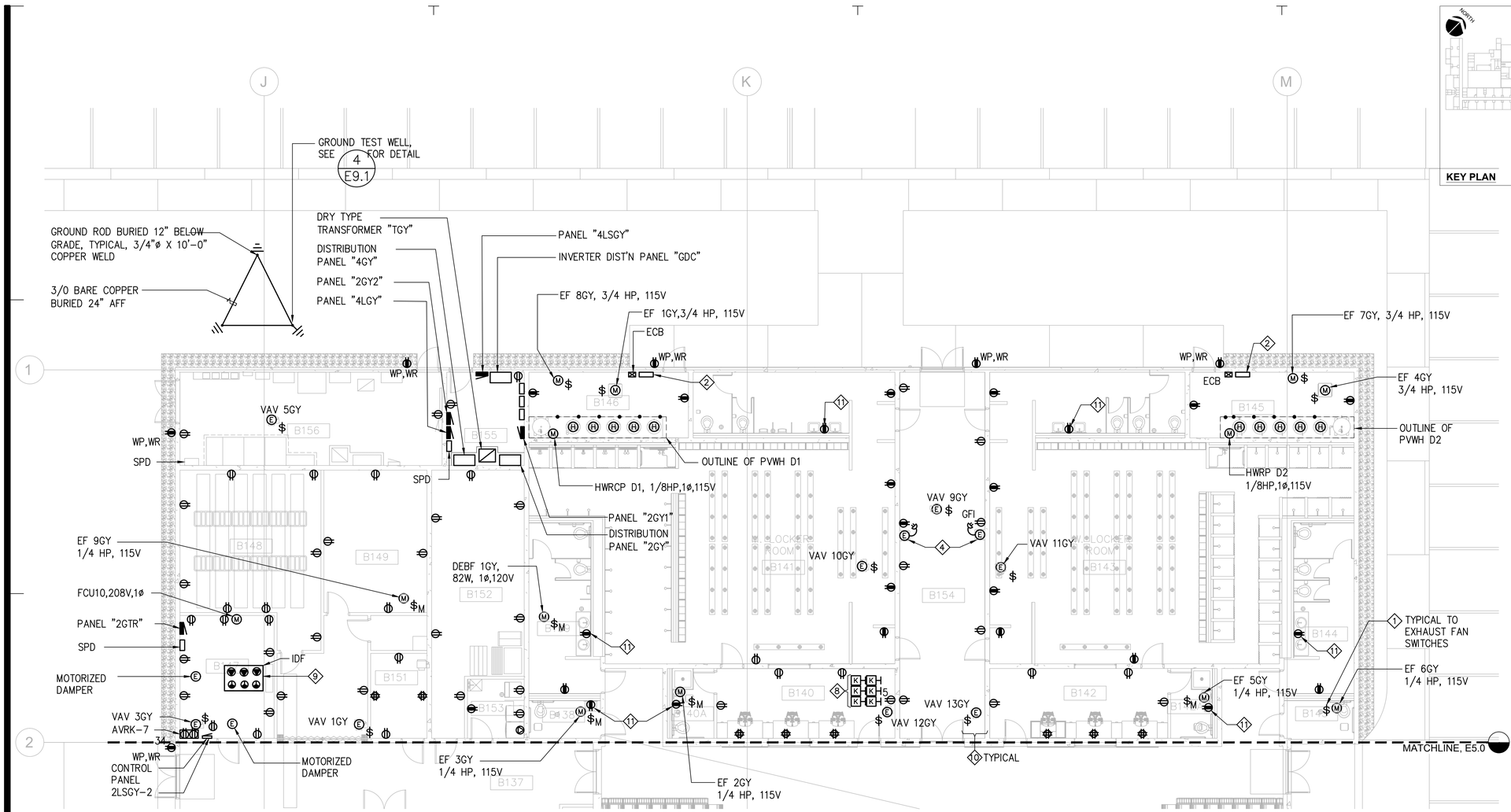
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

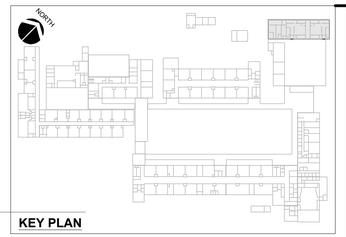
Title: GYMNASIUM POWER PLAN - LEVEL 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E5.0

Sheet No. of





NOTES:

1. HP RATED TOGGLE SWITCH, LOCATE ADJACENT. TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
2. PANEL "PVSH" (GYM), SEE SCHEDULE.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. DRINKING FOUNTAIN.
5. TO DISTRIBUTION PANEL "2GY".
6. WEATHERPROOF, GFI TYPE RECEPTACLE OUTLET, SUITABLE IN WET LOCATION WHILE IN USE.
7. TO GROUND TEST WELL, REFER TO ONE LINE DIAGRAM FOR GROUND WIRE RACEWAY REQUIREMENT.
8. MOTORIZED WINCH KEY SWITCHES (FOR BASKETBALL COURT).
9. EACH CABINET SHALL BE EQUIPPED WITH ONE(1), 208V, 1ø, 30A OUTLET AND ONE(1), 120V, 1ø, 20A OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.
10. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V, TOGGLE SWITCH, LOCATE ADJACENT TO DEVICE, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
11. MOUNT 8" ABOVE SINK.

1 LOCKER ROOM POWER PLAN

SCALE: 1/8"=1'-0"

GRAPHIC SCALE: 0 4' 8' 16'

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

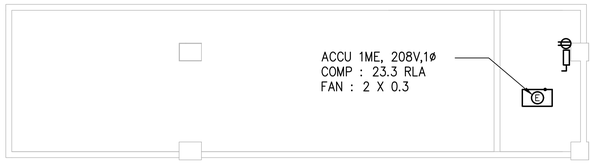
Title: LOCKER ROOM POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

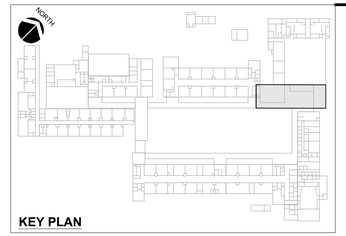
Drawing No. E5.1

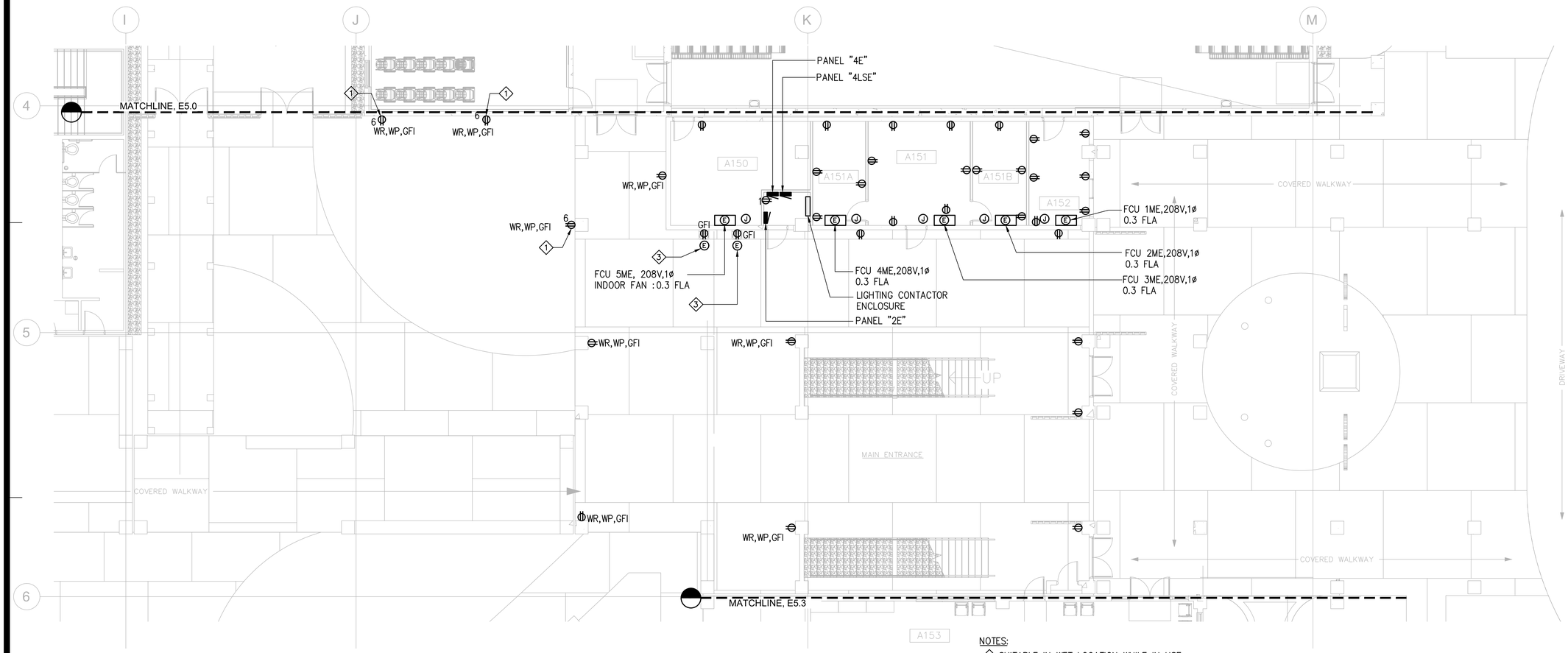
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



2 MAIN ENTRANCE POWER ROOF PLAN
SCALE: 1/8"=1'-0"





1 MAIN ENTRANCE POWER PLAN - LEVEL 1
SCALE: 1/8"=1'-0"

NOTES:
1. SUITABLE IN WET LOCATION WHILE IN USE.
2. 3-1" EMPTY CONDUIT WITH CAP AND MARKER VIA LIGHTING CONTACTOR TO PANEL "2E".
3. DRINKING FOUNTAIN.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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Architecture
Planning
Interior Design

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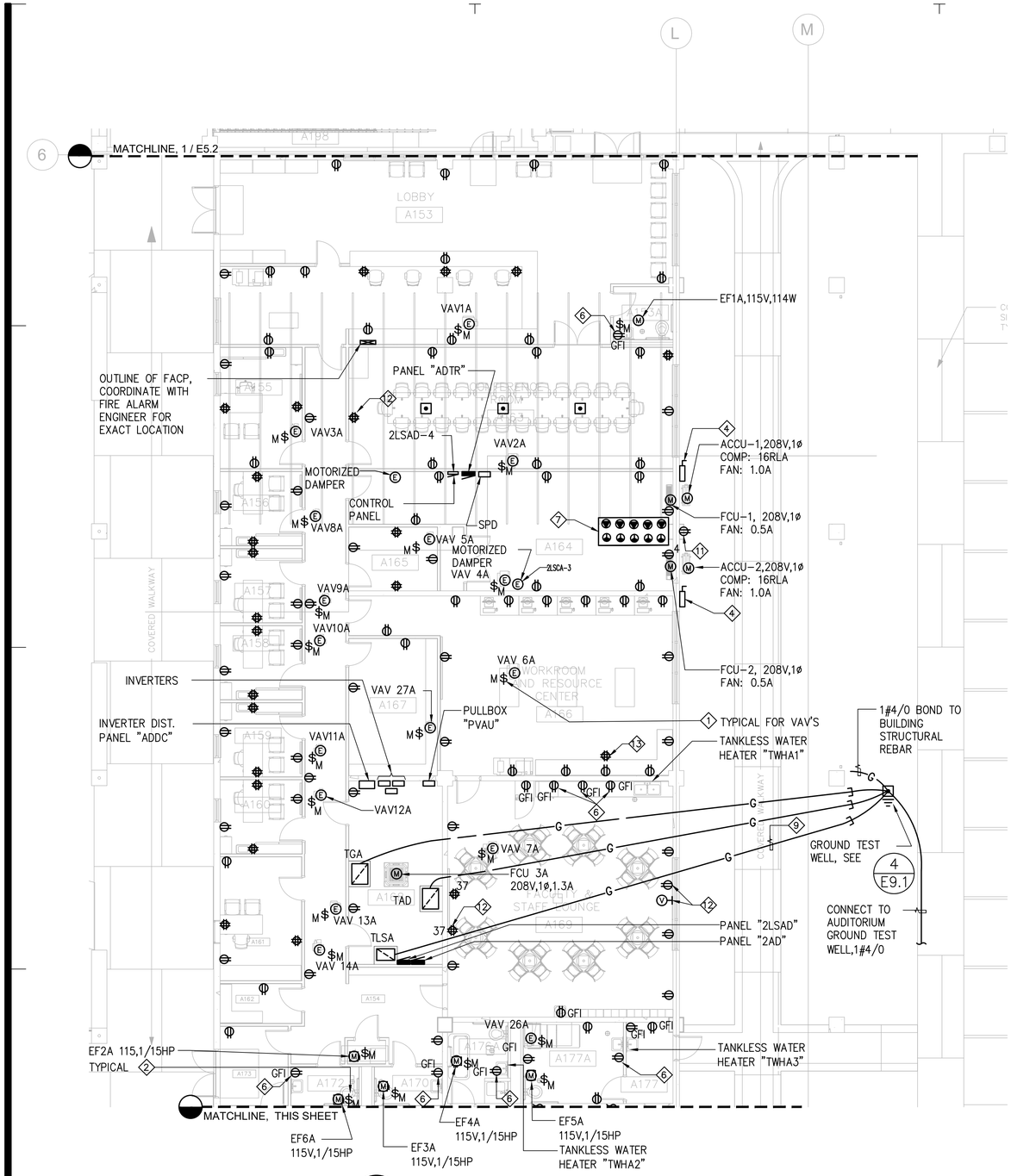
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

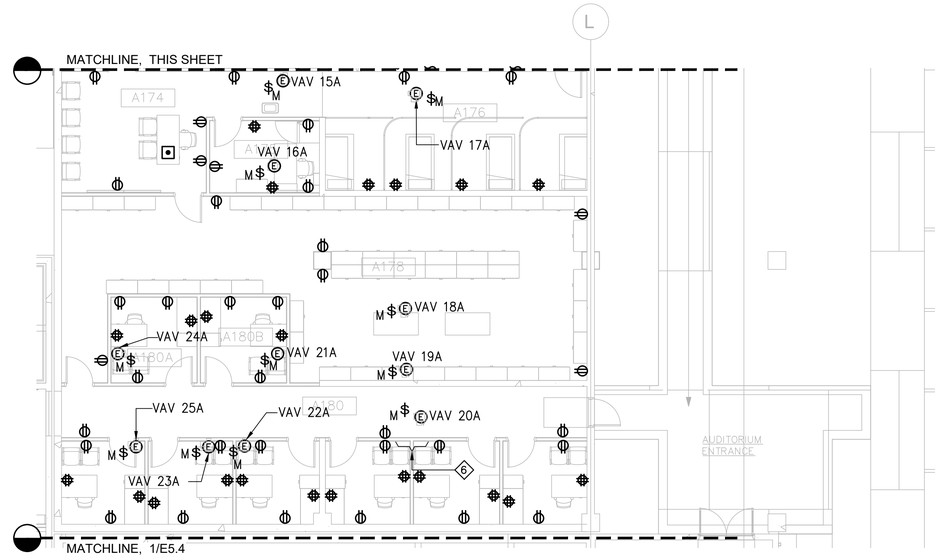
Title: MAIN ENTRANCE POWER PLAN - LEVEL 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E5.2
Sheet No. ____ of ____

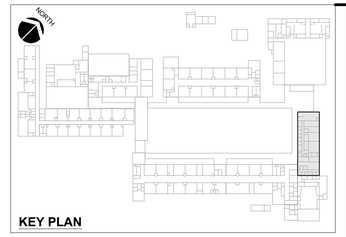


1 ADMIN. POWER PLAN - LEVEL 1
SCALE: 1/8"=1'-0"



NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
5. TO DISTRIBUTION PANEL "2ADP".
6. MOUNT 8" ABOVE COUNTER/SINK.
7. EACH CABINET SHALL BE EQUIPPED WITH ONE(1) 208V,1ø, 30A OUTLET, AND ONE(1) 120V, 1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.
8. 3/4"C, 1#1/0 GROUND WIRE.
9. 3/4"C, 1#8 GROUND WIRE.
10. 3/4"C, 1#2 GROUND WIRE.
11. GFI, WEATHERPROOF TYPE RECEPTACLE OUTLET, SUITABLE IN WET LOCATION WHILE IN USE.
12. MOUNT ADJACENT TO TV OUTLET, 60" AFF.
13. MOUNT 44" AFF ADJACENT TO TELECOM OUTLET.



KEY PLAN

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

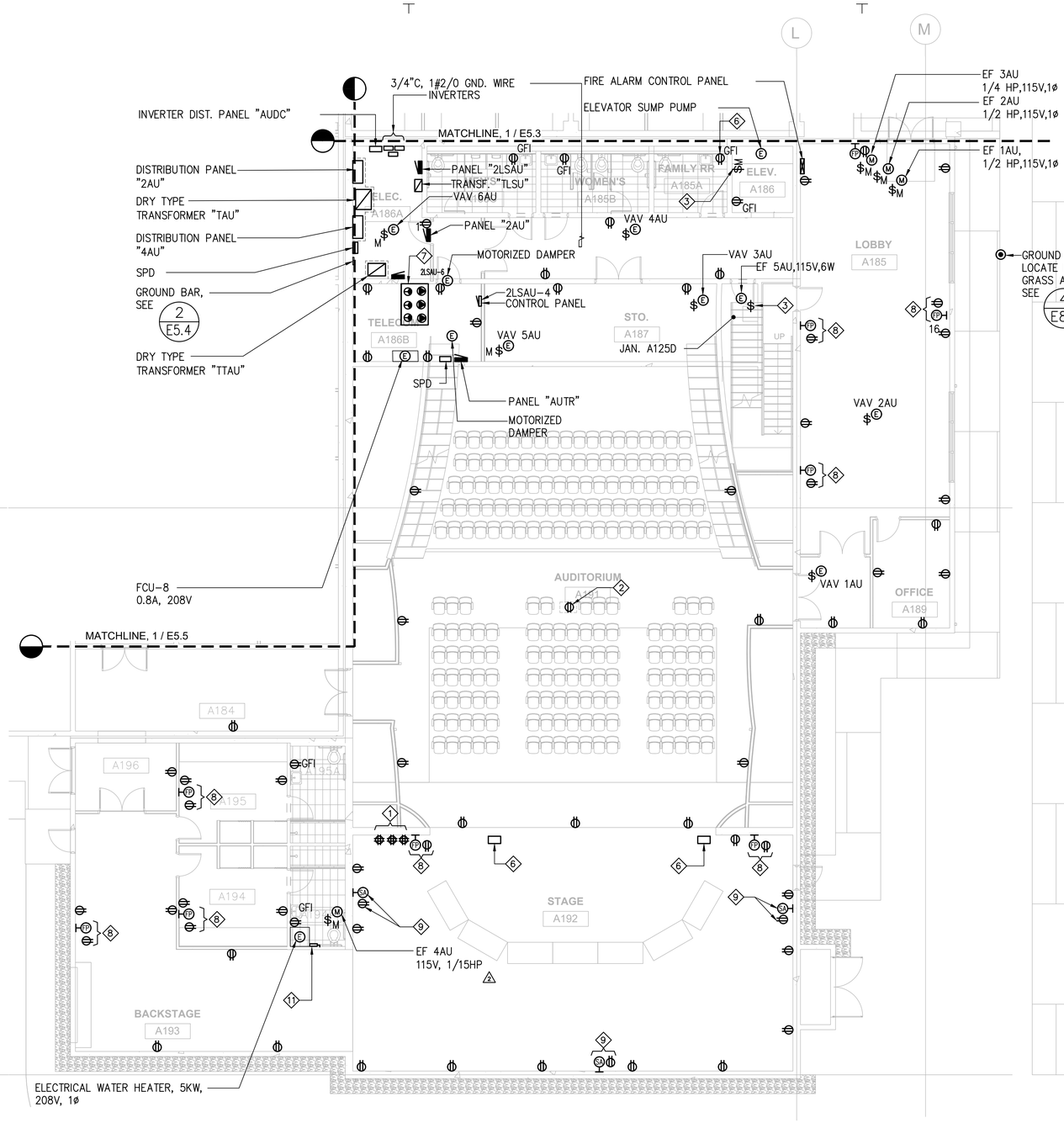
NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ADMIN. POWER PLAN - LEVEL 1

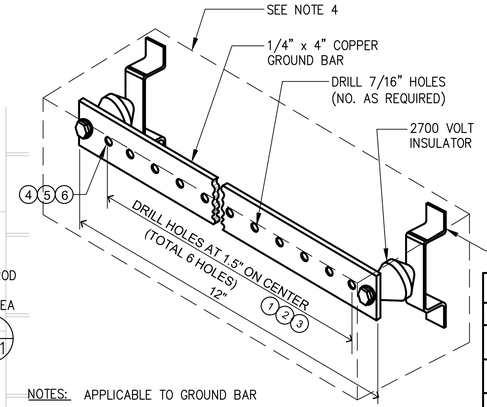
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
Drawing No.	E5.3

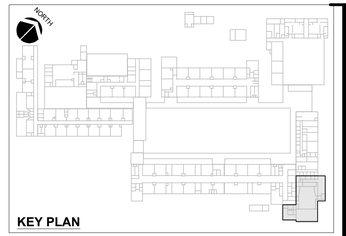
Sheet No. _____ of _____



1 AUDITORIUM POWER PLAN - LEVEL 1

SCALE: 1/8"=1'-0"





BILL OF MATERIALS

ITEM	PART NUMBER	DESCRIPTION
①	1/4"-20x1" HHCS	1/4"-20 HEX HEAD CAP SCREWS CAD PLATED
②	1/4" LOCKWASHER	1/4" LOCKWASHER CAD PLATED
③	1/4"-20 HEX NUTS	1/4"-20 HEX NUT CAD PLATED
④	AS REQUIRED	3/8"-1 1/4 EVERDUR MCH BOLTS DOSSERT OR EQ.
⑤	AS REQUIRED	3/8"-16 EVERDUR LOCK-WASHER DOSSERT OR EQ.
⑥	AS REQUIRED	3/8"-16 EVERDUR HEX NUTS DOSSERT OR EQ.

NOTES: APPLICABLE TO GROUND BAR

1. SURFACES SHALL BE FREE OF BURRS, ETC.
2. CONTACT SURFACES SHALL BE SANDED OR WIRE BRUSHED CLEAN AND A THIN COAT OF ALCOA NUMBER 2 ELEC. JOINT COMPOUND OR EQUIVALENT APPLIED.
3. PROVIDE LUGS AS REQUIRED TO MATCH CABLES BEING TERMINATED.
4. PROVIDE PLASTIC COVER WITH CAPTION "GROUND PLATE" IN 3/8" HIGH LETTERS AND GREEN SLASHES AROUND CAPTION.

2 GROUND BAR DETAIL

NOT TO SCALE

GENERAL NOTES:

① COORDINATE LOCATIONS OF TERMINAL STRIPS, POWER FEEDS, ETC. WITH THEATER CONTRACTOR.

② PROVIDE POWER WIRING IN METALLIC CONDUIT FROM THE DIMMER/RELAY RACKS TO HOUSE LIGHTING AND CONNECTOR SYSTEM CONNECTOR STRIPS, TERMINAL BOXES, WALL BOXES, AND FLOOR BOXES. TERMINATE POWER WIRING AT CUSTOM FACEPLATES ON THEATRE SYSTEMS BOXES AND CONNECTOR STRIPS. CONNECTOR STRIPS AND WALL BOXES WILL BE PROVIDED BY THEATRE CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

③ ALL WIRINGS AND CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH DIRECTIONS FROM THE THEATRE CONTRACTOR.

④ ELECTRICAL CONTRACTOR TO REVIEW THE THEATRE SYSTEM/AUDIO-VISUAL DRAWINGS FOR ADDITIONAL CONDUIT AND POWER REQUIREMENTS.

⑤ PANEL "2TAU" IS TECHNICAL POWER FOR AV "SYSTEM" ALL BRANCH CIRCUITS, TECHNICAL POWER HOT AND NEUTRAL WIRES SHOULD BE TWISTED PAIR TYPE AND BESIDES FROM EQUIPMENT GROUND, SHALL BE PROVIDED WITH ISOLATED GROUND WIRE.

⑥ FOR AUDIO-VIDEO SYSTEM, (TECHNICAL POWER) ALL RECEPTACLES SHOULD BE HEAVY-DUTY ISOLATED GROUND TYPE RECEPTACLES, PROVIDED POWER RECEPTACLES THAT INDICATE THE ISOLATED GROUND SUCH US ORANGE OUTLETS WITH GREEN TRIANGLES. PROVIDE CUSTOM PLATES FOR ALL TECHNICAL POWER RECEPTACLES WITH THE TEXT "AV ONLY".

NOTES:

① AV STAGE MANAGER'S RACK, COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (3) 20A, 120V TECHNICAL POWER CIRCUITS WITH ISOLATED GROUND, QUAD RECEPTACLE OUTLETS. LOCATE OUTLET BEHIND THE RACK.

② FLOOR OUTLET BOX FLUSH MOUNT, COORDINATE WITH THEATRE SYSTEM DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE 20A, 120V, DUPLEX OUTLET IN FLOOR BOX.

③ HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT.

④ TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.

⑤ VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V MOTOR RATED TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL FOR CONTROL REQUIREMENT.

⑥ MOUNT 8" ABOVE COUNTER/SINK.

⑦ EACH CABINET SHALL BE EQUIPPED WITH ONE 208V, 1ø, 30A OUTLET AND ONE(1) 120V, 1ø, 20A OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.

⑧ FLAT PANEL DISPLAY BOX. COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (1) 20A, 120V, TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND AND LOCATE ADJACENT TO FLAT PANEL DISPLAY BOX.

⑨ STAGE I/O BOX (AUDIO-VISUAL), COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (1) 20A, 120V, TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND AND LOCATE ADJACENT TO STAGE I/O BOX.

⑩ AV FLOOR BOX, COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (1) 20A, 120V, TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND DUPLEX RECEPTACLE IN FLOOR BOX.

⑪ NON FUSIBLE SWITCH, 2P-30, 240V, NEMA 34 ENCLOSURE.

GRAPHIC SCALE: 0 4' 8' 16'

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

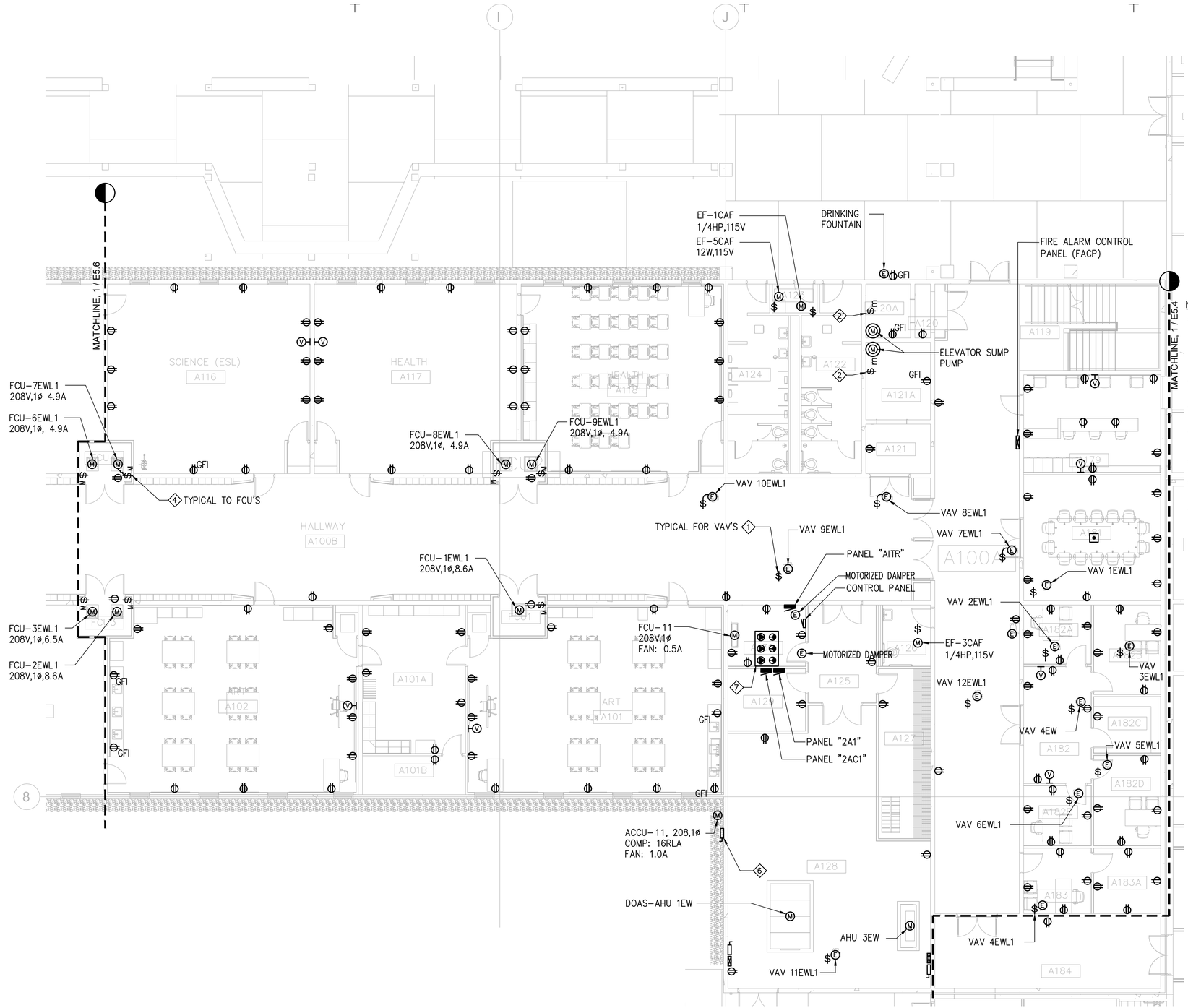
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM POWER PLAN - LEVEL 1

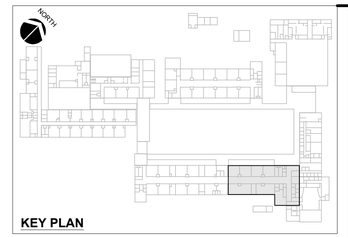
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E5.4

Sheet No. _____ of _____



1 A-WING CLASSROOM POWER PLAN - LEVEL 1 (EAST)
SCALE: 1/8"=1'-0"



NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT. PROVIDE MOUNTING SUPPORT.
3. TO EQUIPMENT CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. STARTER TYPE SWITCH 2P-30A, 240V, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. TO DISTRIBUTION PANEL "4MA".
6. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
7. EACH CABINET SHALL BE EQUIPPED WITH ONE(1), 208V, 1ø, 30AMP OUTLET AND ONE(1) 120V, 1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8'
SCALE: 1/8"=1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM POWER PLAN - LEVEL 1 (EAST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
Title	
Drawing No.	E5.5
Sheet No.	of

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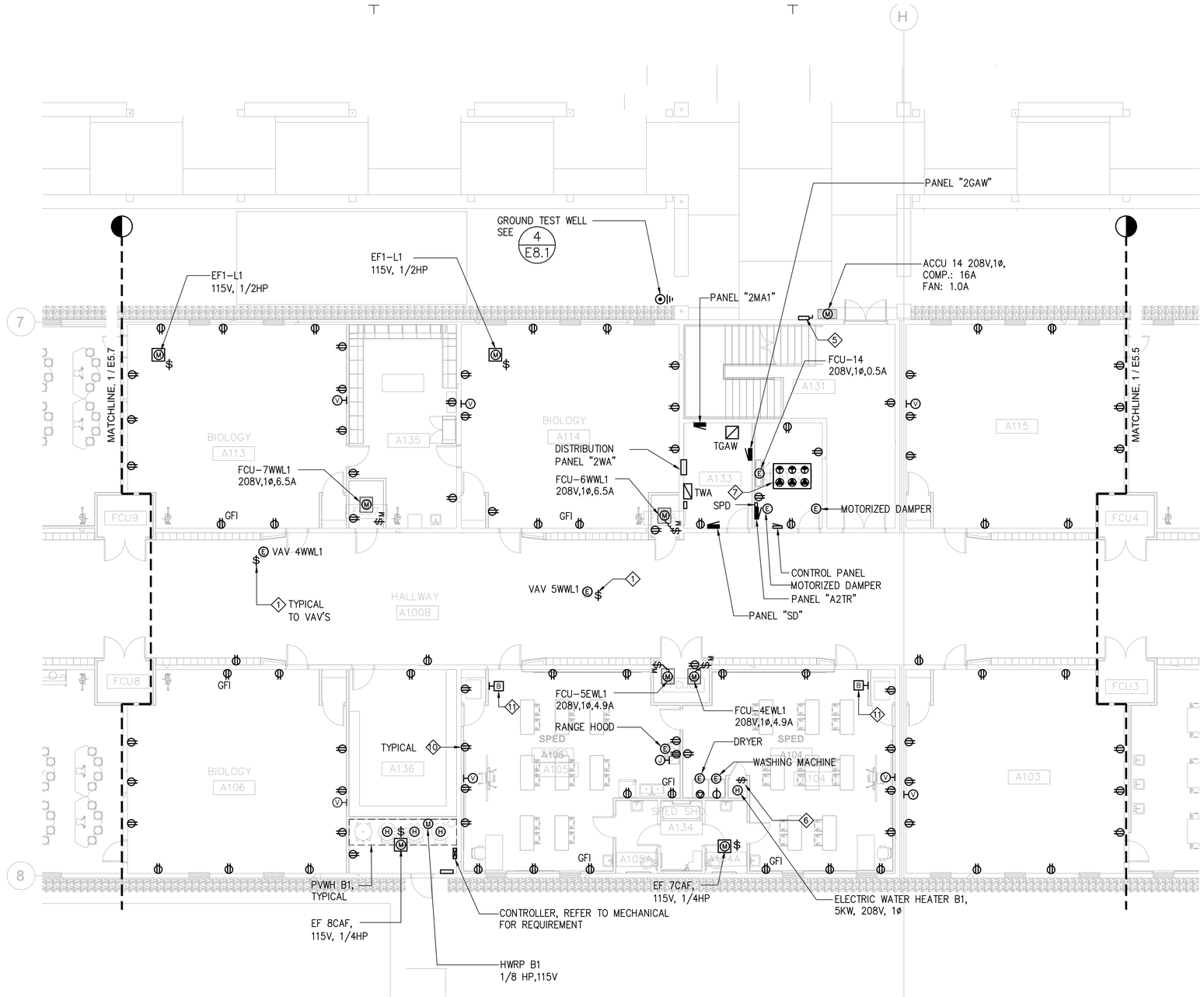
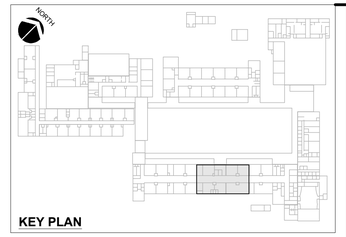
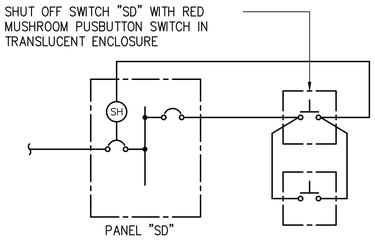


1 A-WING CLASSROOM POWER PLAN - LEVEL 1 (MIDDLE)

SCALE: 1/8"=1'-0"





NOTE:
PROVIDE NAMEPLATE "ELECTRICAL POWER SHUT OFF SWITCH" TO SWITCH ENCLOSURE.

2 SPED ELECTRICAL SHUT OFF SCHEMATIC DIAGRAM

NOT TO SCALE

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. STARTER TYPE SWITCH 2P-30A, 240V, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
6. 2P-30A, 240V, TOGGLE TYPE SWITCH.
7. EACH CABINET SHALL BE EQUIPPED WITH ONE(1), 208V, 1ø, 30AMP OUTLET AND ONE(1) 120V, 1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.
8. 3/4"C, 1#2 BARE COPPER GROUND WIRE.
9. STUB 2-3/4"C AND 2-1" EMPTY CONDUITS TO SPED CEILING SPACE. PROVIDE CONDUIT CAP AND LABEL INDICATING SPARE CONDUIT.
10. RECEPTACLE OUTLET IN SPED CLASSROOMS SHALL BE TAMPER RESISTANT AND MOUNTED 18" ABOVE FINISHED FLOOR.
11. SHUT-OFF SWITCH "SD", SEE FOR (2) SCHEMATIC DIAGRAM.
12. SEE MECHANICAL DRAWING FOR CONTROL REQUIREMENT.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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Architecture
Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM POWER PLAN - LEVEL 1 (MIDDLE)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E5.6

Sheet No. ____ of ____

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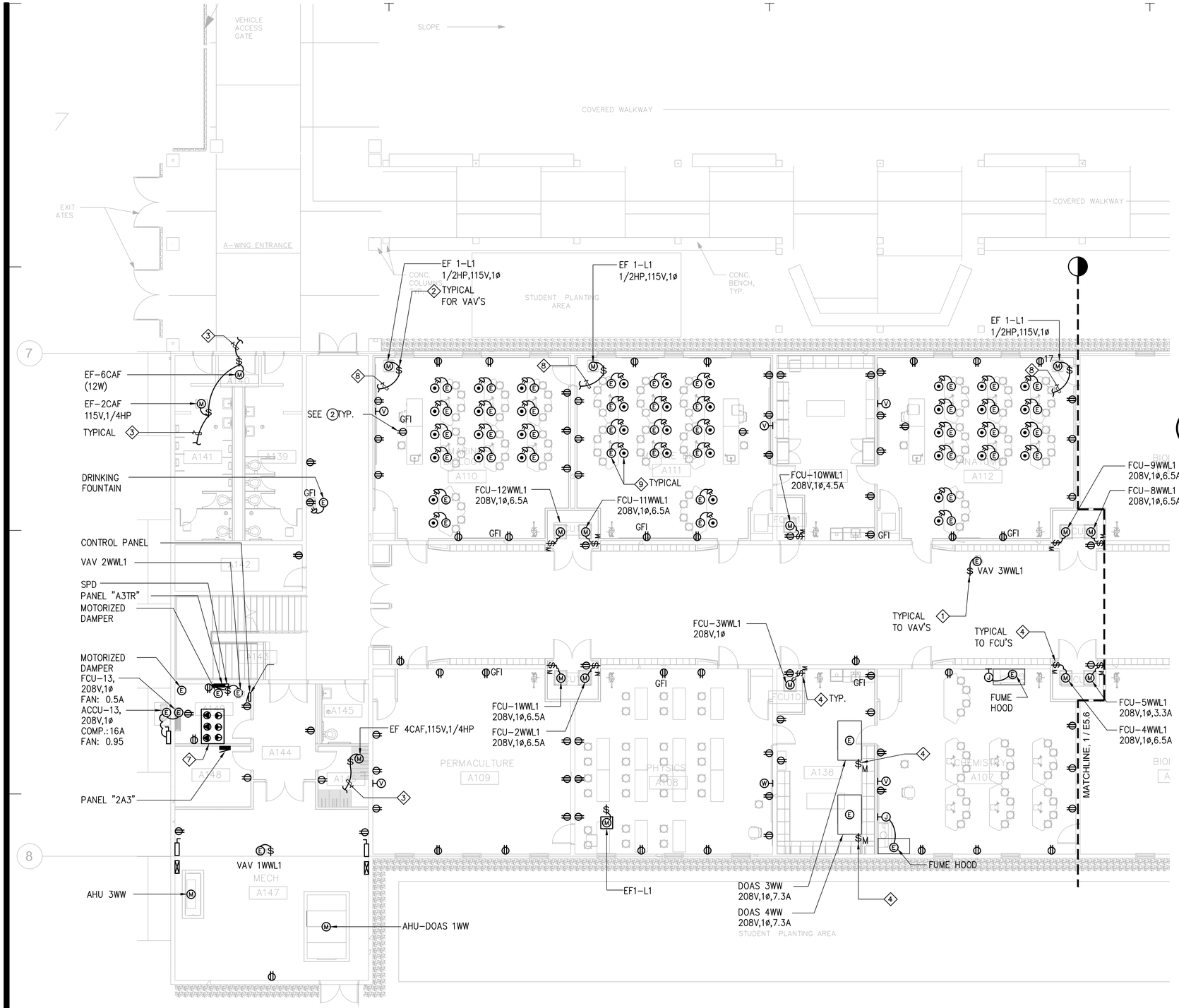
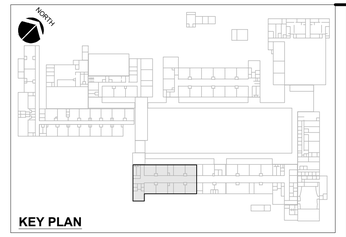
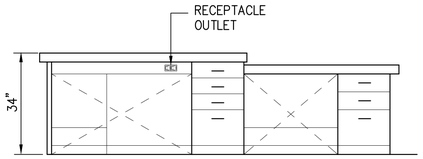


1 A-WING CLASSROOM POWER PLAN - LEVEL 1 (WEST)

SCALE: 1/8"=1'-0"





2 SCIENCE DEMO TEACHER DESK

NOT TO SCALE

GENERAL NOTE:

1. AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SHALL BE AS PER NEC REQUIREMENT.

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EQUIPMENT CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. STARTER TYPE SWITCH 2P-30A, 240V, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
6. TO DISTRIBUTION PANEL "4MA".
7. EACH CABINET SHALL BE EQUIPPED WITH ONE(1), 208V,1ø, 30AMP OUTLET AND ONE(1) 120V,1ø,20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.
8. SEE MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
9. RETRACTABLE CORD, SEE 6/E9.0

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

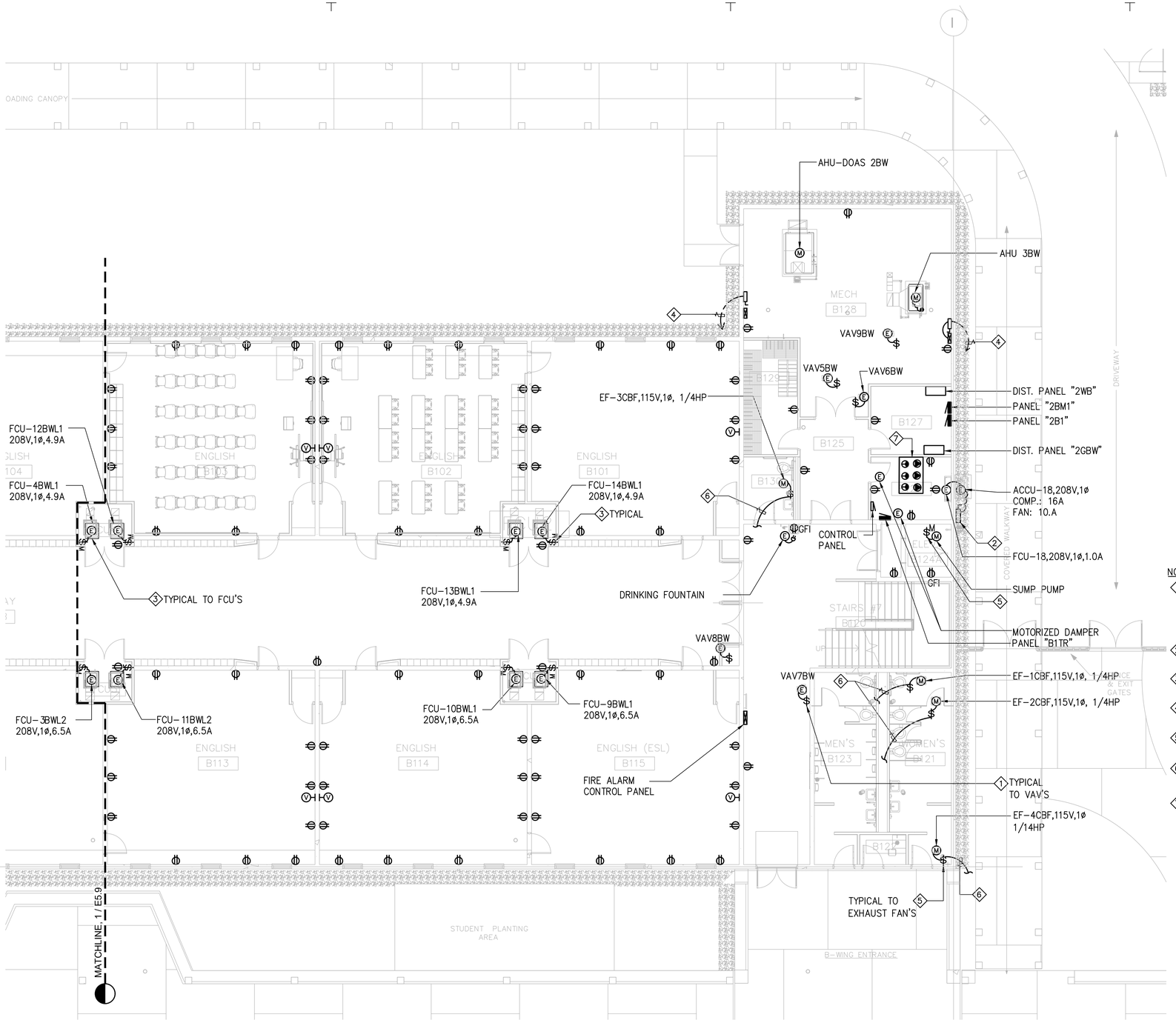
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM POWER PLAN - LEVEL 1 (WEST)

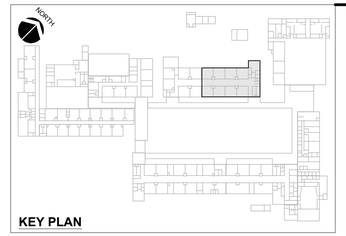
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File:	

Drawing No.: E5.7

Sheet No. of



1 B-WING CLASSROOM POWER PLAN - LEVEL 1 (EAST)
SCALE: 1/8"=1'-0"



NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
3. STARTER TYPE SWITCH FOR FCU. COORDINATE WITH MECHANICAL FOR REQUIREMENT.
4. TO DISTRIBUTION PANEL "4MB", REFER TO ONE LINE DIAGRAM.
5. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT. PROVIDE MOUNTING SUPPORT.
6. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
7. EACH CABINET SHALL BE EQUIPPED WITH ONE 208V,1ø,30A OUTLETAND ONE(1) 120V,1ø, 20A OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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Architecture
Planning
Interior Design

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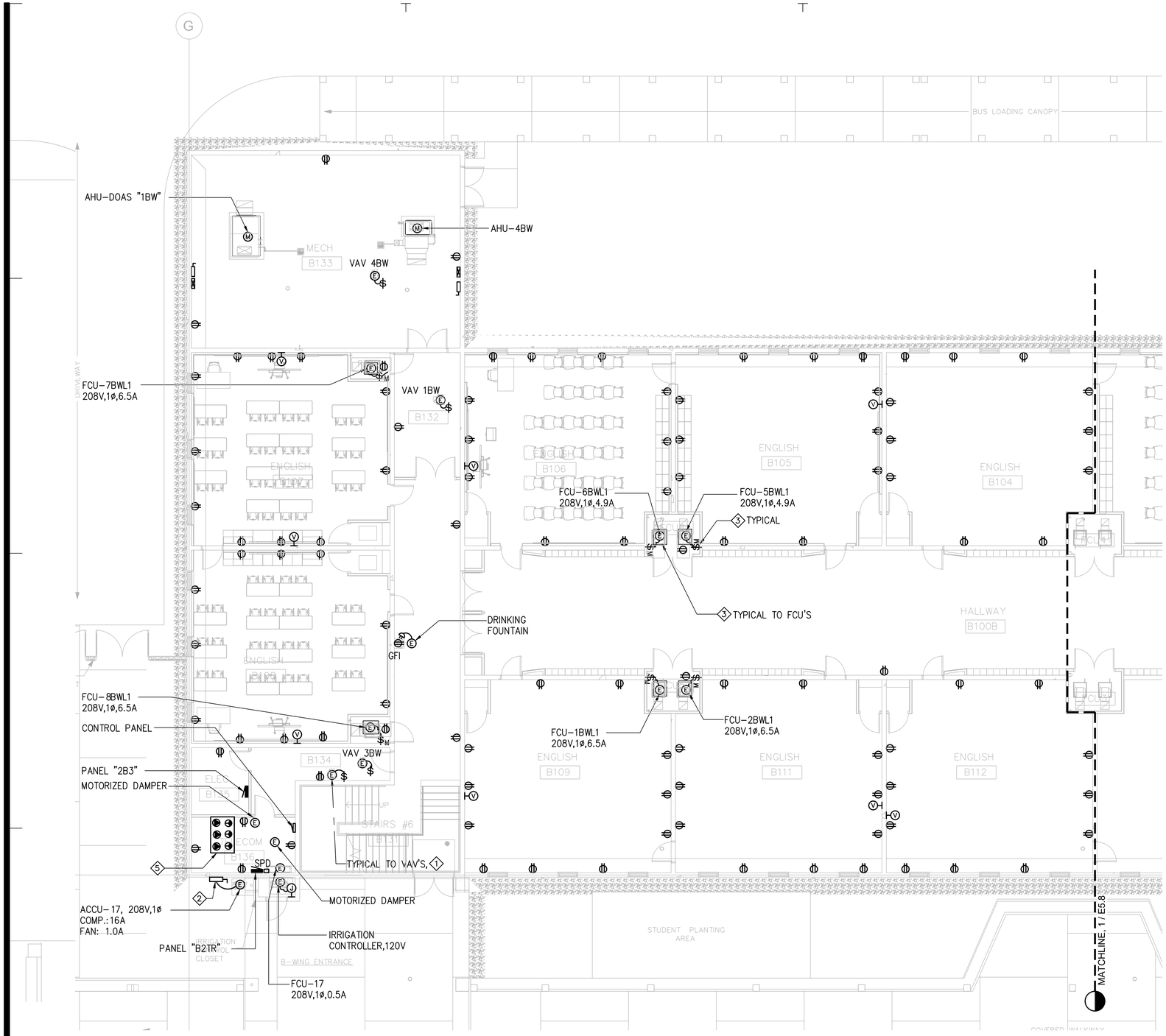
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: B-WING CLASSROOM POWER PLAN - LEVEL 1 (EAST)

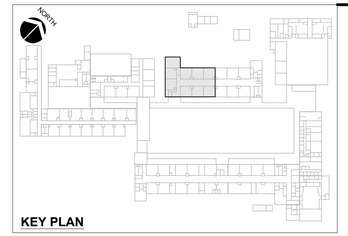
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E5.8

Sheet No. _____ of _____



1 B-WING CLASSROOM POWER PLAN - LEVEL 1 (WEST)
SCALE: 1/8"=1'-0"



NOTES:

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2. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
3. STARTER TYPE SWITCH FOR FCU, COORDINATE WITH MECHANICAL FOR REQUIREMENT.
4. TO DISTRIBUTION PANEL "4MB" REFER TO LINE DIAGRAM FOR REQUIREMENTS.
5. EACH CABINET SHALL BE EQUIPPED WITH ONE 208V,1ø,30A OUTLET AND ONE(1) 120V,1ø, 20A OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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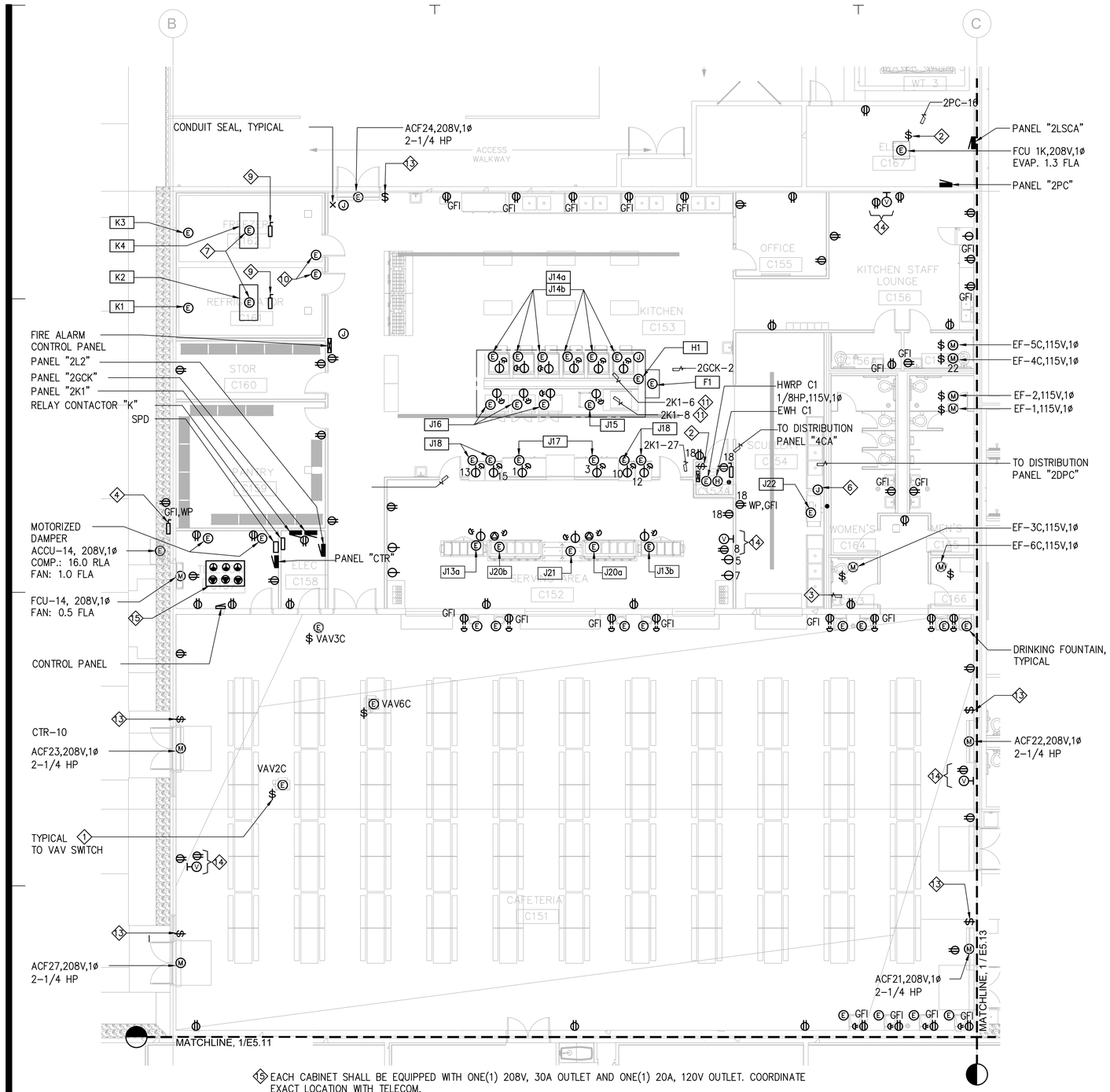
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: B-WING CLASSROOM POWER PLAN - LEVEL 1 (WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No.
E5.9

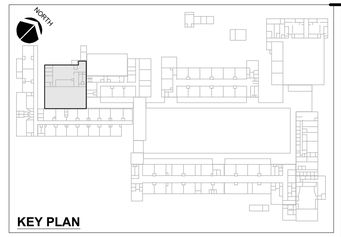
Sheet No. of



15 EACH CABINET SHALL BE EQUIPPED WITH ONE(1) 208V, 30A OUTLET AND ONE(1) 20A, 120V OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.

1 CAFETERIA POWER PLAN
SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"



KEY PLAN

KITCHEN EQUIPMENT SCHEDULE

ITEM NO. / SERVING AREA	DESCRIPTION	ELEC. RATING	REMARKS
J20a	HOT FOOD SERVING		
J20b	HOT FOOD SERVING		
J13a	SERVING COUNTER, COLD FOOD		
J13b	SERVING COUNTER, COLD FOOD		
J21	MILK COOLER	3.7A,120V.	
KITCHEN			
J14a	BRAISING FAN	9.0A,115V.	
J14b	BRAISING FAN	9.0A,115V.	
J15	GRIDDLE	10A,120V.	
J16	DOUBLE STACK CONVECTION OVEN	7.7A,120V.	
J17	REACH-IN REFRIGERATOR	6.2A,208V.	
J18	HOLDING CABINET	12.5A,120V.	
J19	SALAD BAR FOOD PREPARATION TABLE	5.4A,120V.	
J22	DISHWASHER	56A,208V,3ø	ELECTRICAL HOOK UP 4-1/4" OFF THE TOP
	a. WASH PUMP MOTOR,1HP b. RINSE PUMP MOTOR,1/3HP c. CONVEYOR PUMP MOTOR,1/8HP d. BOOSTER HEATER, 13KW,208V,3ø (WASH) d. BOOSTER HEATER, 3KW,208V,3ø (RINSE)		
K1	WALK-IN COOLER FAN	115V, 1ø	
K2	WALK-IN COOLER CONDENSING UNIT	208V, 3ø	
K3	WALK-IN FREEZER FAN	208V, 1ø	
K4	WALK-IN FREEZER CONDENSING UNIT	208V, 3ø	
F1	KITCHENHOOD FIRE SUPPRESSION SYSTEM	208V, 1ø	
H1	HOOD SYSTEM	120V, 1ø 600W	HAND WITH INTEGRAL LIGHT FIXTURE AND CONTROL SWITCH

GENERAL NOTES:

1. CONTRACTOR TO SUBMIT KITCHEN EQUIPMENT SHOP DRAWING INDICATING POINT TO POINT WIRING DIAGRAM, LAYOUT, ELEVATION AND EQUIPMENT DATA SHEET FOR REVIEW AND APPROVAL.
2. SOME OF THE EQUIPMENT ELECTRICAL RATINGS WERE BASED ON UKUDU HIGH SCHOOL KITCHEN EQUIPMENT. VERIFY ACTUAL RATING AND EQUIPMENT POWER POINT OF CONNECTION. IF RATINGS OF ACTUAL EQUIPMENT DIFFERS FROM GIVEN RATINGS, CONTRACTOR TO INFORM THE ELECTRICAL ENGINEER SO ADJUSTMENT TO THE CIRCUIT PROTECTION, WIRINGS CAN BE MADE.

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. NON-FUSIBLE SWITCH, 2P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
5. COORDINATE EQUIPMENT POWER POINT OF CONNECTION, VERIFY WITH EQUIPMENT SUPPLIER.
6. 8"X8"X4"D PULLBOX STAINLESS STEEL WITH HINGED COVER, CEILING MOUNT.
7. OUTLINE OF REFRIGERATION EQUIPMENT ON ROOF, COORDINATE EXACT LOCATION WITH EQUIPMENT SUPPLIER AND MECHANICAL DRAWING.
8. REFRIGERATION CONTROL CONDUIT TO RESPECTIVE EVAPORATOR FAN.
9. NON FUSIBLE DISCONNECT SWITCH 3P-30 AMPS,240 VOLTS, NEMA 4X STAINLESS STEEL ENCLOSURE. PROVIDE MOUNTING FRAME SHOP DRAWING WITH GUAM STRUCTURAL ENGINEER SEAL AND SIGNATURE.
10. REFRIGERATION ACCESSORIES (LIGHT, SWITCH, HEATER, ETC.).
11. VIA RELAY CONTRACTOR "K" SEE 2/E2.5 SCHEMATIC DIAGRAM.
12. DISHWASHER EXHAUST CONNECTION, COORDINATE REQUIREMENT WITH MECHANICAL.
13. LOCATE HP RATED TOGGLE SWITCH, 2P-20A SAME LEVEL AS THE EQUIPMENT.
14. PROVIDE RECEPTACLE OUTLET ADJACENT TO TV OUTLET.

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

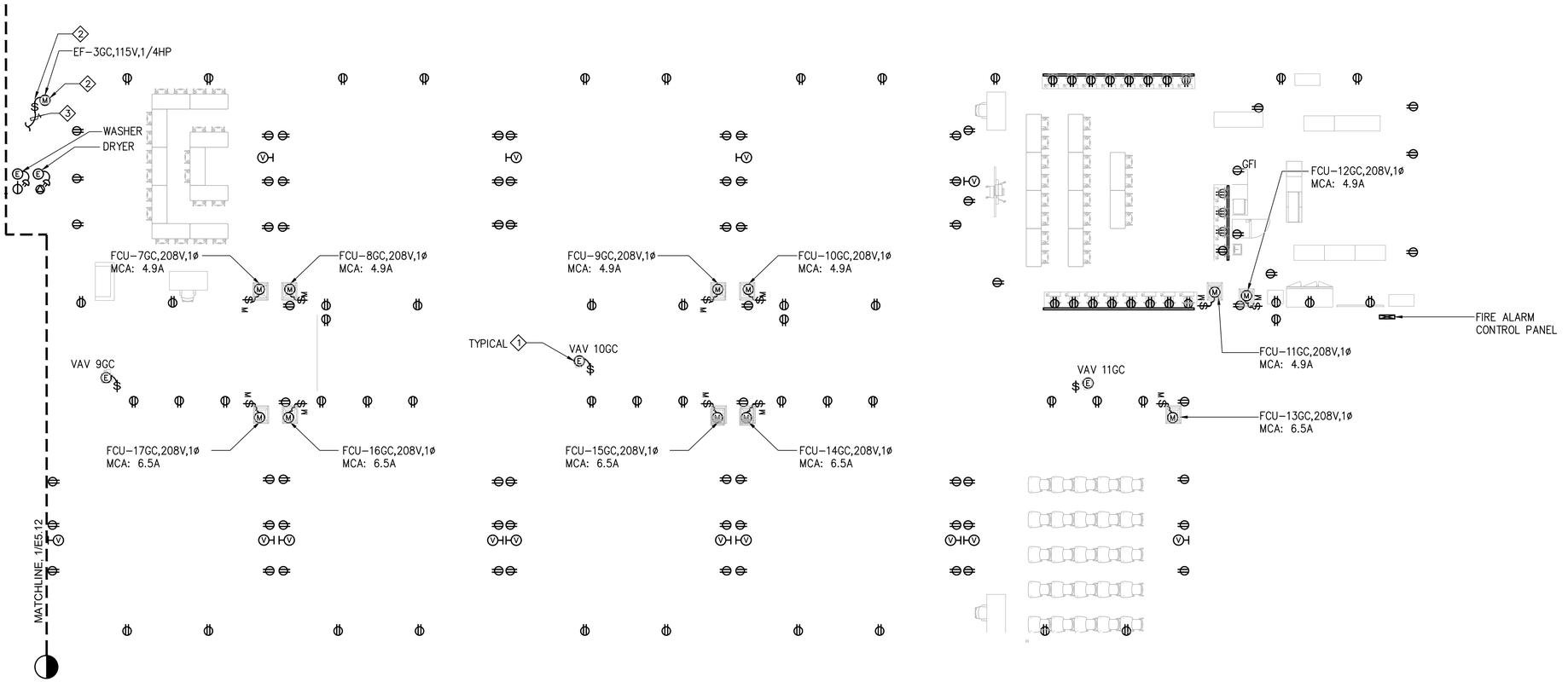
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CAFETERIA POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E5.10

Sheet No. ____ of ____



NOTES:

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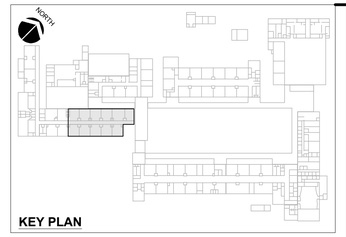
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.

1 GCC CLASSROOM POWER PLAN - (1 OF 2)

SCALE: 1/8"=1'-0"



GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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Architecture
Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

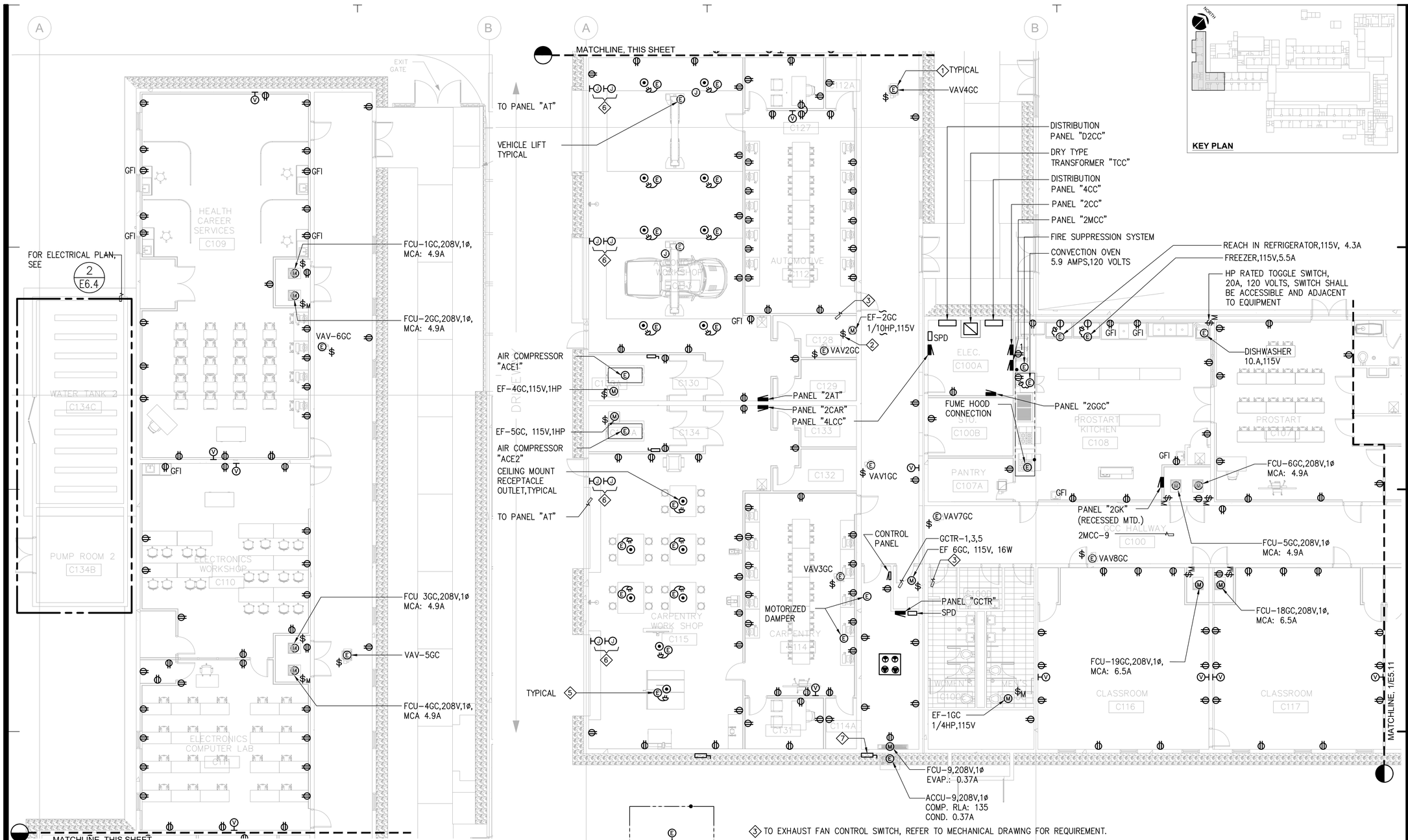
Title: GCC CLASSROOM POWER PLAN - (1 OF 2)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E5.11

Sheet No: ____ of ____

NOT FOR CONSTRUCTION



DUST COLLECTOR "DC1" REFER TO MECHANICAL FOR LOCATION AND CONTROL REQUIREMENTS

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. TO DISTRIBUTION PANEL "4CC".
5. RECTRACTABLE CORD, SEE 6/E9.0 FOR DETAIL.
6. POWER PROVISION FOR ELECTRIC OPERATED ROLL UP DOOR. PROVIDE INTERCONNECTED UTILITY BOX WITH 1" CONDUIT. ONE(1) UTILITY BOX WILL BE FOR MOTOR CONNECTION, LOCATED ON DOOR TOP AND ONE(1) UTILITY BOX FOR START/STOP BUTTON, 48" AFF. STUB CONDUIT TO RESPECTIVE PANEL AS SHOWN.
7. NON-FUSIBLE SWITCH, 2P-30AMPS, 240 VOLT. NEMA 4 STAINLESS STEEL ENCLOSURE.
8. 3-1" CONDUIT STUB WITH CAP INTO CEILING SPACE.

1 GCC CLASSROOM POWER PLAN - (2 OF 2)

SCALE: 1/8"=1'-0"

GRAPHIC SCALE: 0 4' 8' 16'

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

KEY PLAN

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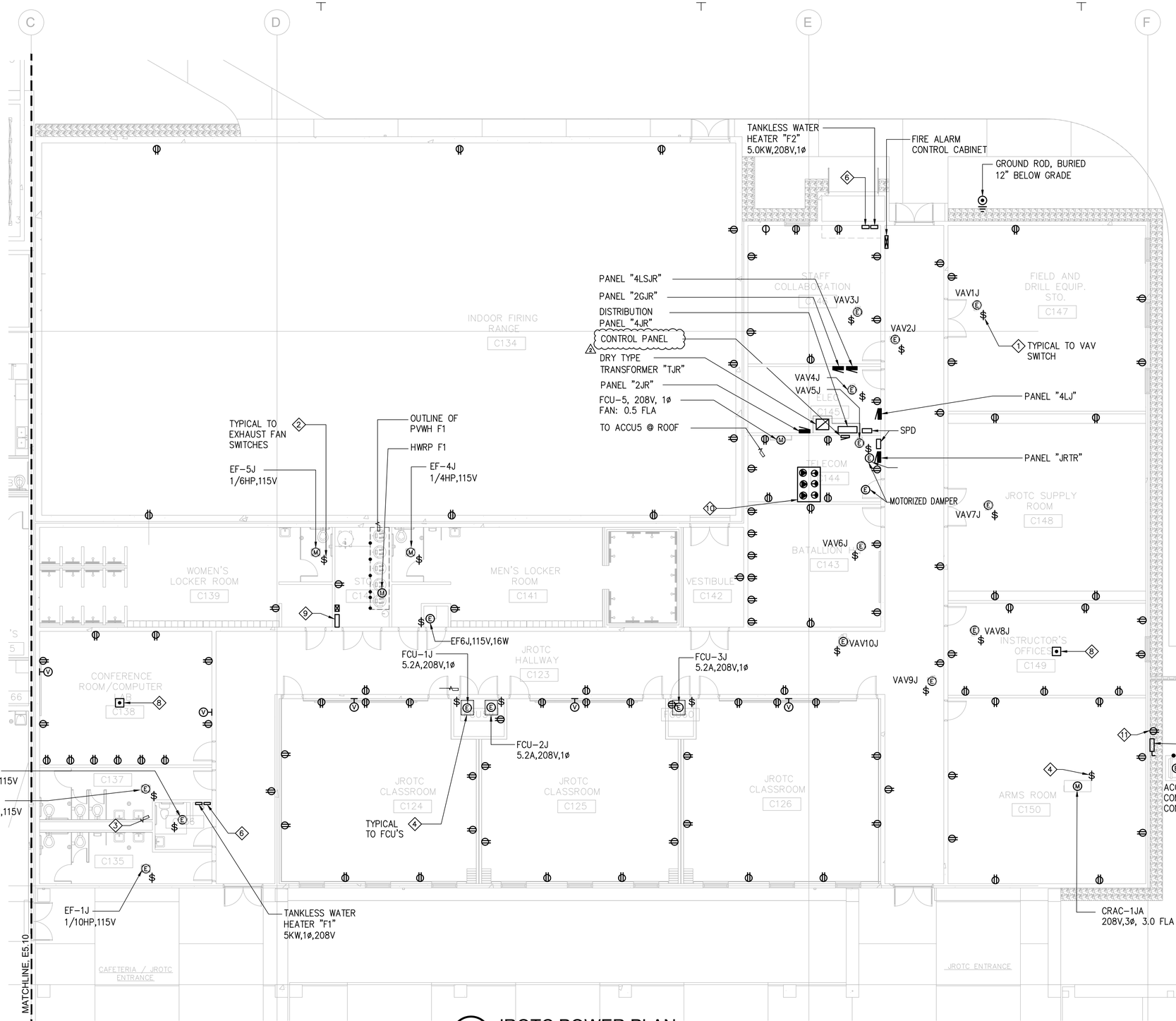
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: GCC CLASSROOM POWER PLAN - (2 OF 2)

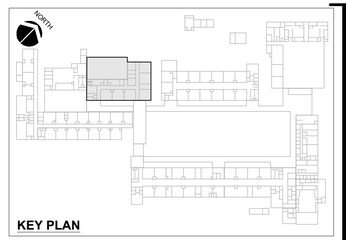
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E5.12

Sheet No: ____ of ____



1 JROTC POWER PLAN
SCALE: 1/8"=1'-0"



NOTES:

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2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. STARTER TYPE SWITCH FOR FCU, COORDINATE WITH MECHANICAL FOR REQUIREMENT.
5. NON-FUSIBLE SWITCH, 3P-30A, 240V NEMA 4 STAINLESS STEEL ENCLOSURE.
6. AC TYPE 2P-30A, HP RATED SWITCH,240V. LOCATE SWITCH ADJACENT TO TANKLESS WATER HEATER.
7. 3/4"C, 1#2 GROUND WIRE.
8. FLOOR MOUNTED RECEPTACLE OUTLET, COORDINATE LOCATION WITH TABLE.
9. PANEL "PVWH" (JROTC), SEE SCHEDULE.
10. EACH CABINET SHALL BE EQUIPPED WITH ONE 208V,1ø,30A OUTLET AND ONE 120V,1ø,20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.
11. SUITABLE IN WET LOCATION WHILE IN USE.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

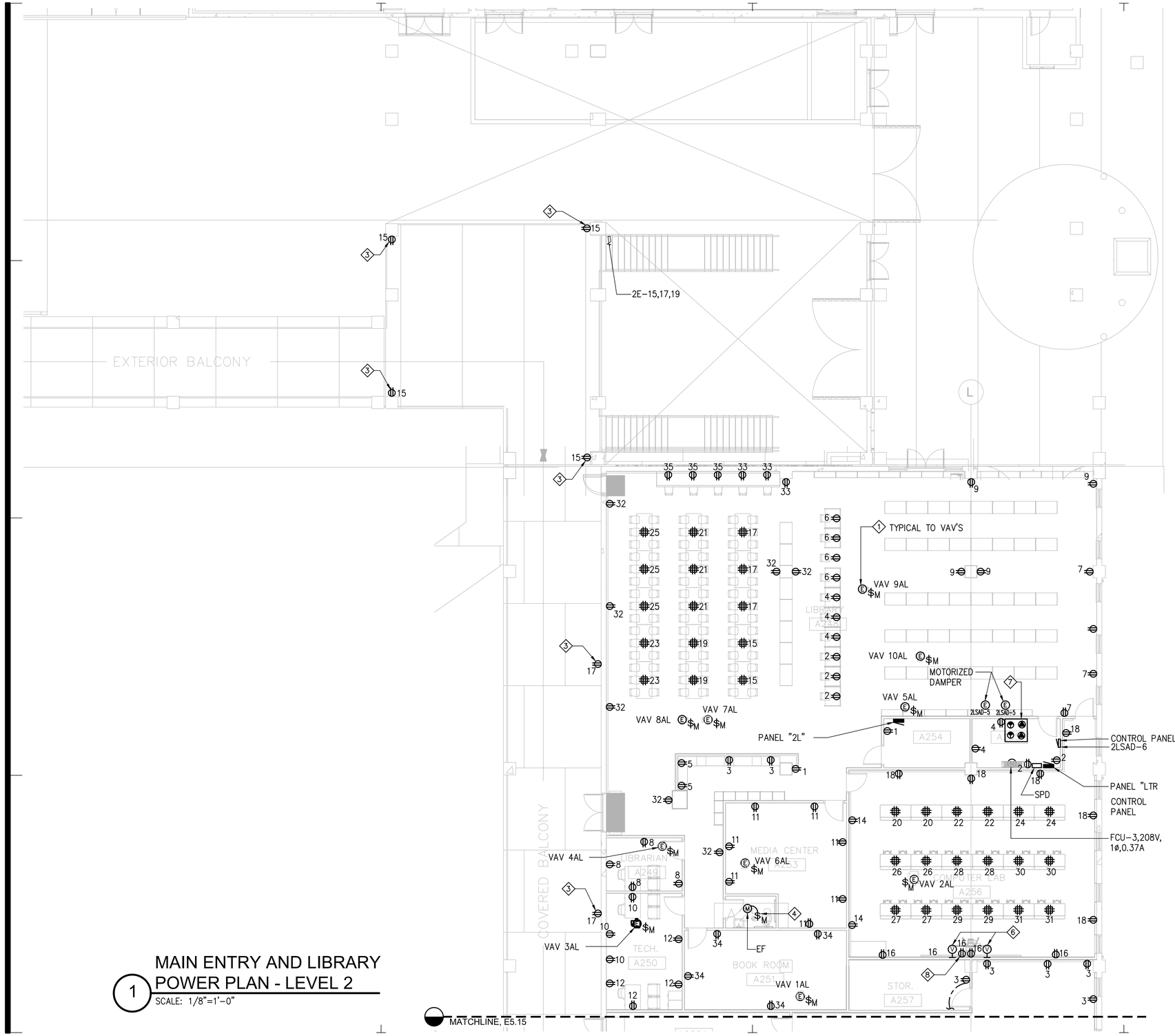
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: JROTC POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E5.13

Sheet No. _____ of _____



1 MAIN ENTRY AND LIBRARY POWER PLAN - LEVEL 2
SCALE: 1/8"=1'-0"

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V MOTOR RATED TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. TO ACCU-3 ON ROOF.
3. GFI, TR, WEATHERPROOF TYPE RECEPTACLE OUTLET. SUITABLE IN WET LOCATION WHILE IN USE.
4. HP RATED TOGGLE SWITCH, LOCATE ADJACENT. TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
5. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
6. VIDEO INPUT. COORDINATE LOCATION WITH AUDIO VISUAL DRAWINGS. PROVIDE DUPLEX OUTLET, 20A, 120 VOLT ADJACENT TO DEVICE.
7. EACH CABINET SHALL BE EQUIPPED WITH ONE(1) 208V,1ø, 30A OUTLET, AND ONE(1) 20A, 120V OUTLET, COORDINATE LOCATION WITH TELECOM.
8. MOUNT ADJACENT TO TV OUTLET, 60" AFF.

KEY PLAN

REVISION		
No.	Description	Date

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Architecture
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Interior Design

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Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: MAIN ENTRY AND LIBRARY POWER PLAN - LEVEL 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486

Drawing No. E5.14

Sheet No. ____ of ____

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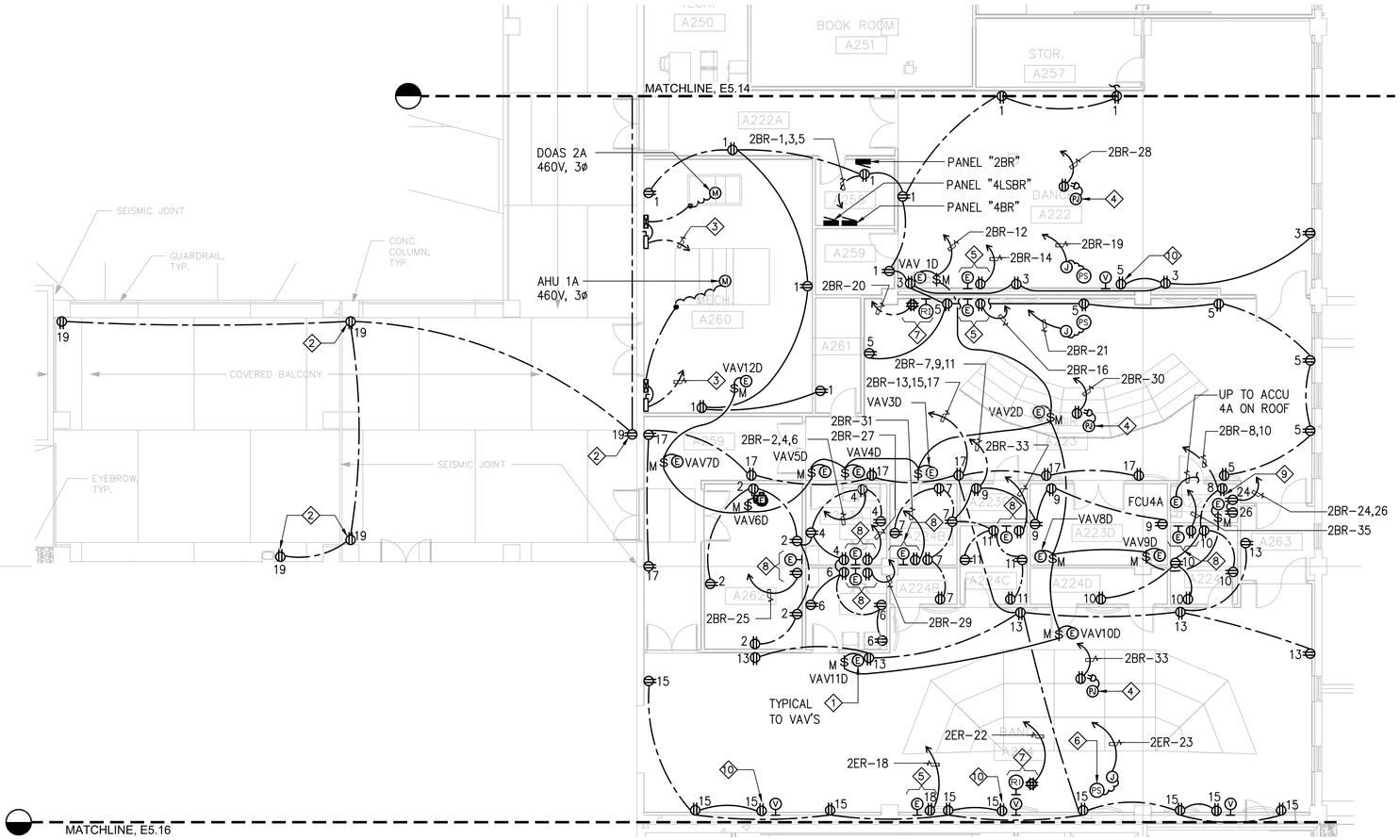

NOTES:

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2. GFI, TR, WEATHERPROOF TYPE RECEPTACLE OUTLET. SUITABLE IN WET LOCATION WHILE IN USE.
3. TO SWITCHBOARD "4AD".
4. PROJECTOR BOX, REFER TO AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE ONE(1) 20A, 120V DUPLEX RECEPTACLE OUTLET ADJACENT TO BOX.
5. CLASSROOM INPUT BOX FOR AUDIO-VISUAL, REFER TO AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE 20A, 120V DUPLEX RECEPTACLE OUTLET ADJACENT TO BOX.
6. PROJECTION SCREEN, REFER TO AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS.
7. RECORDING INTERFACE BOX, REFER TO AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE ONE(1) 20A, 120V QUAD OUTLET ADJACENT TO INTERFACE BOX.
8. PRACTICE/ENSEMBLE/MUSIC OFFICE BOX, COORDINATE WITH AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE 20A, 120V DUPLEX RECEPTACLE OUTLET ADJACENT TO BOX.
9. AV CLASSROOM EQUIPMENT RACK, REFER TO AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE 2-20A, 120V, DUPLEX OUTLET BEHIND RACK.
10. MOUNT ADJACENT TO PV OUTLET, 60"AFF.

1 CHOIR & BAND POWER PLAN - LEVEL 2

SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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KEY PLAN

REVISION

No.	Description	Date

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Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

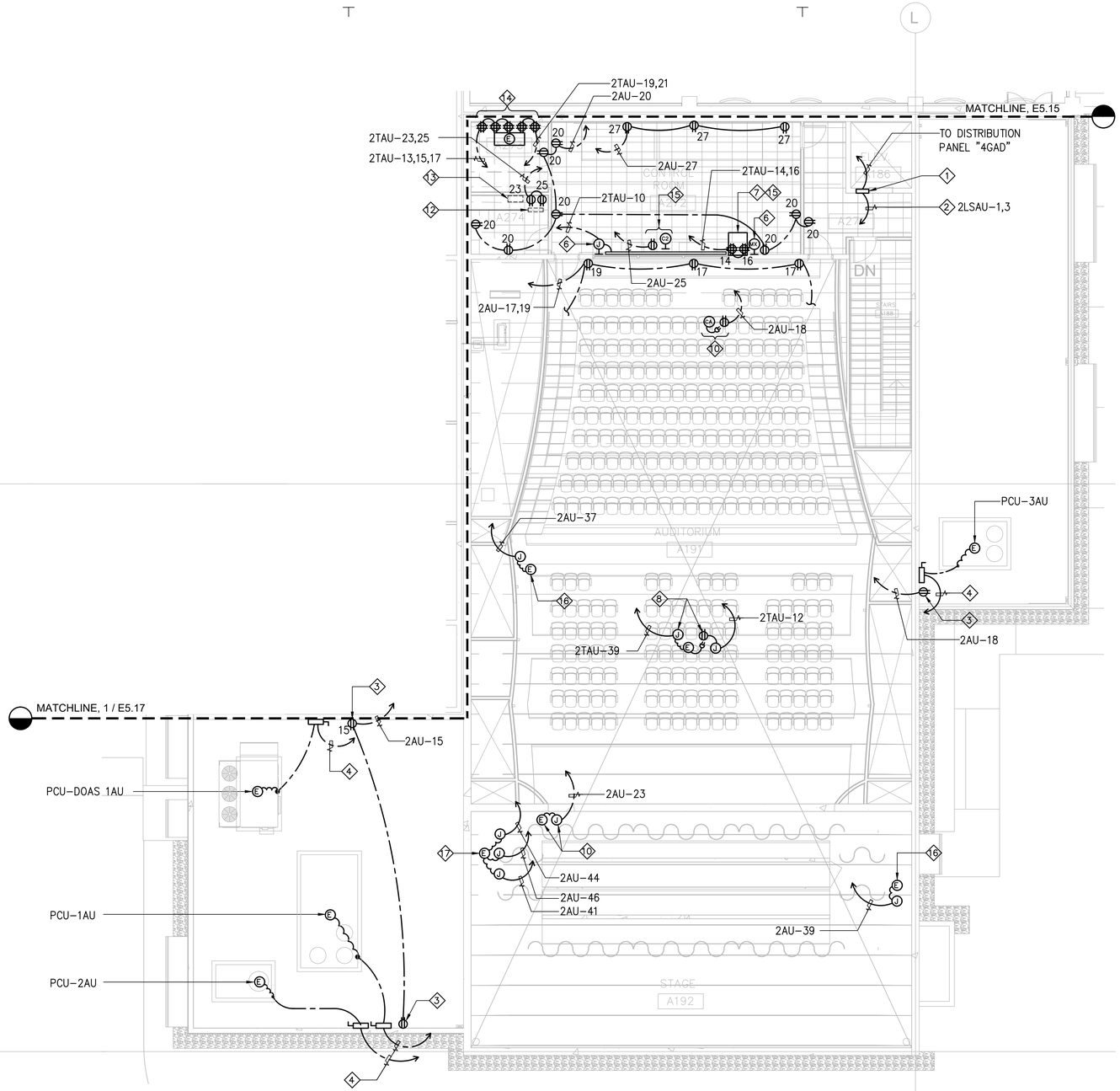
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CHOIR & BAND POWER PLAN - LEVEL 2

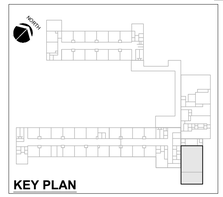
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File:	

Drawing No.: E5.15

Sheet No: ____ of ____



1 AUDITORIUM POWER PLAN - LEVEL 2
SCALE: 1/8"=1'-0"



NOTES:

1. ELEVATOR CONTROLLER, PROVIDE SHOP DRAWING OF COMPLETE LAYOUT, POINT TO POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL.
2. DEDICATED CIRCUIT FOR ELEVATOR CAR LIGHT, ALARM CIRCUIT AND VENTILATION SYSTEM.
3. WEATHERPROOF TYPE WHILE IN USE, GFI TYPE RECEPTACLE.
4. TO DISTRIBUTION PANEL "4AU"
5. AV MIX POSITION UNDERCOUNTER RACK, COORDINATE WITH AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE (1)-20A, 120V TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO QUAD RECEPTACLE BEHIND RACK.
6. MIX POSITION JUNCTION BOX, COORDINATE WITH AUDIO-VISUAL DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE (1)-20AC DEDICATED ISOLATED GROUND, TECHNICAL POWER CIRCUIT TERMINATED INTO PLUGMOLD STRIP ABOVE COUNTER. PROVIDE RECEPTACLE OUTLET EVERY 18" OF STRIP.
7. AV MIX POSITION COUNTERTOP RACK. COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (1) 20A, 120V TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO QUAD RECEPTACLE BEHIND RACK.
8. THEATRE VIDEO PROJECTOR BOX, COORDINATE LOCATION AND REQUIREMENTS WITH AUDIO-VISUAL DRAWINGS. PROVIDE (1)-20A, 120V DEDICATED TECHNICAL CIRCUIT WITH ISOLATED GROUND DUPLEX RECEPTACLE OUTLET AND (1)-20A, 208V DEDICATED TECHNICAL POWER CIRCUIT ADJACENT TO PROJECTOR MOUNTING POINT.
9. PROJECTION SCREEN, COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. TERMINATE TO 120V, CIRCUIT TO PROJECTOR POWER.
10. CEILING CAMERA, COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (1)-20A, 120V TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX RECEPTACLE OUTLET AND ADJACENT TO BOX.
11. LIGHTING CONTROL DESK, COORDINATE EXACT LOCATION AND LAYOUT WITH THEATRE CONTRACTOR. PROVIDE (2) 20A, 120VAC DEDICATED TECHNICAL POWER CIRCUIT. CONNECT TO PANEL 2 TAU-14,16 WITH 3/4"C, 3#12, 1#10 GND.
12. CONTROL EQUIPMENT RACK, COORDINATE EXACT LOCATION AND LAYOUT WITH THEATER CONTRACTOR. PROVIDE (2) 20A, 120VAC DEDICATED ISOLATED GROUND TECHNICAL POWER CIRCUITS INTO NEMA 5-20R RECEPTACLES BEHIND RACK.
13. RELAY PANEL, COORDINATE EXACT LOCATION AND LAYOUT WITH THEATRE CONTRACTOR, SUBMIT SHOP DRAWING OF EQUIPMENT, SHOWING LAYOUT, ELEVATION, POWER CONNECTION FOR REVIEW AND APPROVAL.
14. AV AMPLIFIER RACK, COORDINATE WITH AUDIO-VISUAL DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (5)-20A TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TO QUAD OUTLETS. LOCATE OUTLETS BEHIND RACK.
15. LIGHTING CONTROL RECEPTACLE STATION, COORDINATE WITH THEATRE SYSTEM DRAWINGS FOR LOCATION AND REQUIREMENTS. PROVIDE (1)-20A, 120V DUPLEX OUTLET ADJACENT TO RECEPTACLE STATION.
16. MOTORIZED HOIST CONTROL AND INTERFACE BOX, COORDINATE WITH THEATRE SYSTEM DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE (1)-30A, 208V, 3ø CIRCUIT.
17. MOTORIZED HOIST CONTROL AND INTERFACE BOX, COORDINATE WITH THEATRE SYSTEM DRAWING FOR LOCATION AND REQUIREMENTS. PROVIDE (3)-30A, 208V, 3ø TO RACEWAY.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

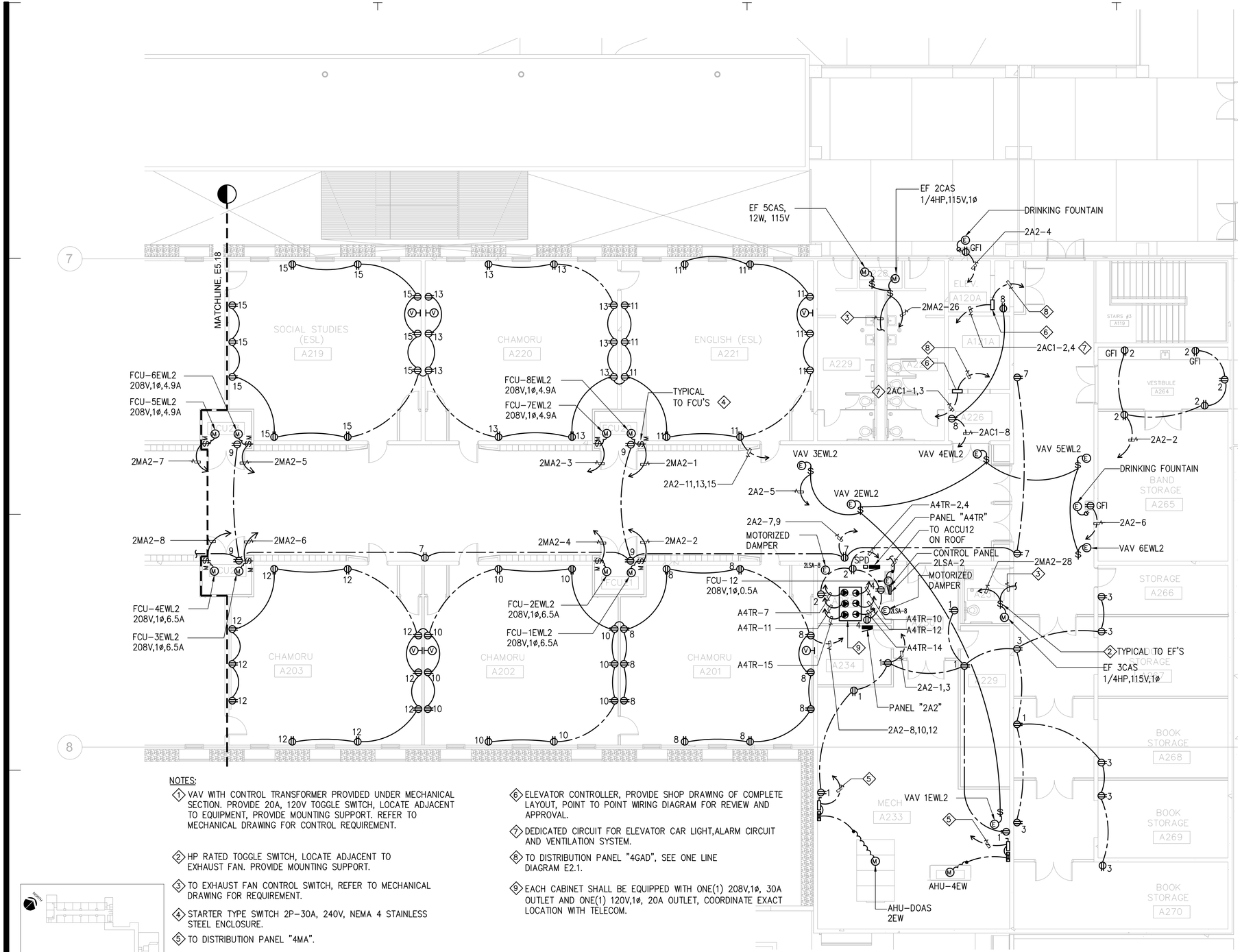
Title: AUDITORIUM POWER PLAN - LEVEL 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25

Project No.: 24-20-486 File

Drawing No.: E5.16

Sheet No. _____ of _____



NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. STARTER TYPE SWITCH 2P-30A, 240V, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. TO DISTRIBUTION PANEL "4MA".
6. ELEVATOR CONTROLLER, PROVIDE SHOP DRAWING OF COMPLETE LAYOUT, POINT TO POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL.
7. DEDICATED CIRCUIT FOR ELEVATOR CAR LIGHT,ALARM CIRCUIT AND VENTILATION SYSTEM.
8. TO DISTRIBUTION PANEL "4GAD", SEE ONE LINE DIAGRAM E2.1.
9. EACH CABINET SHALL BE EQUIPPED WITH ONE(1) 208V,1ø, 30A OUTLET AND ONE(1) 120V,1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.

1 A-WING CLASSROOM POWER PLAN - LEVEL 2 (EAST)

SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Architecture
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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

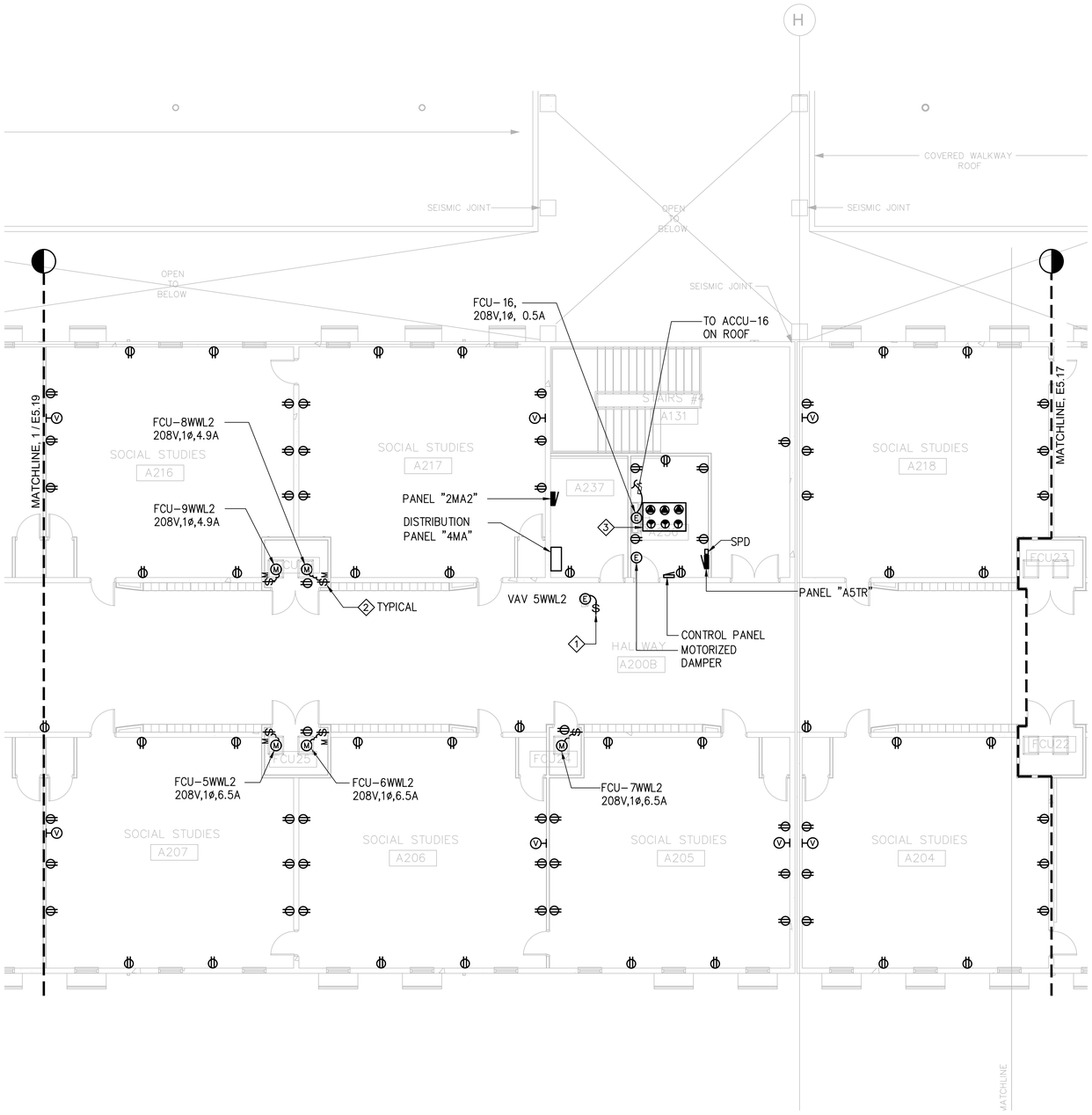
Title: A-WING CLASSROOM POWER PLAN - LEVEL 2 (EAST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	

Drawing No. E5.17

Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 A-WING CLASSROOM POWER PLAN - LEVEL 2 (MIDDLE)

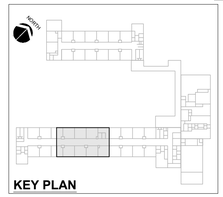
SCALE: 1/8"=1'-0"

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. STARTER TYPE SWITCH FOR FCU, COORDINATE WITH MECHANICAL FOR REQUIREMENT.
3. EACH CABINET SHALL BE EQUIPPED WITH ONE (1) 208V, 1ø, 30A OUTLET, AND ONE (1) 120V, 1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES



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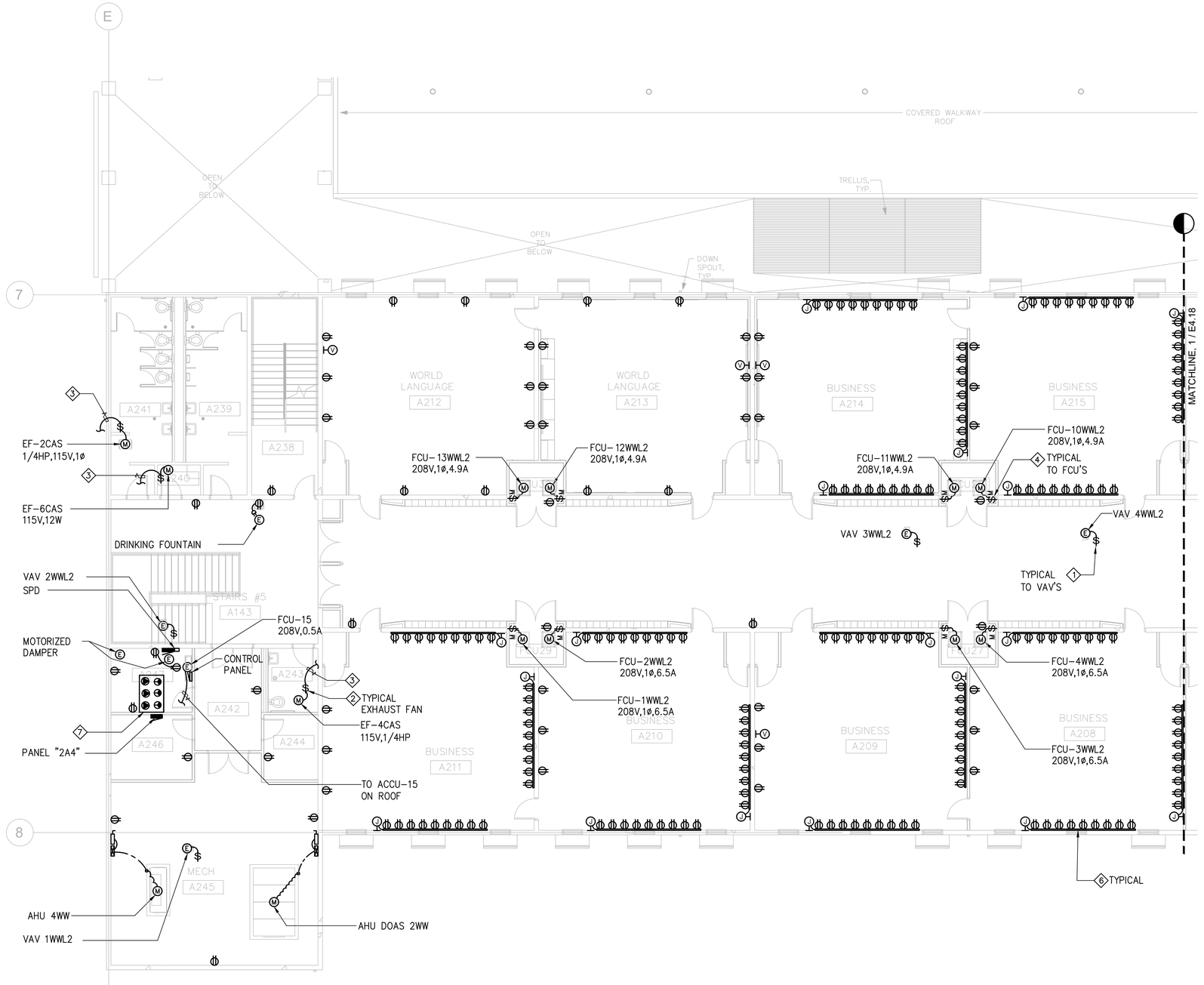
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM POWER PLAN - LEVEL 2 (MIDDLE)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.	24-20-486
File	
Drawing No.	E5.18
Sheet No.	of

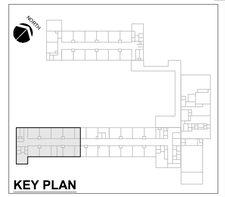


1 A-WING CLASSROOM POWER PLAN - LEVEL 2 (WEST)

SCALE: 1/8"=1'-0"

NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
3. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
4. STARTER TYPE SWITCH 2P-30A, 240V, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. TO DISTRIBUTION PANEL "4MA".
6. WIREMOLD TYPE RACEWAY, WITH 20A, 120 VOLT OUTLETS AS SHOWN AND CIRCUIT AS INDICATED. WIRE CIRCUIT TO RECEPTACLE OUTLETS ALTERNATELY.
7. EACH CABINET SHALL BE EQUIPPED WITH ONE(1) 208V, 1ø,30A OUTLET, AND ONE (1) 120V, 1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.



GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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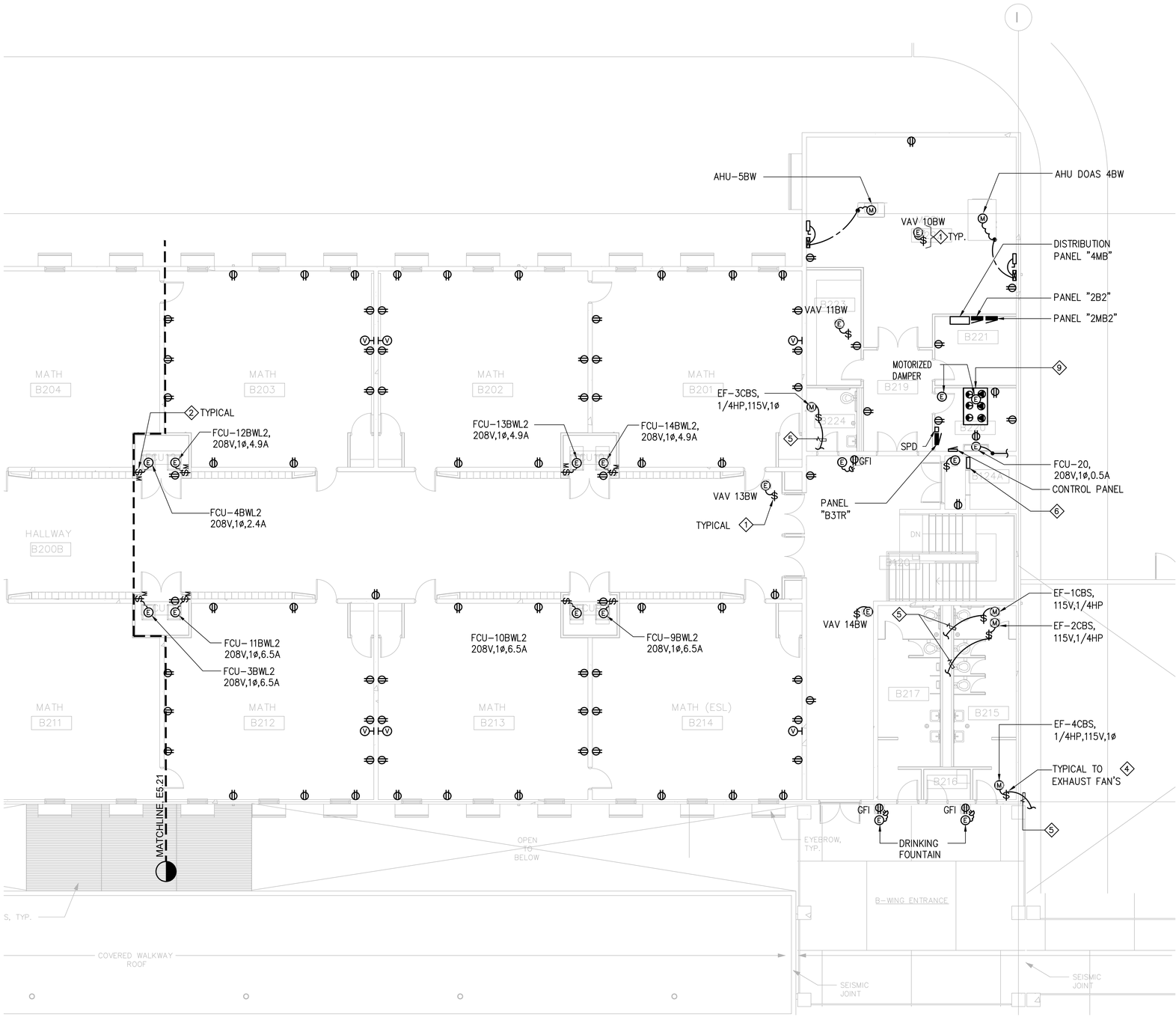
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: A-WING CLASSROOM POWER PLAN - LEVEL 2 (WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

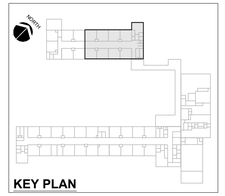
Drawing No.: E5.19

Sheet No. ____ of ____



1 B-WING CLASSROOM POWER PLAN - LEVEL 2 (EAST)

SCALE: 1/8"=1'-0"



NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. STARTER TYPE SWITCH FOR FCU, COORDINATE WITH MECHANICAL FOR REQUIRED.
3. TO DISTRIBUTION PANEL "4MB", REFER TO ONE LINE DIAGRAM.
4. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
5. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
6. ELEVATOR CONTROLLER, PROVIDE SHOP DRAWING OF COMPLETE LAYOUT, POINT WIRING DIAGRAM FOR REVIEW AND APPROVAL.
7. DEDICATED CIRCUIT FOR ELEVATOR CAR LIGHT, ALARM CIRCUIT AND VENTILATION SYSTEM.
8. TO DISTRIBUTION PANEL "4GM" @ MAIN ELECTRICAL ROOM.
9. EACH CABINET SHALL BE EQUIPPED WITH ONE 208V,1ø,30A OUTLETAND ONE(1) 120V,1ø, 20A OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Interior Design

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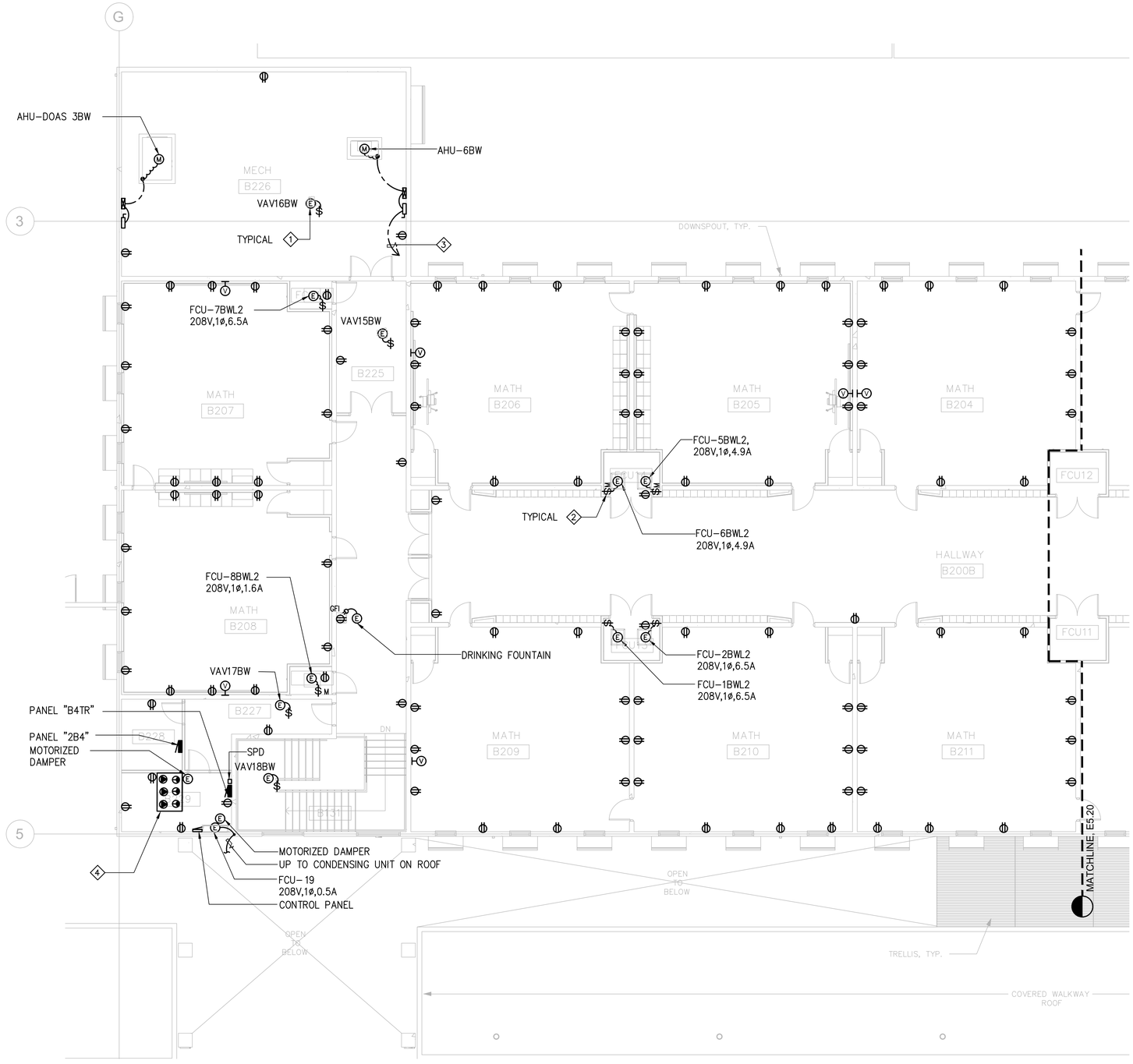
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: B-WING CLASSROOM POWER PLAN - LEVEL 2 (EAST)

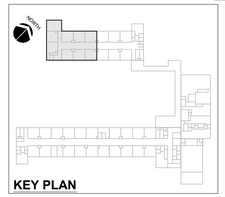
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No. E5.20

Sheet No. _____ of _____



1 B-WING CLASSROOM POWER PLAN - LEVEL 2 (WEST)
SCALE: 1/8"=1'-0"



NOTES:

1. VAV WITH CONTROL TRANSFORMER PROVIDED UNDER MECHANICAL SECTION. PROVIDE 20A, 120V TOGGLE SWITCH, LOCATE ADJACENT TO EQUIPMENT, PROVIDE MOUNTING SUPPORT. REFER TO MECHANICAL DRAWING FOR CONTROL REQUIREMENT.
2. STARTER TYPE SWITCH FOR FCU, COORDINATE WITH MECHANICAL FOR REQUIREMENT.
3. TO DISTRIBUTION PANEL "4MB", REFER TO ONE LINE DIAGRAM.
4. EACH CABINET SHALL BE EQUIPPED WITH ONE(1) 208V, 1ø,30A OUTLET, AND ONE (1) 120V, 1ø, 20A OUTLET, COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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REVISION		
No.	Description	Date
2	ADDENDUM	12/16/22

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Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: B-WING CLASSROOM POWER PLAN - LEVEL 2 (WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No. E5.21

Sheet No. _____ of _____

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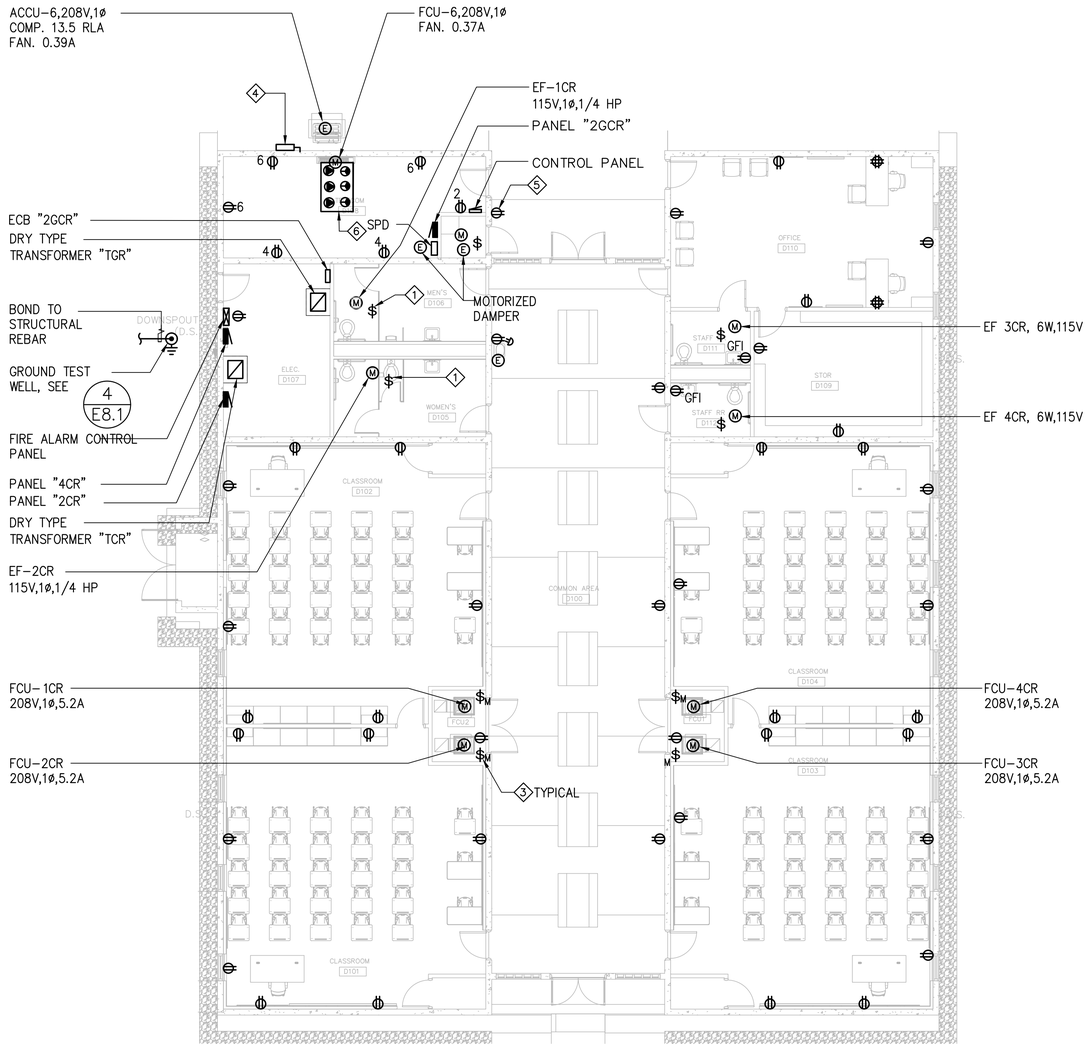

1 CREDIT RECOVERY POWER PLAN

SCALE: 1/8"=1'-0"

NOTES:

1. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN. PROVIDE MOUNTING SUPPORT.
2. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENT.
3. STARTER TYPE SWITCH FOR FCU, COORDINATE WITH MECHANICAL FOR REQUIREMENT.
4. NON FUSIBLE SWITCH 2P-30A, 240 VOLTS, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. WEATHERPROOF TYPE WHILE IN USE, GFI TYPE RECEPTACLE.
6. EACH CABINET SHALL BE EQUIPPED WITH ONE 208V, 1P,20A OUTLET AND ONE(1) 120V, 1P,20A OUTLET. COORDINATE EXACT LOCATION WITH TELECOM.

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Interior Design

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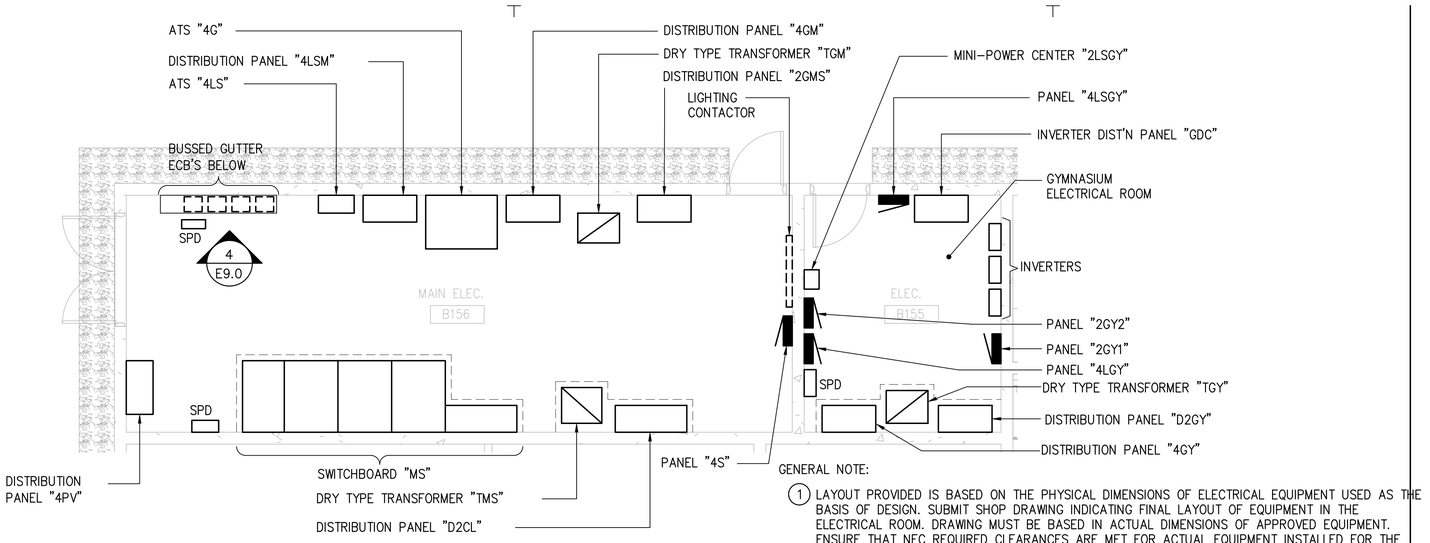
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: CREDIT RECOVERY POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E5.22

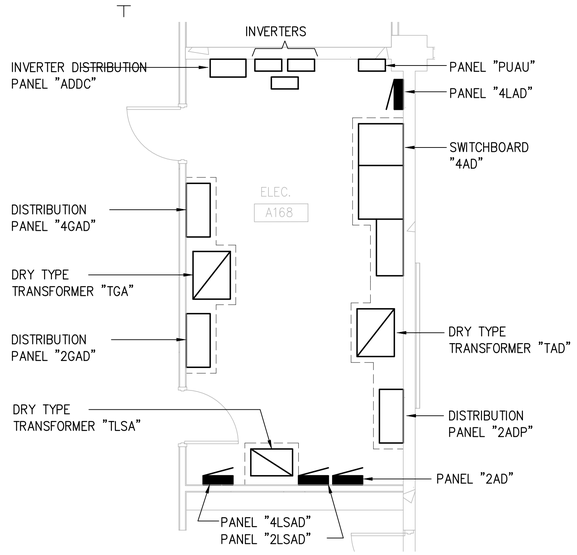
Sheet No: of



GENERAL NOTE:

1. LAYOUT PROVIDED IS BASED ON THE PHYSICAL DIMENSIONS OF ELECTRICAL EQUIPMENT USED AS THE BASIS OF DESIGN. SUBMIT SHOP DRAWING INDICATING FINAL LAYOUT OF EQUIPMENT IN THE ELECTRICAL ROOM. DRAWING MUST BE BASED IN ACTUAL DIMENSIONS OF APPROVED EQUIPMENT. ENSURE THAT NEC REQUIRED CLEARANCES ARE MET FOR ACTUAL EQUIPMENT INSTALLED FOR THE PROJECT. SUBMIT DIMENSIONED PLANS, SECTION AND ELEVATIONS SHOWING MINIMUM CLEARANCES FOR ALL EQUIPMENT. SHOP DRAWINGS MUST BE CERTIFIED BY A LICENSED PROFESSIONAL ELECTRICAL ENGINEER OF MASTER ELECTRICIAN.

1 MAIN ELECTRICAL ROOM
SCALE: 1/4"=1'-0"

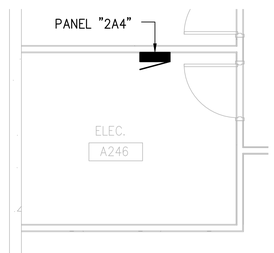


2 ADMINISTRATION ELECTRICAL ROOM
SCALE: 1/4"=1'-0"

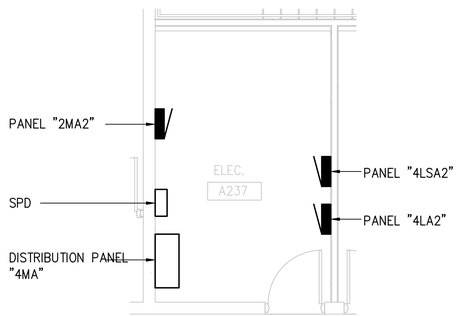
3 ELECTRICAL ROOM - (A-WING CLASSROOMS LEVEL 1 WEST)
SCALE: 1/4"=1'-0"

4 ELECTRICAL ROOM - (A-WING CLASSROOMS LEVEL 1 MIDDLE)
SCALE: 1/4"=1'-0"

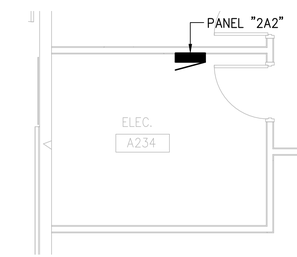
5 ELECTRICAL ROOM - (A-WING CLASSROOMS LEVEL 1 EAST)
SCALE: 1/4"=1'-0"



6 ELECTRICAL ROOM - (A-WING CLASSROOMS LEVEL 2 WEST)
SCALE: 1/4"=1'-0"



7 ELECTRICAL ROOM - (A-WING CLASSROOMS LEVEL 2 MIDDLE)



8 ELECTRICAL ROOM - (A-WING CLASSROOMS LEVEL 2 EAST)

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Planning
Interior Design

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

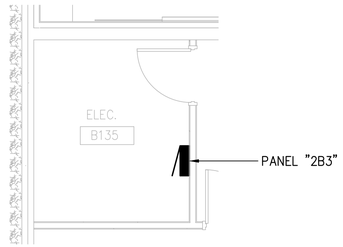
Title: ENLARGED ELECTRICAL ROOM PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E6.0

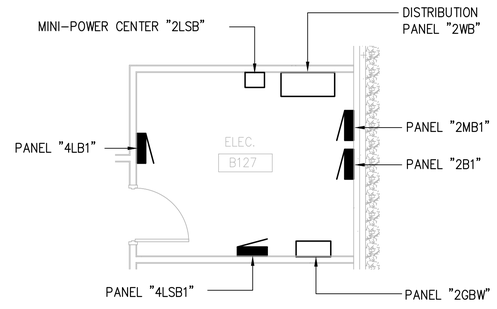
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



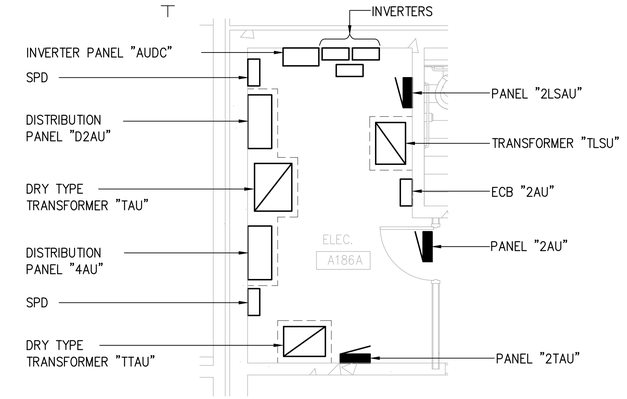
1 ELECTRICAL ROOM - (B-WING CLASSROOMS LEVEL 1 WEST)

SCALE: 1/4"=1'-0"



2 ELECTRICAL ROOM - (B-WING CLASSROOMS LEVEL 1 EAST)

SCALE: 1/4"=1'-0"



3 AUDITORIUM LEVEL 1 ELECTRICAL ROOM

SCALE: 1/4"=1'-0"

4 ELECTRICAL ROOM - (B-WING CLASSROOMS LEVEL 2 WEST)

SCALE: 1/4"=1'-0"

5 ELECTRICAL ROOM - (B-WING CLASSROOMS LEVEL 2 EAST)

SCALE: 1/4"=1'-0"

6 CHOIR & BAND ROOM LEVEL 2 ELECTRICAL ROOM

SCALE: 1/4"=1'-0"

7 LIBRARY LEVEL 2 ELECTRICAL ROOM

SCALE: 1/4"=1'-0"

8 MAIN ENTRANCE ELECTRICAL ROOM

SCALE: 1/4"=1'-0"

GENERAL NOTE:

1. LAYOUT PROVIDED IS BASED ON THE PHYSICAL DIMENSIONS OF ELECTRICAL EQUIPMENT USED AS THE BASIS OF DESIGN. SUBMIT SHOP DRAWING INDICATING FINAL LAYOUT OF EQUIPMENT IN THE ELECTRICAL ROOM. DRAWING MUST BE BASED IN ACTUAL DIMENSIONS OF APPROVED EQUIPMENT. ENSURE THAT NEC REQUIRED CLEARANCES ARE MET FOR ACTUAL EQUIPMENT INSTALLED FOR THE PROJECT. SUBMIT DIMENSIONED PLANS, SECTION AND ELEVATIONS SHOWING MINIMUM CLEARANCES FOR ALL EQUIPMENT. SHOP DRAWINGS MUST BE CERTIFIED BY A LICENSED PROFESSIONAL ELECTRICAL ENGINEER OF MASTER ELECTRICIAN.

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

Project:

Title:
ENLARGED ELECTRICAL ROOM PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File:	
Drawing No.:	E6.1
Sheet No.:	of

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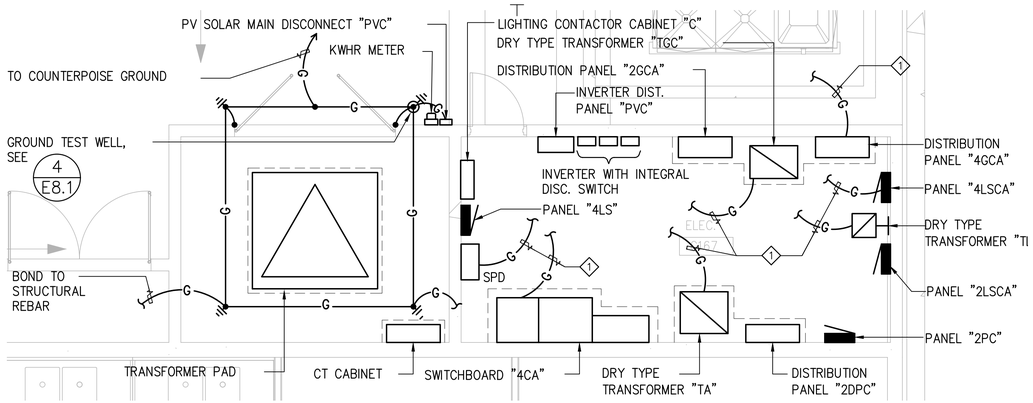
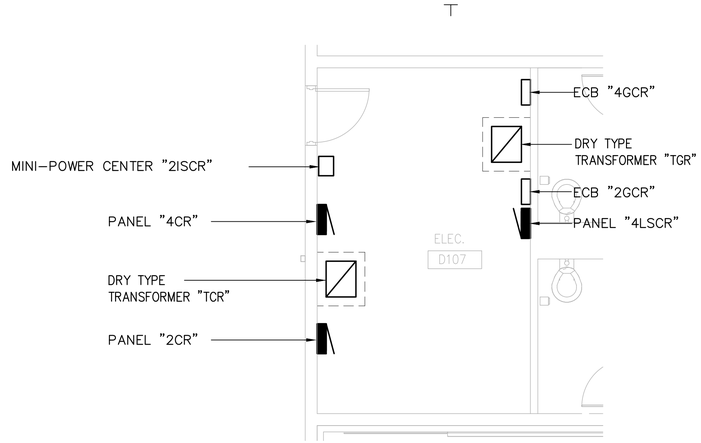


NOTES:

1. TO GROUND TEST WELL.
2. REFER TO 3 E8.0 FOR GROUNDING ADDITIONAL REQUIREMENTS.

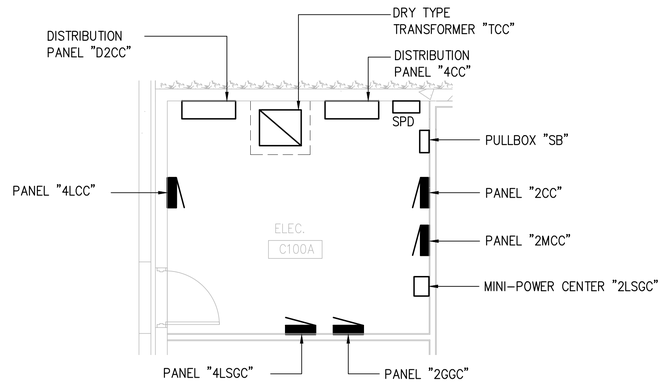
1 MAIN ELECTRICAL ROOM (CAFETERIA)

SCALE: 1/4"=1'-0"



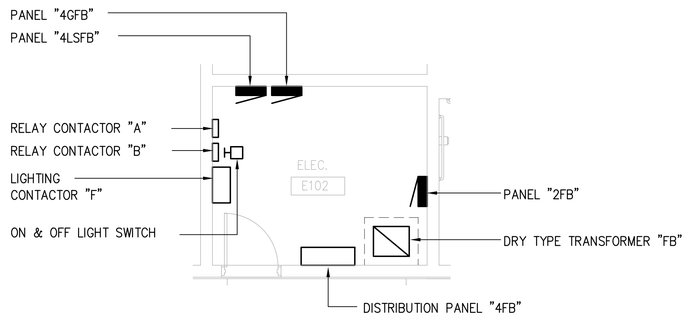
2 ELECTRICAL ROOM, CREDIT RECOVERY

SCALE: 1/4"=1'-0"



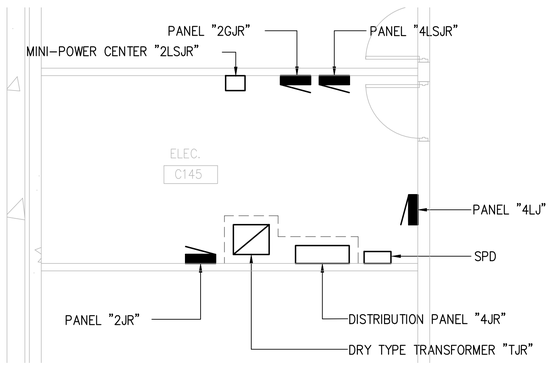
3 GCC ELECTRICAL ROOM

SCALE: 1/4"=1'-0"



4 ELECTRICAL ROOM, FOOTBALL PRESS BOX

SCALE: 1/4"=1'-0"



5 JROTC ELECTRICAL ROOM

SCALE: 1/4"=1'-0"

GENERAL NOTE:

1. LAYOUT PROVIDED IS BASED ON THE PHYSICAL DIMENSIONS OF ELECTRICAL EQUIPMENT USED AS THE BASIS OF DESIGN. SUBMIT SHOP DRAWING INDICATING FINAL LAYOUT OF EQUIPMENT IN THE ELECTRICAL ROOM. DRAWING MUST BE BASED IN ACTUAL DIMENSIONS OF APPROVED EQUIPMENT. ENSURE THAT NEC REQUIRED CLEARANCES ARE MET FOR ACTUAL EQUIPMENT INSTALLED FOR THE PROJECT. SUBMIT DIMENSIONED PLANS, SECTION AND ELEVATIONS SHOWING MINIMUM CLEARANCES FOR ALL EQUIPMENT. SHOP DRAWINGS MUST BE CERTIFIED BY A LICENSED PROFESSIONAL ELECTRICAL ENGINEER OF MASTER ELECTRICIAN.

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

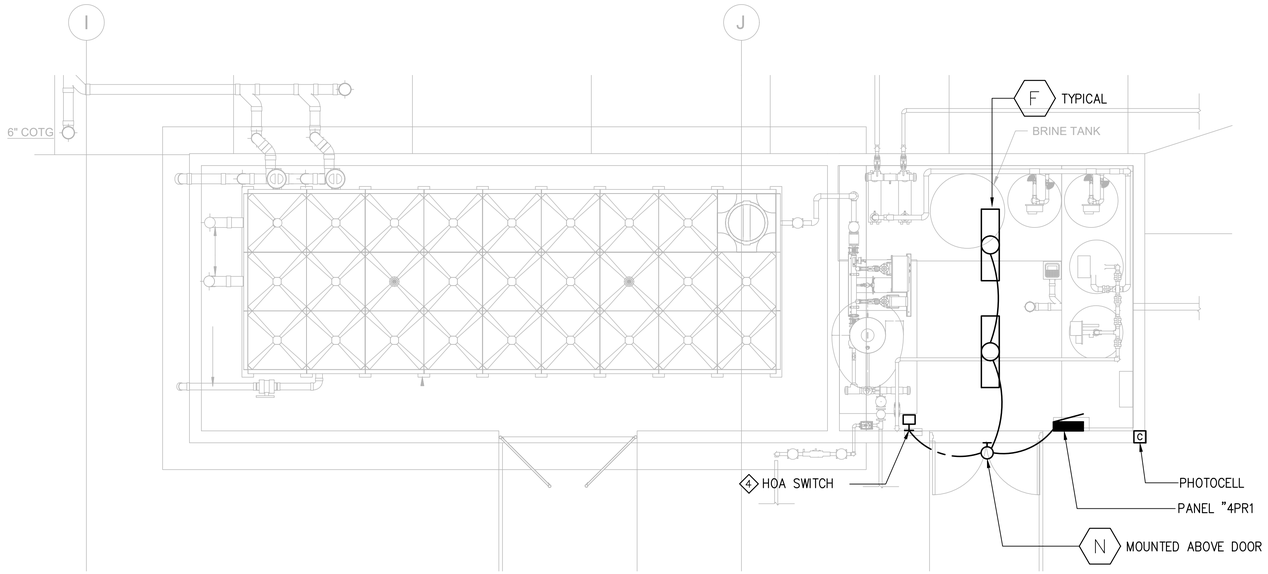
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ENLARGED ELECTRICAL ROOM PLAN

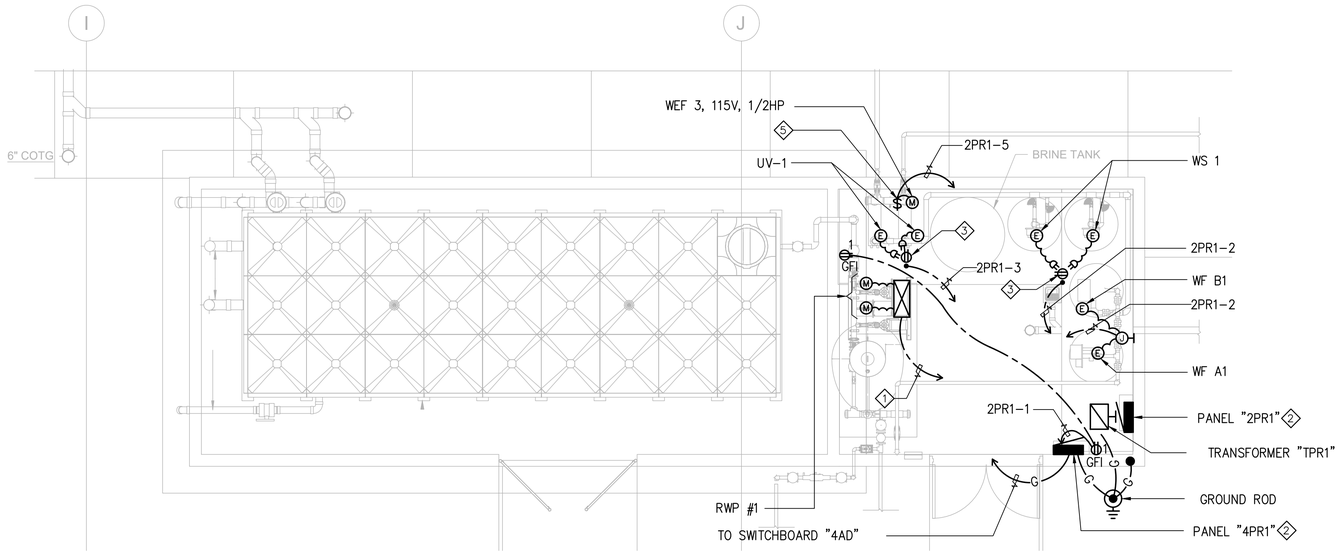
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E6.2

Sheet No: ____ of ____



1 PUMP ROOM #1 (SE) LIGHTING PLAN
SCALE: 1/4"=1'-0"



2 PUMP ROOM #1 (SE) POWER PLAN
SCALE: 1/4"=1'-0"

NOTES:

1. 1#8 TO GROUND ROD. BOND TO BUILDING STRUCTURAL REBAR.
2. SEE ONE LINE DIAGRAM, SHEET E2.0 FOR REQUIREMENTS.
3. PROVIDE OUTLET IN CAST TYPE BOX (WEATHERPROOF TYPE) WITH STAINLESS STEEL MOUNTING SUPPORT.
4. SEE 2/E2.4 FOR LIGHTING CONTROL DIAGRAM.
5. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN.
6. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWINGS FOR REQUIREMENT.
7. TO PANEL "4PR1".

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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Architecture
Planning
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NOT FOR CONSTRUCTION

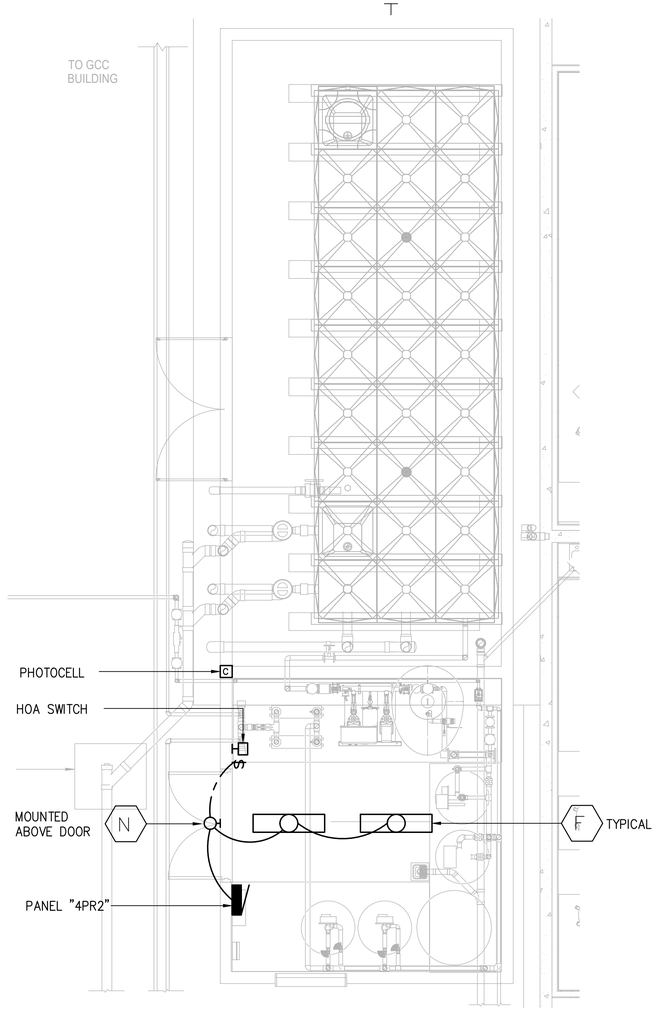
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: PUMP ROOM #1 (SE), LIGHTING AND POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

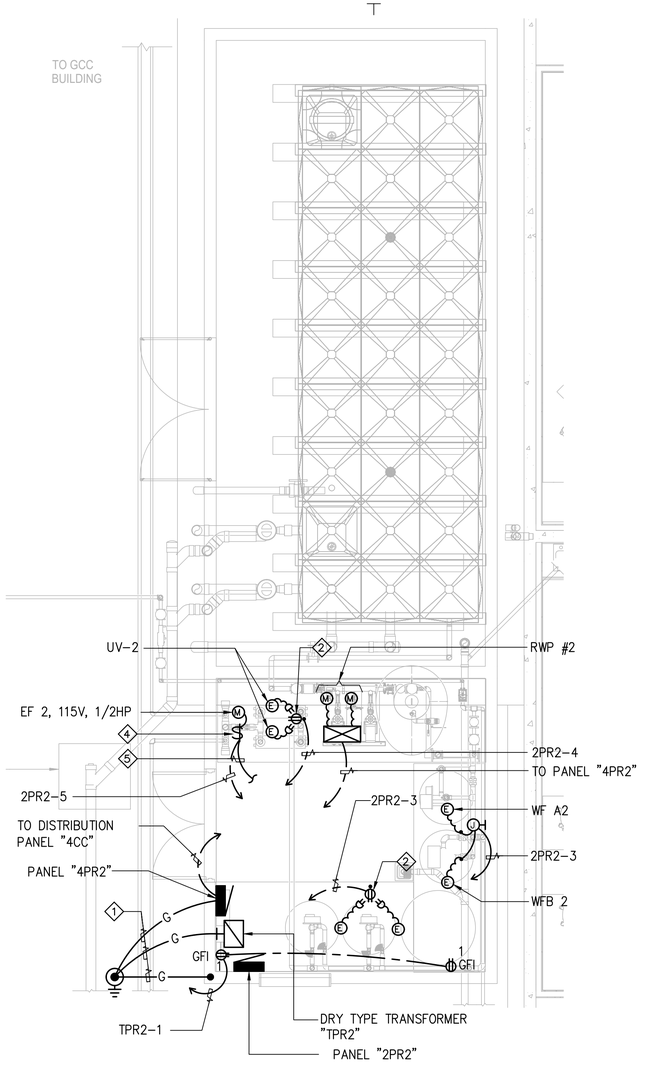
Drawing No.: E6.3

Sheet No. _____ of _____



1 PUMP ROOM #2 (SW) LIGHTING PLAN

SCALE: 1/4"=1'-0"



NOTES:

1. 1#8 TO GROUND ROD. BOND TO BUILDING STRUCTURAL REBAR.
2. PROVIDE OUTLET IN CAST TYPE BOX (WEATHERPROOF TYPE) WITH STAINLESS STEEL MOUNTING SUPPORT.
3. SEE 2/E2.4 FOR LIGHTING CONTROL DIAGRAM.
4. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN.
5. TO EXHAUST CONTROL SWITCH, REFER TO MECHANICAL DRAWINGS FOR REQUIREMENTS.
6. SEE ONE LINE DIAGRAM SHEET E2.3 FOR REQUIREMENTS.

2 PUMP ROOM #2 (SW) POWER PLAN

SCALE: 1/4"=1'-0"

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Planning
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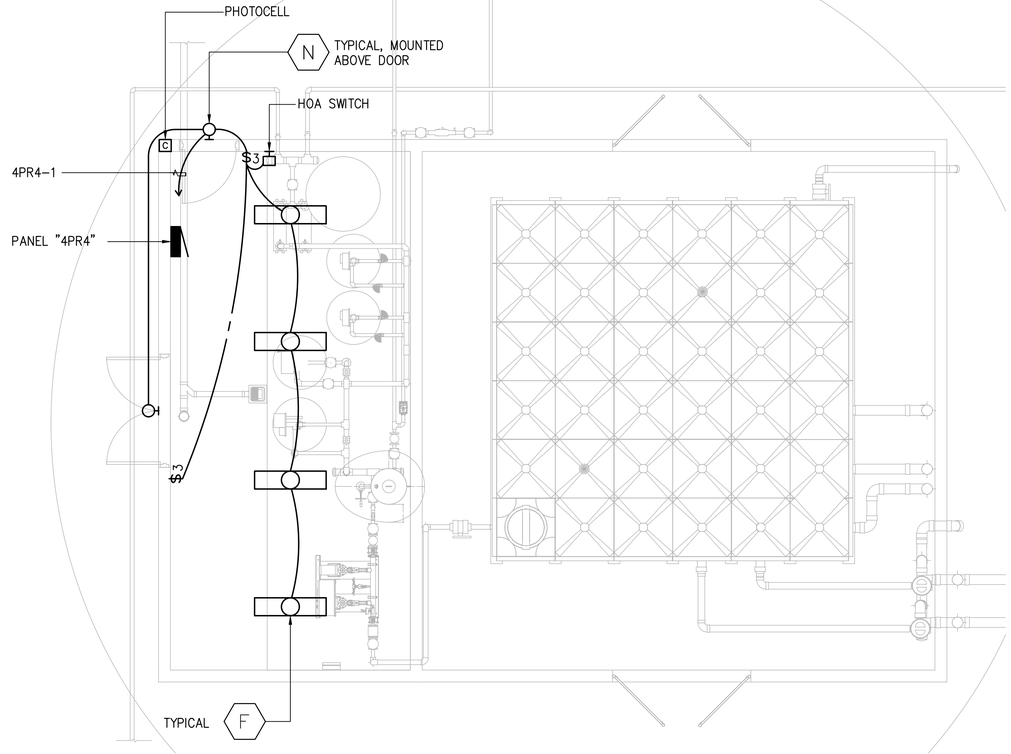
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: PUMP ROOM #2 (SW), LIGHTING AND POWER PLAN

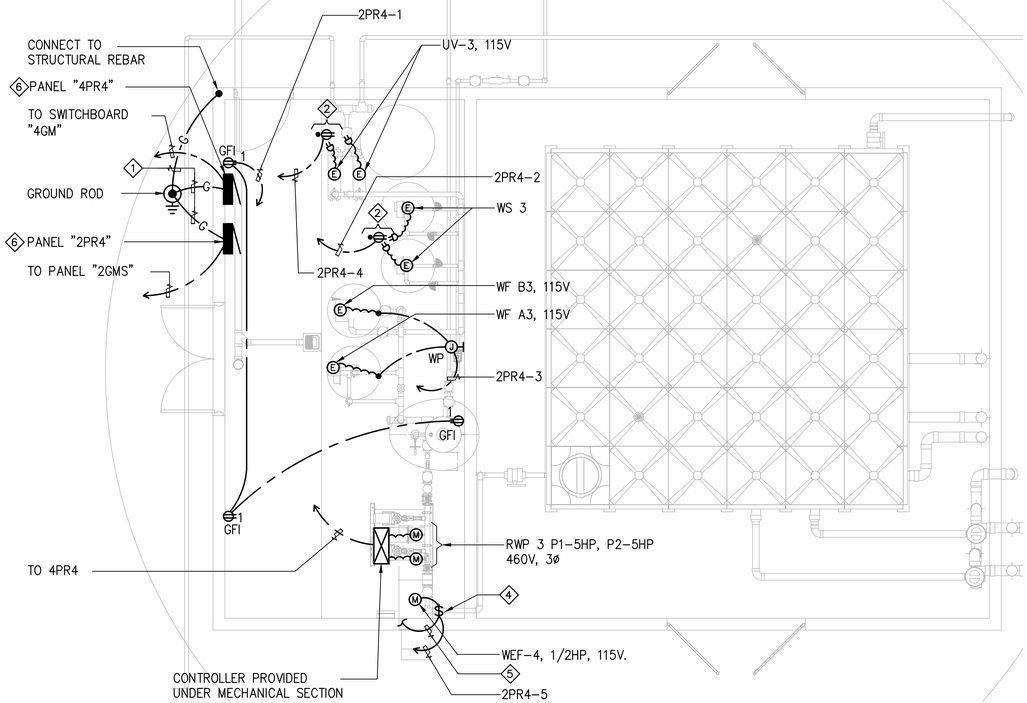
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E6.4

Sheet No. ____ of ____



1 PUMP ROOM #3 (NE) LIGHTING PLAN
SCALE: 1/4"=1'-0"



NOTES:

1. 1#8 TO GROUND ROD. BOND TO BUILDING STRUCTURAL REBAR.
2. PROVIDE OUTLET IN CAST TYPE BOX (WEATHERPROOF TYPE) WITH STAINLESS STEEL MOUNTING SUPPORT. LOCATE ADJACENT TO EQUIPMENT.
3. SEE 2/E2.4 FOR LIGHTING CONTROL DIAGRAM.
4. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN.
5. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWINGS FOR REQUIREMENT.
6. REFER TO ONE LINE DIAGRAM SHEET E2.3 FOR ADDITIONAL REQUIREMENTS.

2 PUMP ROOM #3 (NE) POWER PLAN
SCALE: 1/4"=1'-0"

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Interior Design

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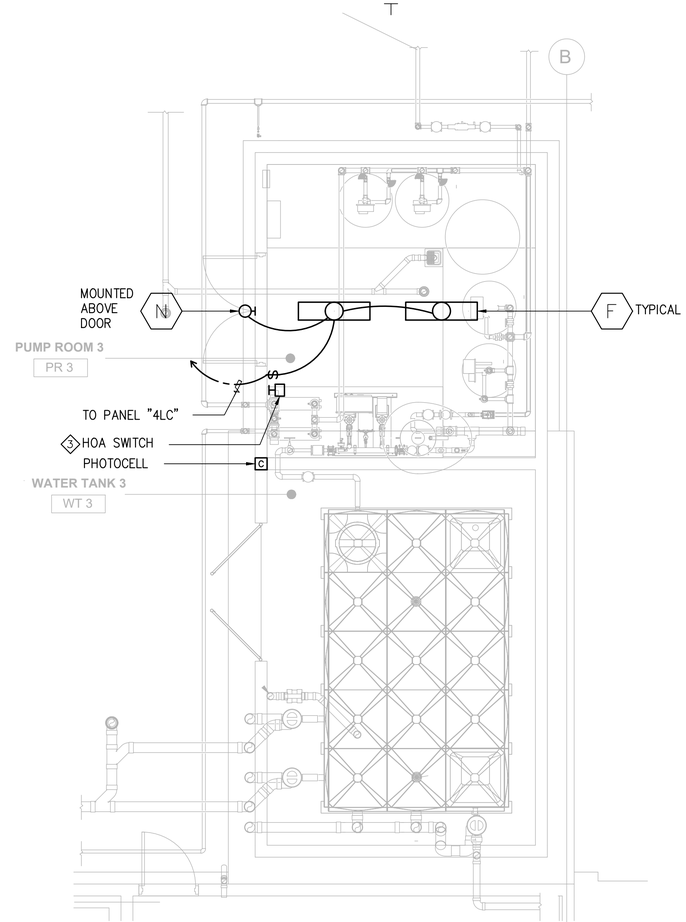
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: PUMP ROOM #3 (NE), LIGHTING & POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486

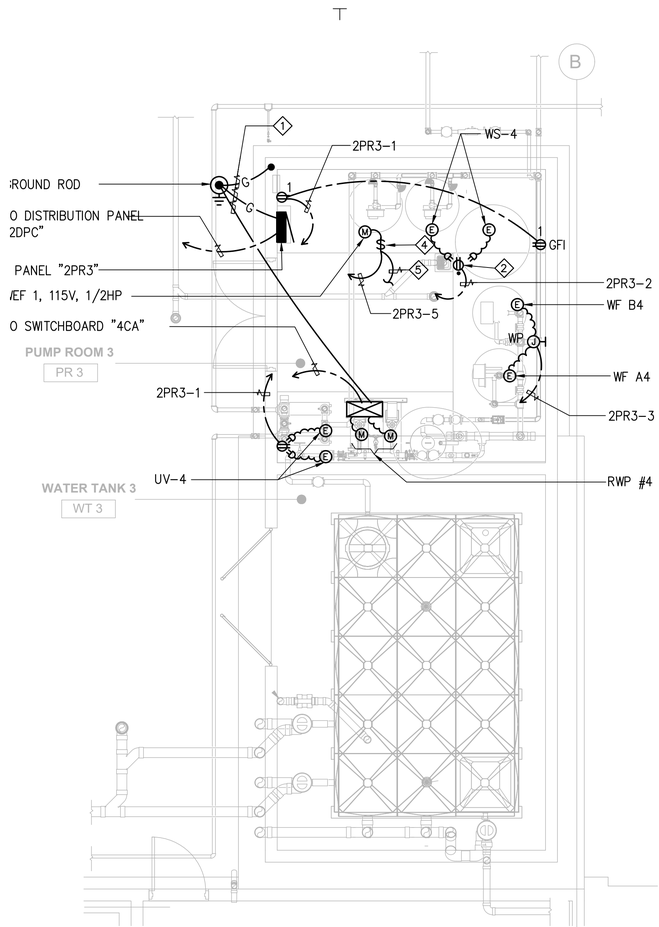
Drawing No.: E6.5

Sheet No. ____ of ____



1 PUMP ROOM #4 (NW) LIGHTING PLAN

SCALE: 1/4"=1'-0"



2 PUMP ROOM #4 (NW) POWER PLAN

SCALE: 1/4"=1'-0"

NOTES:

1. 1#8 TO GROUND ROD. BOND TO BUILDING STRUCTURAL REBAR.
2. PROVIDE OUTLET IN CAST TYPE BOX (WEATHERPROOF TYPE) WITH STAINLESS STEEL MOUNTING SUPPORT.
3. SEE 2/E2.4 FOR LIGHTING CONTROL DIAGRAM.
4. HP RATED TOGGLE SWITCH, LOCATE ADJACENT TO EXHAUST FAN.
5. TO EXHAUST FAN CONTROL SWITCH, REFER TO MECHANICAL DRAWINGS FOR REQUIREMENT.
6. REFER TO ONE LINE DIAGRAM SHEET E2.3 FOR ADDITIONAL REQUIREMENTS.

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Architecture
Planning
Interior Design

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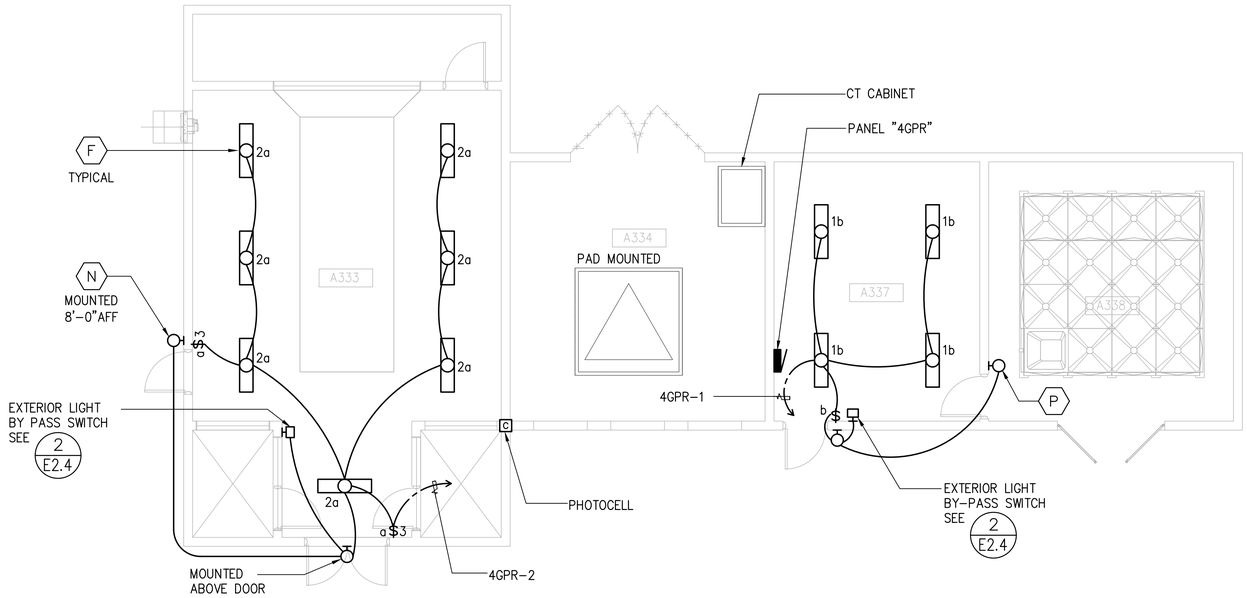
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: PUMP ROOM #4 (NW), LIGHTING AND POWER PLAN

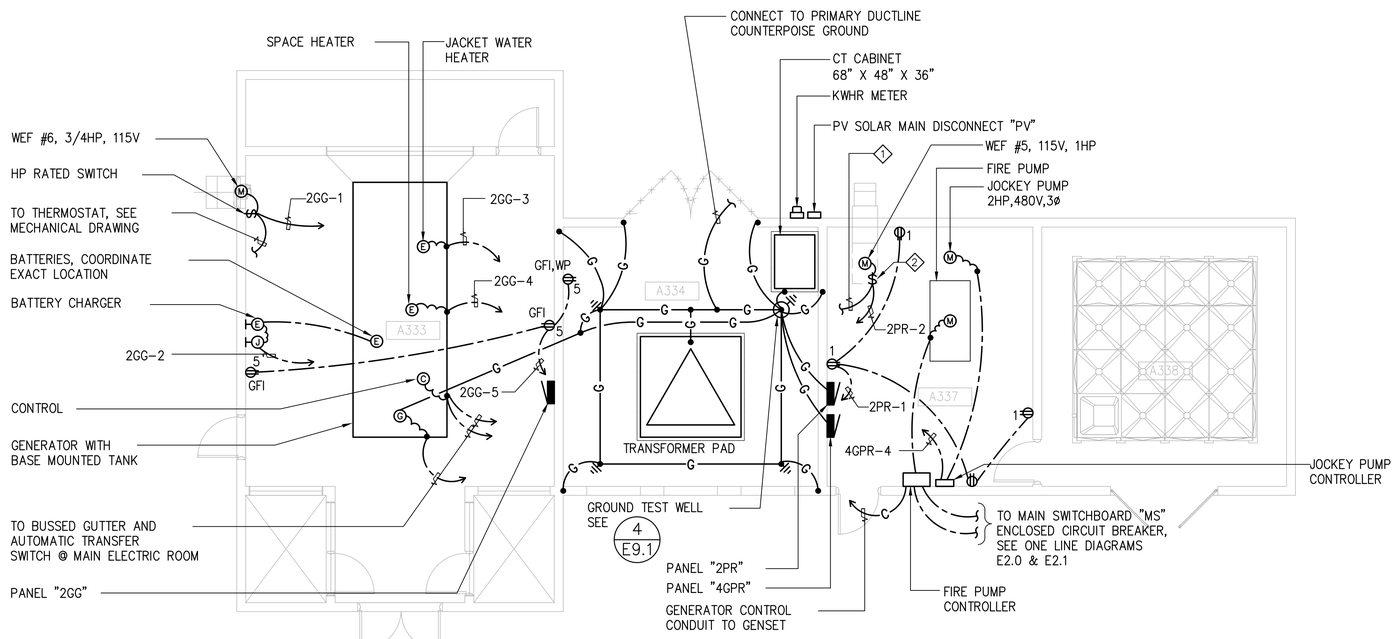
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E6.6

Sheet No. ____ of ____



1 GENERATOR ROOM AND PUMP ROOM LIGHTING PLAN
SCALE: 3/16"=1'-0"



2 GENERATOR ROOM AND PUMP ROOM POWER PLAN
SCALE: 3/16"=1'-0"

GENERAL NOTES:

1. REFER TO TRANSFORMER CONCRETE PAD DETAIL FOR ADDITIONAL GROUNDING REQUIREMENTS. SEE DETAIL 3/E9.0
2. GENERATOR SUPPLIER SHALL SUBMIT CALCULATION THAT THE EQUIPMENT BEING PROVIDED WILL MEET THE BASE LOAD AND THE AIR CONDITIONING REQUIRED FOR GYM. SUBMIT CALCULATION, GENERATOR SHOP DRAWING INCLUDING LAYOUT ELEVATION, COMPLETE DATA SHEET PRIOR TO START OF CONSTRUCTION.

NOTES:

1. TO CONTROL SWITCH, REFER TO MECHANICAL DRAWING FOR REQUIREMENTS.
2. 1P-30A, 120V, AC SWITCH, HP RATED.

GRAPHIC SCALE:
0 2' 4' 8' 12'
SCALE: 3/16"=1'-0"
IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

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Architecture
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Interior Design

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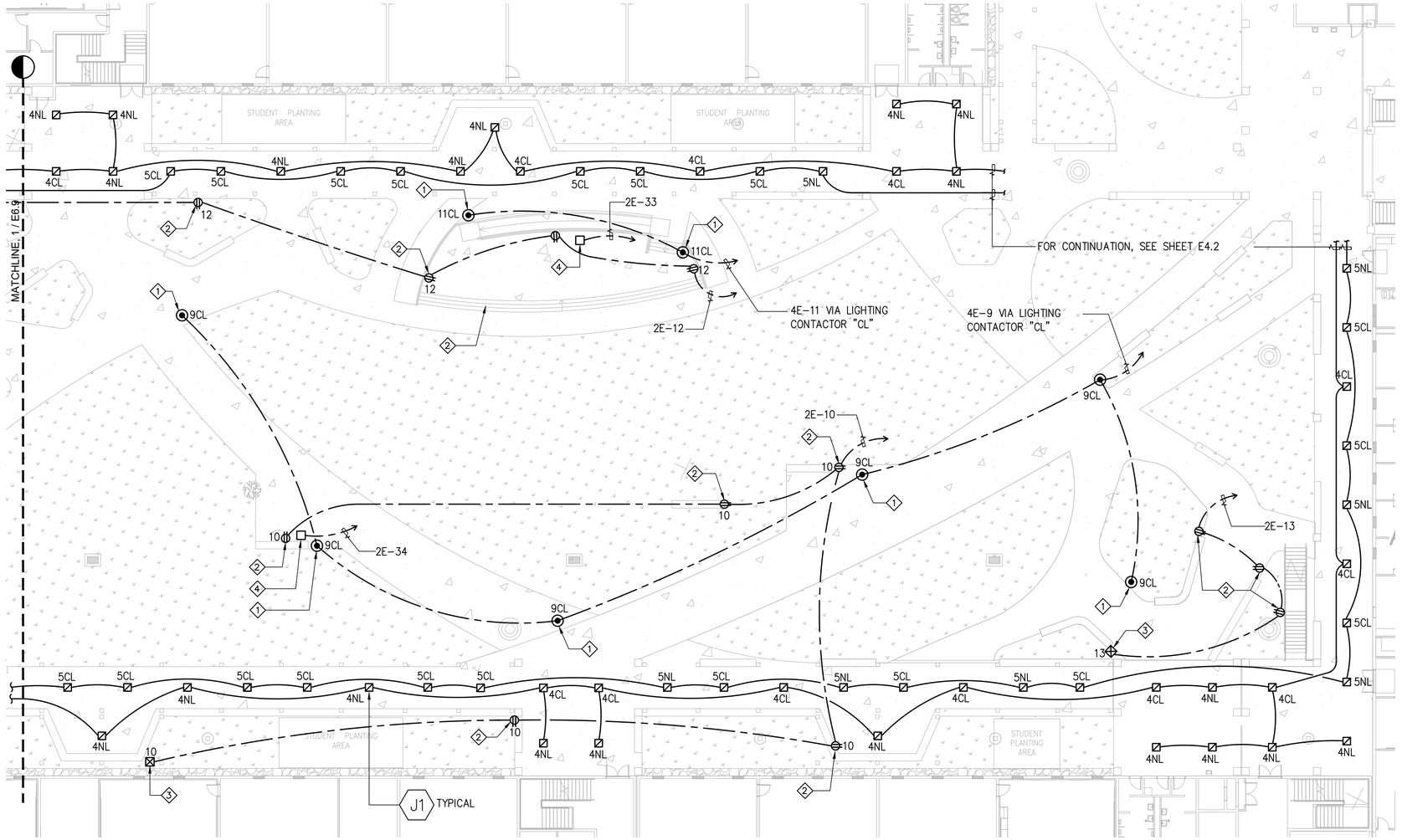
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GENERATOR ROOM AND PUMP ROOM LIGHTING AND POWER PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E6.7
Sheet No. _____ of _____



1 COURTYARD COVERED WALKWAY ELECTRICAL PLAN (1 of 2)

SCALE: 1/16"=1'-0"

NOTES:

1. PEDESTRIAN LIGHT POLE, SEE FOR LIGHT FIXTURE TYPE.
2. 120V. CONVENIENCE OUTLET, WEATHERPROOF TYPE (SUITABLE IN WET LOCATION WHILE IN USE), TAMPER RESISTANT, GFI ON 18" UNISTRUT POST (STAINLESS STEEL), TO BE LOCATED 12" FROM EDGE OF HARDSCAPE. LOCATE DEVICE AND SET INTO THE FACE OF CONCRETE PEDESTAL. REFER TO CONCRETE BENCH DETAIL.
3. POWER PEDESTAL,INCLUDE GFCI,WEATHERPROOF OUTLET AND USB. COORDINATE REQUIREMENT AND LOCATION WITH LANDSCAPE DRAWINGS.
4. EVENT POWER, 208V, 20A, 1Ø. WEATHERPROOF TYPE. COORDINATE LANDSCAPE DRAWING FOR LOCATION.

GRAPHIC SCALE: 0 8 16' 32'

SCALE: 1/16"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Architecture
Planning
Interior Design

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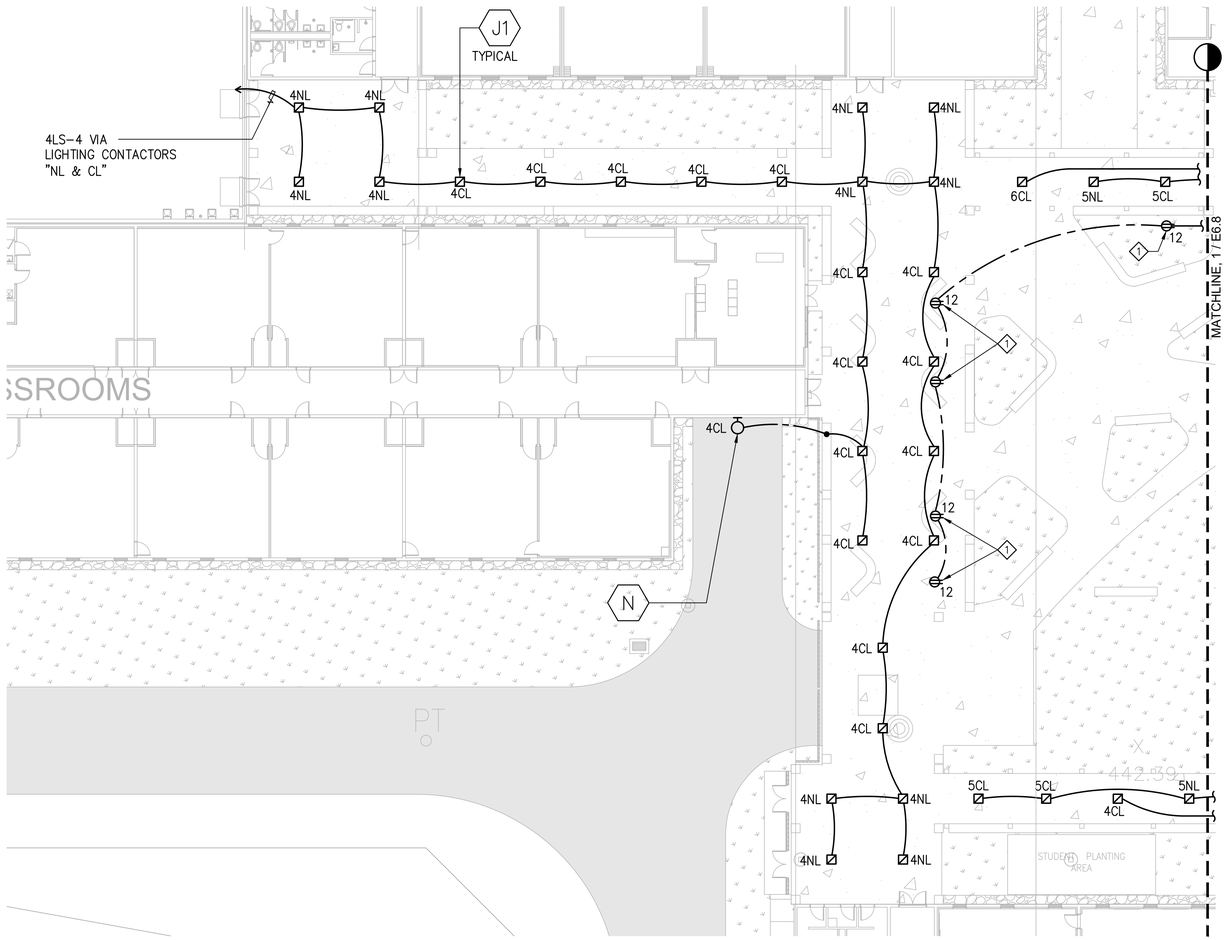
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: COURTYARD COVERED WALKWAY ELECTRICAL PLAN (1 OF 2)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E6.8

Sheet No. ____ of ____



1 COURTYARD COVERED WALKWAY ELECTRICAL PLAN (2 OF 2)
SCALE: 1/16"=1'-0"

NOTE :
1. 120V CONVENIENCE OUTLET, WEATHERPROOF TYPE (SUITABLE IN WET LOCATION WHILE IN USE) TAMPER RESISTANT, GFI TYPE ON 18" UNISTRUT POST (STAINLESS STEEL), TO BE LOCATED 12" FROM EDGE OF HARDSCAPE.

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

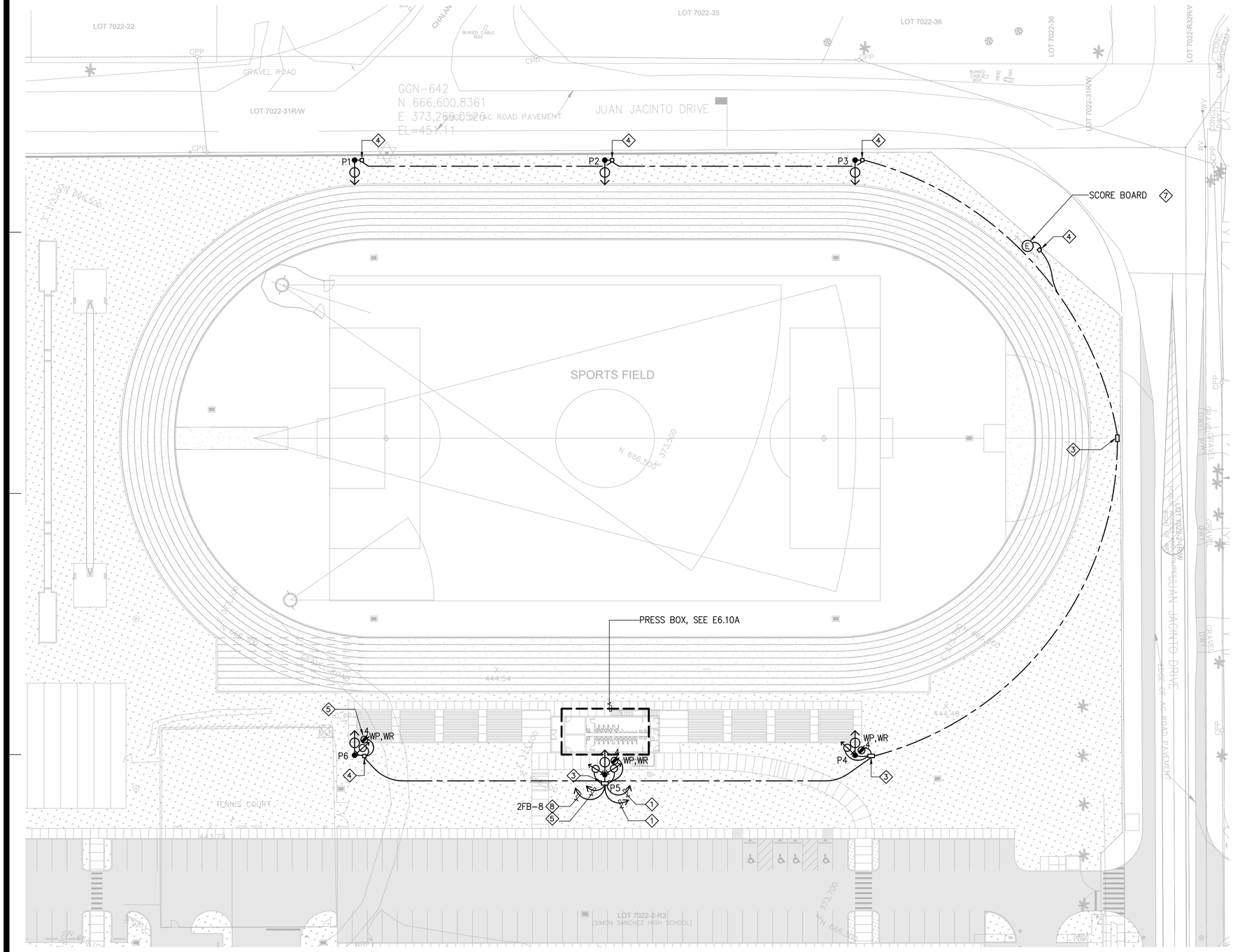
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: COURTYARD COVERED WALKWAY ELECTRICAL PLAN (2 OF 2)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E6.9

Sheet No. _____ of _____



1 FOOTBALL/TRACK AND FIELD ELECTRICAL PLAN
SCALE: 1"=30'-0"

GENERAL NOTE:

(1) SEE 1/E6.10B ONE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

NOTES:

1. TO DISTRIBUTION PANEL "4FB" VIA LIGHTING CONTACTOR "F".
2. TO PANEL "4GFB" VIA RELAY CONTACTOR "B" FOR LIGHT FIXTURES CONNECTED TO GENERATOR POWER.
3. 2'X4' HANDHOLE, SEE 1/E9.4
4. 2'X2' HANDHOLE, SEE 1/E9.3
5. 1 1/2"C SCOREBOARD CONTROL CONDUIT TO SCOREBOARD CONTROL BOX @ PRESS BOX. COORDINATE LOCATION OF CONTROL BOX WITH EQUIPMENT SUPPLIER.
6. TO PANEL "2FB4", CIRCUIT FOR RECEPTACLE FOR OUTLETS, 3/4"C 2#10, 1#10 GND.
7. SCOREBOARD, PROVIDE 120V POWER, COORDINATE EXACT LOCATION OF POWER CONNECTION WITH EQUIPMENT SUPPLIER.
8. 1 1/4"C, 2#8, 1#8 GND.

GRAPHIC SCALE:
0 15' 30' 60'
SCALE: 1"=30'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

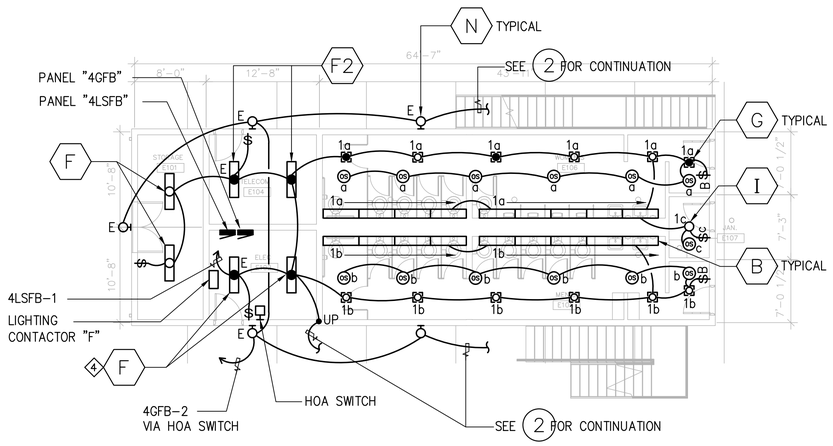
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: FOOTBALL/TRACK AND FIELD ELECTRICAL PLAN

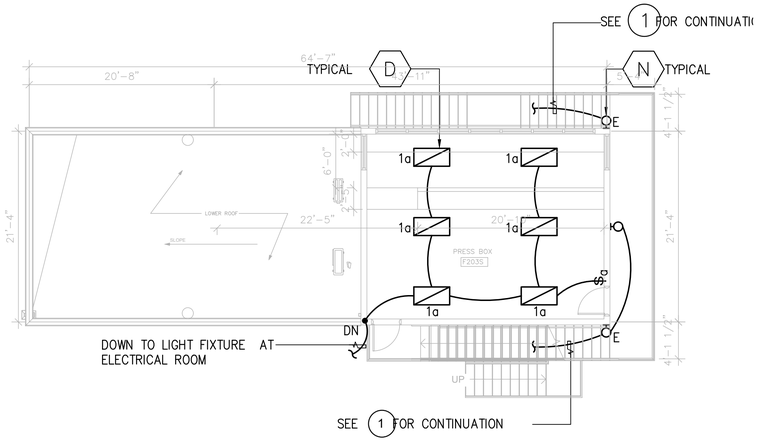
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No. E6.10

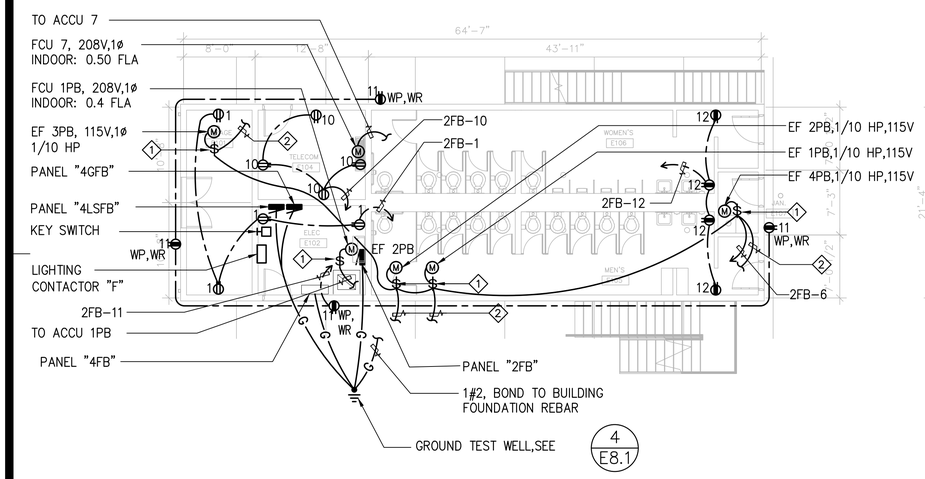
Sheet No: of



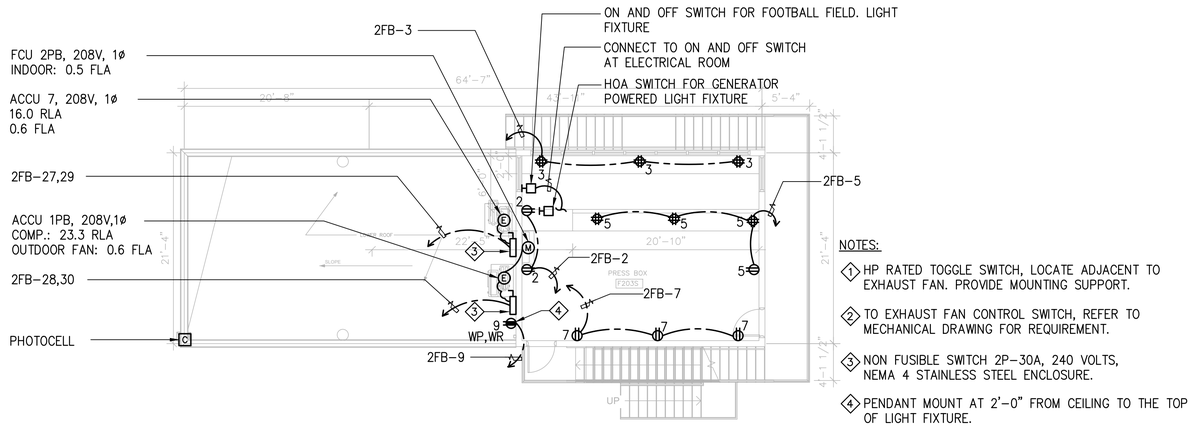
1 PRESS BOX LEVEL 1 - LIGHTING PLAN
SCALE: 1/8"=1'-0"



2 PRESS BOX LEVEL 2 - LIGHTING PLAN
SCALE: 1/8"=1'-0"



3 PRESS BOX LEVEL 1 - POWER PLAN
SCALE: 1/8"=1'-0"



4 PRESS BOX LEVEL 2 - POWER PLAN
SCALE: 1/8"=1'-0"

GRAPHIC SCALE:
0 4' 8' 16'
SCALE: 1/8"=1'-0"

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REVISION

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

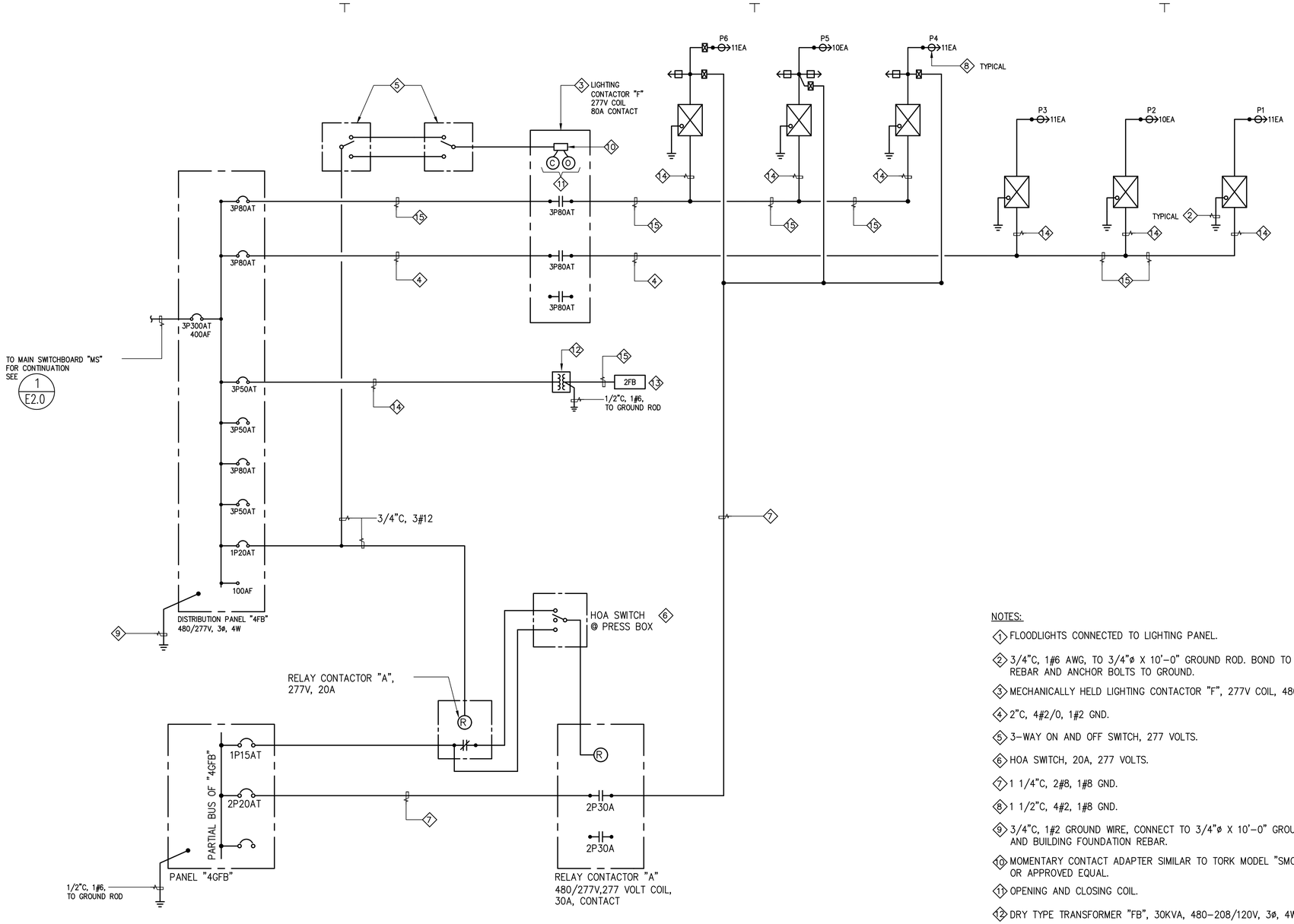
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: PRESS BOX LIGHTING AND POWER PLAN - LEVEL 1 & 2

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E6.10A

Sheet No. _____ of _____



1 ONE LINE DIAGRAM (FOOTBALL, TRACK AND FIELD)

NOT TO SCALE

NOTES:

1. FLOODLIGHTS CONNECTED TO LIGHTING PANEL.
2. 3/4"C, 1#6 AWG, TO 3/4"ø X 10'–0" GROUND ROD. BOND TO FOUNDATION REBAR AND ANCHOR BOLTS TO GROUND.
3. MECHANICALLY HELD LIGHTING CONTACTOR "F", 277V COIL, 480 VOLTS CONTACT.
4. 2"C, 4#2/0, 1#2 GND.
5. 3–WAY ON AND OFF SWITCH, 277 VOLTS.
6. HOA SWITCH, 20A, 277 VOLTS.
7. 1 1/4"C, 2#8, 1#8 GND.
8. 1 1/2"C, 4#2, 1#8 GND.
9. 3/4"C, 1#2 GROUND WIRE, CONNECT TO 3/4"ø X 10'–0" GROUND ROD, AND BUILDING FOUNDATION REBAR.
10. MOMENTARY CONTACT ADAPTER SIMILAR TO TORK MODEL "SMC–3D" OR APPROVED EQUAL.
11. OPENING AND CLOSING COIL.
12. DRY TYPE TRANSFORMER "FB", 30KVA, 480–208/120V, 3ø, 4W.
13. SEE SCHEDULE.
14. 1 1/4"C, 4#8, 1#10 GND.
15. 1 1/2"C, 4#2, 1#8 GND.

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: ONE LINE DIAGRAM (TRACK AND FIELD)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E6.10B

Sheet No. _____ of _____

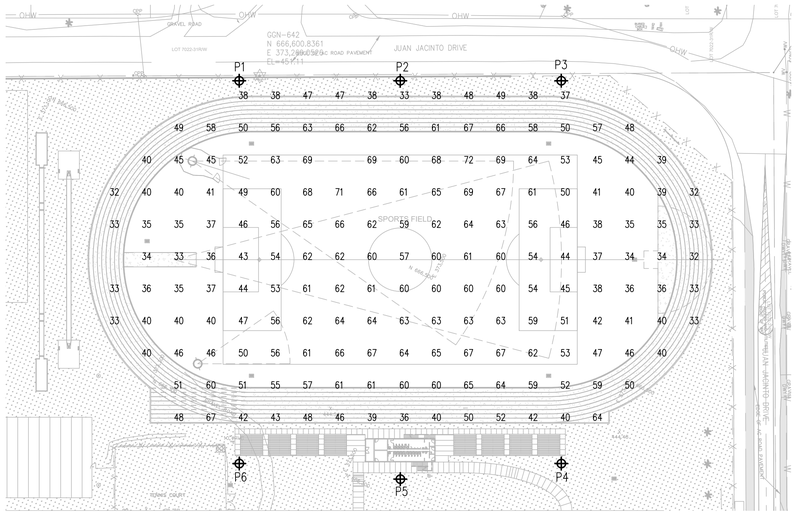
Lighting System

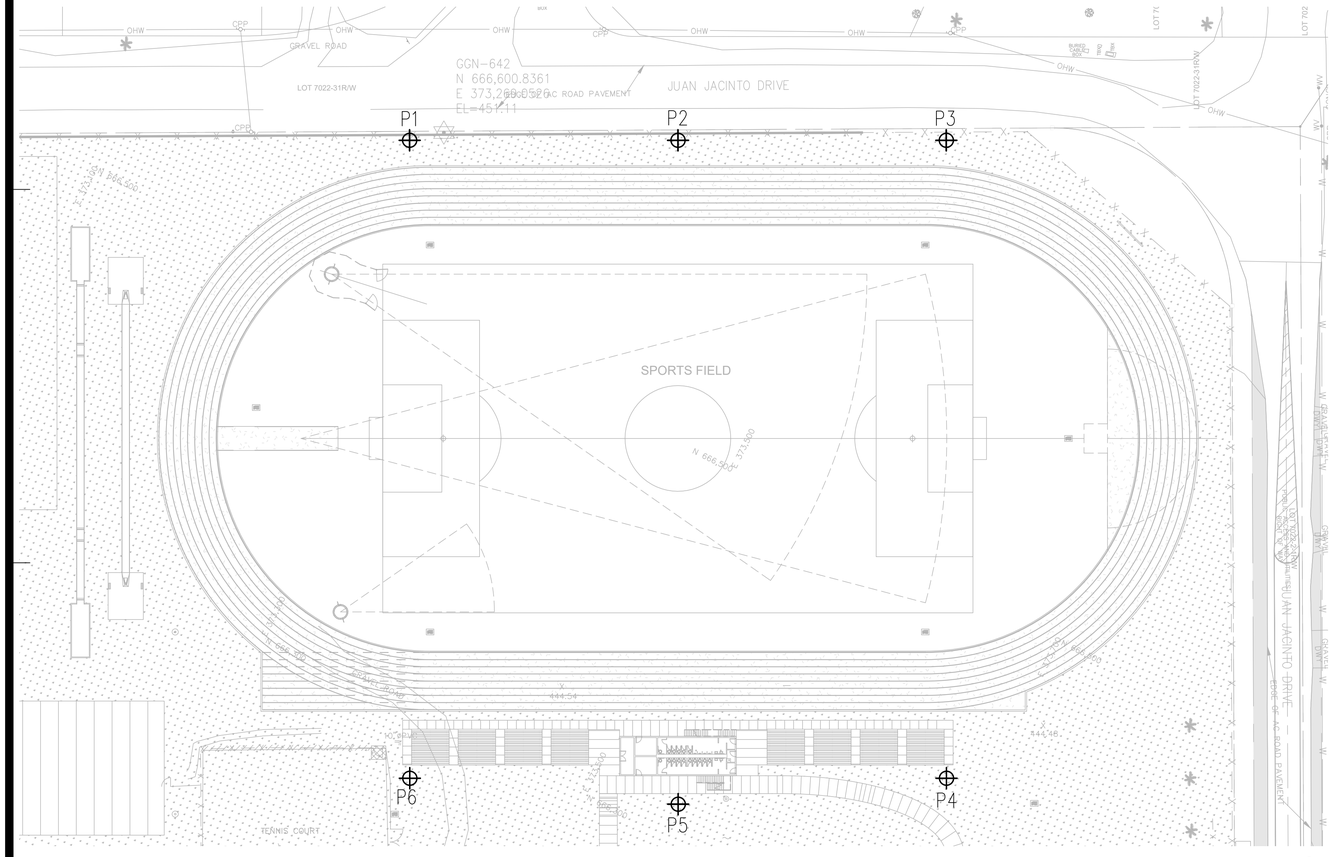
POLE / FIXTURE SUMMARY				
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type
P1, P3–P4, P6	90'	90'	44	MUSCO TLC–LED–1500
P6		16'	1	MUSCO TLC–BT–575
P4		16'	1	MUSCO TLC–BT–575
P2, P5	90'	90'	20	MUSCO TLC–LED–1500
P5	90'	16'	2	MUSCO TLC–BT–575

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC–LED–1500	LED 5700K – 75 CRI	1430W	160,000	>120,000	>120,000	>120,000	64
TLC–BT–575	LED 5700K – 75 CRI	575W	52,000	>120,000	>120,000	>180,000	4

ILLUMINATION REQUIREMENT:

AREA	ILLUMINATION REQUIREMENT (AVE)	UNIFORMITY (MAX./MIN.)
TRACK	20FC @ 3'–0 AFF	4.1
FIELD	30FC @ 3'–0 AFF	4.1

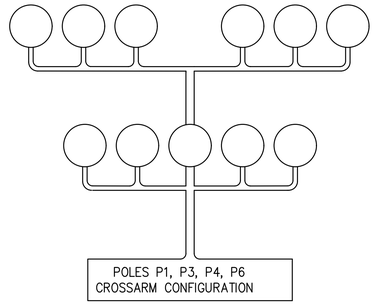


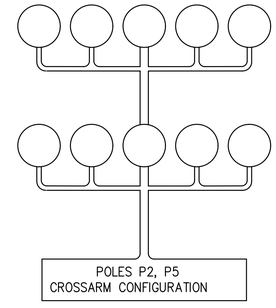


Pole location(s) ⊕ dimensions are relative to 0.0 reference point(s) ⊗

GENERAL NOTES:

1. PERFORM NIGHT TIME LIGHT FIXTURE AIMING WHICH WILL BE WITNESSED BY THE ENGINEER. ADJUST AIMING AS DIRECTED TO ACHIEVE DESIRED ILLUMINATION. OBTAIN APPROVAL OF FINAL RATING.
2. DESIGN IS BASED ON SPECIFIC LIGHT FIXTURE. CONTRACTOR MUST PERFORM COMPUTERIZED POINT TO POINT LIGHTING CALCULATION TO PROVE THAT THE FINAL LIGHT FIXTURE SELECTED WILL MEET THE LIGHTING CRITERIA. ADD LIGHT FIXTURES, AND ADJUST BRANCH CIRCUITING IF NECESSARY TO MEET THE REQUIREMENT AT NO ADDITIONAL COST.





GRAPHIC SCALE:
0 20' 40' 80'
SCALE: 1"=40'–0"
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REVISION

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

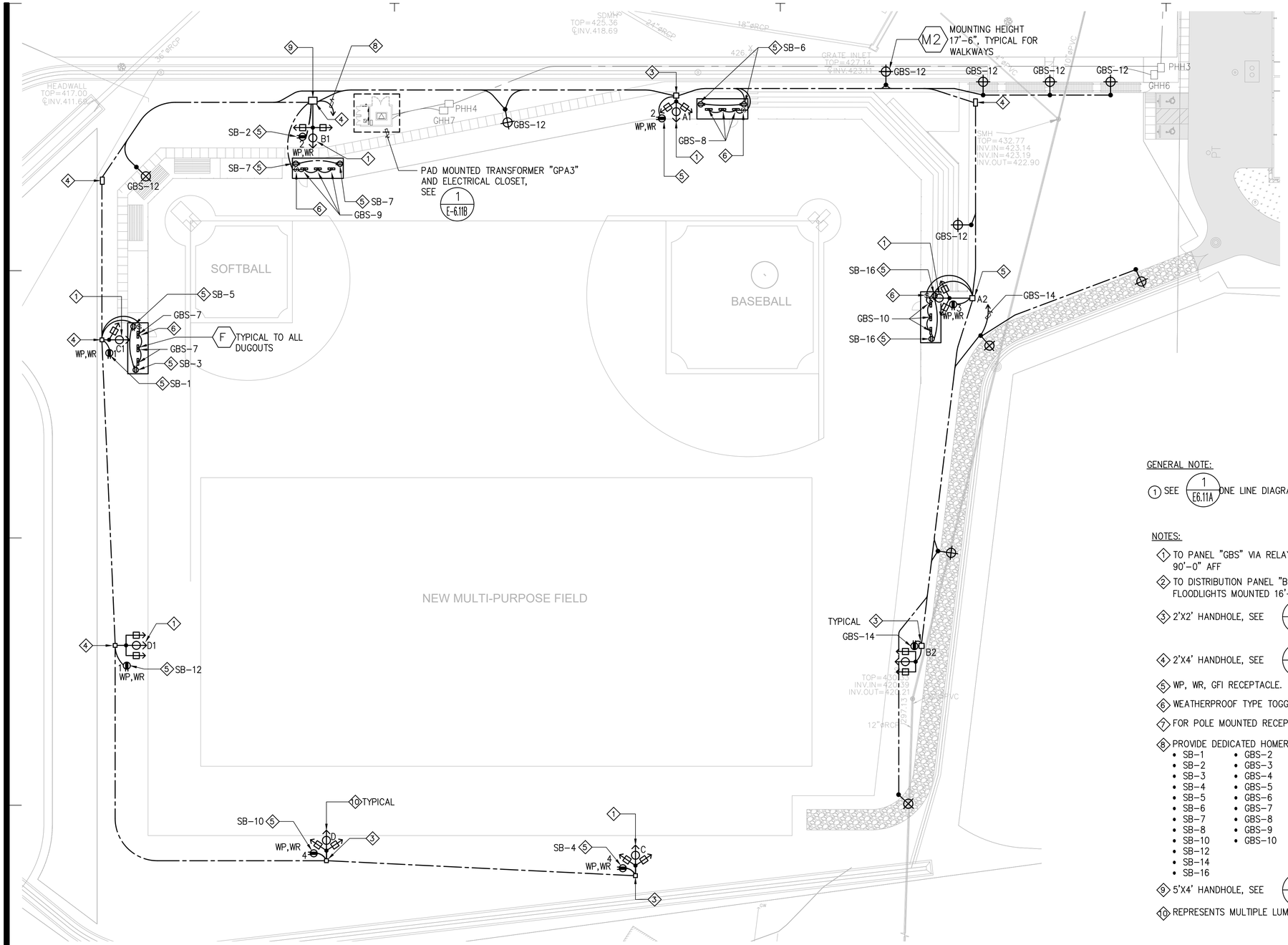
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: SCHEDULES

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No: E6.10C

Sheet No. ____ of ____



1 SOFTBALL/BASEBALL FIELD ELECTRICAL PLAN
SCALE: 1"=30'-0"

GENERAL NOTE:

(1) SEE 1/E6.11A ONE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

NOTES:

1. TO PANEL "GBS" VIA RELAY CONTACTOR "B". FOR FLOODLIGHTS MOUNTED 90'-0" AFF
2. TO DISTRIBUTION PANEL "BS" VIA LIGHTING CONTACTOR "BS". FOR FLOODLIGHTS MOUNTED 16'-0" AFF.
3. 2'X2' HANDHOLE, SEE 1/E9.3
4. 2'X4' HANDHOLE, SEE 1/E9.4
5. WP, WR, GFI RECEPTACLE.
6. WEATHERPROOF TYPE TOGGLE SWITCH.
7. FOR POLE MOUNTED RECEPTACLE.
8. PROVIDE DEDICATED HOMERUN FOR THE FOLLOWING CIRCUIT:
   - SB-1 — GBS-2
   - SB-2 — GBS-3
   - SB-3 — GBS-4
   - SB-4 — GBS-5
   - SB-5 — GBS-6
   - SB-6 — GBS-7
   - SB-7 — GBS-8
   - SB-8 — GBS-9
   - SB-10 — GBS-10
   - SB-12
   - SB-14
   - SB-16
9. 5'X4' HANDHOLE, SEE 1/E8.4
10. REPRESENTS MULTIPLE LUMINAIRES, SEE 1/E6.11A

GRAPHIC SCALE: 0 15' 30' 60'
SCALE: 1"=30'-0"

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Interior Design

NOT FOR CONSTRUCTION

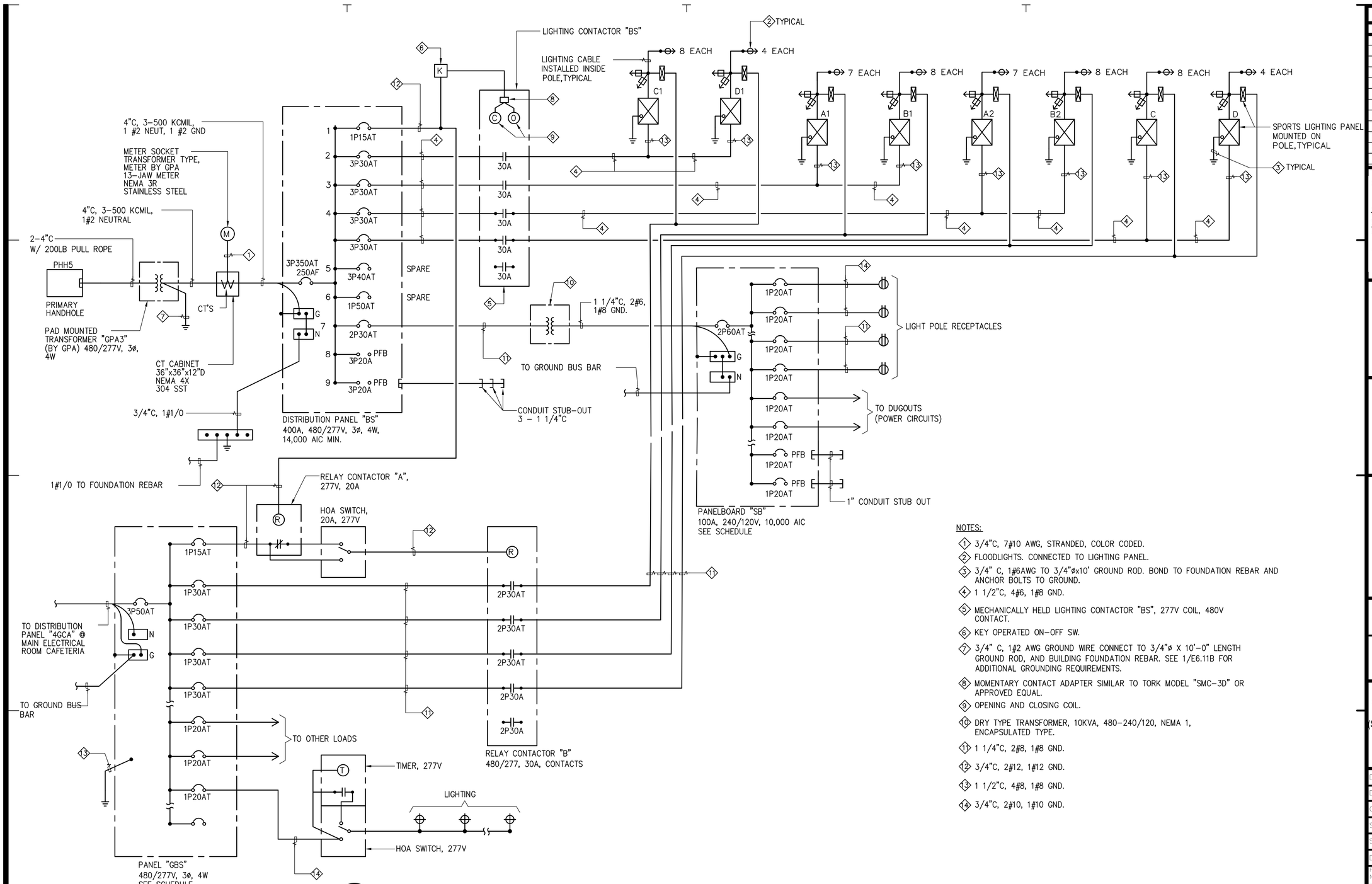
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: SOFTBALL/BASEBALL FIELD ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E6.11

Sheet No. of



1 ONE LINE DIAGRAM (SOFTBALL/BASEBALL FIELD)
NOT TO SCALE

NOTES:

1. 3/4"C, 7#10 AWG, STRANDED, COLOR CODED.
2. FLOODLIGHTS. CONNECTED TO LIGHTING PANEL.
3. 3/4" C, 1#6AWG TO 3/4"ø x10' GROUND ROD. BOND TO FOUNDATION REBAR AND ANCHOR BOLTS TO GROUND.
4. 1 1/2"C, 4#6, 1#8 GND.
5. MECHANICALLY HELD LIGHTING CONTACTOR "BS", 277V COIL, 480V CONTACT.
6. KEY OPERATED ON-OFF SW.
7. 3/4" C, 1#2 AWG GROUND WIRE CONNECT TO 3/4"ø X 10'-0" LENGTH GROUND ROD, AND BUILDING FOUNDATION REBAR. SEE 1/E6.11B FOR ADDITIONAL GROUNDING REQUIREMENTS.
8. MOMENTARY CONTACT ADAPTER SIMILAR TO TORK MODEL "SMC-3D" OR APPROVED EQUAL.
9. OPENING AND CLOSING COIL.
10. DRY TYPE TRANSFORMER, 10KVA, 480-240/120, NEMA 1, ENCAPSULATED TYPE.
11. 1 1/4"C, 2#8, 1#8 GND.
12. 3/4"C, 2#12, 1#12 GND.
13. 1 1/2"C, 4#8, 1#8 GND.
14. 3/4"C, 2#10, 1#10 GND.

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Architecture
Planning
Interior Design

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: ONE LINE DIAGRAM (SOFTBALL/BASEBALL FIELD)

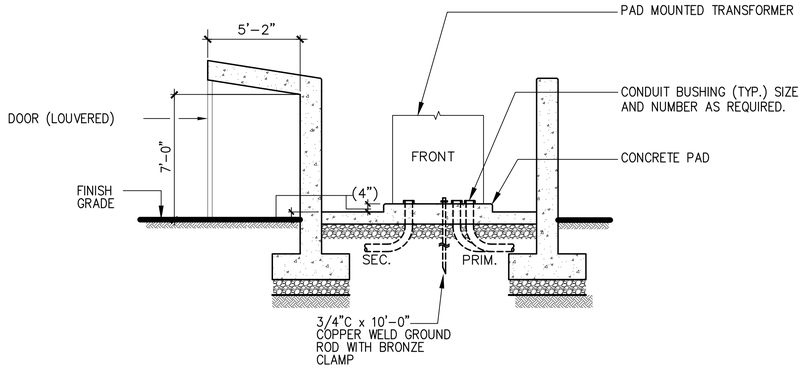
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No.
E6.11A
Sheet No: ____ of ____

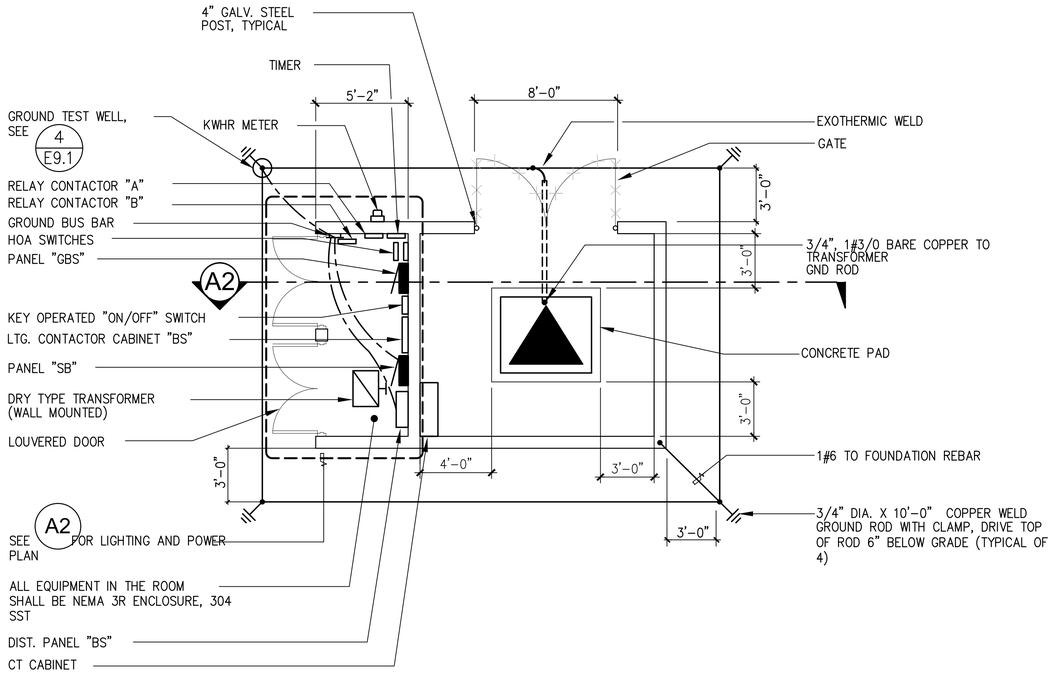
NOT FOR CONSTRUCTION

GENERAL NOTE:

(1) LAYOUT PROVIDED IS BASED ON THE PHYSICAL DIMENSIONS OF ELECTRICAL EQUIPMENT USED AS THE BASIS OF DESIGN. SUBMIT SHOP DRAWING INDICATING FINAL LAYOUT OF EQUIPMENT IN THE ELECTRICAL ROOM. DRAWING MUST BE BASED IN ACTUAL DIMENSIONS OF APPROVED EQUIPMENT. ENSURE THAT NEC REQUIRED CLEARANCES ARE MET FOR ACTUAL EQUIPMENT INSTALLED FOR THE PROJECT. SUBMIT DIMENSIONED PLANS, SECTION AND ELEVATIONS SHOWING MINIMUM CLEARANCES FOR ALL EQUIPMENT. SHOP DRAWINGS MUST BE CERTIFIED BY A LICENSED PROFESSIONAL ELECTRICAL ENGINEER OF MASTER ELECTRICIAN.



2 ELEVATION
SCALE: 1/4"=1'–0"



1 TRANSFORMER SHIELD WALL & CONCRETE PAD DETAIL
SCALE: 1/4"=1'–0"

PANEL: "GBS"	VOLTS: 480/277V	PHASE: 3ø	WIRE: 4W	AIC RATING: 14,000
LOCATION: ■ INDOOR ▭ OUTDOOR ■ DRY ▭ WET	ENCL. TYPE: NEMA 1	MTG: ■ SURF. ▭ FLUSH	AMPERE: 50	MAINS: ■ BREAKER ▭ LUGS ONLY

■ NEUTRAL BUS ■ GROUND BUS ▭ ISOLATED GROUND BUS — NEUTRAL BUS GND. BONDING: ▭ YES ■ NO

BRANCH CIRCUIT DESCRIPTION	WIRE SIZE	POLE/BKR	CKT NO.	LOAD – KVA øA	LOAD – KVA øB	LOAD – KVA øC	CKT NO.	POLE/BKR	WIRE SIZE	BRANCH CIRCUIT DESCRIPTION
HOA/RELAY CONT. "A"	12	1/20	1	0.5	1.18		2	*	*	LIGHT POLE FIXTURES
LIGHT POLE FIXTURES	*	*	3		1.18	1.18	4	*	*	LIGHT POLE FIXTURES
LIGHT POLE FIXTURES	*	*	5			2.3	1.5	6	1/20	10	LIGHT POLES
DUG–OUT LIGHTS (SB)	12	1/20	7	0.1	0.1			8		12	DUG–OUT LIGHTS (BB)
DUG–OUT LIGHTS (SB)	12	1/20	9		0.1	0.1		10		12	DUG–OUT LIGHTS (BB)
ELEC ROOM LIGHTS	12		11			0.1	1.0	12		10	LIGHTPOLE WALKWAYS
SPARE	–		13	1.5	1.5			14		–	SPARE
PFB		–	15		–	–		16	–	–	PFB
TOTAL KVA/ø:				4.88	2.56	5.4					
CONNECTED KVA:				12.84 KVA							
DEMAND LOAD:				7.34 KVA		I = 8.8A					

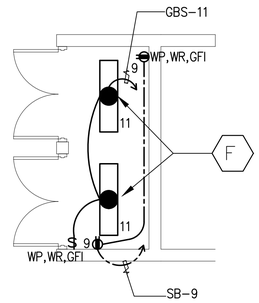
REMARKS:
* REFER TO ONE LINE DIAGRAM SHEET E6.11A FOR SIZES.

PANEL: "SB"	VOLTS: 240/120V	PHASE: 1ø	WIRE: 3W	AIC RATING: 14,000
LOCATION: ■ INDOOR ▭ OUTDOOR ■ DRY ▭ WET	ENCL. TYPE: NEMA 1	MTG: ■ SURF. ▭ FLUSH	AMPERE: 60	MAINS: ■ BREAKER ▭ LUGS ONLY

■ NEUTRAL BUS ■ GROUND BUS ▭ ISOLATED GROUND BUS — NEUTRAL BUS GND. BONDING: ▭ YES ■ NO

BRANCH CIRCUIT DESCRIPTION	WIRE SIZE	POLE/BKR	CKT NO.	LOAD – KVA øA	LOAD – KVA øB	CKT NO.	POLE/BKR	WIRE SIZE	BRANCH CIRCUIT DESCRIPTION
LIGHT POLE RECEP	10	1/20	1	1.0	1.0	2	1/20	10	LIGHTPOLE RECEP
LIGHT POLE RECEP	10	1/20	3		1.0	1.0	4		8	LIGHTPOLE RECEP
DUG–OUT RECEP	10	1/20	5	0.4	0.4		6		10	DUGOUT RECEP
DUG–OUT RECEP	10		7		0.4	0.4	8		10	DUGOUT RECEP
ELEC ROOM RECEP	12		9	1.0	0.2		10		8	LIGHTPOLE RECEP
SPARE	–		11		1.0	0.2	12		10	LIGHTPOLE RECEP
			13	1.0	0.2		14		8	LIGHTPOLE RECEP
			15		1.0	0.2	16		10	LIGHTPOLE RECEP
			17	1.0	1.0		18		–	SPARE
			19		1.0	1.0	20		–	SPARE
PFB	–	–	21	–	–		22	–	–	PFB
PFB	–	–	23		–	–	24	–	–	PFB
TOTAL KVA/ø:				10.0	10.0					
CONNECTED KVA:				20.0 KVA						
DEMAND LOAD:				6.0 KVA	I = 25A					

REMARKS:



3 ELECTRICAL PLAN
SCALE: 1/4"=1'–0"

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'–0"

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REVISION

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: TRANSFORMER SHIELD WALL & CONCRETE PAD DETAIL AND SCHEDULE

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E6.11B

Sheet No. ____ of ____

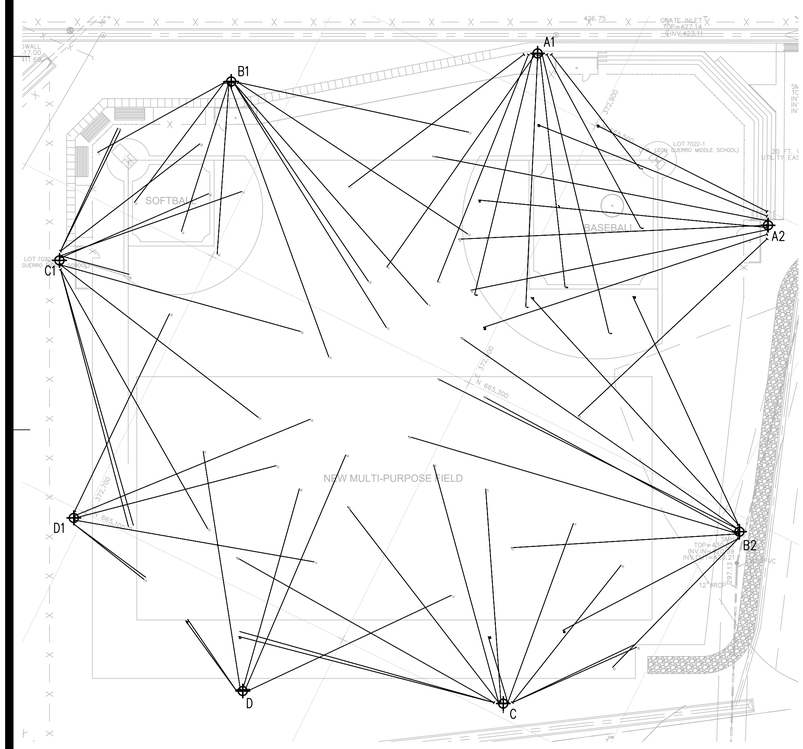
LIGHTING SYSTEM

POLE / FIXTURE SUMMARY				
POLE ID	POLE HEIGHT	MTG HEIGHT	FIXTURE QTY	LUMINAIRE TYPE
A1	90'	90'	7	TLC-LED-1200
		16'	2	TLC-BT-575
A2	90'	90'	7	TLC-LED-1200
		16'	1	TLC-BT-575
B1	90'	90'	8	TLC-LED-1200
		16'	2	TLC-BT-575
B2, C1-C	90'	90'	8	TLC-LED-1200
		16'	1	TLC-BT-575
D1-D	90'	90'	4	TLC-LED-1200
		16'	1	TLC-BT-575
8			64	

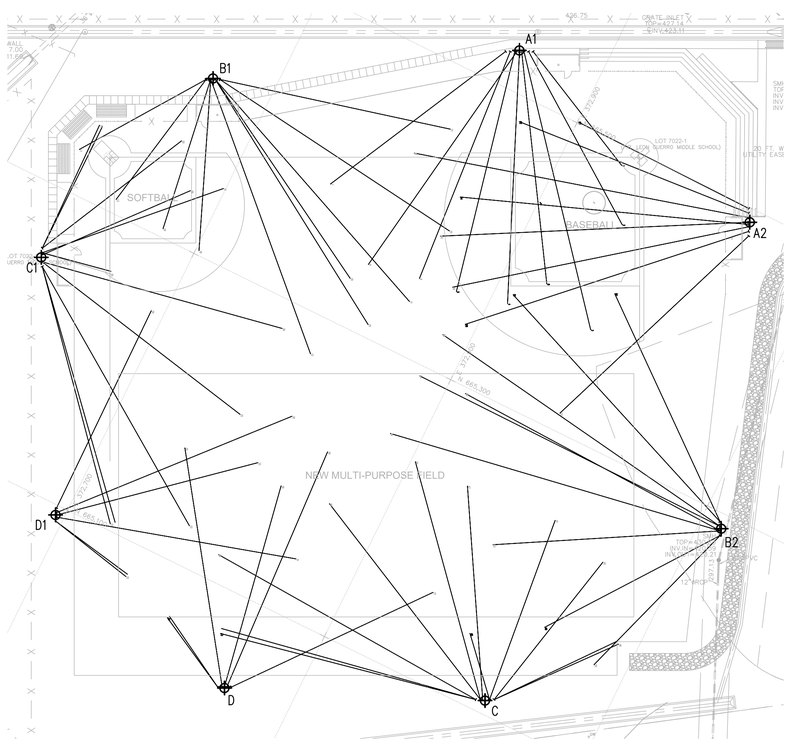
FIXTURE TYPE SUMMARY						
TYPE	SOURCE	WATTAGE	LUMENS	L90	L80	L70
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>120,000	>120,000	>120,000
TLC-LED-1200	LED 5700K - 75 CRI	1170W	136,000	>120,000	>120,000	>120,000

ILLUMINATION REQUIREMENT:

AREA NAME		ILLUMINATION REQUIREMENT (AVE.)	UNIFORMITY (MAX./MIN.)
SOFTBALL	INFIELD:	50FC @ 3'-0 AFF	2:1
	OUTFIELD:	30FC @ 3'-0 AFF	2.5:1
BASEBALL	INFIELD:	50FC @ 3'-0 AFF	2:1
	OUTFIELD:	30FC @ 3'-0 AFF	2.5:1



SOFTBALL



BASEBALL

GENERAL NOTES:

1. PERFORM NIGHT TIME LIGHT FIXTURE AIMING WHICH WILL BE WITNESSED BY THE ENGINEER. ADJUST AIMING AS DIRECTED TO ACHIEVE DESIRED ILLUMINATION. OBTAIN APPROVAL OF FINAL RATING.

2. DESIGN IS BASED ON SPECIFIC LIGHT FIXTURE. CONTRACTOR MUST PERFORM COMPUTERIZED POINT TO POINT LIGHTING CALCULATION TO PROVE THAT THE FINAL LIGHT FIXTURE SELECTED WILL MEET THE LIGHTING CRITERIA. ADD LIGHT FIXTURES, AND ADJUST BRANCH CIRCUITING IF NECESSARY TO MEET THE REQUIREMENT AT NO ADDITIONAL COST.

GRAPHIC SCALE:
0 25' 50' 100'
SCALE: 1"=50'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

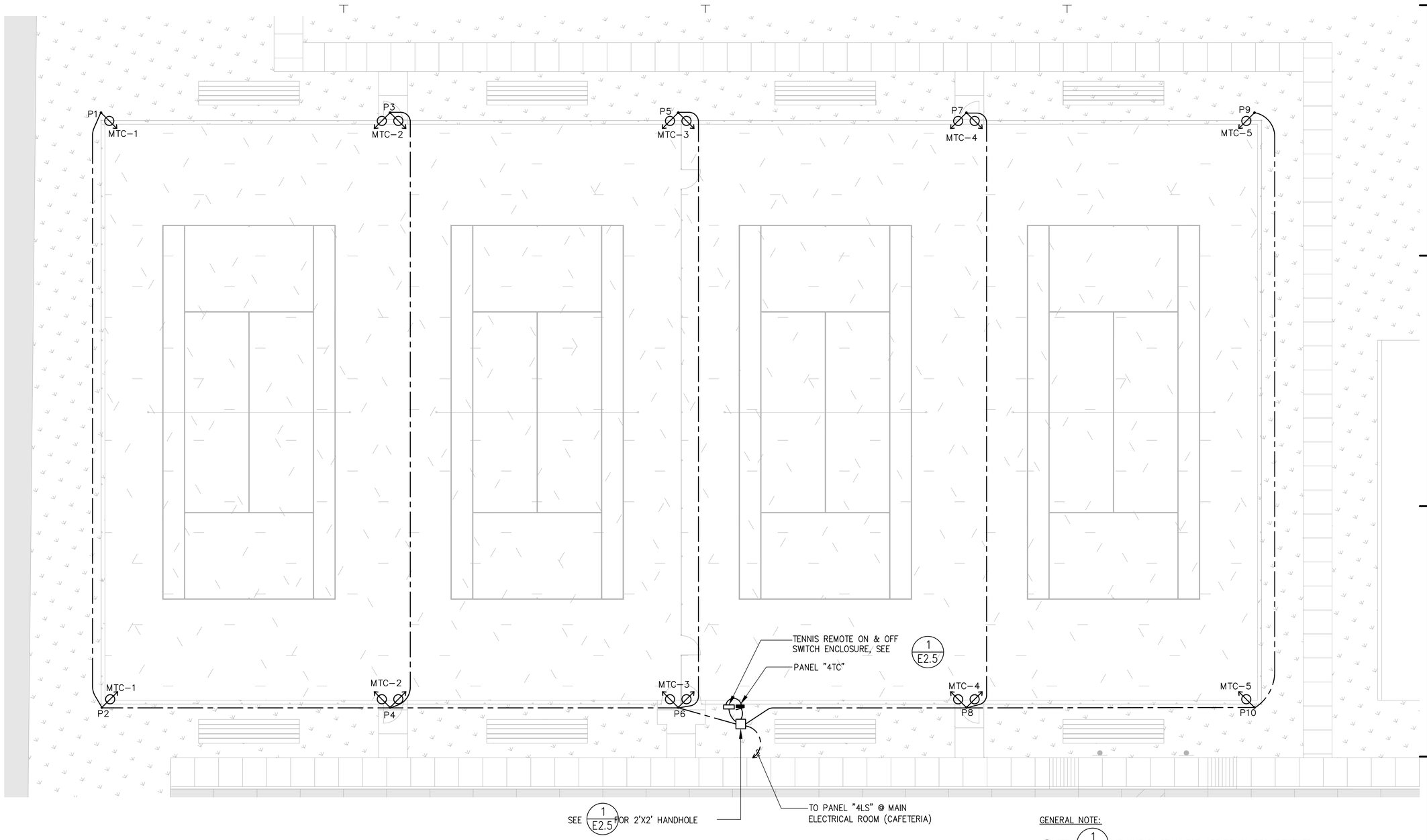
NOT FOR CONSTRUCTION

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
SCHEDULES

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No:
E6.11C
Sheet No: ____ of ____



GENERAL NOTE:

① SEE 1/E2.5 ONE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

1 TENNIS COURT ELECTRICAL PLAN

SCALE: 1"=10'–0"

GRAPHIC SCALE:
0 5' 10' 20'
SCALE: 1"=10'–0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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No.	Description	Date

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Architecture
Planning
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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

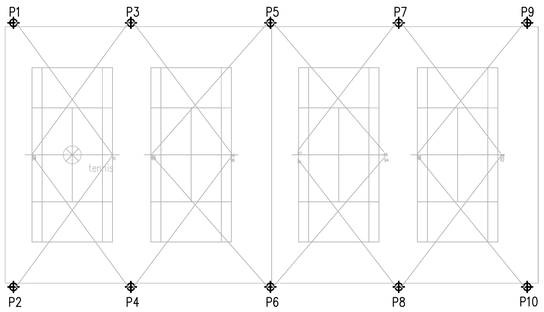
Title: TENNIS COURT ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	
Drawing No.	E6.12
Sheet No.	of

POLE / FIXTURE SUMMARY				
POLE ID	POLE HEIGHT	MTG HEIGHT	FIXTURE QTY	LUMINAIRE TYPE
P1–P2	12.3 (40')	12.3 (40')	2	MUSCO TLC–LED–900
P3–P4	12.3 (40')	12.3 (40')	2	TLC–LED–900
		12.3 (40')	2	TLC–LED–900
P5–P6	12.3 (40')	12.3 (40')	2	TLC–LED–900
		12.3 (40')	2	TLC–LED–900
P7–P8	12.3 (40')	12.3 (40')	2	TLC–LED–900
		12.3 (40')	2	TLC–LED–900
P9–P10	12.3 (40')	12.3 (40')	2	TLC–LED–900
			16	

FIXTURE TYPE SUMMARY							
TYPE	SOURCE	WATTAGE	LUMENS	L90	L80	L70	QUANTITY
TLC–LED–900	LED 5700K – 75 CRI	890W	89,600	>120,000	>120,000	>120,000	16

ILLUMINATION REQUIREMENT		
AREA NAME	ILLUMINATION REQUIREMENT (AVE)	UNIFORMITY RATIO (MAX/MIN)
TENNIS COURT	50.0 FC @ 3'–0" AFF	2:1



GENERAL NOTES:

1. PERFORM NIGHT TIME LIGHT FIXTURE AIMING WHICH WILL BE WITNESSED BY THE ENGINEER. ADJUST AIMING AS DIRECTED TO ACHIEVE DESIRED ILLUMINATION. OBTAIN APPROVAL OF FINAL RATING.
2. DESIGN IS BASED ON SPECIFIC LIGHT FIXTURE. CONTRACTOR MUST PERFORM COMPUTERIZED POINT TO POINT LIGHTING CALCULATION TO PROVE THAT THE FINAL LIGHT FIXTURE SELECTED WILL MEET THE LIGHTING CRITERIA. ADD LIGHT FIXTURES, AND ADJUST BRANCH CIRCUITING IF NECESSARY TO MEET THE REQUIREMENT AT NO ADDITIONAL COST.

TENNIS COURT #1, #2, #3 & #4

REVISION

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Planning
Interior Design

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Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: SCHEDULES

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.: 24-20-486	File
Drawing No.	E6.12A
Sheet No. ____ of ____	

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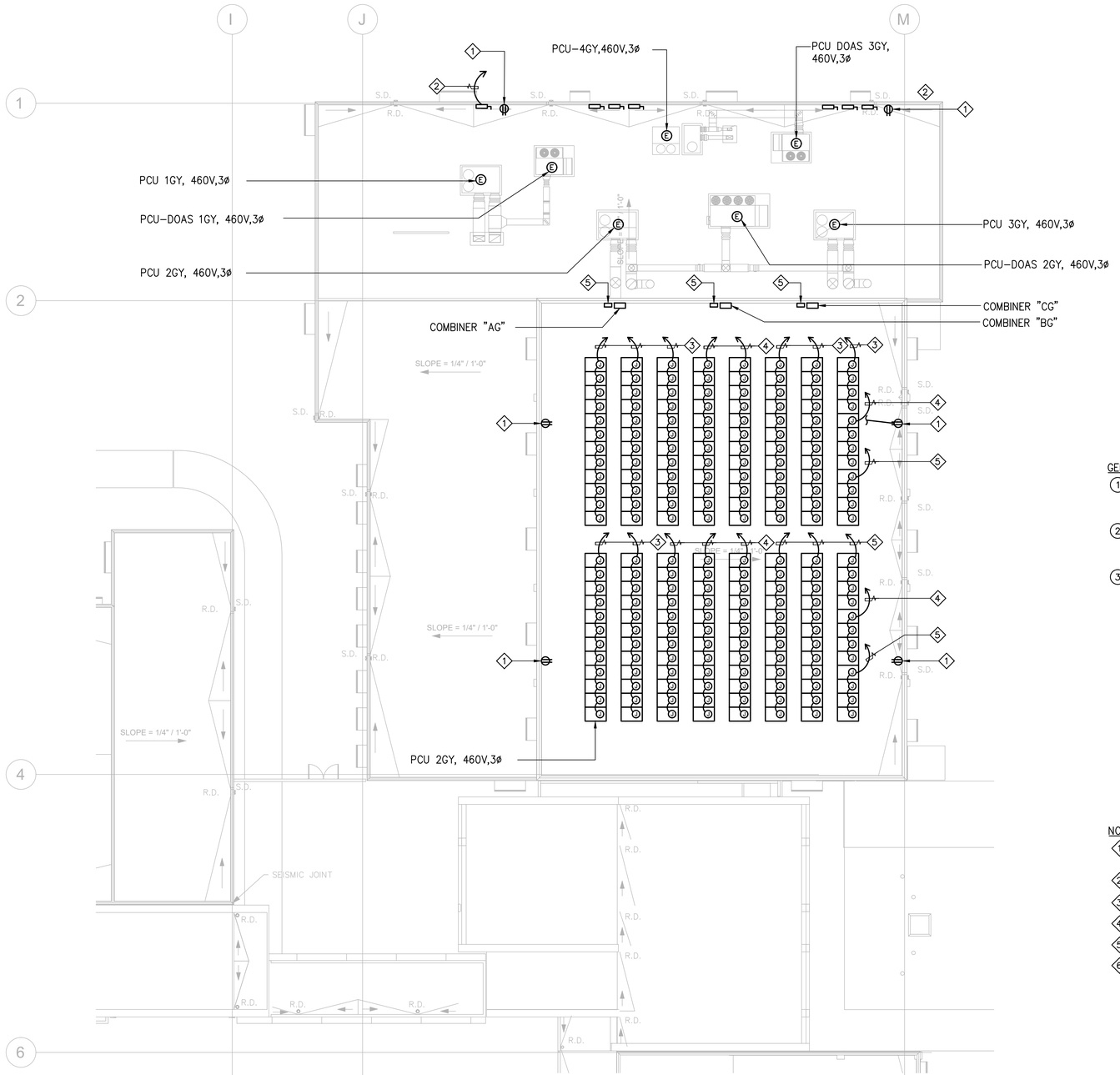

1 GYMNASIUM ROOF ELECTRICAL PLAN

SCALE: 1/16"=1'-0"

GENERAL NOTES:

1. AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SIZES SHALL BE AS PER NEC REQUIREMENT.
2. PROVIDE SHOP DRAWING OF DISCONNECT SWITCH MOUNTING SUPPORT. SHOP DRAWING SHALL BE GUAM STRUCTURAL ENGINEER SEAL AND SIGNATURE.
3. GRID PHOTOVOLTAIC SYSTEM IS FOR GENERAL GUIDELINES ONLY. SUBMIT FOR APPROVAL BY ENGINEER SHOWING THE FOLLOWING:
   1. POINT TO POINT WIRING DIAGRAM
   2. COMPLETE LAYOUT.
   3. COMPLETE EQUIPMENT CATALOG CUT.
   4. EQUIPMENT MOUNTING DETAIL WITH GUAM'S STRUCTURAL ENGINEER'S CALCULATIONS, SEAL AND SIGNATURE.
   5. PV SOLAR CALCULATION.

NOTES:

1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.
2. TO DISTRIBUTION PANEL "4GY".
3. TO COMBINER "AG"
4. TO COMBINER "BG"
5. TO COMBINER "CG"
6. DC DISCONNECT SWITCH.

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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Architecture
Planning
Interior Design

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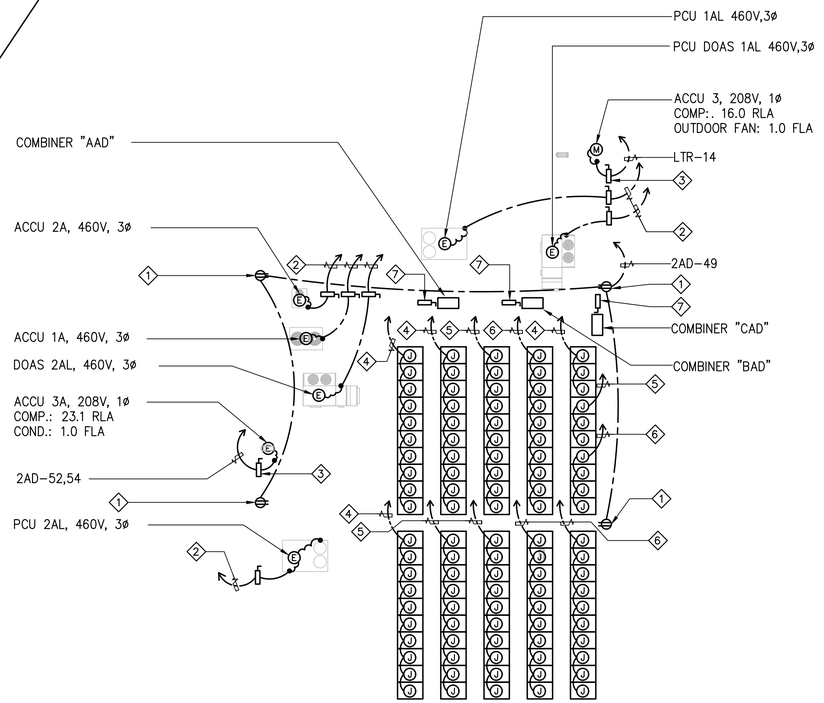
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM ROOP ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No.
E7.0

Sheet No. ____ of ____



1 ADMINISTRATION ROOF ELECTRICAL PLAN
SCALE: 1/16"=1'-0"

GENERAL NOTES:

1. AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SIZES SHALL BE AS PER NEC REQUIREMENT.
2. PROVIDE DISCONNECT SWITCHES MOUNTING SUPPORT. SUBMIT SHOP DRAWING WITH GUAM STRUCTURAL ENGINEER SEAL AND SIGNATURE.
3. GRID PHOTOVOLTAIC SYSTEM IS FOR GENERAL GUIDELINES ONLY. SUBMIT FOR APPROVAL BY ENGINEER SHOWING THE FOLLOWING:
   1. POINT TO POINT WIRING DIAGRAM
   2. COMPLETE LAYOUT.
   3. COMPLETE EQUIPMENT CATALOG CUT.
   4. EQUIPMENT MOUNTING DETAIL WITH GUAM'S STRUCTURAL ENGINEER'S CALCULATIONS, SEAL AND SIGNATURE.
   5. PV SOLAR CALCULATION.

NOTES:

1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.
2. TO DISTRIBUTION PANEL "4AD".
3. NON-FUSIBLE SWITCH, 2P-30A, 600A, NEMA 4X STAINLESS STEEL ENCLOSURE.
4. TO COMBINER "AAD"
5. TO COMBINER "BAD"
6. TO COMBINER "CAD"
7. DC DISCONNECT SWITCH

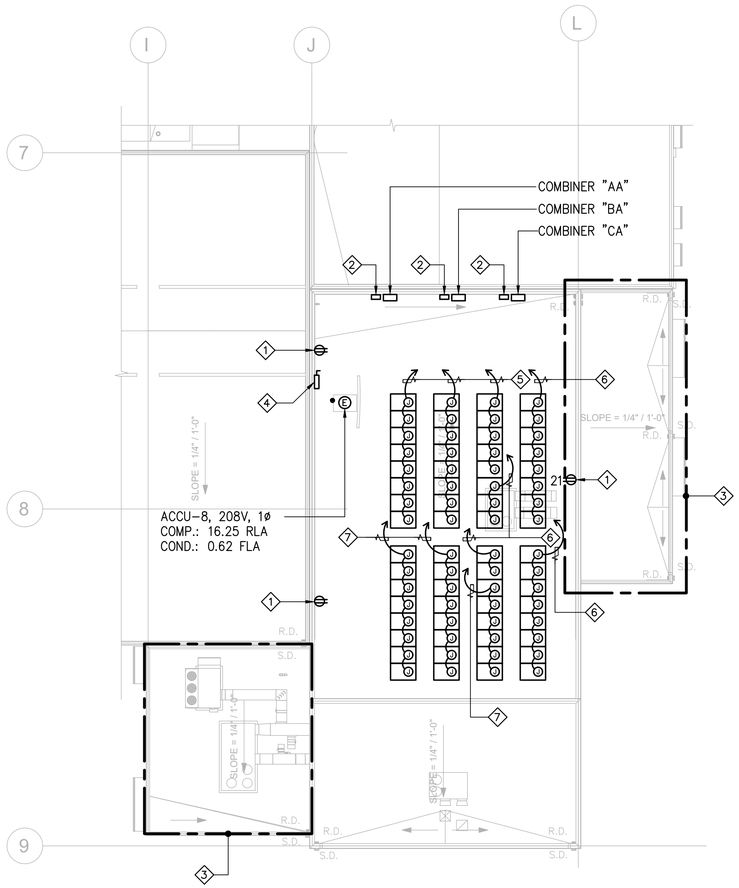
GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

ADMINISTRATION
ROOF ELECTRICAL
PLAN

03/31/25

E7.1

NOT FOR CONSTRUCTION



1 AUTOMATIUM ROOF ELECTRICAL PLAN
SCALE: 1/16"=1'-0"

GENERAL NOTE:

(1) AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SIZES SHALL BE AS PER NEC REQUIREMENT.

(2) GRID PHOTOVOLTAIC SYSTEM IS FOR GENERAL GUIDELINES ONLY. SUBMIT SHOP DRAWING FOR APPROVAL BY ENGINEER SHOWING THE FOLLOWING:
1. POINT TO POINT WIRING DIAGRAM
2. COMPLETE LAYOUT
3. COMPLETE EQUIPMENT CATALOG CUTS
4. EQUIPMENT MOUNTING DETAILS WITH GUAM'S STRUCTURAL ENGINEER'S CALCULATION SEAL AND SIGNATURE.
5. PV SOLAR CALCULATION.

NOTES:

(1) DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.

(2) DC DISCONNECT SWITCH.

(3) FOR ELECTRICAL PLAN FOR EQUIPMENT IN THIS AREA, REFER TO SHEET E5.16.

(4) NON FUSIBLE SWITCH, NEMA 4X ENCSLOSURE.

(5) TO COMBINER "AA"

(6) TO COMBINER "BA"

(7) TO COMBINER "CA"

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

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REVISION

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

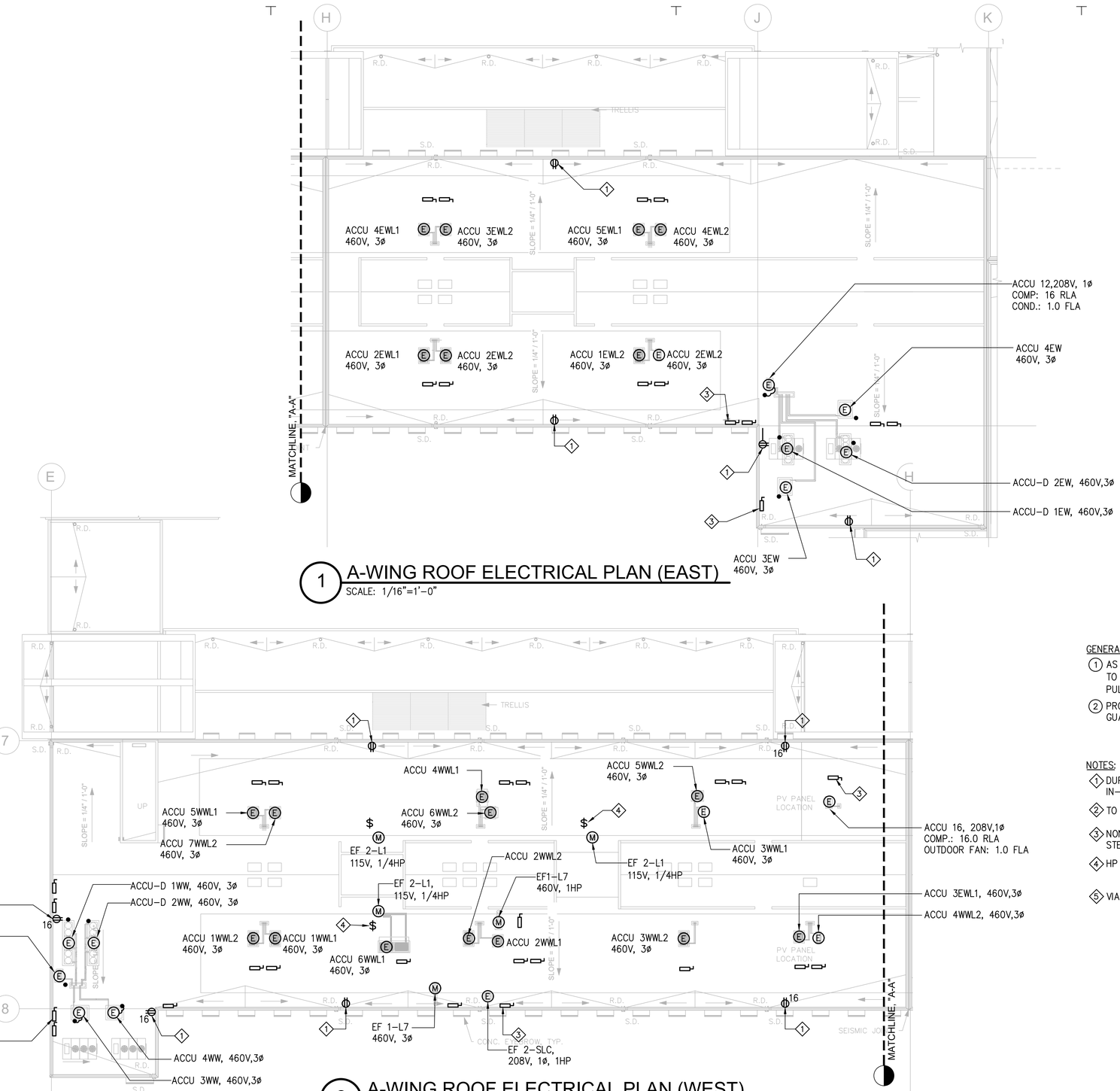
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: AUTOMATIUM ROOF ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E7.2

Sheet No. ____ of ____



1 A-WING ROOF ELECTRICAL PLAN (EAST)
SCALE: 1/16"=1'-0"

2 A-WING ROOF ELECTRICAL PLAN (WEST)
SCALE: 1/16"=1'-0"

GENERAL NOTES:

1. AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SIZES SHALL BE AS PER NEC REQUIREMENT.
2. PROVIDE DISCONNECT SWITCHES MOUNTING SUPPORT. SUBMIT SHOP DRAWING WITH GUAM STRUCTURAL ENGINEER SEAL AND SIGNATURE.

NOTES:

1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.
2. TO DISTRIBUTION PANEL "4MA".
3. NON FUSIBLE SWITCH, 2P-30AMPS, 240 VOLTS. NEMA 4 STAINLESS STEEL ENCLOSURE.
4. HP RATED TOGGLE SWITCH, 120V, NEMA 4 STAINLESS STEEL ENCLOSURE.
5. VIA FUME HOOD EXHAUST CONTROLLER.

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

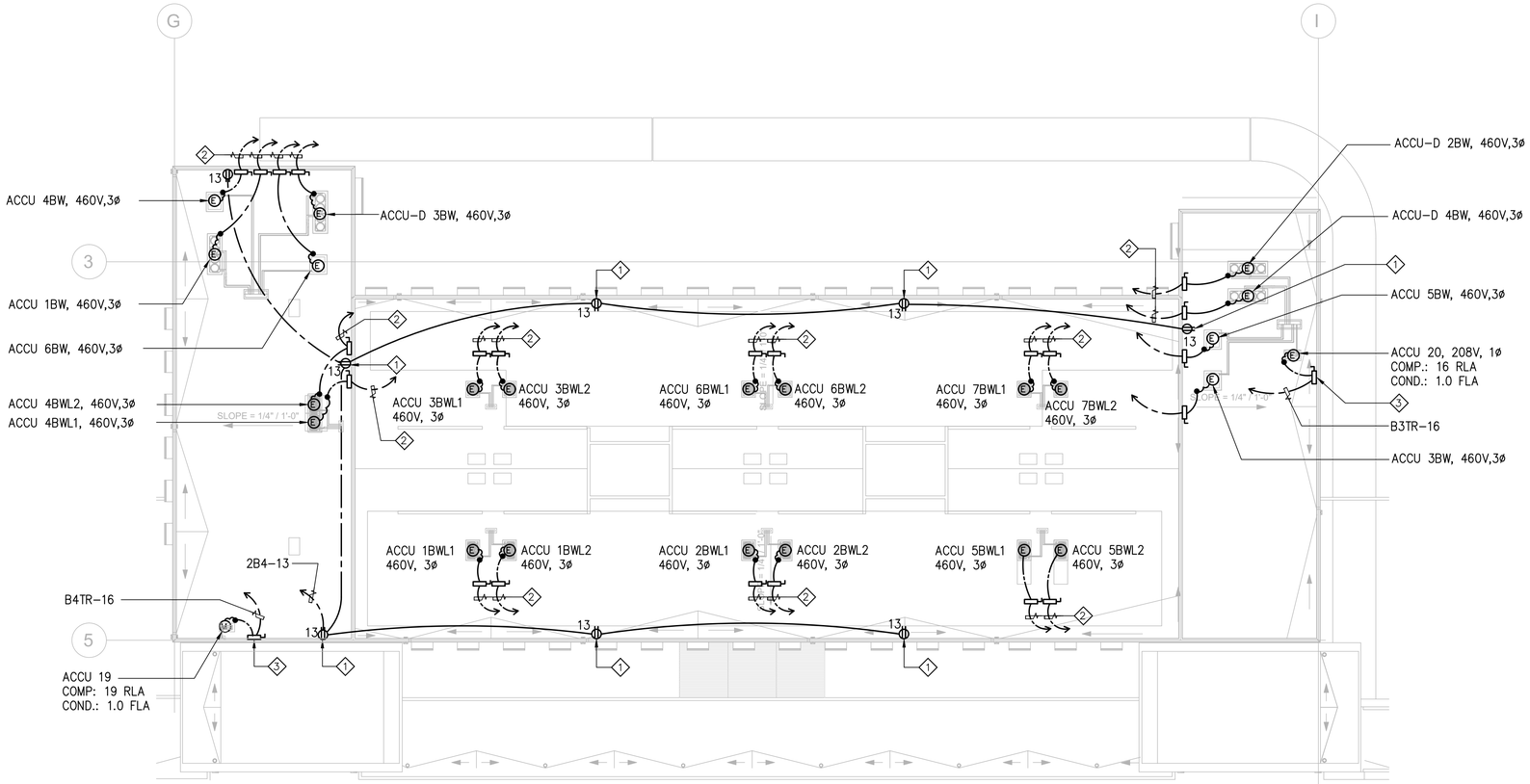
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: A-WING ROOF ELECTRICAL PLAN (EAST & WEST)

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E7.3

Sheet No. ____ of ____



1 B-WING ROOF ELECTRICAL PLAN

SCALE: 1/16"=1'-0"

GENERAL NOTES:

1. AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SIZES SHALL BE AS PER NEC REQUIREMENT.
2. PROVIDE DISCONNECT SWITCHES MOUNTING SUPPORT. SUBMIT SHOP DRAWING WITH GUAM STRUCTURAL ENGINEER SEAL AND SIGNATURE.

NOTES:

1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.
2. TO DISTRIBUTION PANEL "4MB".
3. NON-FUSIBLE SWITCH, 2P-30A, 240V, NEMA 4X 316 STAINLESS STEEL ENCLOSURE.

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

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Planning
Interior Design

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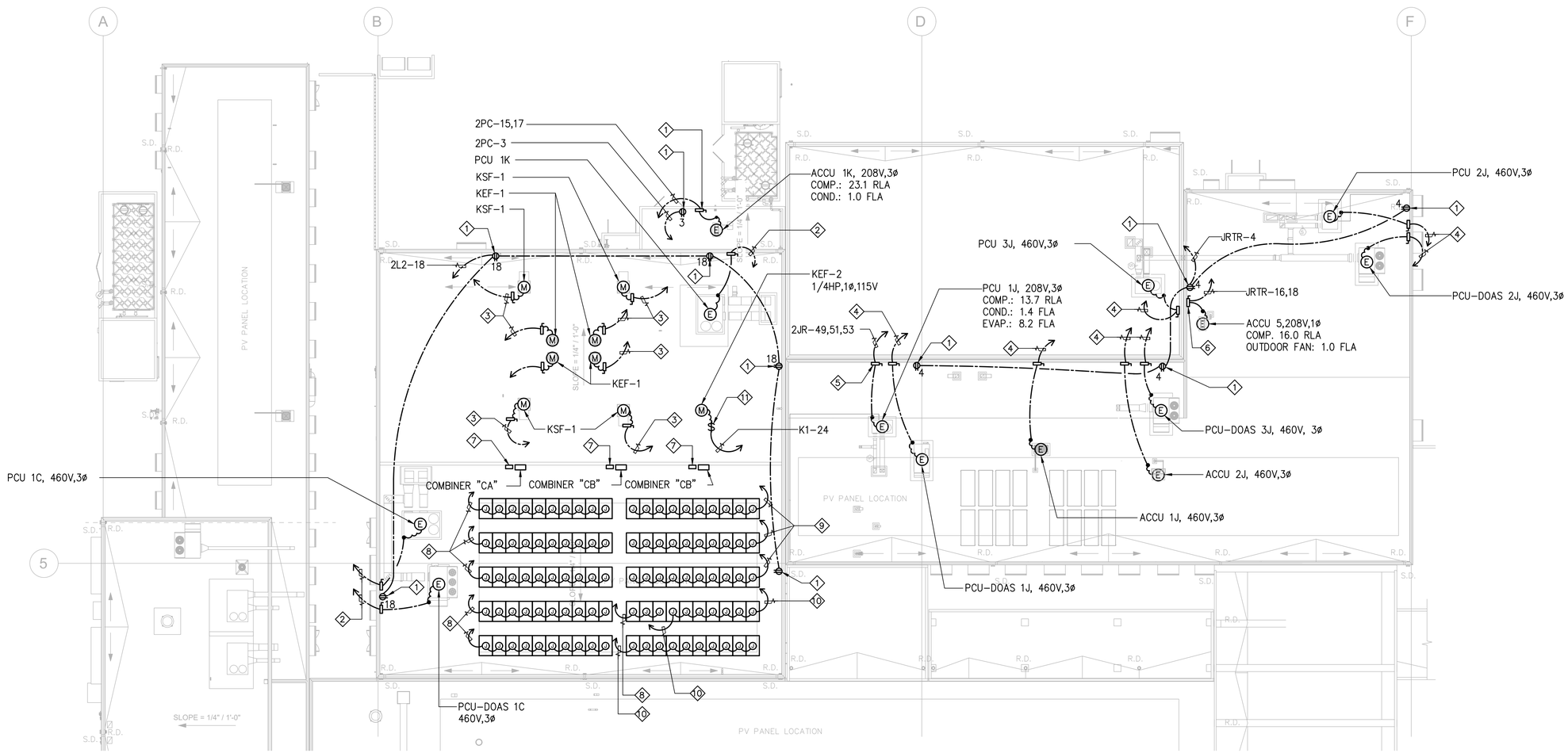
Project: GDOE SIMON SANCHEZ HIGH SCHOOL

Title: B-WING ROOF ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E7.4

Sheet No. _____ of _____



NOTES:

1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.
2. TO DISTRIBUTION PANEL "4CA".
3. TO DISTRIBUTION PANEL "4CA" VIA EQUIPMENT CONTROLLER, COORDINATE WITH MECHANICAL.
4. TO DISTRIBUTION PANEL "4JR"
5. NON FUSIBLE SWITCH 3P-30A, 600V, NEMA 4X 304 STAINLESS STEEL ENCLOSURE.
6. NON FUSIBLE SWITCH 2P-30A, 600V, NEMA 4X 304 STAINLESS STEEL ENCLOSURE.
7. DC LOADBREAK DISCONNECT SWITCH.
8. TO COMBINER "CA".
9. TO COMBINER "CB".
10. TO COMBINER "CC".
11. AC TOGGLE TYPE SWITCH, 20A, 120V, NEMA 4 STAINLESS STEEL ENCLOSURE.

GENERAL NOTES:

1. AS PART OF THE CONTRACT, CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ADDITIONAL PULLBOX (ES) FOR PULLING REQUIREMENT. PULLBOX (ES) SIZES SHALL BE AS PER NEC REQUIREMENT.
2. PROVIDE SHOP DRAWING OF DISCONNECT SWITCH MOUNTING SUPPORT. SHOP DRAWING SHALL BE WITH GUAM STRUCTURAL ENGINEER SEAL AND SIGNATURE.
3. GRID PHOTOVOLTAIC SYSTEM IS FOR GENERAL GUIDELINES ONLY. SUBMIT FOR APPROVAL BY ENGINEER SHOWING THE FOLLOWING:
   1. POINT TO POINT WIRING DIAGRAM
   2. COMPLETE LAYOUT.
   3. COMPLETE EQUIPMENT CATALOG CUT.
   4. EQUIPMENT MOUNTING DETAIL WITH GUAM'S STRUCTURAL ENGINEER'S CALCULATIONS, SEAL AND SIGNATURE.
   5. PV SOLAR CALCULATION.

1 CAFETERIA & JROTC ROOF ELECTRICAL PLAN

SCALE: 1/16"=1'-0"

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

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REVISION		
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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

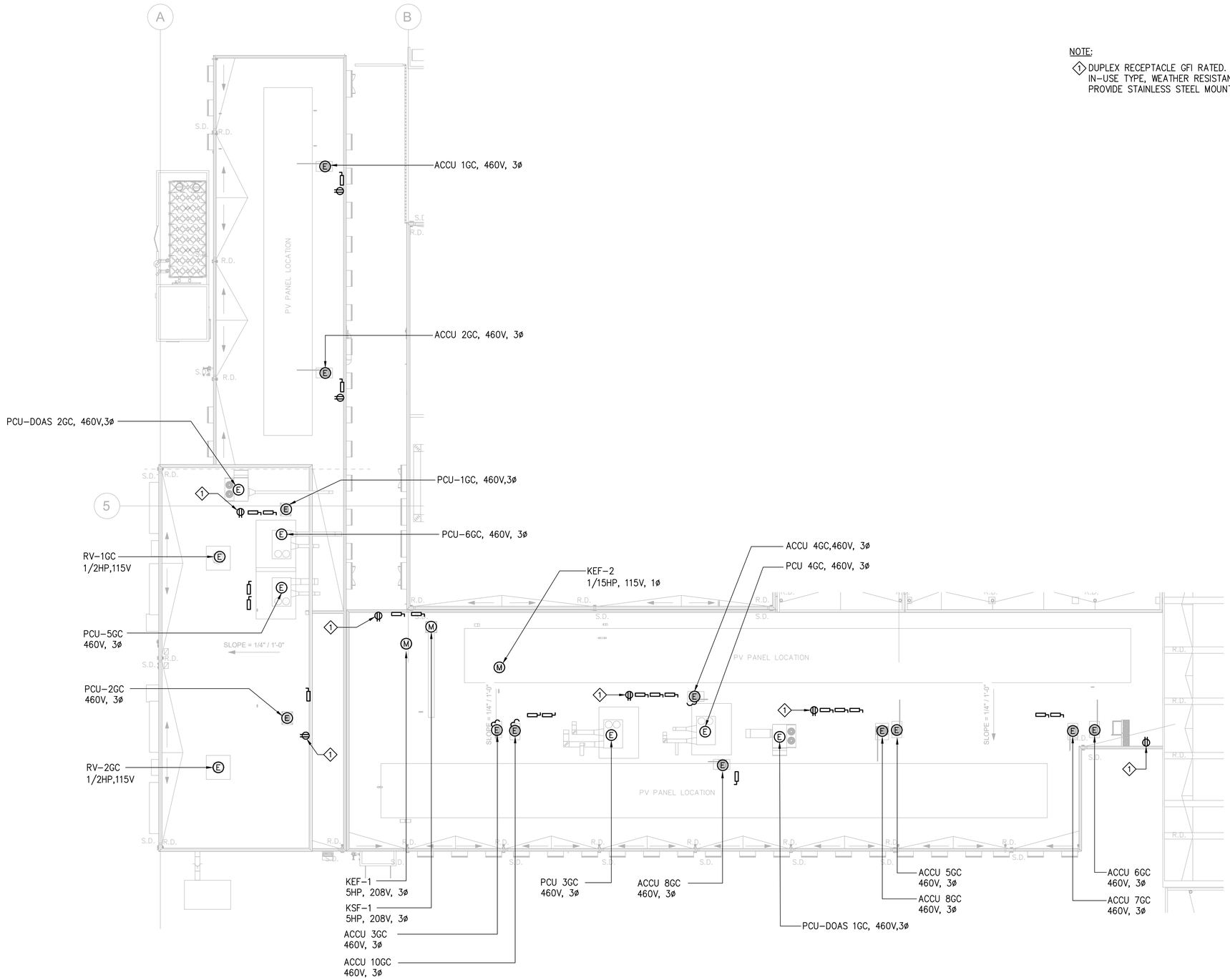
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: CAFETERIA & JROTC ROOF ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No. E7.5

Sheet No: _____ of _____



1 GCC BUILDING ROOF ELECTRICAL PLAN

SCALE: 1/16"=1'-0"

NOTE:

1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN–USE TYPE, WEATHER RESISTANT RATED, 20A, 120V. PROVIDE STAINLESS STEEL MOUNTING SUPPORT AS REQUIRED.

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'–0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

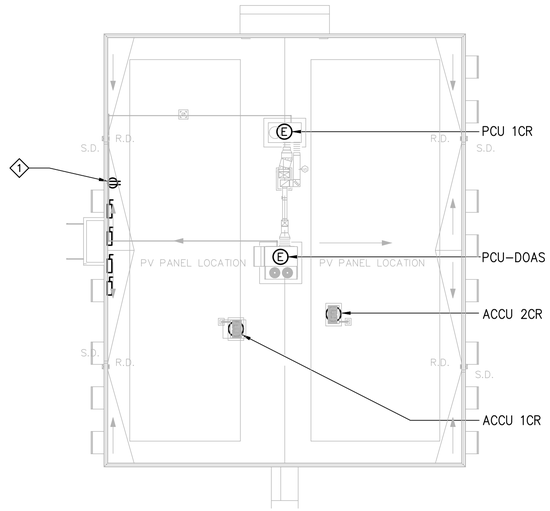
Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: GCC BUILDING ROOF ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File	

Drawing No.: E7.6

Sheet No: ____ of ____



NOTE:
1. DUPLEX RECEPTACLE GFI RATED. WEATHERPROOF COVER, IN-USE TYPE, WEATHER RESISTANT RATED, 20A, 120V.

1 CREDIT RECOVERY ROOF ELECTRICAL PLAN
SCALE: 1/16"=1'-0"

GRAPHIC SCALE:
0 8 16' 32'
SCALE: 1/16"=1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

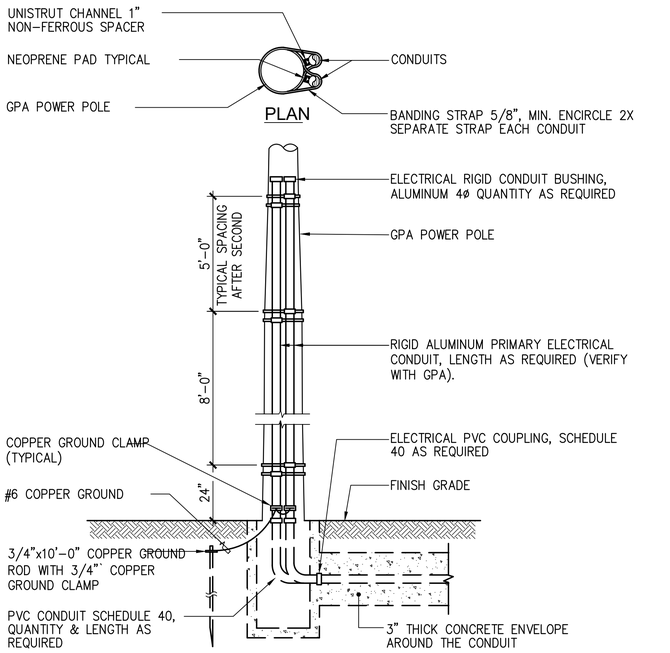
Title:
CREDIT RECOVERY ROOF ELECTRICAL PLAN

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

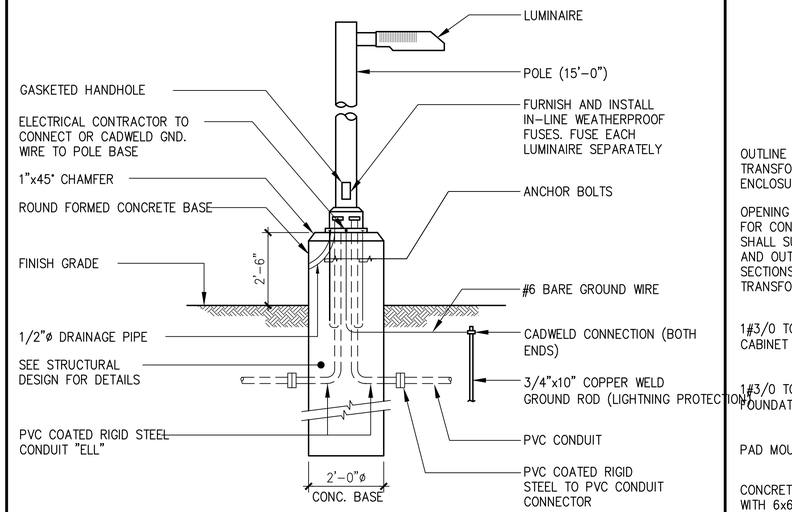
Drawing No.
E7.7

Sheet No. _____ of _____

NOTE TO ENGINEER:
* VERIFY IBC VERSION
* VERIFY FOUNDATION DETAIL WITH STRUCTURAL



1 RISER POLE DETAIL
NOT TO SCALE

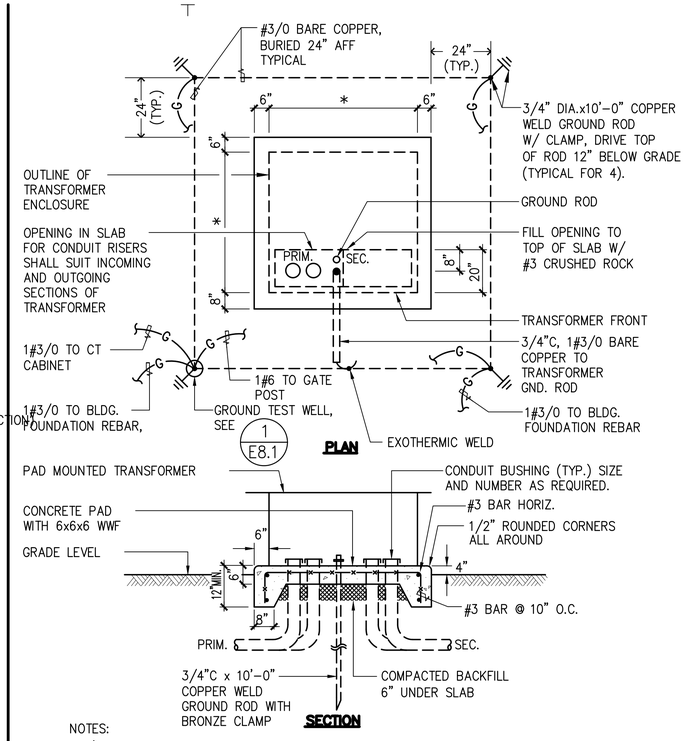


* CONTRACTOR SHALL PROVIDE POLE FOUNDATION DESIGN. DESIGN SHALL MEET 170MPH BASIC WIND SPEED IBC LATEST ED. EXPOSURE C AND ASCE 7-05, BASED ON ACTUAL POLE AND LIGHT FIXTURE WEIGHT, EFFECTIVE PROJECT AREA (EPA), AND SOIL BEARING CAPACITY. DRAWING SHALL BE CERTIFIED BY A GUAM LICENSED STRUCTURAL ENGINEER. SUBMIT SHOP DRAWING FOR REVIEW AND APPROVAL.

GENERAL NOTE:

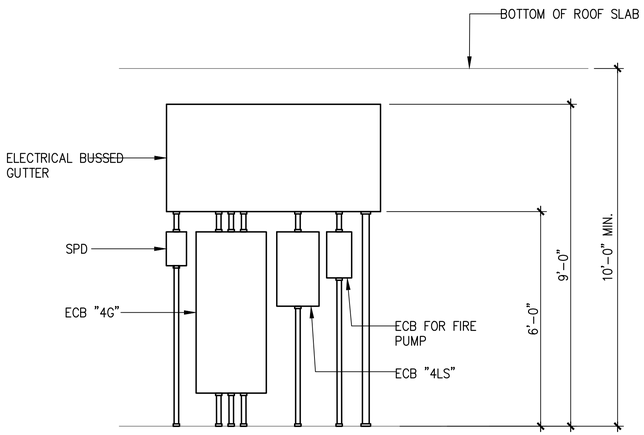
(1) ALL MATERIALS & ASSEMBLIES SHALL BE RATED TO WITHSTAND 170 MPH SUSTAINED WIND LOAD.

2 LIGHT POLE FOUNDATION DETAIL
NOT TO SCALE

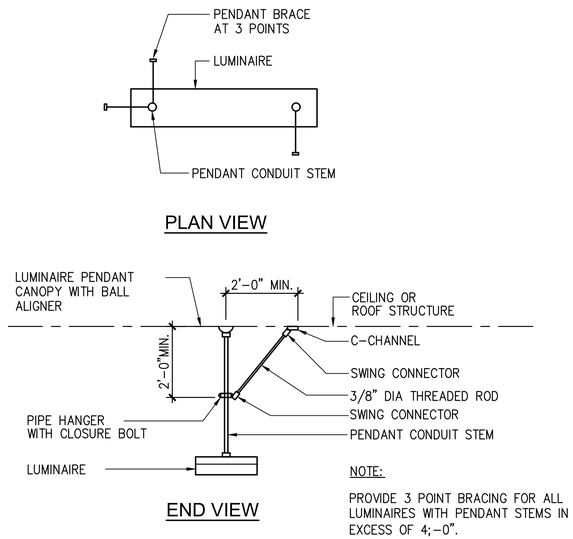


NOTES:
1. VERIFY EXACT DIMENSION WITH TRANSFORMER SUPPLIER.
2. REFER TO PLAN AND ONE LINE DIAGRAM FOR ADDITIONAL REQUIREMENT.

3 TRANSFORMER CONCRETE PAD DETAIL
NOT TO SCALE



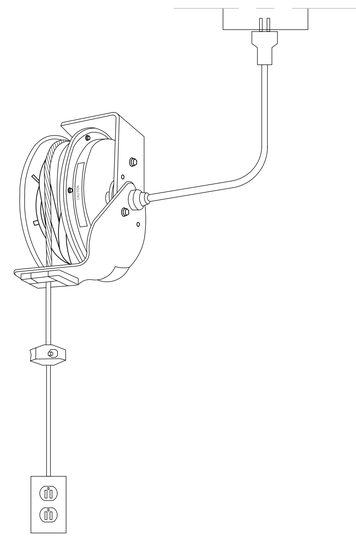
4 ELEVATION (GENERATOR ECB'S)
NOT TO SCALE



NOTE:

PROVIDE 3 POINT BRACING FOR ALL LUMINAIRES WITH PENDANT STEMS IN EXCESS OF 4;-0".

5 PENDANT LUMINAIRE BRACING DETAIL
NOT TO SCALE



6 DETAIL (RETRACTABLE CORD)
NOT TO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: DETAILS

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E8.0

Sheet No: ____ of ____

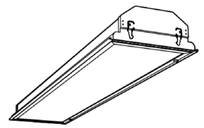


MOUNTING: CEILING, RECESS

DESCRIPTION: 2'X4' LED RECESSED TROFFER, 22 GAUGE COLD-ROLLED STEEL HOUSING, LIGHT WEIGHT, WITH HIGHLY TRANSMISSIVE PATTERN LENS, 80% LED LUMEN MAINTENANCE AT 72,000 HOURS, MULTIVOLT.

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

A A1

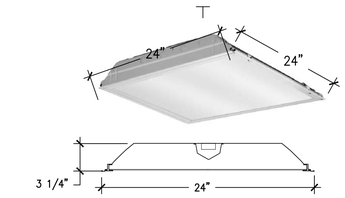


MOUNTING: CEILING, RECESS

DESCRIPTION: 1'X4' LED RECESSED TROFFER, 22 GAUGE COLD-ROLLED STEEL HOUSING, LIGHT WEIGHT, WITH HIGHLY TRANSMISSIVE PATTERN LENS, 80% LED LUMEN MAINTENANCE AT 72,000 HOURS, MULTIVOLT.

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

B B1

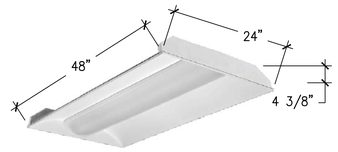


MOUNTING: CEILING, RECESS

DESCRIPTION: 2'X2' LED RECESSED TROFFER, 22 GAUGE COLD-ROLLED STEEL HOUSING, LIGHT WEIGHT, WITH HIGHLY TRANSMISSIVE PATTERN LENS, 80% LED LUMEN MAINTENANCE AT 72,000 HOURS, MULTIVOLT.

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

C



MOUNTING: CEILING, RECESS

DESCRIPTION: 2'X4' LUMINAIRE. RUGGED, ONE-PIECE COLD-ROLLED STEEL COATED POLYESTER CONSTRUCTION. VOLUMETRIC TROFFER. HIGH-PERFORMANCE, IMPACT-MODIFIED, SINGLE CLEAR ACRYLIC DIFFUSER. LONG-LIFE LEDs COUPLED WITH HIGH-EFFICIENCY DRIVERS. VOLUMETRIC ILLUMINATION. 80% LUMEN MAINTENANCE AT 60,000 HOURS, ACRYLIC LINEAR PRISMATIC DIFFUSER, MULTIVOLT.

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

D



MOUNTING: CEILING, RECESS

DESCRIPTION: 2'X2' LUMINAIRE. RUGGED, ONE-PIECE COLD-ROLLED STEEL COATED POLYESTER CONSTRUCTION. VOLUMETRIC TROFFER. HIGH-PERFORMANCE, IMPACT-MODIFIED, SINGLE CLEAR ACRYLIC DIFFUSER. LONG-LIFE LEDs COUPLED WITH HIGH-EFFICIENCY DRIVERS. VOLUMETRIC ILLUMINATION. 80% LUMEN MAINTENANCE AT 60,000 HOURS, ACRYLIC LINEAR PRISMATIC DIFFUSER, MULTIVOLT.

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

E



MOUNTING: CEILING, PENDANT/SURFACE

DESCRIPTION: LOW-PROFILE ENCLOSED AND GASKETED, ONE PIECE FIBER GLASS HOUSING, INJECTION MOLDED, ACRYLIC LENS, HIGH EFFICIENCY DRIVERS, MEDIUM AND WIDE DISTRIBUTION, 80% LUMEN MAINTENANCE AT 60,000 HOURS, MULTIVOLT.

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

F F1 F2

MOUNTING: CEILING, RECESS

DESCRIPTION: 4" DOWNLIGHT, FULL SERVICEABLE AND UPGRADABLE LENS, LED LIGHT ENGINE, CONSTRUCTED OF 16-GAUGE GALVANIZED STEEL, CLEAR REFLECTOR & FLANGE COLOR, SELF-FLANGED TRIM STYLE, SEMI-SPECULAR FINISH, MEDIUM WIDE DISTRIBUTION. TUNABLE WHITE 0-10 VOLT DIMMING, MULTIVOLT

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER)

G1

MOUNTING: CEILING, RECESS

DESCRIPTION: 4" SHOWER DOWNLIGHT, FULLY SERVICEABLE AND UPGRADABLE LENSED LED LIGHT ENGINE, LUMINAIRE HOUSING CONSTRUCTED OF 16-GAUGE GALVANIZED STEEL, NON-CONDUCTIVE DEAD-FRONT TRIM, MEDIUM WIDE DISTRIBUTION, REGRESSED LENSED WHITE PAINTED TRIM, SMOOTH CLEAR LENS. MULTIVOLT

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (10W CONSTANT POWER)

H

MOUNTING: CEILING, SURFACE

DESCRIPTION: HIGH IMPACT DIFFUSE POLYSTYRENE LENS, NON-ELECTRICALLY CONDUCTIVE POLYCARBONATE FRAME, CLOSED CELL GASKET, ULTRA LOW PROFILE SURFACE LUMINAIRE WITH WIDE DISTRIBUTION

I

MOUNTING: CEILING, SURFACE

DESCRIPTION: DIE CAST ALUMINUM HOUSING AND LENS FRAME. VANDAL-RESISTANT POLYCARBONATE TEXTURED OPAQUE. LONG-LIFE LED, HIGH-EFFICACY, SURFACE-MOUNT LEDs, 70% LUMEN MAINTENANCE AT 100,000 HOURS, 277V.

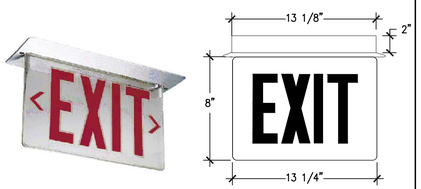
J J1

MOUNTING: UNIVERSAL

DESCRIPTION: HIGH-POLISH, INJECTION MOLDED VIRGIN ACRYLIC PANEL, ULTRASONICALLY WELDED TO ELIMINATE VISIBLE HARDWARE. SEALED, MAINTENANCE-FREE NICKEL CADMIUM BATTERY. DIRECTIONAL INDICATORS AS SHOWN ON LIGHTING PLANS, MOUNTING TYPE AS SHOWN ON LIGHTING PLANS, 277V

REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP

K



MOUNTING: UNIVERSAL

DESCRIPTION: HIGH-POLISH, INJECTION MOLDED VIRGIN ACRYLIC PANEL, ULTRASONICALLY WELDED TO ELIMINATE VISIBLE HARDWARE. SEALED, MAINTENANCE-FREE NICKEL CADMIUM BATTERY. DIRECTIONAL INDICATORS AS SHOWN ON LIGHTING PLANS, MOUNTING TYPE AS SHOWN ON LIGHTING PLANS, 277V

L



MOUNTING: POLE

DESCRIPTION: ONE PIECE DIE-CAST HOUSING, LOW COPPER ALUMINUM ALLOY WITH INTEGRAL COOLING RIBS, STAINLESS STEEL HARDWARE, LUMINAIRE-TO-POLE ATTACHMENT IS BY INTERNAL DRAW BOLTTS, FADE ABRASION RESISTANT, IP65 OPTICAL ASSEMBLY, 10kV SURGE SUPPRESION.

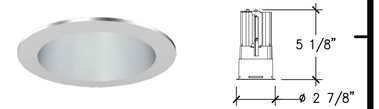
M M1 M2



MOUNTING: WALL, SURFACE

DESCRIPTION: ARCHITECTURAL WALL SCONCE, DIE-CAST ALUMINUM HOUSING, FULLY GASKETED DIE-CAST DOOR FRAME, FULL CUT-OFF RATED, WIDE DISTRIBUTION, DARK BRONZE FINISH, SUITABLE FOR WET LOCATION, 277V.

N



MOUNTING: CEILING, RECESS

DESCRIPTION: 2" DOWNLIGHT, FULL SERVICEABLE AND UPGRADABLE LENS, LED LIGHT ENGINE, CONSTRUCTED OF 16-GAUGE GALVANIZED STEEL, CLEAR REFLECTOR & FLANGE COLOR, SELF-FLANGED TRIM STYLE, SEMI-SPECULAR FINISH, MEDIUM WIDE DISTRIBUTION. TUNABLE WHITE 0-10 VOLT DIMMING, MULTIVOLT

O

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REVISION

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: LIGHT FIXTURE SCHEDULE - SHEET 1

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No:	24-20-486
File:	

Drawing No.: E9.10

Sheet No. of



MOUNTING: WALL, SURFACE
DESCRIPTION: ROUGH SERVICE APPLICATION, ONE PIECE, DIE-CAST ALUMINUM, LOW COPPER ALLOY, UTILIZES HIGH EFFICIENCY LED MOUNTED TO 2 METAL CORE CIRCUIT BOARDS.

P



MOUNTING: WALL, SURFACE
DESCRIPTION: ENGINEERING GRADE THERMOPLASTIC, IMPACT-RESISTANT, CORROSION-PROOF HOUSING, TWO LED LAMPS, CURRENT-LIMITING CHARGER MAXIMIZES BATTERY LIFE, SEALED, MAINTENANCE-FREE NICKEL CADMIUM BATTERY, SELF-DIAGNOSTICS CONTINUOUSLY MONITORS AC FUNCTIONALITY, UVOLT

Q



MOUNTING: CEILING, SUSPENDED
DESCRIPTION: LED HIGH BAY, RUGGED DIE-CAST SINGLE-PIECE ALUMINUM HOUSING, IP65 RATING, TGIC THERMOSET POWDER COAT, 410SS HARDWARE, FROSTED ACRYLIC LENS, MEDIUM DISTRIBUTION, SURGE PROTECTION LEVEL DESIGNED TO WITHSTAND 10kV/5kA, WIRE GUARD ATTACHMENT, AIRCRAFT CABLE KITS, 277V

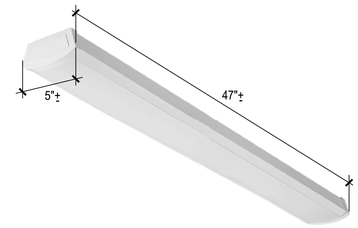
REMARKS: E INDICATES WITH EMERGENCY BATTERY BACKUP (15W CONSTANT POWER), SELF-DIAGNOSTICS BATTERY PACK

R



MOUNTING: CEILING, RECESS
DESCRIPTION: EXTRUDED ALUMINUM HOUSING, PROPRIETARY INJECTION MOLDED OPTIC AND HIGH PERFORMANCE FILM OPTICAL SYSTEM, DAMP LOCATION LISTED

S



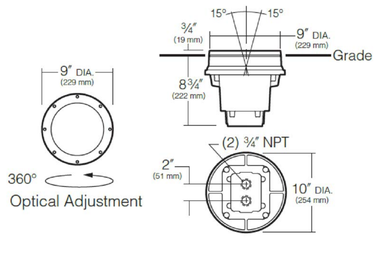
MOUNTING: CEILING, SURFACE
DESCRIPTION: METAL HOUSING WITH DECORATIVE PLASTIC ENDS, WHITE FROSTED DIFFUSER, THERMAL FORMED DIFFUSER, HIGH-EFFICIENCY DRIVER, LISTED FOR DAMP LOCATIONS, ENERGY STAR CERTIFIED

T



MOUNTING: CEILING, RECESS
DESCRIPTION: LED HIGH BAY LIGHT, STEEL CONSTRUCTION, WHITE POLYESTER POWDER-COATED FINISH, INTEGRATED UV STABILIZED POLYCARBONATE LENS

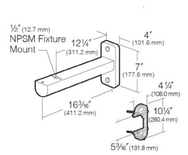
U



MOUNTING: IN-GRADE
DESCRIPTION: DIE-CAST BRASS WITH NATURAL FINISH LENS RING, CLEAR TEMPERED SODA LIME LENS, ONE PIECE MOLDED SILICON LENS GASKET, HEAVY WALL DIE-CAST BRASS HOUSING.

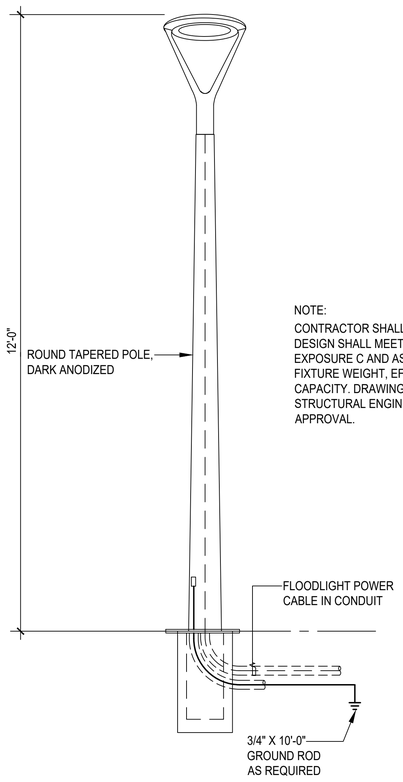
V





MOUNTING: WALL (THREADED KNUCKLE)
DESCRIPTION: LUMINAIRE CONSTRUCTED OF ONE PIECE DIE-CAST, LOW COPPER ALUMINUM ALLOY 360 WITH VENTS. FADE AND ABRASION RESISTANT, ELECTROSTATICALLY APPLIED, THERMALLY CURED, TRIGLYCIDAL ISOCYANURATE POLYESTER POWDERCOAT. IMPACT RESISTANT TEMPERED GLASS WITH ANTI-RELECTIVE COATING LENS, 120-277V.

W



NOTE:
CONTRACTOR SHALL PROVIDE POLE FOUNDATION DESIGN. DESIGN SHALL MEET BASIC WIND SPEED IBC LATEST EDITION EXPOSURE C AND ASCE 7-05, BASED ON ACTUAL POLE AND LIGHT FIXTURE WEIGHT, EFFECTIVE PROJECT AREA (EPA) AND SOIL BEARING CAPACITY. DRAWING SHALL BE CERTIFIED BY A GUAM LICENSED STRUCTURAL ENGINEER. SUBMIT SHOP DRAWING FOR REVIEW AND APPROVAL.

MOUNTING: POLE MOUNTED

X



MOUNTING: WALL, SURFACE
DESCRIPTION: 4' LED HORIZONTALLY WALL-MOUNTED, ROLL FORMED CODE-GAUGE STEEL HOUSING, IMPACT MODIFIED LINEAR FACETED REFRACTOR, HIGH-EFFICIENCY DRIVERS, 90% LED LUMEN MAINTENANCE AT 60,000 HOURS

Y



MOUNTING: CEILING, RECESS
DESCRIPTION: 1'X4' LED RECESSED TROFFER, 20-GAUGE COLD ROLLED STEEL HOUSING, POLYESTER POWDER PAINT, CSA CERTIFIED DRIVER, SURGE PROTECTION LEVEL DESIGNED TO WITHSTAND UP TO 6kV/3kA, WET LOCATION LISTED, IP66 RATING

Z



MOUNTING: CEILING, PENDANT
DESCRIPTION: 20 GAUGE DIE-FORMED STEEL WITH 18 GAUGE DIE FORMED INTERNAL JOINER SYSTEM, FINELITE SIGNAL WHITE POWDER COAT,

AA

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REVISION

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title
LIGHT FIXTURE SCHEDULE - SHEET 2

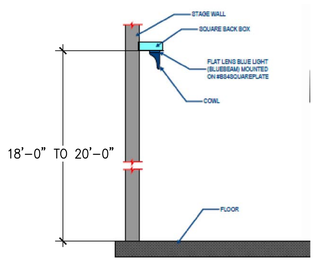
Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.
E9.11
Sheet No. ____ of ____



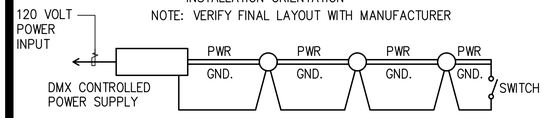
CAT # BSBBVNSPB

LOW VOLTAGE 11–36 VDC OPERATING VOLTAGE
3W LED CONSUMES 85MA @ 36V (130 MA @ 24V)
BLUE BEAM LIGHT FIXTURE
PROVIDE PLATE ADAPTERS, COWL AND MINIMUM
6–CHANNEL DMX–CONTROLLED POWER SUPPLY.



INSTALLATION ORIENTATION

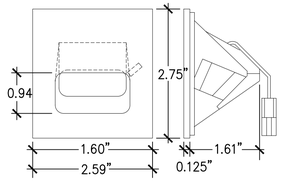
NOTE: VERIFY FINAL LAYOUT WITH MANUFACTURER



BLUE BEAM SCHEMATIC DIAGRAM

AU1

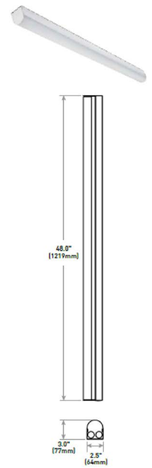




PATHLIGHT: STEALTH STEP LIGHT
CAT # LUCIFER LTG CO. SSLI1 * 80L02B35
* FLANGE FINISH BY ARCHITECT
POWER SUPPLY: 66–UEX2, 6W, 120–277 VAC,
ELDO LED LINEAR DRIVE, DMX (SUPPORTS 1–18 FIXTURES)

NOTE: ELECTRICAL CONTRACTOR IN COORDINATION WITH THEATRE CONTRACTOR SHALL SUBMIT SHOP DRAWING SHOWING POINT TO POINT CONNECTION,MOUNTING DETAIL, SECTION, ELEVATION, COMPLETE INCLUDING LOCATION OF POWER SUPPLY FOR REVIEW AND APPROVAL.

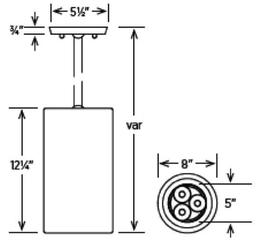
AU2



NOTE: STAGE PERIMETER LIGHT FIXTURE
CAT# CREE LS4G 50L 35K 10 VFD
29W, 120 VOLTS.

AU3

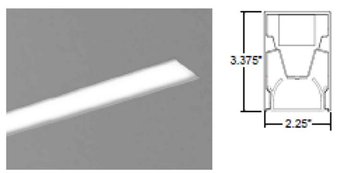




DIMMABLE PENDANT DOWN LIGHT

CAT # RAMBUSH PD–LED 30K 40 STD ELD
FIXTURE MUST BE DIMMABLE AND CONTROLLED
BY PERFORMANCE LIGHTING CONTROL SYSTEM
REAM ANGLE: 40° MEDIUM BEACH
EFFICACY: 61.5
SYSTEM LUMENS: 5509
INPUT WATTS: 89.6, 120 VOLTS, 60 Hz
DIMMING, DMX (RDM)

AU4

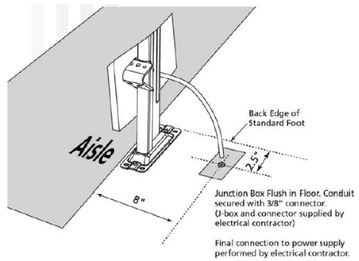


ACCENT LIGHT RECESSED IN WALL

CAT# A – LIGHT ACL5 LS35 90+CRIU HE *D

- COORDINATE MOUNTING AND LIGHT FIXTURE FINISH WITH THE ARCHITECT. COORDINATE LAYOUT WITH THEATRE CONTRACTOR, SUBMIT SHOP DRAWING INDICATING DATA SHEET, ELEVATION, MOUNTING DETAIL FOR REVIEW AND APPROVAL.

AU5

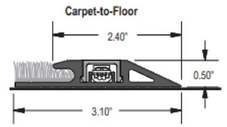


AISLE Lighting

JUNCTION BOX PLACEMENT

- PLACEMENT OF THE JUNCTION BOX NEEDS TO BE PLACED UNDER THE CHAIR WHERE IT WON'T ACT AS A TRIPPING HAZARD.

AU6

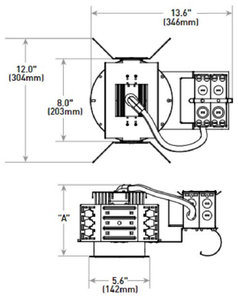




ILLUMINATED GUIDE ALONG CARPETED PATHWAYS, LOW PROFILE, ADA COMPLIANT 6" SPACING.
POWER SUPPLY: CELESTAL LTG. GEM–4D
CATALOG #: CELESTIAL LIGHTING GEM–1900–S–A–6

AU7





BACKSTAGE DOWNLIGHTS, SIMILAR TO TYPE "G" EXCEPT WITH +90 CRI, DIMMABLE TO 0–10V.

AU8

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Architecture
Planning
Interior Design

NOT FOR CONSTRUCTION

Project: GDOE
SIMON SANCHEZ HIGH SCHOOL

Title: AUDITORIUM LIGHT FIXTURE SCHEDULES

Designed:	RB/RR
Drawn:	FC/JB
Checked:	VR/RB
Supv:	VR/AM
Scale:	AS SHOWN
Date:	03/31/25
Project No.:	24-20-486
File	

Drawing No.: E9.12

Sheet No. ____ of ____

INTERIOR TELECOMMUNICATIONS GENERAL NOTES:

1. INSTALLATION OF INTERIOR TELECOMMUNICATIONS PATHWAYS AND INFRASTRUCTURE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), THE NATIONAL ELECTRICAL SAFETY CODE, THE APPLICABLE SECTIONS OF THE UNIFIED FACILITIES CRITERIA, AND THE APPLICABLE STANDARDS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA), UNLESS OTHERWISE NOTED.
2. FURNISH AND INSTALL ALL JUNCTION AND PULLBOXES REQUIRED FOR THE INSTALLATION OF DEVICES AND EQUIPMENT, WHETHER OR NOT SPECIFICALLY INDICATED ON THE PLANS. SIZE PULLBOXES PER THE APPLICABLE TIA STANDARDS, IF NOT OTHERWISE INDICATED ON THE DRAWINGS. ALL JUNCTION AND PULLBOXES SHALL BE READILY ACCESSIBLE.
3. NO SECTION OF CONDUIT SHALL BE LONGER THAN 100 FEET WITHOUT A PULLBOX. A PULLBOX SHALL BE PLACED IN A CONDUIT RUN WHERE THE LENGTH IS OVER 100 FEET, THERE ARE MORE THAN TWO 90 DEGREES BENDS, OR EQUIVALENT, OR THERE IS A REVERSE (U-SHAPED) BEND IN THE RUN. PULLBOXES SHALL BE PLACED IN A STRAIGHT SECTION OF CONDUIT AND SHALL NOT BE USED IN LIEU OF A BEND.
4. CONDUIT RUNS SHOWN ARE DIAGRAMMATIC ONLY. INSTALL ALL CONDUITS TO SUIT FIELD CONDITIONS.
5. MINIMUM CONDUIT SIZE SHALL BE 1"C, UNLESS OTHERWISE NOTED.
6. CONDUIT BENDING CRITERIA:
   a. FOR CONDUITS 2" IN DIAMETER OR SMALLER, MINIMUM RADIUS BENDS SHALL BE SIX TIMES THE DIAMETER OF THE CONDUIT.
   b. FOR CONDUITS LARGER THAN 2" IN DIAMETER, MINIMUM RADIUS BENDS SHALL BE TEN TIMES THE DIAMETER OF THE CONDUIT.
   c. ALL CONDUIT BENDS SHALL BE PRE-FORMED TYPE WHERE PRE-FORMED BENDS OF THE REQUIRED SIZES ARE AVAILABLE.
7. PROVIDE INSULATED BUSHINGS AT ALL TELECOMMUNICATIONS CONDUIT TERMINATIONS AT ALL BOXES AND CONDUIT STUBS.
8. CONDUIT FILL SHALL BE IN ACCORDANCE WITH THE APPLICABLE TIA STANDARDS.
9. THE MAXIMUM FILL RATIO OF ANY CABLE TRAY SHALL BE 50%. THE MAXIMUM FILL DEPTH OF ANY CABLE TRAY SHALL BE 6 INCHES IN ACCORDANCE WITH THE APPLICABLE TIA STANDARDS.
10. ALL TELECOMMUNICATION CONDUITS OUTSIDE THE TELECOMMUNICATION ROOMS OR CLOSETS SHALL BE CONCEALED EITHER ABOVE SUSPENDED CEILINGS, EMBEDDED IN CONCRETE OR BELOW CONCRETE FLOORS OR CEILING STRUCTURES. JUNCTION BOXES FOR CONDUITS ABOVE DRYWALL CEILINGS SHALL BE ACCESSIBLE BY CEILING ACCESS POINTS.
11. ALL CABLE PATHWAYS INCLUDING CONDUITS, PULLBOXES, AND JUNCTION BOXES SHALL BE PROVIDED WITH LABELS THAT STATE WHERE THEY ORIGINATE AND TERMINATE. PULLBOXES AND JUNCTION BOXES SHALL BE NUMBERED IN SEQUENCE FROM THE TELECOM ROOM OUTWARDS. ALL CONDUITS, EMPTY OR USED, SHALL BE CLEARLY AND PERMANENTLY MARKED AT BOTH ENDS, TO INDICATE DESTINATION. MARKING MUST BE CLEARLY VISIBLE AFTER CONSTRUCTION IS COMPLETED.
12. ALL CONDUITS ENTERING THE BUILDING FROM THE EXTERIOR SHALL BE SEALED TO PREVENT ENTRANCE OF MOISTURE, GASES, AND RODENTS.
13. SEAL ALL PENETRATIONS THROUGH FIRE RATED WALLS AND SLABS USING A U.L. LISTED FIRE RATED SEALANT OR ASSEMBLY TO MAINTAIN THE INTEGRITY OF THE FIRE RATING.
14. OUTLET BOXES IN FIRE RATED WALLS SHALL HAVE A MINIMUM SEPARATION OF 24" FROM ANY OUTLET BOXES ON THE OPPOSITE SIDE OF SAME WALL, UNLESS ALLOWED OTHERWISE BY BUILDING CODES.
15. PROVIDE GROUNDING AND BONDING FOR THE TELECOMMUNICATIONS SYSTEM INSTALLATION PER THE NEC AND THE APPLICABLE TIA STANDARDS.
16. ALL NON-CURRENT CARRYING METAL PARTS OF EQUIPMENT RACKS AND SUPPORTING STRUCTURES (CABLE TRAYS, CONDUITS, ETC.) SHALL BE BONDED TO THE TELECOM ROOM SIGNAL GROUND PER THE APPLICABLE TIA STANDARDS.
17. EXTERIOR MOUNTED EQUIPMENT SHALL BE PROVIDED WITH A WEATHERPROOF, NEMA 4X TYPE 316 STAINLESS STEEL ENCLOSURE.
18. INSTALL ALL EQUIPMENT, DEVICES, CONDUIT AND CONDUIT SUPPORTS TO MEET THE PROJECT LOCATION'S SEISMIC RESTRAINT REQUIREMENTS.
19. UNLESS SHOWN OTHERWISE, PROVIDE TREATED, FIRE RATED PLYWOOD BACKBOARDS ON A MINIMUM OF 2 WALLS IN EACH TELECOM ROOM.
20. CABLE LENGTH FROM IDF OR MDF TO DATA OUTLET SHALL NOT EXCEED 290 FEET. NOTIFY THE ARCHITECT OF ANY CABLE LENGTHS OVER 290 FEET.

SITE TELECOMMUNICATIONS GENERAL NOTES:

1. INSTALLATION OF SITE TELECOMMUNICATIONS PATHWAYS AND INFRASTRUCTURE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), THE NATIONAL ELECTRICAL SAFETY CODE, THE APPLICABLE SECTIONS OF THE UNIFIED FACILITIES CRITERIA, AND THE APPLICABLE STANDARDS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA), UNLESS OTHERWISE NOTED.
2. THE EXISTING CONDITIONS OF BELOW GROUND PIPING AND UTILITIES SUCH AS WATER MAINS, SANITARY SEWERS, STORM SEWERS, FUEL LINES, ELECTRICAL CONDUITS, COMMUNICATION CONDUITS AND OTHER UTILITIES ARE TAKEN FROM EXISTING RECORD DRAWINGS AND VERIFIED BY LIMITED FIELD OBSERVATION. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO FIELD VERIFY THE EXACT LOCATION AND DEPTH OF BELOW GROUND PIPING AND UTILITIES IN THE IMMEDIATE VICINITY OF SUBSURFACE WORK, WHETHER SHOWN ON THE DRAWINGS OR NOT. CONTRACTOR SHALL MARK ALL EXISTING PIPING AND UTILITIES AFFECTED BY THE WORK USING UNDERGROUND MAP LOCATOR POSITION OF PIPES AND CONDUITS ON THE SURFACE. CONTRACTOR SHALL CONTACT THE UTILITIES REPRESENTATIVE 10 DAYS IN ADVANCE FOR ASSISTANCE IN MARKING OUT THE AREAS INVOLVING SUBSURFACE WORK. CONTRACTOR SHALL ADD THE EXISTING UNDERGROUND UTILITIES FOUND DURING PRELIMINARY STAKING TO DRAWINGS FOR RECORD. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. SUBMIT SHUTDOWN/OUTAGE SCHEDULE IN A TIMELY MANNER TO THE OWNER'S REPRESENTATIVE IN SUFFICIENT TIME TO SUBMIT AN OUTAGE REQUEST.
3. CONDUIT BENDING CRITERIA:
   a. THERE SHALL BE NO MORE THAN TWO 90-DEGREES BENDS OR A TOTAL OF 180 DEGREES BETWEEN MAINTENANCE HOLES, HANDHOLES, AND PULLBOXES.
   b. FOR CONDUITS 2" IN DIAMETER OR SMALLER, MINIMUM RADIUS BENDS SHALL BE SIX TIMES THE DIAMETER OF THE CONDUIT.
   c. FOR CONDUITS LARGER THAN 2" IN DIAMETER, MINIMUM RADIUS BENDS SHALL BE TEN TIMES THE DIAMETER OF THE CONDUIT.
   d. ALL CONDUIT BENDS SHALL BE PRE-FORMED TYPE WHERE PRE-FORMED BENDS OF THE REQUIRED SIZES ARE AVAILABLE.
   e. ALL CONDUIT BENDS REQUIRED DUE TO CHANGES IN GRADE SHALL HAVE A RADIUS BEND OF NOT LESS THAN 25 FEET (HORIZONTAL OR VERTICAL CHANGE).
4. AFTER THE CONDUITS ARE INSTALLED BETWEEN UNDERGROUND STRUCTURES, A ROUND SOLID TEST MANDREL NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF NO MORE THAN 1/4" LESS THAN THE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT AFTER WHICH A BRUSH WITH STIFF BRISTLES SHALL BE PULLED THROUGH TO MAKE CERTAIN THAT NO PARTICLES OF EARTH, SAND, OR GRAVEL HAVE BEEN LEFT IN THE CONDUIT.
5. AFTER THE CONDUITS ARE INSTALLED BETWEEN UNDERGROUND STRUCTURES AND BUILDING OR CABINET RISERS, A ROUND SOLID TEST MANDREL NOT LESS THAN 6" LONG AND HAVING A DIAMETER OF NO MORE THAN 1/4" LESS THAN THE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT AFTER WHICH A BRUSH WITH STIFF BRISTLES SHALL BE PULLED THROUGH TO MAKE CERTAIN THAT NO PARTICLES OF EARTH, SAND, OR GRAVEL HAVE BEEN LEFT IN THE CONDUIT.
6. MANDREL TEST RESULTS SHALL BE DOCUMENTED AND PROVIDED TO THE CONTRACTING OFFICER WITHIN 14 DAYS OF COMPLETING THE TESTS FOR DISSEMINATION TO THE BASE COMMUNICATIONS OFFICE.
7. PROVIDE 3 SETS OF 3-CELL, 3" PER CELL, FLEXIBLE FABRIC INNER DUCTS IN A MINIMUM OF 50% OF NEW 4" DUCTS. INSTALL POLYESTER PULL ROPE IN ALL NEW CONDUITS AND CAP ALL CONDUITS AFTER TESTING. THE POLYESTER PULL ROPE SHALL BE PRE-LUBRICATED AND PRINTED WITH SEQUENTIAL FOOTAGE MARKINGS. FOR DUCT SYSTEMS WITH MULTIPLE ROWS, THE TOP ROWS SHALL BE PROVIDED WITH INNERDUCTS. EX: FOR A 2x2 DUCT INSTALLATION, FILL THE TOP TWO DUCTS WITH INNERDUCT.
8. ALL CONDUITS SHALL ENTER UNDERGROUND STRUCTURES AT 90 DEGREE ANGLES AND SHALL BE FLUSH WITH FLARED OR BELL ENDS TO PREVENT CABLE DAMAGE.
9. ALL DUCTS ASSOCIATED WITH PULL BOXES OR MAINTENANCE HOLES SHALL BE INSTALLED WITH ADEQUATE DRAINAGE TOWARD THE PULLBOXES OR MAINTENANCE HOLES (MINIMUM ONE-FOURTH PERCENT SLOPE UNLESS OTHERWISE NOTED).
10. ALL DUCTS AND MAINTENANCE HOLES SHALL BE INSPECTED AND ACCEPTED BY THE GOVERNMENT A MINIMUM OF 30 DAYS PRIOR TO SERVICE REQUIRED DATE.
11. ALL DUCTLINES SHALL BE CONCRETE ENCASED, UNLESS SPECIFICALLY IDENTIFIED OTHERWISE.
12. UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40, INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE, UNLESS OTHERWISE NOTED. ABOVE GROUND CONDUIT SHALL BE GALVANIZED RIGID STEEL (UP TO 10' AFF) OR EMT (ABOVE 10' AFF).
13. ALL SPARE CONDUITS SHALL BE SEALED TO PREVENT ENTRANCE OF MOISTURE, GASES, AND RODENTS.
14. ALL OUTSIDE PLANT UNDERGROUND FIBER OPTIC CABLE SHALL BE ARMORED.
15. PROVIDE A MINIMUM 50 FOOT MAINTENANCE LOOP FOR ALL CABLES IN THE LAST MAINTENANCE HOLE FEEDING INTO BUILDING ENTRANCE FACILITIES.
16. PROVIDE CABLE TAGS FOR EACH TELECOMMUNICATIONS CABLE OR WIRE LOCATED IN MAINTENANCE HOLES, HANDHOLES, AND VAULTS IN ACCORDANCE WITH APPLICABLE TIA STANDARD.
17. EXTERIOR MOUNTED EQUIPMENT SHALL BE PROVIDED WITH A WEATHERPROOF, NEMA 4X TYPE 316 STAINLESS STEEL ENCLOSURE.
18. COORDINATE TELECOMMUNICATIONS WORK WITH ALL OTHER TRADES.

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INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
INTERIOR & SITE TELECOM GENERAL NOTES
PROGRAMMING DOCUMENT

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Date:	3/31/25
Project: 20-133	File

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NOT FOR CONSTRUCTION

TELECOMMUNICATIONS GENERAL NOTES:

1. ALL WORK SHOWN ON THE TELECOMMUNICATIONS DRAWINGS IS NEW UNLESS OTHERWISE NOTED. ALL MATERIALS SHALL BE NEW AND "LISTED" OR "LABELED" AS DEFINED BY THE NATIONAL ELECTRICAL CODE (NEC). WORK INCLUDES INSTALLATION OF ALL TELECOMMUNICATIONS SYSTEMS COMPLETE AND OPERATIONAL AS LIMITED BY THE INTENT OF THE CONTRACT DOCUMENTS.
2. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL ELECTRICAL SAFETY CODE, RULES AND REGULATION OF THE DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT OF GUAM. CONSTRUCTION PRACTICES SHALL CONFORM TO THE LATEST EDITION OF AMERICAN ELECTRICIANS' HANDBOOK BY CROFT AND APPLICABLE INSTRUCTIONS OF MANUFACTURERS OF EQUIPMENT AND MATERIAL SUPPLIED FOR THIS PROJECT.
3. OBTAIN AND PAY FOR BUILDING / TELECOMMUNICATIONS PERMIT, ARRANGE FOR PERIODIC INSPECTION BY LOCAL AUTHORITIES, AND DELIVER CERTIFICATE OF FINAL INSPECTION TO THE ARCHITECT.
4. CONTACT THE TELEPHONE AND CABLE TELEVISION UTILITY COMPANIES AND COORDINATE ALL WORK WITH THEM. PAY ALL UTILITY COMPANY CHARGES RELATED TO THIS PROJECT UNLESS OTHERWISE DIRECTED. THE DRAWINGS DEPICT ANTICIPATED UTILITY COMPANY REQUIREMENTS. DO NOT PROCEED WITH THE UTILITY COMPANY RELATED WORK WITHOUT VERIFYING THEIR EXACT REQUIREMENTS. NOTIFY THE ARCHITECT OF ANY DIFFERENCES BETWEEN WHAT IS SHOWN ON THE CONTRACT DRAWINGS AND WHAT IS REQUIRED BY THE UTILITY COMPANIES. ARRANGE FOR PERIODIC INSPECTIONS BY THE UTILITY COMPANIES AND PERFORM ALL WORK IN ACCORDANCE WITH THE UTILITY COMPANY STANDARDS.
5. RETENTION OF PLANS: ONE SET OF APPROVED PLANS, SPECIFICATIONS, AND COMPUTATIONS SHALL BE RETAINED BY THE BUILDING OFFICIAL FOR A PERIOD OF NOT LESS THAN 90 DAYS FROM DATE OF COMPLETION OF THE WORK COVERED THEREIN, AND ONE SET OF APPROVED PLANS SHALL BE RETURNED TO THE APPLICANT, AND SAID SET SHALL BE KEPT ON THE SITE OF THE BUILDING OR WORK AT ALL TIMES DURING WHICH THE WORK AUTHORIZED THEREBY IS IN PROGRESS.
6. STRUCTURES UNDERGOING CONSTRUCTION, ALTERATION, OR DEMOLITION OPERATIONS, INCLUDING THOSE IN UNDERGROUND LOCATIONS, SHALL COMPLY WITH NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS, AND NFPA 1, AS LOCALLY AMENDED.
7. FIRE SAFETY DURING ALTERATION:
   a. NFPA 1, 16.4.4.1 WHERE THE BUILDING IS PROTECTED BY FIRE PROTECTION SYSTEMS, SUCH SYSTEMS SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES DURING ALTERATION.
   b. NFPA 1, 16.4.4.2 WHERE ALTERATION REQUIRES MODIFICATION OF A PORTION OF THE FIRE PROTECTION SYSTEM, THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE AND THE FIRE DEPARTMENT SHALL BE NOTIFIED.
   c. NFPA 1, 16.4.4.3 WHEN IT IS NECESSARY TO SHUT DOWN THE SYSTEM, THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE ALTERNATE MEASURES OF PROTECTION UNTIL THE SYSTEM IS RETURNED TO SERVICE.
   d. NFPA 1, 10.7.1.1 AS NECESSARY DURING EMERGENCIES, MAINTENANCE, DRILLS, PRESCRIBED TESTING, ALTERATIONS, OR RENOVATIONS, PORTABLE OR FIXED FIRE-EXTINGUISHING SYSTEMS OR DEVICES OR ANY FIRE-WARNING SYSTEM SHALL BE PERMITTED TO BE MADE INOPERATIVE OR INACCESSIBLE. A FIRE WATCH SHALL BE REQUIRED AS SPECIFIED IN SECTIONS 13.3.3.6.5.2(4)(b), 13.7.1.5.3, 16.5.4, 34.6.3.3, 41.2.2.6, 41.2.2.7, 41.2.4, 41.3.5, 41.4.1, 34.5.4.3, AND 25.1.8 AT NO COST TO THE AHJ. NFPA 1, AS LOCALLY AMENDED.
8. THE DRAWINGS DO NOT REFLECT ALL THE EXISTING CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. VISIT THE PROJECT SITE AND BECOME FAMILIAR WITH THE READILY OBSERVABLE EXISTING CONDITIONS, THE EXTENT OF ANY DEMOLITION, RELOCATION, RECONNECTION, AND THE NEW WORK PRIOR TO BIDDING. REPORT ANY READILY OBSERVABLE DISCREPANCIES AND/OR DIFFERENCES BETWEEN THE EXISTING CONDITIONS AND THE CONSTRUCTION DOCUMENTS TO THE ARCHITECT. RESOLVE ALL READILY OBSERVABLE DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. BID SUBMISSION SHALL BE CONSIDERED AS EVIDENCE THAT THE CONTRACTOR HAS VISITED THE SITE AND RESOLVED ALL READILY OBSERVABLE DISCREPANCIES AND QUESTIONS AND NO EXTRA PAYMENT WILL BE AUTHORIZED FOR WORK REQUIRED BY THE CONTRACTOR'S FAILURE TO DO SO.
9. PHASING AND SEQUENCING OF THE TELECOMMUNICATIONS WORK WILL BE REQUIRED. COORDINATE ALL TELECOMMUNICATIONS WORK WITH THE WORK OF THE OTHER TRADES AND SCHEDULE WORK TO MINIMIZE THE NUMBER AND DURATION OF TELECOMMUNICATIONS OUTAGES AND IMPACT TO THE OPERATIONS IN OR ADJACENT TO THE PROJECT AREA. COORDINATE ACCESS TO THE PROJECT AREA AND SCHEDULE ALL REQUIRED SYSTEM OUTAGES WITH THE ARCHITECT.
10. VERIFY AND COORDINATE ALL PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS PRIOR TO THE START OF CONSTRUCTION. OBTAIN APPROVAL BEFORE MAKING ANY PENETRATIONS THROUGH STRUCTURAL MEMBERS OR FIRE RATED WALLS AND CEILINGS.
11. SCAN (E.G. X-RAY, ELECTROMAGNETIC, ETC.) ALL CONCRETE WALLS OR FLOOR STRUCTURES PRIOR TO COMMENCING WITH CORING/DRILLING WORK FOR PENETRATIONS TO AVOID DAMAGING THE EXISTING REINFORCING STEEL.
12. COORDINATE AND PROVIDE ACCESS PANELS FOR ALL CONCEALED TELECOMMUNICATIONS EQUIPMENT, DEVICES, BOXES, AND CONDUIT BODIES SO THAT THEY ARE ACCESSIBLE.
13. TONING: EXISTING UNDERGROUND UTILITY LINES INDICATED ON THE DRAWINGS ARE SHOWN IN APPROXIMATE LOCATIONS BASED ON TOPOGRAPHIC SURVEY AND ARE SUBJECT TO FIELD VERIFICATION BY THE CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR TONING THE PROPOSED ROUTES OF THE PROJECT DUCTLINES TO IDENTIFY ANY POTENTIAL CONFLICTS PRIOR TO EXCAVATION. DAMAGE TO EXISTING UTILITIES CAUSED BY THE CONTRACTOR, AS A RESULT OF THE FAILURE TO TONE THE ROUTE PRIOR TO EXCAVATION WORK, WILL REQUIRE THE CONTRACTOR TO REPAIR THE DAMAGE AT NO ADDITIONAL COST TO THE PROJECT. THE DAMAGED UTILITIES SHALL BE REPAIRED/RESTORED TO ITS ORIGINAL WORKING CONDITION AND TO THE SATISFACTION OF THE OWNER.
14. PROVIDE ALL LABOR, EQUIPMENT, AND HAULING/DISPOSAL SERVICE FOR DEWATERING EFFORTS FOR NEW BELOW GRADE EXCAVATION/TRENCHING IF GROUND WATER IS ENCOUNTERED IN THE PROJECT AREA.
15. WORK INCIDENTAL TO THE CONTRACT AND NECESSARY TO COMPLETE THE PROJECT, ALTHOUGH NOT SPECIFICALLY REFERRED TO IN THE CONTRACT DOCUMENTS, SHALL BE FURNISHED AND PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT. AN EXAMPLE OF SUCH INCIDENTAL WORK ARE OUTLET BOXES, JUNCTION BOXES, AND PULL BOXES REQUIRED FOR THE INSTALLATION OF TELECOMMUNICATIONS DEVICES AND EQUIPMENT. ALL INCIDENTAL WORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE NEC.
16. SHOULD PROJECT CONDITIONS REQUIRE REARRANGEMENT OF THE PROJECT'S WORK, THE CONTRACTOR SHALL MARK SUCH CHANGES ON THE AS-BUILT DRAWINGS. IF THESE CHANGES REQUIRE AN ALTERNATE METHOD TO THOSE SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUBMIT DRAWINGS TO REFLECT THE PROPOSED ALTERNATE METHODS TO THE ARCHITECT FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL NOT PROCEED UNTIL APPROVAL IS OBTAINED. REARRANGEMENT OF WORK FOR THE PURPOSE OF COORDINATION SHALL NOT BE CONSIDERED AN ITEM FOR EXTRA COST.
17. THE TELECOMMUNICATIONS DRAWINGS ARE BASED ON PROPOSED EQUIPMENT. VERIFY ALL SYSTEM REQUIREMENTS (ELECTRICAL, MECHANICAL, FIRE ALARM, SPECIALTY SYSTEMS, ETC.) WITH THE SELECTED SYSTEM'S MANUFACTURER OR AUTHORIZED REPRESENTATIVE PRIOR TO COMMENCING WITH ANY WORK. CORRECT ALL DISCREPANCIES SO AS TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM. RECORD CHANGES ON THE AS-BUILT DRAWINGS.
18. ALL EQUIPMENT AND APPARATUS SHALL BE CAPABLE OF FITTING IN THE SPACES SHOWN WHILE MEETING THE MANUFACTURER'S RECOMMENDED ACCESS REQUIREMENTS AND APPLICABLE CODE REQUIREMENTS. REVIEW ALL SPACES WHERE EQUIPMENT IS TO BE INSTALLED PRIOR TO ORDERING OF EQUIPMENT AND NOTIFY THE ARCHITECT OF ANY INADEQUATE CLEARANCES OR CONDITIONS THAT WILL PREVENT THE PROPER INSTALLATION, MAINTENANCE, AND OPERATION OF THE EQUIPMENT.
19. CONCEAL ALL CONDUIT WHEREVER REASONABLY POSSIBLE; EXPOSED CONDUITS ARE PERMITTED ONLY WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. ALL EXPOSED CONDUITS IN FINISHED AREAS SHALL BE INSTALLED IN THE LEAST VISIBLE LOCATIONS. CARE SHALL BE TAKEN TO INSTALL CONDUIT IN THE MOST AESTHETICALLY PLEASING MANNER.
20. WHERE DEVICES, EQUIPMENT, BOXES, AND OTHER TELECOMMUNICATIONS MATERIALS ARE INDICATED TO BE OF WEATHERPROOF (WP) CONSTRUCTION, THE INTERCONNECTING RACEWAYS, INCLUDING COUPLINGS AND CONNECTORS, SHALL BE LISTED FOR AND INSTALLED TO PROVIDE A COMPLETE WEATHERPROOF / WET LOCATION INSTALLATION. ALL INCIDENTAL MATERIALS REQUIRED TO COMPLETE THE INSTALLATION SHALL ALSO BE OF WEATHERPROOF / WET LOCATION LISITING.
21. WIRING DEVICES AND CONDUITS SHALL BE FLUSH MOUNTED, WHEREVER REASONABLY POSSIBLE.
22. PROVIDE NYLON PULLSTRINGS IN ALL EMPTY CONDUITS UNLESS OTHERWISE INDICATED.
23. THE TELECOMMUNICATIONS RACEWAY SYSTEM INSTALLATION SHALL COMPLY WITH TIA/EIA AND BISCI STANDARDS UNLESS OTHERWISE NOTED.
24. CONDUIT BODIES (e.g. LB, LR, etc.) SHALL NOT BE PERMITTED IN THE TELECOMMUNICATIONS RACEWAY SYSTEMS UNLESS SPECIFICALLY INDICATED TO BE UTILIZED AND LISTED FOR TELECOMMUNICATIONS SYSTEM USE.
25. PROVIDE INSULATED BUSHINGS AT ALL TELECOMMUNICATIONS CONDUIT TERMINATIONS AT ALL BOXES, BACKBOARDS, AND CONDUIT STUBS
26. PENETRATIONS THROUGH FIRE-RATED WALLS, CEILINGS, AND FLOORS SHALL BE SEALED TO MAINTAIN FIRE RATINGS. UTILIZE 3M CP25, PUTTY 303, OR OTHER SUITABLE UL-LISTED SEALING SYSTEM.
27. PATCH, REFINISH, AND PAINT ALL PENETRATIONS THROUGH WALLS AND SLABS TO MATCH FINISH OF ADJACENT SURFACES.
28. RESTORE/REPAIR ANY DAMAGE TO SURFACES RESULTING FROM THE INSTALLATION OF NEW ELECTRICAL ITEMS. THE AREAS REPAIRED SHALL MATCH THE ADJACENT SURFACES IN TEXTURE, FINISH, AND COLOR.
29. PAINTING OF TELECOMMUNICATIONS EQUIPMENT:
   a. INTERIOR LOCATIONS - PRIME AND PAINT ALL EXPOSED CONDUITS, BOXES, FITTINGS, SUPPORT CHANNELS, MOUNTING HARDWARE, AND ACCESSORIES WITH TWO FINISH COATS TO MATCH THE SURFACE ON WHICH THEY ARE MOUNTED OR TO MATCH THE FINISH OF THE ADJACENT SURFACES. EQUIPMENT SURFACES/COMPONENTS WITH A FACTORY-APPLIED PAINT FINISH NEED NOT BE PAINTED.
   b. EXTERIOR LOCATIONS - PRIME ALL EXPOSED CONDUITS, BOXES, FITTINGS, SUPPORT CHANNELS, MOUNTING HARDWARE, AND ACCESSORIES WITH A 2-PART EPOXY PRIMER AND FINISH WITH 2 COATS OF AN ALIPHATIC ACRYLIC URETHANE PAINT. PAINT FINISH TO MATCH THE SURFACE ON WHICH THEY ARE MOUNTED OR TO MATCH THE FINISH OF THE ADJACENT SURFACES. STAINLESS STEEL MATERIALS NEED NOT BE PAINTED.
30. PROVIDE EARTHQUAKE BRACING FOR ALL TELECOMMUNICATIONS EQUIPMENT, APPARATUS, AND RACEWAYS. BRACING SHALL, AS A MINIMUM, COMPLY WITH THE GUAM GOVERNMENT BUILDING CODE.
31. ALL CONDUITS ENTERING THE BUILDING FROM THE EXTERIOR SHALL BE SEALED TO PREVENT ENTRANCE OF MOISTURE, GASES, AND RODENTS.

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MECHANICAL • ELECTRICAL • FIRE PROTECTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
TELECOM GENERAL NOTES
PROGRAMMING DOCUMENT

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Drawn:	DP
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Scale:	NTS
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Project: 20-133	File

Drawing No.
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Sheet No. ____ of ____

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TELECOMMUNICATIONS SYMBOL LIST / MOUNTING HEIGHT SCHEDULE

MOUNTING HEIGHT FROM FLOOR TO		(SPECIAL MOUNTING HEIGHTS INDICATED ON PLAN)	
		SYMBOL	
TOP	℄	NEW	DESCRIPTION
	18"		WALL MOUNTED, DOUBLE GANG, FOUR POSITION, (4) CAT6A RJ45 JACKS
	18"	AV	WALL MOUNTED, SINGLE GANG, DOUBLE POSITION, (2) CAT6A RJ45 JACKS, DEDICATED FOR A/V EQUIPMENT
	18"		WALL MOUNTED, SINGLE GANG, DOUBLE POSITION, (2) CAT6A RJ45 JACKS
			TELEPHONE OUTLET BOX, FLUSH FLOOR MOUNTED, RATED FOR SLAB-ON-GRADE, (4) CAT6A RJ45 JACKS
		AV	TELEPHONE OUTLET BOX, FLUSH FLOOR MOUNTED, RATED FOR SLAB-ON-GRADE, (2) CAT6A RJ45 JACKS, DEDICATED FOR A/V EQUIPMENT
	102"	W	WIRELESS ACCESS POINT, (1) CAT6A RJ45 JACK
	18"	AD	WALL MOUNTED, SINGLE GANG, DOUBLE POSITION, (2) CAT6A RJ45 JACKS
			LADDER TYPE CABLE TRAY
			WELDED WIRE CABLE TRAY
			GROUND BUS BAR
			TELECOM CABINET
			CCTV OUTLET BOX, CEILING MOUNTED, WITH BLANK DEVICE PLATE
	90"		CCTV OUTLET BOX, WALL MOUNTED, WITH BLANK DEVICE PLATE
		S	SPEAKER OUTLET BOX, CEILING MOUNTED, WITH BLANK DEVICE PLATE
	90"	S	SPEAKER OUTLET BOX, WALL MOUNTED, WITH BLANK DEVICE PLATE
			1" CONDUIT STUB TO CABLE TRAY
	60"	V	TV OUTLET, WALL MOUNTED, WITH (1) F-TYPE ADAPTER AND COAX CABLE
		PJ	VIDEO PROJECTOR OUTLET, CEILING MOUNTED, WITH BLANK DEVICE PLATE
	18"	ID	INSTRUCTIONAL DATA OUTLET, WALL MOUNTED, 4 11/16" SQ BOX WITH BLANK 2 GANG STAINLESS STEEL DEVICE COVER
	46"	IC	SUBSTATION INTERCOM OUTLET BOX, WALL MOUNTED
	46"	MS	MASTER STATION INTERCOM OUTLET BOX, WALL MOUNTED
		WP	WEATHERPROOF

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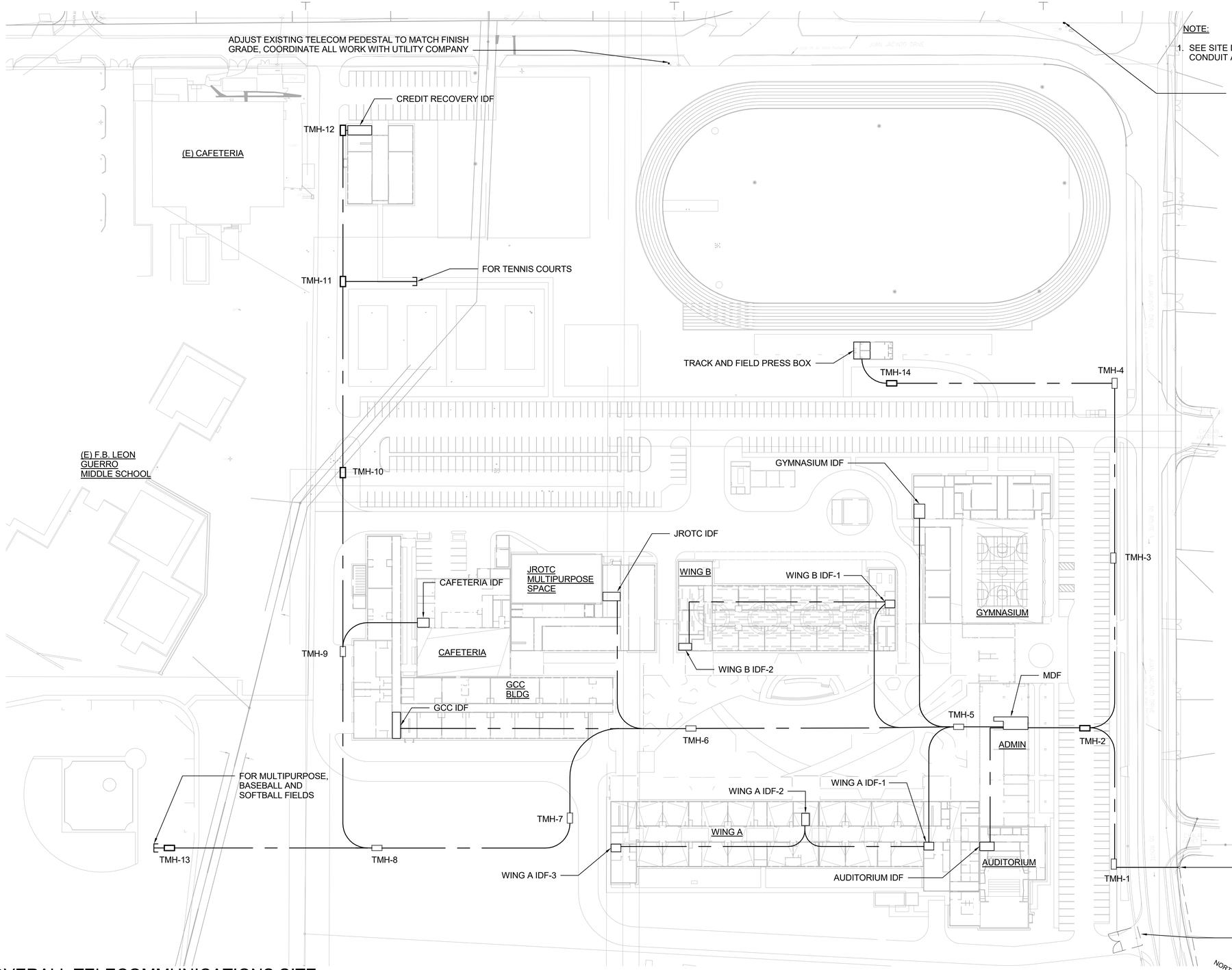
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
TELECOM SYMBOLS LIST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project: 20-133	File

Drawing No.
T0.3
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



NOTE:

1. SEE SITE DISTRIBUTION DIAGRAM FOR CONDUIT AND CABLING REQUIREMENTS.

EXISTING TELECOM PULLBOX TO REMAIN AND BE PROTECTED DURING DEMOLITIOIN

1 OVERALL TELECOMMUNICATIONS SITE PLAN

SCALE: 1" = 60'-0"

REVISION		
No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Interior Design

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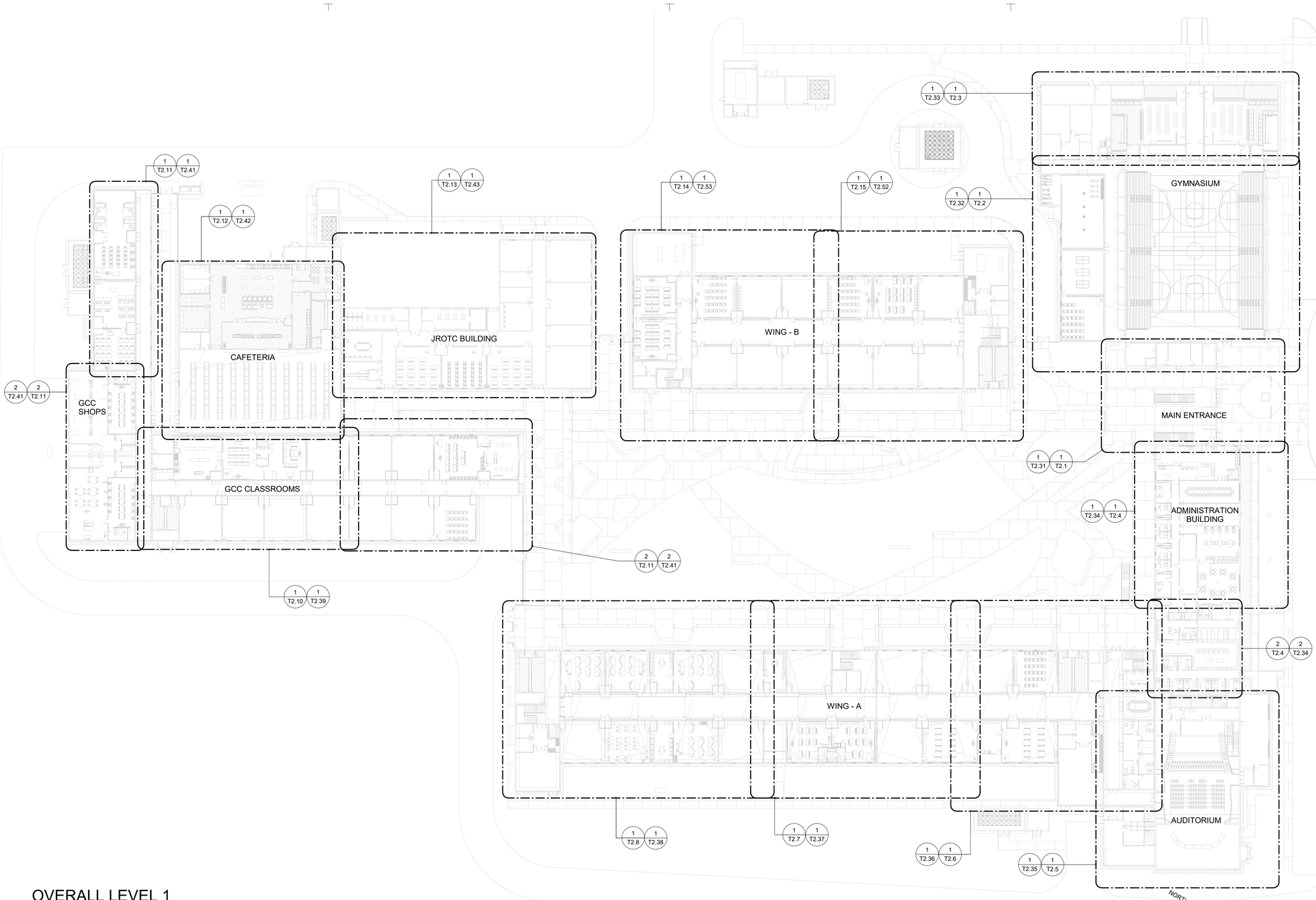
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL TELECOMMUNICATIONS SITE PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1" = 60'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T1.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 OVERALL LEVEL 1 TELECOMMUNICATIONS PLAN

SCALE: 1/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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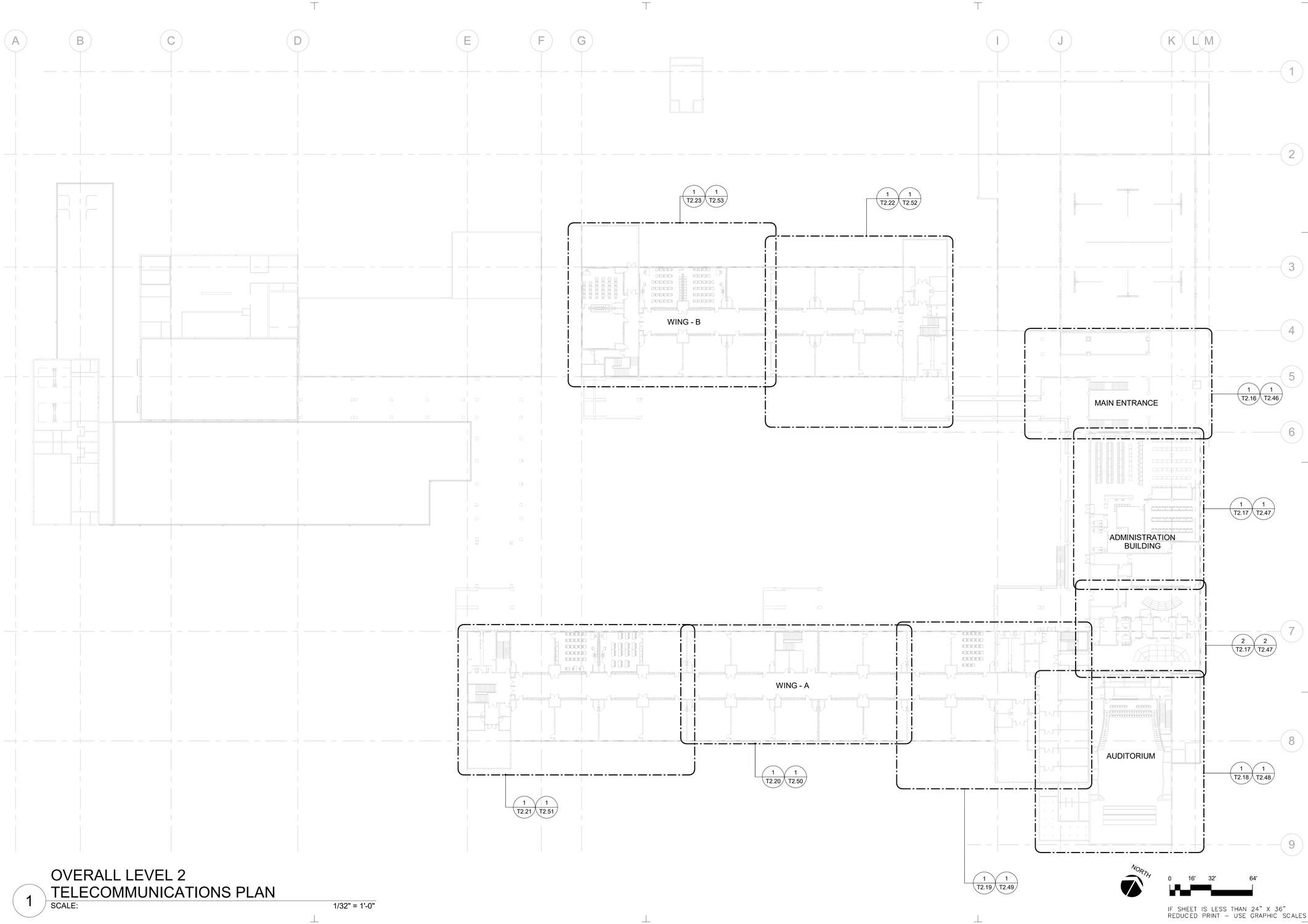
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL LEVEL 1 TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/32" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T1.2
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 OVERALL LEVEL 2 TELECOMMUNICATIONS PLAN

SCALE: 1/32" = 1'-0"

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
OVERALL LEVEL 2 TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

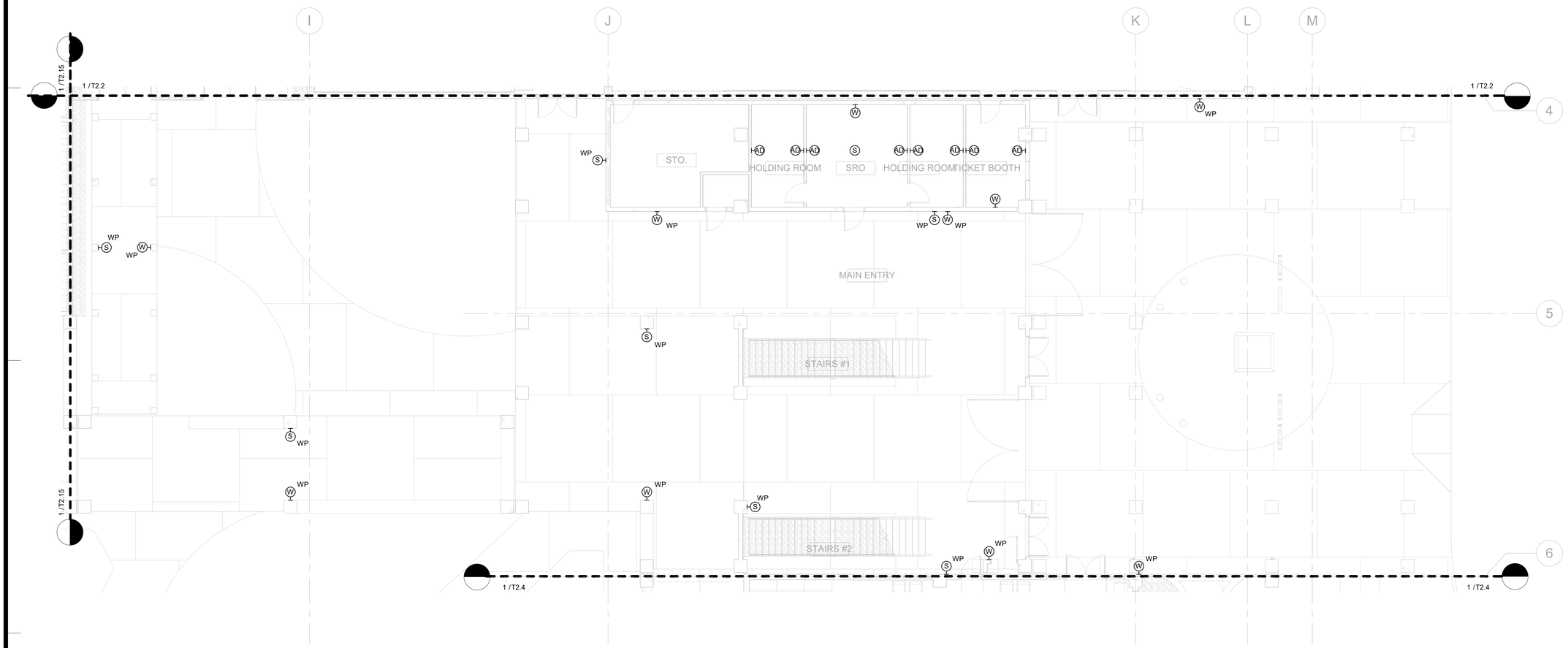
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/32" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T1.3
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

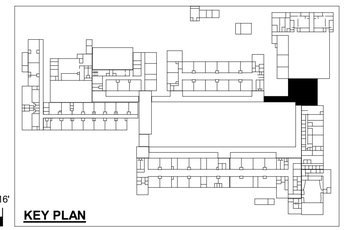
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 MAIN ENTRANCE LEVEL 1 TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"



NORTH 0' 4' 8' 16'

KEY PLAN

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REVISION		
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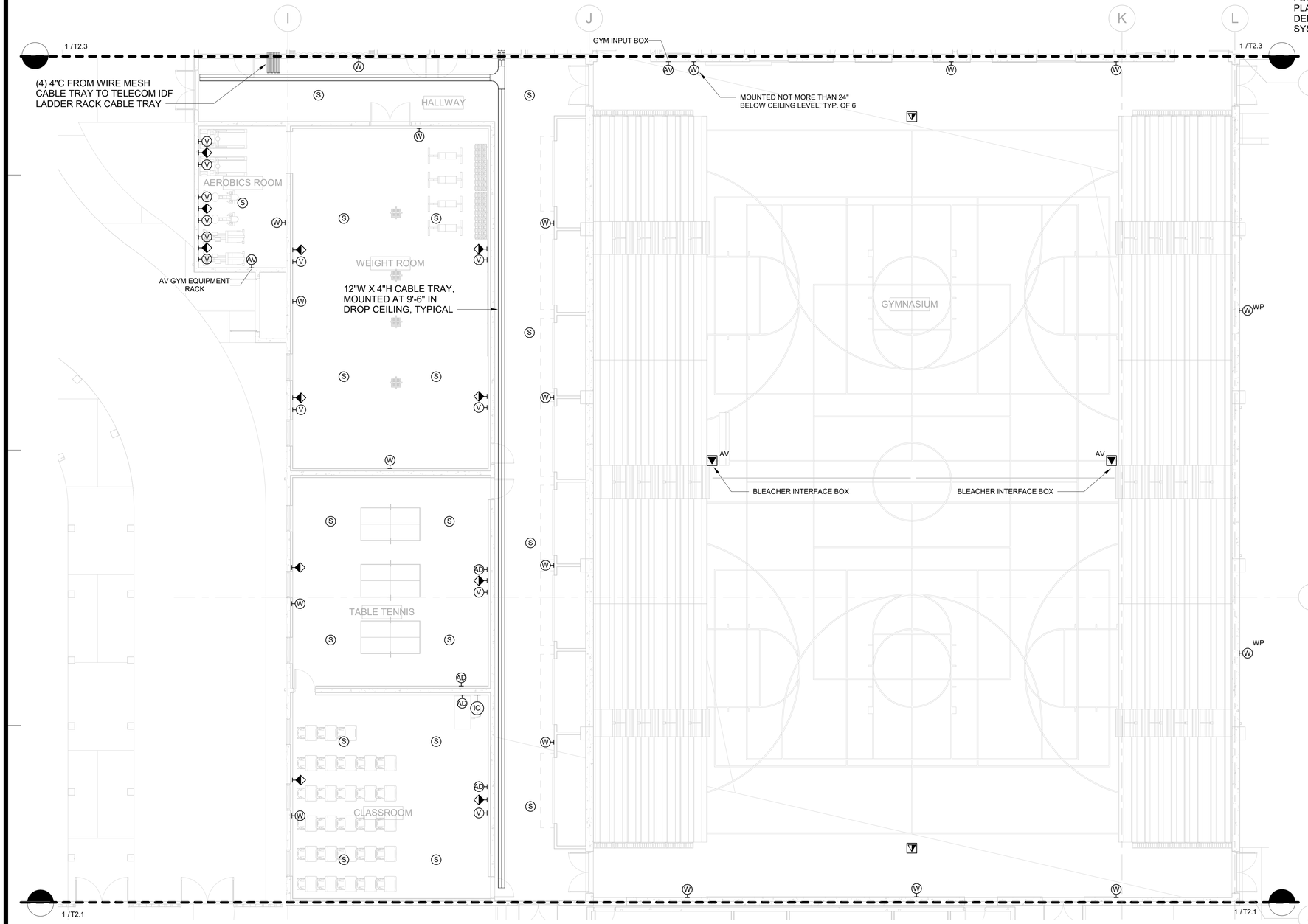
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MAIN ENTRANCE LEVEL 1 TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.1
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



NOTE:

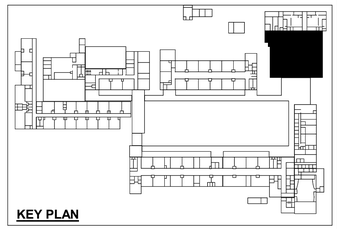
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).
2. FUNISH AND INSTALL ALL NETWORK CABLING, FIBER AND TWISTED PAIR, EXCLUDING DEDICATED AV NETWORK CABLING. FURNISH AND INSTALL ALL NETWORK CONNECTORS AND PLATES, EXCLUDING NETWORK CONNECTORS AND PLATES DEDICATED TO AV EQUIPMENT. COORDINATE WITH AV SYSTEMS DRAWINGS.

1 GYMNASIUM TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



KEY PLAN

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Project:
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Title:
GYMNASIUM TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

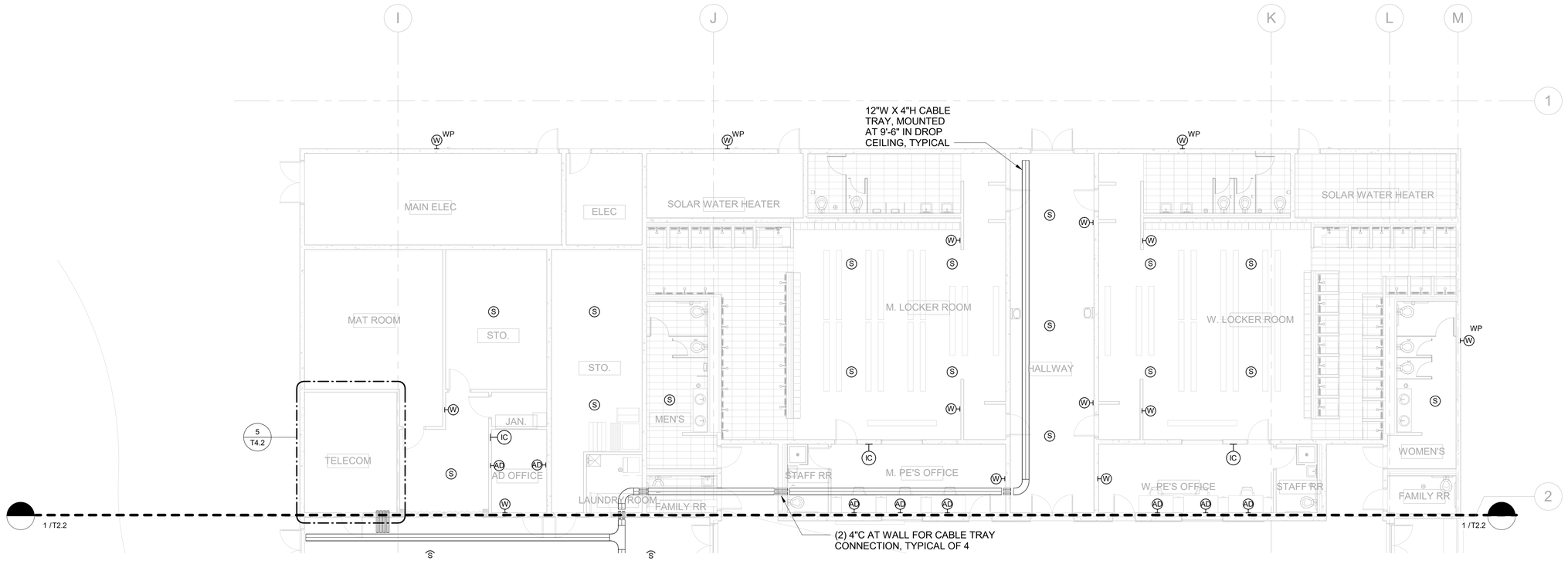
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.2
Sheet No. of

NOT FOR CONSTRUCTION

NOTE:

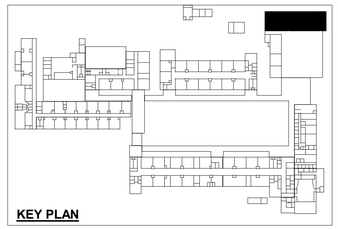
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 GYMNASIUM LOCKER ROOMS TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

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Project:
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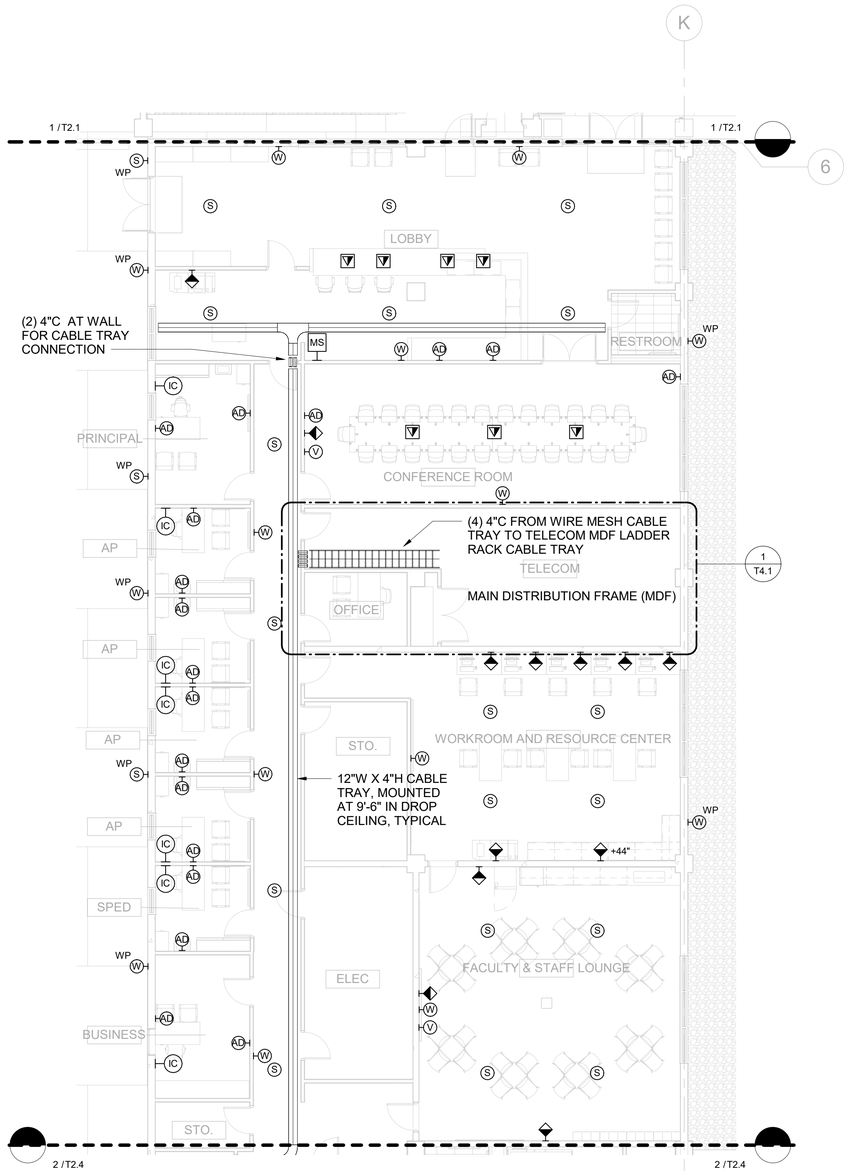
SIMON SANCHEZ HIGH SCHOOL

Title:
GYMNASIUM LOCKER ROOMS TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

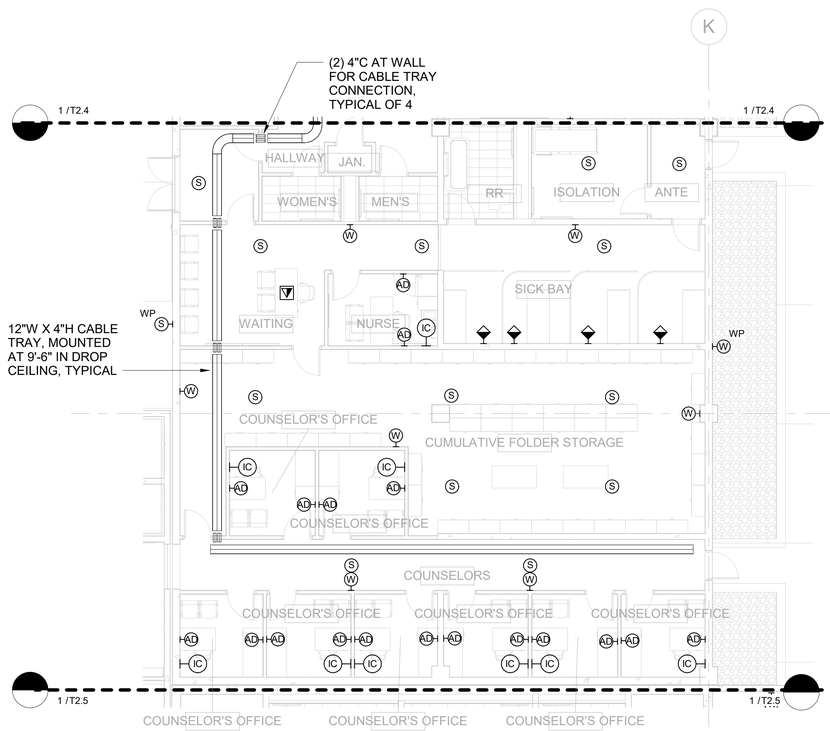
Drawing No.
T2.3
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



1 ADMINISTRATION OFFICES TELECOMMUNICATIONS PLAN - NORTH

SCALE: 1/8" = 1'-0"



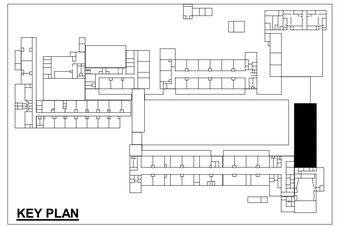
2 ADMINISTRATION OFFICES TELECOMMUNICATIONS PLAN - SOUTH

SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project:
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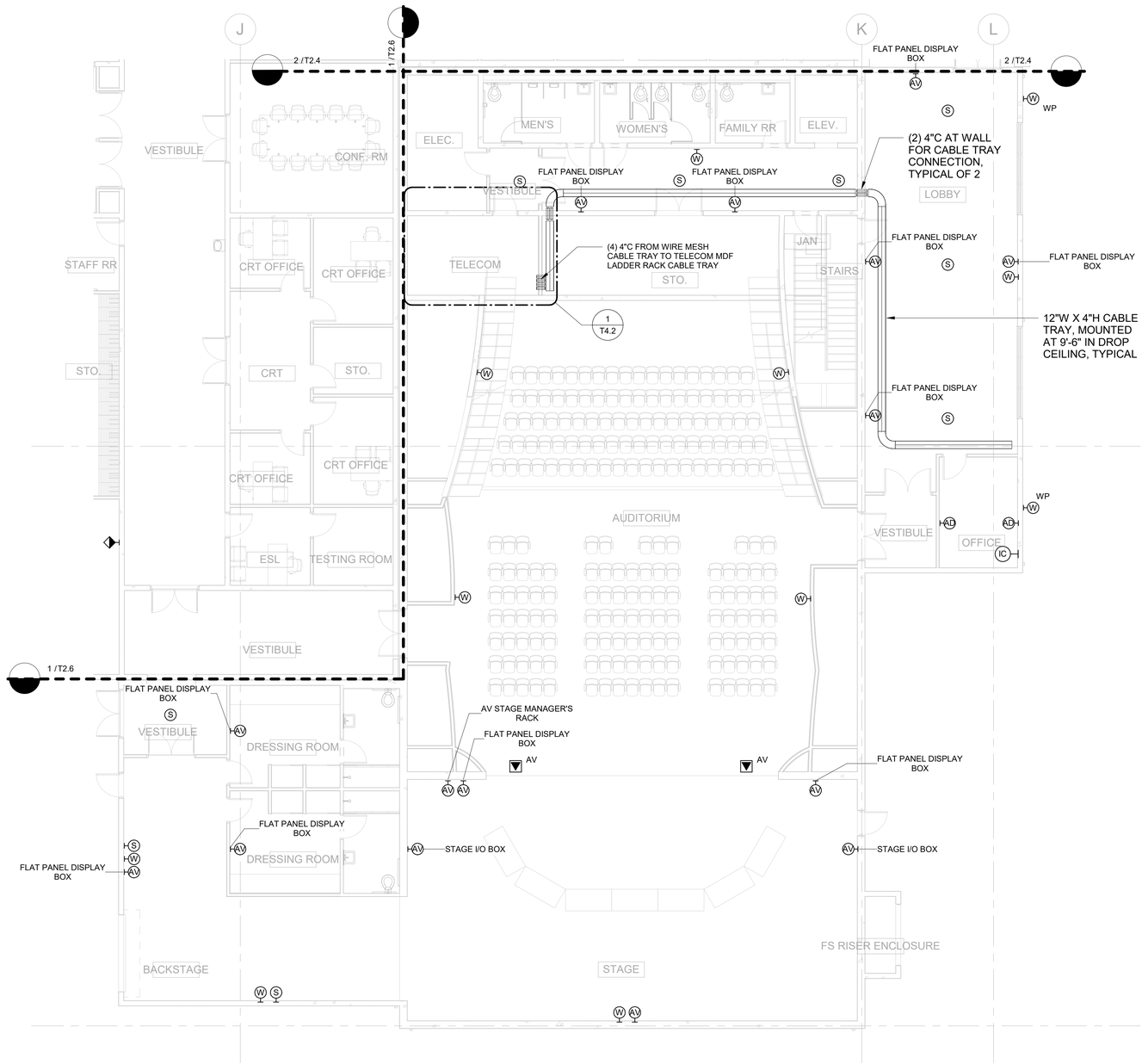
Title:
ADMINISTRATION OFFICES TELECOMMUNICATIONS PLANS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	20-133
File	

Drawing No.
T2.4
Sheet No. of

NOT FOR CONSTRUCTION



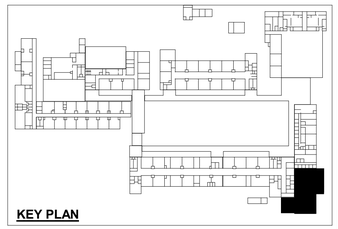
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).
2. FUNISH AND INSTALL ALL NETWORK CABLING, FIBER AND TWISTED PAIR, EXCLUDING DEDICATED AV NETWORK CABLING. FURNISH AND INSTALL ALL NETWORK CONNECTORS AND PLATES, EXCLUDING NETWORK CONNECTORS AND PLATES DEDICATED TO AV EQUIPMENT. COORDINATE WITH AV SYSTEMS DRAWINGS.
3. FURNISH AND INSTALL VOICE/DATA NETWORK CABLING (FIBER AND TWISTED PAIR), EXCEPT FOR PERFORMANCE LIGHTING SYSTEMS-SPECIFIC CABLE. COORDINATE WITH THEATRE SYSTEMS DRAWINGS.

1 AUDITORIUM LEVEL 1 TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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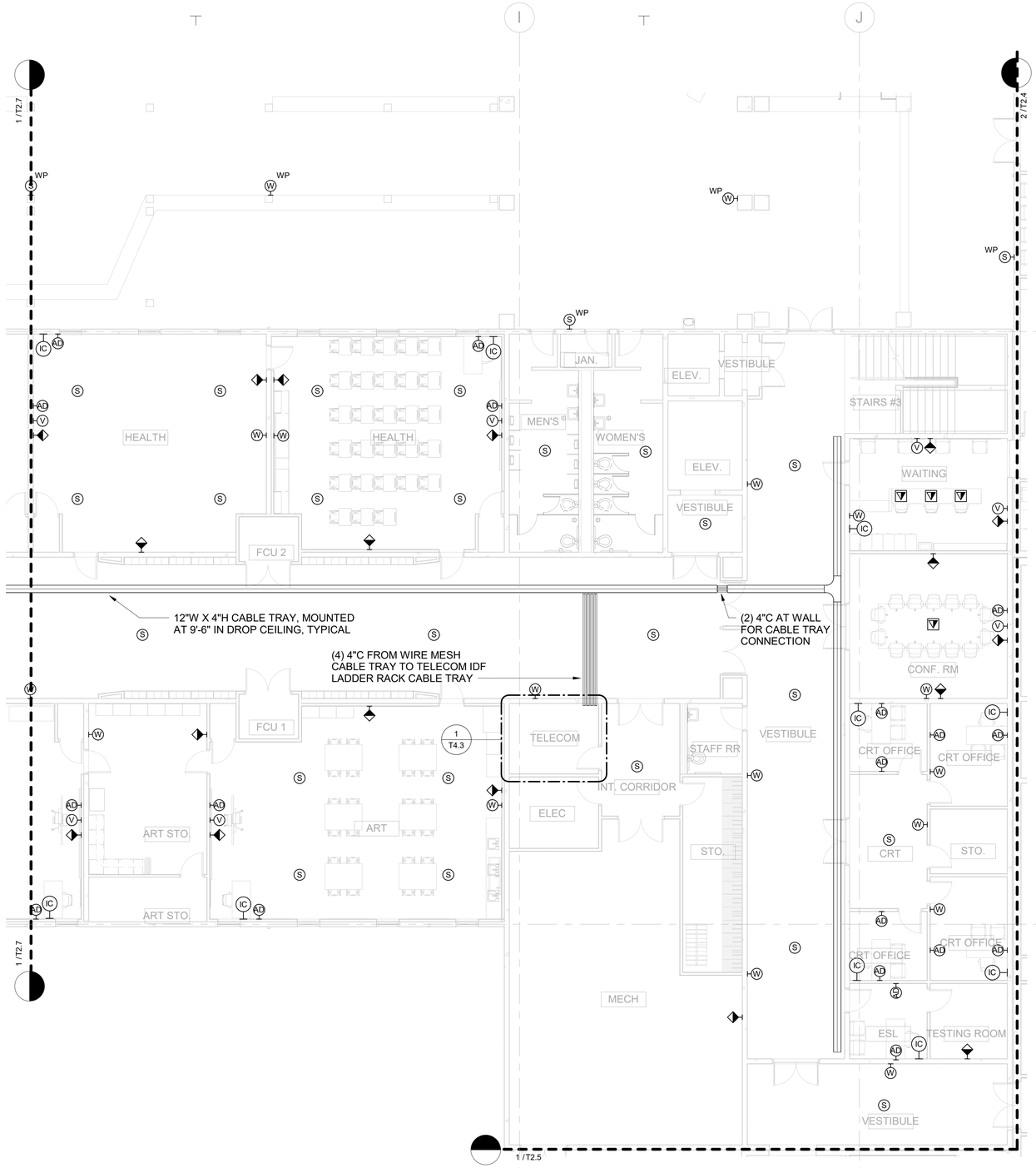
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM LEVEL 1 TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.5
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



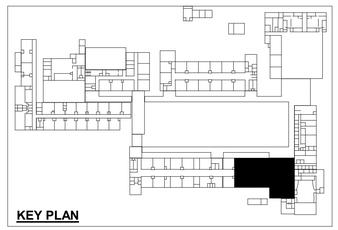
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

1 A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - EAST

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - EAST
PROGRAMMING DOCUMENT

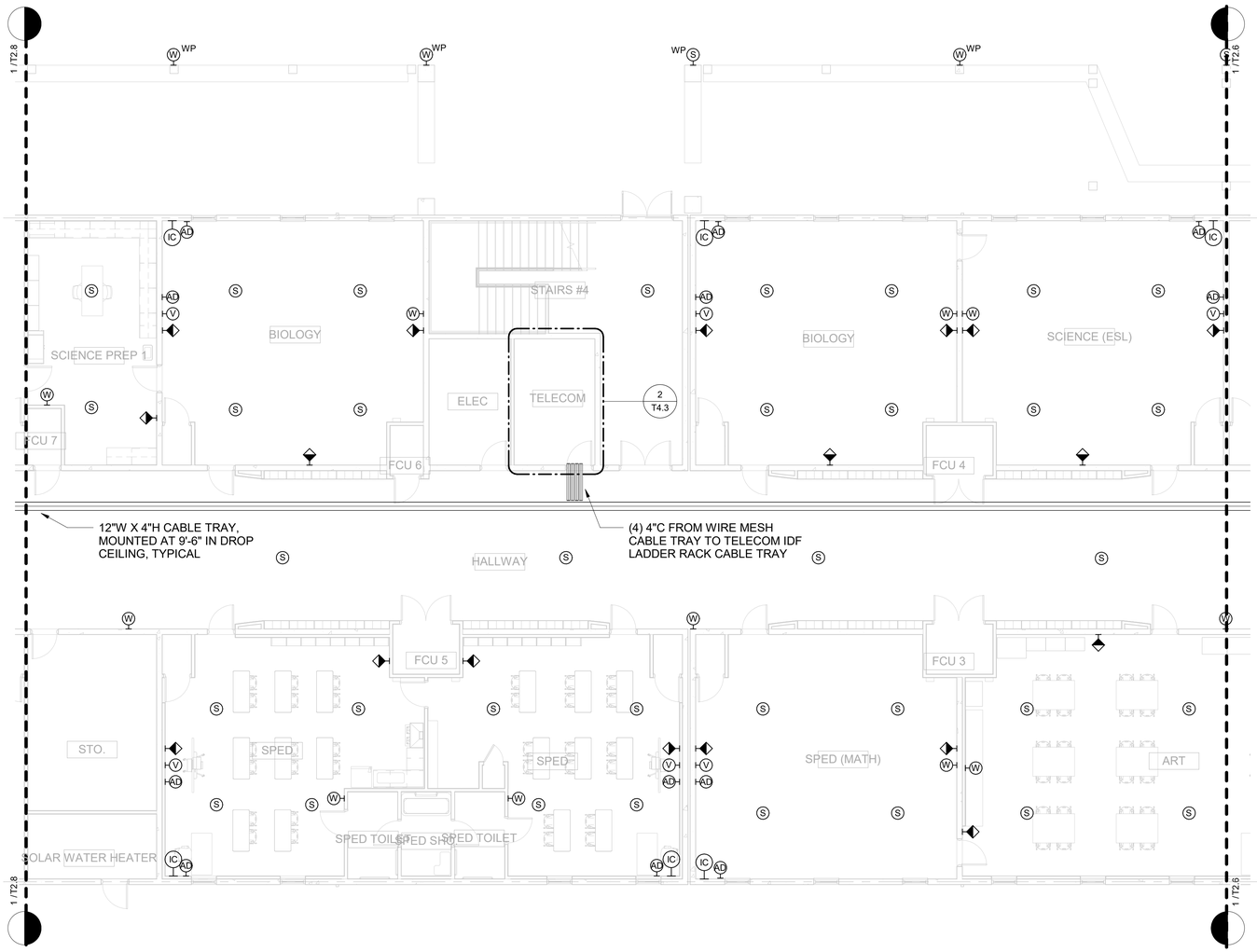
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.6

Sheet No. ____ of ____

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

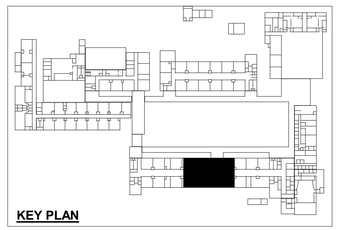


A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - CENTER

1 SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Title:
A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - CENTER
PROGRAMMING DOCUMENT

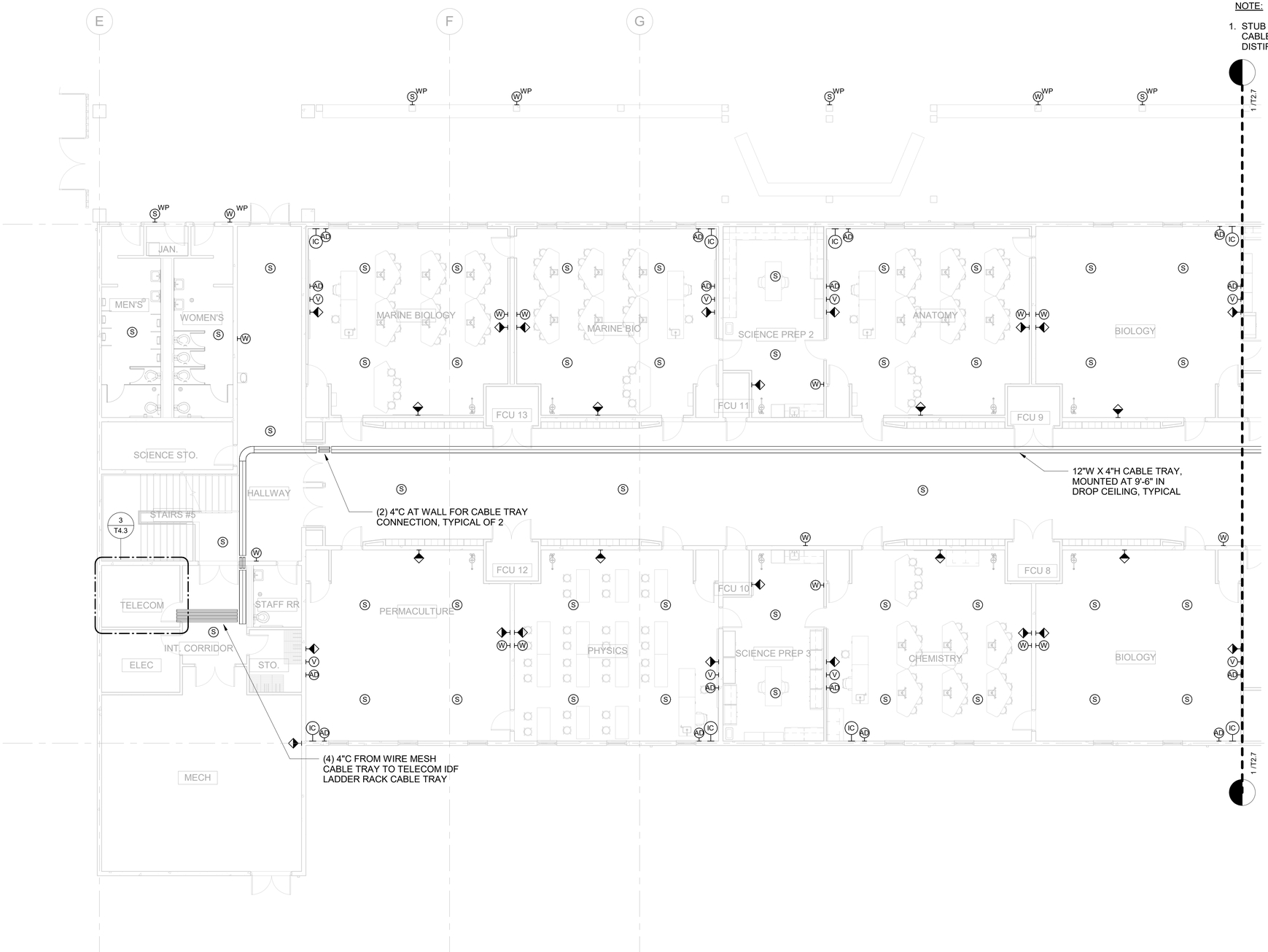
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.7
Sheet No. of

NOT FOR CONSTRUCTION

NOTE:

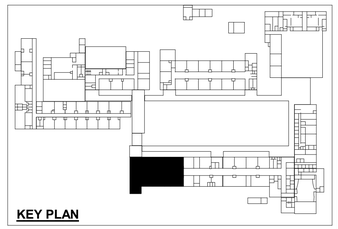
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - WEST

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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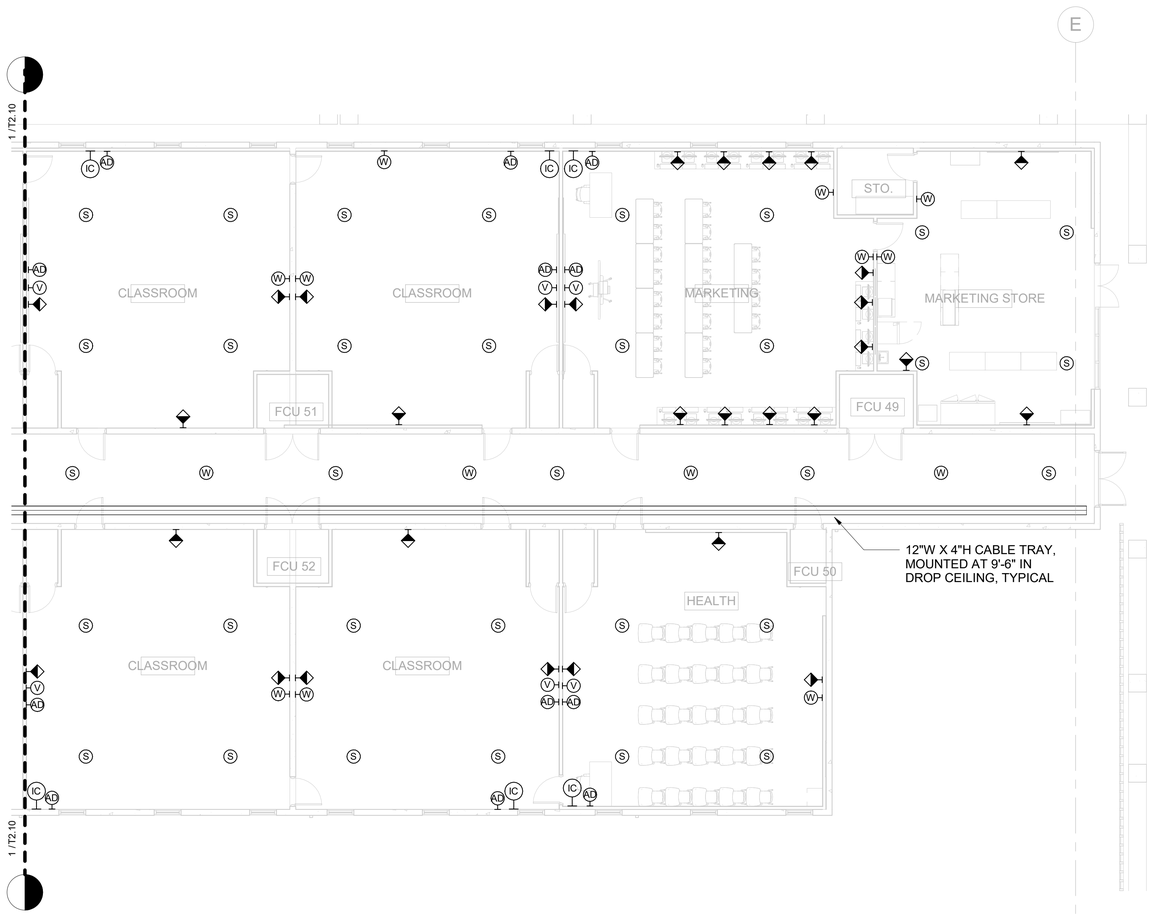
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 1 TELECOMMUNICATIONS PLAN - WEST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.8
Sheet No. ____ of ____



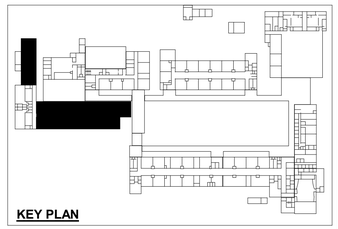
1 C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - EAST

SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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NOT FOR CONSTRUCTION

Project:
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SIMON SANCHEZ HIGH SCHOOL

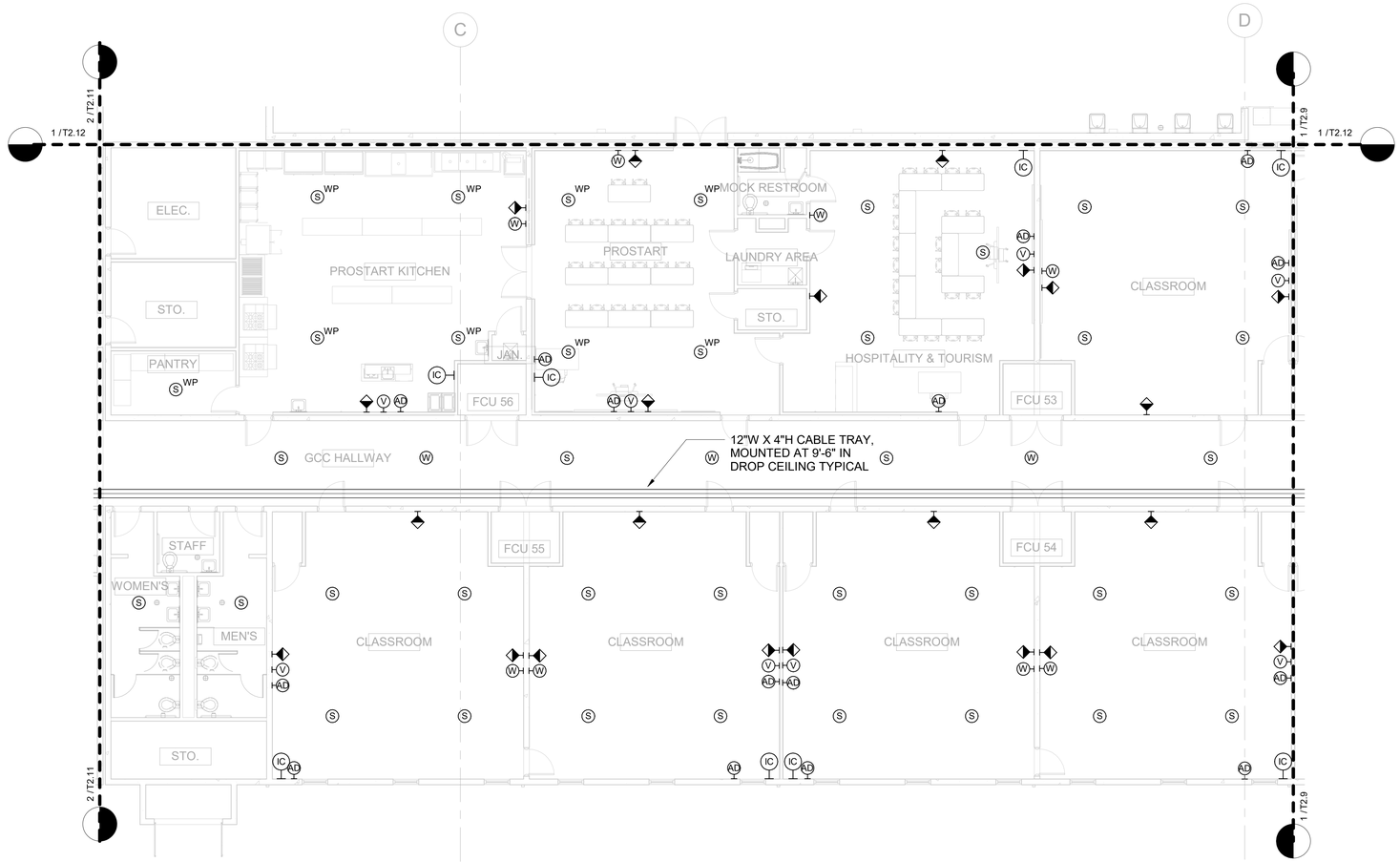
Title:
C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - EAST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.9
Sheet No. ____ of ____

NOTE:

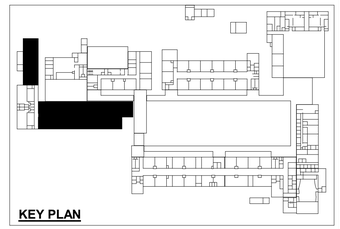
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - CENTER

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Architecture
Planning
Interior Design

INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

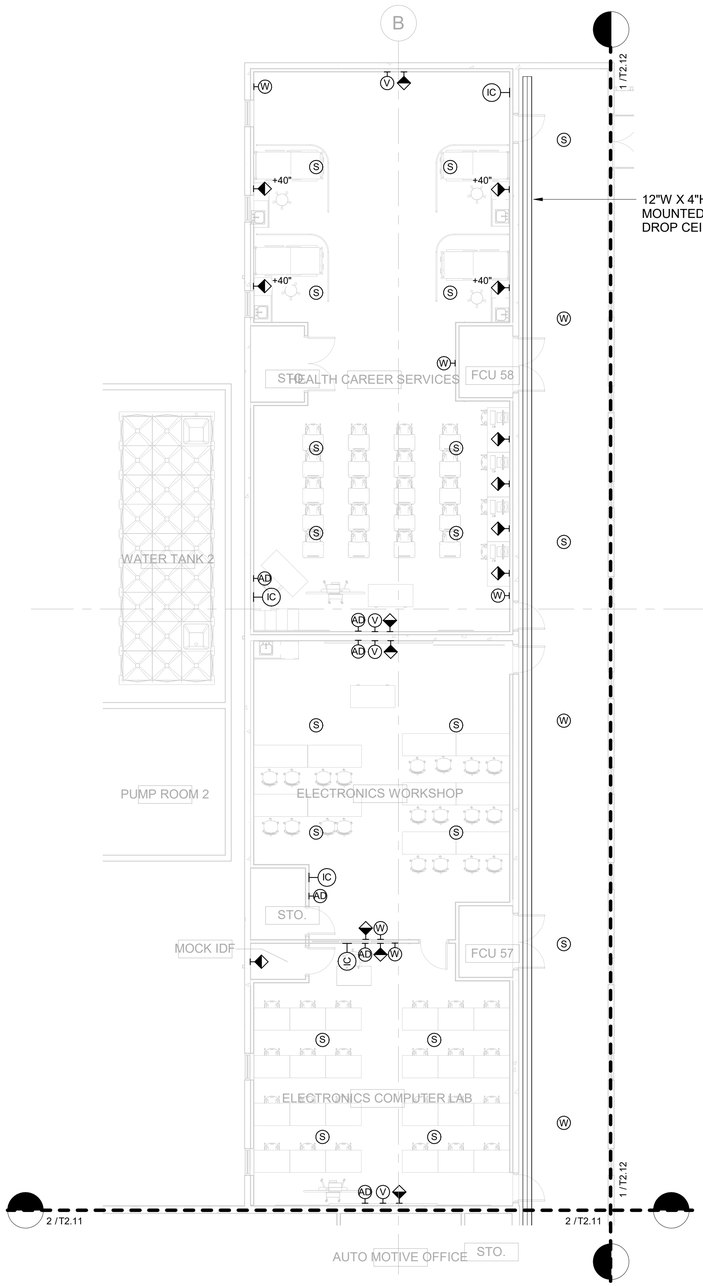
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - CENTER
PROGRAMMING DOCUMENT

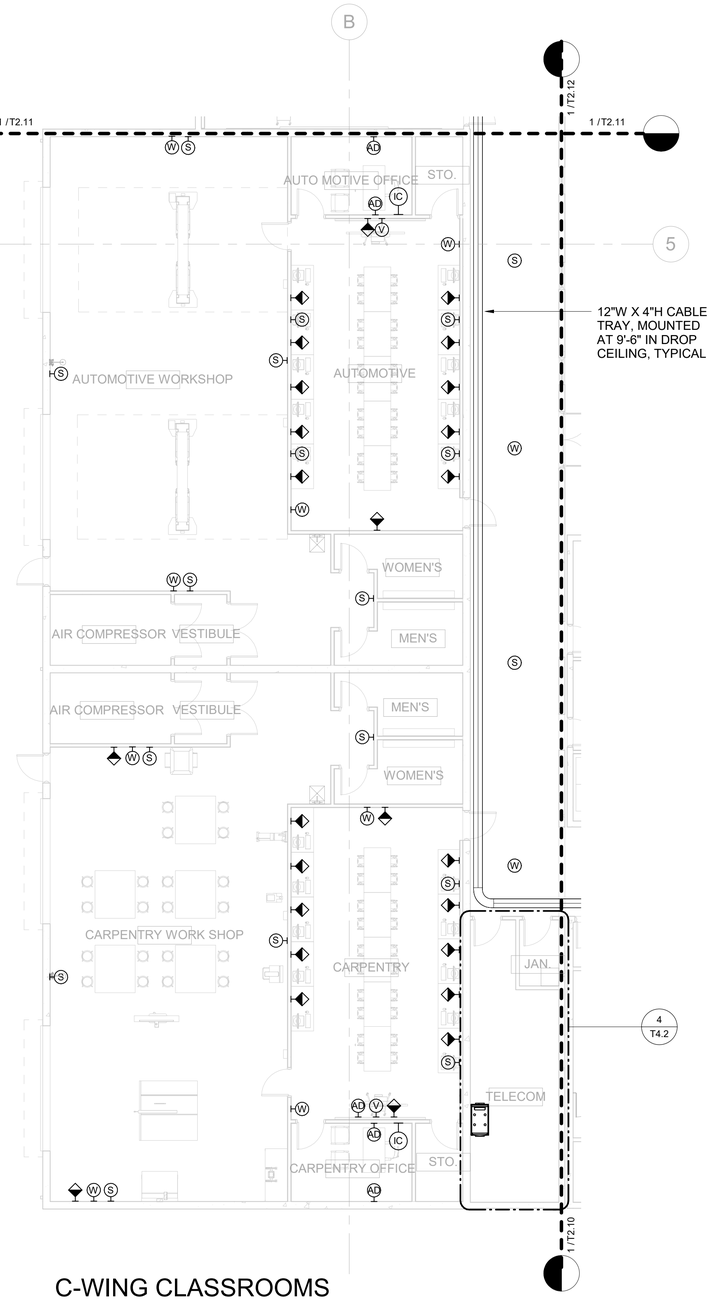
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.10
Sheet No. ____ of ____



C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - NORTHWEST

1 SCALE: 1/8" = 1'-0"



C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - SOUTHWEST

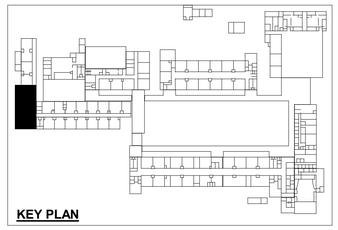
2 SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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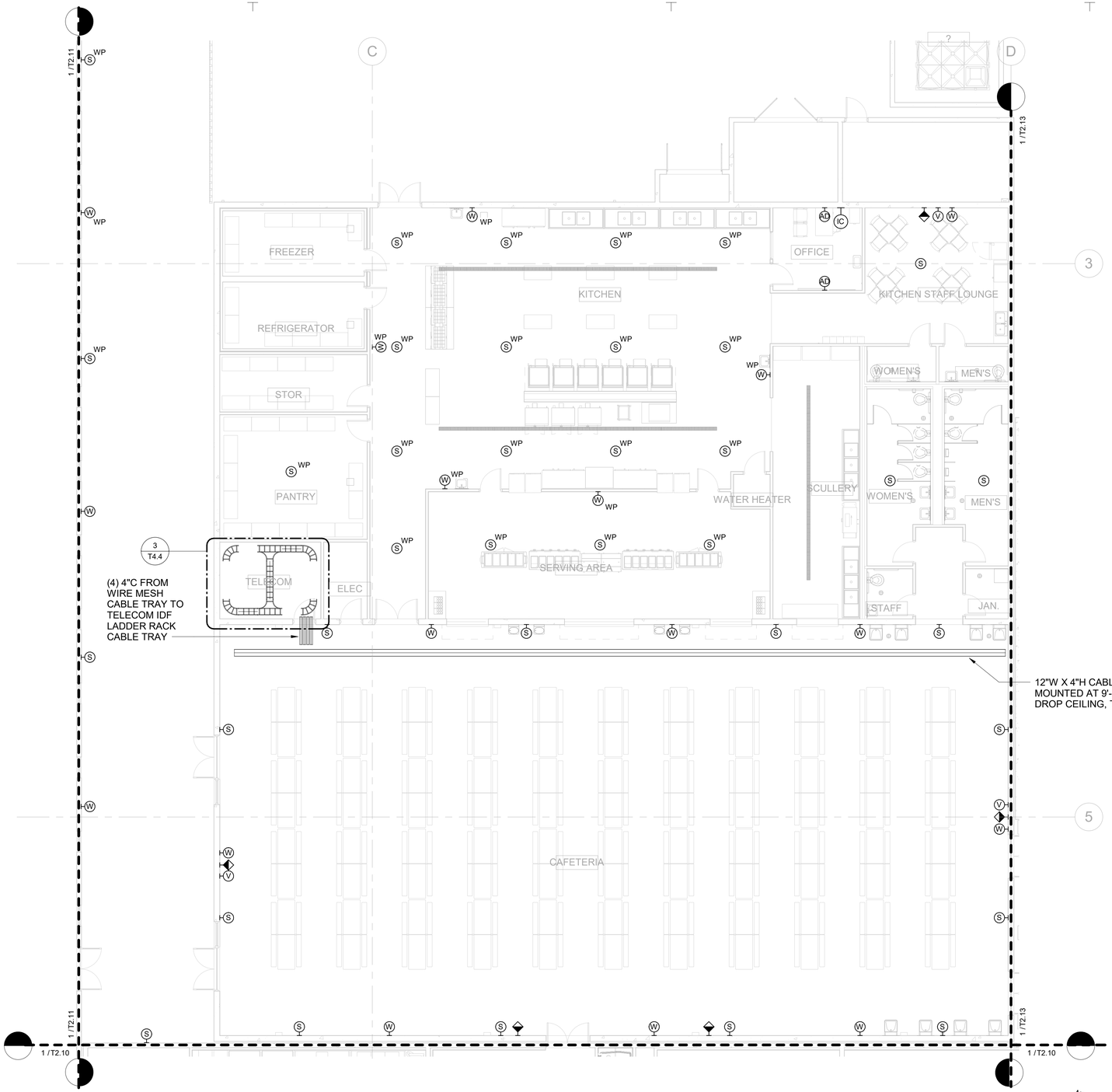
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
C-WING CLASSROOMS TELECOMMUNICATIONS PLAN - WEST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.11
Sheet No. of

NOT FOR CONSTRUCTION



CAFETERIA TELECOMMUNICATIONS PLAN

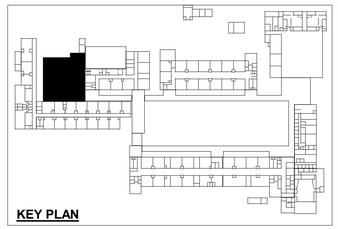
1 SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

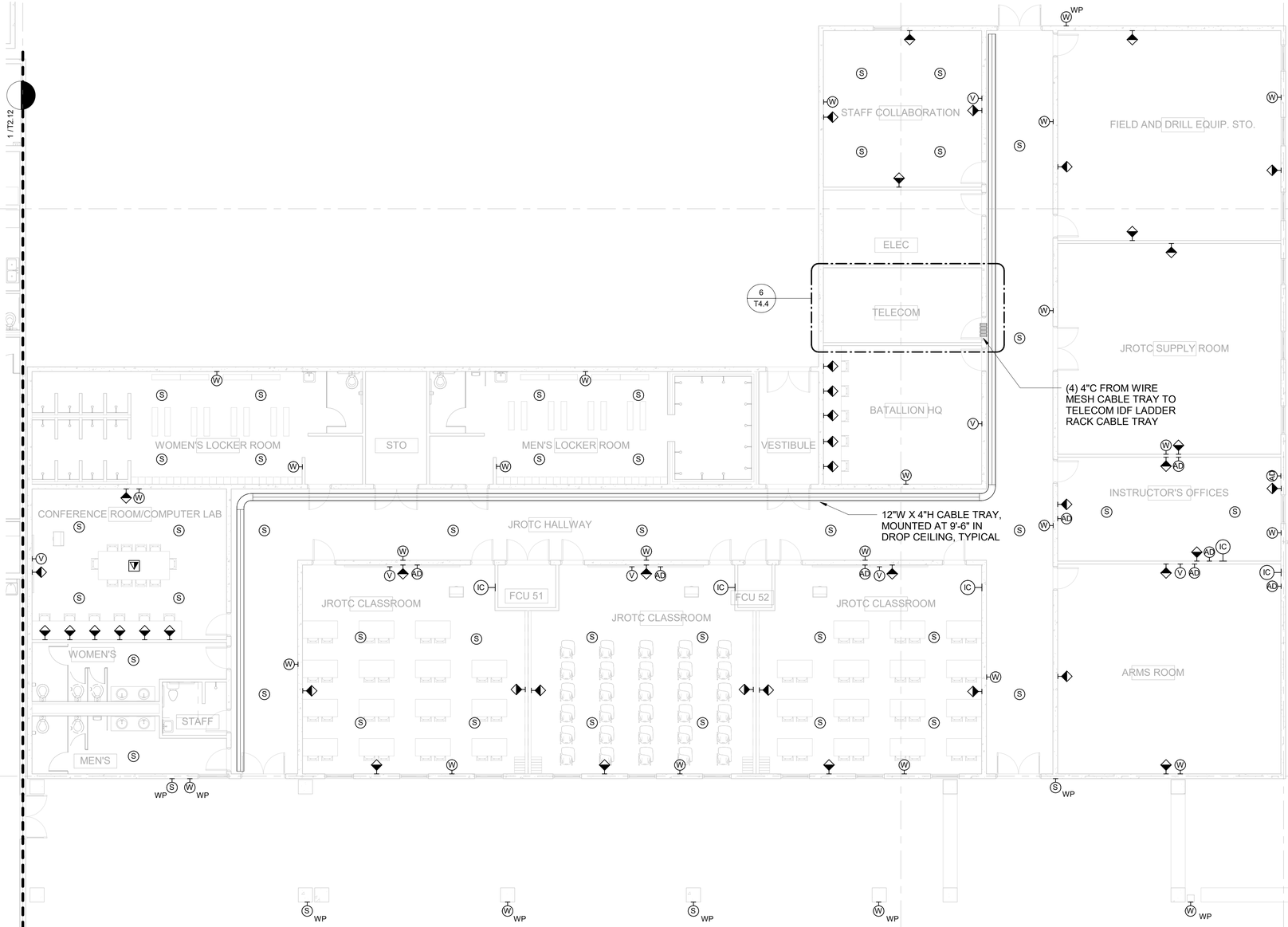
Title:
CAFETERIA TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.12
Sheet No. of

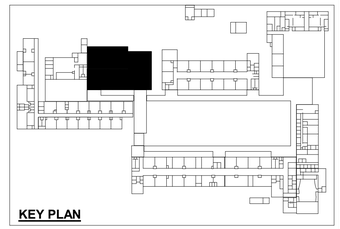
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



C-WING TELECOMMUNICATIONS PLAN (JROTC)

1 SCALE: 1/8" = 1'-0"



NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
C-WING TELECOMMUNICATIONS PLAN (JROTC)
PROGRAMMING DOCUMENT

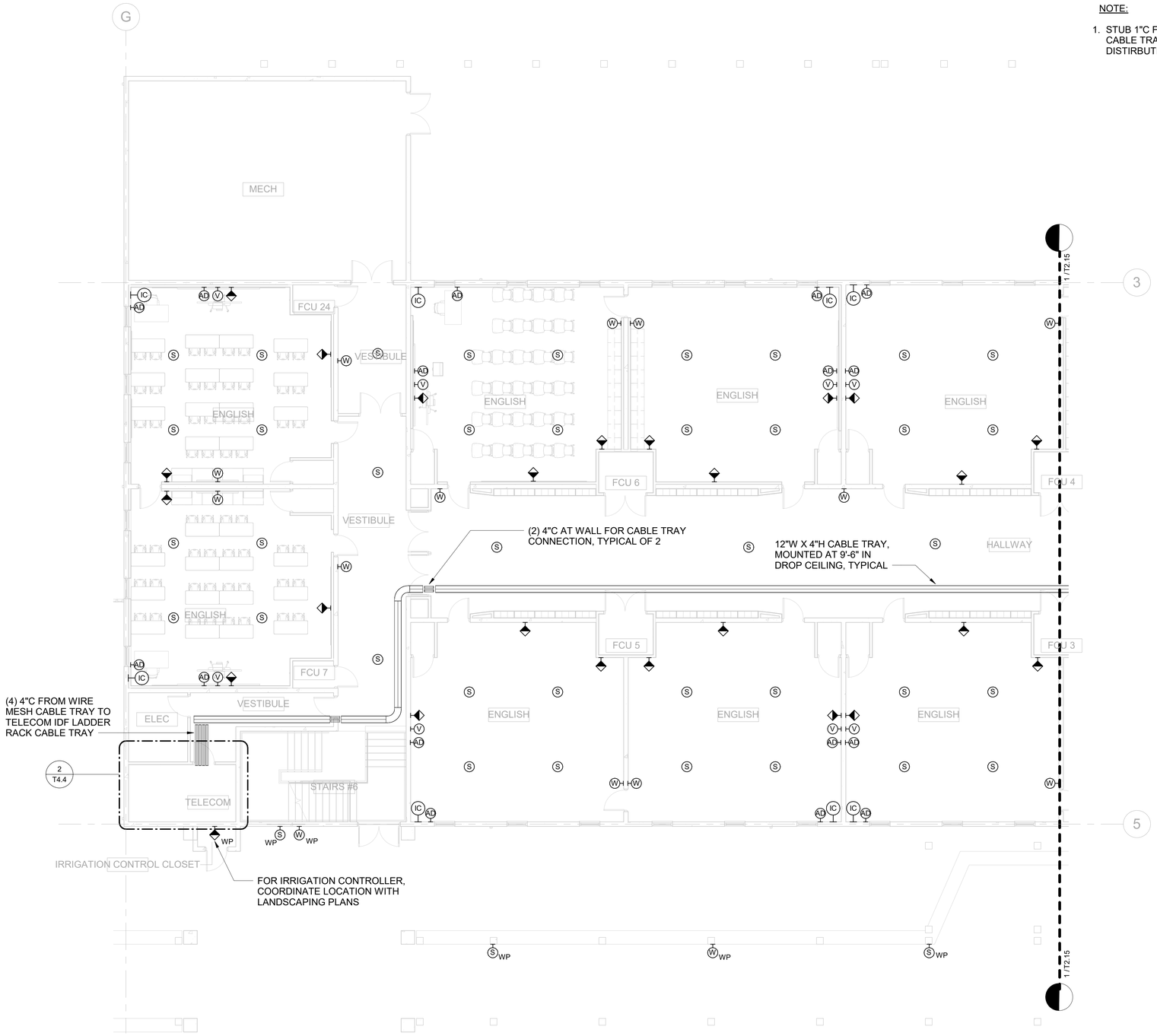
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.13
Sheet No. of

NOT FOR CONSTRUCTION

NOTE:

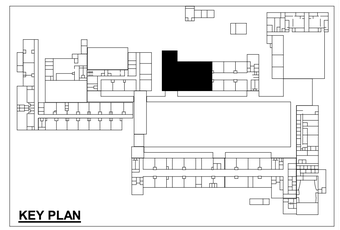
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



B-WING LEVEL 1 TELECOMMUNICATIONS PLAN - WEST

1 SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 1 TELECOMMUNICATIONS PLAN - WEST
PROGRAMMING DOCUMENT

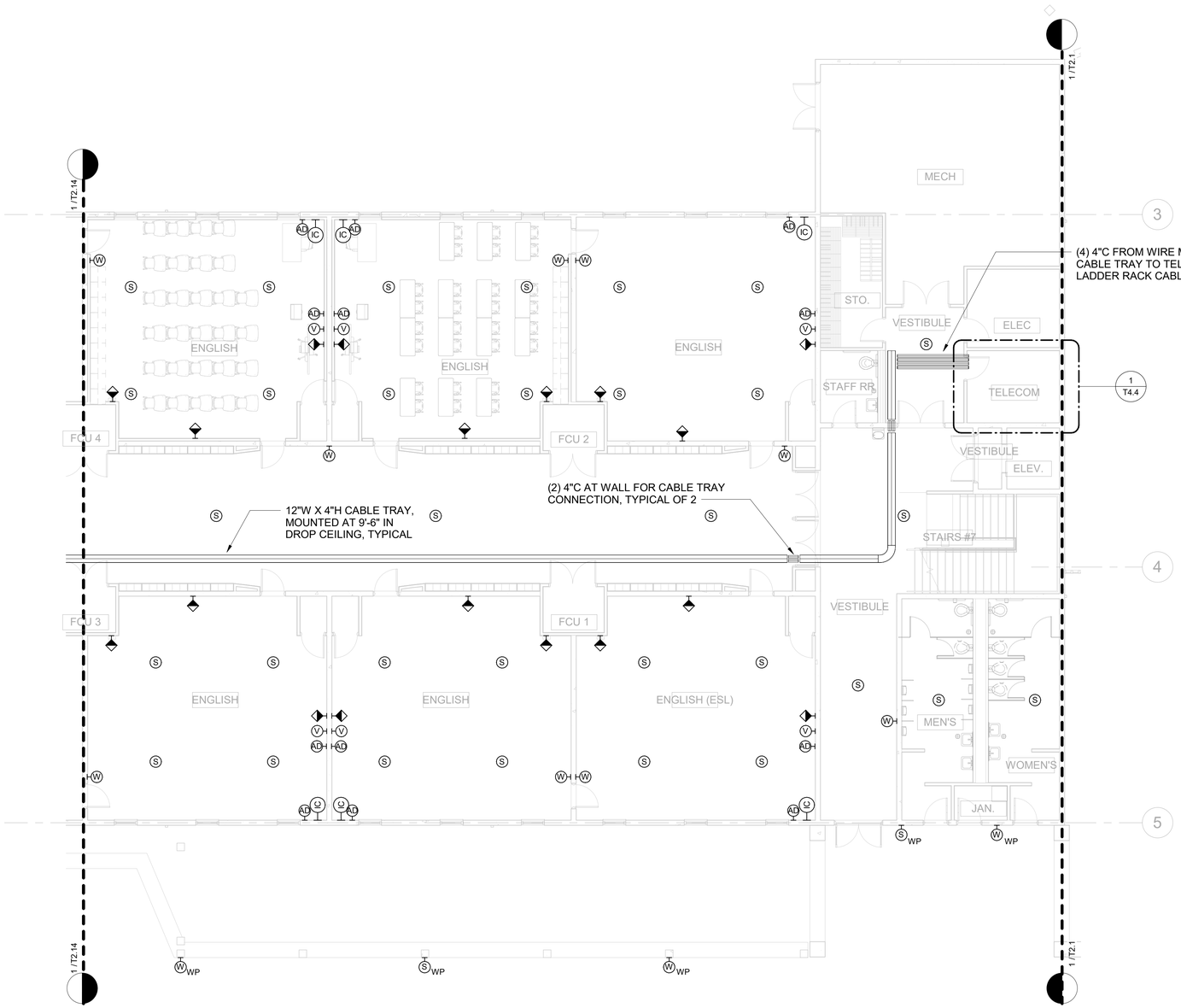
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.14

Sheet No. ____ of ____

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

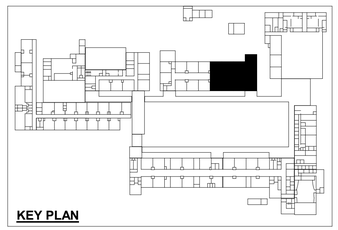


1 B-WING LEVEL 1 TELECOMMUNICATIONS PLAN - EAST

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



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IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

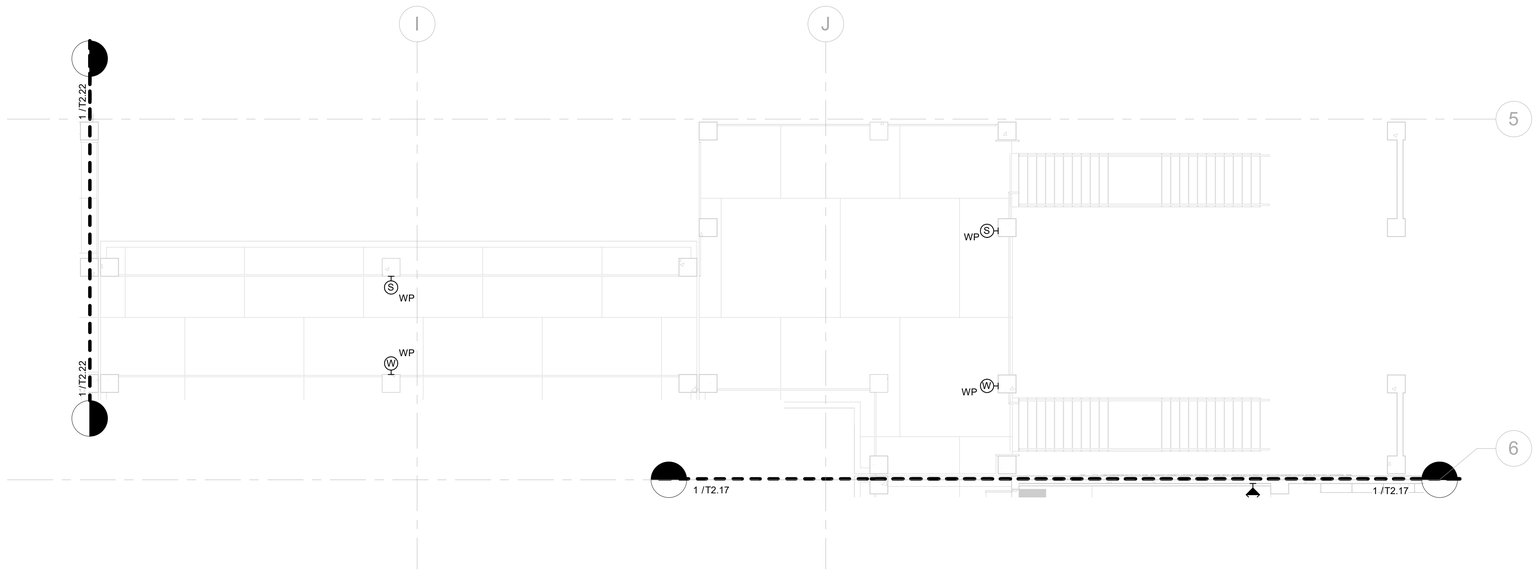
Title:
B-WING LEVEL 1 TELECOMMUNICATIONS PLAN - EAST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File 20-133
Drawing No.	T2.15
Sheet No.	of

NOT FOR CONSTRUCTION

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

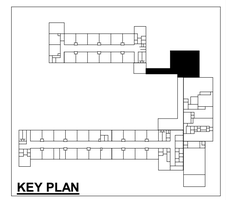


1 MAIN ENTRANCE LEVEL 2 TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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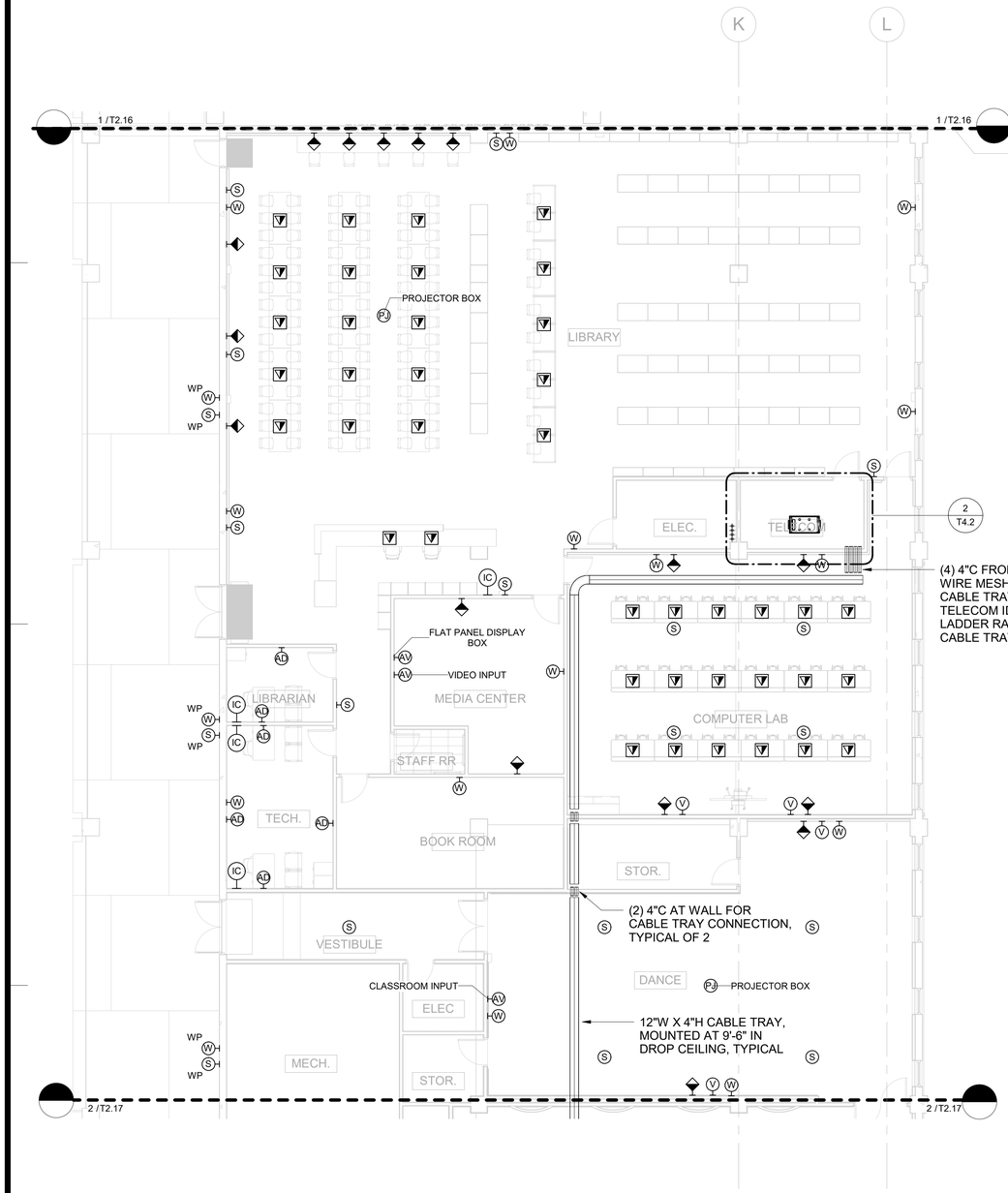
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

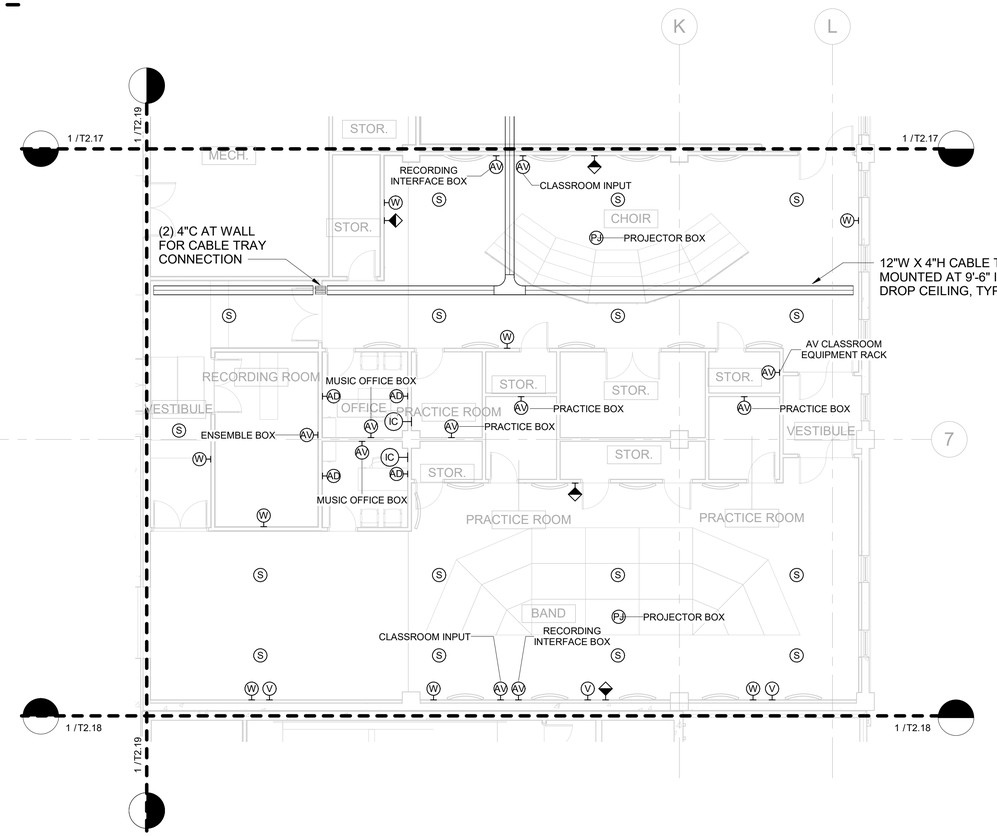
Title:
MAIN ENTRANCE LEVEL 2 TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File: 20-133
Drawing No.	T2.16
Sheet No.	of



A-WING LEVEL 2 TELECOMMUNICATIONS PLAN

1 SCALE: 1/8" = 1'-0"



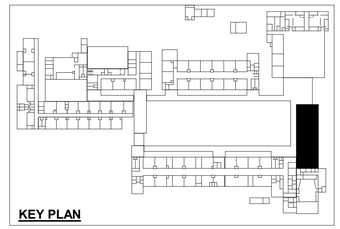
CHOIR & BAND LEVEL 2 TELECOMMUNICATIONS PLAN

2 SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).
2. FUNISH AND INSTALL ALL NETWORK CABLING, FIBER AND TWISTED PAIR, EXCLUDING DEDICATED AV NETWORK CABLING. FURNISH AND INSTALL ALL NETWORK CONNECTORS AND PLATES, EXCLUDING NETWORK CONNECTORS AND PLATES DEDICATED TO AV EQUIPMENT. COORDINATE WITH AV SYSTEMS DRAWINGS.

NORTH 0' 4' 8' 16'



KEY PLAN

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MECHANICAL • ELECTRICAL • FIRE PROTECTION

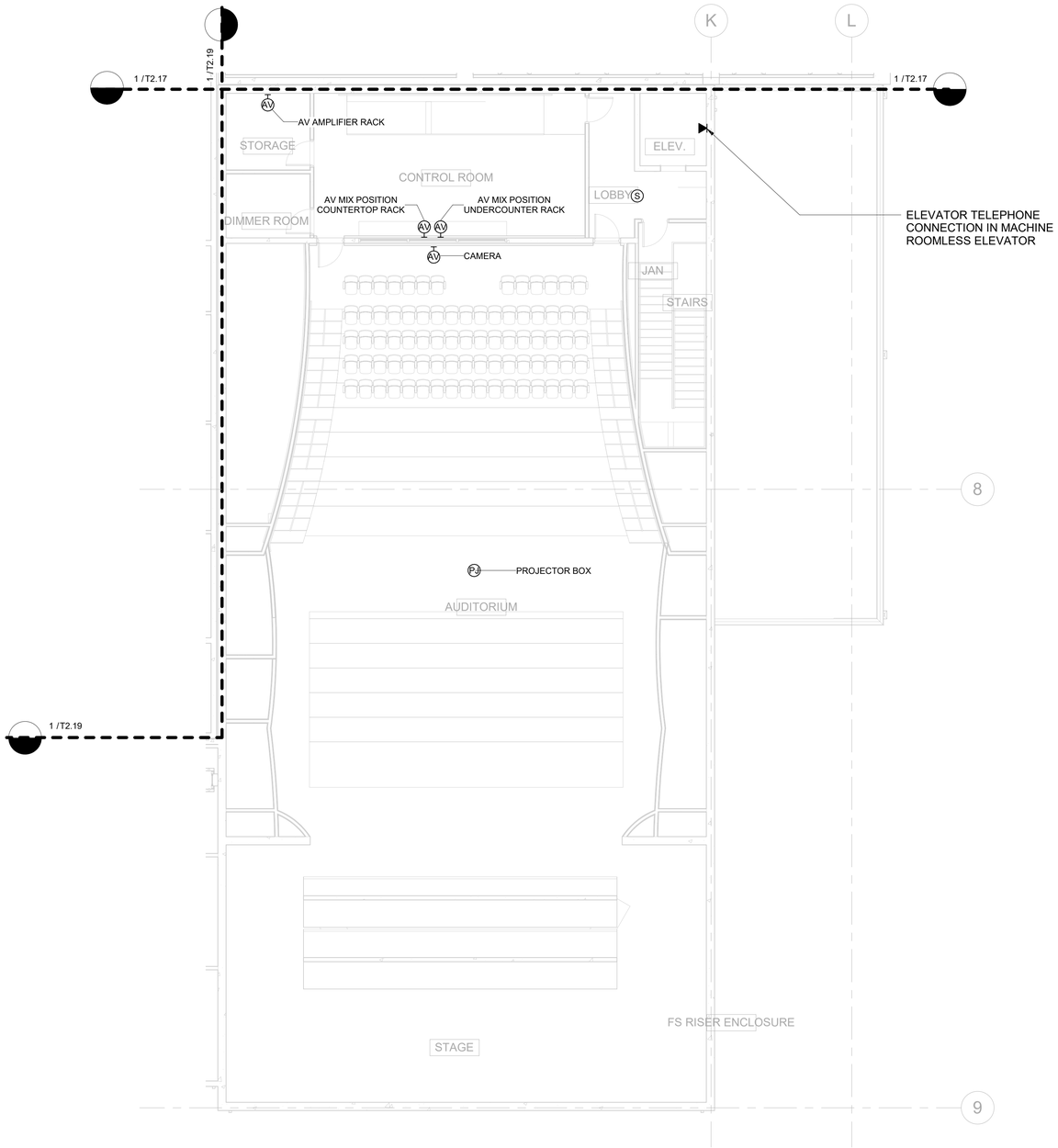
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING, CHOIR & BAND LEVEL 2 TELECOMMUNICATIONS PLANS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.17
Sheet No. of

NOT FOR CONSTRUCTION



NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).
2. FUNISH AND INSTALL ALL NETWORK CABLING, FIBER AND TWISTED PAIR, EXCLUDING DEDICATED AV NETWORK CABLING. FURNISH AND INSTALL ALL NETWORK CONNECTORS AND PLATES, EXCLUDING NETWORK CONNECTORS AND PLATES DEDICATED TO AV EQUIPMENT. COORDINATE WITH AV SYSTEMS DRAWINGS.
3. FURNISH AND INSTALL VOICE/DATA NETWORK CABLING (FIBER AND TWISTED PAIR), EXCEPT FOR PERFORMANCE LIGHTING SYSTEMS-SPECIFIC CABLE. COORDINATE WITH THEATRE SYSTEMS DRAWINGS.

1 AUDITORIUM LEVEL 2 TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'

KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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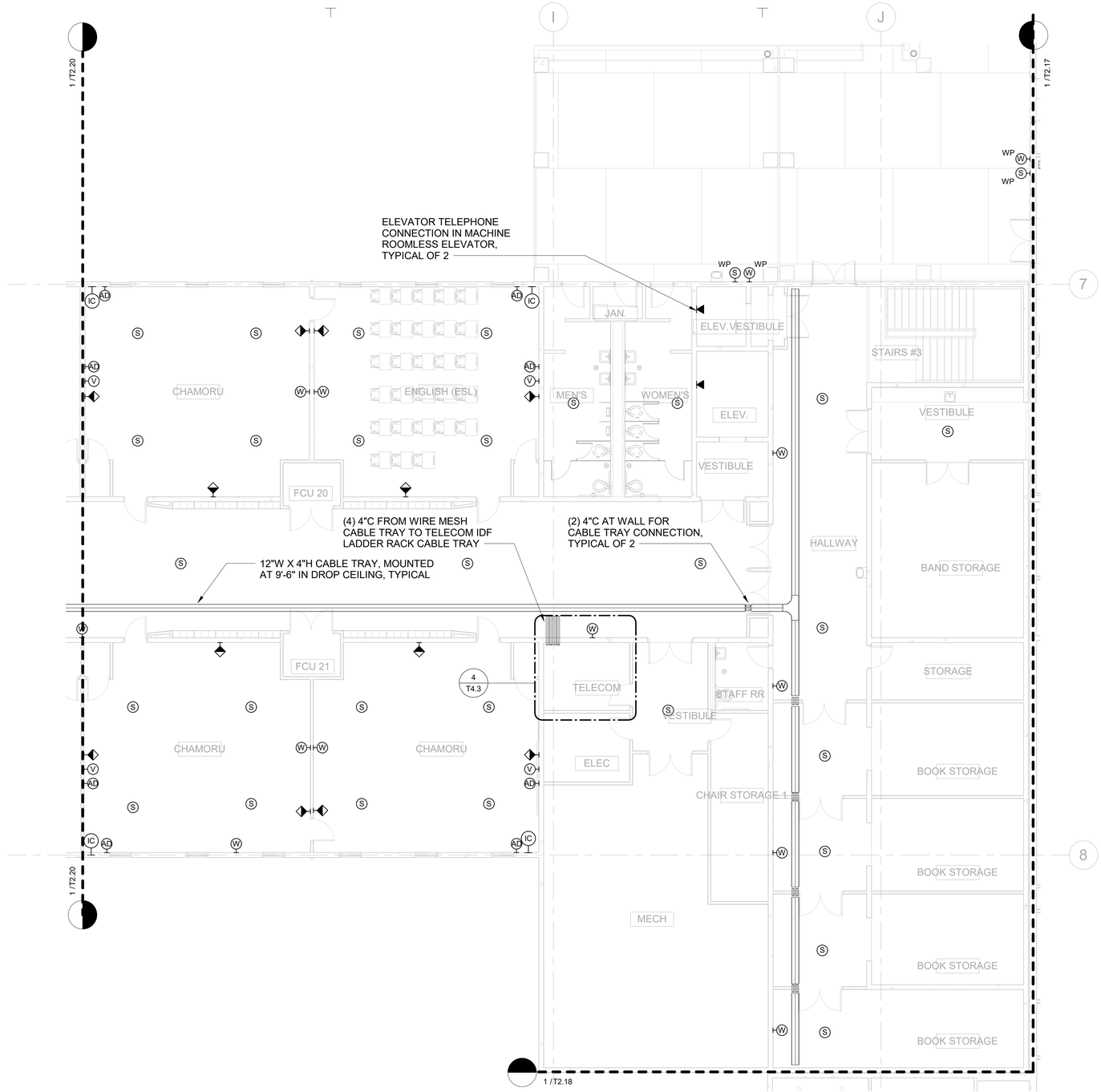
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AUDITORIUM LEVEL 2 TELECOMMUNICATIONS PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.18
Sheet No. of



1 A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - EAST

SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTRIBUTION FRAME (MDF or IDF).

NORTH 0' 4' 8' 16'

KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

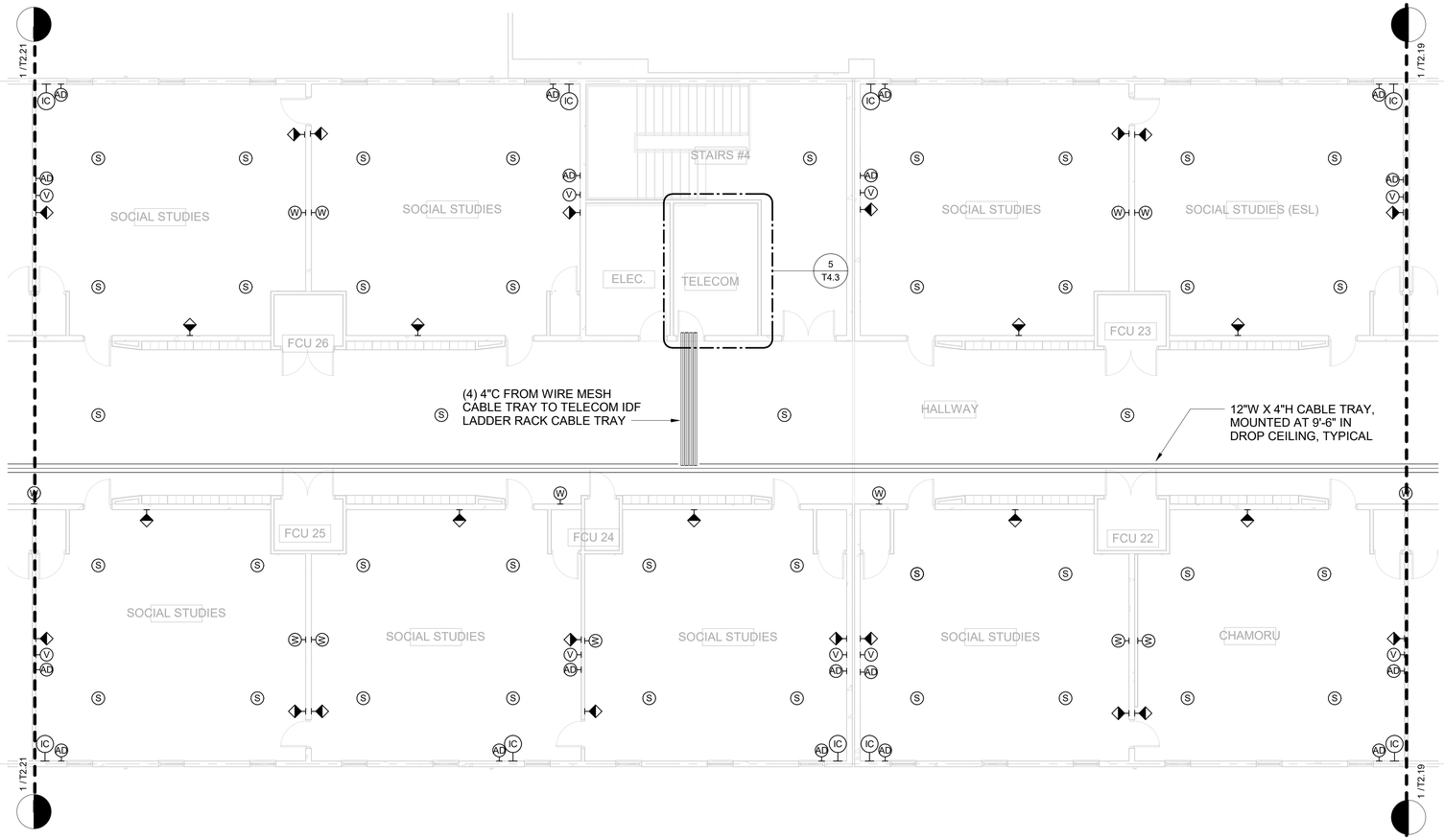
Title:
A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - EAST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.19
Sheet No. of

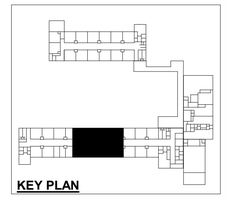
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTRIBUTION FRAME (MDF or IDF).



1 A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - CENTER
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'


KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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NOT FOR CONSTRUCTION

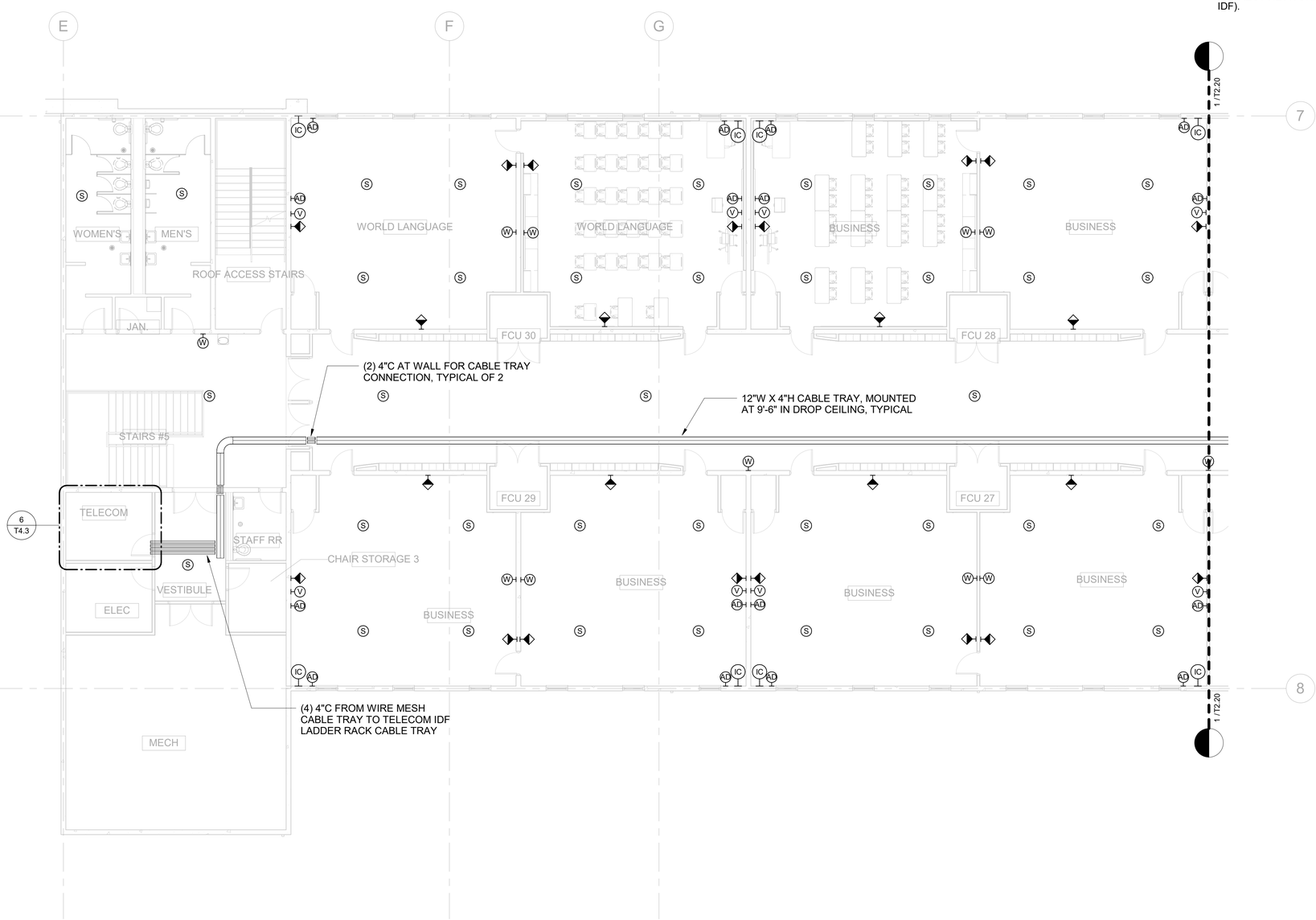
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - CENTER
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File: 20-133
Drawing No.	T2.20
Sheet No.	of

NOTE:

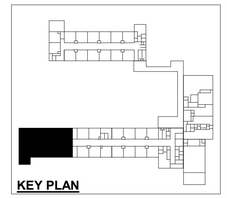
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTRIBUTION FRAME (MDF or IDF).



1 A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - WEST

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 2 TELECOMMUNICATIONS PLAN - WEST
PROGRAMMING DOCUMENT

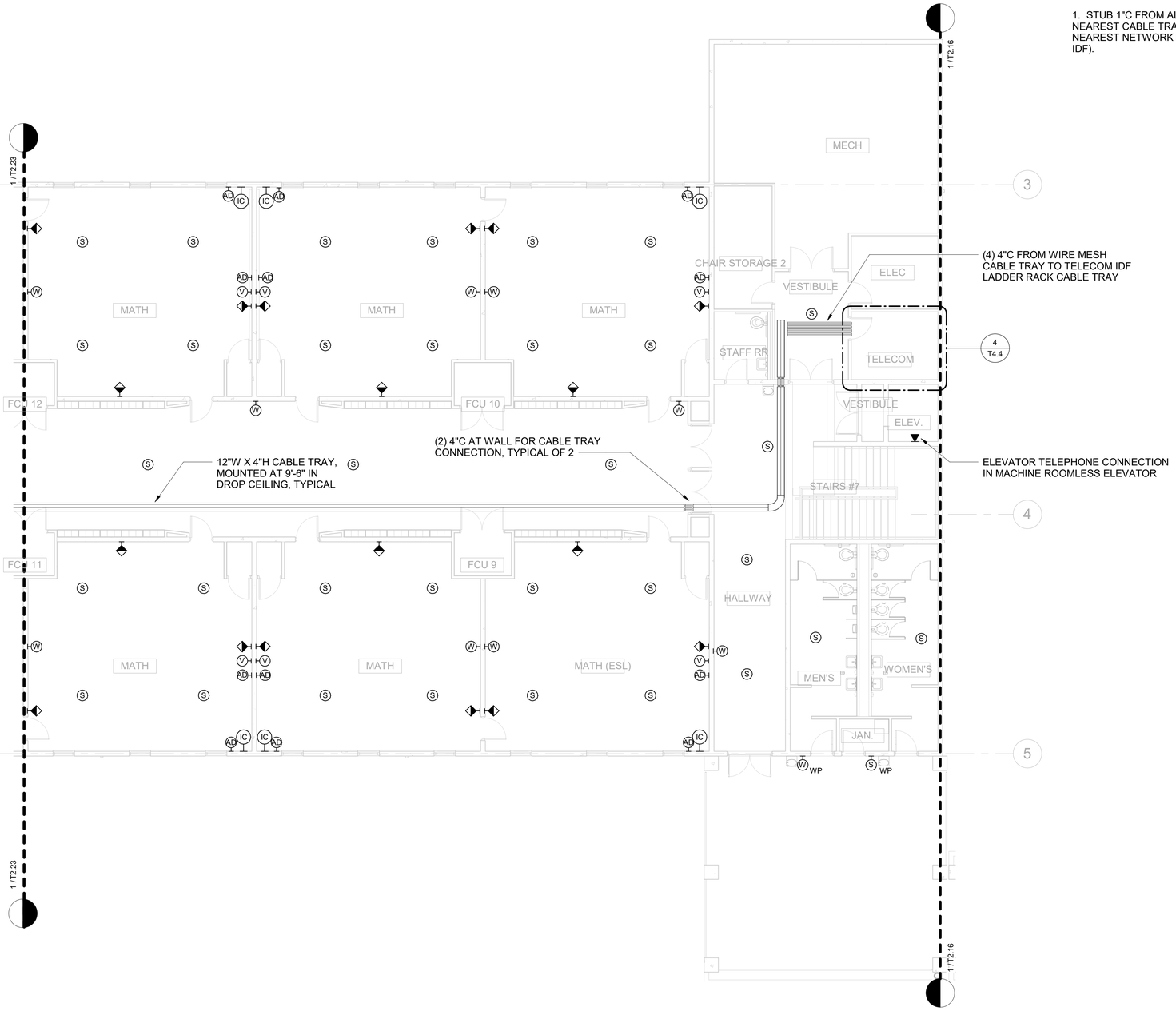
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.21
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTRIBUTION FRAME (MDF or IDF).



1 B-WING LEVEL 2 TELECOMMUNICATIONS PLAN - EAST

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'

KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
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INSYNERGY ENGINEERING
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 2 TELECOMMUNICATIONS PLAN - EAST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.22
Sheet No. of

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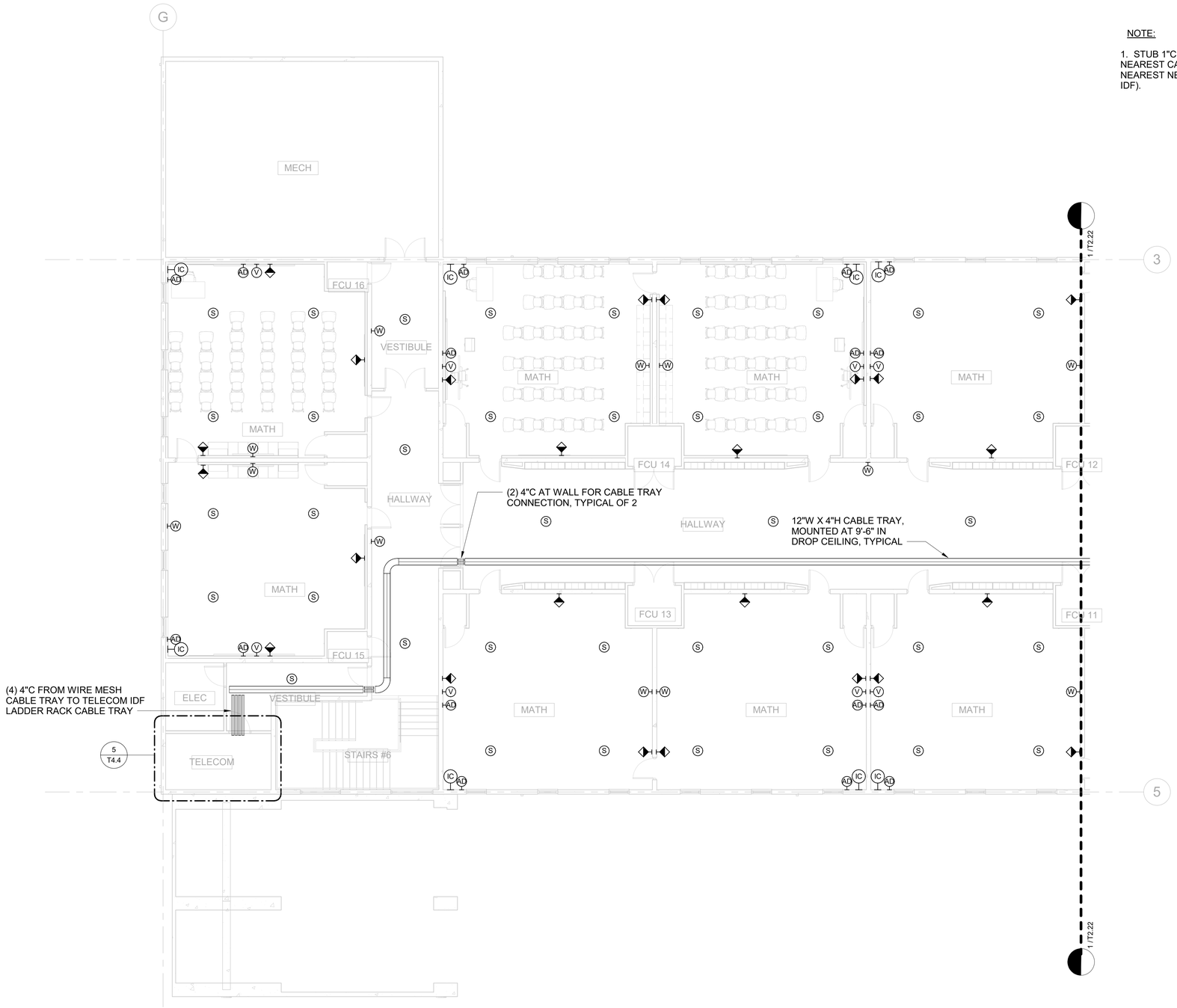

NOTE:

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1 B-WING LEVEL 2 TELECOMMUNICATIONS PLAN - WEST

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'

KEY PLAN

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Project:
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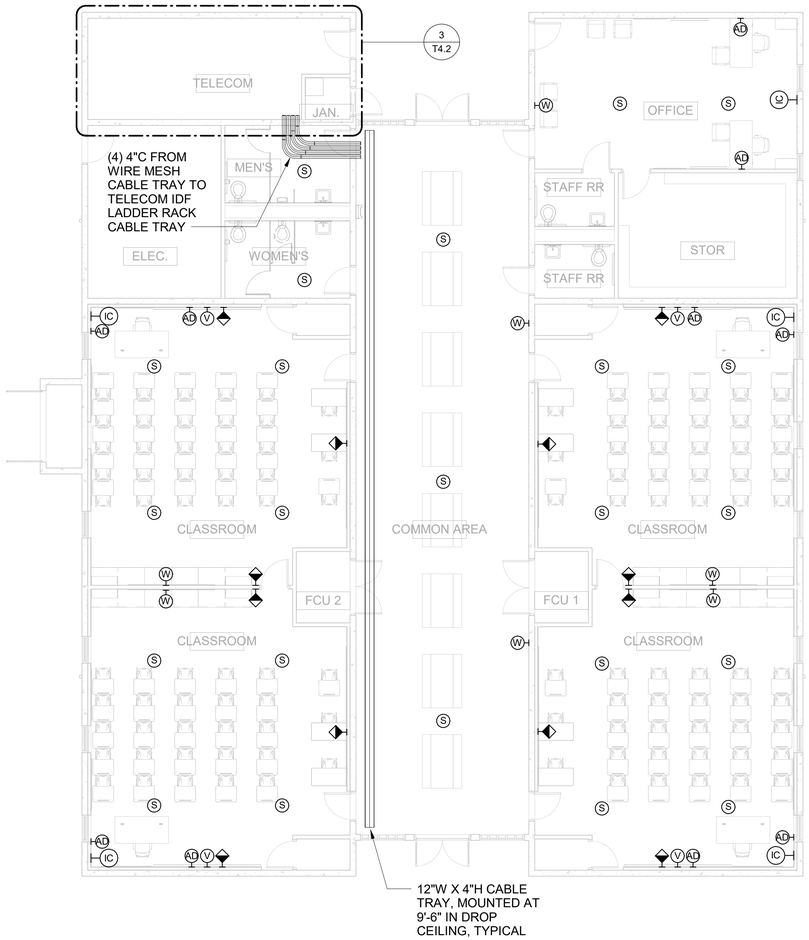
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 2 TELECOMMUNICATIONS PLAN - WEST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.23
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



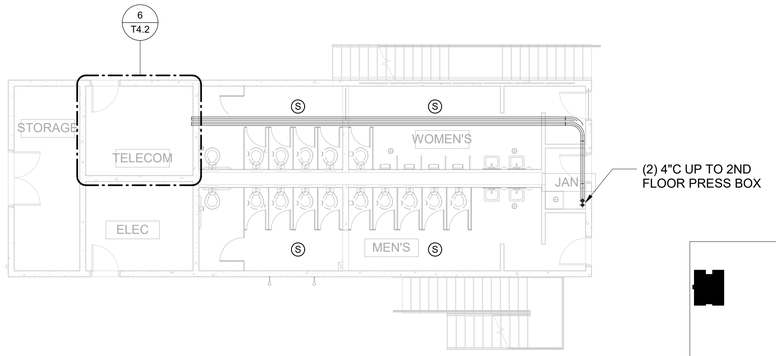
1 CREDIT RECOVERY TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"



3 PRESS BOX LEVEL 2 TELECOMMUNICATIONS PLAN

SCALE: 1/8" = 1'-0"



2 PRESS BOX LEVEL 1 TELECOMMUNICATIONS PLAN

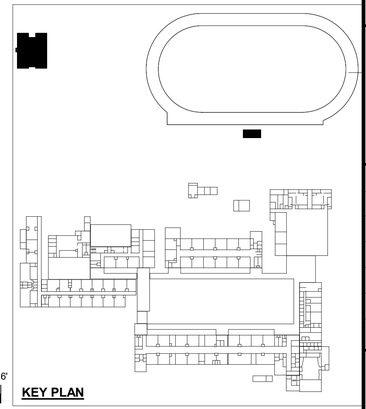
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



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Project:
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SIMON SANCHEZ HIGH SCHOOL

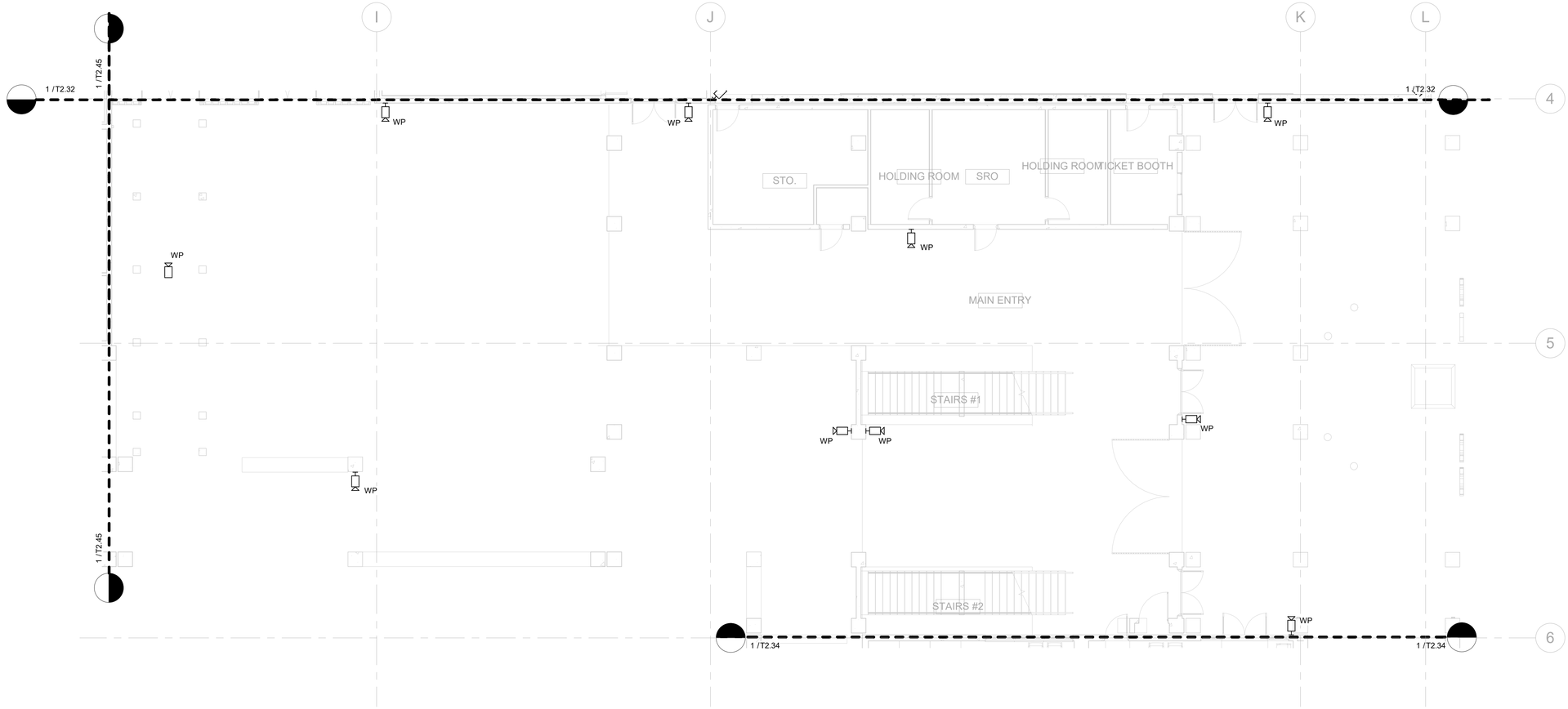
Title:
CREDIT RECOVERY AND PRESS BOX TELECOMMUNICATIONS PLANS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.24
Sheet No. of

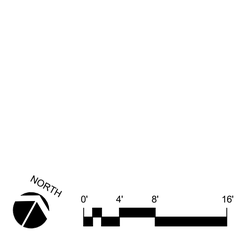
NOTE:

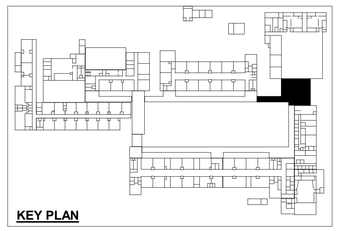
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 MAIN ENTRANCE LEVEL 1 SECURITY PLAN

SCALE: 1/8" = 1'-0"





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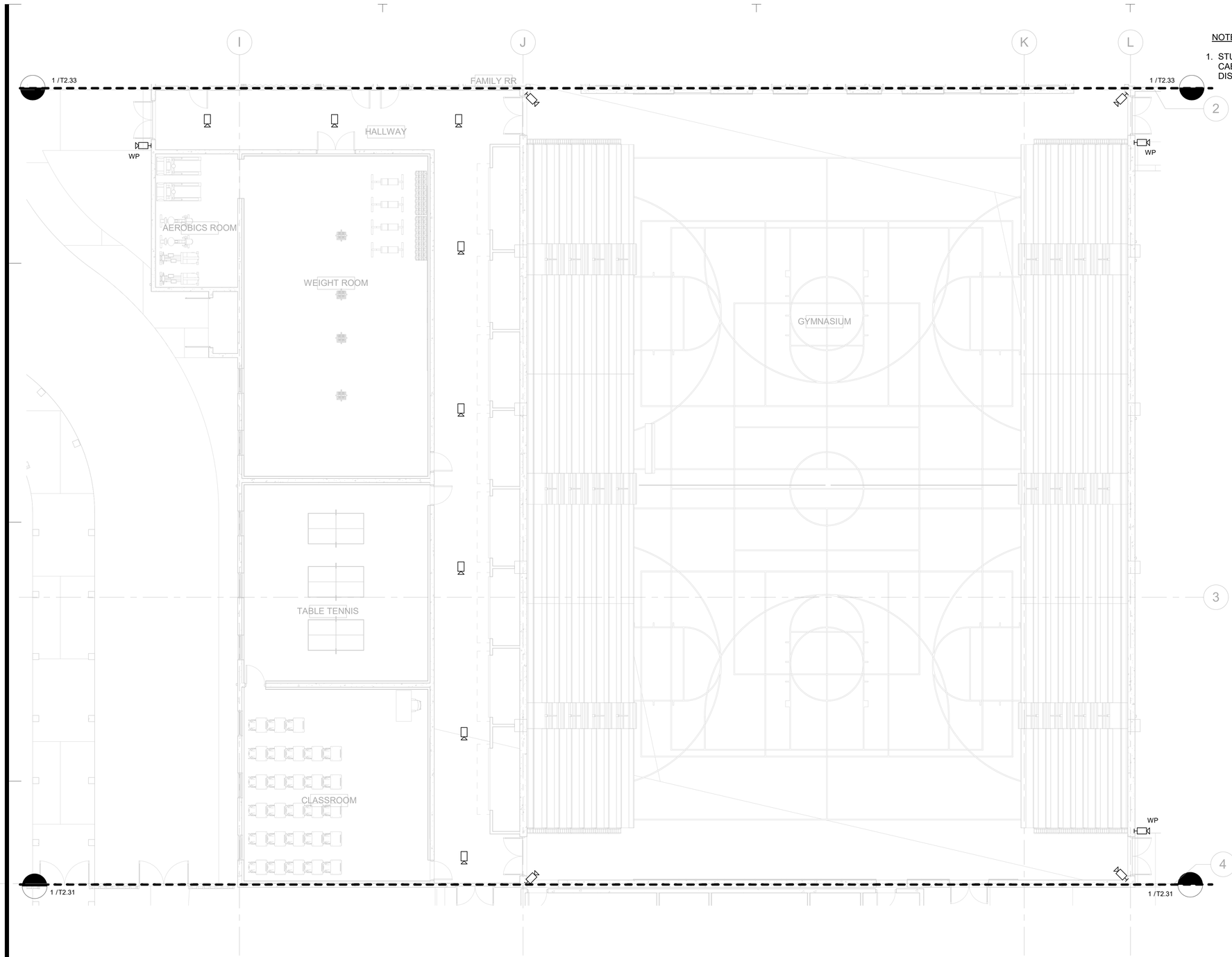
SIMON SANCHEZ HIGH SCHOOL

Title:
MAIN ENTRANCE LEVEL 1 SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.31
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



NOTE:

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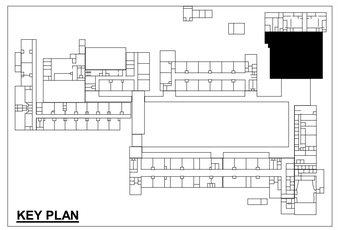
1 GYMNASIUM SECURITY PLAN
SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



KEY PLAN

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Title:
GYMNASIUM SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.32
Sheet No. of

NOT FOR CONSTRUCTION

NOTE:

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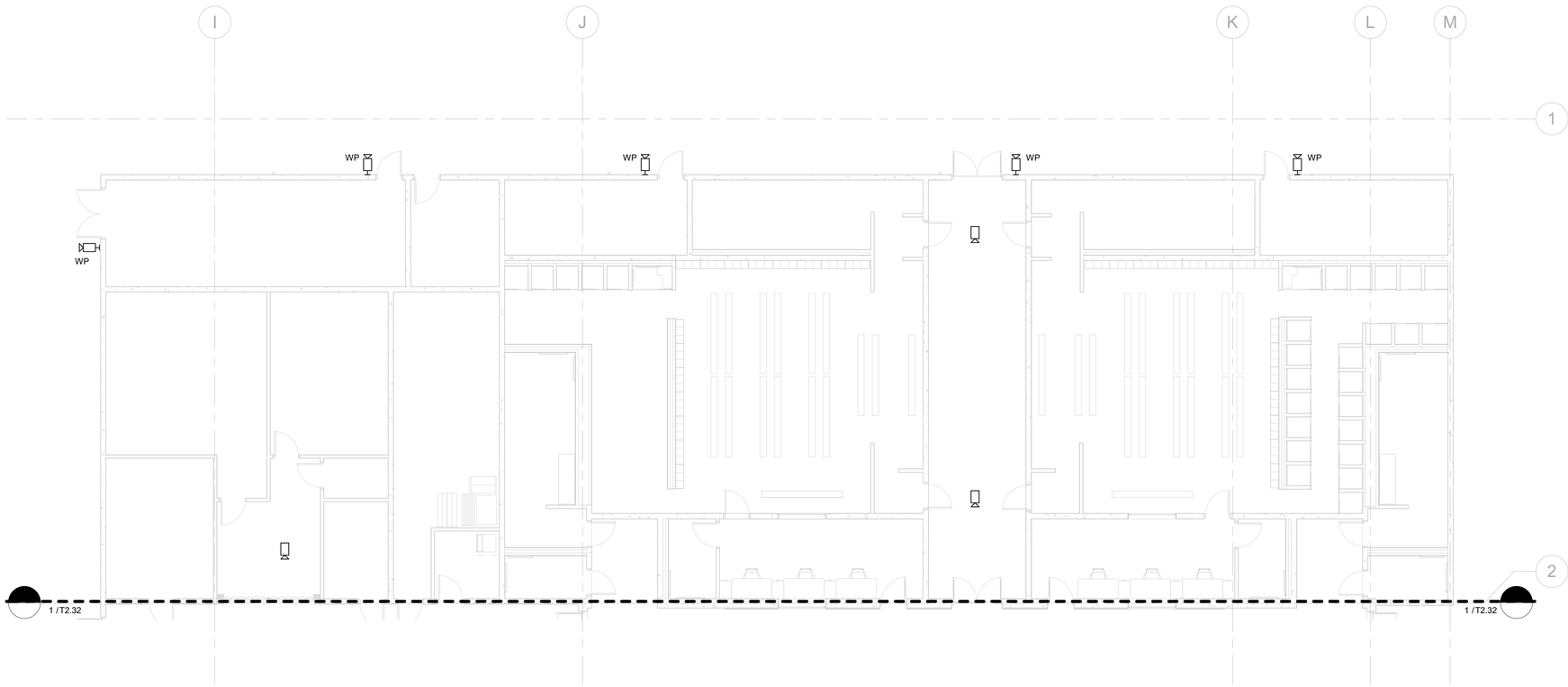
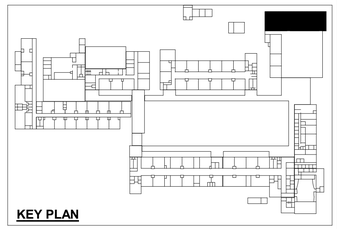


1 GYMNASIUM LOCKER ROOMS SECURITY PLAN

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



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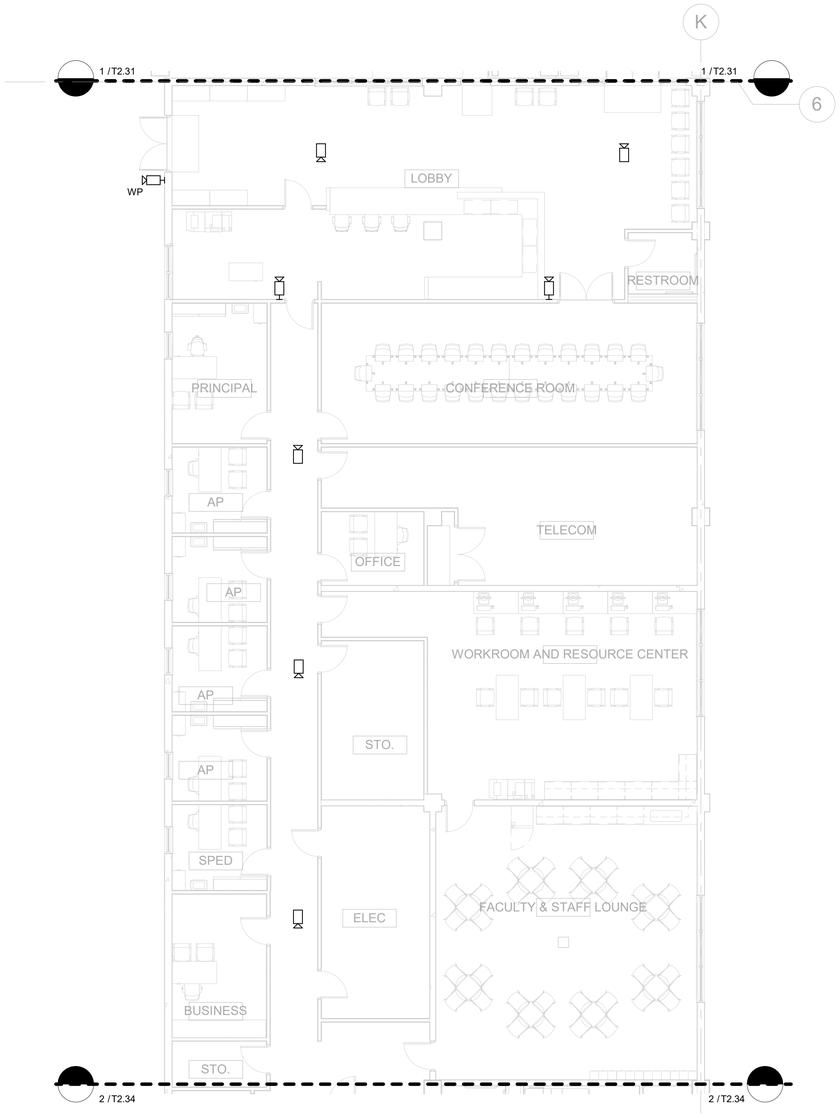
Title:
GYMNASIUM LOCKER ROOMS SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

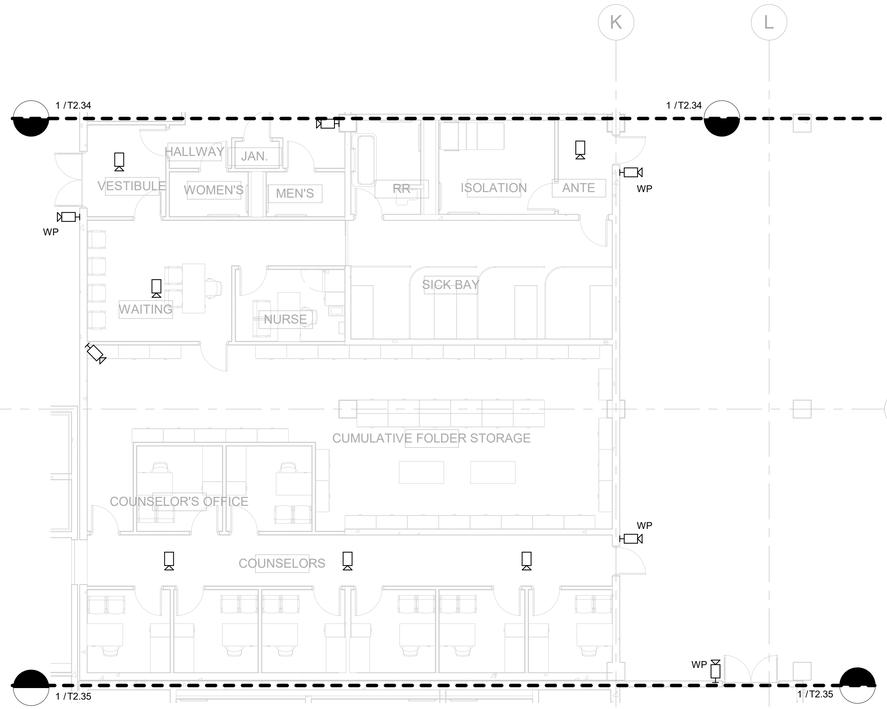
Drawing No.
T2.33
Sheet No. of

NOT FOR CONSTRUCTION



1 ADMINISTRATION OFFICES SECURITY PLAN - NORTH

SCALE: 1/8" = 1'-0"

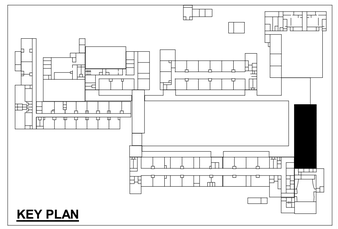


2 ADMINISTRATION OFFICES SECURITY PLAN - SOUTH

SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



KEY PLAN

NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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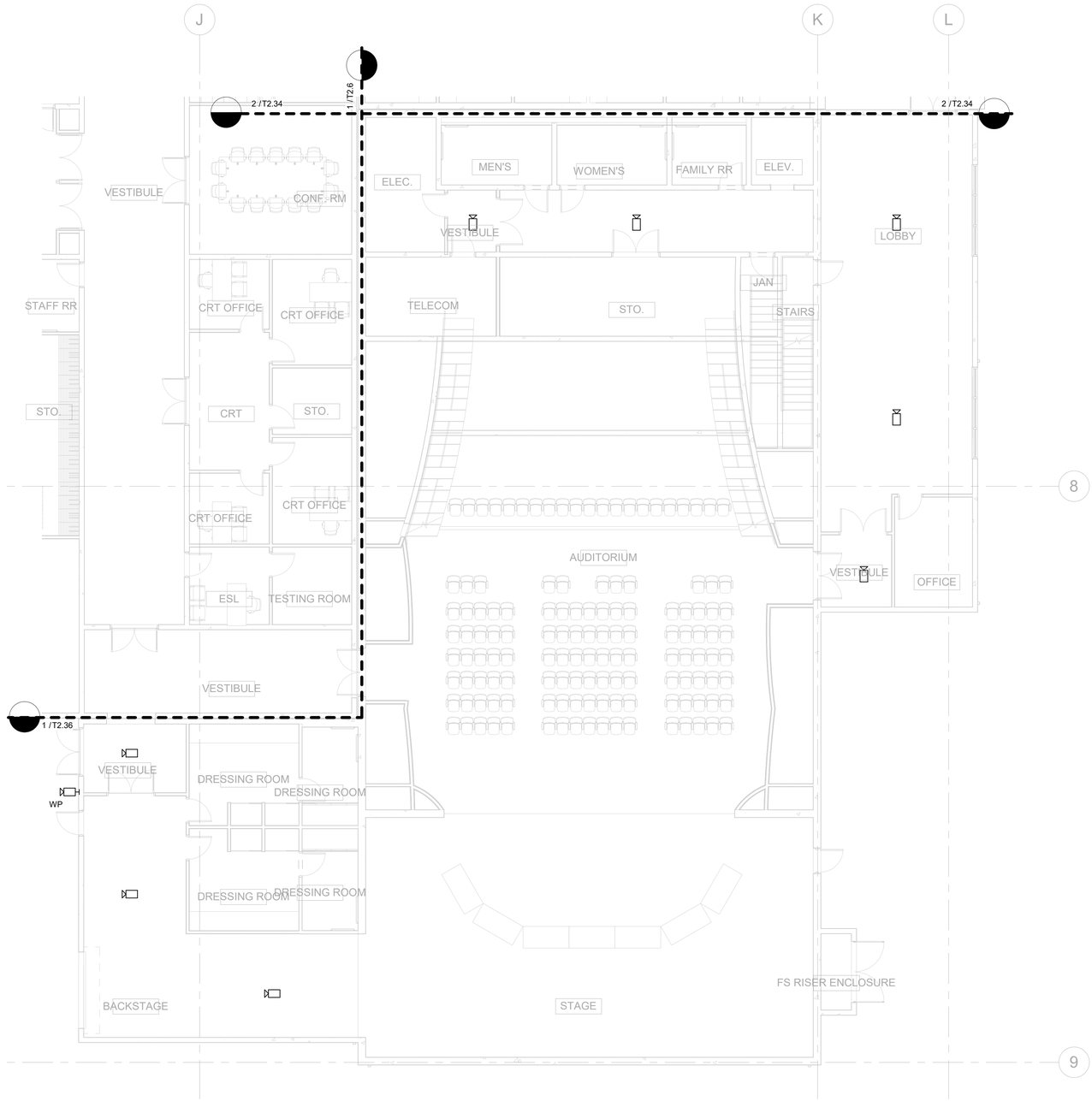
Title:
ADMINISTRATION OFFICES SECURITY PLANS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.34
Sheet No. of

NOT FOR CONSTRUCTION



NOTE:

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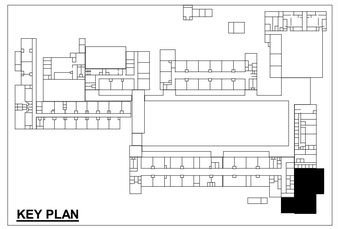
1 AUDITORIUM LEVEL 1 SECURTIY PLAN

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



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Title:
AUDITORIUM LEVEL 1 SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
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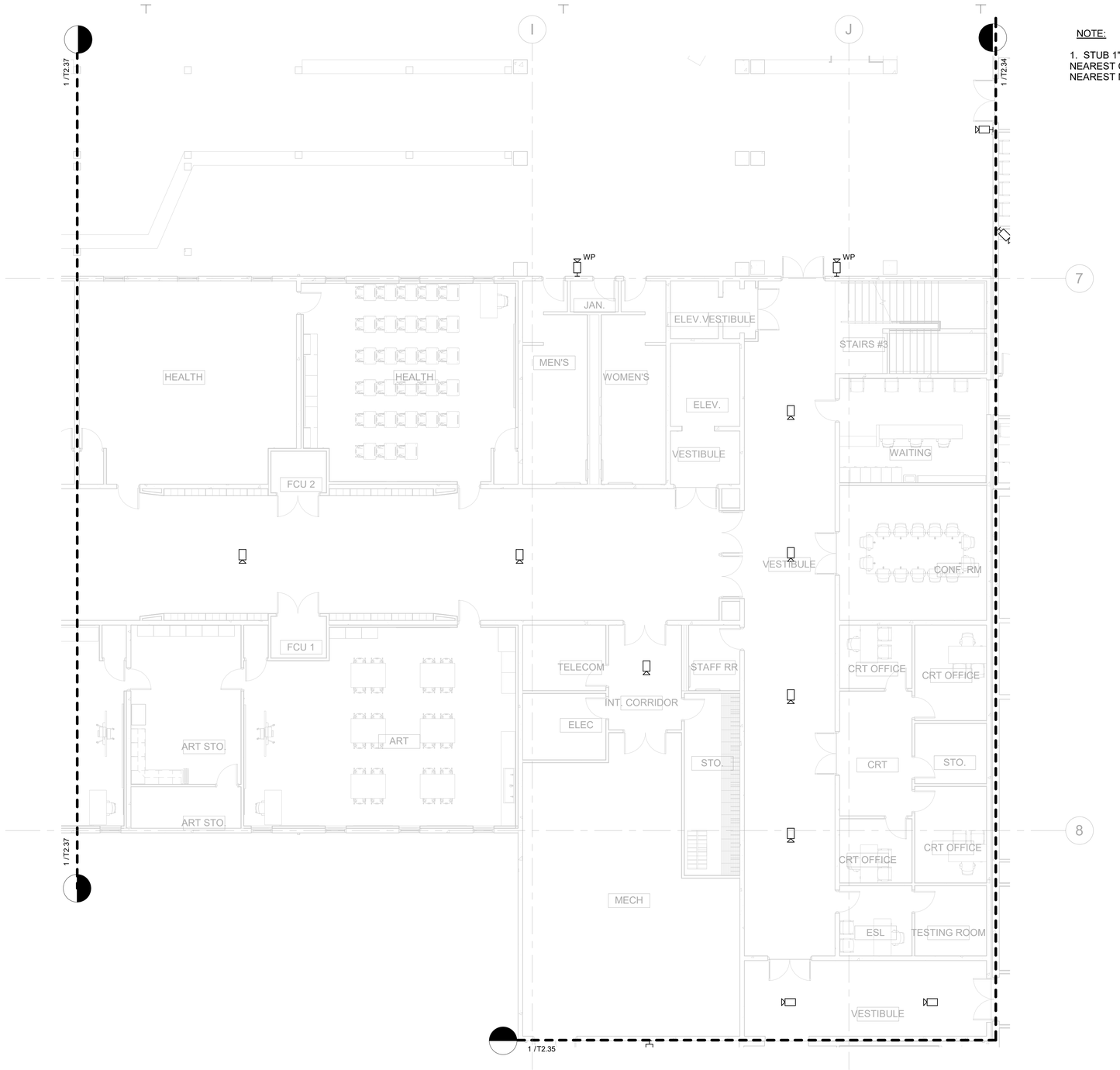
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.35
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



NOTE:

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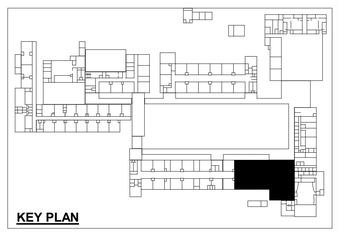
1 A-WING LEVEL 1 SECURITY PLAN - EAST
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

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Project:
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Title:
A-WING LEVEL 1 SECURITY PLAN - EAST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.36
Sheet No. ____ of ____

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NOTE:

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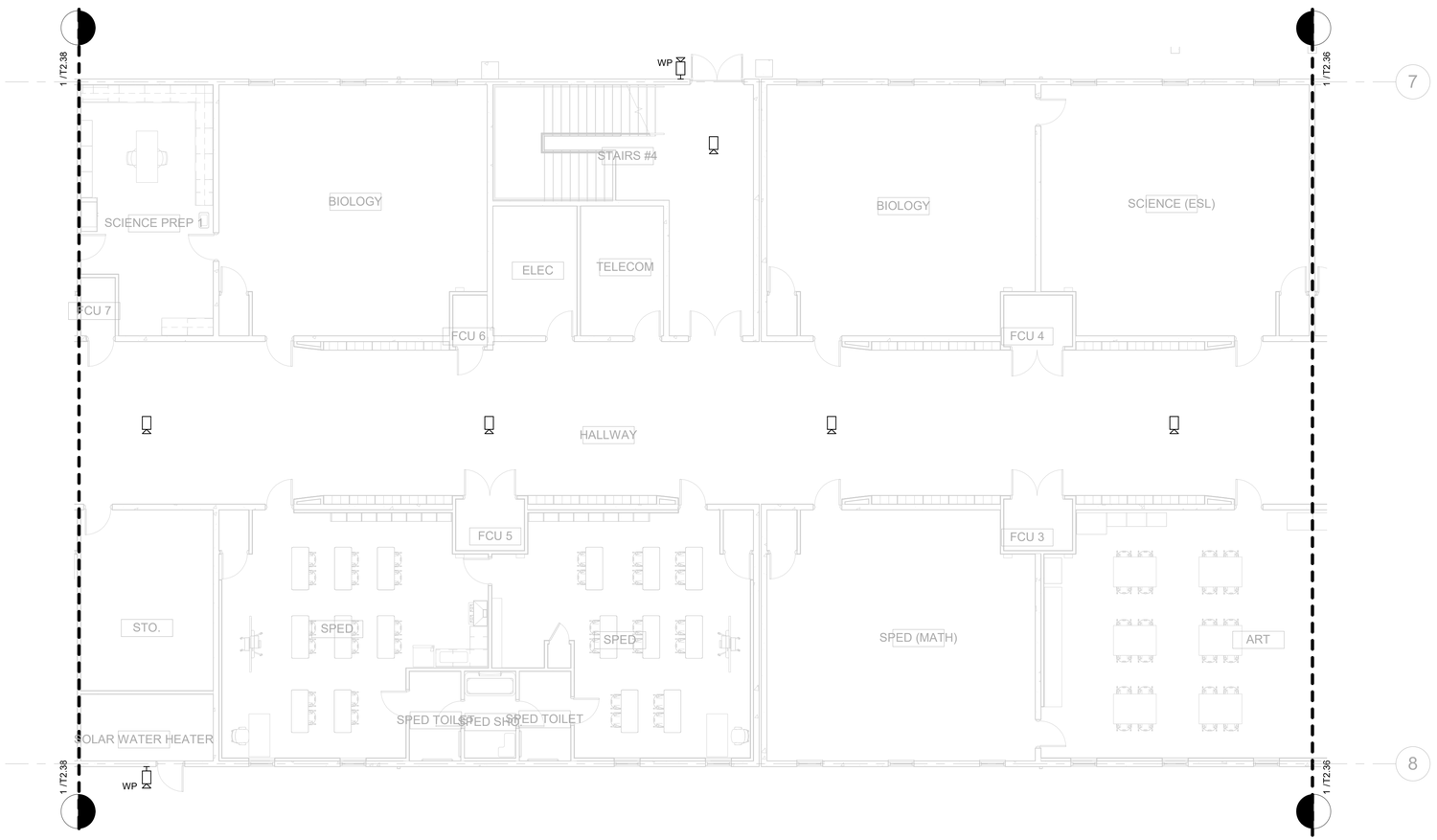
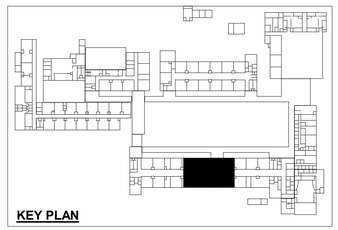


1 A-WING LEVEL 1 SECURITY PLAN - CENTER

SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



KEY PLAN

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Title:
A-WING LEVEL 1 SECURITY PLAN - CENTER
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.37
Sheet No. of

NOT FOR CONSTRUCTION

NOTE:

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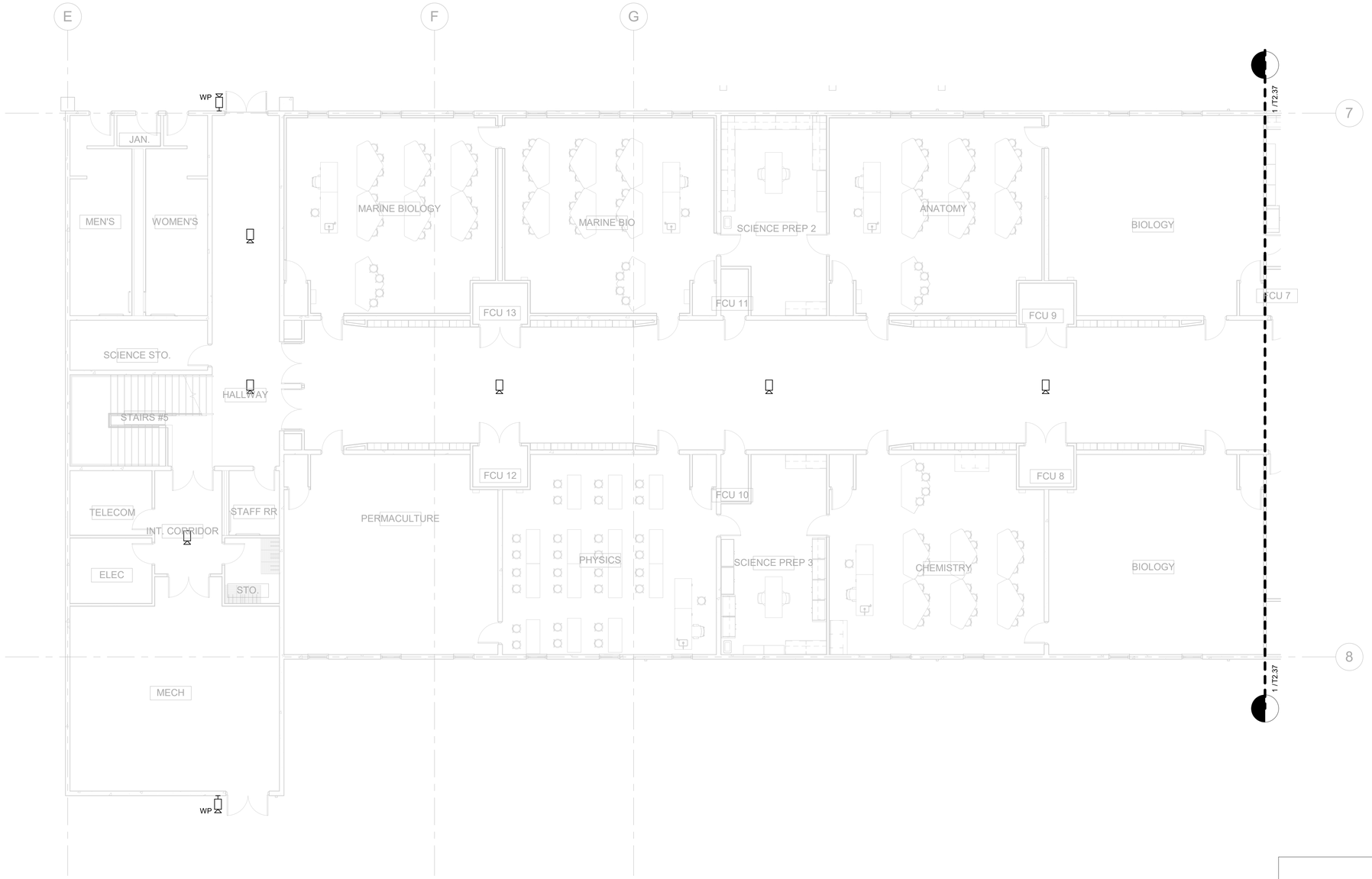
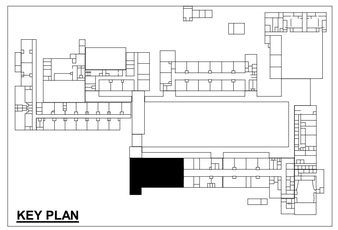


1 A-WING LEVEL 1 SECURITY PLAN - WEST
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 1 SECURITY PLAN - WEST
PROGRAMMING DOCUMENT

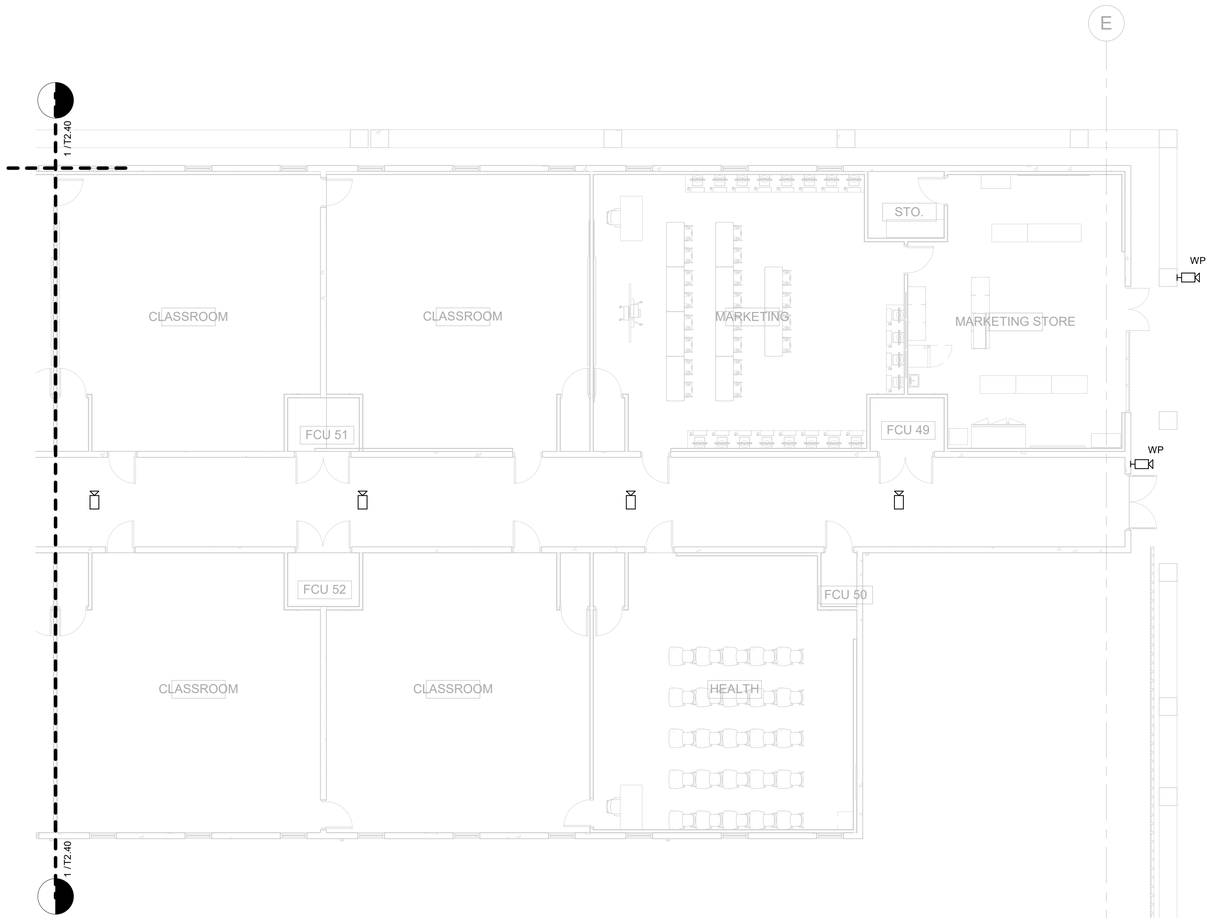
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.38
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

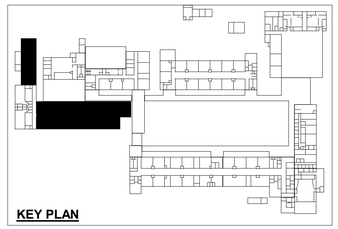
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 C-WING CLASSROOMS SECURITY PLAN - EAST
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
C-WING CLASSROOMS SECURITY PLAN - EAST
PROGRAMMING DOCUMENT

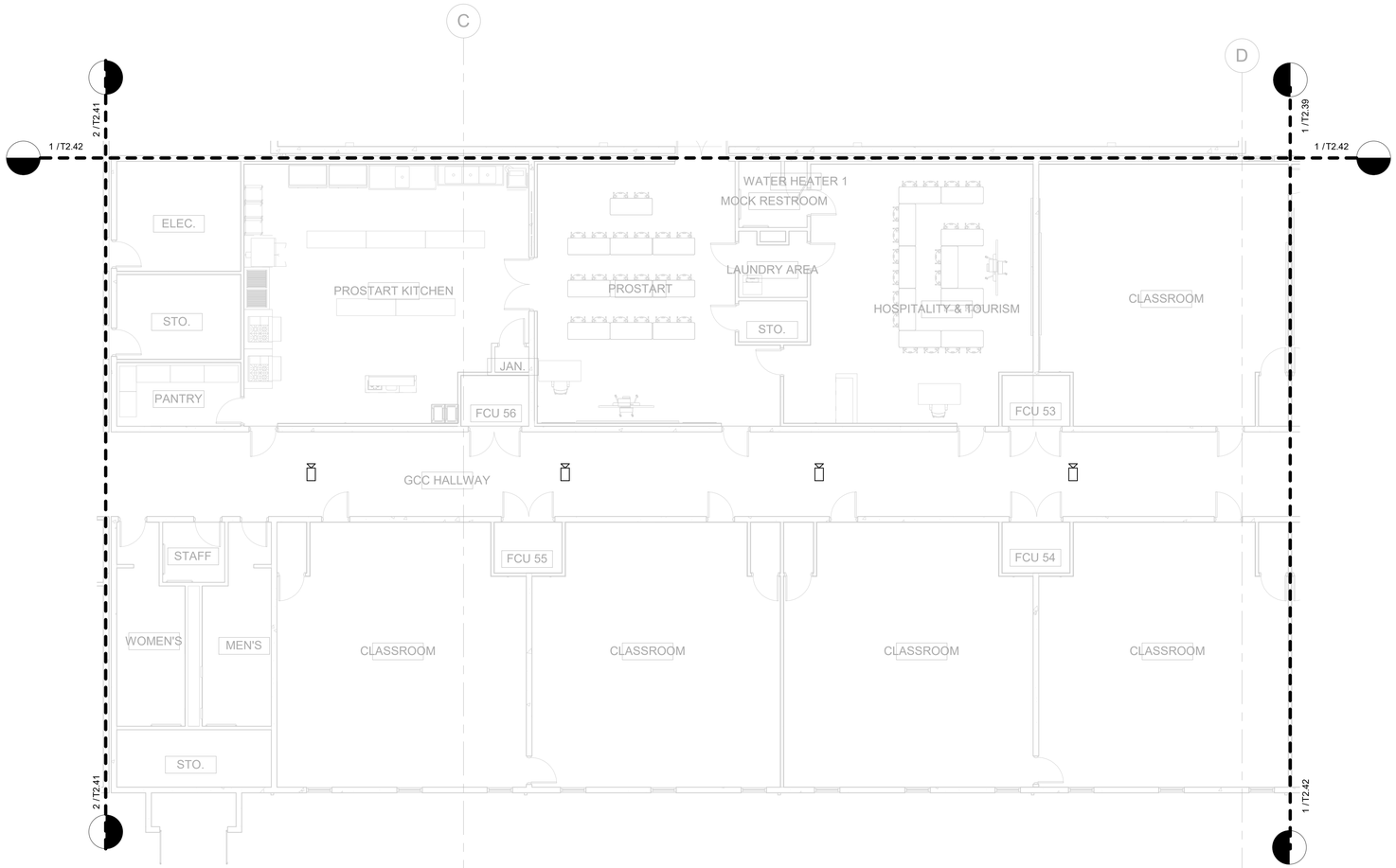
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.39
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

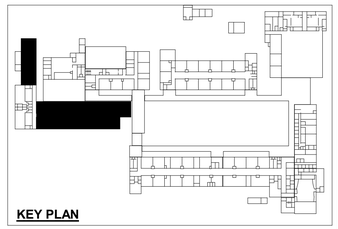


1 C-WING CLASSROOMS SECURITY PLAN - CENTER

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA

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INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

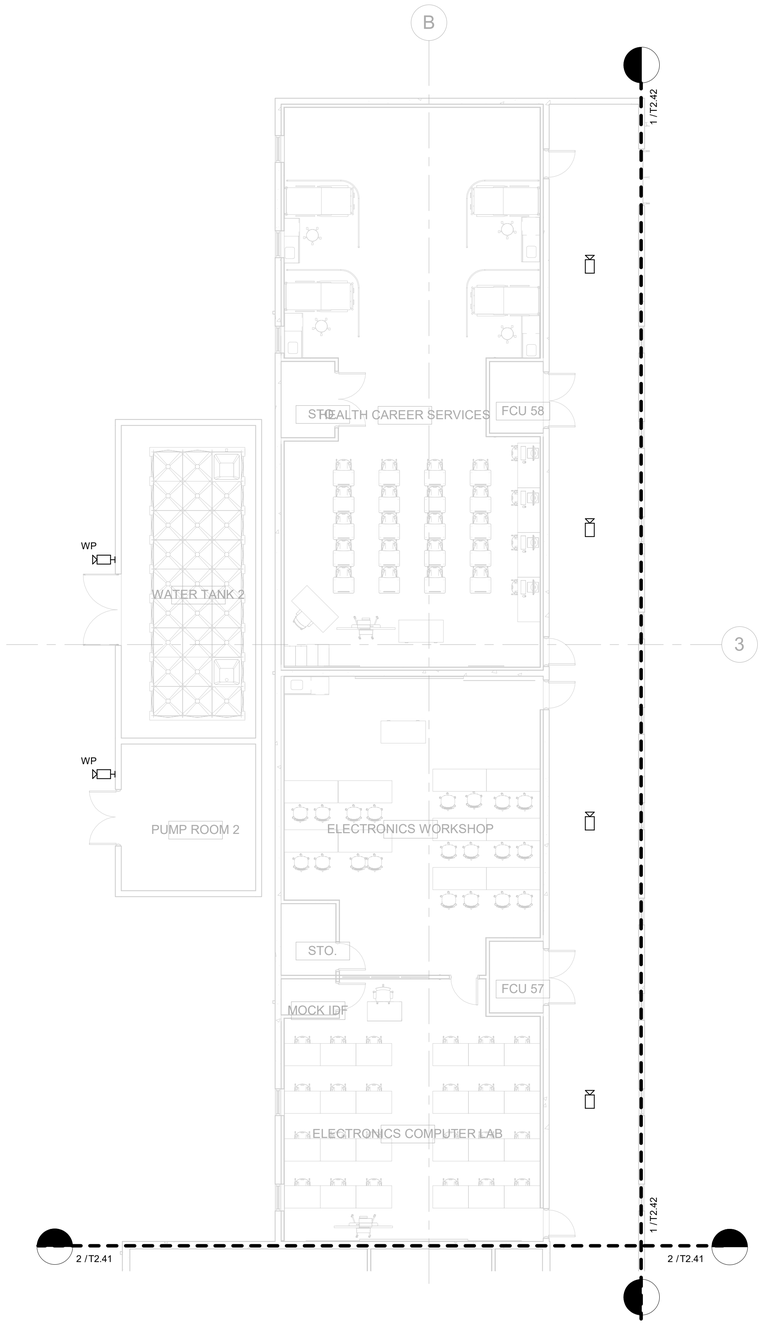
Title:
C-WING CLASSROOMS SECURITY PLAN - CENTER
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	
Drawing No.	

T2.40

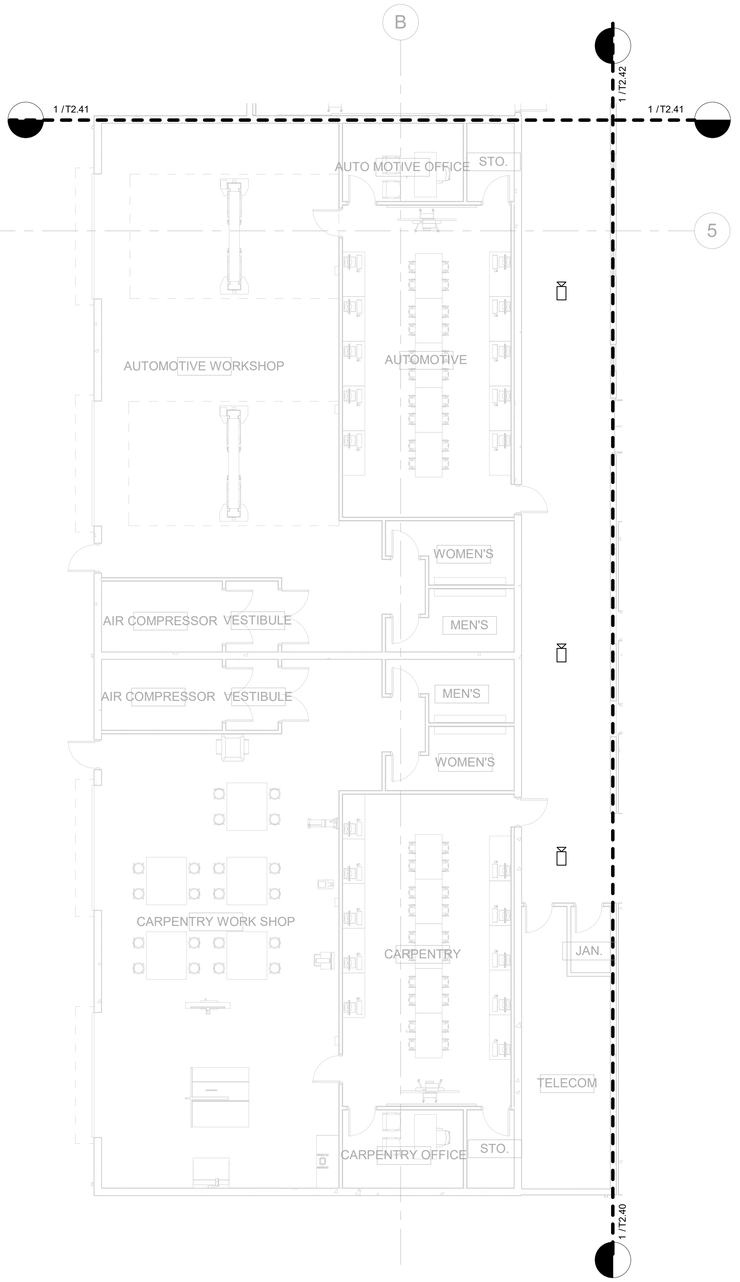
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 C-WING CLASSROOMS SECURITY PLAN - NORTHWEST

SCALE: 1/8" = 1'-0"



2 C-WING CLASSROOMS SECURITY PLAN - SOUTHWEST

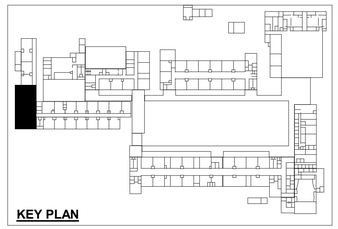
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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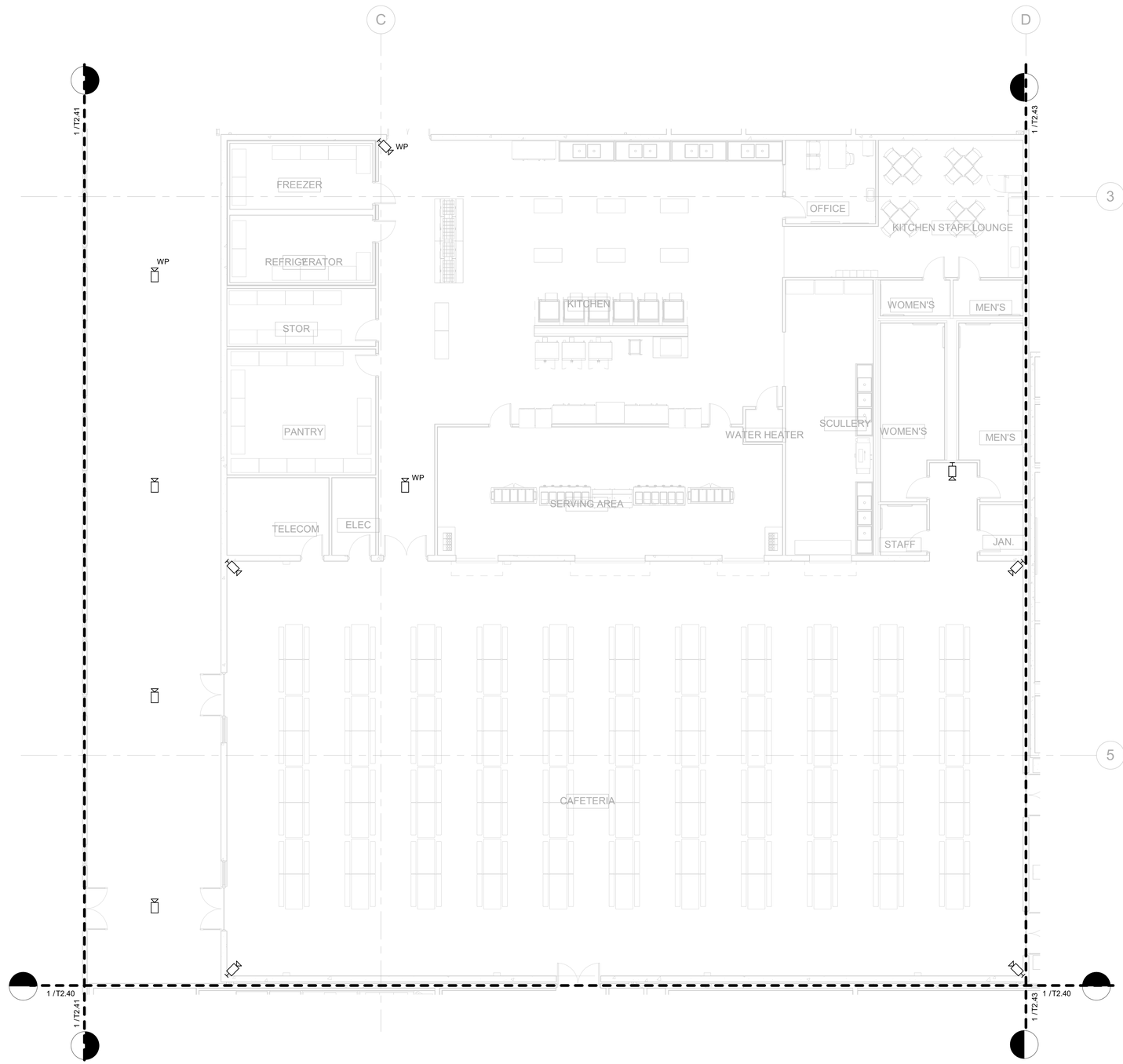
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
C-WING CLASSROOMS SECURITY PLAN - WEST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	03/31/25
Project No.	File
20-133	

Drawing No.
T2.41

Sheet No. ____ of ____



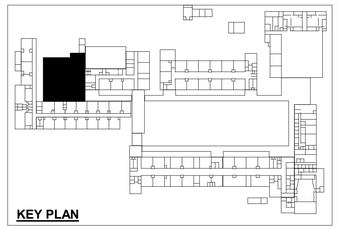
1 CAFETERIA SECURITY PLAN
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



KEY PLAN

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REVISION		
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Project:
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Title:
CAFETERIA SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.42
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

D

E

F

3

5

1 / T2.42

1 / T2.42

WP

STAFF COLLABORATION

FIELD AND DRILL EQUIP. STO.

ELEC

TELECOM

JROTC SUPPLY ROOM

BATALLION HQ

WOMEN'S LOCKER ROOM

STO

MEN'S LOCKER ROOM

VESTIBULE

INSTRUCTOR'S OFFICES

JROTC HALLWAY

CONFERENCE ROOM/COMPUTER LAB

FCU 51

FCU 52

WOMEN'S

JROTC CLASSROOM

JROTC CLASSROOM

JROTC CLASSROOM

ARMS ROOM

STAFF

MEN'S

WP

WP

WP

WP

1 C-WING SECURITY PLAN (JROTC)

SCALE: 1/8" = 1'-0"

NORTH

0' 4' 8' 16'

KEY PLAN

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

NOTE:

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Project:
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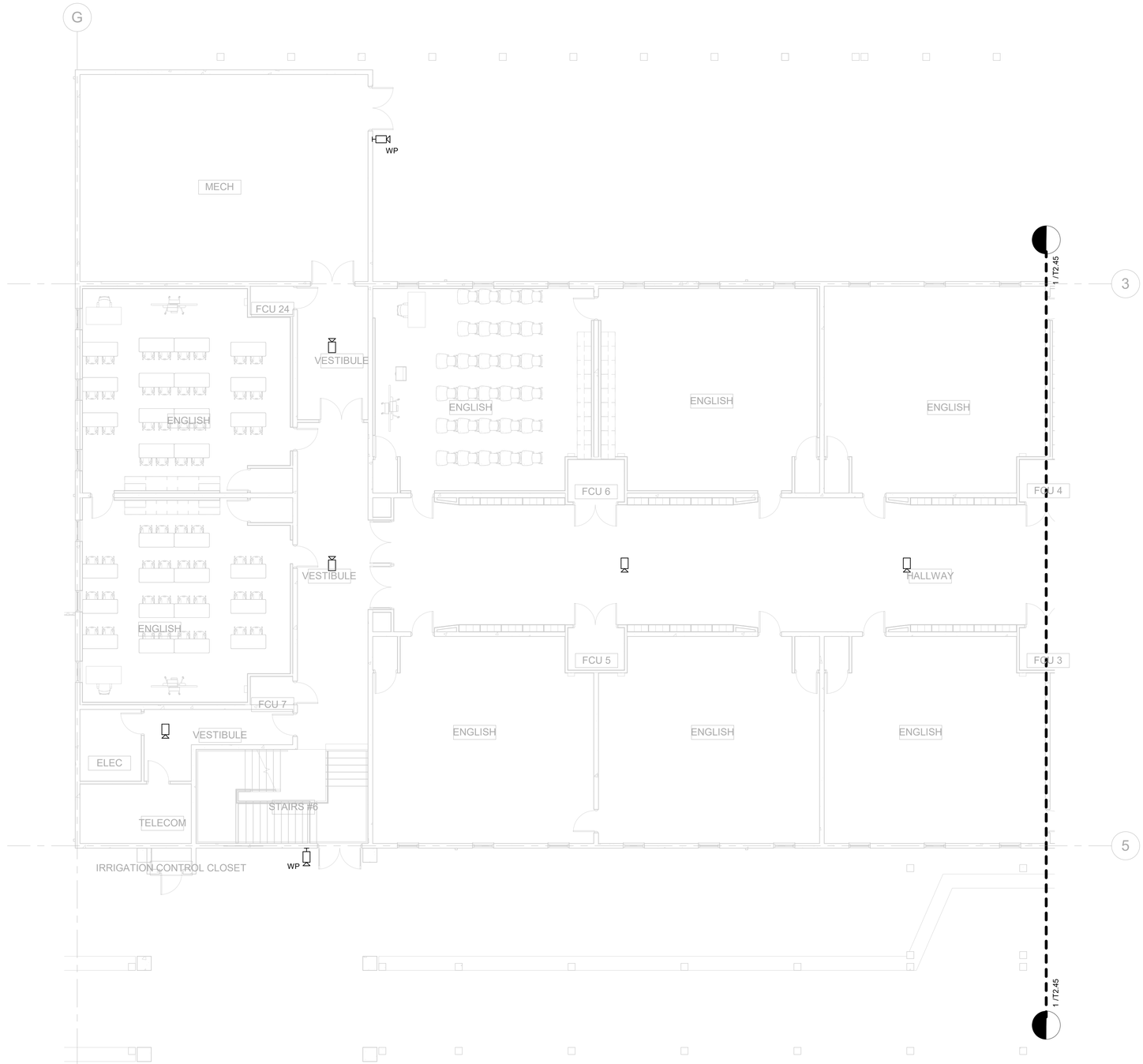
Title:
C-WING SECURITY PLAN (JROTC)
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. / File	20-133
Drawing No.	T2.43
Sheet No.	of

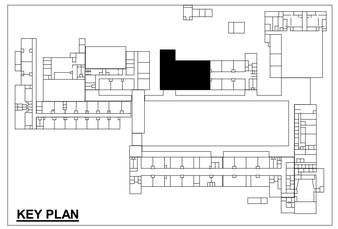


1 B-WING LEVEL 1 SECURITY PLAN - WEST
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH 0' 4' 8' 16'



KEY PLAN

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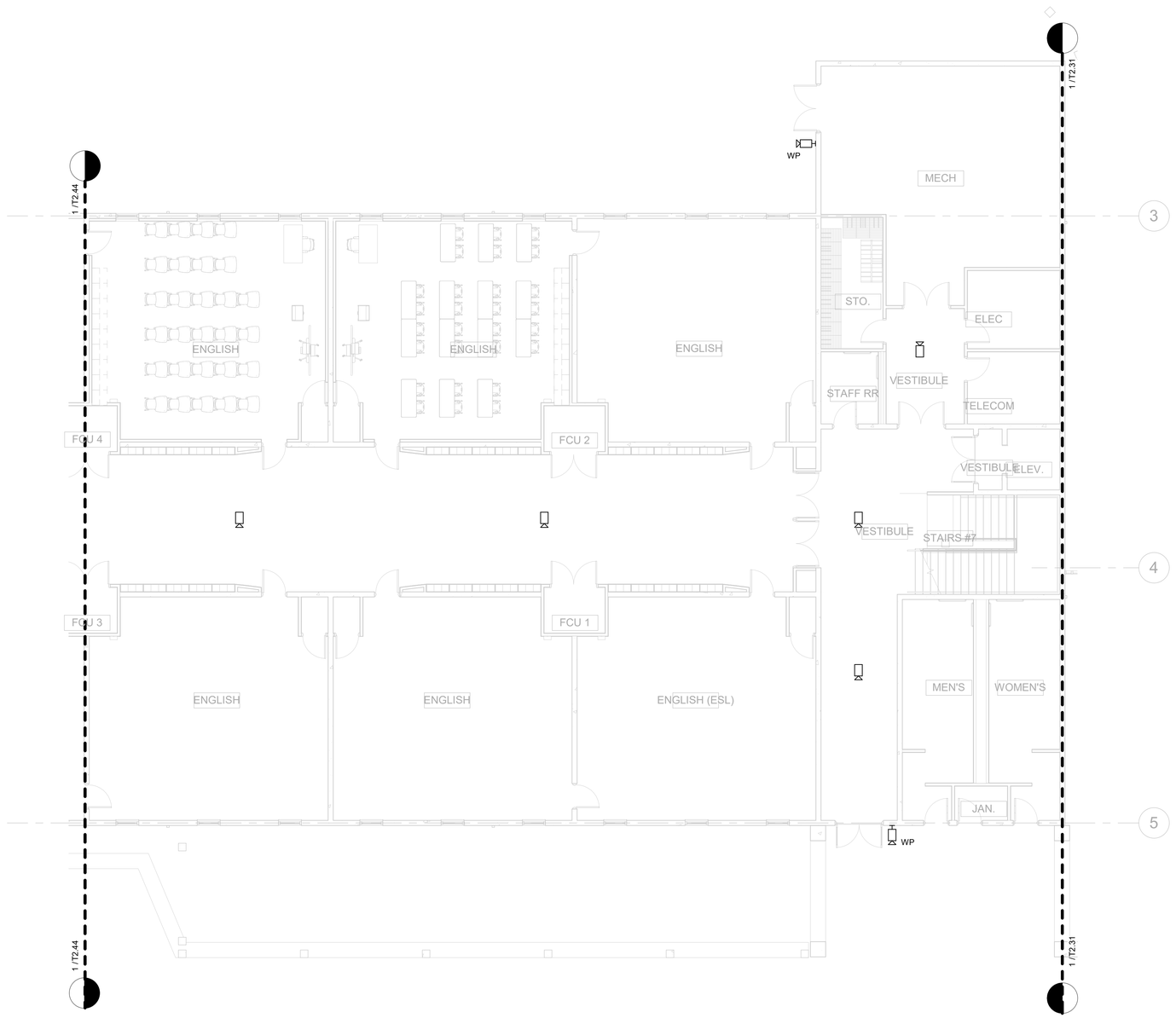
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 1 SECURITY PLAN - WEST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.44
Sheet No. of

NOT FOR CONSTRUCTION



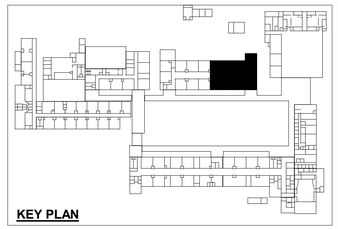
1 B-WING LEVEL 1 SECURITY PLAN - EAST
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36"
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REVISION		
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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 1 SECURITY PLAN - EAST
PROGRAMMING DOCUMENT

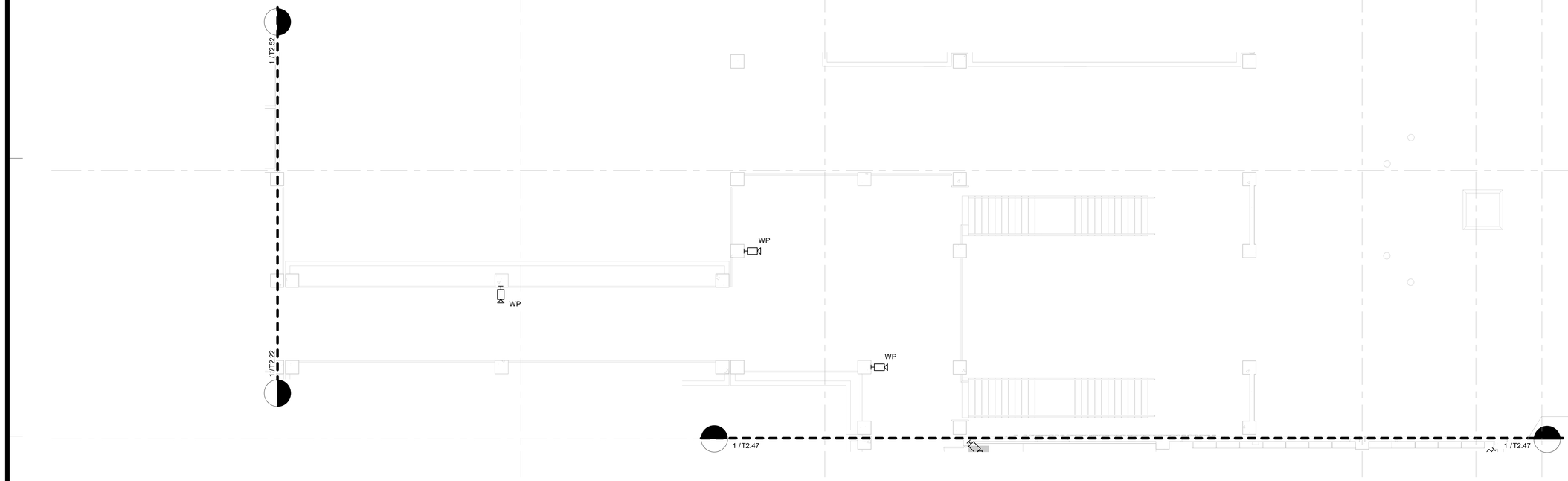
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.45
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

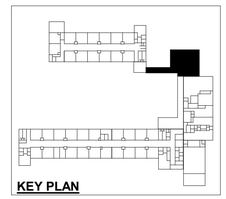
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 MAIN ENTRANCE LEVEL 2 SECURITY PLAN
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'


KEY PLAN

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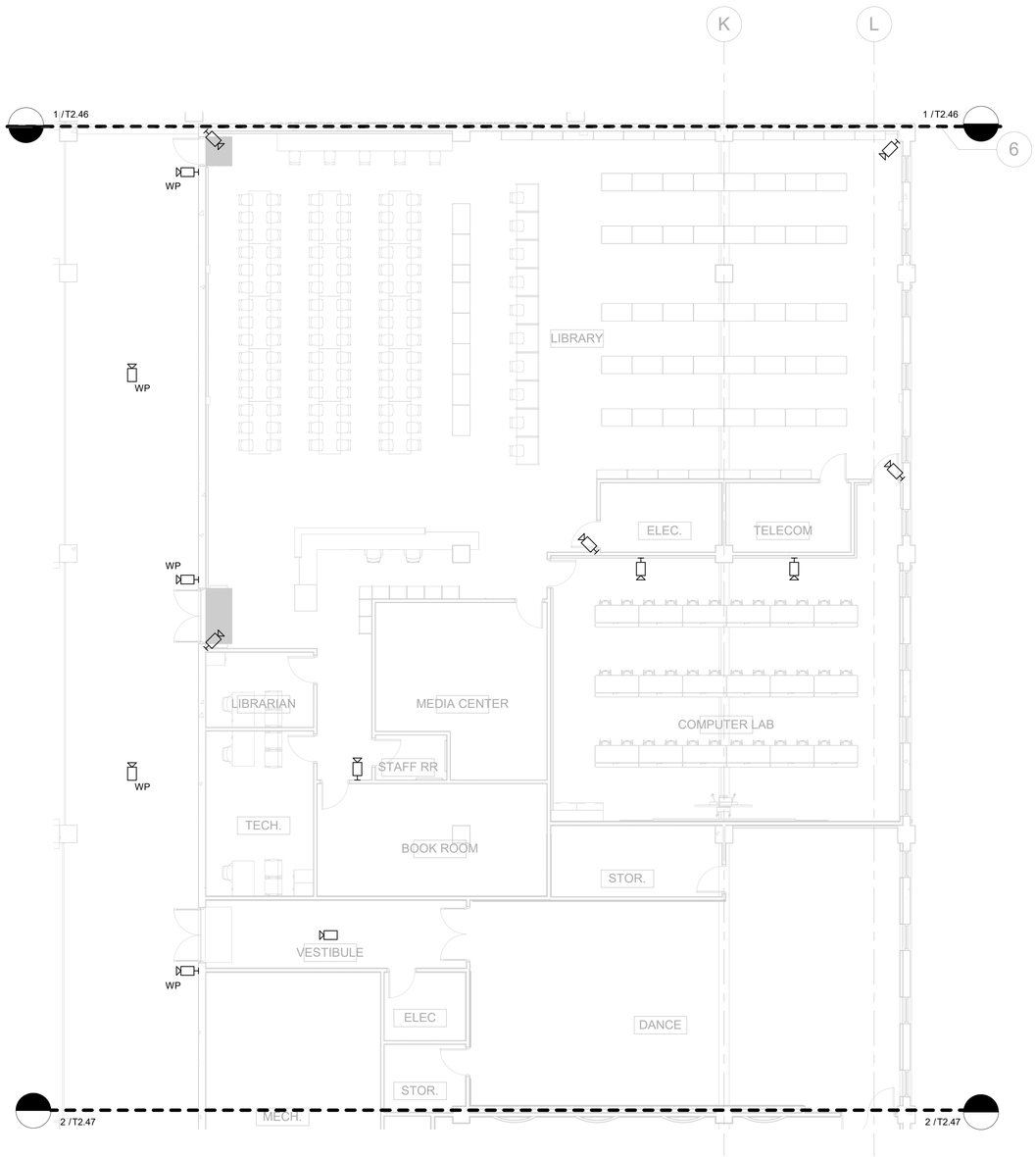
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
MAIN ENTRANCE LEVEL 2 SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

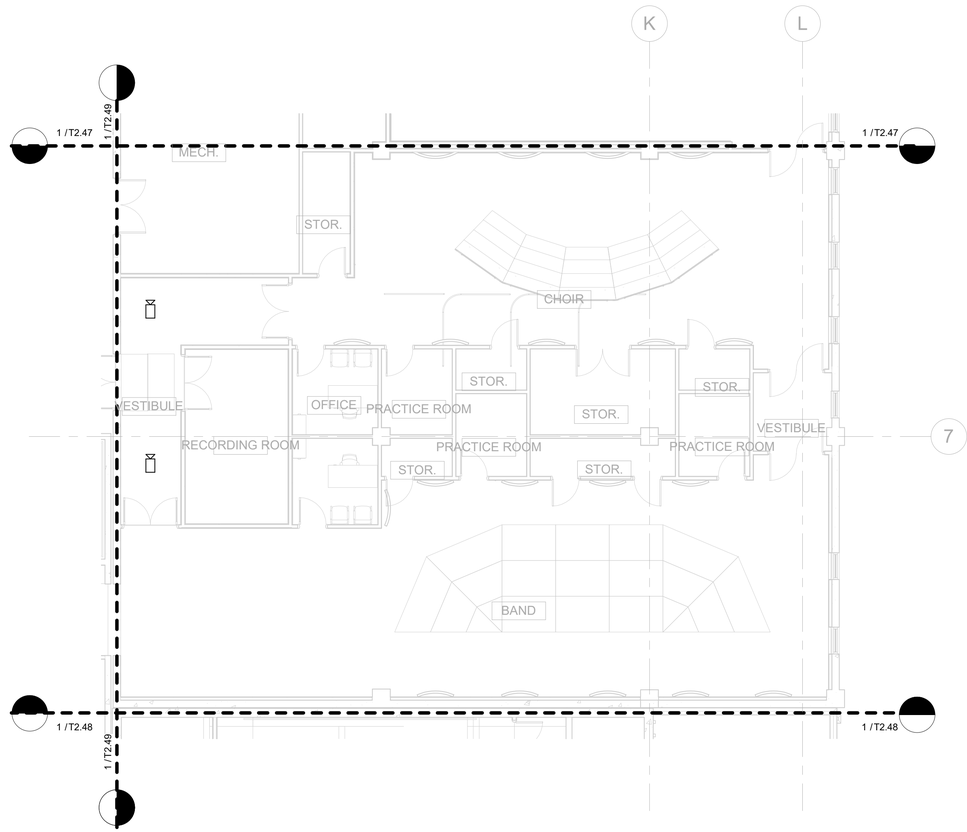
Drawing No.
T2.46
Sheet No. ____ of ____



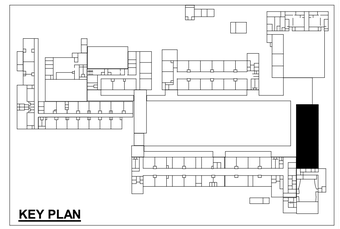
1 A-WING LEVEL 2 SECURITY PLAN
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



2 CHOIR & BAND LEVEL 2 SECURITY PLAN
SCALE: 1/8" = 1'-0"



NORTH 0' 4' 8' 16'

IF SHEET IS LESS THAN 24" X 36"
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REVISION		
No.	Description	Date

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Project:
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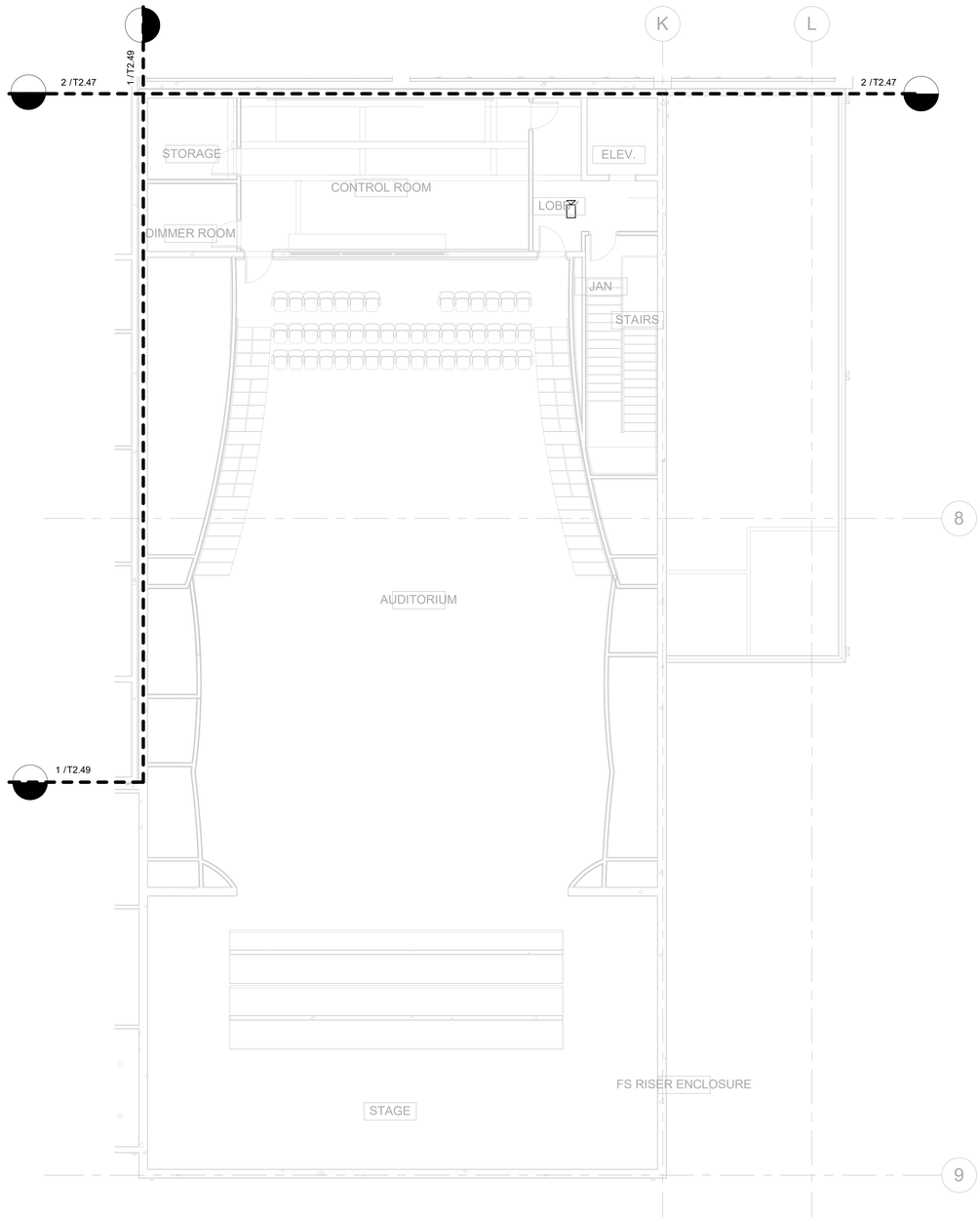
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING, CHOIR & BAND LEVEL 2 SECURITY PLANS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.47
Sheet No. of

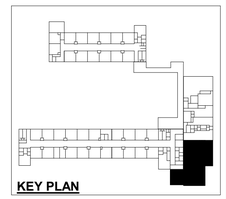


NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

1 AUDITORIUM LEVEL 2 SECURITY PLAN
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'


KEY PLAN

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Project:
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Title:
AUDITORIUM LEVEL 2 SECURITY PLAN
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.48
Sheet No. ____ of ____

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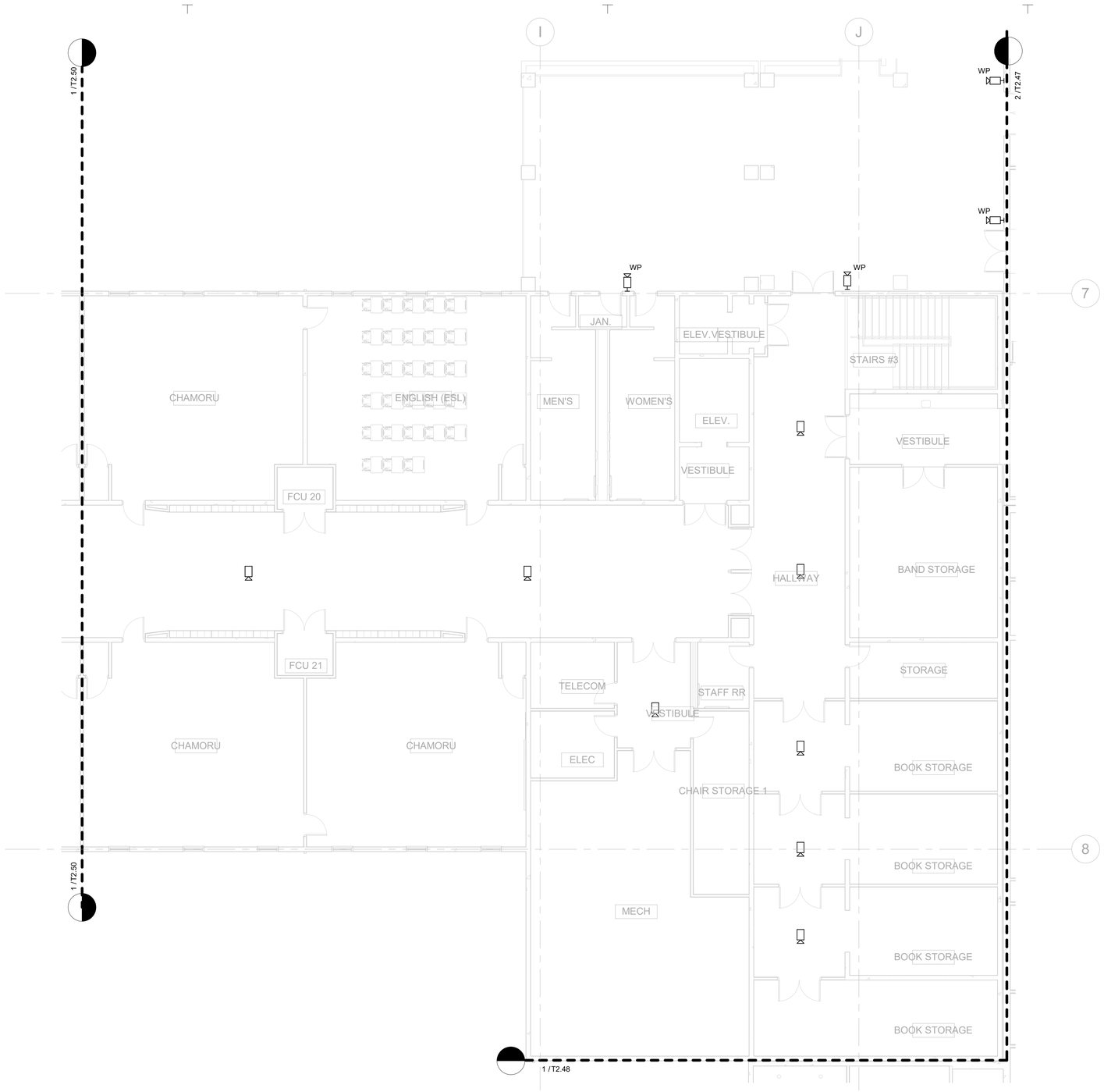
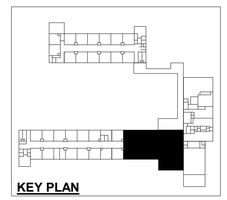


NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

1 A-WING LEVEL 2 SECURITY PLAN - EAST
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 2 SECURITY PLAN - EAST
PROGRAMMING DOCUMENT

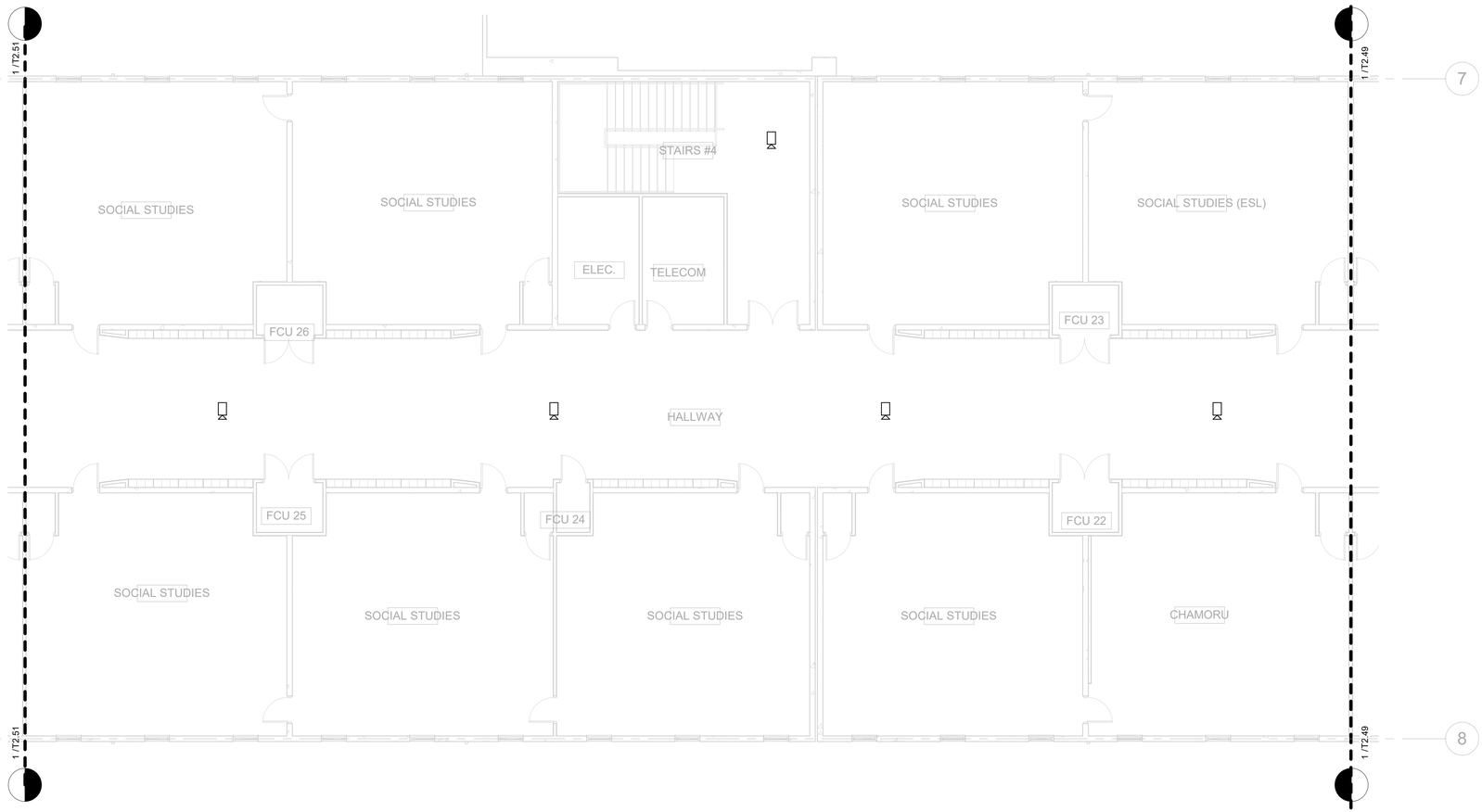
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.49
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

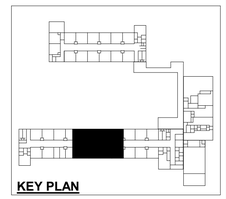
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 A-WING LEVEL 2 SECURITY PLAN - CENTER
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 2 SECURITY PLAN - CENTER
PROGRAMMING DOCUMENT

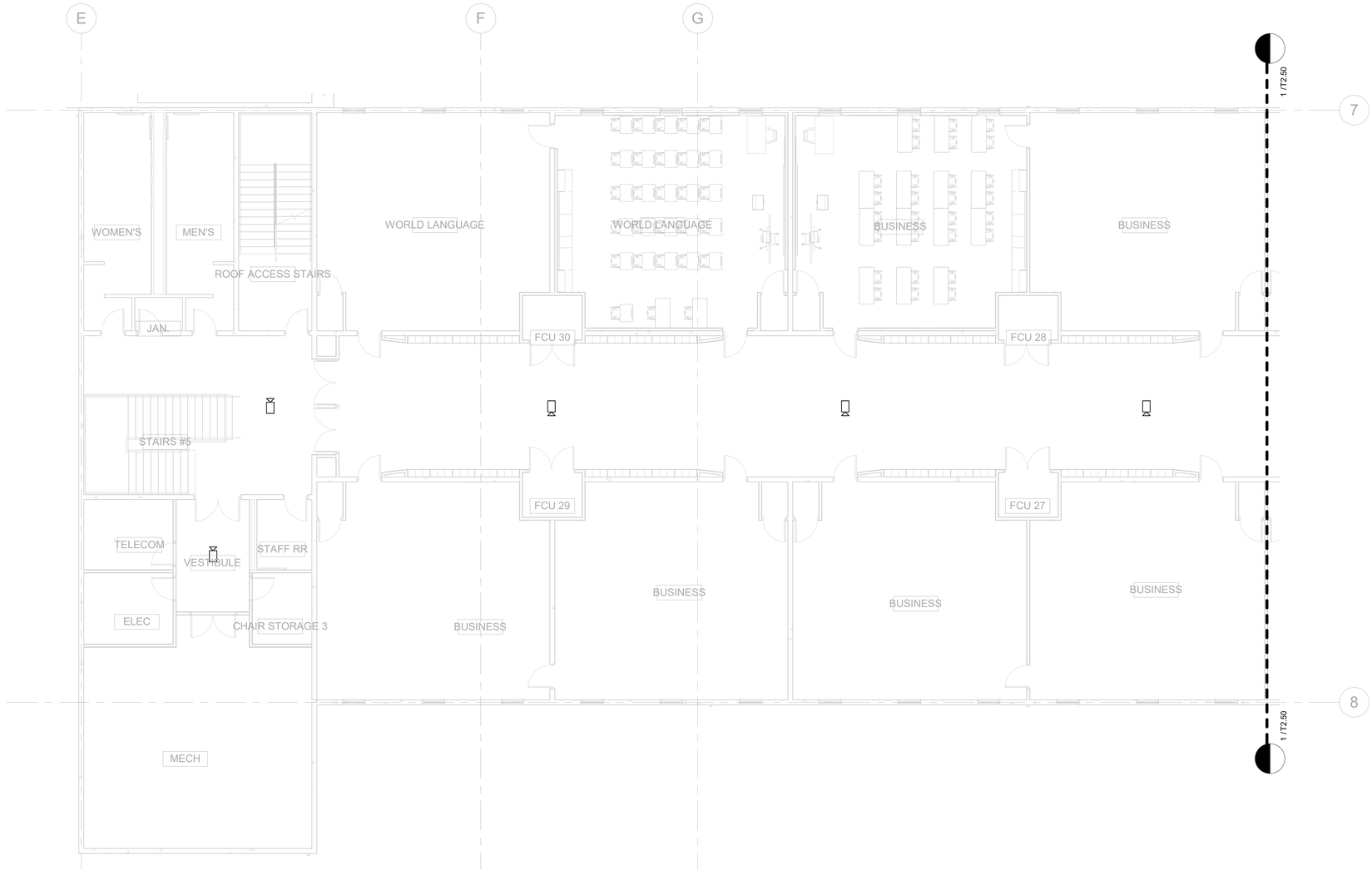
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.50
Sheet No. of

NOT FOR CONSTRUCTION

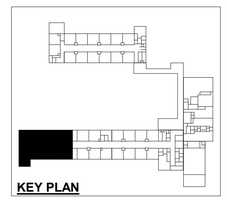
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 A-WING LEVEL 2 SECURITY PLAN - WEST
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'



IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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MECHANICAL • ELECTRICAL • FIRE PROTECTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
A-WING LEVEL 2 SECURITY PLAN - WEST
PROGRAMMING DOCUMENT

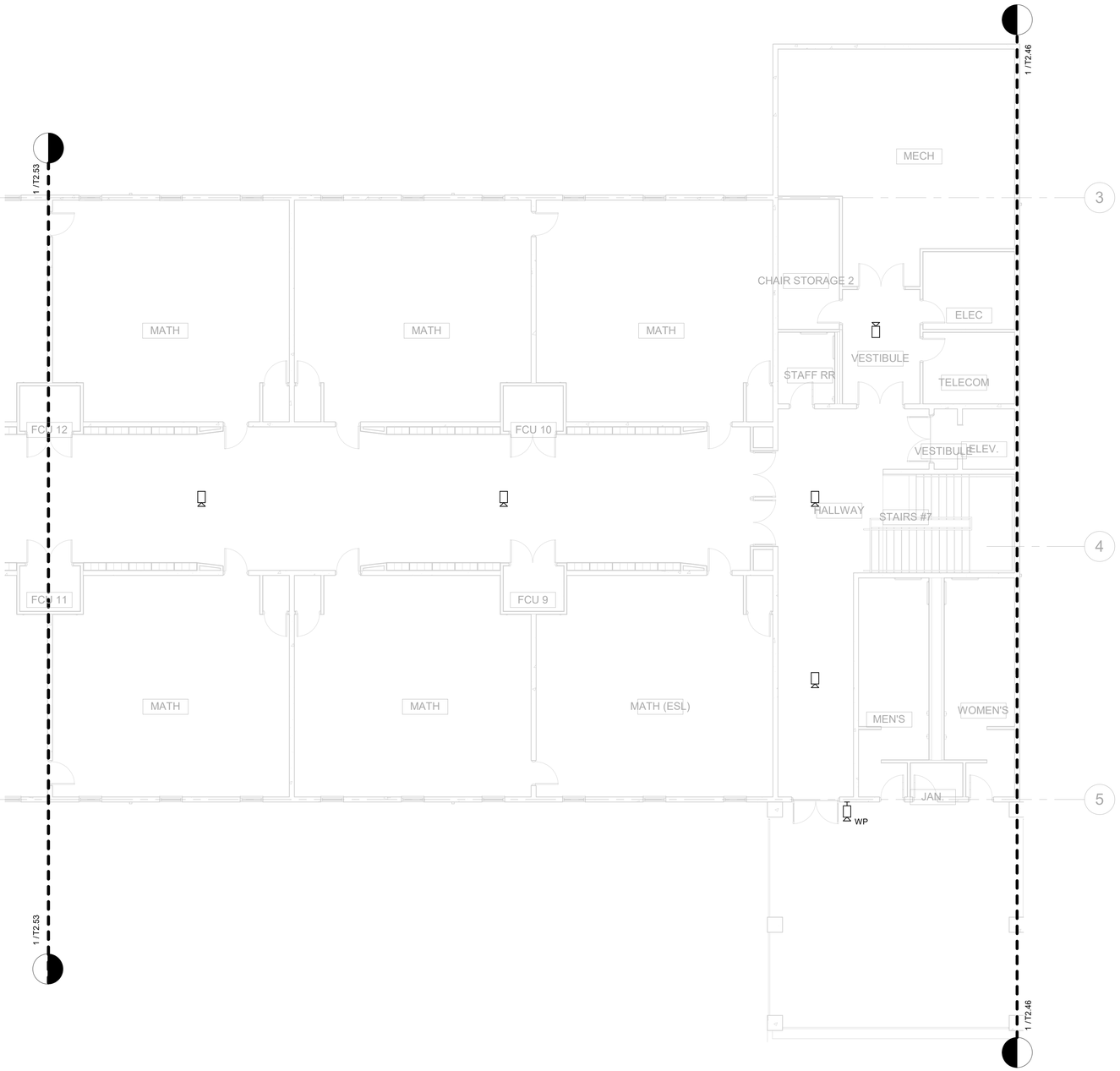
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.51
Sheet No. ____ of ____

NOT FOR CONSTRUCTION

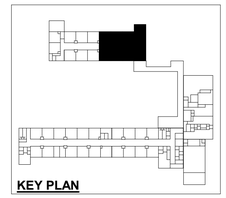
NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).



1 B-WING LEVEL 2 SECURITY PLAN - EAST
SCALE: 1/8" = 1'-0"

NORTH 0' 4' 8' 16'


KEY PLAN

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

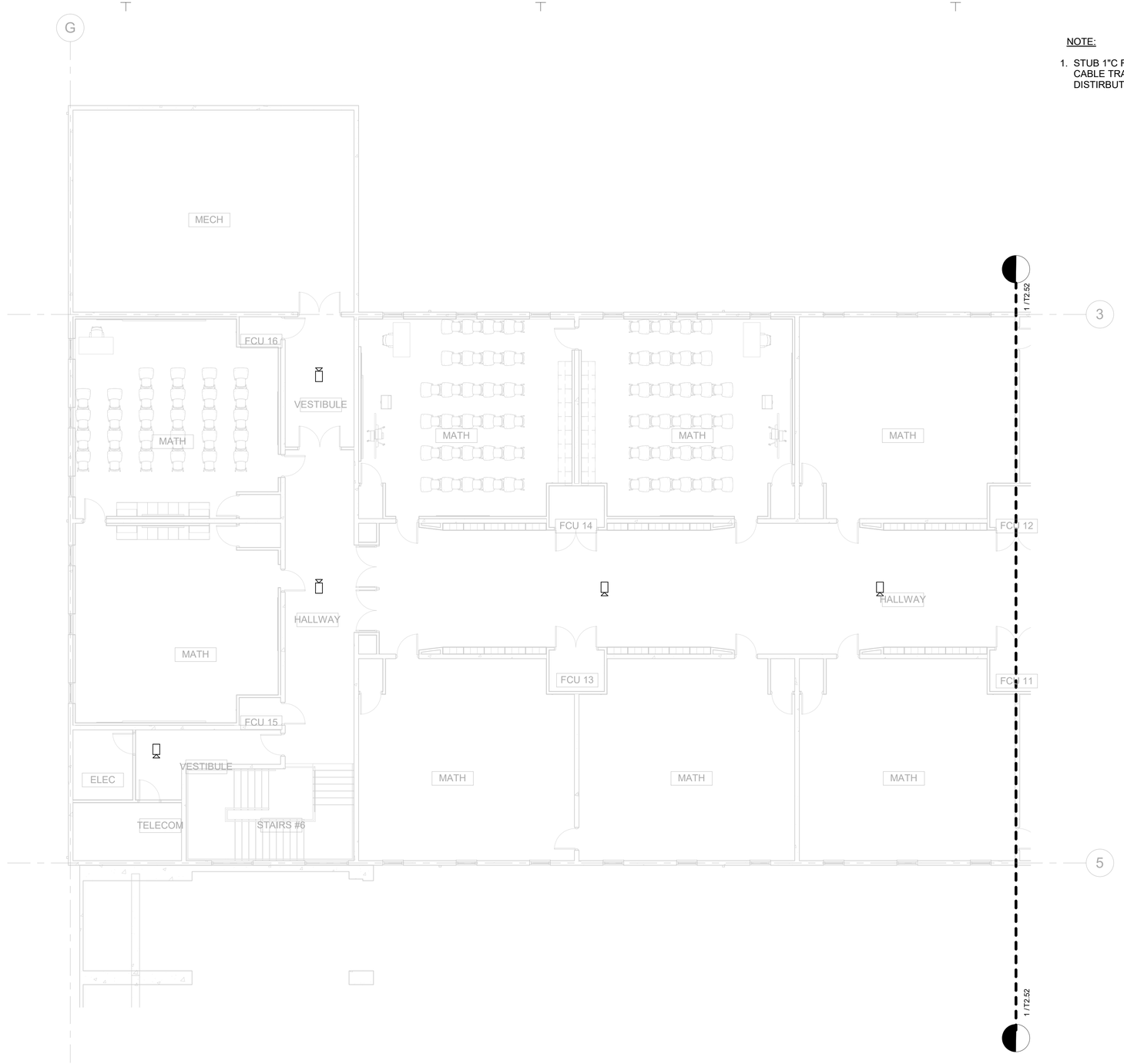
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 2 SECURITY PLAN - EAST
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.52
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



NOTE:

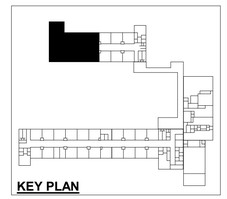
1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'

1 B-WING LEVEL 2 SECURITY PLAN - WEST

SCALE: 1/8" = 1'-0"



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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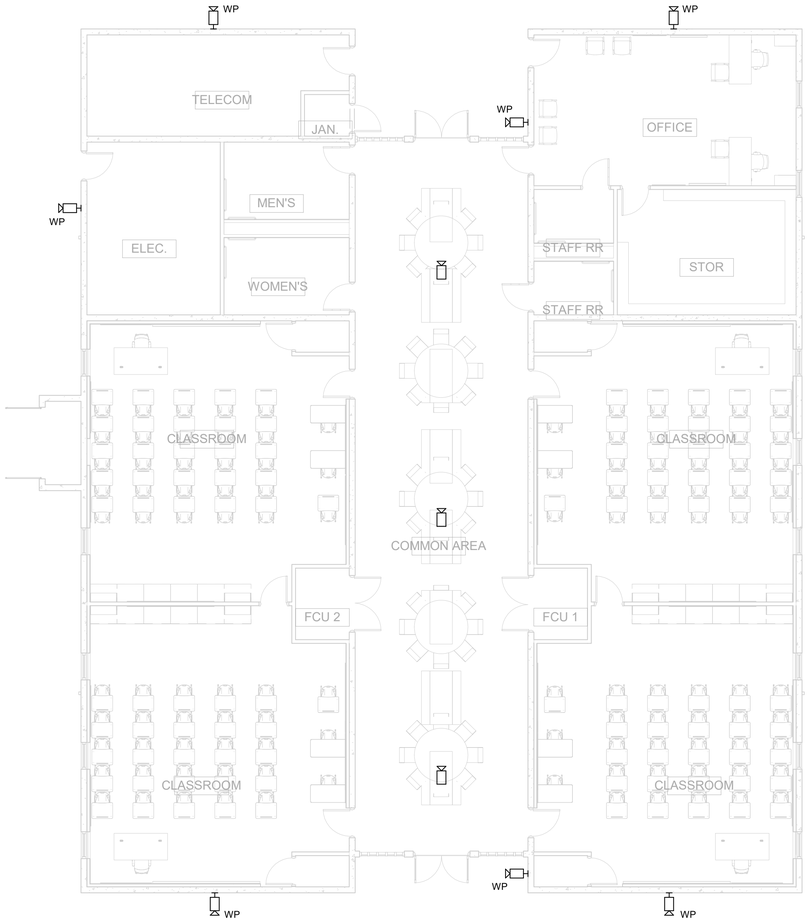
MECHANICAL • ELECTRICAL • FIRE PROTECTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
B-WING LEVEL 2 SECURITY PLAN - WEST
PROGRAMMING DOCUMENT

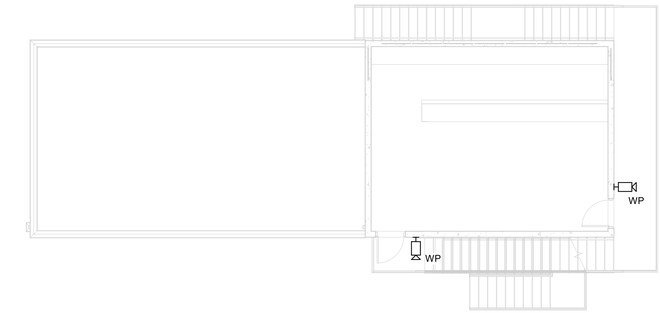
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No. / File	20-133
Drawing No.	T2.53
Sheet No.	of

NOT FOR CONSTRUCTION



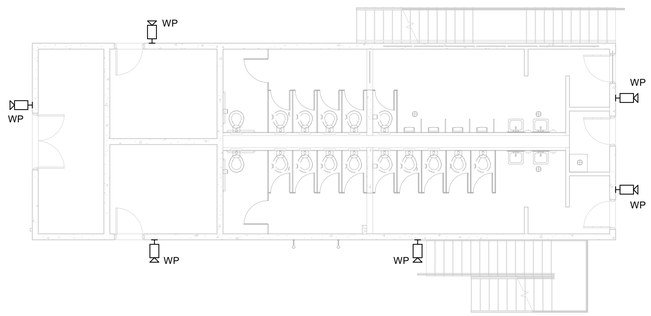
1 CREDIT RECOVERY SECURITY PLAN

SCALE: 1/8" = 1'-0"



3 PRESS BOX LEVEL 2 SECURITY PLAN

SCALE: 1/8" = 1'-0"



2 PRESS BOX LEVEL 1 SECURITY PLAN

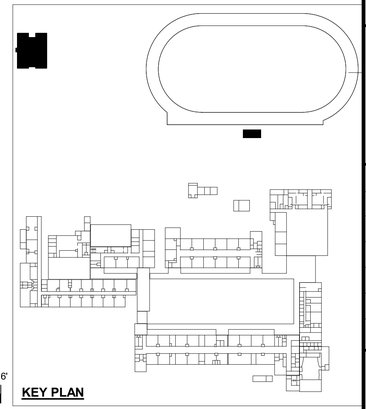
SCALE: 1/8" = 1'-0"

NOTE:

1. STUB 1"C FROM ALL TELECOM DEVICES TO THE NEAREST CABLE TRAY. HOMERUN CABLES TO THE NEAREST NETWORK DISTIRBUTION FRAME (MDF OR IDF).

NORTH

0' 4' 8' 16'



KEY PLAN

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

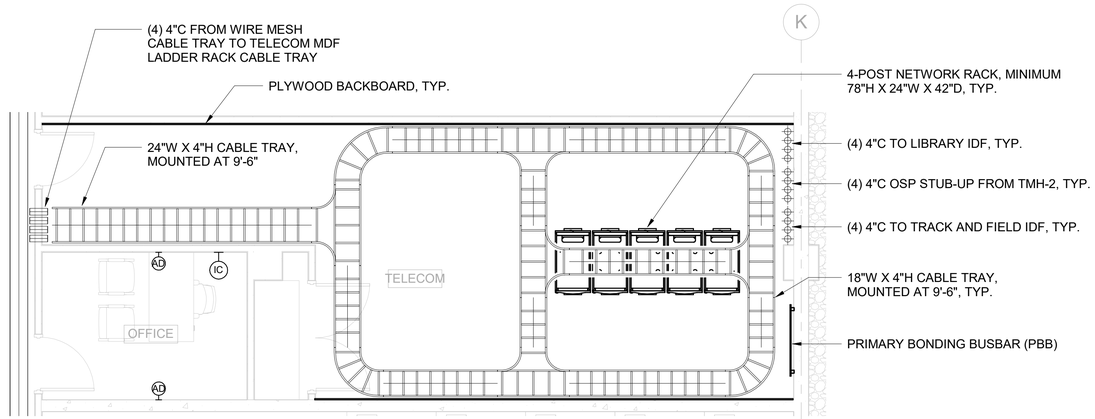
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CREDIT RECOVERY AND PRESS BOX SECURITY PLANS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/8" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T2.54
Sheet No. of

NOT FOR CONSTRUCTION



1 ENLARGED MAIN DISTRIBUTION FRAME (MDF) ROOM

SCALE: 1/4" = 1'-0"

NORTH

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION

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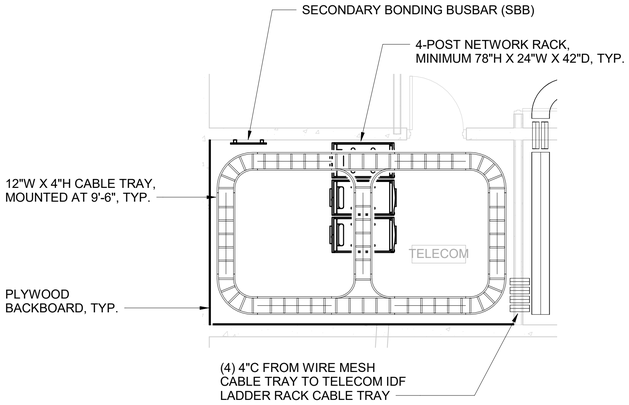
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED MAIN DISTRIBUTION FRAME (MDF) ROOM
PROGRAMMING DOCUMENT

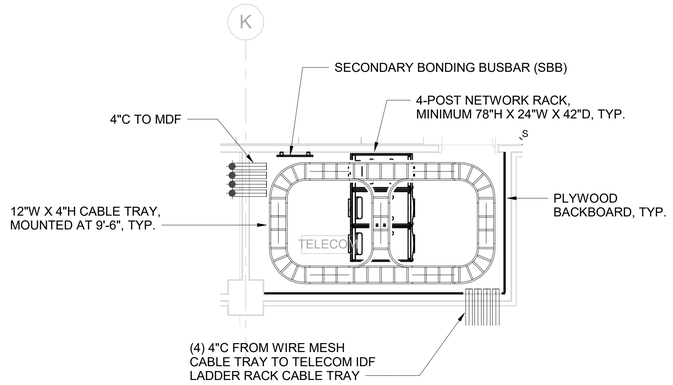
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	20-133
File	

Drawing No.
T4.1
Sheet No. _____ of _____



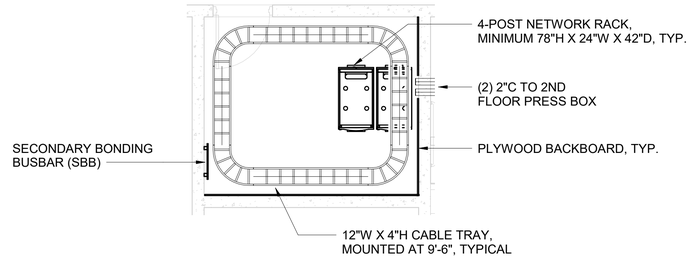
1 ENLARGED AUDITORIUM IDF - LEVEL 1

SCALE: 1/4" = 1'-0"



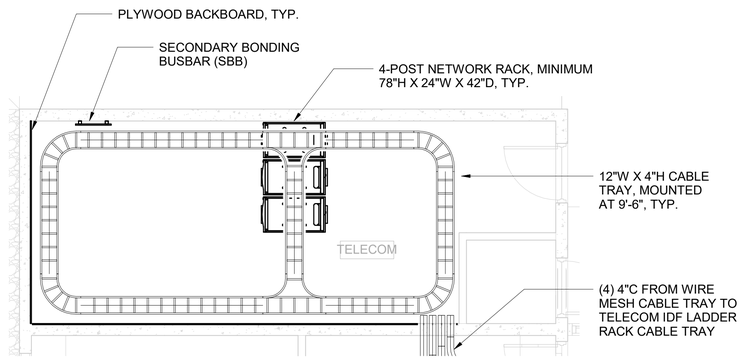
2 ENLARGED ADMINISTRATION IDF - LEVEL 2

SCALE: 1/4" = 1'-0"



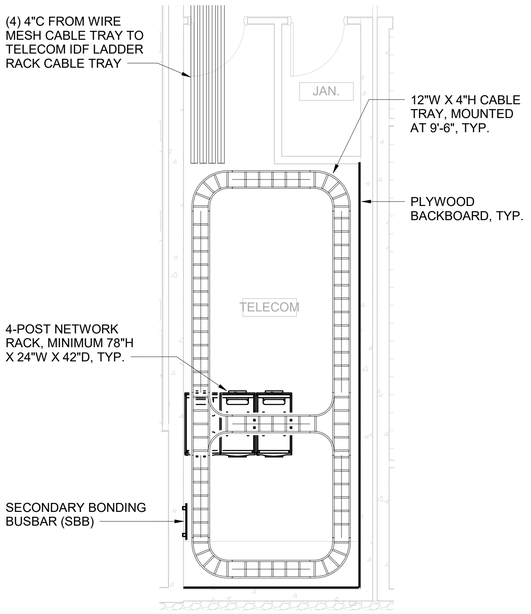
6 ENLARGED PRESS BOX IDF - LEVEL 1

SCALE: 1/4" = 1'-0"



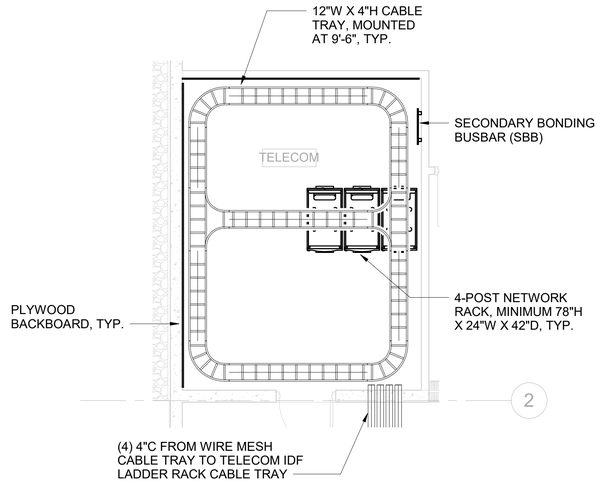
3 ENLARGED CREDIT RECOVERY IDF - LEVEL 1

SCALE: 1/4" = 1'-0"



4 ENLARGED GCC BUILDING IDF - LEVEL 1

SCALE: 1/4" = 1'-0"



5 ENLARGED GYMNASIUM IDF - LEVEL 1

SCALE: 1/4" = 1'-0"

NORTH

0' 1' 2' 4'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISION		
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Architecture
Planning
Interior Design

INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

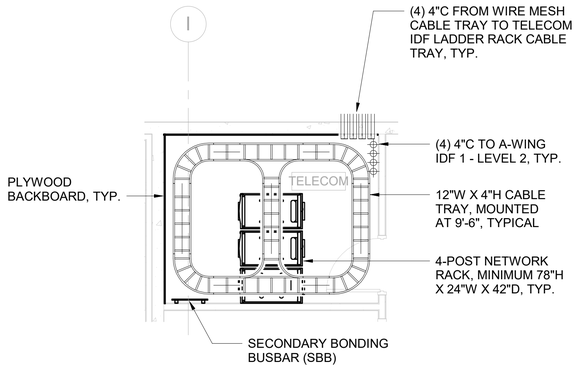
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

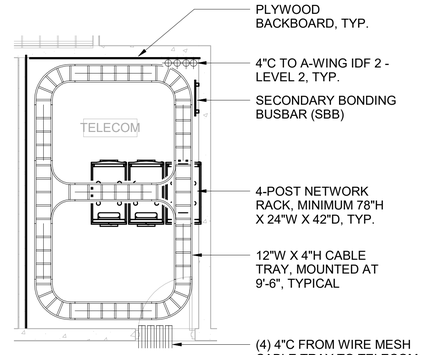
Title:
ENLARGED INTERMEDIATE DISTRIBUTION FACILITY (IDF) ROOMS PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

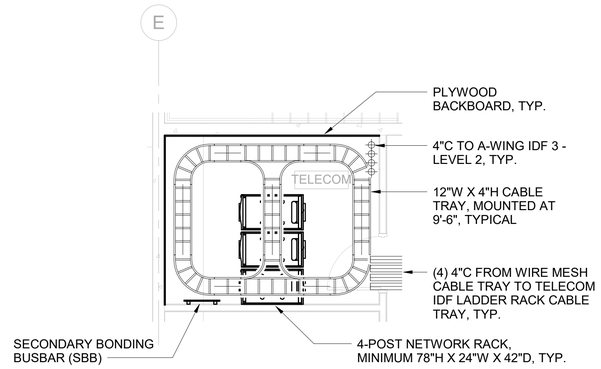
Drawing No.
T4.2
Sheet No. ____ of ____



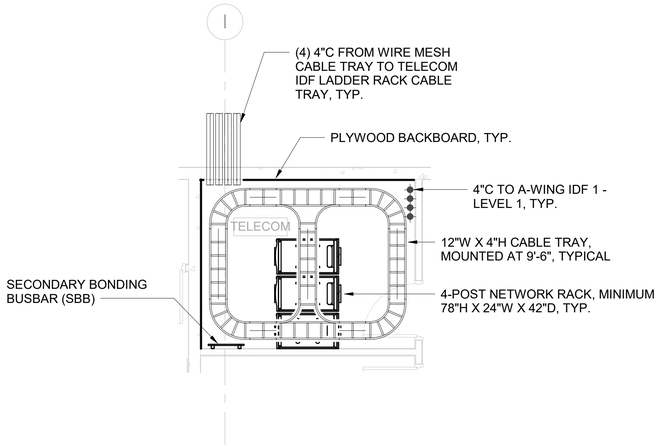
1 ENLARGED A-WING IDF 1 - LEVEL 1
SCALE: 1/4" = 1'-0"



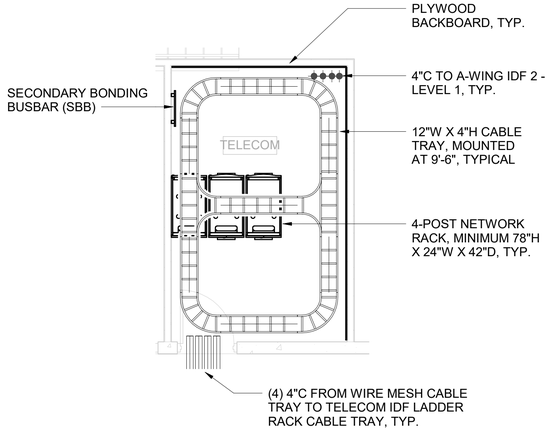
2 ENLARGED A-WING IDF 2 - LEVEL 1
SCALE: 1/4" = 1'-0"



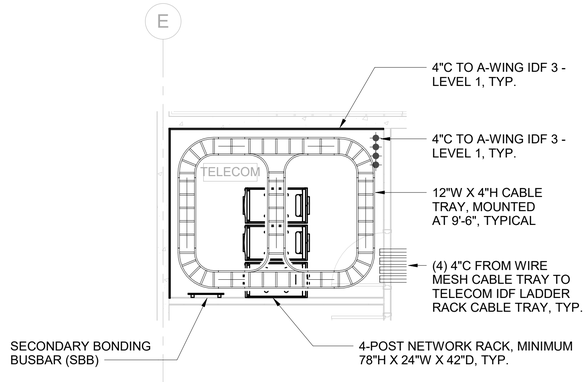
3 ENLARGED A-WING IDF 3 - LEVEL 1
SCALE: 1/4" = 1'-0"



4 ENLARGED A-WING IDF 1 - LEVEL 2
SCALE: 1/4" = 1'-0"



5 ENLARGED A-WING IDF 2 - LEVEL 2
SCALE: 1/4" = 1'-0"



6 ENLARGED A-WING IDF 3 - LEVEL 2
SCALE: 1/4" = 1'-0"

NORTH
0' 1' 2' 4'

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Architecture
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INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

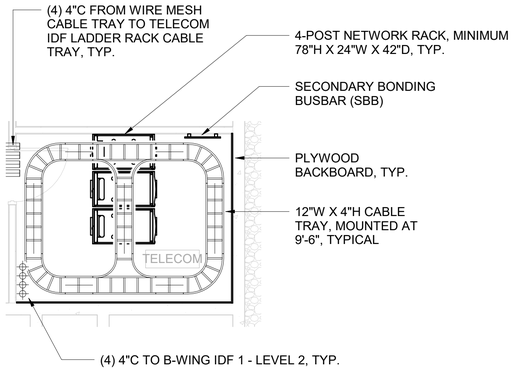
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED INTERMEDIATE DISTRIBUTION FACILITY (IDF) ROOMS
PROGRAMMING DOCUMENT

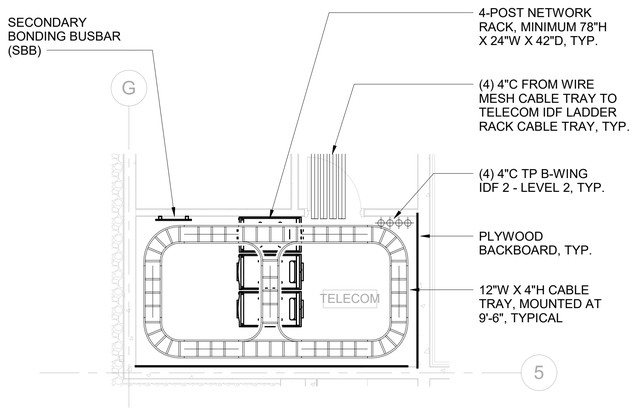
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T4.3
Sheet No. ____ of ____



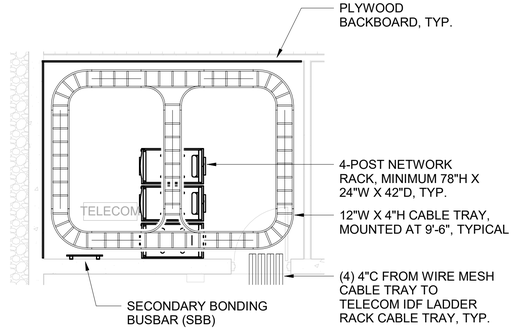
1 ENLARGED B-WING IDF 1 - LEVEL 1

SCALE: 1/4" = 1'-0"



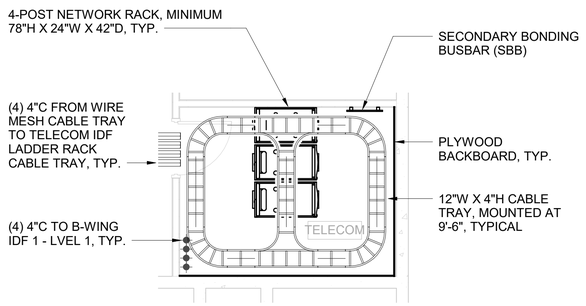
2 ENLARGED B-WING IDF 2 - LEVEL 1

SCALE: 1/4" = 1'-0"



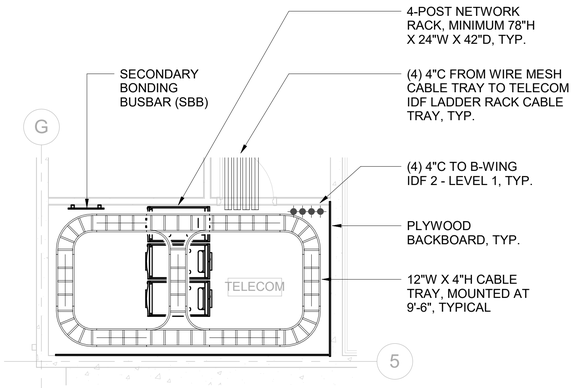
3 ENLARGED CAFETERIA IDF - LEVEL 1

SCALE: 1/4" = 1'-0"



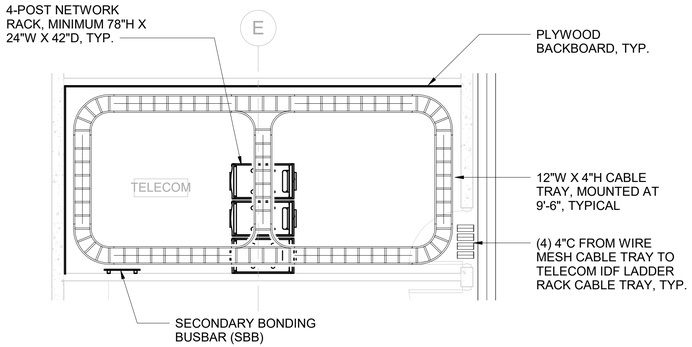
4 ENLARGED B-WING IDF 1 - LEVEL 2

SCALE: 1/4" = 1'-0"



5 ENLARGED B-WING IDF 2 - LEVEL 2

SCALE: 1/4" = 1'-0"



6 ENLARGED JROTC IDF - LEVEL 1

SCALE: 1/4" = 1'-0"



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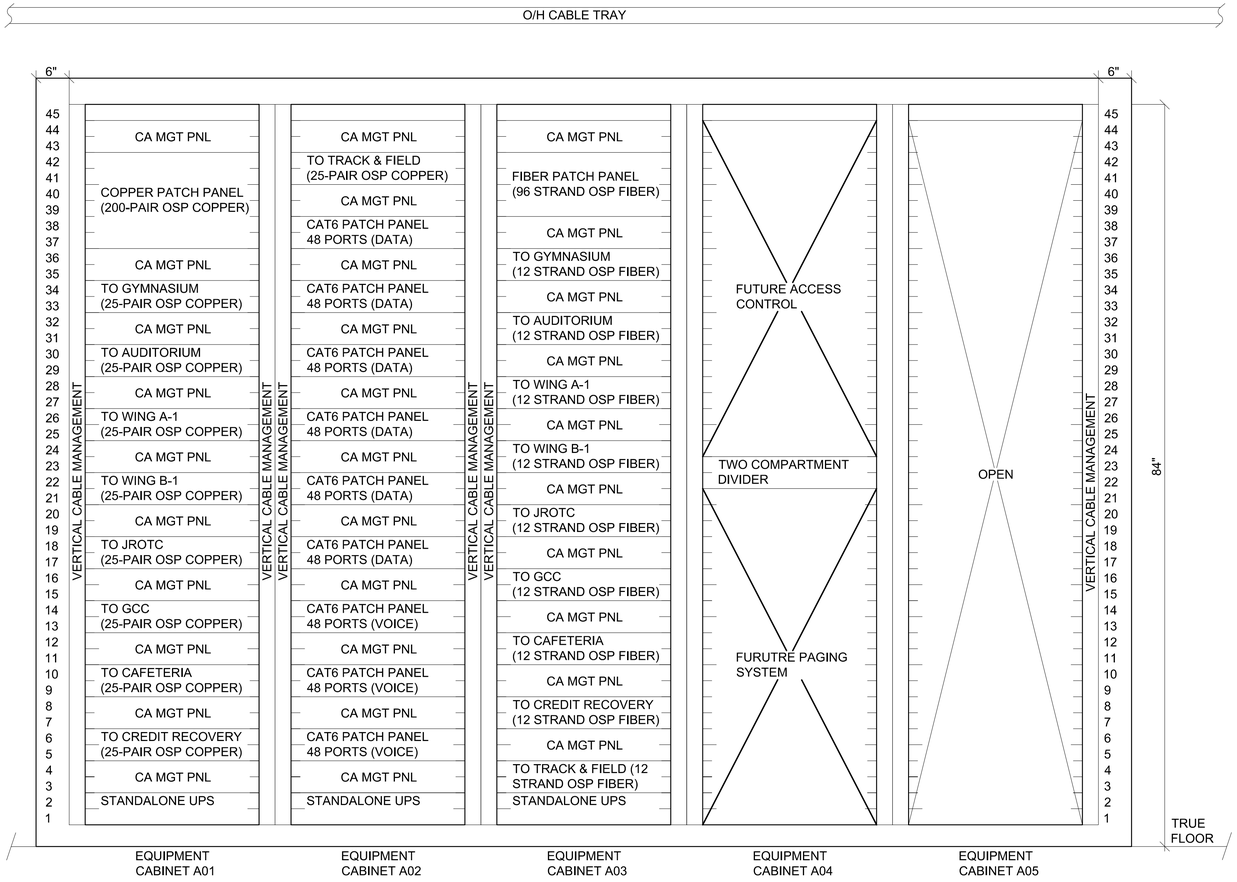
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
ENLARGED INTERMEDIATE DISTRIBUTION FACILITY (IDF) ROOMS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	1/4" = 1'-0"
Date:	3/31/25
Project No.	File
20-133	

Drawing No.
T4.4
Sheet No. ____ of ____

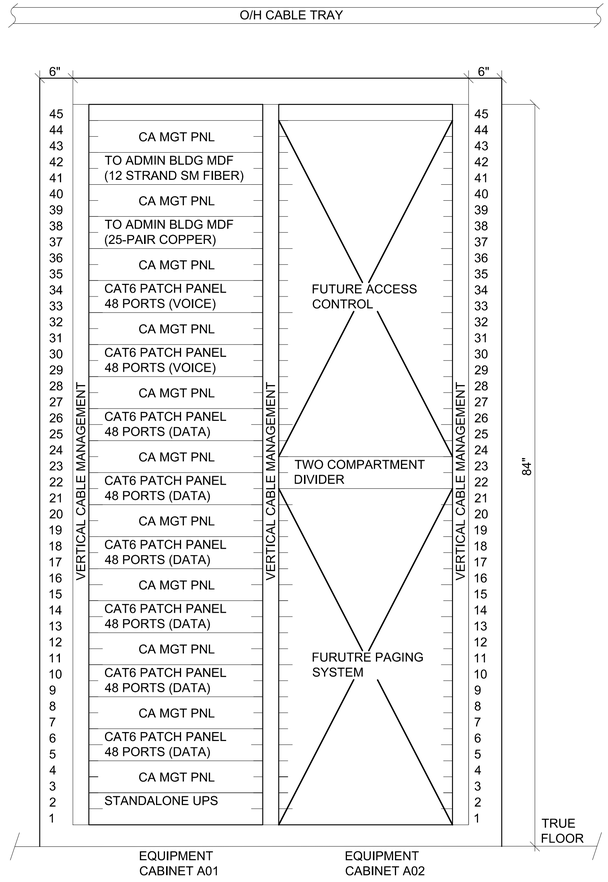


NOTES:

1. ALL EQUIPMENT CABINETS SHALL BE ANCHORED TO TRUE FLOOR USING MANUFACTURER'S RECOMMENDED ANCHORING SYSTEM.
2. PROVIDE, TERMINATE AND TEST ALL SIGNAL, POWER AND GROUND CABLES.
3. PATCH CORDS SHALL BE NEATLY ROUTED AND DRESSED IN CABLE MANAGEMENT PANELS, VERTICAL CHANNELS AND O/H CABLE LADDER.
4. ALL PATCH CORDS SHALL BE LABELED ON EACH END (APPROXIMATELY 3 INCHES FROM CONNECTOR).
5. ALL PATCH PANELS SHALL BE LABELED USING ANSI/TIA/EIA-606 LABELING SCHEME.
6. EACH CABINET SHALL BE EQUIPPED WITH TWO (2) VERTICAL POWER STRIPS. ONE POWER STRIP MUST BE 208V, 1-PHASE AND THE OTHER MUST BE 120V 1-PHASE.

1 CABINET ELEVATION - ADMIN BUILDING MDF

SCALE: NO SCALE



NOTES:

1. ALL EQUIPMENT CABINETS SHALL BE ANCHORED TO TRUE FLOOR USING MANUFACTURER'S RECOMMENDED ANCHORING SYSTEM.
2. PROVIDE, TERMINATE AND TEST ALL SIGNAL, POWER AND GROUND CABLES.
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4. ALL PATCH CORDS SHALL BE LABELED ON EACH END (APPROXIMATELY 3 INCHES FROM CONNECTOR).
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6. EACH CABINET SHALL BE EQUIPPED WITH TWO (2) VERTICAL POWER STRIPS. ONE POWER STRIP MUST BE 208V, 1-PHASE AND THE OTHER MUST BE 120V 1-PHASE.

2 CABINET ELEVATION - PRESS BOX IDF

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CABINET ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T5.1
Sheet No._____ of _____

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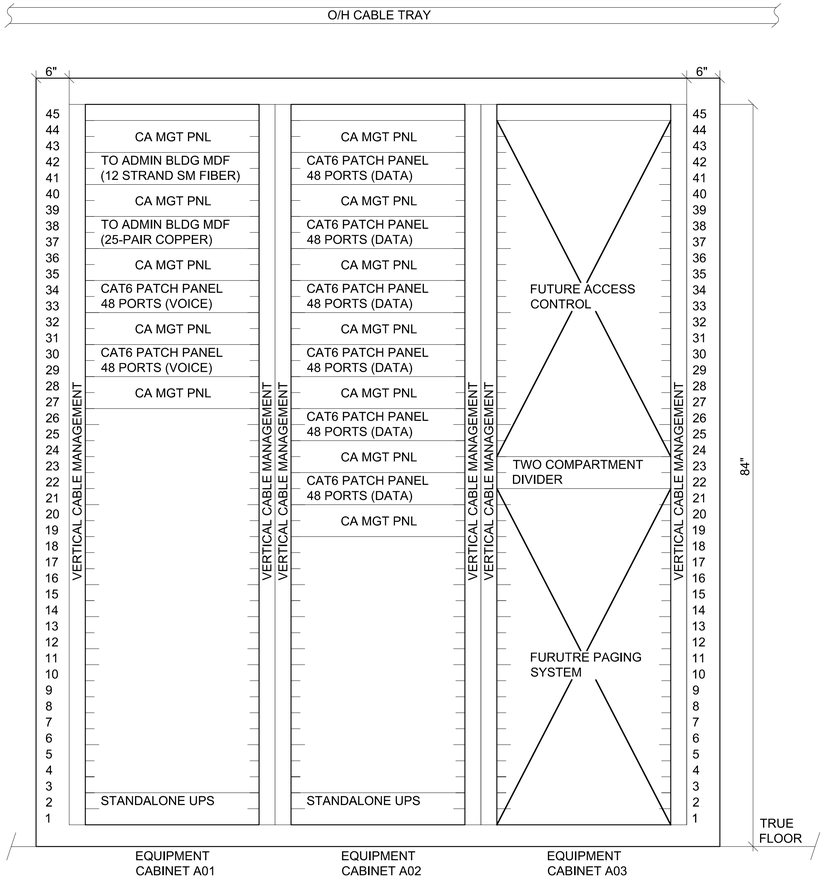
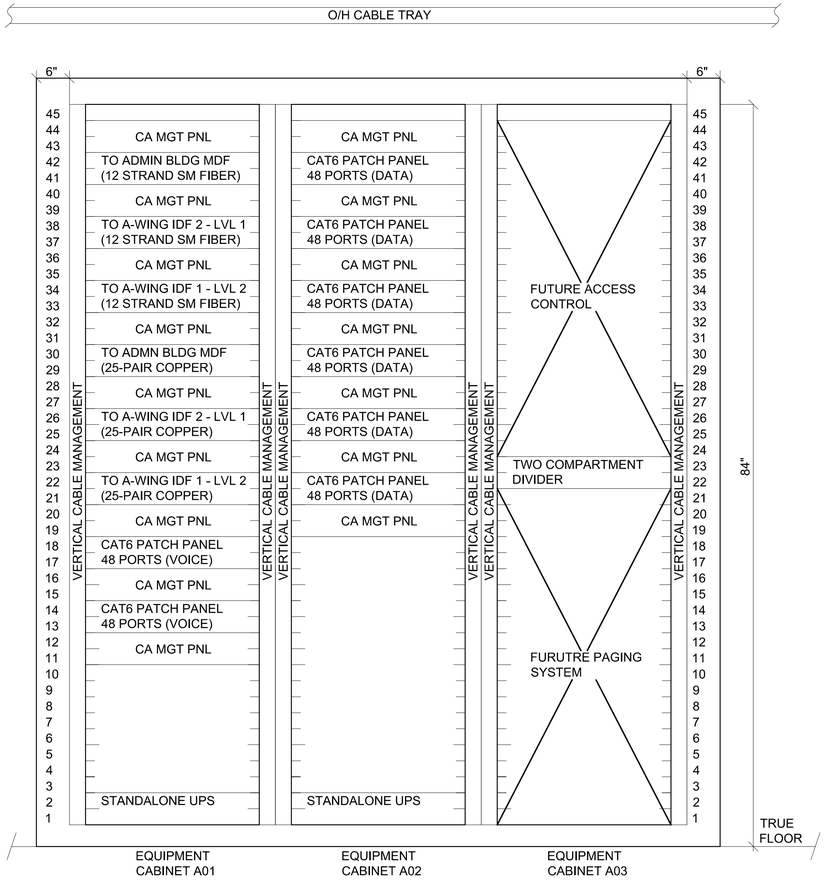


NOTES:

1. ALL EQUIPMENT CABINETS SHALL BE ANCHORED TO TRUE FLOOR USING MANUFACTURER'S RECOMMENDED ANCHORING SYSTEM.
2. PROVIDE, TERMINATE AND TEST ALL SIGNAL, POWER AND GROUND CABLES.
3. PATCH CORDS SHALL BE NEATLY ROUTED AND DRESSED IN CABLE MANAGEMENT PANELS, VERTICAL CHANNELS AND O/H CABLE LADDER.
4. ALL PATCH CORDS SHALL BE LABELED ON EACH END (APPROXIMATELY 3 INCHES FROM CONNECTOR).
5. ALL PATCH PANELS SHALL BE LABELED USING ANSI/TIA/EIA-606 LABELING SCHEME.
6. EACH CABINET SHALL BE EQUIPPED WITH TWO (2) VERTICAL POWER STRIPS. ONE POWER STRIP MUST BE 208V, 1-PHASE AND THE OTHER MUST BE 120V 1-PHASE.

1 CABINET ELEVATION - GYMNASIUM, AUDITORIUM, ADMIN (L2), CREDIT RECOVERY, GCC, CAFETERIA, & JROTC IDFs

SCALE: NO SCALE



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2 CABINET ELEVATION - A-WING IDF 1 - LEVEL 1

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36"
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REVISIONS

No.	Description	Date

TRMA
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100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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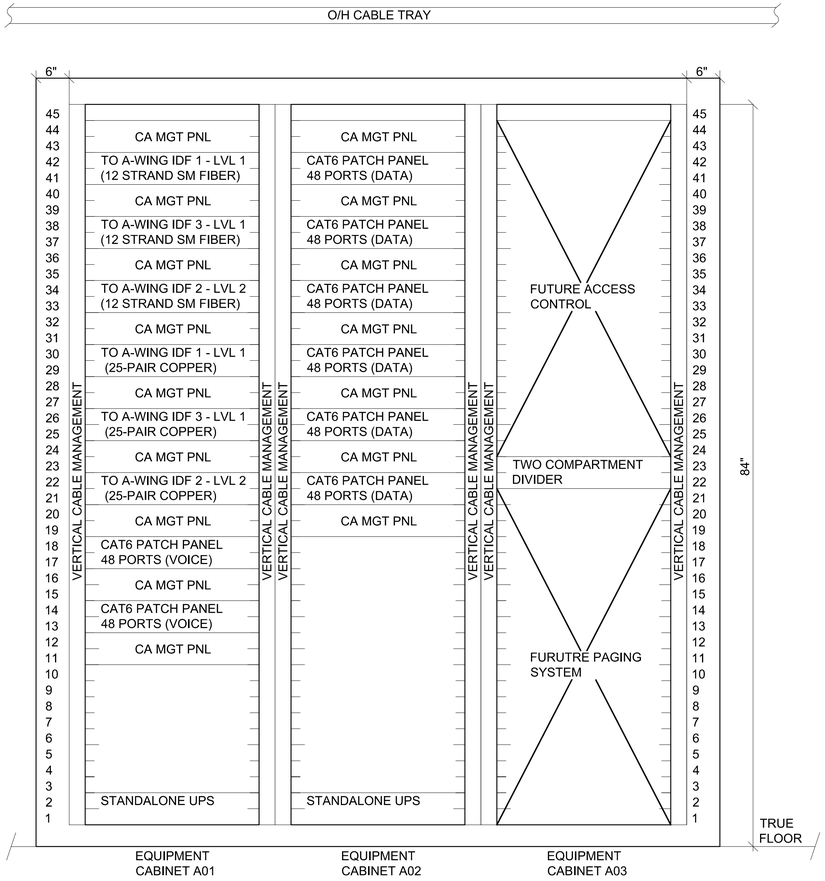
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CABINET ELEVATIONS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project: 20-133	File

Drawing No.
T5.2
Sheet No._____ of _____

NOT FOR CONSTRUCTION



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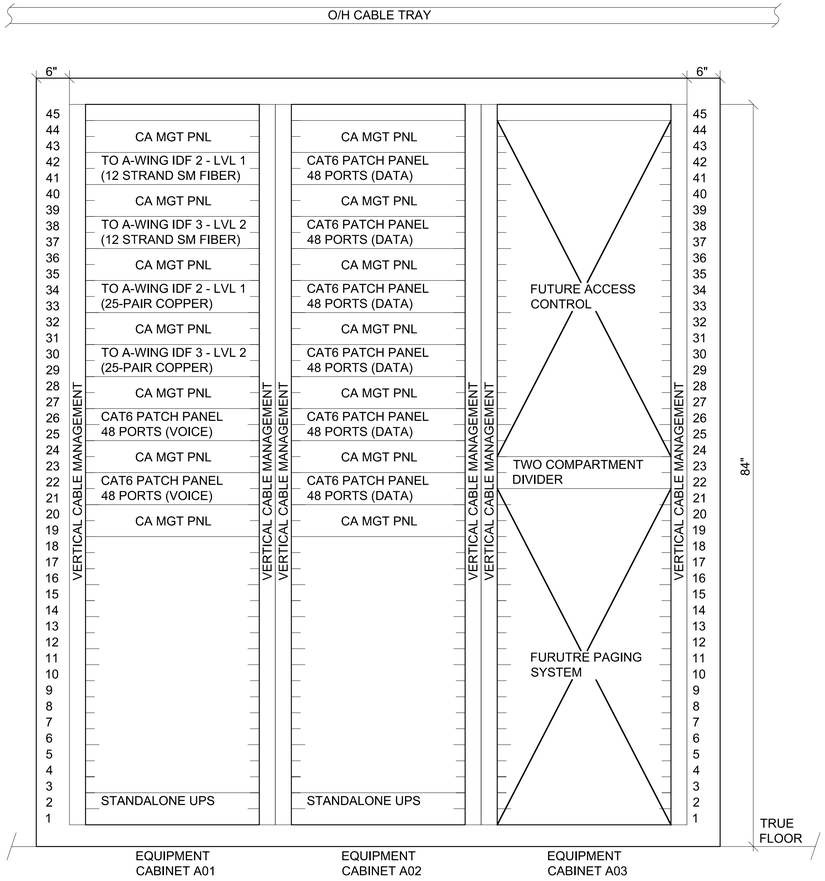
1 CABINET ELEVATION - A-WING IDF 2 - LEVEL 1

SCALE: NO SCALE



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2 CABINET ELEVATION - A-WING IDF 3 - LEVEL 1

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:	20-133
File:	

Drawing No.
T5.3
Sheet No._____ of _____

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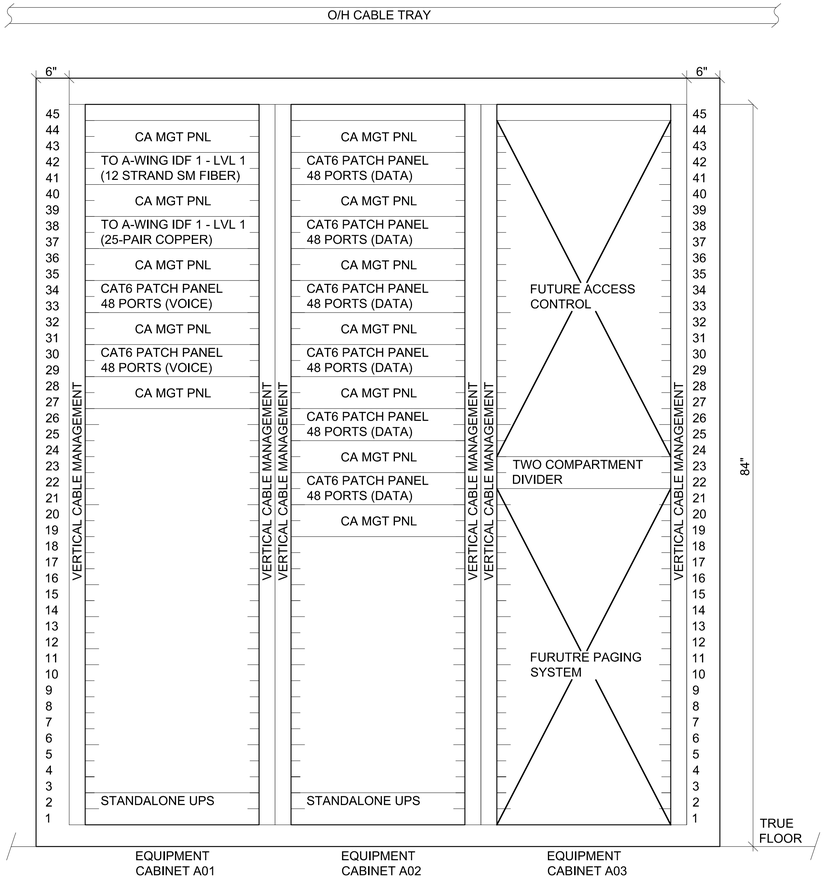

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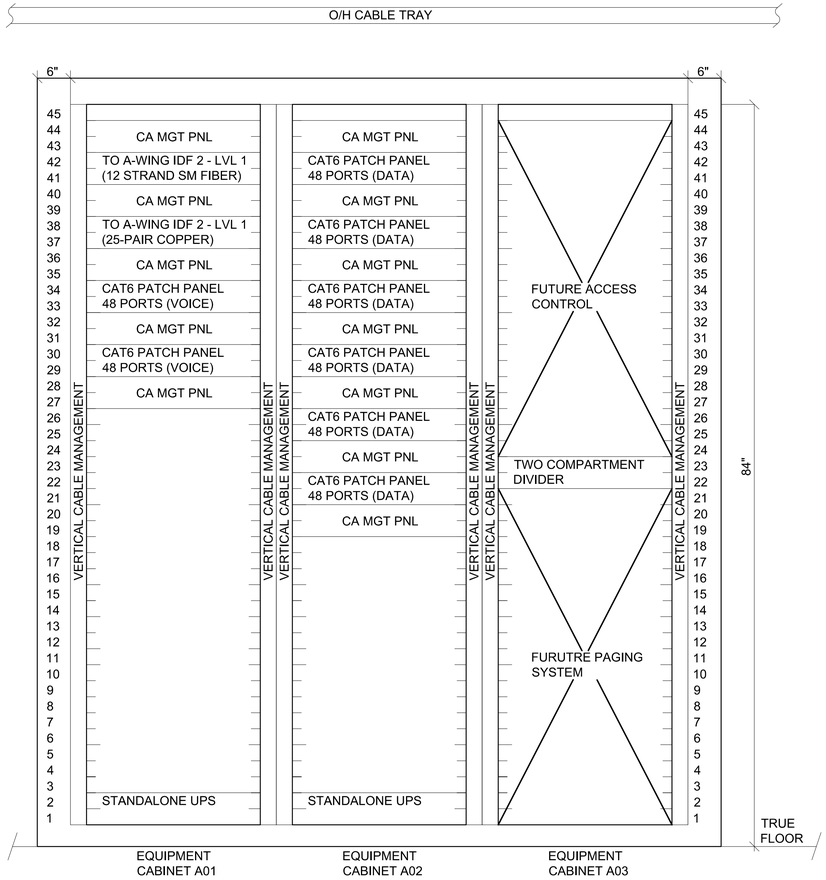
1 CABINET ELEVATION - A-WING IDF 1 - LEVEL 2

SCALE: NO SCALE



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2 CABINET ELEVATION - A-WING IDF 2 - LEVEL 2

SCALE: NO SCALE

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T5.4
Sheet No._____ of _____

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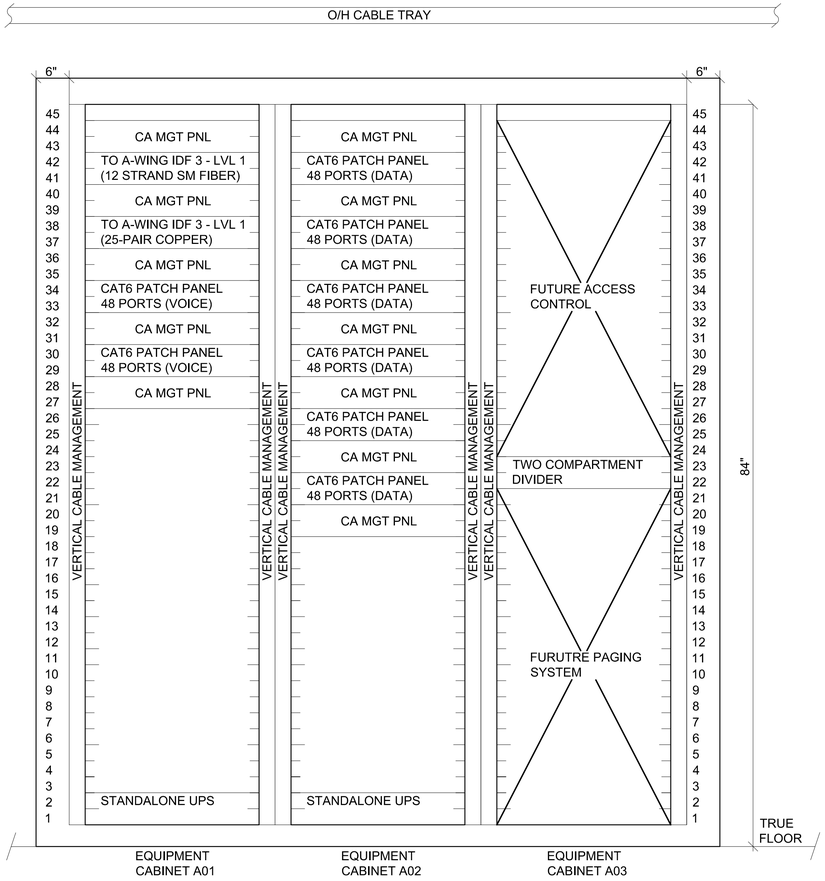

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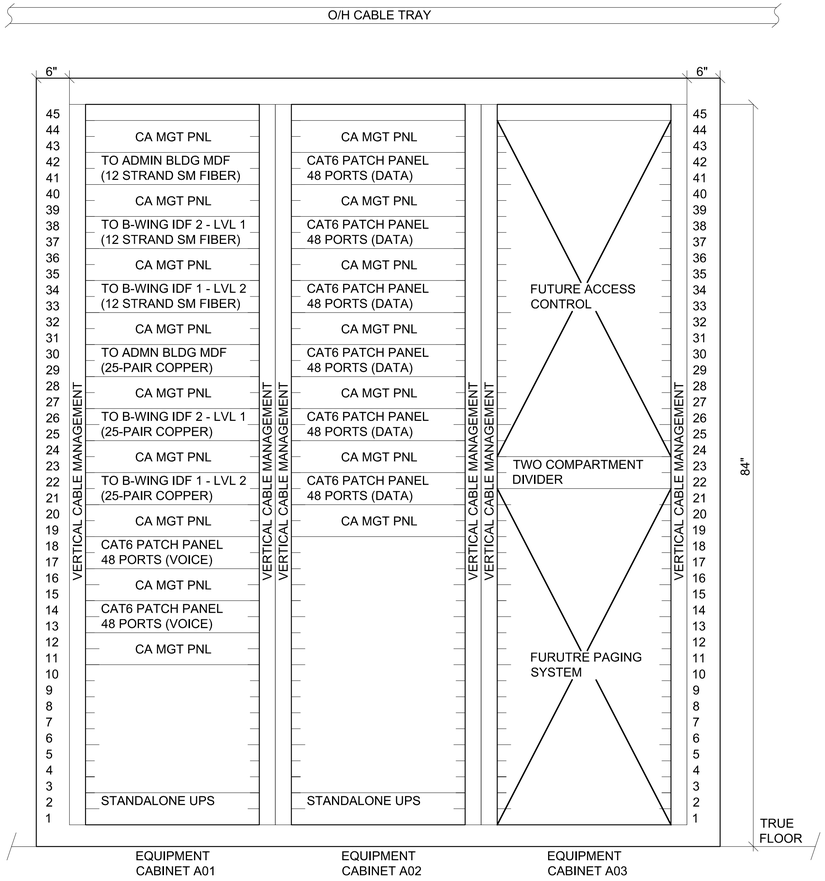
1 CABINET ELEVATION - A-WING 3 - LEVEL 2

SCALE: NO SCALE



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2 CABINET ELEVATION - B-WING 1 - LEVEL 1

SCALE: NO SCALE

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
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PROGRAMMING DOCUMENT

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Date:	3/31/25
Project	20-133
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Drawing No.
T5.5
Sheet No._____ of _____

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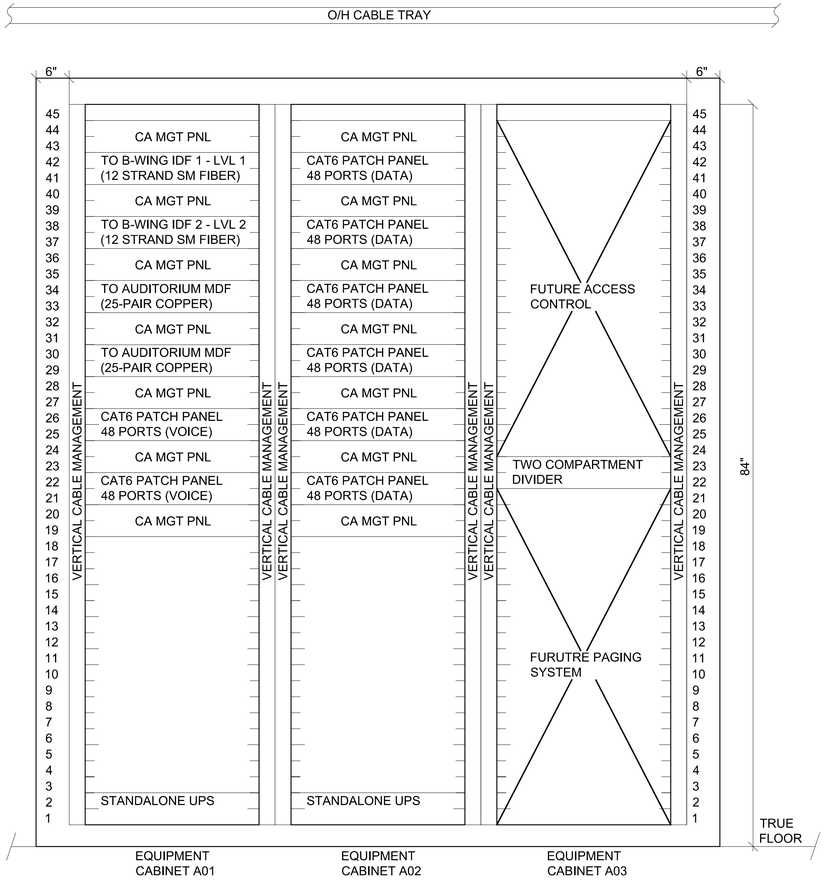

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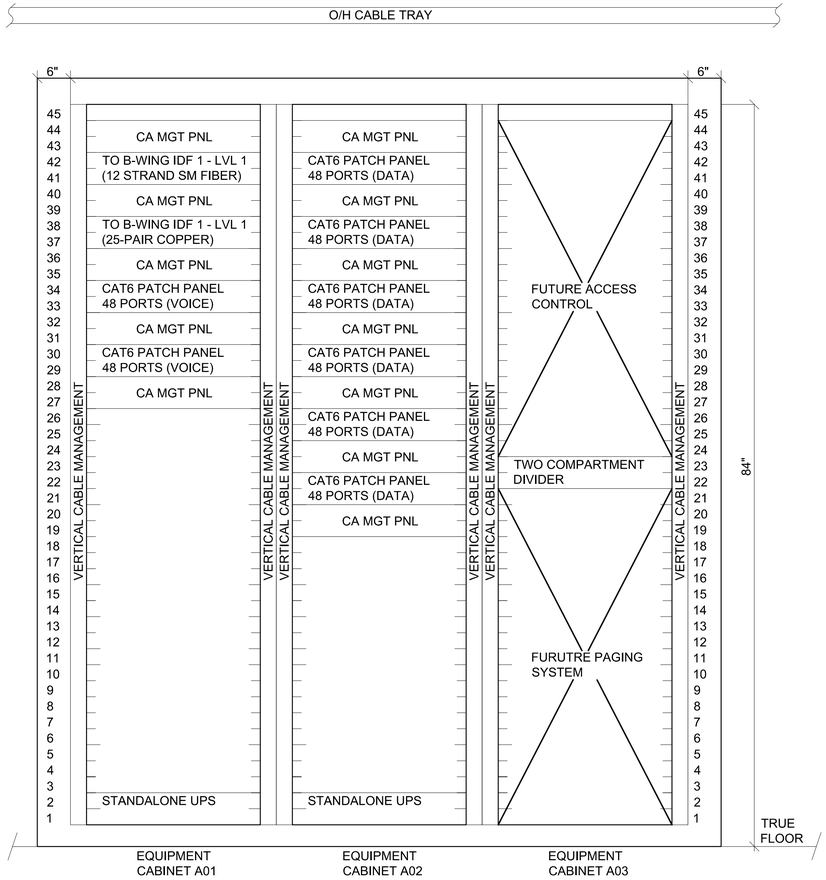
1 CABINET ELEVATION - B-WING IDF 2 - LEVEL 1

SCALE: NO SCALE



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2 CABINET ELEVATION - B-WING IDF 1 - LEVEL 2

SCALE: NO SCALE

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Project:
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Date:	3/31/25
Project	20-133
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T5.6
Sheet No._____ of _____

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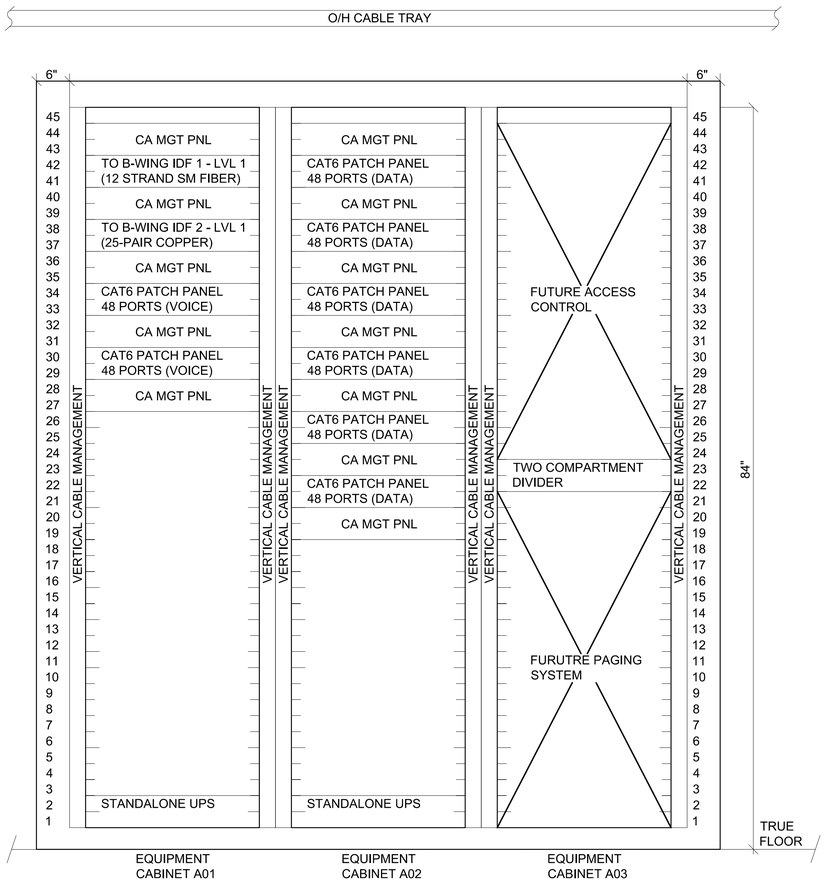

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1 CABINET ELEVATION - B-WING IDF 2 - LEVEL 2

SCALE: NO SCALE

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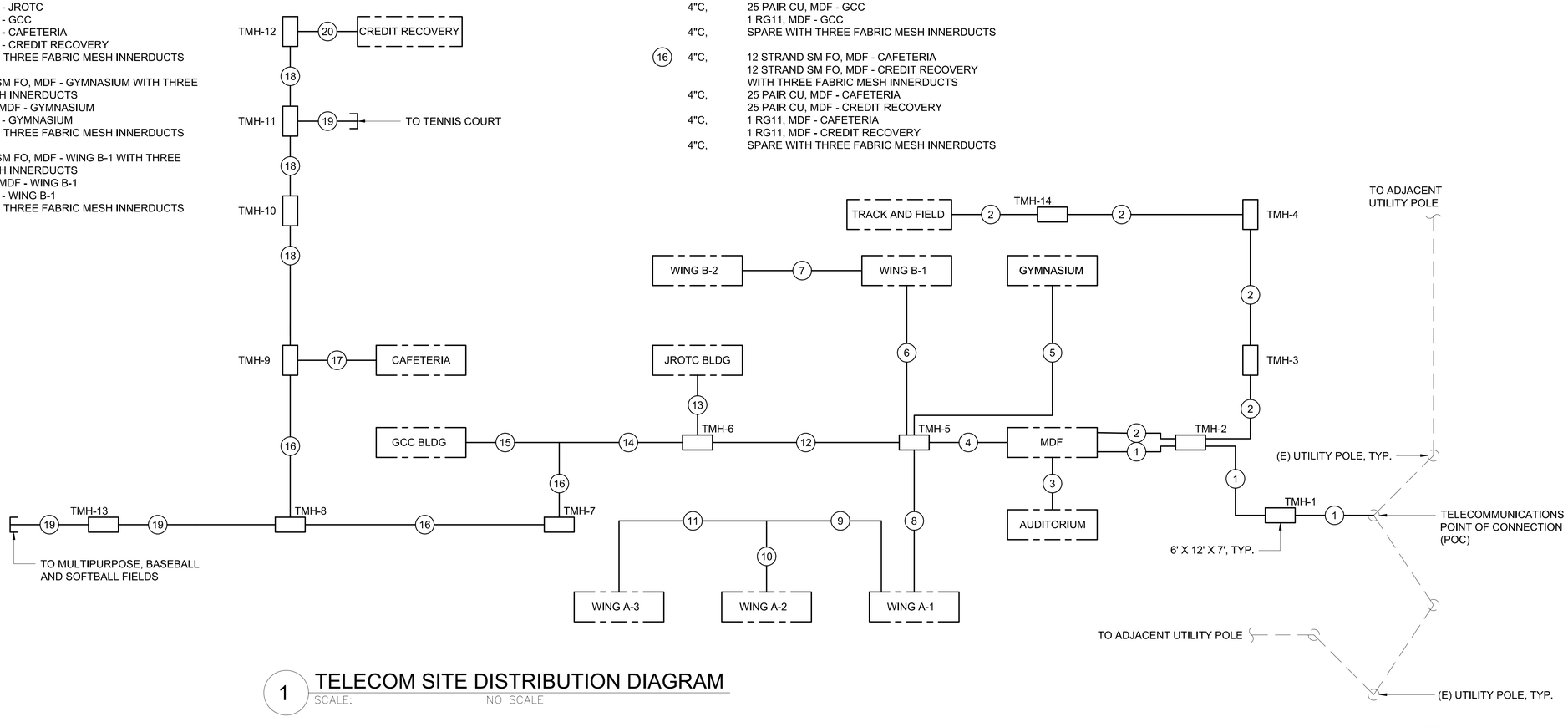
Drawing No.
T5.7
Sheet No._____ of _____

NOT FOR CONSTRUCTION

CONDUIT / CABLE SCHEDULE

(1)	4"C,	96 STRAND SM FO WITH THREE FABRIC MESH INNERDUCTS
	4"C,	200 PAIR CU
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(2)	4"C,	12 STRAND SM FO, MDF - TRACK AND FIELD
	4"C,	25 PAIR CU, MDF - TRACK AND FIELD
	4"C.	1 RG11, MDF - TRACK AND FIELD
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(3)	4"C,	12 STRAND SM FO, MDF - AUDITORIUM WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - AUDITORIUM
		1 RG11, MDF - AUDITORIUM
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(4)	4"C,	12 STRAND SM FO, MDF - GYMNASIUM
		12 STRAND SM FO, MDF - WING B-1
		12 STRAND SM FO, MDF - WING A-1
		12 STRAND SM FO, MDF - JROTC
		12 STRAND SM FO, MDF - GCC
		12 STRAND SM FO, MDF - CAFETERIA
		12 STRAND SM FO, MDF - CREDIT RECOVERY WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - GYMNASIUM
		25 PAIR CU, MDF - WING B-1
		25 PAIR CU, MDF - WING A-1
		25 PAIR CU, MDF - JROTC
		25 PAIR CU, MDF - GCC
		25 PAIR CU, MDF - CAFETERIA
		25 PAIR CU, MDF - CREDIT RECOVERY
	4"C,	1 RG11, MDF - GYMNASIUM
		1 RG11, MDF - WING B-1
		1 RG11, MDF - WING A-1
		1 RG11, MDF - JROTC
		1 RG11, MDF - GCC
		1 RG11, MDF - CAFETERIA
		1 RG11, MDF - CREDIT RECOVERY
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(5)	4"C,	12 STRAND SM FO, MDF - GYMNASIUM WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - GYMNASIUM
		1 RG11, MDF - GYMNASIUM
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(6)	4"C,	12 STRAND SM FO, MDF - WING B-1 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - WING B-1
		1 RG11, MDF - WING B-1
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(7)	4"C,	12 STRAND SM FO, WING B-1 - WING B-2 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, WING B-1 - WING B-2
		1 RG11, WING B-1 - WING B - 2
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(8)	4"C,	12 STRAND SM FO, MDF - WING A-1 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - WING A-1
		1 RG11, MDF - WING A-1
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(9)	4"C,	12 STRAND SM FO, WING A-1 - WING A-2 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	12 STRAND SM FO, WING A-1 - WING A-3 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, WING A-1 - WING A-2
		1 RG11, WING A-1 - WING A-2
	4"C,	25 PAIR CU, WING A-1 - WING A-3
		1 RG11, WING A-1 - WING A-3
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(10)	4"C,	12 STRAND SM FO, WING A-1 - WING A-2 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, WING A-1 - WING A-2
		1 RG11, WING A-1 - WING A-2
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(11)	4"C,	12 STRAND SM FO, WING A-1 - WING A-3 WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, WING A-1 - WING A-3
		1 RG11, WING A-1 - WING A-3
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(12)	4"C,	12 STRAND SM FO, MDF - JROTC
		12 STRAND SM FO, MDF - GCC
		12 STRAND SM FO, MDF - CAFETERIA
		12 STRAND SM FO, MDF - CREDIT RECOVERY WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - JROTC
		25 PAIR CU, MDF - GCC
		25 PAIR CU, MDF - CAFETERIA
		25 PAIR CU, MDF - CREDIT RECOVERY
	4"C,	1 RG11, MDF - JROTC
		1 RG11, MDF - GCC
		1 RG11, MDF - CAFETERIA
		1 RG11, MDF - CREDIT RECOVERY
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(13)	4"C,	12 STRAND SM FO, MDF - JROTC WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - JROTC
		1 RG11, MDF - JROTC
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(14)	4"C,	12 STRAND SM FO, MDF - GCC
		12 STRAND SM FO, MDF - CAFETERIA
		12 STRAND SM FO, MDF - CREDIT RECOVERY WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - GCC
		25 PAIR CU, MDF - CAFETERIA
		25 PAIR CU, MDF - CREDIT RECOVERY
	4"C,	1 RG11, MDF - GCC
		1 RG11, MDF - CAFETERIA
		1 RG11, MDF - CREDIT RECOVERY
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(15)	4"C,	12 STRAND SM FO, MDF - GCC WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - GCC
		1 RG11, MDF - GCC
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(16)	4"C,	12 STRAND SM FO, MDF - CAFETERIA
		12 STRAND SM FO, MDF - CREDIT RECOVERY WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - CAFETERIA
		25 PAIR CU, MDF - CREDIT RECOVERY
	4"C,	1 RG11, MDF - CAFETERIA
		1 RG11, MDF - CREDIT RECOVERY
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(17)	4"C,	12 STRAND SM FO, MDF - CAFETERIA WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - CAFETERIA
		1 RG11, MDF - CAFETERIA
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(18)	4"C,	12 STRAND SM FO, MDF - CREDIT RECOVERY WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - CREDIT RECOVERY
	4"C,	1 RG11, MDF - CREDIT RECOVERY
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(19)	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS
(20)	4"C,	12 STRAND SM FO, MDF - CREDIT RECOVERY WITH THREE FABRIC MESH INNERDUCTS
	4"C,	25 PAIR CU, MDF - CREDIT RECOVERY
		1 RG11, MDF - CREDIT RECOVERY
	4"C,	SPARE WITH THREE FABRIC MESH INNERDUCTS



1 TELECOM SITE DISTRIBUTION DIAGRAM
SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

No.	Description	Date

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Tel.: (671) 475-8772 • Fax.: (671) 472-3381
Architecture
Planning
Interior Design

INSYNERGY ENGINEERING
MECHANICAL • ELECTRICAL • FIRE PROTECTION

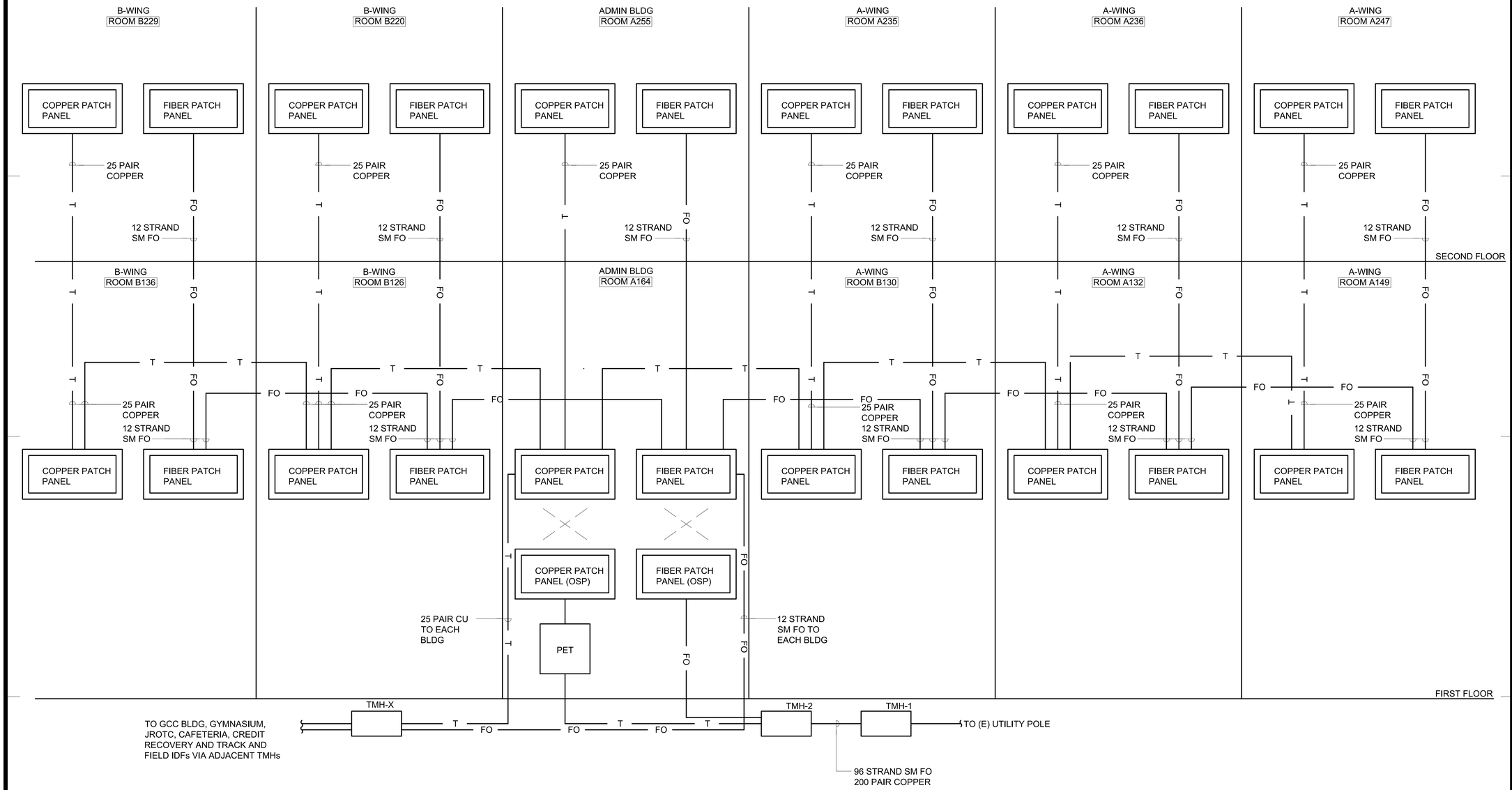
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
TELECOM SITE DISTRIBUTION DIAGRAM
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.1
Sheet No._____ of _____



1 TELECOM RISER DIAGRAM - ADMIN, A-WING AND B-WING

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
TELECOM RISER DIAGRAM - ADMIN, A-WING AND B-WING
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project: 20-133	File

Drawing No.
T6.2
Sheet No._____ of _____

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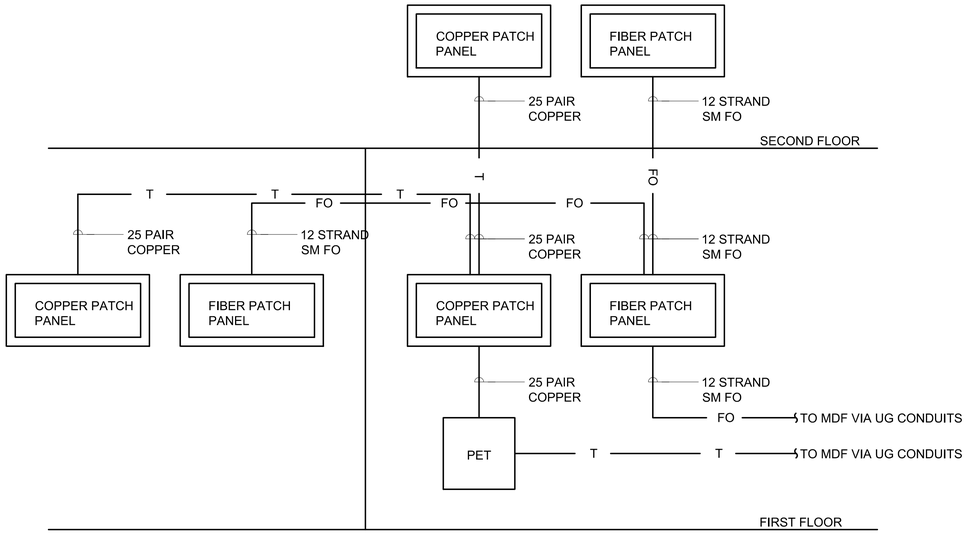
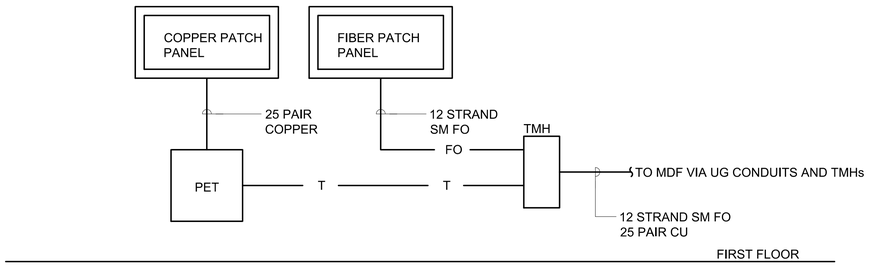


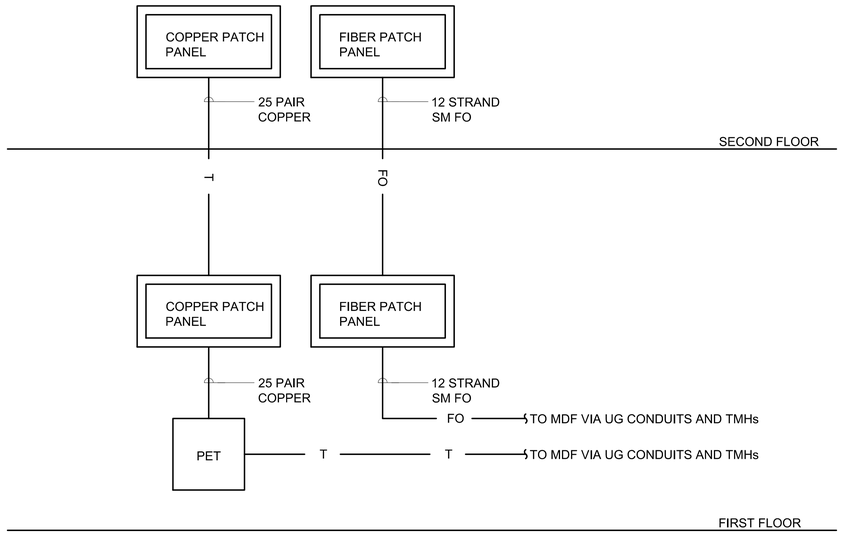
3 TELECOM RISER DIAGRAM - AUDITORIUM A186B

SCALE: NO SCALE



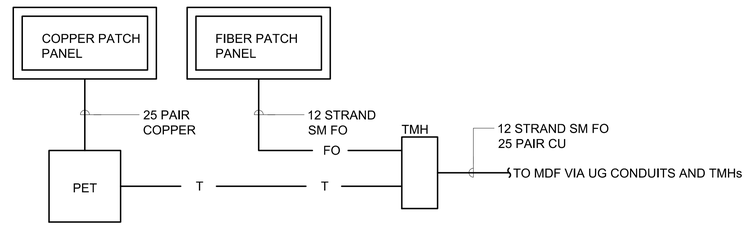
4 TELECOM RISER DIAGRAM - JROTC, GCC AND CAFETERIA BLDGS

SCALE: NO SCALE



1 TELECOM RISER DIAGRAM - GYMNASIUM B147

SCALE: NO SCALE



2 TELECOM RISER DIAGRAM - CREDIT RECOVERY AND TRACK AND FIELD BLDGS (PHASE 2)

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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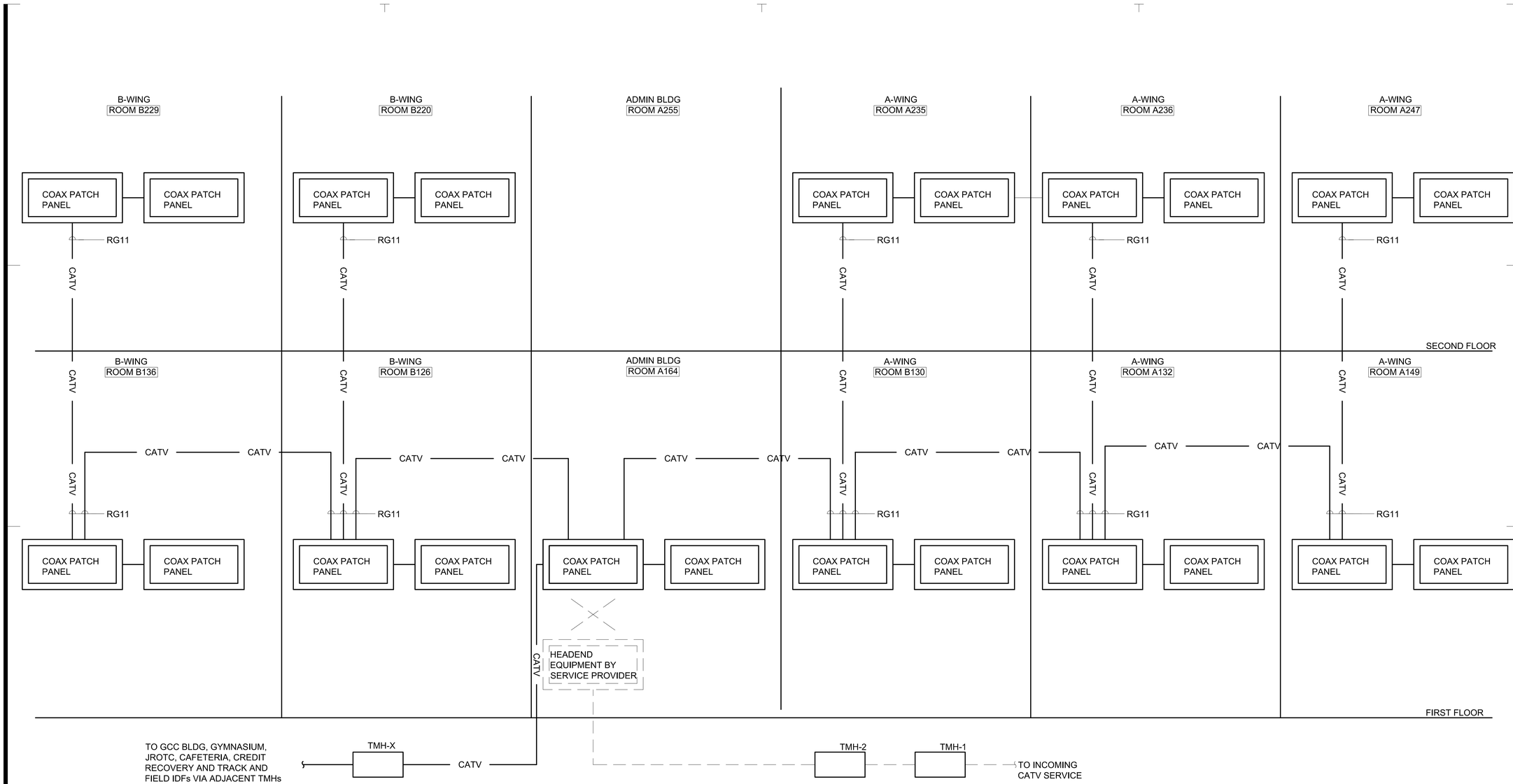
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
TELECOM RISER DIAGRAMS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.3
Sheet No._____ of _____



NOTES:

1. PROVIDE A COMPLETE SYSTEM CONSISTING OF BACKBOARDS / CABINETS, CABLE, CONDUIT, AND OUTLETS WITH JACKS. INCLUDE AMPLIFIERS, SPLITTERS, COMBINERS, LINE TAPS, CABLES, OUTLETS, TILT COMPENSATORS AND ALL OTHER PARTS, COMPONENTS, AND OTHER HEADEND EQUIPMENT NECESSARY TO PROVIDE A COMPLETE AND USABLE SYSTEM. OUTSIDE PLANT TRUNK CABLES AND HEADEND EQUIPMENT SHALL BE PROVIDED BY CATV PROVIDER.

2. COORDINATE ALL WORK WITH LOCAL CATV PROVIDER.

1 CATV SYSTEM RISER DIAGRAM - ADMIN, A-WING AND B-WING

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

REVISIONS

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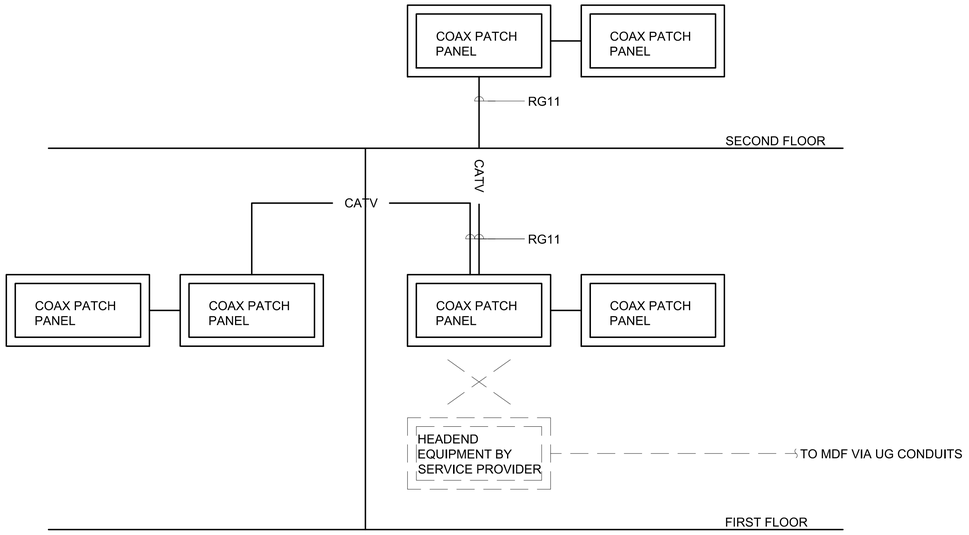
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CATV SYSTEM RISER DIAGRAM - ADMIN, A-WING AND B-WING
PROGRAMMING DOCUMENT

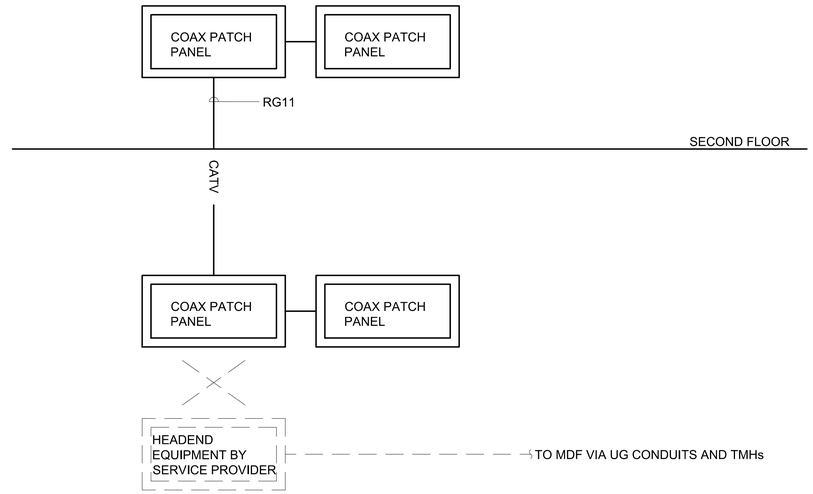
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.4
Sheet No. ____ of ____

NOT FOR CONSTRUCTION



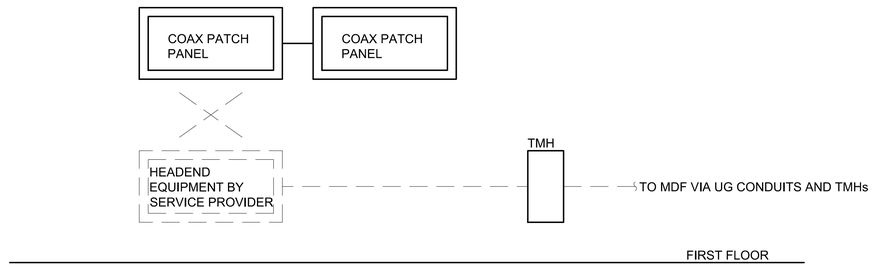
3 CATV SYSTEM RISER DIAGRAM - AUDITORIUM
SCALE: NO SCALE



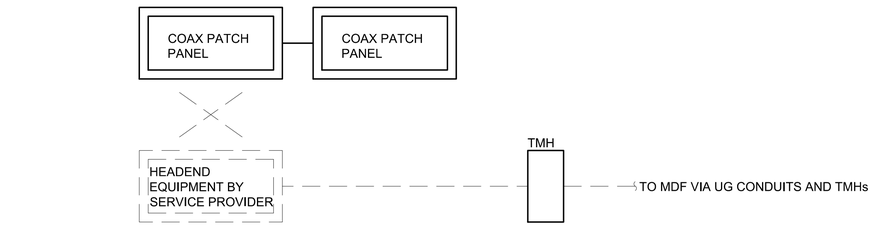
1 CATV SYSTEM RISER DIAGRAM - GYMNASIUM
SCALE: NO SCALE

NOTES:

1. PROVIDE A COMPLETE SYSTEM CONSISTING OF BACKBOARDS / CABINETS, CABLE, CONDUIT, AND OUTLETS WITH JACKS. INCLUDE AMPLIFIERS, SPLITTERS, COMBINERS, LINE TAPS, CABLES, OUTLETS, TILT COMPENSATORS AND ALL OTHER PARTS, COMPONENTS, AND OTHER HEADEND EQUIPMENT NECESSARY TO PROVIDE A COMPLETE AND USABLE SYSTEM. OUTSIDE PLANT TRUNK CABLES AND HEADEND EQUIPMENT SHALL BE PROVIDED BY CATV PROVIDER.
2. COORDINATE ALL WORK WITH LOCAL CATV PROVIDER.



4 CATV SYSTEM RISER DIAGRAM - JROTC, GCC AND CAFETERIA BLDGS
SCALE: NO SCALE



2 CATV SYSTEM RISER DIAGRAM - CREDIT RECOVERY AND TRACK AND FIELD BLDGS (PHASE 2)
SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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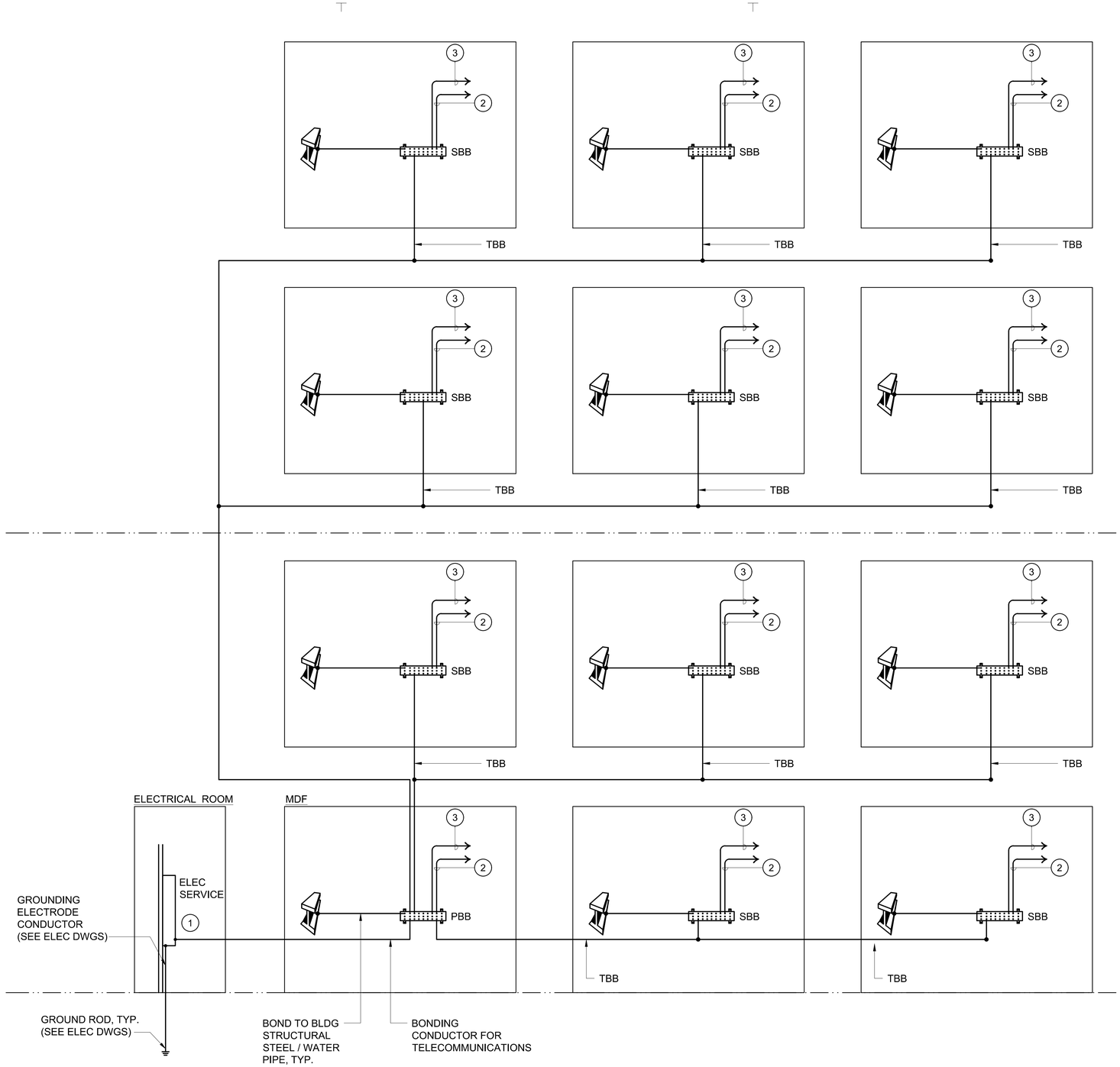
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
CATV SYSTEM RISER DIAGRAMS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.5
Sheet No. of

NOT FOR CONSTRUCTION



GENERAL NOTES:

1. BOND ALL RACKS, PATHWAYS, AND EQUIPMENT TO GROUND PER TIA-607 AND THE NEC.
2. EACH TELECOMMUNICATIONS GROUNDING AND BONDING CONDUCTOR SHALL BE LABELED. LABELS SHALL BE LOCATED ON CONDUCTORS AS CLOSE AS PRACTICABLE TO THEIR POINT OF TERMINATION IN A READABLE POSITION. LABELS SHALL BE NONMETALLIC. REFER TO TIA-606 AND FOR ADDITIONAL LABELING REQUIREMENTS.
3. VERIFY GROUNDING CONDUCTOR SIZE WITH TABLE 1, TIA-607, PARAGRAPH 6.3.2. ADJUST SIZE BASED ON LENGTH AS REQUIRED.

KEY NOTES:

(1) BONDING CONDUCTOR TO ELECTRICAL SERVICE ENTRANCE GROUND. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL SERVICE ENTRANCE EQUIPMENT.

(2) TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR (TEBC) TO EQUIPMENT AND PATHWAYS, #6 AWG MIN. SIZE GROUND CONDUCTORS PER ANSI TIA-607.

(3) BOND TO TELECOM ROOM PANELBOARD GROUND.

1 GROUNDING SYSTEM DIAGRAM - ADMIN BLDG, A-WING & B-WING

SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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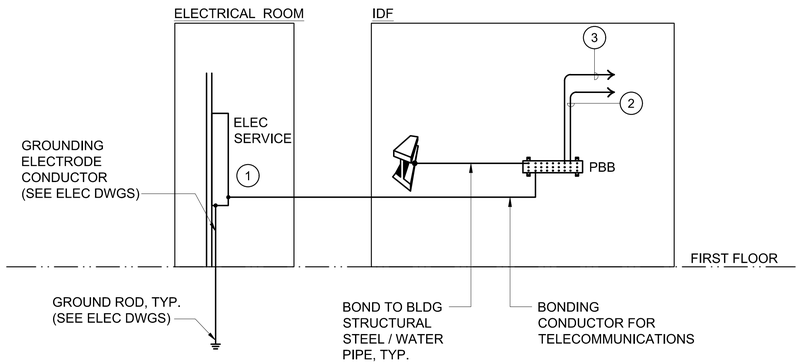
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
GROUNDING SYSTEM DIAGRAMS
PROGRAMMING DOCUMENT

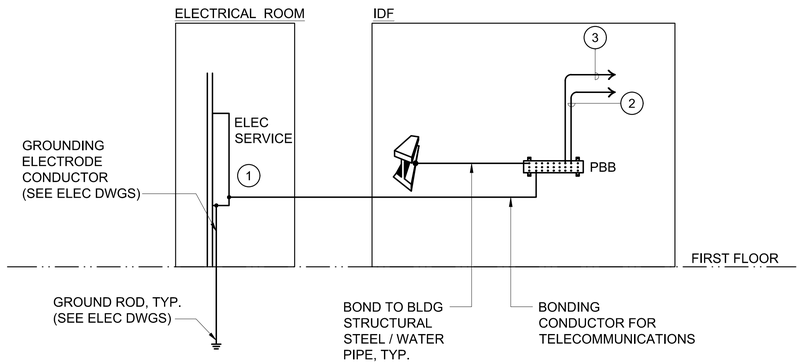
Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.6
Sheet No._____ of _____



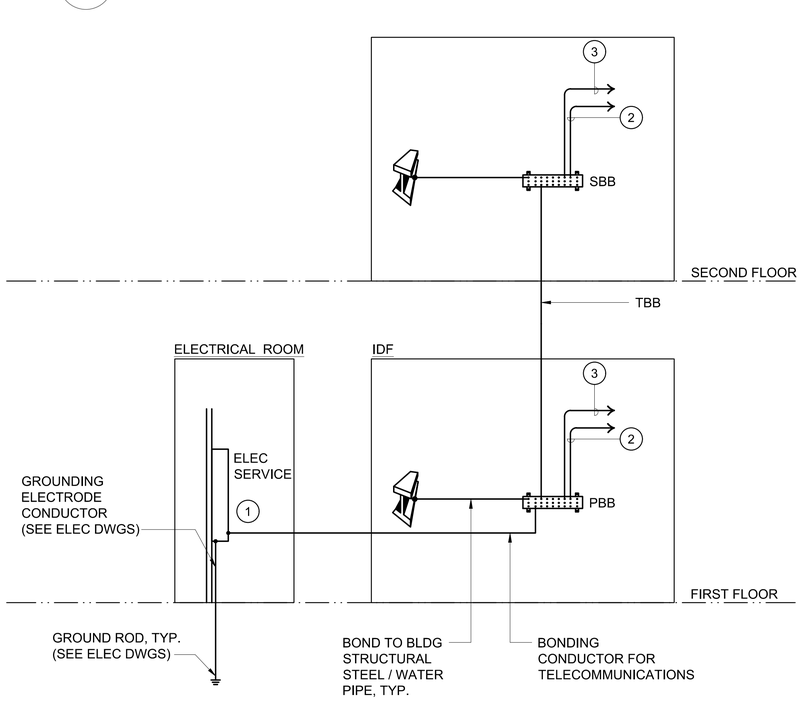
3 GROUNDING SYSTEM DIAGRAM - JROTC, GCC AND CAFETERIA BLDGS

SCALE: NO SCALE



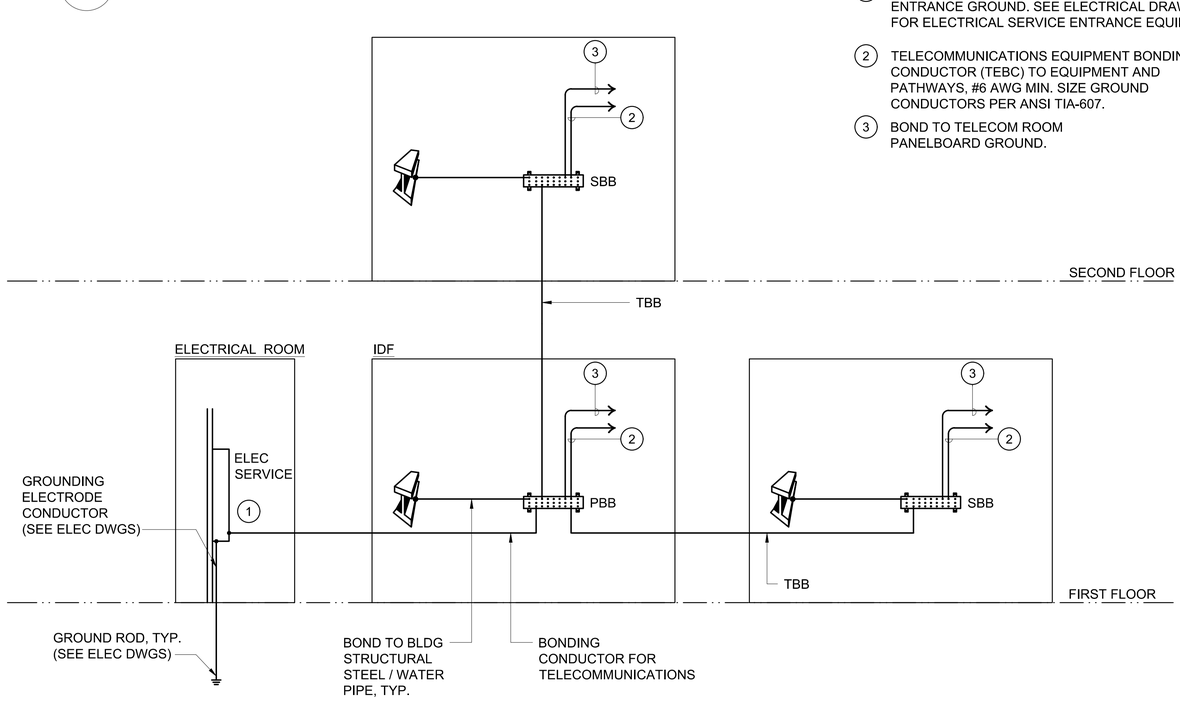
4 GROUNDING SYSTEM DIAGRAM - CREDIT RECOVERY AND TRACK AND FIELD BLDGS (PHASE 2)

SCALE: NO SCALE



1 GROUNDING SYSTEM DIAGRAM - GYMNASIUM

SCALE: NO SCALE



2 GROUNDING SYSTEM DIAGRAM - AUDITORIUM

SCALE: NO SCALE

GENERAL NOTES:

1. BOND ALL RACKS, PATHWAYS, AND EQUIPMENT TO GROUND PER TIA-607 AND THE NEC.
2. EACH TELECOMMUNICATIONS GROUNDING AND BONDING CONDUCTOR SHALL BE LABELED. LABELS SHALL BE LOCATED ON CONDUCTORS AS CLOSE AS PRACTICABLE TO THEIR POINT OF TERMINATION IN A READABLE POSITION. LABELS SHALL BE NONMETALLIC. REFER TO TIA-606 AND FOR ADDITIONAL LABELING REQUIREMENTS.
3. VERIFY GROUNDING CONDUCTOR SIZE WITH TABLE 1, TIA-607, PARAGRAPH 6.3.2. ADJUST SIZE BASED ON LENGTH AS REQUIRED.

KEY NOTES:

(1) BONDING CONDUCTOR TO ELECTRICAL SERVICE ENTRANCE GROUND. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL SERVICE ENTRANCE EQUIPMENT.

(2) TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR (TEBC) TO EQUIPMENT AND PATHWAYS, #6 AWG MIN. SIZE GROUND CONDUCTORS PER ANSI TIA-607.

(3) BOND TO TELECOM ROOM PANELBOARD GROUND.

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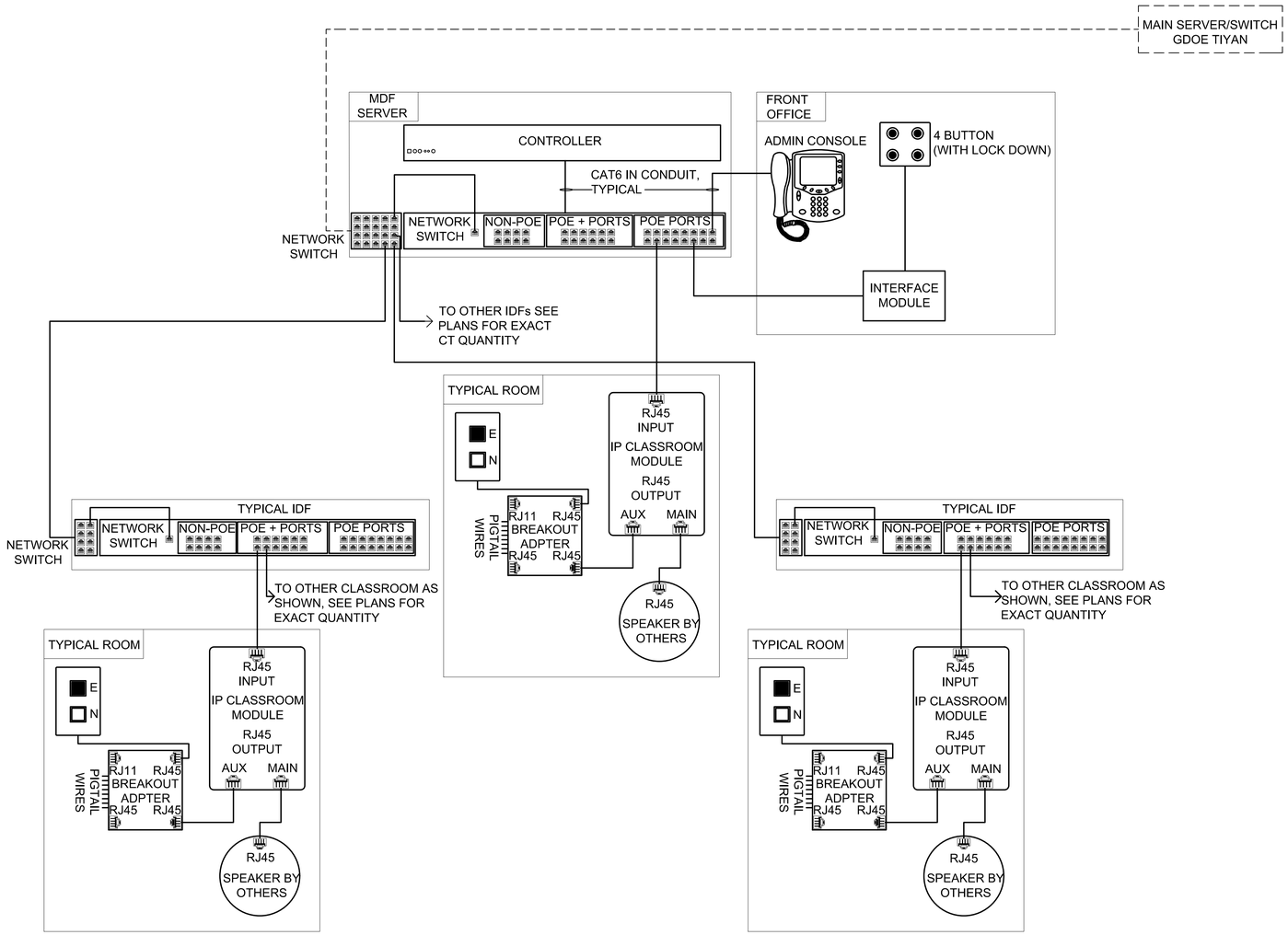
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

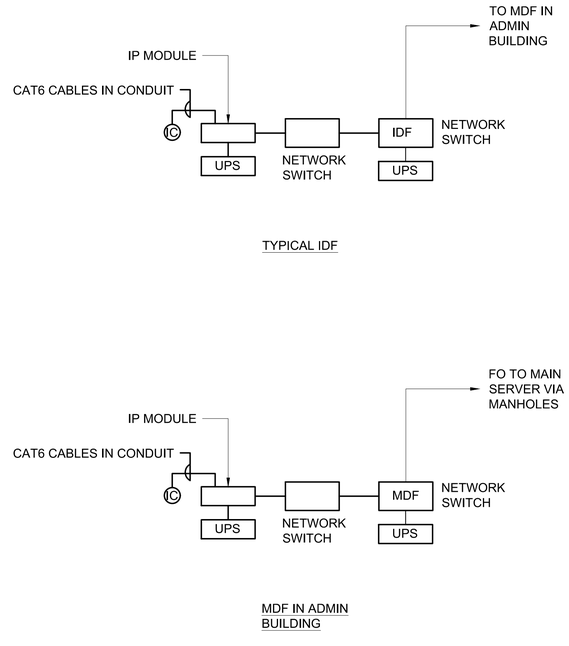
Title:
GROUNDING SYSTEM DIAGRAMS
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.7
Sheet No. of



1 INTERCOM SYSTEM RISER DIAGRAM
SCALE: NO SCALE



2 INTERCOM SYSTEM DIAGRAM
SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT – USE GRAPHIC SCALES

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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
INTERCOM SYSTEM RISER DIAGRAM
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project	20-133
File	

Drawing No.
T6.8
Sheet No. _____ of _____

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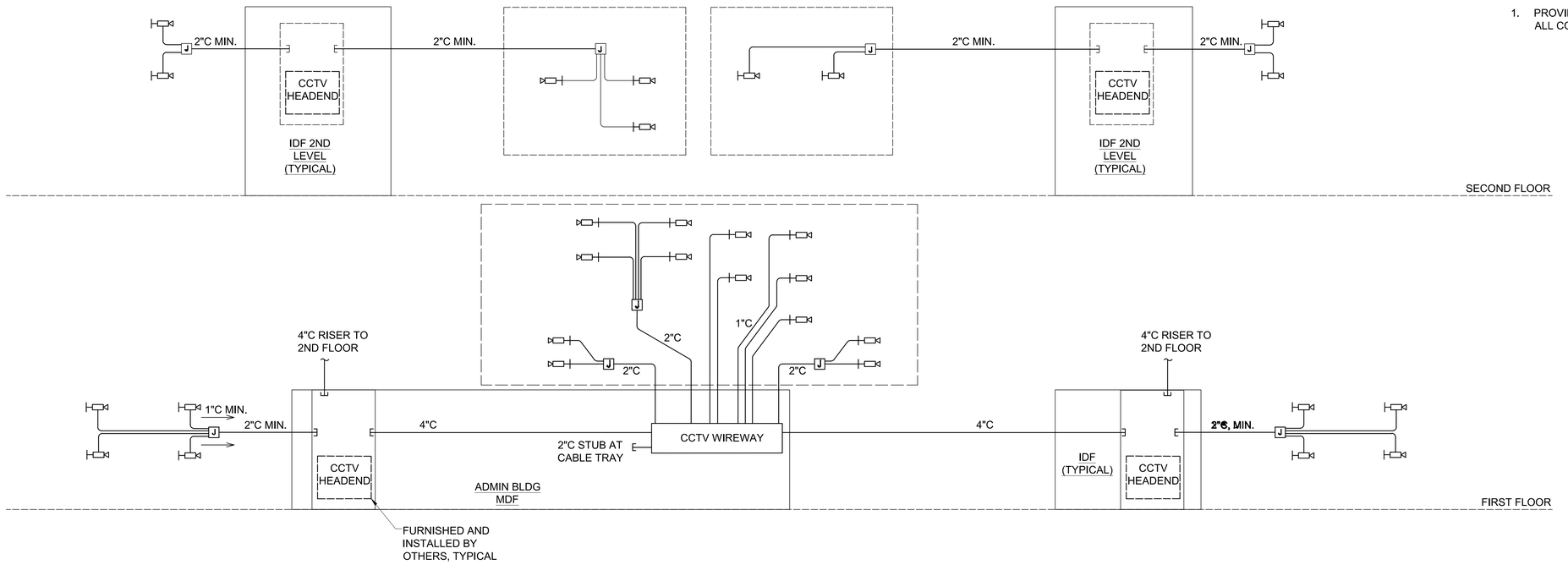

NOTES:

1. PROVIDE PULLSTRING IN ALL CCTV PATHWAYS.

1 CCTV SYSTEM RISER DIAGRAM
SCALE: NO SCALE

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT – USE GRAPHIC SCALES

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SIMON SANCHEZ HIGH SCHOOL

Title:
CCTV SYSTEM DIAGRAM
PROGRAMMING DOCUMENT

Designed:	KH
Drawn:	DP
Checked:	JR
Supv:	GM
Scale:	NTS
Date:	3/31/25
Project: 20-133	File

Drawing No.
T6.9
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

SECTION 01068

REFERENCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Specifications format and content.

2. Quality assurance.

3. Reference standards.

4. Abbreviations.

5. Definitions.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 SPECIFICATIONS FORMAT AND CONTENT

A. Specifications Format: The Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's (CSI) 16-Division format numbering system.

B. The Bid and Contract Documents issued by the Owner are included with the Specifications. The Owner-issued documents will take precedence should there be any conflict between them and the Specifications.

C. Specifications Content: The Specifications use certain conventions in language and intended meaning of certain terms, words and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated type. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe the responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

a. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

1.3 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or other consensus standards, the Contractor shall comply with the requirements of the standard, except when more rigid requirements are specified or are required by applicable codes. Such standards are made a part of the Contract Documents by reference.

B. Conform to the reference standards by the date of issue that was current on the original date of the Contract Documents.

C. Obtain copies of the standards when required by the Contract Documents.

D. Maintain a copy of the standards at the Project Site during submittals, planning and progress of the specific work until Final Acceptance.

E. Should a specified reference standard conflict with the Contract Documents, request clarification from the Owner's representative before proceeding.

F. Neither the contractual relationship, duties or responsibilities of the parties to the Contract nor those of the Owner's representative shall be altered from the Contract Documents by any mention or inference otherwise in any reference document.

1.4 INDUSTRY STANDARDS AND CODES:

A. General Applicability of Standards: Applicable standards of the construction industry and Building Codes adopted by the governing agencies have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith.

B. Referenced Standards (referenced directly in the Contract Documents or by governing regulations) have precedence over non-referenced standards which are recognized in the industry for applicability to the work. Except as otherwise indicated, where compliance with an industry standard is required, comply with the standard in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, refer the requirements that are different but apparently equal, and uncertainties to the Owner's representative for decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified or it may exceed the minimum within reasonable limits. In complying with these requirements, the indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Owner's representative for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction of the Project is required to be familiar with the industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound within the Contract Documents.

1. Where copies of standards are needed for the performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

1.5 ABBREVIATIONS

A. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Company.

1.6 DEFINITIONS (People and Entities)

A. Definitions specified herein are included in order to further clarify terms.

B. Architect-Engineer (of Record): The Architect-Engineer is the person lawfully licensed to practice in professional disciplines such as architecture or civil, structural, mechanical, and electrical engineering.

C. Installer: The Contractor or another entity engaged by the Contractor, either as employee, subcontractor or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, unpacking, assembly, placing, finishing, curing, adjusting, cleaning, protection or similar operation. Installers are required to be experienced in the operations they are engaged to perform.

1. Experienced: The term "experienced," when used with the term "installer," means having a minimum number of years experience on projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authorities having jurisdiction.

2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that the requirements specified apply exclusively to tradespersons of the corresponding generic name.

D. Manufacturer: A person, firm or corporation who makes products.

E. Owner: The individual, firm, corporation or government entity that owns the Project.

F. Owner’s Representative: The individual, firm or company administering the Contract on behalf of the Owner. Owner’s representative may be the Owner him / herself, the Architect of Record, project engineer, Project Manager or other, as designated by the Owner, and includes a duly appointed successor or authorized representative.

G. Project Field Superintendent: The Contractor's representative at the Project Site who is responsible for continuous field supervision, coordination, quality control, completion of the Project, and for the prevention of accidents, unless another person is designated, in writing, by the Contractor.

H. Subcontractor: An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for performance of a part of the work at the Project Site.

I. Supplier: A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with the Contractor or with any subcontractor to furnish materials or equipment to be incorporated into the work by the Contractor or any subcontractor, but does not perform labor at the Project Site.

J. Separate Contractor: An individual, firm or corporation having a direct contract with the Owner for performance of part of the work at the Project Site.

K. Testing Laboratory: An independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret the results of those inspections or tests.

L. Trade: See Installer.

M. Utility: Local utility agency providing service to the Project..

1.7 DEFINITIONS (Things, Services, and Dispositions)

A. Acceptable: Satisfactory to and approved by the Owner's representative.

B. Approve: The term "approved," when used in conjunction with the Owner representative's action on the Contractor's submittals, applications and requests, is limited to the Owner representative's duties and responsibilities as stated in the Contract.

C. Change Order: A modification to the Contract.

D. Clarification Drawing: A graphic interpretation of a Drawing or other Contract Documents issued by the Architect through the Owner's representative.

E. Construction Operations: Activities of the Contractor at the Project Site.

F. Directed: Instructed by the Owner's representative.

G. Experienced (Qualified): When used to describe the "installer", "fabricator" or similar terms; a person, firm or corporation skilled through observation or of participation in the particular activities required to complete the work or a portion of the work to the degree of quality specified.

H. Final Connections: Complete plumbing, mechanical and electrical connections as required and recommended by the manufacturer for optimum operation of the equipment.

I. Indicated: The term "indicated" refers to graphic representations, notes or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled" and "specified" are used, it is to help the reader locate the reference. Location is not limited.

J. Install: Operations at the Project Site including actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

1. Final Connections: Complete plumbing, mechanical and electrical connections as required and recommended by the manufacturer for optimum operation of equipment.

K. Mobilization: To establish and commence work activity at the Project Site.

L. Partial Occupancy: Partial Occupancy occurs when the Owner begins to occupy part of the Project for its own purposes, such as early fixture set-up, merchandising, etc. Partial Occupancy shall not constitute acceptance of work not in accordance with the Contract Documents.

M. Premises: Space or property made available to the Contractor for constructing the work.

N. Project Site: The space available to the Contractor for performing construction operations, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

O. Receive: Accepting a delivery. (Entity responsible for accepting a delivery.)

P. Regulations: The term "Regulations" includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the work.

Q. Reviewed: Examined and found acceptable by the Owner's representative.

R. Substantial Completion: The stage in progress of the work when the work or a designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the work for its intended use.

S. Substitution: A product that is exchanged for another of the same function and is of equal or better quality.

T. Supply: To supply, deliver, unload and inspect for damage (same as Furnish).

U. Unacceptable: Determined not satisfactory by the Owner's representative.

1.8 DRAWING:

A. Except as otherwise indicated, graphic symbols used on the Drawings are those symbols recognized in the construction industry for the purposes indicated.

B. Discrepancies: In the event of a discrepancy, as between small scale Drawings and larger scale Details, or between Drawings and Specifications, or within the Specifications, immediately bring the discrepancy to the attention of the Owner's representative / Architect / Engineer for a decision before proceeding with the particular work involved. Work carried out disregarding these instructions is subject to removal and replacement at the Contractor's expense.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01150

SCHEDULES, REPORTS, PAYMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Coordination

2. Progress Schedule

3. Submittal Schedule

4. Schedule of Values

5. Payment Requests

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 COORDINATION

A. Coordinate both the procedural timing and listing (naming and sequencing) of reports / activities required by the provisions of this Section and other Sections, to afford consistency and logical coordination between submitted reports or lists. Maintain the coordination and correlation between the separate reports by updating on a regular basis. Make the appropriate distribution of each report and updated report to entities involved in the work including the Owner's representative / Architect / Engineer. In particular, provide close coordination of the progress schedule, schedule of values, listing of subcontracts, schedule of submittals, progress reports, and payment requests.

1.3 PROGRESS SCHEDULE

A. The Progress Schedule to comply with requirements set forth in the "General Conditions of the Contract for Construction". Update the Schedule on a regular basis, but no less than every two months.

1.4 SUBMITTAL SCHEDULE

A. General: Immediately following development and acceptance of a fully developed Progress Schedule, prepare a complete schedule of work- related Submittals. Correlate the Submittal Schedule with the listing of principal subcontractors, as required by the General Conditions, and with the "listing of products" or "procurement schedule" as specified in "Products and Substitutions" Section 01605 and elsewhere in the Contract Documents.

B. Form: Show the category of the Submittal, name of the subcontractor, generic description of work covered, related Section number, activity or event number on the Progress Schedule, scheduled date for first submission, and blank columns for the actual date of submittal, re-submittal, and final release or acceptance by the Owner's representative / Architect / Engineer.

1.5 SCHEDULE OF VALUES

A. General: Prepare a Schedule of Values acceptable to the Owner's representative, as required by the General and Supplementary Conditions, in coordination with preparation of the Progress Schedule. Correlate line items with other administrative schedules and forms required for the work, including Progress Schedule, payment request form, listing of subcontractors, schedule of allowances, schedule of alternates, listing of products and principal suppliers and fabricators, and Schedule of Submittals. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of payment requests and progress reports. Break down the principal subcontract amounts into several line items. Round off sums to the nearest whole dollar, but with the total equal to the Contract Sum. Submit three (3) copies of the Schedule of Values to the Owner's representative / Architect / Engineer for review and comment.

B. Unit Cost Allowances: Where required, identify line item values as a product of unit cost x measured quantity, as estimated from best indications in the Contract Documents.

C. Schedule Updating: Update the Schedule of Values when Change Orders affect the listing, and when actual performance of the work involves necessary changes of substance to values previously listed.

1.6 PAYMENT REQUESTS

A. General: Except as otherwise indicated, the sequence of progress payments is to be regular, and each must be consistent with previous applications and payments. It is recognized that certain applications involve extra requirements, including the initial application, application at the time of substantial completion, and the final payment application.

B. Waivers of Lien: For each payment application, waivers of lien from subcontractors who could lawfully and possibly file a lien arising out of the Contract and related to work covered by payment, may be requested. Submit partial waivers for the amount requested (prior to deduction or retainage) on each item; and when the application shows completion of an item, submit final or full waivers. The Owner reserves the right to designate which entities involved in the work must submit waivers.

C. Payment Application Times: The "date" for each progress payment is as indicated in the Owner-Contractor Agreement, or if none, as indicated therein - the 30th day of each month.

D. Application for Payment Form: AIA Document G702 and G703 Continuation Sheets.

E. Application for Payment Preparation: Except as otherwise indicated, complete every entry provided for on the form, including notarization and execution by an authorized person. Incomplete applications will be returned without action. Entries must match the current data of the Schedule of Values and Progress Schedule. Listings must include the amount of Change Orders approved prior to the last day of the "period of construction" covered by the Application.

F. Application Transmittal: Submit four (4) signed copies of each Application for Payment, one copy which is to be completed with waivers of lien and similar attachments. Submit each copy with a transmittal form listing those attachments, and recording the appropriate information related to the Application in a manner acceptable to the Owner's representative / Architect / Engineer.

G. Application Processing: Within ten (10) days of receipt of a properly documented Application, the Owner's representative / Architect / Engineer shall review and certify to

the Owner the amount determined to be properly due, or if the form is incorrectly prepared, return to the Contractor for correction. Upon receipt of a certified Application from the Owner's representative / Architect / Engineer, the Owner will make payment within the time allowed by the Contract Documents.

H. Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of the first Application for Payment can be summarized as follows, but not necessarily by way of limitation:

1. Listing of subcontractors, testing laboratory, principal suppliers and fabricators.

2. Listing of Contractor's staff assignments and principal consultants.

3. Copies of Building Permit (if Contractor's responsibility) and similar authorizations and permits from governing authorities.

4. Progress Schedule.

5. Performance and Labor and Materials Payment Bonds.

6. Schedule of Values.

7. Certificates of Insurance.

8. Submittal Schedule.

I. Application at Time of Substantial Completion: Following issuance of Owner representative's / Architect's / Engineer's final "Certificate of Substantial Completion," and also, in part, as applicable to prior Certificates on portions of completed work as designated, a "special" payment application may be prepared and submitted by the Contractor. The principal administrative actions and submittals which must proceed or coincide with such special applications can be summarized as follows, but not necessarily by way of limitation:

1. Occupancy Permit(s) and similar approvals or certifications by governing authorities and franchised services, assuring the Owner's full access and use of completed work.

2. Final cleaning of the work.

3. Coordination with the Owner on the change over of insurance coverage, including proof of extended coverage, as required.

4. Change of door locks and other Contractor's access provisions to the Owner's property.

5. Listing of the Contractor's incomplete work, recognized as exceptions to the Certificate of Substantial Completion.

J. Final Payment Application: The administrative actions and submittals which must precede or coincide with submittal of a final Application for Payment can be summarized as follows, but not necessarily by way of limitation:

1. Warranties, (Guarantees), maintenance agreements, and similar provisions of the Contract Documents.

2. Test / adjust / balance records, maintenance, instructions, meter readings,

start-up performance reports, training, and similar change-over information germane to the Owner's occupancy, use, operation and maintenance of completed work.

3. Turn-over of spare materials, parts and tools to the Owner, as specified herein.

4. Completion of items specified for completion beyond the time of Substantial Completion (regardless of whether or not a special payment application was previously submitted).

5. Release of liens and other assurances, satisfactory to the Owner that unsettled claims will be settled, and that work not actually completed and accepted will be completed without undue delay.

6. Transmittal of required project construction records to the Owner.

7. Proof, satisfactory to the Owner, that taxes, fees and similar obligations of the Contractor have been paid.

8. Satisfactory removal of temporary facilities, services, surplus materials, rubbish and similar elements.

9. Consent of surety for final payment, as required.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01205

PROCEDURES AND CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The Contractor shall be responsible for the control and coordination of all work by his forces, subcontractors and suppliers. Procedures and performance required for this purpose include:

1. Coordination and meetings including meeting minutes.

2. Pre-Installation Conferences.

3. Adequate administrative and supervisory personnel.

4. Maintenance of surveys and records.

5. Enforcement of trades people and workmanship standards.

6. Coordination of the various trades and subcontractors.

7. Conducting of inspections, tests and reports.

8. Coordination of general installation provisions.

9. Proper cutting and patching procedures and techniques.

10. Cleaning and protection of the work.

1.2 COORDINATION AND MEETINGS

A. General: Prepare and distribute to each entity performing work at the Project Site, a written memorandum of instructions on required coordination of activities, including required notices, reports and attendance at meetings. Prepare similar memoranda for separate contractors where the interfacing of work is required.

B. Coordination Drawings: Where work by separate entities requires off-site fabrication of products and materials which must be accurately interfaced and closely intermeshed to produce the required results, prepare coordination drawings to interface and sequence the work shown by separate Shop Drawings.

1.3 PRE-INSTALLATION CONFERENCES

A. General: Schedule and conduct pre-fabrication and pre-installation meetings as required by the Contract Documents. Pre-fabrication and pre-installation meetings are intended to assist the Contractor in determining, before hand, specific project requirements and to encourage coordination between the various trades. Schedule meetings at times appropriate to the type of work involved. Provide adequate notice to all parties to be involved.

1.4 ADMINISTRATIVE / SUPERVISORY PERSONNEL

A. General: In addition to a general superintendent and other administrative and supervisory personnel required for performance of the work, provide specific coordination personnel as specified herein.

B. Project Coordination: Provide a full-time Project Coordinator, who is experienced in the administration and supervision of building construction, including mechanical and electrical work, and who is hereby authorized to act as the general coordinator of interfaces between units of work. For purpose of this provisions, "interface" is defined to include the scheduling and sequencing of work, sharing of access to work spaces, installations, protection of each other's work, cutting and preparation of coordination drawings, inspections, tests, and temporary facilities and services.

1.5 SURVEYS AND RECORDS / REPORTS

A. General: Working from lines and levels established by property survey, and as shown in relation to the work, establish and maintain bench marks and other dependable markers to set lines and levels for the work at each story of construction and elsewhere on-site as needed to properly locate each element of the entire project. Advise tradesmen performing the work, of the marked lines and levels provided for their use in the layout of work.

B. Survey Procedures: Verify layout information shown on the Drawings, in relation to the property survey and existing bench marks before proceeding with layout of the actual work. As work proceeds, check every major element for line, level and plumb (where applicable), and maintain an accurate surveyor's log or record book of such checks, available for reference at reasonable times. Record deviations on the Record Drawings.

1.6 TRADESPEOPLE AND WORKMANSHIP STANDARDS

A. General: Instigate and maintain procedures to ensure that persons performing work at the site are skilled and knowledgeable in the methods and craftsmanship needed to produce the required quality levels for workmanship in the completed work. Coordinate the work of trades and subcontractors. Remove and replace work which does not comply with the workmanship standards as specified and as recognized in the construction industry for the applications indicated. Remove and replace work damaged or deteriorated by faulty workmanship and lack of protection of the work.

1.7 INSPECTIONS, TESTS AND REPORTS

A. General: Required inspection and testing services, as called for in the Specifications are intended to assist in the determination of probable compliance of the work with requirements, but do not relieve the Contractor of responsibility for compliance, or for general fulfillment of the requirements of the Contract Documents. The specified inspections and tests are not intended to limit the Contractor's quality control program. Afford reasonable access to agencies and companies performing tests and inspections. Provide adequate notification to the testing service of the schedule which impacts performance of the required tests.

B. Contract Conforming Work:

1. Resulting from Contract and Code Required Testing / Inspection: The Contractor to obtain and pay the cost of Testing / Inspection Services. Contractor to provide for work required to patch any damaged work.

2. Resulting from Owner Required Testing / Inspection: The Owner to pay the cost

for initial Testing / Inspection Services. Contractor to patch any damaged work as follows:

a. Non-conforming Work:

1) The Contractor to pay the cost for initial testing / inspection and other fair costs, if any, incurred by the Owner and Architect which directly result from the testing / inspection requirements of non-conforming work.

2) The Contractor to correct defective work to meet the Contract requirements. Pay for all subsequent costs including, but not limited to, further testing, as may be required. Requests for additional time will generally not be considered when resulting from the installation of and/or correction of defective work.

C. Qualification of Testing Agencies:

1. Except as otherwise indicated, and except where manufacturer's testing facilities are indicated as acceptable, engage independent testing laboratories specializing in the required services, and complying with "Recommended Requirements for Independent Laboratory Qualification" by American Council of Independent Laboratories (ACIL).

D. Reports: Submit test / inspection reports, including agency's analysis of the results and recommendations, where applicable, in duplicate, except as otherwise indicated, and submit copies directly to the governing authorities where required or when requested.

1.8 DAMAGE CLAIMS

A. The Contractor will be responsible for adequately securing materials stored at the Project Site, and the work in progress, and to conduct the work in such a way as to not create undue risk of injury or damage to persons or property. It is required that the Contractor adequately fence and sign the Project Site, as necessary, and / or arrange and provide for security personnel to adequately keep unauthorized persons from entering the construction area at any hour of the day or night. Notwithstanding anything to the contrary in the General Conditions, and without limiting the generality of anything contained in the General Conditions, Drawings or Specifications, the Contractor is responsible for all damages to persons and property, including damage to the work of other contractors, that occurs as a result of the Contractor's negligence or the negligence of its employees, agents, representatives, or subcontractors upon the Project, in connection with its operations, use of the Project, or prosecution of the work. The Contractor will indemnify and hold harmless the Owner and all of its officers, agents, employees and consultants from any liability, claims, demands or causes of action of any nature whatsoever for damages of any kind, as above set forth, and the Contractor agrees, at its expense, to defend any legal or other action brought against the Owner founded upon such liability, claim, demand or cause of action and to pay any attorneys' fees incurred by the Owner in connection therewith.

1.9 COORDINATION WITH OTHER CONTRACTORS

A. Schedule work activity in coordination with all on-site contractors; make adjustments in work activities to accommodate the requirements of other contractors.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Pre-Installation Conferences: Well in advance of the start of installation of every major unit of work which requires coordination and interfacing with other work, meet at the Project Site with installers and representatives of manufacturers and fabricators involved in or affected by the unit of work, and in its coordination or integration with other work which has preceded or will follow. At each meeting review the progress of other work and preparations for the particular work under consideration, including requirements of the Contract Documents, options, related Change Orders, purchases, deliveries, Shop Drawings, product data, quality control samples, possible conflicts, compatibility problems, time schedules, weather limitations, temporary facilities, space and access limitations, structural limitations, governing regulations, safety inspection and testing requirements, required performance results , recording requirements, and protection. Record the significant discussions of each conference, record agreements and disagreements, along with a final plan of action. Distribute records of meetings promptly to everyone concerned, including the Owner’s representative / Architect / Engineer.

B. Installer's Inspection of Conditions: Require Installer of each major unit of work to inspect substrate to receive work, and conditions under which work will be performed, and to report (in writing to Contractor) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

C. Manufacturer's Instructions: Where installations include manufactured products, comply with the manufacturer's applicable instructions and recommendations for installation to the extent these are more explicit or more stringent than requirements indicated in the Contract Documents.

D. Inspect each item of materials and equipment immediately prior to installation, and reject damaged and defective items.

E. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerances if not otherwise indicated. Allow for expansions and building movements, provide uniform joint widths in exposed work, organized for the best possible visual effect, as approved by the Architect.

F. Re-check measurements and dimensions of the work as an integral step for starting each installation.

G. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure the best possible results for each unit of work, and in coordination with the entire work. Isolate each unit of work from non-comparable work as necessary to prevent deterioration.

H. Coordinate enclosure (closing-in) of the work with required inspections and tests to minimize the necessity of uncovering work for that purpose.

I. Mounting Heights: Where mounting heights are not indicated, mount individual units of the work in compliance with ADAAG or industry recognized standards for the applications indicated. Refer questionable mounting heights to the Owner’s representative / Architect / Engineer for a final decision.

3.2 CUTTING AND PATCHING

A. General: Do not cut-and-patch structural work in a manner that will result in reduction of

the load-carrying capacity or load / deflection ratio; submit proposed cutting and patching of structural elements to the Owner's representative / Architect / Engineer for structural approval before proceeding. Do not cut-and-patch operational elements and safety related components in a manner that will result in decreased operational life, increased maintenance, or decreased safety. Do not cut-and-patch work which is exposed on the exterior or exposed in occupied spaces, in a manner that will result in the reduction of visual qualities or result in substantial evidence of cut-and-patch work, both as judged solely by the Architect. Remove and replace work judged to be cut-and-patched in a visually unsatisfactory or otherwise objectionable manner.

B. Materials: Except as otherwise indicated or approved, provide materials for cutting-and-patching which will result in equal-or-better work than the work being cut-and-patched, in terms of performance characteristics, and including visual effect, where applicable. Use materials identical to the original materials where feasible, and where recognized that satisfactory results can be produced thereby.

C. Temporary Support and Protection: Provide adequate temporary support for work to be cut, to prevent failure. Do not endanger other work. Provide adequate protection of other work during cutting-and- patching, to prevent damage, and provide protection of the work from adverse weather exposure.

D. Cut work by methods least likely to damage work to be retained and adjoining work.

1. Where physical cutting action is required, cut the work with sawing and grinding tools, not with hammering and chipping tools. Core drill openings through concrete work.

2. Comply with the requirements of applicable Division 2, Specifications Sections where cutting-and-patching requires excavating and backfilling.

E. Restore exposed finishes of patched areas, and, where necessary, extend the finish restoration onto the adjoining retained work, in a manner which will eliminate evidence of patching.

1. Where patching occurs in a smooth, painted surface, extend the final paint coat over the entire unbroken surface containing the patch after the patched areas have received prime and base coats.

3.3 CLEANING AND PROTECTION

A. General: During handling and installation of work at the Project Site, clean and protect work in progress and the adjoining work on a basis of perpetual maintenance. Apply suitable protective covering over newly installed work where reasonably required to ensure freedom from damage and deterioration at the time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessarily throughout the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

B. Limiting Exposures of Work: To the extent possible through reasonable control and protection methods, supervise performance of the work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during the construction period.

END OF SECTION

SECTION 01310

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Administrative and supervisory personnel.

2. Submittals.

3. Contractor’s quality control.

4. Coordination.

5. Project coordination.

6. Pre-Construction meeting.

7. Progress meetings.

8. Pre-Installation meetings.

9. Schedule of Values.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. Project Coordination Administrator: Contractor=s Representative experienced in administration, supervision, and quality control of building construction similar to the work of this Project, including mechanical, plumbing and electrical work.

B. Project Field Superintendent: Contractor=s Representative experienced in general field supervision of building construction similar to the work of this Project including finish work, mechanical, plumbing and electrical work; to supervise, direct, inspect and coordinate work of the Contractor, subcontractors, suppliers and installers, and expedite the work to ensure compliance with the Construction Schedule.

1.3 SUBMITTALS

A. Submit a list of the Contractor's principal staff assignments including Project Coordination Administrator, Project Field Superintendent, Quality Control Representative, and other personnel assigned to the Project Site; identify their duties and responsibilities.

B. Submit Shop Drawings, product data, and other required submittals in accordance with Section 01330 - Submittal Procedures, for review and compliance with the Contract Documents.

C. Submit Requests for Information (RFI) and interpretation of Contract Documents in a timely manner.

1.4 CONTRACTOR'S QUALITY CONTROL

A. Perform project quality control in accordance with requirements in the Contract and as specified in Section 01450 - Quality Control.

B. Coordinate the scheduling of inspections and testing required by the individual Specification Sections and in accordance with Section 01450 - Quality Control.

1.5 COORDINATION DRAWINGS

A. Prepare and distribute coordination drawings where close coordination is required for the installation of products and materials fabricated off-site by separate entities, and where limited space availability requires maximum utilization of space for the efficient installation of different components. Show the interrelationship of components shown on separate Shop Drawings. Indicate the required installation sequences.

1.6 PROJECT COORDINATION

A. Coordinate construction activities and the work of all trades under various Sections of these Specifications and work of the Contract to facilitate the orderly installation of each part of the work. Coordinate construction operations included under different Sections of the Specifications and the Contract that are dependent upon each other for proper installation, connection and operation.

B. Coordinate the construction activities of this Contract with Contractors retained separately the Owner.

C. Where installation of one part of the work is dependent upon installation of other components, either before or after that part of the work, schedule construction activities in a sequence to obtain an uninterrupted installation.

D. Obtain drawings, manufacturer's product data, instructions, and other data to provide a proper and complete installation.

1. Check field dimensions prior to installing products. Verify necessary clearances and means of access for equipment from storage to the final position.

2. Make data and information available to all trades involved.

E. Ensure that utility requirements of operating equipment are compatible with the building utilities. Coordinate the work of various Specification Sections for installation and final connection of the equipment.

1. Ensure that mechanical, plumbing and electrical rough-ins have been installed and are properly sized and located.

F. Coordinate space requirements and the installation of mechanical, plumbing and electrical work indicated diagrammatically on the Drawings. Follow the routing shown for pipes, ducts, conduits and wiring as closely as possible; make runs parallel with the lines of the building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

G. Where space is limited, coordinate the installation of different components to ensure maximum accessibility for required maintenance, service and repairs.

H. Provide for installation of items scheduled for future installation.

I. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Prepare memoranda for the Owner=s representative, separate contractors, where coordination of their work is required.

J. In finished areas, conceal pipes, ducts, conduit and wiring within the construction. Coordinate the location of fixtures and outlets with finish elements.

K. Coordinate completion and clean up of the work of the separate Sections in preparation for completion of the Project.

L. After occupancy, coordinate access to the Site for correction of defective work and work not in accordance with the Contract Documents, to minimize disruption of the Owner's / Tenants activities.

1.7 PRE-CONSTRUCTION MEETING

A. The Owner's representative will schedule a Pre-Construction Meeting after issuance of a Notice to Proceed.

B. Attendance: Owner's representative, Architect, Engineers, Contractor, Project Superintendent and Contractor's Quality Control Representative and other contractors retained by the Owner.

C. Agenda:

1. Submission of executed Bonds and Insurance Certificates.

2. Distribution of Contract Documents.

3. Submission of the Schedule of Values.

4. Designation of personnel representing the parties to the Contract.

5. Procedures and processing of Requests for Information (RFI), field decisions, submittals, substitutions, applications for payment, change proposals, Change Orders, and contract closeout procedures.

6. Scheduling.

7. Construction facilities and temporary controls.

D. The Contractor will record minutes of the meeting and distribute copies to the participants and those affected by the decisions made.

1.8 PROGRESS MEETINGS

A. The Contractor will schedule and administer meetings throughout progress of the work at intervals to be determined.

B. The Contractor will make arrangements for meetings, prepare an agenda, distribute copies to participants and preside over the meetings.

C. Attendance: Job Superintendent, Contractor's Quality Control Representative, major subcontractors and suppliers, Architect and the Owner's representative, engineers and subcontractors as appropriate to the agenda for each meeting.

D. Agenda:

1. Minutes of previous meetings.

2. Work progress.

3. Status of payments.

4. Field observations, problems, and decisions.

5. Submittals Schedule and the status of submittals.

6. Status of off-site fabrications and delivery schedules.

7. Progress Schedule.

8. Corrective measures to regain projected schedules, if necessary.

9. Planned progress during the succeeding work period.

10. Quality and work standards and pre-installation meetings.

11. Pending change proposals and effect of proposed changes on the progress schedule, and coordination.

12. Other business relating to the work.

D. The Owner's representative will record the minutes and distribute copies to the participants.

1.9 PRE-INSTALLATION MEETING

A. When required by an individual Specifications Section or as determined necessary by the Owner's representative, convene a Pre-Installation Meeting at the Project Site prior to commencing the work of that Section.

B. Require attendance of the parties directly affecting, or affected by the work of the specific Specifications Section.

C. Notify the Architect seven (7) days in advance of the meeting date.

D. Prepare an agenda and preside at the meetings:

1. Review requirements of the Contract Documents, conditions of installation, preparation, and installation procedures.

2. Review coordination with related work.

E. The Contractor shall record minutes of the meetings and distribute copies to the participants and those affected by the decisions made.

1.10 SCHEDULE OF VALUES

A. Prior to submittal of the first payment application, submit a construction cost breakdown to the Architect in a form and format acceptable to the Architect.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTIONS

Not Used.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal procedures.

2. Product data, Shop Drawings, samples and miscellaneous work.

3. Assurance / Control submittals.

a. Certificates.

b. Manufacturer's installation instructions.

4. Owner representative=s action.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 DEFINITIONS

A. Product Data: Includes manufacturer=s standard printed information on materials, products and systems; not especially prepared for this Project, other than the designation of selections from among available choices printed therein.

B. Shop Drawings: Include specially-prepared technical data for this Project, including drawings, details, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form.

C. Samples: Include both fabricated and unfabricated physical examination of materials, products and units of work; both as competed units and as smaller portions of units of work; either for limited visual inspection or, where indicated, for more detailed testing and analysis.

D. Mock-Ups: A special form of samples, which are too large or otherwise inconvenient for handling in the specified manner for transmittal of sample submittals.

E. Design Calculations: As required to show that component parts of a system meet the design criteria and performance requirements. Manufacturer=s published calculations or as certified by a professional engineer. Subject to approval of the Owner=s representative, manufacturer or fabricator certifications may be accepted in lieu of calculations.

F. Miscellaneous Submittals: Includes warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, quality testing and field measurement data, operating and maintenance materials, extra and overrun stock, devices and similar information; applicable to the work and not processed as product data, shop drawings or samples.

1.3 SUBMITTALS

A. Submit two (2) copies of a proposed Schedule of Submittals to the Owner=s representative within 30 days after receipt of a Notice to Proceed. List all items requiring submittal for review and approval by the Architect - Engineer / Owner=s representative.

B. Schedule of Submittals. Include the following:

1. Indicate the type of submittal: Product Data, Shop Drawing, sample, certificate, warranty, technical representative=s report or other submittal.

2. Identify the Specifications Section number, Section paragraph number where the item is specified and a description of the item being submitted.

3. Indicate the scheduled date for initial submittal, date for approval and date for possible re-submittal for each required submittal.

C. Coordinate the Schedule of Submittals with the Construction Schedule.

1.4 SUBMITTAL PROCEDURES

A. General:

1. Coordination and Sequencing: Coordinate the preparation and processing of submittals with performance of the work so that the work will not be delayed by submittals. Coordinate and sequence different categories of submittals of the same work, and or interfacing units of work, so that one will not be delayed by coordination of the submittal review with another.

2. Transmit each submittal to the Owner=s representative on an Owner-approved transmittal form.

3. On the Transmittal form, provide a place to indicate the Project name, date, ATo:@, AFrom:@; names of the Contractor, subcontractors, suppliers, manufacturers, pertinent drawings(s), detail number(s), Specifications Sections, category and type of submittal, purpose, description, distribution record (for both transmittal and submittals), and signature of the transmitter.

4. Identify variations from the Contract Documents and product or system limitations which may affect successful performance of the completed work.

5. Apply the Contractor's stamp, signed or initialed certifying that review, verification of the products required, field dimensions, adjacent construction work and the coordination of information, is in accordance with requirements of the work and the Contract Documents.

6. Provide space for the Owner representative=s remarks and AAction@ stamp.

7. Sequentially number each transmittal form. Provide the original number and a sequential alphabetic suffix on each re-submittal.

8. Package each submittal appropriately for transmittal handling.

9. Schedule submittals to comply with the scheduling requirements of the Construction Schedule.

10. On each re-submittal, identify all changes made since the previous submission.

11. Distribute copies of reviewed submittals to the field, subcontractors and suppliers, as appropriate. Instruct the parties to promptly report any inability to comply with the provisions.

12. Submittals not required will not be processed.

13. Submittals received from sources other than through the Contractor=s office will be returned Awithout action@.

14. Except as otherwise indicated in individual Specifications Sections, comply with the requirements specified herein for each indicated category of submittal. Provide and process intermediate submittals, where required between the initial and final submittals, similar to initial submittals.

B. Product Data:

1. Collect required data into one submittal for each unit of work or system; mark each copy to show which choices or options are applicable to the Project.

2. Include manufacturer=s standard printed information such as catalog cuts, manufacturer's published instructions, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, performance curves and other similar items. Include manufacturer=s standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements.

3. Mark each copy to identify the applicable products, models, options, and other data. Supplement the manufacturers' standard data with information unique to this Project.

4. Indicate product utility and electrical characteristics, utility connection requirements, and the location of utility outlets for service to functional equipment and appliances.

5. Submit the number of copies the Contractor requires, plus four (4) copies to be retained by the Owner=s representative. Submit six (6) sets of product data; three (3) sets will be returned. Maintain one (1) set of product data at the Project Site, available for reference.

6. Do not submit product data or permit its use on the Project until compliance with requirements of the Contract Documents has been confirmed by the Contractor.

7. Do not proceed with the installation of materials, products or systems until the final copy of applicable product data is in the possession of the installer.

C. Shop Drawings:

1. Provide newly prepared information on reproducible sheets, with graphic information at accurate scales, and with the name of the preparer indicated. Show dimensions and notes based on field measurements. Identify materials and products in the work shown. Provide key plans or cross reference to room numbers to identify the location of multiple elements. Indicate compliance with standards and special coordination requirements. Identify deviations from the Contract Documents, check dimensions; check that trades have been coordinated and that no conflict will develop in its installation.

2. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service to functional equipment and appliances.

3. Shop Drawings: Submit for review. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES above.

4. Submit in the form of one (1) translucent reproducible transparency and two (2) blueline or blackline prints. The transparency will be returned to the Contractor after review.

5. Do not allow copies of shop drawings without appropriate final AAction@ markings by the Owner=s representative to be used in connection with the work.

D. Samples:

1. Submit samples to illustrate the functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

2. Include full Project information on each sample submitted.

3. Provide units identical to the final condition of the proposed materials or products of the work. Include Arange@ samples of not less than three (3) units where unavoidable variations must be expected, and describe or identify variations between the units of each set. Provide a full set of optional samples where selection is required. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Submit samples for review and confirmation of color, pattern, texture, and Akind@.

4. Submit samples of finishes in the available colors, textures and patterns.

5. Submit the number of samples specified in the individual Specifications Sections; a minimum of two (2), one of which will be retained by the Owner=s representative. At Contractor=s option, provide preliminary submittal of a single set of samples for review and AAction@. Otherwise, initial submittals will be considered the final submittal unless returned with an AAction@ mark that requires re-submittal. Submit three (3) sets of samples in the final submittal; two (2) sets will be returned.

6. Maintain one (1) final set of samples at the Project Site, in suitable condition and available for quality control comparisons.

7. The Owner=s representative will not Atest@ samples, except as otherwise indicated, for compliance with other requirements, which are the responsibility of the Contractor.

8. Returned samples intended or permitted to be incorporated into the work are so indicated in the individual Specifications Sections Samples; must be in an undamaged condition at the time of acceptance.

E. Mock-Ups:

1. Mock-ups and similar samples indicated in individual Specifications Sections are recognized as a special type of sample. Comply with the requirements for Asamples@, to the greatest extent possible, and process transmittal forms to provide a record of activity.

F. Certificates:

1. When specified in individual Specifications Sections, submit certification by the manufacturer Owner=s representative in the quantities specified in Product Data above.

2. Indicate that the material or product conforms to or exceeds the specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.

3. Certificates may be recent or previous test results on materials or products, but must be acceptable to the Owner=s representative.

G. Inspection and Test Reports:

1. Classify each as either Aproduct data@ or Ashop drawing@, depending upon whether the report is uniquely prepared for the Project or a standard publication or workmanship control testing at the point of production. Process accordingly.

H. Manufacturer=s Installation Instructions:

1. When specified in individual Specification Sections, submit printed instructions for delivery, storage, assembly, installation, adjusting, and finishing in the quantities specified in Product Data above.

2. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for the application or installation.

I. Warranties:

1. Refer to individual Specifications Sections for specific general requirements on warranties, product / workmanship bonds, and maintenance agreements. In addition to copies for the Contractor=s use, furnish two (2) additional executed copies. Furnish two (2) additional copies when required for the maintenance manuals.

J. Standards:

1. Where copy submittal is indicated, and except where specified integrally with

AProduct Data@, submit two (2) copies for the Owner representative=s use. Where workmanship at the Project Site and elsewhere is governed by standards, furnish additional copies to the fabricators, installers and others involved in performance of the work.

K. Closeout Submittals:

2. Refer to individual Specifications Sections and to Acloseout@ paragraphs for specific requirements on submittal of closeout information, materials, tools and similar items.

L. Record Document Copies:

1. Submit one (1) set.

M. Maintenance / Operating Manuals;

1. Submit two (2) bound sets.

N. Materials and Tools:

1. Refer to individual Specifications Sections for the required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.

O. Administrative Submittals:

1. Submit three (3) copies. No copies will be returned.

P. General Distribution:

1. Provide additional distribution of submittals to the subcontractor, suppliers, fabricators, installers, governing authorities and others as necessary for proper performance of the work. Include such additional copies in the transmittal when required to receive an AAction@ marking before final distribution. Record distributions on the transmittal forms.

1.5 OWNER REPRESENTATIVE=S ACTION

A. For submittals where action and return is required or requested, the Owner=s representative will review each submittal, mark to indicate the action taken, if any, and return promptly, generally within 20 days, excluding delivery time to and from the Contractor. When a submittal is to be reviewed by an off-island consultant or when it must be held for coordination, 25 days will be required for review.

1. Compliance with the specified characteristics is the Contractor's responsibility.

2. No action will be taken on submittals for information, closeout documents, record documents and other submittals for similar purposes.

B. Action Stamp: Owner=s representative will stamp each submittal to be returned to the Contractor with a uniform, self-explanatory AAction@ stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. "Accepted" or AApproved@: Final Unrestricted Release. When a submittal is marked "Accepted" or AApproved@, that part of the work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. "Accepted@ or AApproved as Noted": Final-But-Restricted Release. When a submittal is marked "Accepted= or AApproved as Noted", that part of the work covered by the submittal may proceed provided it complies with the notations and corrections marked on the submittal and meets requirements of the Contract Documents; final acceptance will depend on that compliance.

3. "Rejected or Disapproved: Submit Specified Item" or "Revise and Resubmit": Returned for Re-submittal. When a submittal is marked "Rejected or Disapproved: Submit Specified Item", or "Revise and Resubmit," do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity. Revise or prepare a new submittal in accordance with the notations; re-submit without delay. Repeat as necessary to obtain an acceptable action mark.

    a. Do not permit submittals marked "Rejected or Disapproved: Submit Specified Item" or "Revise and Resubmit" to be used at the Project Site or elsewhere where work is in progress.

4. "Returned: Not Required": Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Returned: Not Required".

C. Any review and approval by the Owner=s representative of any Product Data, Shop Drawings, or Samples is only for conformance to the general design concept of the work and does not extend to consideration of structural integrity, safety, detailed compliance with the Contract Documents or any other obligation of the Contractor. Review and approval of any such data does not relieve the Contractor from its obligation to meet his requirements under the Contract Documents, not shall it give rise to any claim in favor of the Contractor or any third party against the Owner.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01440

REQUESTS FOR INFORMATION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Administrative requirements for ARFI=s@.

1.2 DEFINITIONS

A. Request for Information (RFI): Contractor=s written request for information to confirm, re-verify, or clarify the intent required by the Contract Documents.

1.3 SUBMITTALS

A. Submit RFI=s on the Contractor=s standard form.

1.4 QUALITY ASSURANCE

A. Architect=s Intent: It is a condition of the Contract for Construction, that prior to signing of the Contract, the Contractor be fully familiar with and clear as to the requirements (Architect=s design intent) for this Project as presented in the Contract Documents. It is also a condition of the Contract, that prior to signing of the Contract, should there be any aspect of the Contract which is not clear or not complete enough, that the Contractor secure the necessary information from the Architect in order to attain the required understanding of the Project. The primary reasons for this is so the Owner can receive a fair and complete cost proposal for the Work, without hidden or additional costs and to minimize unnecessary costs to administer the Project during progress of the Work.

B. Architect=s Drawings and Specifications

1. Design Intent: It is an accepted historical and understood practice in the industry that the Architect=s Drawings and Specifications reasonably and professionally convey the design intent for the Project without necessarily indicating every single condition for the Work, but to the degree necessary for Contractor=s to propose a fair and complete cost for the Work, including for Work not indicated, but implied by the Architect=s design intent.

2. RFI=s - Basis of Communication: Due to the fact that all conditions are not indicated in the Contract Documents, it is understood that additional clarifications will be necessary during the course of the Work for the Contractor to fully achieve all aspects of the Architect=s design intent, and that the RFI procedure becomes the administrative basis by which information is formally conveyed between the Architect and the Contractor.

C. Misuse of the RFI Process: RFI=s are not to be used frivolously, including as a method of enlisting the Architect=s services for finding information already indicated in the Contract Documents.

D. Contractor Initiation: All RFI=s must be submitted by the General Contractor.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 CONTRACTOR=S RESPONSIBILITIES

A. Examination: Upon discovering a potential aspect of the Work which may require further clarification from the Architect, the Contractor shall thoroughly examine the Contract Documents to ensure that the information is not indicated.

B. Submittal: When a reasonable search for the needed information has been made without success, complete and submit an RFI.

3.2 ARCHITECT=S RESPONSIBILITIES

A. Review: Not later than ten (10) working days after an RFI is received, return a response to the Contractor on the submittal form.

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Owner representative=s quality assurance (QA).

2. Contractor=s quality control (QC).

3. Quality control procedures.

4. Testing and inspection laboratory services.

5. Contractor=s field inspection and testing.

6. Contractor=s reports.

7. Contractor=s testing and inspection reports.

8. Non-compliance check-off list.

9. Completion and inspection of work.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM C 802 - Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials.

2. ASTM C 1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

3. ASTM C 1093 - Practice for Accreditation of Testing Agencies for Masonry.

4. ASTM D 3740 - Practice for Minimum Requirements for Agencies Engaged in Testing and / or Inspection of Soil and Rock as Used in Engineering Design and Construction.

5. ASTM D 4561 - Practice for Quality Control Systems for Organizations Producing and Applying Bituminous Paving Materials.

6. ASTM E 329 - Specification for Agencies Engaged in Construction Inspection and / or Testing.

7. ASTM E 543 - Specification for Agencies Performing Nondestructive Testing.

8. ASTM E 699 - Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components.

1.3 SUBMITTALS

A. Submit four (4) copies of a proposed Contractor Quality Control Plan within fifteen (15) days after receipt of the Notice to Proceed.

B. Contractor=s Quality Control Plan. Indicate the following:

1. Quality Control Organization: In chart form, showing relationship of the Quality Control organization to other elements of the Contractor's organization.

2. Names and qualifications of personnel in the Quality Control organization, including the Contractor=s Quality Control Representative, inspectors, independent testing and inspection laboratory, independent fire alarm test and certification agency, independent fire sprinkler test and certification agency, independent HVAC test and balance agency, etc.

3. Procedures for reviewing coordination drawings, Shop Drawings, certificates, certifications and other submittals.

4. Testing and Inspection Schedule, keyed to the Construction Schedule, indicating tests and inspections to be performed, names of persons responsible for the inspection and testing for each segment of the work, including preparatory, initial and follow-up.

5. Proposed forms to be used including Contractor's Daily Report, Contractor=s Test and Inspection Report, and Non-Compliance Check-Off List.

C. Independent Testing and Inspection Laboratory. Submit the following:

1. Name.

2. Address.

3. Telephone number.

4. Name of full-time registered Engineer.

1.4 OWNER REPRESENTATIVE=S QUALITY ASSURANCE

A. The Owner=s representative will inspect the quality of work being installed, review and verify the accuracy of changes in the work, receive and distribute the Contractor=s submittals, determine compliance with the Contract Documents and preside at progress and coordination meetings.

B. The Owner=s representative will arrange for factory tests when needed; at the Contractor=s cost.

C. Owner=s Field Inspection: The Owner= representative will perform inspections of the work for quality assurance (QA).

1.5 CONTRACTOR=S QUALITY CONTROL REPRESENTATIVE

A. Qualifications for Contractor=s Quality Control Representative: Minimum five (5) years construction quality control or construction management experience on work similar to the work of this Contract.

1.6 CONTRACTOR=S QUALITY CONTROL

A. The Contractor is responsible for the overall quality of the work performed by the Contractor and subcontractors working under this Contract. The quality of any part of the work must not be less than that required by the Contract Documents. If the Owner=s representative determines that the quality of the work does not conform to the Contract Documents, the Owner=s representative will notify the Contractor, in writing. The Contractor must correct the identified deficiencies and advise the Owner=s representative of the corrective action taken within 7 days of the date of notification.

B. Monitor quality control over the Contractor=s staff, subcontractors, suppliers, manufacturer's, products, services, site conditions and workmanship.

C. Comply fully with the manufacturer's published instructions, including each step in the sequence of installation.

D. Should the manufacturer's published instructions conflict with the Contract Documents, request clarification from the Owner=s representative before proceeding.

E. Comply with the specified standards as a minimum quality for the work, except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

F. Perform the work by persons who are thoroughly qualified and trained in their respective trade to produce workmanship of the specified quality.

G. Secure products in place with positive anchorage devices, designed and sized to withstand wind and seismic loads, stress, vibration, physical distortion and disfigurement.

H. Perform tests required by governing authorities and utility agencies having jurisdiction.

I. Contractor=s Field Inspection: The Contractor or his authorized representative(s) shall inspect all work under this Contract for quality control (QC).

1.7 QUALITY CONTROL TESTING:

A. Field tests made at, or in the vicinity of the Project Site in connection with the actual construction, including but not limited to, concrete batch plants, asphalt batch plants and similar establishments directly involved in the construction process.

1. Field Tests by the Contractor: The Contractor shall perform all field testing specifically required of him in the Contract Specifications and all field tests required by AApplicable Publications@ referenced in the Contract Specifications. The cost of testing shall be borne by the Contractor. The Contractor shall furnish all equipment, instruments, qualified personnel and facilities necessary to perform all tests required by the Contract Documents. The required testing services shall be performed by the Contractor or acquired by the Contractor through a qualified commercial testing laboratory. If a commercial testing laboratory is retained to perform tests under this Contract, all test reports shall be certified by the

laboratory. Test reports shall include the acceptable value for each specification item, actual test results obtained, methods used, and a statement that the product, equipment or system conforms or does not conform to the Specifications requirements.

2. Field Tests by Owner: Field tests conducted by the Owner will be made as necessary to assure quality or as otherwise provided herein.

B. Factory tests made at the point of manufacture of various products shipped to the Project Site as a unit.

C. Certified tests made by approved testing agencies on material and / or equipment to be incorporated into the Project under the Contract. These tests are those performed by Factory Mutual, Underwriters= Laboratories, Inc., and others.

1. Manufacturer=s Certified Tests: Certified tests on materials to be incorporated into the work will be acceptable, provided they are performed by the manufacturer or by Owner=s representative approved agencies or laboratories, show that the materials conform to the Specifications, and that tests and certifications meet the requirements of the paragraph entitled AQuality Assurance@ below.

1.8 TESTING AND INSPECTION LABORATORY SERVICES

A. Selection and Payment:

1. Employment and payment for services of an Independent Testing and Inspection Laboratory to perform specified testing and inspection shall be by the Contractor.

2. Owner Approval of Laboratories: All laboratory work performed under this Contract shall be done by a Laboratory approved by the Owner=s representative, whether the laboratory is employed by the Contractor or by others, or is owned and operated by the Contractor. The basis of approval includes the following:

a. Laboratories performing work in connection with concrete, steel and bituminous material must conform to American Society for Testing and Materials (ASTM) E 329.

b. Laboratories performing work not in connection with concrete, steel and bituminous materials must conform to Sections 3 and 4 of ASTM E 329.

3. Employment of Independent Testing and Inspection Laboratory in no way relieves the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents.

B. Quality Assurance:

1. Comply with the requirements of ASTM C 802, ASTM C 1077, ASTM C 1093, ASTM D 3740, ASTM D 4561, ASTM E 329, ASTM E 543, ASTM E 699 and ASTM E 1691.

2. Laboratory Staff: Maintain a full-time registered Engineer on staff to review the services provided.

3. Testing Equipment: Calibrated at reasonable intervals with devices of and accuracy traceable to either National Bureau of Standards or accepted values of natural physical constraints.

C. Laboratory Responsibilities:

1. Test samples of mixes submitted by the Contractor.

2. Provide qualified personnel at the Project Site. Cooperate with the Owner=s representative and the Contractor in the performance of services.

3. Perform the specified sampling, testing and inspection of products in accordance with the specified standards.

4. Determine compliance of the materials and mixes with requirements of the Contract Documents.

5. Promptly notify the Contractor=s Quality Control Representative and the Owner=s representative of observed irregularities or non-conformance of work or products.

6. Perform additional tests as required by the Owner=s representative.

1.9 CONTRACTOR=S FIELD INSPECTION AND TESTING

A. Contractor: Test and inspect the work provided under this Contract to ensure that the work is in compliance with the Contract requirements. Required tests and inspections are indicated in the individual Specifications Sections.

B. Preparatory Inspection: Performed prior to beginning the work and prior to beginning each segment of work and includes:

1. Review of Contract requirements.

2. Review of Shop Drawings and other submittal data after approval and return.

3. Examination to assure that the materials and equipment conform to the Contract requirements.

4. Examination to assure that the required preliminary or preparatory work is complete.

C. Initial Inspection: Performed when a representative portion of each segment of the work has been completed, and includes:

1. Performance of the required tests.

2. Quality of the workmanship.

3. Review for omissions and dimensional errors.

4. Examination of products used, connections and supports.

5. Approval or rejection of the inspected segment of work.

D. Follow-Up Inspections: Performed daily and more frequently, as necessary, to ensure that non-complying work has been corrected.

E. Testing and Inspection: Perform testing and inspection in accordance with requirements of the individual Specifications Sections.

1.10 CONTRACTOR'S WEEKLY REPORTS

A. Submit weekly reports to the Owner=s representative for days that work was performed. Include the following information:

1. Contractor=s name and address.

2. Job reference and information.

3. Date, weather, minimum and maximum temperatures, rainfall and other pertinent weather conditions.

4. Daily workforce of the Contractor and subcontractors, by trade.

5. Description of the work started, on-going work, and work completed by each subcontractor.

6. Coordination implemented between the various trades.

7. Approval of substrates received from various trades.

8. Non-conforming and unsatisfactory items to be corrected.

9. Remarks.

1.11 CONTRACTOR'S TESTING AND INSPECTION REPORTS

A. Prepare and submit a written report of each test and inspection, signed by the Contractor=s Quality Control Representative performing the inspection, within two (2) days after the day the inspection was made.

B. Include the following on the written inspection reports:

1. Cover sheet prominently identifying that the inspection "CONFORMS" or "DOES NOT CONFORM" to the Contract Documents.

2. Date of the inspection and date of the report.

3. Project name, location, solicitation number and Contractor.

4. Names and titles of individuals making the inspection.

5. Description of the Contract requirements for inspection by referencing the Specifications Section.

6. Description of the inspection made, interpretation of the inspection results, and notification of significant conditions at the time of the inspection.

7. Requirements for follow-up inspections.

1.12 NON-COMPLIANCE CHECK-OFF LIST

A. Maintain Check-Off List of work that does not comply with the Contract Documents,

stating specifically what is non-complying, date the faulty work was originally discovered and the date the work was corrected. There is no requirement to report deficiencies corrected the same day the deficiency was discovered. Submit a copy of the Non-Compliance Check-Off List of non-complying work items on a weekly basis for review at the next Progress / Coordination Meeting.

1.13 COMPLETION AND INSPECTION OF WORK

A. Prior to final acceptance by the Owner=s representative, submit a certification signed by the Contractor stating that all work has been inspected and that all work, except as specifically noted, is complete and in compliance with the Contract Documents.

B. Record Documents: By Contractor=s Quality Control Representative. Ensure that "Record Documents" required by Section 01780 - Closeout Submittals, are marked to show any deviations made during construction and are kept current on a daily basis. Upon completion of the work, certify the accuracy of the "Record Documents" and submit to the Owner=s representative.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Coordination and Approval.

2. Temporary Utilities: Electrical power, lighting, air conditioning and ventilation, water and sanitary facilities.

3. Fencing.

4. Barriers and Enclosures.

5. Erosion Controls: Surface water control and protection of work.

6. Access Roads and Parking Areas.

7. Project Signs.

8. Field Office and Sheds: Temporary buildings.

9. Construction Aids

10. Progress Cleaning and Waste Removal.

11. Ownership of Temporary Facilities and Controls.

12. Removal of Temporary Construction Facilities and Controls.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 COORDINATION AND APPROVAL

A. Coordinate with and obtain approval of the Owner=s representative for each temporary facility and control, location, sequence and schedule before starting any temporary work.

1.3 ELECTRICAL POWER

A. Contractor to provide and pay for electrical power from the local power authority; provide generator when island power is not available.

B. Provide a temporary electric feeder from the electrical service at a location determined by the local power authority and approved by the Owner=s representative.

C. Provide temporary power panels, wiring and outlets for construction operations with branch wiring and distribution boxes located as required; provide properly sized flexible power cords.

D. Provide temporary transformers, emergency generators, lines, etc., as necessary for continuous electrical supply to existing buildings affected by the construction of this Project.

1.4 LIGHTING

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 footcandles.

B. Permanent building lighting may be utilized during construction.

1.5 AIR CONDITIONING AND VENTILATION

A. Provide and pay for cooling devices and cooling, as needed, to maintain the specified conditions for construction operations.

B. Enclose the building prior to activating the temporary cooling equipment.

C. Prior to the operation of permanent equipment for temporary purposes, verify that the installation is approved for operation, the equipment is lubricated, ductwork and equipment are clean, unfinished construction procedures will not be detrimental to use of the equipment, and filters are in place. Provide and pay for the operation, maintenance and regular replacement of filters and worn or consumed parts.

D. Ventilate enclosed areas to assist the cure of materials, dissipate humidity, and prevent the accumulation of dust, fumes, vapors and gases.

1.6 WATER

A. Provide, maintain and pay for suitable quality drinking water for site personnel.

B. Provide temporary water lines, maintain and pay for water required for construction, including compaction, grading and dust abatement.

1.7 SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.

B. Comply with regulations of the governing authorities having jurisdiction.

1.8 FENCING

A Provide 6' high temporary fence around the entire construction area meeting the requirements, if any, of the Department of Public Works; provide vehicular and pedestrian gates with locks.

1.9 BARRIERS AND ENCLOSURES

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from demolition and construction

operations in accordance with regulations of OSHA and governing authorities having jurisdiction.

B. Provide barricades and covered walkways as required by governing authorities having jurisdiction for public rights-of-way.

C. Protect non-owned vehicular traffic from injury and damage.

1.10 EROSION CONTROL

A. Provide erosion control measures and facilities satisfactory to the environmental agency having jurisdiction and as required by Section 01560 - Environmental Protection.

B. Grade the Site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment as necessary.

C. Protect the Project Site from ponding and running water. Provide water barriers as required to protect the Site from soil erosion.

1.11 ACCESS ROADS AND PARKING AREAS

A. Construct and maintain temporary roads accessing a public thoroughfare to serve the construction area.

B. Extend or relocate as work progress requires. Provide detours necessary for unimpeded traffic flow.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Parking: Arrange for temporary parking areas to accommodate site personnel=s vehicles.

1. When site space is not adequate, provide for off-Site parking.

1.12 PROJECT SIGNS

A. Provide a 4' x 8' temporary project sign. Use new materials; 3/4" exterior grade plywood with hardwood edge trim; mount on treated 4" x 4" hardwood posts or the fence, as appropriate. Sign design to be provided by the Architect.

B. Use primer and two coats of exterior paint on the sign background, rear and posts. Use exterior paint for lettering on the face. Have lettering done by a professional sign painter.

C. Locate the sign(s) as indicated or as directed.

D. Allow no other signs or advertising of any kind on the Project Site, except safety, Directional and warning signs and signs required by law.

1.13 FIELD OFFICE AND SHEDS

A. Provide a building and sheds adequate in size and accommodation for the Contractor=s office and storage.

B. Provide space for Project meetings with a table and chairs to accommodate 10 persons.

C. Place the office and sheds at approved locations.

1.14 CONSTRUCTION AIDS

A. Furnish, install and maintain for the duration of the construction, all scaffolds, shoring, tarpaulins, barricades, canopies, warning signs, steps, bridges, platforms, and other temporary work necessary for proper completion of the Project and protection of the public and site personnel in compliance with relevant OSHA safety and other regulations.

1.15 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris and rubbish. Maintain the Project Site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to the start of surface finishing and continue cleaning to prevent the accumulation of dust.

D. Collect and remove waste materials, debris and rubbish from the Site weekly, daily if necessary, or as directed by the Owner=s representative, and dispose off-Site.

1.16 OWNERSHIP OF TEMPORARY FACILITIES AND CONTROLS

A. Items provided by the Contractor under this Section shall remain the property of the Contractor and all shall be removed from the Project Site immediately upon completion of the work.

1.17 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

A. Remove temporary utilities, equipment, facilities and materials prior to the Substantial Completion inspection.

B. Remove temporary underground installations.

C. Clean and repair damage caused by installations and temporary work.

D. Restore existing and permanent facilities used during construction to their original condition, as specified.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 ACCESS PROVISION

A. Provide ramps, stairs, ladders and similar temporary access elements as reasonably required to perform the work and to facilitate its inspection. Comply with reasonable requests of governing authorities performing inspections. When permanent stairs are

available for access during construction, cover finished surfaces with sufficient protection to ensure freedom from damage and deterioration at the time of Substantial Completion.

3.2 SECURITY / PROTECTION PROVISION

A. The types of temporary security and protection provisions required include, but is not limited to, fire, protection, barricades, warning signs / lights, site enclosure fence, building enclosure / lockup, watchman service, personnel security program (theft prevention), environmental protection, and similar provisions intended to minimize property losses, personal injuries and claims for damages at the Project Site.

3.3 EXTERIOR CLOSURES

A. Temporarily close exterior openings, weather-tight, to provide acceptable working conditions and for the protection of products, to allow for the maintenance of required ambient temperatures identified in the individual Specifications Sections, and to prevent the entry of unauthorized persons. Provide access doors with self-closing hardware and padlocks.

3.4 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual Specifications Sections.

B. Provide temporary and removable protection for installed work. Control activity in the immediate area to prevent damage.

C. Protect finished floors, and other surfaces from traffic, dirt, wear, damage and movement of heavy objects by covering with durable sheet materials.

D. Prohibit traffic and storage of materials on waterproofed and finished roof surfaces. If traffic or activity is necessary, obtain recommendations for protection from the waterproofing or roofing material manufacturer.

E. Prohibit traffic from landscape areas into interior work areas.

3.5 PERMANENT FIRE PROTECTION

A. Complete each fire protection facility at the earliest reasonable date, make ready for emergency use, and inform site personnel of its availability and proper use.

END OF SECTION

SECTION 01560

ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 DEFINITIONS OF CONTAMINANTS

A. Sediment: Soil and other debris that has been eroded and transported by runoff water.

B. Solid Waste: Rubbish, debris, garbage, and other discarded materials resulting from industrial, commercial, and agricultural operations, and from community activities, such material having insufficient liquid content to be free flowing.

C. Rubbish: A variety of combustible and noncombustible wastes such as ashes, waste materials that result from construction or maintenance and repair work, leaves and tree trimmings.

D. Chemical Wastes: Includes salts, acids, alkalies, herbicides, pesticides, petroleum-derived products and organic chemicals.

E. Sewage: Water-carried waste products from residences, public buildings, institutions or other buildings, including excrementitious or other discharge from the bodies of human beings or animals, together with such ground water infiltration and surface water as may be present.

F. Garbage: Refuse and scraps resulting from preparation, cooling, dispensing, and consumption of food.

G. Asbestos and Asbestos Materials: Asbestos means actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite. Asbestos materials means asbestos or any material containing asbestos such as asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing consigned for disposal. Friable asbestos material requires a Waste Disposal Permit. Submit one (1) copy of Guam Environmental Protection Agency (GEPA) permit or license which reflects such agency's approval of the disposal plan as being in compliance with their waste disposal regulations.

1.2 ENVIRONMENTAL PROTECTION REQUIREMENTS

A. Provide and maintain during the life of the contract, environmental protection as defined herein. Provide environmental protective measures as required to control pollution that develops during normal construction practice.

B. Provide also environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with all federal and local statutes and regulations pertaining to environmental protection.

1.3 SUBMITTALS

A. Environmental protection Plan: Submit two (2) copies of the proposed Environmental Protection Plan (EPP) to the Guam Environmental Protection Agency (GEPA) and 2 copies to the Engineer/Owner’s Representative for review and approval no later than 10 calendar days after receipt of the Notice to Proceed (NTP) with work under this project. Review of the plan by the Engineer and GEPA will be accomplished simultaneously. The Contractor shall not undertake any clearing, grubbing, earthwork, and excavations until the EPP has been approved by the GEPA and the Engineer/Owner’s Representative.

B. Solid waste Disposal Permit: Submit one (1) copy of local permit or license which reflects Guam Environmental Protection Agency's (GEPA) approval of the disposal plan as being in compliance with their solid waste disposal regulations.

C. The Contractor must submit an approved Erosion Control Plan (ECP) to Guam EPA, which will be implemented and maintained throughout the duration of the project.

PART 2 - PRODUCT (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES: The natural resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the work schedule, drawings, and specifications.

A. Land Resources: Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special permission from the Engineer/Owner's Representative.

B. Protection: Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Protect monuments, markers, and works of art.

C. Repair or Restoration: Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment or operations. Obtain approval of the repair or restoration from the Engineer prior to its initiation.

D. Temporary Construction: At the conclusion of the project, obliterate all signs of temporary construction facilities such as work areas, stockpiles of excess or waste materials, and all other vestiges of construction.

E. Water Resources: Perform all work in such a manner that any adverse environmental impact on water resources is reduced to a level acceptable to the Engineer/Owner's Representative.

F. Oily and Other Hazardous Substances: Take special measures to prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water.

3.2 CONTROL AND DISPOSAL OF SOLID, CHEMICAL AND SANITARY WASTES: Pick up solid waste and place in containers which are emptied on a regular schedule. The preparation, cooking, and disposing of food are strictly prohibited on the project site. Conduct handling and disposal of waste to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Remove signs of temporary construction and activities incidental to construction of the permanent work in place.

A. Disposal of Rubbish and Debris: Dispose of rubbish and debris in accordance with the requirements specified herein.

Remove rubbish and debris from the project site and dispose of it in compliance with federal and local requirements.

B. Garbage Disposal: Place garbage in appropriate containers and transport such refuse to an approved landfill for disposal at least once per week. As an alternative, the Contractor may arrange for weekly pickup and disposal service either with the Government of Guam or a privately-owned garbage collection service. The Contractor shall pay all fees associated with obtaining and maintaining garbage collection and disposal services.

C. Sewage, Odor, and Pest Control: Dispose of sewage through connection to the public sewage system. Where such system is not available, use chemical toilets or comparably effective units and periodically empty waste into the public sanitary sewage system. Include provisions for pest control and elimination of odors.

D. Chemical Waste: Store chemical waste in corrosion resistant containers labeled to identify type of waste and date filled. Remove containers from the project site, and dispose of chemical waste in accordance with federal, state, and local regulations. For oil and hazardous material spills which may be large enough to violate federal and local regulations, notify the Engineer immediately and take measures as instructed by the Engineer/Owner's Representative or appropriate regulatory agencies, at no additional costs to the Owner.

E. Petroleum Products: Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting federal and local regulations.

3.3 DUST CONTROL: Keep dust down at all times, including non-working hours, weekends, and holidays. Sprinkle or treat, with dust suppressors, the soil at the site, haul roads, and other areas disturbed by operations. No dry brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing is permitted only for cleaning non-particulate debris, such as steel reinforcing bars. No sandblasting is permitted unless dust therefrom is confined. Only wet cutting of concrete blocks, concrete, and asphalt is permitted. No unnecessary shaking of bags is permitted where bagged cement, concrete mortar, and plaster is used.

3.4 NOISE: When available, make the maximum use of "low-noise emission products" as certified by Guam Environmental Protection Agency.

END OF SECTION 01560

SECTION 01567

MAINTENANCE OF TRAFFIC

PART 1 - GENERAL

1.1 Traffic control and safety devices shall be in accordance with Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) For Streets and Highways, Latest Edition.

1.2 Prior to beginning work, the Contractor shall submit to Department of Public Works Traffic Engineering Section approved Traffic Control Plan and a "**copy"** furnished to the Engineer/Owner's Representative. The Contractor shall also include a schedule listing the types and number of traffic control and safety devices proposed for use.

1.3 Unless otherwise approved or directed by the Engineer/Owner's Representative, the minimum widths for one-lane and two-lane traffic shall be 10 feet and 20 feet, respectively.

PART 2 - PRODUCTS

2.1 Traffic control devices shall conform to the applicable specifications, standards and principles of the Manual except as amended herein. The traffic control devices shall be used at the site for construction, construction survey, and related work that might endanger passing motorists, pedestrians and workers.

A. Traffic control devices shall be in place prior to the start of any construction, maintenance, construction survey, and related work and shall be removed until the obstruction or danger of obstruction no longer exists. Where work is performed in stages, there shall be in place those devices that apply to the conditions and activities present during the stage in progress.

B. All signs, markers, barricades, cones, lights, and other devices indicating the existence of special conditions and activities shall remain in place until their need is no longer required, unless otherwise directed by the Engineer/Owner's Representative. Signs that do not apply to existing conditions and activities shall be removed or covered. All devices employed shall be neatly constructed and shall be repaired, cleaned, repainted, and properly maintained in good condition. Special care shall be taken to see that shrubbery, construction materials, equipment, spoil and other obstructions do not obscure any sign, light or barricade, particularly at intersections or curves.

C. When it becomes necessary to excavate along or across a highway or any lane thereof, the work shall be performed to avoid existing local peak traffic hours. The Contractor must coordinate this work with DPW.

2.2 SIGNS:

A. Regulatory signs, warning signs and guide signs used at construction, surveying or other sites shall be reflectorized and shall conform to the basic standards prescribed in the Manual and as specified in the applicable Sections of the Specifications. Generally, signs shall be placed in the most effective locations so as to assure the fastest and most adequate driver response time. All advance warning signs shall be placed on each approach and shall indicate the general character of the work being done, and the distance from the sign to the actual work area.

B. The Engineer/Owner's Representative may waive any requirements specified herein if advance application is made by the Contractor when in his judgment, the placement of signs may not be feasible or such placement may interfere with the progress of the work.

2.3 BARRIERS AND CHANNELIZING DEVICES:

A. Barriers and channelizing devices used at work sites shall follow the basic standards prescribed in the Manual and the following provisions:

1) When it is necessary to confine the traffic to singular lanes, additional transverse barricades and drums shall be placed at close intervals (approximately 120-foot spacing on tangents and curves of more than 500 feet radius and approximately 60-foot spacing on curves of 500 feet radius or less) in the closed lane.

2) Where hazardous locations occur, a series of Type II barricades, cones or drums shall be placed in longitudinal rows along the edge of the closed area (continuously for barricades and at approximately 15-foot spacing for cones and drums).

PART 3 - EXECUTION

3.1 Maintaining Traffic: The Contractor shall conduct construction operations with minimum interference to traffic on roads, streets and driveways and he shall have under construction, no greater length or amount of work than he can prosecute properly with due regard to the rights of the public. Roads, streets and driveways shall be kept free of dirt and debris at all times. Convenient access to driveways, houses and buildings along the line of the work shall be maintained. In all areas, the Contractor shall install and maintain appropriate signs, lights, flares and barricades for the protection of the public. Such signs and barricades and their placement shall conform to instructions contained in Part VI of the "Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways". The Contractor is expected to be familiar with all applicable Government of Guam laws and compliance with such laws is considered a part of this contract.

3.2 Coordination:

A. In the case of conflict between the Manual and the Specifications, the most stringent requirements shall apply.

B. This Section of the specifications shall be coordinated with all related documents affecting the work.

C. All work shall be coordinated through the Engineer/Owner’s Representative.

END OF SECTION 01567

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Definitions.

2. Products.

3. Product options.

4. Product substitution procedures.

5. Product delivery requirements.

6. Product handling and storage requirements.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 DEFINITIONS

A. Products: Items for incorporation into the work, whether purchased specifically for the Project or taken from previously purchased stock. This term includes the terms material, equipment, systems, and other terms of similar intent.

B. Named Products: Items identified by manufacturer's name, including make or model number or other designation, as shown or listed in the manufacturer's published product literature.

C. Materials: Products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the work.

D. Equipment: Products with operational parts, whether motorized or manually-operated, that require service connections, such as water piping, waste piping and / or electrical wiring.

1.3 PRODUCTS

A. Provide products that comply with the Contract Documents, and are new and undamaged at the time of installation.

B. Provide products complete with accessories, trim, finish, safety guards, and other devices and details required for a complete installation and for its intended use and effect.

C. Provide products of a kind from a single source. When the products specified are available only from a source that does not, or cannot produce the quantity necessary to meet the Project requirements, in compliance with the Project Schedule, contact the

Architect, in writing, to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability and compatibility. When the Architect makes a determination, select products from a source that produces products that possess those qualities to the greatest extent possible.

1.4 PRODUCT OPTIONS

A. Products: Throughout the Contract Documents products may be specified by a manufacturer's name and catalog number to establish standards of quality and performance, and not for the purpose of limiting competition. Substitute methods and products may be submitted to the Owner’s representative for consideration in conformance with the article entitled "Product Substitution Procedures" below.

B. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

C. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting the Specifications requirements. Substitutions may or may not be permitted, as stated in the particular Section specifying the product.

D. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named, Submit in accordance with the article entitled "Product Substitution Procedures" below.

E. Standards, Codes and Regulations: Where only compliance with an imposed standard, code or regulation is required, selection from among products which comply with the requirements, including those standards, codes and regulations, is the Contractor's option.

F. Performance Requirements and Design Criteria: Provide products which have been produced in accordance with the prescriptive requirements for structural capability, anchorage, mixing, fabricating, curing, finishing, testing and similar operations in the manufacturing process.

G. Prescriptive Requirements: Provide products which have been produced in accordance with the prescriptive requirements using the specified ingredients and components, and complying with the specified testing and similar operations in the manufacturing process.

H. Visual Matching:

1. Where matching with an established sample is required, final judgment of whether a product matches the specified cost category is available, which matches the sample satisfactorily, and complies with requirements, comply with the Contract Document provisions concerning, "substitutions".

2. Visual Selection: Except as otherwise indicated, where specified product requirements include "...as selected from the manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturer and basic product is the Contractor's option, and the subsequent selection of color, pattern and texture is by the Architect.

1.5 SUBSTITUTIONS

A. Conditions: Contractor's request for substitution will be received and considered when extensive revisions to the Contract Documents are not required, and changes are in keeping with the general intent of the Contract Documents; when timely, fully documented

and properly submitted; and when one or more of following conditions is satisfied, all as judged by the Owner's representative. Otherwise, requests will be returned without action except to record non-compliance with the requirements.

1.6 PRODUCT SUBSTITUTION PROCEDURES

A. Submit each Request for Substitution on a "Contractor's Substitution Request" form with complete data substantiating compliance of the proposed substitution with the Contract Documents.

B. A request constitutes a representation that the Contractor:

1. Has investigated the proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the substitution as for the specified product.

3. Will coordinate the installation and make changes to other work which may be required for the work to be completed at no additional cost to the Owner.

4. Waives claims for additional cost and time extension which may subsequently become apparent.

C. Substitutions will not be considered when they are indicated or implied on the Shop Drawing or product data submittals, without a separate written request, or when acceptance will require revision of the Contract Documents.

D. Substitution Submittal Procedure:

1. Submit four (4) copies of the "Contractor's Substitution Request" form for substitution consideration. Limit each request to one (1) proposed substitution.

2. Submit Shop Drawings, product data, and certified test results attesting to the proposed product's equivalence. The burden of proof lies with the proposer.

3. The Architect will notify the Contractor, in writing, of the decision to accept or reject the substitution request.

1.6A Requests for Substitutions:

1. Provide a written substitution request, fully documented to show compliance with the requirements for substitutions. Include product data / drawings, description of methods and samples where applicable. The Contractor shall submit a comparison of significant qualities between the specified item and the proposed substitution, including life expectancy, weatherability, durability, fire resistance, compatibility with other materials, susceptibility to defects due to characteristics unique to the product, and product limitations, including other characteristics such as slip resistance, acoustical properties, etc. The Contractor shall submit a statement of effect on construction time, coordination with other affected work, and the Contractor's statement to the effect that the proposed substitution is satisfactory for use in the Project and will result in overall work equal-to-or-better-than the work originally indicated.

2. When not equal-to-or-better, the Contractor shall submit a justification and deductive cost proposal resulting from the substitution.

1.7 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with the manufacturer's instructions, using means and methods to prevent damage, deterioration, and loss, including theft.

B. Schedule product delivery to minimize long-term storage at the Project Site, and to prevent overcrowding of construction spaces.

C. Coordinate product delivery with the installation schedule to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

D. Deliver products to the Project Site in undamaged condition, in the manufacturer's original, new, sealed container(s) or packaging system, complete with labels intact and instructions for handling, storing, unpacking, protecting, and installing.

E. Promptly inspect shipments to ensure that the products comply with the Project requirements, that quantities are correct, products are undamaged, and are properly protected.

1.8 PRODUCT HANDLING AND STORAGE REQUIREMENTS

A. Store and protect products in accordance with the manufacturers' published instructions, with seals and labels intact and legible.

B. Store products subject to deterioration above ground, under cover, in a weathertight enclosure and with ventilation adequate to prevent condensation and potential degradation. Maintain temperature and humidity within the range required by the manufacturer's published instructions.

C. For exterior storage of fabricated products, place on sloped supports, above ground.

D. Provide off-site storage and protection when the Project Site does not permit on-site storage or proper protection.

E. Store loose granular materials on solid flat surfaces in a well drained area. Prevent mixing with foreign matter.

F. Provide equipment and personnel to handle and store products by methods to prevent soiling, disfigurement, and damage.

G. Arrange storage of products to permit access for inspection. Periodically inspect to verify that the products are undamaged and are maintained in an acceptable condition.

1.9 WARRANTIES

A. Comply with the Warranty provisions of Section 01012 - Supplementary Conditions.

B. Categories of Specific Warranties: Warranties on the work are in several categories, including those of the General Conditions, and including, but not necessarily limited to, Sections of Divisions 2 through 16 of these Specifications.

C. Special Project Warranty (Guarantee): A Warranty specifically written and signed by the Contractor for a defined portion of the work; and, where required, countersigned by the subcontractor, installer, manufacturer or other entity engaged by the Contractor.

D. Specified Product Warranty: A Warranty which is required by the Contract Documents, to be provided for a manufactured product incorporated into the work.

E. Coincidental Product Warranty: A Warranty which is not specifically required by the Contract Documents, other than as specified in this Section, but which is available on a product incorporated into the work, by virtue of the fact that the manufacturer has published a Warranty in connection with purchase and use of the product without regards to specific applications.

F. General Limitations: It is recognized that specific Warranties are intended primarily to protect the Owner against failure of the work to perform as required, and against deficient, defective and faulty materials and workmanship, regardless of the source. Except as otherwise indicated, specific Warranties do not cover failures in the work which result from:

1. Unusual and abnormal phenomena of the elements,

2. The Owner's misuse, maltreatment or improper maintenance of the work,

3. Vandalism after the date of Substantial Completion, or

4. Insurrection or acts of aggression, including war.

G. Start Date: Warranties will commence on the date of Substantial Completion of the Project unless otherwise agreed to by the Owner’s representative.

H. Reinstatement of Warranty Period: Except as otherwise indicated, when work covered by a special Project Warranty or product Warranty has failed and has been corrected by replacement or restoration, reinstate the Warranty by written endorsement for the original time period, starting on the date of acceptance of the replaced or restored work.

I. Replacement Cost, Obligations: Except as otherwise indicated, the cost of replacing or restoring failing warranted units or products is the Contractor's obligation, without regard for whether or not the Owner has already benefitted from use through a portion of the anticipated useful service life.

J. Related Damages and Losses: In connection with the Contractor's correction of warranted work which has failed, remove and replace other work of the Project which has been damaged as a result of the failure, or must be removed and replaced to provide access for correction of the warranted work.

K. Rejection of Warranties: The Owner reserves the right, at the time of Substantial Completion or thereafter, to reject coincidental product Warranties submitted by the Contractor, which in the opinion of the Owner tend to detract from or confuse interpretation of the requirements of the Contract Documents.

L. Contractor's Procurement Obligations: Do not purchase, subcontract for, or allow others to purchase or sub-subcontract for materials or units of work for the Project where a special Project Warranty, specified product Warranty, certification or similar commitment is required, until it has been determined that the entities required to countersign such commitment are willing to do so.

M. Submittal of Warranty Forms: Where a special Project Warranty (Guarantee) or specified product Warranty is required, prepare a written document to contain terms and appropriate identification, ready for execution by the required parties. Submit a draft to the Owner via the Owner's representative for approval and final execution.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Examination.

2. Preparation.

3. Execution.

4. Cleaning.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other documents.

1.2 EXAMINATION

A. Visit the Project Site to determine the existing conditions.

1. Take field measurements and verify field conditions, compare field measurements, conditions, locations of survey benchmarks, and other information known to the Contractor, with the Construction Documents before starting the work.

2. Be responsible for determining conditions of the Project Site, including all existing improvements, paving, above and below ground utilities, and existing construction.

3. Contact local utility companies and agencies and make arrangements to obtain utility locations and marking service before the start of work.

B. Review Bidding and Contract Documents.

1. Carefully study and compare the Contract Documents with each other.

2. Be responsible for thorough knowledge of the Contract Documents and their relationship to each other.

3. If the Contractor performs work knowing it involves a recognized error, inconsistency, or omission in the Contract Documents, without notice to the Owner=s representative, the Contractor assumes responsibility for performance of the work, and is responsible for the cost of corrective work.

C. Verify that existing conditions and substrate surfaces are acceptable and meet the manufacturer's requirements for the application or installation of work.

D. Verify that the substrate is capable of structurally supporting attachment of the work being applied or installed.

E. Examine and verify specific conditions described in the individual Specifications Sections.

F. Verify that utility services are available, of the correct characteristics, and in the correct location for the installation of work.

1.3 PREPARATION

A. Construction Layout:

1. Be responsible for the accuracy of measurements, elevations, lines, and grades of the work.

2. Do not scale Drawings. Use the dimensions indicated on the Drawings for the laying out of work.

3. Errors in construction caused by the Contractor scaling Drawings to obtain measurements for laying out the work is the responsibility of the Contractor. By scaling Drawings, the Contractor assumes responsibility for the performance of such work, and is responsible for the cost of corrective work.

4. Perform field work necessary to lay out and maintain work to the dimensions indicated in the Contract Documents.

B. Field Engineering:

1. Establish permanent benchmarks on the Project Site referenced to established control points indicated on the Drawings. Record locations, with horizontal and vertical data, on the Project Record Drawings.

2. Establish elevations, lines, and levels, for work using survey instrumentation for:

a. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.

b. Grid or axis for structures.

c. Building foundations, column locations, and finish floor elevations.

d. Location of existing utilities necessary to adjust, move, or relocate existing structures, utility poles, lines, services, and other items located within the Project Site or affected by the work.

3. Periodically verify layouts by the same means.

C. Preparation for product Installation:

1. Conduct a Pre-Installation Meeting when specified in the individual Specifications Sections.

2. Obtain, read, and understand applicable reference standards and manufacturer's published instructions regarding erection, application, and installation of products.

3. Clean substrate surfaces before applying products.

4. Seal cracks and openings of substrates before applying products.

5. Apply manufacturer=s required or recommended substrate primer, sealer, or conditioner before applying products in contact or bond.

1.4 EXECUTION

A. Cutting and Patching:

1. Employ skilled and experienced tradesmen to perform cutting and patching work.

2. Submit a written request, in advance of cutting or altering elements which affect:

a. Structural integrity of an element.

b. Integrity of weather-exposed or moisture-resistant elements.

c. Efficiency, maintenance, or safety of an element.

d. Visual quality of sight exposed elements.

3. Execute cutting, fitting, and patching to complete work, and to:

a. Fit several parts together, to integrate with other work.

b. Uncover work to install or correct ill-timed work.

c. Remove and replace defective and non-conforming work.

d. Remove samples of installed work for testing.

e. Provide openings in elements of the work for penetrations of mechanical and electrical work.

4. Execute work by methods that will avoid damage to other work, and will provide proper surfaces to receive patching and finishing.

5. Cut masonry and concrete materials using a masonry saw or core drill.

6. Restore work with new products in accordance with requirements of the Contract Documents.

7. Fit work tight to pipes, sleeves, ducts, conduit, and other penetrations.

8. Maintain the integrity of wall, ceiling, and floor construction; completely seal voids.

9. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to the nearest intersection; for an assembly, refinish the entire unit.

10. Identify any hazardous substance or condition exposed during the work to the Owner=s representative for a decision or remedy.

B. Installation:

1. Refer to the installation requirements in individual Specifications

Sections.

2. For each product, inspect the substrate and conditions under which the work will be performed. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3. Comply with manufacturer's published installation instructions and recommendations, to the extent that instructions and recommendations are more explicit or stringent than requirements in the Contract Documents.

4. Inspect products ready for installation immediately upon delivery to the Project Site.

    a. Inspect products immediately before the start of application, installation, or erection.

    b. Reject damaged and defective products.

5. Verify and check dimensions and measurements before the start of application, installation or erection.

6. Coordinate the closing-in of work with required inspections and tests.

    a. Do not cover work until inspected and approved by the appropriate person or entity.

    b. Uncover work that has not been inspected as directed by the Owner=s representative.

7. Provide fasteners, attachments, connection devices, and methods as indicated on the Drawings, or as specified.

    a. Where not indicated or specified, provide appropriate methods necessary for securing the work.

    b. Secure work plumb, level and true to line.

    c. Provide for expansion and building movement.

1.5 CLEANING

A. Cleaning During Construction: Coordinate with Section 01500 - Temporary Facilities and Controls.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01705

PROJECT CLOSEOUT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Description of requirements.

2. Prerequisites for Substantial Completion.

3. Closeout procedures.

4. Final cleaning.

5. Starting and adjusting.

6. Operation and maintenance instructions.

7. Partial occupancy or use.

8. Prerequisites for final acceptance.

9. Default.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 DESCRIPTION OF REQUIREMENTS

A. Definitions: Closeout is hereby defined to include the general requirements near the end of the Contract Time in preparation for substantial completion, beneficial occupancy, final acceptance, and final payment.

1.3 PREREQUISITES TO SUBSTANTIAL COMPLETION

A. General: Prior to requesting an Owner representative=s inspection for certification of substantial completion (for either the entire work or portions thereof), complete the following:

1. Provide a list of incomplete items, reasons for being incomplete and a schedule for completion.

2. Obtain and submit releases enabling the Owner's full and unrestricted use of the work and access to services and utilities, including recorded Occupancy Permit(s), operating certificates, and similar releases.

3. Make final change-over of locks and transmit keys to the Owner. Advise the Owner's personnel of the change-over in security provisions.

4. Complete start-up and testing of equipment and systems including instruction of

Owner's operations / maintenance personnel. Discontinue (or change-over) and remove from the Project Site all temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.

5. Place in good working order all equipment and systems, including but not limited to, all fire, mechanical, electrical and life safety systems.

6. Submit manuals and other supporting documentation, as indicated in the Contract Documents.

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7. Complete final cleaning.

B. Inspection Procedures: Upon receipt of the Contractor's request, the Owner=s representative will either proceed with the inspection or advise the Contractor of prerequisites not fulfilled. Following the initial inspection, the Owner=s representative will either prepare a Certificate of Substantial Completion, or advise the Contractor of work which must be performed prior to the issuance of a certificate. Repeat the inspection when requested and assured that the work has been substantially completed. Results of completed inspection will form the initial "punch-list" for final acceptance.

1.4 CLOSEOUT PROCEDURES

A. At completion of the work of each subcontract or designated division of the work, conduct an initial inspection to verify completion of the work; prepare a list of work to be completed or corrected, and conduct a follow-up inspection to verify that the corrections have been made.

B. Beneficial Occupancy:

1. When the Contractor considers the work, or a portion of the work which the Owner agrees to accept separately, is substantially complete, submit written certification to the Owner=s representative stating that the Contract Documents have been reviewed, work has been inspected, the work is complete in accordance with the Contract Documents, and the work is ready for inspection.

a. Submit a list of items to be completed or corrected.

b. Complete and correct items on the list.

c. Failure to include an item on the list does not change the Contractor=s responsibility to complete the work in accordance with the Contract Documents.

d. Submit Closeout Submittals to the Owner=s representative.

2. The Owner=s representative will review the list and make an inspection to determine if the work, or designated portion of the work, is substantially complete.

a. The Contractor will be notified of items identified during inspection as not in accordance with the Contract Documents, whether they were included on the Contractor=s list or not.

b. Contractor to complete and correct items on the list.

c. Notify the Owner=s representative that the items have been corrected and request re-inspection.

3. The Owner=s representative will re-inspect to determine if the work, or designated portion of the work, is substantially complete.

4. When the work, or designated portion of the work, is substantially complete, the Owner=s representative will notify the Contractor and document the Date of Beneficial Occupancy.

C. Final Acceptance:

1. The Contractor to submit written certification that the Contract Documents have been reviewed, work has been inspected, work is complete in accordance with the Contract Documents, and is ready for final inspection.

2. The Owner=s representative will make an inspection to determine if the work of the Contract is complete.

a. The Contractor will be notified by the Owner=s representative of items identified during inspection as not in accordance with the Contract Documents, and not ready for final acceptance.

b. Contractor to complete and correct items on the list.

c. Contractor to notify Owner=s representative that items on the list have been corrected and request an inspection.

3. When the work is complete, as determined by the Owner=s representative, the Owner=s representative will notify the Contractor and document the Date of Final Acceptance.

1.5 FINAL CLEANING

A. Complete cleaning operations before requesting inspection for Substantial Completion for Final Acceptance or a portion of the Project.

B. Provide final cleaning of the work consisting of cleaning each surface or unit of work to a normal "clean" condition expected from a first class building cleaning and maintenance program. Comply with the manufacturer's instructions for cleaning operations.

C. Use cleaning materials and agents recommended by the manufacturer or fabricator of surfaces to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.

1. Remove tools, construction equipment, machinery and surplus materials from the Project Site.

2. Remove temporary protection devices and facilities installed during construction.

3. Clean the Project Site, yard and grounds, in areas disturbed by the construction activities, including landscape development areas. Remove rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petrochemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even textured surface.

4. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.

5. Broom clean concrete floors in unoccupied spaces.

6. Clean exposed exterior and interior hard-surface finishes to a dirt-free condition, free of stains, films and similar foreign substances. Avoid disturbing the natural weathering of exterior surfaces.

7. Remove labels that are not permanent.

8. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision obscuring materials. Replace chipped and broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch the surfaces.

9. Vacuum clean carpet and similar soft surfaces, remove debris and excess nap; shampoo if required.

10. Touch-up and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that can not be satisfactorily repaired or restored, or that show evidence of repair or restoration. Do not paint over "UL" and similar labels, including mechanical and electrical name plates.

11. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure. Clean food service equipment to a condition of sanitation ready and acceptable for its intended service use.

12. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace burned out lamps, and defective and noisy starters in fluorescent and mercury vapor fixtures.

13. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills. Clean ducts, blowers, and coils if units were operated without filters during construction.

14. Wipe surfaces of mechanical and electrical equipment clean, including elevator and similar equipment. Remove excess lubricants, paint, mortar droppings and other foreign substances.

15. Leave the entire Project Site clean and ready for occupancy.

D. Engage an experienced licensed exterminator to make a final inspection, and rid the Project Site of rodents, insects, and other pests. Comply with regulations of the local authorities having jurisdiction.

E. Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the Project Site and dispose at a designated site, and in accordance with requirements of the local authorities having jurisdiction.

1.6 STARTING AND ADJUSTING

A. Inspect mechanical and electrical equipment start-up operations, observe testing and balancing, and record the start-up results, including the time and date of start-up.

B. Starting Systems:

1. Coordinate the schedule for start-up of the various items of equipment and systems.

2. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for any conditions which may cause damage upon start-up.

3. Verify that tests, meter readings, and the specified electrical characteristics agree with those required by the equipment or system manufacturer.

4. Verify that wiring and support components for equipment are complete and have been tested.

5. Execute start-up under the supervision of appropriate Contractor=s personnel, and in accordance with the manufacturers' instructions.

1.7 OPERATION AND MAINTENANCE INSTRUCTIONS

A. Arrange for each installer of work requiring continuing maintenance or operation to meet with the Owner's personnel at the Project Site to provide basic instructions for proper operation and maintenance of the entire work. Utilize the Operations and Maintenance Manuals as the basis for instructions. Review contents of the manuals, in detail, to explain all aspects of operation and maintenance. Include instructions by manufacturer's representatives where the installers are not expert in the required procedures.

B. Review maintenance manuals, record documentation, tools, spare parts and materials, lubricants, fuels, identification system, control sequences, shutdown, hazards, trouble-shooting, cleaning, servicing, maintenance and similar procedures.

C. For operational equipment, demonstrate start-up, shut-down, operation, control, emergency operations, noise and vibration adjustments, safety, economy / efficiency adjustments, energy effectiveness, and similar operations.

D. Review operations and maintenance in relation to applicable warranties, agreements to maintain, bonds, and similar continuing commitments.

E. Prepare and insert additional data in the Operations and Maintenance Manuals when need, for data that becomes apparent during the instructions.

1.8 PARTIAL OCCUPANCY OR USE

A. The Owner shall have the right to occupy or permit its employees, agents, representatives, or subcontractors to occupy any part or parts of the Project (to the extent that such work is not covered hereunder) and to install special Items, fixtures, furniture, appliances and equipment, notwithstanding that all work hereunder shall not have been completed at the time of such occupancy, provided, however, that:

1. The work completed in the part or parts to be occupied shall have been conditionally accepted by the Owner, in writing, specifying any claimed deficiencies in the work completed;

2. The Owner assumes liability for utilities and the risk of loss with respect to the portion of the Project subject to such early occupancy; and

3. Any such early occupancy shall not reasonably interfere with the Contractor's sequence for completing its work in the areas occupied or in other areas. The Contractor agrees to fully cooperate and coordinate its effort with such early "occupancy" of the Project under this paragraph, and shall give to the Owner

prompt notice of any inconvenience, damage, or delay likely to arise from such early occupancy. Such early occupancy shall have no bearing on the commencement of warranty periods.

1.9 PREREQUISITES FOR FINAL ACCEPTANCE

A. Prior to requesting final inspection for certification of final acceptance and final payment, as required by the General Conditions, complete the following and list known exceptions in the request:

1. Submit final payment request with final releases and supporting documentation not previously submitted and accepted.

2. Submit a dated final statement accounting for changes to the Contract Sum.

3. Submit a certified copy of the final Punch List of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by the Owner=s representative.

4. Submit final meter readings for temporary utilities per Specifications Section 01500 - Temporary Facilities, a measured record of stored fuel, and similar data as of the time of Substantial Completion or when the Owner took possession of and responsibility for corresponding elements of the work.

5. Submit a consent of Surety to the release of final payment.

6. Deliver tools, spare parts, extra stocks of materials, and similar physical items to the Owner.

7. Submit Record Drawings, Record Product Data and Miscellaneous Record Submittals.

8. Submit Warranties, workmanship / maintenance bonds, maintenance agreements, final certifications and similar documents.

9. Submit compliance with mechanics liens laws.

B. Re-inspection Procedure: Upon receipt of the Contractor's notice that the work has been completed, including Punch List items resulting from earlier inspections, and excepting incomplete items delayed because of acceptable circumstances, the Owner=s representative will re-inspect the work. Upon completion of the re-inspection, the Owner=s representative will either process final closeout documents or advise the Contractor of work not completed or obligations not fulfilled, as required for final acceptance.

C. Final Payment, Liens and Punch List of Work: If at the time of Final Payment, any application or applications for mechanic's or materialmen's liens have been filed against the Project, the Owner may withhold an amount equal to two hundred percent (200%) of the amount of the claimed lien or liens until the liens are removed or the Contractor posts a bond or cash deposit discharging such liens. The Owner may also withhold from the final payment such amount as the Owner reasonably deems necessary to cover: 1) minor corrective work (Punch List items) until such corrective work has been completed by the Contractor, and 2) any remaining work the Contractor is required to perform under the Contract Documents. The amount withheld shall be two hundred percent (200%) of the value of the incomplete work as reasonably estimated by the Owner.

1.10 DEFAULT

A. The Owner may declare the Contractor in default in accordance with and in the manner described in the General Conditions of the Contract for Construction for any of the following reasons:

1. Failure to complete the work within the Contract period or any extension thereof.

2. Failure or refusal to comply with an order of the Owner or Architect within a reasonable time.

3. Failure or refusal to remove rejected materials.

4. Failure or refusal to perform anew any defective or unacceptable work.

5. Bankruptcy or insolvency, or the making of an assignment for the benefit of creditors.

6. Failure to pay subcontractors and suppliers promptly.

7. Repeated failure to provide a qualified superintendent, competent workmen or subcontractors to carry out the work in an acceptable manner, or failure to prosecute the work according to the agreed schedule for completion.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Maintenance contracts.

2. Operation and maintenance data.

3. Product warranties.

4. Project record documents.

5. Extra materials.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 MAINTENANCE CONTRACTS

A. Provide Plant Maintenance as part of the work of this Contract as specified in Section 02930 - Exterior Plants.

B. Provide Elevator Maintenance as part of the work of this Contract as specified in Section 14240 - Hydraulic Elevators.

1.3 OPERATION AND MAINTENANCE DATA

A. Prepare instructions and data by personnel experienced in operation and maintenance of the described products and equipment.

B. Format:

1. Prepare data in the form of an instructional manual.

2. Binders: Commercial quality, 8-1/2" x 11", three D, side ring binders with durable plastic covers; 2" maximum ring size. When multiple binders are used, correlate the data into related, consistent groupings.

3. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify the title of the Project; identify the subject matter of the contents.

4. Provide tabbed dividers for each separate product and system, with a typed description of the product and major component parts of equipment.

5. Text: Manufacturer's published data, or typewritten data on 20 pound paper.

6. Drawings: Provide with reinforced punched binder tabs. Bind in with text; fold large drawings to the size of the text pages.

7. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:

   a. Part 1: Directory, listing the name, address, and telephone number of the Architect, Engineers, Contractor, subcontractor, and major equipment suppliers.

   b. Part 2: Operations and maintenance instructions, arranged by system and subdivided by Specifications Section. For each category, identify the name, address, and telephone number of the subcontractor and suppliers. Identify the following:

      1) Significant design criteria.

      2) List of equipment.

      3) Parts list for each component.

      4) Operating instructions.

      5) Maintenance instructions for equipment and systems.

      6) Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

   c. Part 3: Project documents and certificates, including the following:

      1) Shop Drawings and product data.

      2) Air and water balance reports.

      3) Certificates.

      4) Copies of Warranties.

C. Contents, Each Volume:

1. Table of Contents: Provide the title of the Project; name, address, and telephone number of the Architect, Engineer, subconsultant, and the Contractor with the name of the responsible party; schedule of products and systems, indexed to the content of the volume.

2. For Each Product or System: List the name, address and telephone number of subcontractor and suppliers, including the local source of supplies and replacement parts.

3. Product Data: Mark each sheet to clearly identify the specific products and component parts, and data applicable to the installation. Delete or do not include inapplicable information.

4. Drawings: Supplement product data to illustrate the relationship of component parts of equipment and systems, to show control and flow diagrams. Do not use the Project Record Documents as maintenance drawings.

5. Typed Text: As required to supplement product data. Provide a logical sequence of instructions for each procedure, incorporating the manufacturer's instructions.

6. Warranties: Bind in a copy of each.

7. Lien Release: Include a copy from each subcontractor and major supplier.

D. Manual for Materials and Finishes:

1. Building Products, Applied Materials, and Finishes: Include product data, with catalog numbers, sizes, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.

2. Instructions for Care and Maintenance: Include the manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

3. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

4. Additional Requirements: As specified in the individual product Specifications Sections.

5. Provide a listing in the Table of Contents for design data, with a tabbed fly sheet and space for insertion of data.

E. Manual for Equipment and Systems:

1. Each Item of Equipment and Each System: Include description of the unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

2. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

3. Include color coded wiring diagrams, as installed.

4. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include any special operating instructions.

5. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

6. Provide a servicing and lubrication schedule, and a list of lubricants required.

7. Include the manufacturer's published operation and maintenance instructions.

8. Include sequence of operation by the controls manufacturer.

9. Provide the original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

10. Provide control diagrams by the controls manufacturer, as installed.

11. Provide the Contractor's coordination drawings, with color coded piping diagrams, as installed.

12. Provide charts of valve tag numbers, with the location and function of each valve, keyed to flow and control diagrams.

13. Provide a list of the original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

14. Include test and balancing reports, as specified.

15. Additional Requirements: As specified in the individual product Specifications Sections.

16. Provide a listing in the Table of Contents of design data, with tabbed dividers and space for insertion of additional data.

1.4 PRODUCT WARRANTIES

A. Submit Warranties required for specific products or work, as specified in the individual Specifications Sections.

B. Form of Submittals:

1. Bind in commercial quality 8-1/2" x 11" three D, side ring binders with durable plastic covers.

2. Cover: Identify each binder with the typed or printed title WARRANTIES with the title of the Project; name, address and telephone number of the Contractor and equipment supplier; and the name of the responsible company principal.

3. Table of Contents: Neatly typed, in the sequence of the Project Manual, Table of Contents, with each item identified with a number and title of the Specifications Section in which specified, and the name of the product or work item.

4. Separate each Warranty with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets, as necessary. List the subcontractor, supplier, and manufacturer, with the name, address, and telephone number of the responsible principal.

C. Preparation of Submittals:

1. Obtain Warranties executed in duplicate by the responsible subcontractor, supplier, and manufacturer, within ten (10) days after completion of the applicable item of work. Except for items put into use with the Owner representative=s

approval, leave the date of the beginning of the warranty time until the Date of Final Acceptance has been determined.

2. Verify that the documents are in the proper form, contain complete information, and are notarized.

3. Co-execute submittals when required.

4. Retain Warranties until the time specified for submittal.

D. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with the Owner representative=s approval, submit documents within ten (10) days after acceptance.

2. Make other submittals within ten (10) days after the Date of Substantial Completion, and prior to the final Application for Payment.

3. For items of work for which acceptance is delayed beyond the Date of Substantial Completion, submit within ten (10) days after acceptance.

1.5 PROJECT RECORD DOCUMENTS

A. Project Record Documents required include:

1. As-Built copies of the Contract Drawings.

2. Marked-up copies of the Shop Drawings.

3. Marked-up copies of the Specifications, addenda and Contract Modifications.

4. Marked-up product data submittals.

5. Field records for variable and concealed conditions.

6. Record information on work that is recorded only schematically.

B. Specific record copy requirements that expand the requirements of this Section are included in the individual Specifications Sections of Division 2 through Division 16.

C. Maintenance of Documents: Store the Record Documents in a field office apart from the Contract Documents used for construction. Do not permit the Project Record Documents to be used for construction purposes. Maintain and protect the Record Documents from damage in a clean, dry, legible condition. Make Documents available at all times for inspection by the Owner=s representative.

D. Record (As-Built) Drawings:

1. During construction, maintain a set of blackline, white prints of the Contract Drawings and Shop Drawings for Project Record Document purposes.

a. Mark these Drawings to indicate actual installations where the installations vary from the installation originally shown. Give particular attention to information on concealed elements which would be difficult to

identify or measure and record later. Items required to be marked include but are not limited to:

1) Dimensional changes to the Drawings.

2) Revisions to Details shown on the Drawings.

3) Depth of foundations below the first floor.

4) Locations and depths of underground utilities.

5) Revisions to the routing of piping and conduits.

6) Revisions to electrical circuitry.

7) Actual equipment locations.

8) Duct sizes and routing.

9) Locations of concealed internal utilities.

10) Changes made by Contract Modifications.

11) Details not on the original Contract Drawings.

b. Mark completely and accurately record on prints of the Contract Drawings or Shop Drawings, whichever is most capable of showing the actual physical conditions. Where Shop Drawings are marked, show a cross-reference on the Contract Drawings.

c. Mark important additional information which was either shown schematically or omitted from the original Drawings.

d. Note construction change directive numbers, alternate numbers, Change Order numbers, clarification numbers and similar identification.

e. Responsibility for Markup and Supervision: Contractor Quality Control Representative, as specified in Section 01450 - Quality Control. Where feasible, the name of the individual or entity who obtained the record data, whether individual or entity is installer, subcontractor, or similar entity, is required to prepare mark-ups on the Record Drawings.

1) Accurately record information in an understandable Drawing technique.

2) Record data as soon as possible after it has been obtained. In case of concealed installations, record and check mark-ups prior to concealment.

3) Contractor Quality Control Representative: Affix signature and certify accuracy of the Record Drawings.

2. Preparation of As-Built Drawings: Immediately prior to the inspection for Final Acceptance, review the completed marked-up record Drawings with the Owner=s representative. Prepare a full set of corrected Drawings of as-built conditions.

a. Incorporate changes and additional information previously marked on the print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT AS-BUILT DRAWINGS" in a prominent location on each Drawing.

b. Refer instances of uncertainty to the Owner=s representative for resolution.

c. The Owner=s representative will make the original Contract Drawings available to the Contractor in electronic format .

d. The Contractor is responsible for printing the original Contract Drawings and other Drawings.

e. Review of Drawings: Before copying and distributing, submit corrected Drawings and the original marked-up prints to the Owner=s representative for review.

3. Copies and Distribution: After completing the preparation of As-Built Drawings, submit two (2) complete sets of the Drawings on reproducible vellum sheets (24" x 36"), and two (2) complete zip disks (100 mb AutoCAD). Place each set of Drawings in durable tube-type containers with end caps. Mark the end cap of each container with suitable identification. Mark the zip disks similarly.

a. Organize and bind the original marked-up set of prints that were maintained during construction in the same manner.

E. Record Specifications:

1. During the construction period, maintain one copy of the Project Specifications, including addenda and any modifications issued, for Project Record Document purposes.

a. Mark the Specifications to indicate actual installations where the installation varies from that indicated in the Specifications and modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, and information on concealed installations that would be difficult to identify or measure and record later.

1) In each Specifications Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.

2) Record the name of the manufacturer, supplier and installer, and other information necessary to provide a record of the selections made and to document coordination with the Record Product Data submittals and Maintenance Manuals.

3) Note the related Record Product Data, where applicable. For each principal product specified, indicate whether the Record Product Data has been submitted in a Maintenance Manual instead of submitted as Record Product Data.

3. Upon completion of the mark-up, submit Record Specifications to the Owner=s representative.

F. Record Product Data:

1. During construction, maintain one (1) copy of each Product Data submittal for Project Record Document purposes.

a. Mark the Product Data to indicate the actual product installation where the installation varies from that indicated in the Product Data submitted. Include significant changes in the product delivered to the Project Site, and changes in the manufacturer's instructions and recommendations for installation.

b. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

c. Note related Contract Modifications and mark-up of Record Drawings, where applicable.

d. Upon completion of the mark-up, submit a complete set of the Record Product Data to the Owner=s representative with an index of all product data cross-referenced wo submittal numbers.

e. Where the Record Product Data is required as part of the Maintenance Manuals, submit the marked-up Product Data as an insert in the Manual instead of submittal as Record Product Data.

G. Additional Record Submittals:

1. Refer to other Specifications Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Final Acceptance, complete additional records and place in order, properly identified and bound or filed, ready for use and reference. Submit to the Owner=s representative.

a. Categories of requirements resulting in miscellaneous records include, but are not limited to the following:

1) Field records of excavations and foundations.

2) Field records of underground construction and similar work.

3) Survey showing locations and elevations of underground lines.

4) Invert elevations of drainage piping.

5) Surveys establishing building lines and levels.

6) Authorized measurements utilizing unit prices or allowances.

7) Records of plant treatment.

8) Ambient and substrate condition tests.

9) Certifications received in lieu of labels on bulk products.

10) Batch mixing and bulk delivery records.

11) Testing and qualification of tradesmen.

12) Documented qualifications of installation firms.

13) Load and performance testing.

14) Inspections and certifications by governing authorities.

15) Leakage and water-penetration tests.

16) Fire resistance and flame spread test results.

17) Final inspection and correction procedures.

1.6 EXTRA MATERIALS

A. Provide products, spare parts, maintenance, and extra materials in the quantities specified in the individual Specifications Sections.

B. Deliver to the Project Site and place in a location directed by the Owner=s representative; obtain a receipt prior to final payment.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01910

GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.1 DESCRIPTION

A. Purpose - The purpose of commissioning is to provide the Owner assurance that the systems listed in this section (mechanical, electrical & specialty systems) have been installed in the prescribed manner and will operate properly to fulfill the design intent as laid out in the Contract documents. Commissioning is a systematic process intended to enhance the quality of system start-up and aid in the orderly transfer of systems to beneficial use by the Owner. Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify that applicable component equipment and systems are installed according to the manufacturer's recommendation and to industry accepted standards and that they receive adequate operational checkout by installing contractors.

2. Verify and document proper performance of component equipment and systems.

3. Verify that O&M documentation left on site is complete.

4. Verify that the Owner's operating personnel are adequately trained.

1.2 RESPONSIBILITIES

A. General Responsibilities: The Contractor verifies installation, provides scheduling and coordination of commissioning activates, performs training, starts up component equipment, assists with functional performance testing, corrects deficiencies and assists with retests.

B. The Furnish labor and material to accomplish building commissioning as specified herein. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product. Commissioning does not relieve the Contractor of Contract obligations.

C. The Commissioning Authority (CA) will be provided by the Owner to lead the commissioning process, and provide an objective view of the systems, installation, documentation, operation, and performance. The responsibilities of the CA are indicated here for information only.

D. The CA will participate in reviewing the Owners Project Requirements (OPR).

E. The CA will participate in reviewing the Basis of Design (BOD).

F. The CA reviews submittals for compliance with the original design intent as reflected in the contract documents.

G. The CA will participate and perform a design review.

H. The CA will implement the Commissioning Plan

I. The CA will review the Division 15 mechanical and Division 16 electrical submittals.

J. The CA performs components equipment installation verification throughout the course of the project. The CA verifies completion of installation and may witnesses startup of component equipment.

K. The CA develops Functional Performance Tests (FPT) for component equipment and systems listed in this section.

L. The CA, with the assistance of the contractor, tests the systems designated in this section to verify conformance to the sequence of operation and design intent as reflected in the contract documents.

M. The CA will develop and maintain an Issues log throughout the commissioning process.

N. The CA will develop a Systems Manual for the Owner with participation from the contractors.

O. The CA will with the assistance of the contractors verify the owner's requirements for training have been completed.

P. The CA will provide a final commissioning report to the owner.

1.3 COORDINATION

A. The Contractor will provide overall coordination of the commissioning program as specified herein. The Commissioning process will require cooperation of the Contractor, subcontractors, vendors, Architects, CA, and Owner. The commissioning team will be comprised of the following:

1. Contractor

    a. Project Manager

        1) Subcontractor (as required by the Contractor)

2. Commissioning Authority (CA)

    a. Project Manager

    b. Contractor Consultants (as required by the CA)

3. Owner's Representative (s)

    a. Project Manager

    b. Maintenance Staff

4. Architect

    a. Architect

    b. Mechanical consultant

    c. Electrical consultant

    d. Specialty consultant (s)

1.4 SCHEDULE

A. Integrate commissioning requirements into the Critical Path Method (CPM) master construction schedule. Com missioning scheduling is the responsibility of the Contractor. In the Construction Schedule, the Contractor will schedule Commissioning Tasks. These tasks will include but are not limited to the following:

1. Submittals

2. Installation Checklist

3. Component's equipment Start-up

4. System Integration

5. Functional Performance Test

6. O&M Manuals

7. Training

8. Other tasks as required, i.e., phasing

B. The contractor will provide a copy of the CPM master construction schedule and updates to the CA as part of regular schedule updates and distribution.

1.5 COMMISSIONING MEETINGS

A. Commissioning Scoping Meeting: Within 60 days from Notice to Proceed, the CA will call for a Commissioning Scoping Meeting. The purpose of this meeting is to give instructions to the contractor on the importance of construction Installation checklists and how they will be used throughout the project. The need to have the checklists in place when work starts will be stressed. The Commissioning process will be explained in detail, including startup procedures, O&M manuals, training, and closeout procedures.

Issues related to commissioning will be discussed as required during regularly scheduled Project Meetings.

The CA may require additional meetings if the commissioning process appears to be behind schedule or if there are coordination issues.

1.6 COMPONENT EQUIPMENT & SYSTEMS TO BE COMMISSIONED

A. Definitions:

1. Component equipment or Component – a constituent element, as of a system, part of a mechanical or electrical complex.

2. System – A group of interacting, interrelated, or interdependent elements forming a complex whole, A condition of harmonious, orderly interaction.

3. Integrate – To make into a whole by bringing all parts together; unify. Many systems are coordinated with or integrated into other system s (fire/smoke dam pers with fire alarm). Integration of com ponent equipment into system s, and system -to-system integration will be tested as noted in the matrix.

Critical Mechanical systems are identified in the General Conditions, Division 15, and summarized, but not limited to, the following:

B. Systems:

1. HVAC: All HVAC systems including controls.

2. Domestic Water & DW V: All domestic water systems including, but not limited to: Water Heaters, pumps, and pressure regulators. Alternative Bid Item 8 - Rainwater Catchment system, pumps and controls.

3. Lighting: All lighting fixture interior and exterior, controls for each, occupancy sensors, low voltage control system connections & interface to energy management system. Alternative Bid Item 4 – Photovoltaics system.

1.7 COMMISSIONING REQUIREMENTS

A. The matrix below outlines required commissioning activities by system. The CA is responsible for Functional Performance Testing of the component equipment listed in this section.

As noted in the matrix, testing required by the Architect's consultants, or the Authority Having Jurisdiction (AHJ) will serve as Functional Performance Tests for those system s. The contractor will notify the CA fourteen (14) days in advance of such tests. The CA will witness testing by the Architect's Consultants and the AHJ to assure that they are adequate to completely test the system s. If the CA is unavailable at the scheduled time and location of the activity, so note, and proceed per schedule.

The Contractor will provide the CA with copies of the results of testing performed by others and within three (3) working days of the test. A list of corrections (if required) will be included.

If the CA determines that the tests are not adequate to exercise all functions of the system, the CA will develop additional tests and test the system to assure the owner that the system is completely functional.

SYSTEM	Submittal Review	Pre-functional Test Checklists	Functional Performance Test Checklist	O&M Data Review		Pre-functional Tests	Functional Performance Tests	O & M Manual	Training and Demonstration
HVAC systems									
HVAC & Controls	X	X	X	X		X	X	X	X
Domestic water systems									
Domestic hot water system & Controls	X	X	X	X		X	X	X	X
Rainwater Catchment System & Controls	X	X	X	X		X	X	X	X
Lighting systems									
Lighting Controls	X	X	X	X		X	X	X	X
Photovoltaics System	X	X	X	X		X	X	X	X

1.8 SUBMITTALS

A. The Contractor will provide copies of all approved submittals to CA for the systems

listed in this section, (see matrix above). Provide copies to the CA within 14 days of return of approved copies from Architect.

1.9 INSTALLATION CHECKLISTS

A. Contractors will utilize Installation Checklists provided by the CA which will be developed from the approved submittals. Installation Checklists are used to track proper and complete installation, start up and system integration of each component and each system being commissioned.

CA will verify that Installation Checklists are completed before any component equipment is started up. Contractor will make available the specific installation checklist for each component being started at that time for approval by the CA.

1.10 START UP

A. Develop a project startup plan for all components and systems to be commissioned. Commence with com ponent start-up after CA & Architect has approved the start-up plan and the CA has reviewed the installation checklists for completion.

The Contractor will witness system start-up and repair all system and component deficiencies noted during start-up.

The CA, the Architect's consultant (s), and / or the Owner's Representative will witness all start-up and test activities specified in this Section. The CA will designate witness and alternation for each activity.

Obtain the signature of designated witness on all data form s. If the witness is unavailable at the scheduled time and location of the activity, so note, and proceed per schedule without witness.

1.11 FUNCTIONAL PERFORMANCE TESTING (FPT)

A. Description: The purpose of Functional Performance Testing (FPT) is to assure the Owner that all work has been completed as specified and that system s are functioning in the manner intended, within the limits of the design and the contract documents.

The Contractor will verify the functional readiness of systems to be tested prior to requesting Functional Performance Testing by the CA.
Provide the Declaration of Completion to the CA with the box checked for the appropriate contractor and sign and date the form to affirm functional readiness.

Functional performance testing will commence as systems are brought to substantial completion and will be done on a system -by-system basis. The results of these tests will be documented by the CA and presented to the Owner for final system acceptance.

The FPTs and results will be passed to the owner at the end of the job as a record of baseline building performance. The owner may use the tests at any time in the future as a diagnostic tool to determine proper operation of any commissioned system in the building.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION

3.1 SUBMITTALS

A. Normal Submittals

The CA will receive a copy of the normal submittals for all component equipment or systems to be commissioned.

The CA will review and approve normal Contractor submittals applicable to systems being commissioned for compliance with design intent, concurrent with the A/E reviews.

3.2 INSTALLATION CHECKLIST

A. Installation Checklists and Installation Verification

The contractor will install all equipment in accordance with the Contract Documents. The Contractor will track the installation of all com ponent equipment and systems being installed as listed in this section. Tracking will be done as the work progresses using the Installation Checklist which will be provided by the CA after the equipment submittals have been approved by the Architect.

The Installation Checklist will be copied to provide individual checklists for each component or system. The installation checklist will be maintained on-site in standard 3-hole binders with Division and Section tabs for all Commissioned systems.

During on-site visits, the CA will perform a quality review of the work being completed. This may include a review of the installation checklist to ensure the work is being accomplished according to the contract documents.

If issues are found, the contractor will be notified of the issues and will be responsible for rechecking all com ponents and systems affected. Once this is accomplished, the CA will re- verify the checklist for compliance with the contract documents.

The level of urgency will be indicated on the notification.

Immediate remedy required Correct within 7 days
Correct within 30 days
Correct before job closeout

The actual completed installation checklist for each com ponent being started will be available to the CA for review and approval prior to Startup and Commissioning. Startup will not proceed without the approval of the CA.

Minor equipment issues will be listed on the Installation checklist and a complete list of issues for all equipment to be started will be available to the CA prior to start up.

The Contractor will be responsible for completion of all work including change orders and punch list items to the satisfaction of the Owner's Representative and Architect.

If any work is found to be incomplete, inaccessible, incorrect, or non-functional, make note of deficiencies and correct deficiencies before system start-up work proceeds.

Each checklist will have a place for the person doing the checklist to initial and date each item indicating the task has been completed.

3.3 PROJECT START-UP

A. Project Start-up Plan: At least 14 days prior to start-up, submit to the Commissioning

Team for review and approval, a Project start-up plan for all equipment to be commissioned, consisting of the following items:

1. Project Name
2. Data and time of planned start-up
3. System and component equipment name (s)
4. Component equipment location and ID number
5. Participating parties
6. A copy of the specification section and manufacture's installation instructions describing the start requirement.
7. The specific sequence of operations or other specified parameters being used during the start-up process.
8. Specific step-by-step procedures to execute the start-up, in a clear, sequential repeatable format for each component in the system.
9. Special cautions, alarm limits, load restrictions, etc.
10. The Contractor will take corrective action on all system deficiencies noted and demonstrate suitable system operation.
11. Owner's Representative and CA will physically witness start-up procedures.
12. Contractor will obtain signature of the Owner's Representative and CA indicating successful start-up.

Notify the Commissioning Team in writing seven (7) days prior to component equipment start-up with an agenda that will include the date, time, location, and anticipated duration for each piece of component equipment and/or system to be started.

Provide written notice a minimum of 7 working days in advance of any changes in date, time, location, or anticipated duration of start-up activities. All participants of the Commissioning team will receive notice. Contractor will reimburse Owner for actual costs incurred by the Owner as a result of failure to provide timely notice.

3.4 SUBSTANTIAL COMPLETION

A. General: See Division 1 for all requirements related to Project Closeout and Substantial Completion.

The CA must approve Substantial Completion.

Substantial Completion in the Commissioning process requires that:

1. All startup of commissioned component equipment and systems must be completed and approved.
2. All installation checklists are complete and approved.
3. O&M Manuals are complete, approved, and one copy on site.
4. The Training Plan is complete and approved.

3.5 FUNCTIONAL PERFORMANCE TEST PROCEDURES

A. Objective and Scope: Functional testing facilities bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected. A representative sample of each system will be tested in all modes of operation (seasonal, occupied, unoccupied, warm -up, cool-down, part- and full-load) where there is a specified system response. Tests will verify proper responses to standard operating modes as well as failure and alarm conditions.

B. Development of Test Procedures:

1. Tests will be developed by the CA and will be based on the specifications and Sequence of Operations provided in these documents.

2. Before the CA prepares final test procedures, the Contractor will provide to the CA all documentation and a current list of change orders affecting com ponent equipment or systems, control sequence of parameters.

3. Each subcontractor or vendor responsible for component equipment or systems being tested will provide assistance to the CA in developing the FPT procedures. This assistance will be in the form of answering questions, providing documentation, etc.

4. 30 days after final submittal approval, the CA will provide a copy of the test procedures to the Architect and Contractor, who will review the test for feasibility, safety, component, and warranty protection. The contractor and Architect's Consultant will respond with approval or revisions within 2 weeks of receiving the proposed tests.

C. Execution of Testing:

1. FPT begins after all component equipment and systems are started up and TAB and all controls work is complete.

2. Testing may proceed on finished systems for which TAB has been completed before all building systems are finished at the discretion of the CA. CA must have a draft balance report for such systems before testing can proceed.

3. O&M Manuals will be completed, approved by the CA and on-site for reference during FPT. The Owner's witness will attend the Functional Performance Testing.

4. The CA will document the results of all testing and maintain a log of all issues found.

5. Address current A/E punch-lists before testing starts.

D. Test Methods:

Functional performance testing and verification may be achieved by manual testing (persons manipulate the control system or component equipment and observe performance) or by monitoring the performance and analyzing the results using the control system 's trend log capabilities or by stand-alone dataloggers. No sampling by contractors is allowed in installation checklist execution.

E. Acceptance Criteria for FPT

1. All systems and their components must pass Functional Performance Testing at a rate of 90% or higher to be acceptable.

2. Systems and their components with a passing rate of 90% or higher, will be deemed acceptable. The contractor will correct all deficiencies found by the testing procedures and notify the CA when repairs are complete. The failed tests will be repeated to verify proper system operation. If the system fails any testing during the second round of tests, the contractor will correct the deficiencies and the system will be retested until all tests are passed at the contractor's expense.

3. Systems and their components with a passing rate of less than 90% will be deemed unacceptable. The contractor will correct all deficiencies and notify the CA when repairs are complete. The system will be retested until all tests are passed at the contractor's expense.

F. Coordination and Scheduling: The Contractor will provide sufficient notice to the Owner's representative and CA to schedule FPT. This will be communicated through the Master Construction Schedule to updates hereto.

The contractor will verify the FPT schedule with the CA not less than 14 days before FPT begin by delivering the Declaration of Completion to the CA (electronically or in writing).
The Owner's witness will observe and witness the FPT of all component equipment and systems.
Provide ladders, scaffolding, and staging as required to permit the CA & Owner's witness to directly access and observe the performance of the component equipment being tested. The contractor will provide experienced craftsmen with tools to assist the CA during FPT.

Corrections of Minor Issues identified during testing may be made during the tests at the discretion of the Architect's consultant and/or the CA. In such cases the issue and resolution will be documented on the procedure form. The issues will be scored as a failure on the test form.

G. Problem Solving: The Commissioning team may recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the contractor and Architect.

H. Deferred Testing

If during testing, the desired results cannot be produced because of seasonal conditions, Functional Performance Testing may be deferred until the environmental conditions are satisfactory for performing the test. The Owner's Representative and the CA will determine the scheduling for deferred seasonal test. The contractor will supply labor, material and equipment as required to assist the CA with deferred testing at no additional cost to the owner. The CA will work with the Contractors to accommodate scheduling, but no more than 14 days notice will be required to the Contractor to schedule Deferred Testing.

3.6 DOCUMENTATION, ISSUES AND APPROVALS

A. Documentation: The CA will document the results of all functional performance tests. The CA will include the completed test forms in the Commissioning manual.

B. Issues: Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.

However, the CA will not be pressured into overlooking deficient work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of the Owner's representative.

As tests progress and deficiencies are identified, the CA will discuss the issues with the Contractor.

When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it.

The CA documents the deficiency. The contractor corrects the deficiency.
The contractor reschedules the test and test is repeated.

If there is a dispute about a deficiency, regarding whether it is a deficiency of who is responsible:

The deficiency will be documented on the deficiency list with the contractor's response and a copy given to the Contractor and the Architect.

Resolutions are made at the lowest management level possible. Other parties
are brought into the discussion as needed. Final interpretive authority is with the Architect. Final acceptance authority is with the Owner/Architect.

The CA documents the resolution process.

Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency and provides notifies the CA. The Contractor researches the test, and the test is repeated until satisfactory performance is achieved.

The Contractor will respond in writing to the Architect and CA at least as often as project meetings are being scheduled concerning the status of each outstanding issue identified during commissioning. Discussion will cover explanations of any disagreements and proposals for their resolution.

The CA retains the original Issues list until the end of the project.

The contractor will not consider any required retesting by any contractor a justified reason for a claim of delay or for a time extension.
Failure Due to Manufacturer's Defect: If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of component equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the Architect or Owner's representative. In such case, the

Contractor will provide the Owner with the following:

Within one week of notification from the Architect or Owner's representative, the Contractor or manufacturer's representative will examine all other identical units making a record of the findings. The findings will be provided to the Architect,
Owner's representative within two weeks of the original notice.

Within two weeks of the original notification, the Contractor or manufacturer will provide a signed and dated, written explanation of the issue, cause of failures, etc. and all proposed solutions' which will include full component equipment submittals. The proposed solutions will not significantly exceed the specification requirements of the original installation.

The Architect or Owner's representative will determine whether a replacement of all identical units or a repair is acceptable.

Two examples of the proposed solution will be installed by the Contractor and the Architect or Owner's representative will be allowed to test the installation for up to one week, upon which the Architect or Owner's representative will decide whether to accept the solution.

Upon acceptance, the Contractor and/or manufacturer will replace or repair all identical items, at their expense and extend the warranty accordingly, if the original component equipment warrant has begun. The replacement/repair work will proceed with reasonable speed beginning within one week from when parts can be obtained.

B. Approval. The CA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the Architect's consultant and the CA and by the Owner's representative, if necessary. The CA recommends acceptance of testing to the Owner's representative in this final report. Non-Conformance – Cost of Retesting. The cost for the Contractor to retest a pre-functional or functional test, if they are responsible for the deficiency, shall be theirs. If they are not responsible, any cost recovery for retesting costs shall be negotiated with the Architect.

1. For a deficiency identified during Functional Performance Testing, the following shall apply:

a. The Commissioning Authority and/or Owner's Representative will retest the equipment, when notified by the Contractor in writing that the deficiency has been corrected. The cost for retesting will be changed to the Contractor. The amount of the change will be deducted from the final progress payment. These charges can include lodging, meals, travel, equipment rental, and labor costs for the Commissioning Authority and/or Owner's Representative.

2. The reason that the charges are the Contractor's responsibility are as follows:

a. The Contractor approved the Functional Performance tests prior to testing. The Contractor and subcontractor signed the Declaration of Completion. The Contractor has run the tests to make sure the equipment functions.

C. Any design deficiencies discovered during the Contractor test were identified and worked out with the Architect/Engineer prior to scheduling the Functional Performance tests.

D. The retesting process will be repeated until satisfactory performance is achieved. Because the Contractor has verified that the equipment is ready for retesting, each retest is subject to a charge to the Contractor, if the test fails. It is important that the Contractor verify performance before asking for a retest.

E. Refer to the sampling section of Section 01810, Part 3.5 for requirements for testing and retesting identical equipment.

3.7 OPERATIONAL AND MAINTENANCE (O&M) MANUALS

A. As part of the required submittals for the Contractor, Contractor will submit a draft copy of the Operation and Maintenance Manuals within 30 days after normal submittals have been approved.

Submit the draft for review by the Owner's Representative, Architect, and Commissioning Agent to ensure completeness, proper written communications, and compliance with each review's knowledge of the significant requirements. The CA will review O&M manuals for compliance with the specifications. Unacceptable Manuals will be returned to the Contractors for revision and resubmitted for review by the CA. The following documentation

will be included for all Divisions:

1. Format: 8 ½" x 11" loose-leaf binders. Each binder will be clearly labeled on the spine. Use as many as required. Do not overload binders. There will be dividers with permanently marked tabs of card stock separating each section and subsection. Tab labels will not be handwritten.

2. There will be a title page and table of contents in the front of each binder for each binder's contents. In each binder, there will be a main tab for each specification section. Behind the section number tab there will be the component equipment ID tag sub-tab for each piece of major component equipment (or group, if small or numerous). These sub-tabs will be similar to the specification number tabs but have a different color. Behind each component equipment name tab will be following sections, in the given order, divided by a double weight colored sheet labeled with the title of the section.

B. Contractor: The first page behind the component equipment tab will contain the name, address and telephone number of the manufacturer and installing contractor and the 24-hour number for emergency service for all component equipment in this section, identified by component equipment.

C. Submittal and Product Data: This section will include all approved submittal data, cut sheets and appropriate shop drawings. If submittal was not required for approval, descriptive product data will be included.

D. Operation and Maintenance Instructions: These will be the written manufacturer's data with the model and features of this installation clearly marked and edited to omit reference to product or data not applicable to this installation. This section will include data on the following:

1. Installation, startup and break-in instructions.

2. All starting, normal shutdown, emergency shutdown, manual operation, seasonal changeover and normal operating procedures and data, including any special limitations.

3. O&M and installation instructions that were shipped with the unit.

4. Preventative maintenance and service procedures and schedules.

5. Troubleshooting procedures

6. A parts list, edited to omit reference to items that do not apply to this installation.

7. Lists of any special tools required to service or maintain the component equipment.

8. Performance data, ratings and curves

9. Warranty, which clearly lists conditions to be maintained to keep warranty in effect and conditions that would affect the validity of the warranty.

10. Any service contracts issued.

E. Supplemental Data: Prepare written text and/or special drawings to provide necessary information, where manufacturer's standard printed data is not available and information is necessary for a proper understanding and operation and

maintenance of component equipment or systems, or where it is necessary to provide additional information to supplement data included in the manual or project documents.

F. Specifications: This section is comprised of the component or system specification section copied and inserted complete with all addenda.

G. System Description: This section will include the individual component equipment portion of the overall system Design Documentation Narrative, if available. It will contain simplified professionally drawn single ling system diagrams on 8 ½ x 11 or folded 11 x 17 sheets, if the system's control drawing is not adequate.

H. Preventive Maintenance Instructions: This section will include condensed typewritten excerpts from the manufacturer's written instructions for weekly, monthly, quarterly, annual, etc. maintenance.

I. Preventive Maintenance Index: This section will include a list of the location by O&M document name and page number of any preventative maintenance instructions applicable to this piece of component equipment.

J. Condensed Operating Instructions: This section will include condensed instructions for start-up, shutdown, emergency operation, safety precautions, unusual features and troubleshooting suggestions. Where control is clearly covered in controls description, it is not to be duplicated here.

In addition, a copy of these instructions will be clearly laminated and secured adjacent to the component equipment where it can be easily read by operating personnel. These instructions will be provided for boilers, furnaces, chillers, pumps, heat rejection component equipment, large air-handling units (greater than 10 tons), heat pump systems, control system, air compressor and dryers.

3.8 TRAINING

A. Prepare and submit for approval an owner's facilities maintenance staff training plan. Training plan will include for each training session:

1. Dates, start and finish times and locations.

2. Outline of the information to be presented.

3. Names and qualifications of the presenters.

4. List of texts and other materials required to support training.

Training materials are due 30 days before training is scheduled to begin. This will be provided to the Architect for review and approval by the design team and the CA.

Obtain assistance from appropriate subcontractors and vendors to provide training for the Owner's operations staff, as specified in all Divisions.

The Owner's Representative will arrange to provide videotaping of training sessions. Training will be in a classroom setting with the appropriate schematics, handouts and audio/visual training aids.

Host each training session.

Provide program overview and curriculum guidance.

Obtain signatures of attendees on a sign-in list.

Component equipment vendors provide training on the specifics of each system and philosophy, troubleshooting and repair techniques as specified in the relevant sections of this specification.

Installation subcontractors provide training on peculiarities specific to this project and job-specific experience as specified in the relevant sections of this specification.

3.9 FINAL COMPLETION

A. The CA will review Contractor's records of completion of commissioning requirements. Upon receiving evidence of satisfactory completion of Final Completion requirements, the CA will submit to the Owner recommendation to accept Final Completion.

3.10 EXCLUSIONS

A. The Owner's Representative and CA are not responsible for construction means, methods, job safety or any management function related to commissioning on the job site.

The Contractor will provide all technician services requiring tools or the use of tools to test, adjust, or otherwise bring component equipment into a full operational state.

DOCUMENTATION REQUIRED FOR DIVISION 1

B The General Contractor will provide the following documentation before Final Acceptance:

1. Copy of Completed Certificate of Occupancy with approval signatures of all Authority Having Jurisdiction

DECLARATION OF COMPLETION

Prior to Functional Performance Testing, the General Contractor will verify with the listed Subcontractors that work is ready and then will complete this document.

Declaration

I declare that I have reviewed the specifications and construction documents and found that all work has been completed, verified and ready to perform as specified by the following subcontractors:

Irrigation / Rainwater system Contractor
Mechanical Contractor
Controls Contractor
TAB Contractor
Electrical Contractor

I have determined that all work has been completed; all corrections, punch-list items, and deficiencies have been corrected to the best of my knowledge and ability, except for those items listed here:

1.
2.
3.
4.
5.

I affirm that the com ponents and system s are ready for Functional Performance Testing and understand the penalties associated with retesting, as outlined in Section 01910, should com ponents or system s fail to perform as specified.

General Contractor: _____ Date: _____

END OF SECTION 01910

SECTION 02050

DEMOLITION AND REMOVAL

PART 1 - GENERAL

1.1 PROCEDURES: Areas in which demolition and removal is to be accomplished shall be as indicated on the drawings either specifically or as a necessary or incidental part of the work. The procedures shall provide for the safe conduct of the work, careful removal and disposition of materials to be removed, protection of property, which is to remain undisturbed, and coordination with other work involved.

1.2 Do not begin demolition until authorization is received from the Engineer. Remove rubbish and debris from the project site daily; do not allow accumulations inside or outside the buildings. Store materials that cannot be removed daily in areas designated by the Engineer/Owner's Representative.

1.3 The Contractor shall submit his/her demolition and removal procedures to the Engineer/Owner's Representative for approval before work is started. Demolition plan shall include procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, and a detailed description of methods and equipment to be used for each and sequence of operation.

1.4 EXPLOSIVES: Use of explosives will not be permitted.

1.5 PROTECTION OF EXISTING STRUCTURES, UTILITIES AND OTHER ITEMS OF PROPERTIES: Existing structures, utilities, and other items of properties to remain shall be protected from damage during demolition and removal operation. Any damage to existing facilities, structures, utilities or other works shall be repaired by the Contractor, using materials equal to or better than those existing, all at the Contractor's expense.

1.6 In addition, the Contractor shall seek and obtain written clearances from all utility agencies of the Government of Guam, specifically DPW, GPA, GTA, GWA, DOCOMO, etc. prior to undertaking demolition/removal operations. As part of obtaining such clearances, the Contractor shall specifically request each utility agency to stake out the location of their utilities prior to undertaking any demolition or removal work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DEMOLITION

A. The work includes the demolition and removal of existing structures, concrete pads, fences, waterlines, and other items as indicated on the drawings or as required to accomplish the work. Miscellaneous items that will be a hindrance or hazardous to the work to be done shall be removed and disposed of as directed by the Engineer/Owner's Representative.

B. Dust and Noise Control: The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the area and to avoid creation of a nuisance in surrounding areas. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as flooding, or pollution. Noise associated with the demolition shall be controlled by proper selection of the equipment used, procedure selected, time of day, or day of the week the work is accomplished, to minimize adverse effects of the necessary noise on the every-day operations or activities of the Contractor.

C. Notifications: Furnish timely notification of demolition work to the Engineer/Owner's Representative in writing 10 working days prior to the commencement of demolition work.

D. Traffic Control Plan: Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Engineer/Owner's Representative prior to beginning such work.

E. Existing Work: Protect existing work, which is to remain in place, be reused, or remain the property of the Government. Repair items, which are to remain, and which are damaged during the performance of the work to their original or better condition or replace with new. Provide new supports and reinforcements to existing construction weakened by demolition or removal work. Repairs, reinforcements, or structural replacements must have Engineer's/Owner's Representative's approval.

F. Relocations: Perform the removal and reinstallation of relocated items as indicated with the workmen skilled in the trades involved. Coordinate with agency that has jurisdiction over the utility to be relocated. Repair items to be relocated, which are damaged or replace damaged items with new undamaged items as approved by the Engineer/Owner's Representative.

G. Title to Materials: Except where specified in other Sections, all material and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from the project site. Title to material resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Engineer/Owner's Representative of the Contractor's demolition and removal procedures, and authorization by the Engineer/Owner's Representative to begin demolition. The Owner will not be responsible for the condition or loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

H. Salvage: The Contractor shall remove existing facilities, as necessary or as indicated; salvage usable materials as directed; store, transport, stockpile and/or protect it at the location designated. All salvaged materials shall be the property of the Owner.

I. Disposition: Refuse resulting from demolition operations shall be hauled at the Contractor's expense to an approved disposal site(s) or landfill and shall be disposed of at the Contractor's expense in such a manner as to meet all applicable requirements, regulations and laws of the Government of Guam regarding environmental protection, health, safety and public welfare. The Contractor may not dispose of such refuse by burning on the site of the project at any time.

In no case shall any material be left on the project, shoved onto abutting properties or areas, or be burned in embankments or trenches on the project. Demolition and removal/disposal operations shall be carried out well in advance of construction operations so as to permit a well planned schedule of work.

3.2 CLEANUP: Upon completion of demolition and removal operations, the entire area shall be cleaned of all debris and rubbish in a manner satisfactory to the Engineer/Owner's Representative.

END OF SECTION 02050

SECTION 02050

DEMOLITION AND REMOVAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of existing structures, concrete pads, water lines, sewer lines, fences, and other items as indicated on the Drawings, and as required to accomplish the work.

2. Disconnection, capping and identification of utilities.

3. Removal and disposal of miscellaneous items that will be a hindrance or hazardous to the work to be done, as directed by the Owner=s representative.

4. Demolition of designated structures, foundations, walls, columns, beams and roofs.

5. Removal of suspended ceilings and components; light fixtures, grills and diffusers.

6. Removal of designated partitions and components; frames, doors and windows.

7. Removal of designated building equipment, fixtures and cabinetry.

8. Removal of designated finishes and specialty items.

9. Disconnection, capping and identification of utilities.

10. See Mechanical Sections for fire sprinkler, air conditioning and ventilation systems requirements.

11. See Electrical Sections for lighting, power and alarm systems requirements.

12. Protection of materials removed and stored for re-use.

13. Construction and maintenance of temporary partitions to allow continual occupancy of adjacent building areas.

14. Disposal of materials at approved off-site location(s).

15. Procedures for safe conduct of the work.

16. Protection of property to remain.

17. Coordination with other work.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 DESCRIPTION OF WORK

A. The extent of the demolition and removal work is indicated on the Drawings and as specified herein, and includes the demolition of designated existing construction, equipment, fixtures and cabinetry; protection of materials for re-use; construction of temporary partitions; disconnection, capping and identification of utility services; removal and disposal of debris; and protection of property to remain.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Submit a demolition and removal plan for approval before work begins. Include procedures for careful removal and disposition of the materials specified to be salvaged, disconnection schedule for utility services, coordination with other work, and a detailed description of methods and equipment to be used for each, and the sequence of operation.

1.4 REQUIREMENTS

A. Conform to Section 01560 - Environmental Protection and applicable codes and regulations of authorities having jurisdiction for demolition, removal and disposal.

B. Obtain written clearances from all public and private utility companies and agencies serving the Project Site prior to the start of any demolition work. Request that each utility agency mark the location of their utility service.

C. Obtain all required government Permits.

D. Conform to applicable regulatory procedures if hazardous, toxic or contaminated materials are encountered. Immediately notify the Owner=s representative, in writing.

E. Conduct demolition to minimize impact on existing and adjacent structures. Protect existing structures, utilities, and other items of properties to remain from damage during demolition and removal operations.

F. Minimize interference with adjacent building occupancies.

G. Immediately cease operations if adjacent structures appear to be in danger, and take appropriate corrective measures to ensure safety of the structures and occupancies.

1.5 PROJECT CONDITIONS

A. Provide, erect, and maintain temporary shoring, dust barriers, and security and protection barriers.

B. Conduct demolition to minimize interference with adjacent building areas.

C. Maintain protected access and egress at all times.

D. The use of explosives will not be permitted.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that measurements, surfaces, materials, substrates and conditions are as indicated.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section, Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Construct and maintain weatherproof closures for unprotected existing openings.

B. Construct and maintain temporary partitions or barriers to prevent the spread of dust, fumes, noise and smoke to adjacent occupied facilities.

C. Protect existing work not indicated to be altered or removed.

D. Provide bracing and shoring as required for work to remain.

E. Disconnect, remove and cap designated utility services within the demolition area. Mark the location of disconnected utilities. Identify and indicate the capped locations on the Project Record Documents.

3.3 REMOVAL

A. Do not begin demolition until authorization has been received from the Owner=s representative.

B. Notify the Owner=s representative, in writing, ten (10) working days prior to commencement of the work.

C. Construct demolition in an orderly and careful manner. Protect existing construction to remain.

D. Where indicated, remove foundation walls and footings to the dept below finished grade, as shown.

E. Remove concrete curbs, walks and asphalt paving on grade. Backfill, rough grade and compact areas affected by the demolition.

F. Dust and Noise Control:

1. Dust resulting from the demolition shall be controlled to prevent the spread to occupied portions of the area, and to avoid creation of a nuisance in surrounding areas. The use of water will not be permitted when it will result in, or create hazardous, objectionable conditions, flooding or pollution.

2. Noise associated with the demolition shall be minimized by the selection and use of the proper equipment, procedures implemented, time of day, or day of the week the work is to be accomplished, to minimize the adverse effects of noise from operations and activities of the Contractor.

G. Traffic Control Plan: Where pedestrian and driver safety is endangered in the area of the removal work, install traffic barricades with flashing lights.

H. Existing Work: Protect existing work which is to remain in place, be reused, or remain the property of the Owner. Repair items, which are to remain but are damaged during performance of the work, to their original or better condition or replace with new. Provide new supports and reinforcements to existing construction weakened by the demolition and removal work. Repairs, reinforcements and structural replacements must be approved by the Owner=s representative.

I. Relocations: Perform removal and reinstallation of relocated items, as indicated, with workmen skilled in the trades involved. Coordinate with the agency that has jurisdiction over a utility to be relocated. Repair items to be relocated, which are damaged or replace damaged items with new undamaged items, as approved by the Owner=s representative.

J. Ownership of Materials: Except where specified in other Sections, all material and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from the Project Site. The ownership of materials resulting from demolition, and materials and equipment removed, is vested in the Contractor upon approval of the Contractor=s demolition and removal plan and procedures, and authorization by the Owner=s representative. The Owner will not be responsible for the condition or loss of, or damage to, such property after the Contract award. Prospective purchasers shall not be allowed on the Project Site to view materials and equipment to be sold by the Contractor.

K. Salvage: The Contractor shall remove existing facilities, as necessary or as indicated; salvage usable materials as directed; store, transport, stockpile and / or protect materials at the location designated. All salvaged materials shall remain the property of the Owner.

L. Disposition:

1. Refuse resulting from demolition operations shall be hauled to an approved disposal site(s) or landfill and shall be disposed of in a manner to meet all applicable federal and local requirements, regulations and laws regarding environmental protection, health, safety and public welfare.

2. Remove rubbish and debris from the Project Site daily. Do not allow accumulation inside or outside the building. Store materials that cannot be removed daily in areas designated by the Owner=s representative.

3. Materials shall not be left on the Project Site, moved to adjoining properties or areas, or be buried on-site.

4. Refuse may not be burned on the Project Site.

5. Remove and promptly dispose of contaminated, vermin infested, and dangerous materials encountered.

M. Restore damaged surfaces, equipment and fixtures to their condition prior to beginning the work, with the same type materials, size and finish as the existing. Damage to existing facilities, structures, utilities or other work to remain shall be repaired by the Contractor using materials equal to or better than those existing, and at the Contractor=s expense.

3.4 CLEANUP

1. Upon completion of demolition and removal operations, the entire area shall be cleaned of all debris and rubbish in a manner satisfactory to the Owner=s representative.

2. Leave the areas of work in a broom clean condition.

END OF SECTION

SECTION 02102

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 PROCEDURES: Areas in which clearing and grubbing is to be accomplished shall be as indicated on the drawings either specifically or as a necessary or incidental part of the work. The procedures shall provide for the safe conduct of the work, careful removal and disposition of materials to be removed, protection of property that is to remain undisturbed and coordination with other work involved.

1.2 EXPLOSIVES: Explosives shall not be used for clearing and grubbing work.

1.3 PROTECTION OF EXISTING STRUCTURES, UTILITIES AND OTHER ITEMS OF PROPERTIES: Existing structures, utilities, and other items of properties designated to remain not identified to be removed shall be protected from damage during clearing and grubbing.

In addition, the Contractor shall seek and obtain written clearances from utility agencies, with existing utilities at the site, structures, and facilities at or near the project site, prior to undertaking any clearing and grubbing operations. Any damage to existing facilities, structures, utilities or other works shall be repaired by the Contractor, using materials equal to or better than those existing, all at the Contractor's expense.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CLEARING: Clearing shall consist of the felling of trees and the satisfactory disposal of surface objects, trees, and other vegetation not designated to remain, including mowing, as required. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off six (6) inches below the existing ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Hedges shall be pulled or grubbed in such a manner as to assure complete and permanent removal. Clearing shall also include the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work. Demolition is specified in the Section 02050 entitled “Demolition and Removal”.

3.2 TREE REMOVAL: Trees not designated by the drawings or by the Engineer/Owner’s Representative to remain shall be removed by cutting to 6 inches below the existing ground without removing stumps, unless otherwise required. The work shall include the felling and disposal of such trees.

3.3 GRUBBING: Grubbing shall consist of the removal and disposal of stumps, roots larger than three (3) inches in diameter, and matted roots from the area as affected by the proposed site improvements. This material, together with logs and other organic or non-perishable solid objects shall be excavated and removed to a depth of not less than twelve (12) inches below the original soil surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform to the original adjacent surface of the ground.

3.4 DISPOSAL OF CLEARED AND GRUBBED MATERIALS: All trees, shrub vegetation, and debris shall be removed from the project site and disposed of at an approved location. The Contractor shall make all necessary arrangements with property owners in writing as well as obtain required permits for the use of off-site disposal locations. Woody material may be disposed of by chipping. The wood chips may be used for mulch, slope erosion control or may be uniformly spread over selected areas as directed.

END OF SECTION 02102

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: In addition to the recommendations provided within the soils report, which is to be followed closely by the Contractor, the latest issues of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Society for Testing and Materials:

C 136	Sieves or Screen Analysis of Fine and Coarse Aggregates
D 1140	Amount of Material in Soils Finer than the No. 200 (75 micrometer) Sieve
D 1556	Density of Soil in Place by the Sand Cone Method
D 1557	Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 10-lb. (4.54kg) Rammer and 18-in (457-mm) Drop
D 2419	Test for Sand Equivalent Value of Soils and Fine Aggregate
D 2487	Classification of Soils for Engineering Purposes
D 2922	Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)
D 3017	Moisture Content of Soil and Soil Aggregate In Place by Nuclear Methods (Shallow Depth)
D 4318	Liquid Limit, Plastic Limit and Plasticity Index of Soils

1.2 Army Corps of Engineers Publications:

Army Corps of Engineers Manual EM-385-1-1

1.3 DESCRIPTION OF WORK

This Section covers all earthwork required by the project and other work necessary to complete the work, as shown in the drawings. In addition, this Section covers all earthwork required for restoration of damaged existing roads and driveways affected by the construction activities.

1.4 SUBMITTALS

A. Certified Test Reports: Submit certified test reports before starting work for the following:

1. Fill, backfill, bedding tested in accordance with ASTM C136 and ASTM D2487.

1.5 DELIVERY AND STORAGE: Deliver and store materials in a manner to prevent contamination or segregation.

1.6 SOIL SUBSURFACE INVESTIGATIONS: Refer to General Site Assessment and Preliminary Geotechnical Recommendations, prepared by Geo-Engineering & Testing, Inc., dated 15 June 2022. The boring logs show majority of subsurface soils at the site are moderately hard to hard coralline

limestone. The Contractor shall be prepared to work on this type of condition without additional costs to the Owner.

1.7 CRITERIA FOR BIDDING AND PREVAILING WORK CONDITIONS: Base bids on the following criteria and be fully prepared to work under the following prevailing conditions:

A. Surface elevations are as indicated.

B. Pipes, cables and/or other artificial obstructions in addition to those indicated will likely be encountered.

C. Abandoned pipes or other artificial obstructions encountered are to be demolished and removed at the direction of the Engineer/Owner's Representative.

D. Hard material in the form of concrete foundations, asphaltic-concrete pavement and coral rock will be encountered. Hard material is defined as solid rock, firmly cemented unstratified masses, or conglomerate deposits possessing the characteristics of solid rock which can not ordinarily be removed without systematic drilling and blasting or use of special high impact rock-breaking equipment, and any boulder, masonry, or concrete except slabs, pavement, curbs and foundations, exceeding 1/2-cubic yard in volume.

E. Unless allowed in other parts of the Contract, all earthworks are unclassified and that no special or additional compensation will be made for any class of excavation whatsoever, regardless of the type of material or quantity encountered. No extra compensation will be made by reason of any misunderstanding or error on the part of the Contractor with regards to the site, the conditions thereof or the amount and kind of earthwork to be performed.

1.8 PROTECTION OF EXISTING FACILITIES

Existing utilities and construction shall be protected from damage during earthwork operations. The Contractor shall seek and obtain written clearances from all utility agencies, both private and the Government of Guam, specifically DPW, GPA, GWA, GTA, DOCOMO, etc. prior to undertaking any earthwork operations. As part of obtaining such clearances, the Contractor shall specifically request each utility agency to stake out the location of their utilities prior to undertaking any excavation or filling work. In addition, the Contractor shall obtain and use as reference as-built drawings of existing utilities from all utility agencies that may have utilities at the project site. Any damages to existing facilities, public or private, shall be promptly repaired by the Contractor at no additional costs. Damages to existing facilities, structures, utilities or other works shall be repaired by the Contractor, using materials equal to or better than those existing, all at the Contractor's expense.

When directed by the Engineer/Owner's Representative, excavation near or around known utilities shall be by careful hand excavation. Hand excavation shall start at a reasonable distance from each side of the indicated obstruction and shall be continued until the obstruction is uncovered or until clearance for the new work is assured. The Contractor shall properly support all uncovered utilities or other existing work as affected by the contract excavation.

Report to the Engineer/Owner's Representative any condition found which is not indicated on or anticipated by the drawings and specifications and do not proceed with work in the affected area until a decision is rendered.

1.9 SAFETY REQUIREMENTS: Work on this project shall comply with OSHA requirements and conform to safety requirements set forth in Army Corps of Engineers (ACOE) Manual, EM-385-1-1.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS: In general, shall be free of debris, roots, wood scrap material, vegetable matter,

refuse, soft unsound particles, deleterious, or objectionable materials.

A. General Fill: Shall conform to the general requirements for soil materials and shall meet the following requirements:

1. Liquid Limit (minus #40 mesh material): Not more than 40.
2. Plasticity Index: Not more than 15.
3. Material passing No. 200 mesh sieve: 25 percent maximum.
4. Maximum particle size (in any dimension): 4 inches

On-site excavated materials or materials obtained from designated borrow areas meeting the above requirements may be used.

B. Select Fill: Material for select fill shall be coral limestone or basalt, free of objectionable materials and of fragments no larger than two (2) inches in any dimension. Material shall meet the following requirements:

Sieve Size	Percent Passing by Weight
2 inches	100
No. 4	10 - 100
No. 200	8 - 25
Liquid Limit = 25 maximum	
Plasticity Index = 6 maximum	

C. Crushed Rock: Crushed rock specified for use as sub-grade improvement, or blending with on-site excavated soil materials shall consist of clean crushed coral rock, and except where otherwise specified, shall be in pieces varying from 1/2 inch to 2 inches.

D. Sub-basecourse: Sub-basecourse may be pit run coral limestone, meeting the following properties:

Sieve Size	Percent Passing
3 inches	100
2.5 inches	90 – 100
2 inches	-
1.5 inches	-
¾ inch	-
No. 4	40 – 90
No. 30	-
No. 200	0 – 25
Liquid Limit	Not greater than 25
Plasticity Index	Not greater than 6
R-Value	Not less than 56
Loss Angeles Abrasion	Not greater than 50
Sand Equivalent	Not less than 25

E. Base Course: Refer to Section 02203 of this specification.

F. Unsuitable Materials: In general, unsuitable materials consist of soft soils that cannot meet the compaction requirements after reconditioning by approved methods, and of other objectionable materials.

G. Material Sources: The Contractor shall be responsible for procuring materials from sources approved by the Engineer/Owner's Representative. Unless otherwise indicated by the

drawings, all borrow or imported materials for earthwork shall be obtained from approved sources off site. Materials shall be selected, mixed and or blended thoroughly to conform to the required specifications for each class of material and stored in stockpiles that are segregated from other materials. Representative samples of each stockpile must be taken by the Independent Laboratory employed by the Contractor in the presence of the Engineer/Owner's Representative. No material shall be used in the work or placed in any other location on the project site without the written approval of the Engineer/Owner's Representative.

All clearing, grubbing, quarrying, crushing, hauling, mixing or blending and other work related or incidental to the importation or processing of materials shall be at the Contractor's expense.

PART 3 - EXECUTION

3.1 GENERAL

A. Demolition and Removal: Shall be as specified in Section 02050, entitled "Demolition and Removal".

B. Removal of Unsuitable Material: Remove soil, muck, rubbish, debris and other unsuitable material at and under areas designated for construction, to a depth as determined by the Soils Engineer.

C. Excavation: This work shall consist of excavation, disposal and/or compaction of all materials of whatever character encountered within the limits of the work and which is necessary for the construction of improvements in accordance with the grades, thicknesses and typical cross sections shown on the drawings or established by the Engineer/Owner's Representative. Suitable materials removed from the excavation may be used as far as practicable in the formation of embankment, sub-grade, bedding, and backfill for structures and pipes, and for other purposes shown on the drawings or as directed.

D. Filling (Placement of Fill and Embankment): Filling in areas indicated on the drawings shall consist of placing and compacting of approved material on approved sub-grade, including the placing and compacting of fill material in areas where unsuitable materials have been removed, holes, pits, and other depressions within the project area.

E. Dewatering: Include in dewatering the collection and disposal of all forms of surface and subsurface water that may be encountered in the course of construction.

3.2 REQUIREMENTS FOR GRADING

A. Preparation for Grading: Prior to beginning excavation, grading, and filling work in any area, perform all necessary demolition and removal and clearing and grubbing work in that area in accordance with Section 02050, entitled "Demolition and Removal" and Section 02102, entitled "Clearing and Grubbing".

Where filling below sub-grade is to be made, all sod and vegetable matter, and unsuitable materials shall be removed from the surface upon which the fill is to be placed, and the cleared surface shall be completely broken up by plowing, scarifying, or stripping to a minimum depth of 6 inches and compacted as per Subparagraph 3.2(F).

B. Utilization of Excavated Materials: All suitable material removed from excavation shall be used as far as practicable in the formation of the embankment, filling, sub-grade, and backfill for structures, and for other purposes shown on the drawings or as directed. Only approved materials shall be used in the construction of embankments and backfills. All unsuitable

material shall be properly disposed of at the Contractor's expense at designated and/or approved disposal areas. All excess materials, including rock and boulders that cannot be used in fill areas shall be disposed of as directed by the Engineer/Owner's Representative on or off the project site at the Contractor's expense. Material encountered in the excavation and determined by the Engineer/Owner's Representative as suitable for topping or fill, or other purposes shall be conserved and utilized as directed.

C. Drainage Ditches and Swales: If any drainage ditches and swales required or to be restored after construction shall conform to the slope, grade, and shape of the required cross-section, with no projections of roots, stumps, rock or similar matter. The Contractor shall maintain and keep open and free from leaves, sticks, and other debris all ditches dug by him until final acceptance of the work.

D. Removal of Unsuitable Material: The Contractor shall not excavate beyond the dimensions and elevations established, except where unsuitable materials are encountered in the sub--grade. Where unsuitable materials are encountered, such material shall be removed to a depth required to obtain a dense, unyielding sub-grade as determined by the Soils Engineer. The excavation shall then be backfilled with select fill compacted as required in this Section. If the bottom of excavation is too soft for placing compacted select fill, crushed rock shall be used for backfill in lieu of general fill. Crushed rock backfill shall be spread uniformly without segregation. The upper surface of the crushed rock shall be compacted until it is dense and non-yielding. This work shall be a basic responsibility of the Contractor and shall be accomplished at no additional costs.

E. Placing General Fill: Unless otherwise permitted by the Engineer/Owner's Representative, fills and backfills shall not contain mulch, roots, sod, or other deleterious matter. Rocks, broken concrete, or other solid, bulky materials shall not be placed in embankments areas where piling is to be placed or driven.

Fill material shall be placed in horizontal layers not exceeding 8 inches (loose measurement) and shall be compacted as specified before the next layer is placed, except as otherwise directed by the Engineer/Owner's Representative. Effective spreading equipment shall be used on each lift to obtain uniform thickness prior to compacting. As the compaction of each layer progresses, continuous leveling and manipulating will be required to assure uniform density. Water shall be added or removed, if necessary, in order to obtain the required density. Removal of water shall be accomplished through aeration by plowing, blading, disking, or other methods satisfactory to the Engineer/Owner's Representative. Hauling equipment shall be dispersed uniformly over the entire surface of the previously constructed layer to minimize rutting or uneven compaction.

F. Compaction: Unless otherwise indicated on the drawings or in the other Sections of these specifications, the Contractor shall compact the material placed in all general fill layers, including sub-basecourse, sub-grade fills, and other materials scarified to the designated depth below sub-grade in cut sections, until a uniform density of not less than 95 percent of the maximum dry density as determined by ASTM D1557.

3.3 EARTHWORK FOR STRUCTURES AND PAVEMENTS

A. Description: This work shall consist of the necessary excavating and backfilling for foundations, structures, and pavements in reasonably close conformity with the drawings or as established by the Engineer. This work shall also include necessary dewatering as well as the furnishing of equipment and materials thereto and their subsequent removal.

B. Excavation Requirements (All Structures): Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the drawings. They shall be of sufficient size to permit the placing of structures or structure

footings of the full width and length shown. The elevations of the bottoms of footings, if shown on the drawings, shall be considered as approximate only, but, in fact, the actual dimensions or elevations of footings shall be those deemed necessary by the Engineer/Owner's Representative to permit the placement of base or bedding material as indicated on the drawings or to otherwise secure a satisfactory foundation. Boulders, logs, trash, debris, and any other objectionable material encountered in excavation shall be removed. After each excavation is completed, the Contractor shall notify the Engineer/Owner's Representative to that effect, and no backfill, base course, structure footing or any part of the structure shall be placed until the Engineer/Owner's Representative has approved the depth of excavation and the character of the foundation material.

In excavations for footings carried below the depths indicated without specific directions from the Engineer/Owner's Representative, the additional depths shall be backfilled with lean concrete or other approved materials, or the footing shall be extended to the bottom of the excavations; all additional work of this nature shall be at the Contractor's expense. All foundation excavations shall be cleaned of all loose materials and cut to a firm surface. All loose and disintegrated rock and thin strata shall be removed.

After the required excavations are completed, in the areas to be filled and in the excavated areas within the building footprints, pavements and other concrete on-grade slabs, such as sidewalks, including at least 3 feet wider al around, and any exposed, reddish brown to dark brown silt and clay soils including silty sand of similar color, shall be further excavated to a minimum depth of 18 inches below the finished sub-grade elevation and replaced with compacted non-expansive limestone sand/gravel soils.

When soft or yielding sub-grade soils are encountered during the excavations and /or during re-compaction, soft or yielding soils shall be excavated and removed. The final exposed surface shall be lightly scarified to 6 to 8 inches deep, moisture conditioned, as necessary, and compacted to at least 95% of its maximum dry density. In the event soft or yielding soils are thicker than 2 feet, the Contractor shall consult the Geotechnical Engineer for inspection to determine if complete removal can be modified.

Excavations shall be shored and sheeted with members of sizes and arrangement sufficient to prevent injury to persons, damage to structure, injurious caving, or erosion. Shoring, sheeting, and bracing shall be removed, as the excavations are backfilled; care shall be exercised to prevent injurious caving during the removal of the shoring and/or sheeting.

Utilization of Excavated Materials: All excavated material, so far as suitable, shall be utilized as fill and/or backfill. The surplus material shall not be placed within a drainage area, but shall be stockpiled or disposed of finally as directed by the Engineer/Owner's Representative and in such manner as not to obstruct drainage, or otherwise impair the efficiency or appearance of the structure. No excavated material shall be deposited at any time so as to endanger the partly finished structure.

C. Backfill for/Fill against Structures: Backfill for or fill against structures shall be select fill or sub-base materials per Paragraphs 2.1B and 2.1D, placed simultaneously on both sides of the structure, except where conditions require that backfill or embankment is to be placed on only one side or be higher on one side. In such circumstances, backfill shall be placed only with the permission of the Engineer/Owner's Representative or after the structure has attained sufficient strength. All backfill and embankments adjacent to structures shall be placed in horizontal layers having 8 inches maximum loose thickness, and then compacted as specified herein.

D. Compaction: If the limits of backfill are within the zone of a road, pavement structure, or immediately beneath foundations, as defined on the drawings, backfill shall be basecourse

conform to Paragraph 2.1F, and compacted to not less that 95% as determined by ASTM D1557.

E. Grading Adjacent to Structures: The Contractor shall perform all grading in the areas so indicated. Fill shall be brought to finish grades indicated within 0.10 of a foot and shall be graded to drain water away from structures. Existing grades that are to remain and which are disturbed by the Contractor's operations shall be graded to provide surfaces suitable for the proper use of mowing machines. Grades in areas to receive topsoil shall be brought to acceptable elevation.

F. Disposition of Surplus and Unsuitable Material: Surplus material not required for filling, backfilling, or grading and other soil material shall be deposited in areas designated by the Engineer or hauled off the project site at the Contractor's expense to approved disposal areas. Wasted material shall be spread and leveled at the disposal area(s) to a degree satisfactory to the Engineer/Owner's Representative.

3.4 RESTORATION

All disturbed work, including grassing, planting strips, pavements, etc., shall be restored to their original condition or better. Replacement materials shall be subject to the approval of the Engineer/Owner's Representative.

All remaining work that will be exposed shall have all damaged unfinished areas, or defects caused by the removal and preparatory work completely repaired, patched or filled in as required to match the adjoining existing surfaces. Where the method of repair work is not indicated or specified, the Contractor shall perform the repair work in accordance with the best recognized workmanlike procedure for the area and the surrounding construction involved, subject to the approval of the Engineer/Owner's Representative.

3.5 FIELD SAMPLING AND TESTING

A. Samples: Submit one (1) 50-pound composite sample for fill or backfill material taken from one source or from excavated materials of a similar, uniform character. Samples in the number directed, shall be submitted whenever the source or character of the material changes. Where imported material is used, a sample shall be taken which is representative of each source. Samples shall be placed in a clean container, which shall be secured to prevent loss of material, and tagged for identification. The tag shall contain the following information:

Contract No.:	Source:
Sample No.:	Intended Use:
Date of Sample:	Sampler:

B. Tests: Fill, backfill and bedding shall be tested in accordance with ASTM C136 and for conformance to ASTM D2419, and D2487 gradation limits. Test fill and backfill for material finer than the No. 200 sieve in accordance with ASTM D1140. Test fill and backfill for liquid limit, plastic limit, and plasticity index in accordance with ASTM D4318. Test fill and backfill materials for moisture density relations in accordance with ASTM D1557. Perform one (1) of each of the required tests for each material used when directed by the Engineer/Owner's Representative. Provide additional tests as specified above for each source change. Perform density tests in randomly selected locations and in accordance with ASTM D1556 or D2922 as follows: One test per 2,000 square feet in each layer of lift on fill areas or per 2,000 square feet of sub-grade area in cut; one test per layer of lift per 500 linear feet of utility trench, or per utility trench section, whichever is less.

Determine moisture content of soil material in place in accordance with ASTM D3017 as follows: One test per 2,000 square feet in each layer of lift at fill areas or one test per layer of lift per 500 linear feet of utility trench, or per utility trench section, whichever is less. A change in testing frequency or other requirements may be effected only upon the written approval of the Engineer/Owner's Representative.

END OF SECTION 02200

SECTION 02201

EARTHWORK FOR UTILITIES AND STRUCTURES

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS:The latest issues of the publications listed below referred to thereafter by basic designation only, as a part of this specification to the extent indicated by references thereto.

A. American Society for Testing and Materials (ASTM) Publications:

C136 Method for Sieve Analysis of Fine and Coarse Aggregates.

D1556 Test Method for Density of Soil in Place by the Sand-Cone Method.

D1557 Moisture-Density Relations of Soils Using 10-lb. Rammer and 18 inch Drop.

D2922 Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.2 QUALITY CONTROL:The Quality Control provisions of Division 1, Section 01450 applies to this section. All approvals except those required for field installations, field applications, and field tests shall be obtained before construction is started and before delivery materials or equipment to the project site.

1.3 DESCRIPTION OF WORK:This Section covers all earthworks required for construction of the proposed Simon Sanchez High School project, as shown on the drawings.

1.4 SUBMITTALS:

A. Certified Test Reports:Before delivery of materials and equipment, at least four (4) certified copies of the reports of all tests required in referenced publications or specified herein shall be submitted for review and approval by the Engineer/Owner's Representative. The testing shall have been performed in a laboratory meeting the requirements specified. The testing shall have been performed within three (3) years of submittal of the reports for approval. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the tested material and equipment is of the same type, quality manufacture, and make as that proposed to be supplied.

B. Dewatering Plan (If Applicable):Before commencing earthwork operation, four (4) copies of the proposed dewatering plan shall be submitted to the Engineer/Owner's Representative for review and approval. Dewatering plan shall include provisions for the control of all forms of surface and subsurface water that may be encountered during construction.

1.5 DELIVERY AND STORAGE:Materials shall be delivered to and stored at the site in a manner, which will maintain different materials in segregated piles and preclude the introduction of deleterious materials.

1.6 ENVIRONMENTAL PROTECTION

A. Environmental Protection:All work and Contractor operations shall comply with the requirements specified in Section 01560.

B. Protection of Utility Lines:Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and trenching and that are to remain, shall

be protected from damage during excavation, trenching and backfilling, and if damaged, shall be repaired as directed by the Engineer/Owner's Representative at the Contractor's expense.

C. Blasting:Use of explosives will not be permitted. Remove material by drilling and use of jacks or feathered wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers, or as approve by the Engineer/Owner's Representative.

1.7 SOIL BORING LOGS AND SUBSURFACE INVESTIGATIONS: Refer to General Site Assessment and Preliminary Geotechnical Recommendations, prepared by Geo-Engineering & Testing, Inc., dated 15 June 2022. The boring logs show majority of subsurface soils at the site are moderately hard to hard coralline limestone. The Contractor shall be prepared to work on this type of condition without additional costs to the Owner.

1.8 PROTECTION OF EXISTING UTILITIES/FACILITIES: Existing utilities and facilities shall be protected from damage during excavation operations. The Contractor shall seek and obtain written clearances from utility agencies prior to undertaking any excavation operations. As part of obtaining such clearances, the Contractor shall specifically request to stake out the location of each utility prior to undertaking any excavation or filling work. Any damages to existing facilities shall be promptly repaired by the Contractor at his own expense.

When directed by the Engineer/Owner's Representative, excavation near or around known utilities shall be by careful hand excavation. Hand excavation shall start at a reasonable distance from each side of the indicated obstruction and shall be continued until the obstruction is uncovered or until clearance for the new line is assured. The Contractor shall properly secure all uncovered lines or other existing work as affected by the contract excavation.

1.9 SAFETY REQUIREMENTS:Work on this project shall comply with OSHA requirements and conform to safety requirements set forth in Army Corps of Engineers (ACOE) Manual EM-385-1-1.

1.10 CRITERIA FOR BIDDING AND PREVAILING WORK CONDITIONS: Refer to Paragraph 1.7 of Section 02200 of these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bedding Material:Bedding materials shall be manufactured sand free of organic substances and/or rubbish. When tested in accordance with ASTM C136, the material shall conform to the following gradation limits.

Sieve Size	Percent Passing
3/8 inch	100
No. 4	85 – 100
No. 16	45 - 80
No. 50	10 - 30
No. 100	0 - 10
No. 200	0 - 5

Note: Mining of beach sand is not permitted on the islands of Guam.

B. General Fill: Refer to Paragraph 2.1A of Section 02200 of this specification.

C. Select Fill: Refer to Paragraph 2.1B of Section 02200 of this specification.

D. Crushed Rock: Refer to Paragraph 2.1C of Section 02200 of this specification.

2.2 TOPSOIL: Material from the areas to be excavated or graded which are suitable for topsoil, shall be deposited in piles separate from other excavated material. Piles of topsoil shall be located so that the material can be used readily for the finished surface grading: topsoil shall be protected and maintained until needed. Any surplus of topsoil shall be stockpiled as directed by the Engineer/Owner's Representative. When used for finished surface grading, topsoil shall be spread uniformly over the areas indicated.

2.3 The Contractor shall provide additional topsoil from approved sources off the site, if stockpiled top soil material is insufficient to complete the work indicated.

PART 3 - EXECUTION

3.1 LOCATION OF EXISTING UNDERGROUND UTILITY LINES: Location of existing water, sewer, electrical, telephone, television, and storm drain lines are approximate and may vary in the field; the Contractor shall be responsible for verifying the exact location of these utilities by using suitable detecting devices and shall exercise caution during operations to avoid damage to these utilities. The Contractor shall not commence any grading, digging, and excavation works until all existing utilities at or near the proposed utilities are located or verified in the field.

3.2 EXCAVATING, BACKFILLING, COMPACTION, AND GRADING

A. General: Excavations shall be carried to grades and dimensions indicated or necessary. Excavations shall be kept free from water while construction is in progress. The bottom of the trench excavation shall be compacted to 90 percent ASTM D1557. Soft soil or unsuitable material encountered at bottom of excavation shall be removed to the depth and replaced with suitable material necessary to obtain the required compaction. The excavation shall then be backfilled with select fill compacted to 95 percent. All additional work of this nature shall be at the Contractor's expense.

B. Grading: The Contractor shall perform all grading in the areas so indicated. Fill shall be brought to finished grades indicated within a one-tenth (1/10) of a foot and shall be graded to drain water away from structures. Grades under areas to receive topsoil shall be brought to acceptable elevation.

C. Disposition of Surplus Material: Surplus material not required for filling, backfilling, or grading and other material shall be wasted by disposition in the area indicated or hauled at the Contractor's expense to an approved disposal site in compliance with federal and local requirements.

D. Compaction: Unless otherwise indicated on the drawings or in the other sections of these specifications, the Contractor shall compact the material placed in all general fill layers, sub-grade and the material scarified to the designated depth below sub-grade in cut sections, until a uniform density of not less than 95 percent of the maximum dry density as determined by ASTM D1557. Compact pipe bedding material, to not less than, 90 percent of ASTM D1557 maximum density.

If Contractor uses manufactured sand (Commonly Known as Hammer Mill Sand, which is 100% passing 3/8" Sieve) for pipe bedding, the material shall be compacted until it is dense and non-yielding. No compaction tests are required for this material.

E. Trench Backfill: Trench backfill shall be select fill, placed in horizontal layers having 8-inch maximum loose thickness, and then compacted, as specified in Paragraph 3.2(D) above.

3.3 DEWATERING (If Applicable): Dewatering shall include the control of all forms of surface and subsurface water that may be encountered in the course of construction. The Contractor shall be responsible for obtaining all necessary permits for dewatering operations.

3.4 CUTTING EXISTING PAVEMENTS: Saw cut with neat, parallel, straight lines, one foot wider than trench width on each side, or as indicated in the drawings. When saw cut is within three (3) feet of an existing pavement joint, remove the pavement to the existing joint.

3.5 FIELD SAMPLING AND TESTING

A. Sampling: All sampling shall be conducted by the Contractor at his expense. A 50-lb. sample of bedding material shall be taken at every five hundred (500) cubic yards for sieve analysis of aggregate. Duplicate samples shall be provided to the Engineer/Owner's Representative on an average of one sample a month. The duplicate samples shall be taken at the same time and in the same manner.

B. Sample Identification: Each sample shall be contained in a clean container which shall be securely fastened to prevent loss of material. Each sample shall be tagged for identification. The tag shall contain the following information:

Contract No.:	Sampler:
Sample No.:	Source:
Date of Sample:	Intended Use:
Quantity:	For Testing:

C. Testing: All testing shall be conducted by the Contractor as specified herein at the Contractor's expense.

1. Bedding Material and Select Fill Testing: Gradation test shall be made on each sample in accordance with ASTM C136.

2. Compaction Testing: Compaction shall be made in randomly selected locations in accordance with ASTM D1556 or ASTM D2922 as follows:

Material	Test Frequency
Bedding	1 per 600 linear feet/2,000 sq. ft.
Select Fill Materials	1 per lift per 2,500 sq. ft.

The Engineer/Owner's Representative may reduce, at his discretion the Sampling and Testing frequency if he is assured that quality control is being carefully observed.

END OF SECTION 02201

SECTION 02203

BASE COURSE

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The latest issues of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Society for Testing and Materials (ASTM) Publications:

C136	Sieve or Screen Analysis of Fine and Coarse Aggregate.
D75	Sampling Stone, Slag, Gravel, Sand and Stone Blocks for use as Highway Materials.
D1140	Amount of Material in Soils Finer Than the No. 200 Sieve.
D1556	Density of Soil in Place by the Sand Cone Method.
D1557	Moisture-Density Relations of Soils Using 10-lb. Rammer and 18-inch Drop.
D2922	Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

1.2 QUALITY CONTROL: The Quality Control provisions of Division 1, Section 01450, apply to this section. Approvals, except those required for field installations, field applications, and field tests, shall be obtained before construction is started and before delivery of materials or equipment to the project site.

1.3 CERTIFIED TEST REPORTS: Before delivery of materials and equipment, at least four (4) certified copies of the reports of all tests required in referenced publications or specified herein, shall be submitted and approved. The testing shall have performed in a laboratory meeting the requirements specified in the Quality Control Section of Division 1. The tests shall have been performed within two (2) years of submittal of the reports for approval. Tests reports shall be accompanied by notarized certificates from the manufacturer certifying that the tested material and equipment is of the same type, quality, manufacture, and make as that proposed to be supplied. Certified test reports are required for the following:

A. Plasticity Index.
B. R-Value.
C. Liquid Limit.
D. Aggregate gradation.
E. L.A. Abrasion.
F. Sand equivalent.

1.4 DELIVERY AND STORAGE: Materials delivered to the site shall be inspected for damage, unloaded and sorted with a minimum of handling. Aggregates shall be stored in such a manner as to prevent segregation.

PART 2 - PRODUCTS

2.1 MATERIALS: Base Course shall consists of crushed coralline limestone meeting the requirements indicated herein:

Mechanical Analysis:

Sieve Size	Percentage Passing
2 inches	100
1-1/2 inches	90 – 100
3/4 inches	50 - 80
No. 4	30 - 60
No. 40	15 - 30
No. 200*	5 - 13

*Fraction passing No. 200 mesh sieve should not be more than ½ of the fraction passing No. 40 sieve.

Liquid Limit: Not greater than 25.

Plasticity Index: Not greater than 6

California Bearing Ration (CBR) Not less than 100

Los Angeles Abrasion: Not greater than 40

Sand Equivalent: Not less than 35

2.2 CONSTRUCTION EQUIPMENT: The Contractor shall submit a list of all construction equipment to the Engineer for approval 15 days prior to bringing equipment on the job. All equipment shall be dependable and adequate for the purpose intended, and shall be properly maintained in satisfactory and safe operating condition at all times. Calibrated equipment such as scales, batching equipment, spreaders and similar equipment, shall have been re-calibrated by a calibration laboratory recommended by the Contractor and approved by the Engineer/Owner's Representative within 12 months of commending work and every 24 months thereafter, by such laboratory from the date of recalibration, during the term of the contract. The list of equipment shall include the make, model, and serial number, and the date on which the calibrated equipment was last re-calibrated.

A. Three-Wheel General Purpose Rollers: These rollers shall be self-propelled, weighing not less than 10 tons, and having a minimum compression of 300 pounds per inch width of rear wheel. The wheels of the rollers shall be equipped with adjustable scrapers.

B. Tamping Rollers (Sheepsfoot Type): Tamping rollers shall consist of one or more units. Each unit shall be a watertight cylindrical drum not less than 48 inches in length, surmounted by metal studs with tamping feet projecting not less than 6 nor more than 10 inches, measured diagonally from center to center. The tamping feet shall be a type suitable for compacting the material to be used. Each unit shall be equipped with a suitable device for cleaning the tamping feet. The rolling units of multiple type tamping rollers shall be pivoted on the main frame in a manner which will permit the units to adapt themselves to uneven ground surfaces and to rotate independently. When fully loaded, the roller shall produce at least 3,500 pounds per liner foot of drum.

C. Pneumatic-Tired Rollers: Pneumatic-tired rollers shall be single or double axle, vibrating or non-vibrating type, equipped with tires of equal size and diameter, uniformly inflated, so that the air pressure of the several tires shall not vary more than 5 pounds per square inch. Rollers may be self-propelled or towed by a suitable powered unit. The self-propelled roller, or the power unit and towed roller shall be considered a pneumatic-tired roller unit.

1. Light Pneumatic-Tired Rollers: Light pneumatic-tired rollers shall have two axles on which are mounted not less than 9 pneumatic-tired wheels in such a manner that the rear group of tires will not follow in the tracks of the forward group. The axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. The roller shall develop a compression of not less than 225 pounds per inch width of tire tread and shall be capable of being loaded to provide loads up to 300 pounds per inch of normal tire width. The rollers shall be weighted as directed by the Engineer.

2. Heavy Pneumatic-Tired Rollers: Heavy pneumatic-tired rollers shall be of the vibratory or non-vibratory type with a minimum loading of 25,000 pounds per tire. The tires shall be suitable for inflation to not less than 90 psi. The loading shall be distributed equally to all wheels.

D. Grid Rollers: Grid rollers have at least two similar metal drums having a minimum outside diameter of 5 feet and a minimum length of 2 feet 6 inches, independently mounted on a common shaft in a rigid frame. The face of the drums shall have the appearance of woven open-mesh made by interlacing bars. Opening between bars shall be not less than 3 inches nor more than 4 inches,; bars shall be not less than 1-1/4 inches or more than 1-3/4 inches in diameter. The roller shall be constructed so that counterweights can be used to adjust the gross weight to 450 pounds per inch of length of roller drum.

E. Vibrating Tampers: Vibrating tampers shall be the self-propelled, crawler mounted type suitable for use on the project.

F. Mechanical Hand Tampers: Mechanical hand tampers shall be standard commercial plate-type vibratory compactors.

G. Tractors: Tractors shall be of the crawler type, suitable for compacting base course.

H. Blade Graders: Blade graders shall have a wheel base of not less than 15 feet and a blade not less than 10 feet in length, and shall be self-propelled.

I. Sprinkling Equipment: Sprinkling equipment shall include tank trucks, pressure distributors, or other equipment designated to apply water uniformly and at controlled quantities to variable widths of surface.

J. Disks: Disks shall be the tandem type, and shall be constructed to prevent any cutting of the sub-grade during mixing operations.

K. Plows: Plows shall be of the multiple-furrow type, and shall be designed so that depth of furrow can be accurately controlled.

L. Hauling Equipment: Hauling equipment shall consist of pneumatic-tired vehicles having dump bodies suitable for dumping materials in layers on the underlying course.

M. Miscellaneous Equipment: Miscellaneous equipment scarifiers, tractors, spring-tooth or spike-tooth harrows, windrow equalizers, spreaders, and other equipment shall be of types suitable for constructing mechanically stabilized aggregate base course.

PART 3 - EXECUTION

3.1 CONSTRUCTION

A. General: The graded aggregate base course shall be constructed on a previously

constructed course, as indicated. The base course shall consist of aggregate processed, deposited, spread, and when the atmospheric temperature is below 35 degrees F or when other weather conditions detrimentally affect the quality of the base course. It shall be the responsibility of the Contractor to protect all areas of complete base course against any detrimental effects. Areas of base course that are damage by weather conditions, during any phase of construction, shall be reconditioned, reshaped, and re-compacted in conformance with the requirements of this specification without additional cost to the Owner. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be placed in lanes paralleling the centerline of the area to the paved, and suitably spaced for string lining.

B. Mixing of Materials: Coarse and fine aggregate shall be mixed in a stationary plant, or in a traveling plant. Coarse and fine aggregates shall be proportioned by weight or by volume in such quantities that specified gradation, liquid limit, and plasticity index requirements should be met after the base course has been placed and compacted. Water measured by weight or by volume in quantities sufficient to provide the necessary moisture content for the specified compaction, shall be incorporated during the mixing operation. Mixing operations shall produce satisfactory uniform blending and the method of discharging into trucks shall not produce segregation.

C. Placing: Mixed material shall not be dumped in piles, but shall be placed on the prepared sub-grade in layers of 8" uniform thickness with a spreader or grader. Layers shall be so placed that when compacted they will be true to grades or levels required with the least possible surface disturbance. Where the base course is constructed in more than one layer, the previously constructed layers shall be cleaned of loose and foreign matter by sweeping with power sweepers, power brooms, or hand brooms. Water content of the material shall be maintained during the placing period as required to obtain the compaction specified. Adjustment in placing procedures or equipment shall be made as required to obtain true grades, to minimize segregation and degradation, to reduce or increase water content, and to insure a satisfactory base course.

D. Compacting and Finishing: Immediately following the spreading, the layer shall be compacted with steel-faced, vibrating or pneumatic-tired rollers, or other suitable compacting equipment or combinations thereof. Compaction shall continue until the layer is compacted to at least 95 percent of maximum dry density when tested in accordance with ASTM D1557. In all areas not accessible to rollers or compactors, the mixture shall be compacted with mechanical hand tampers. If the mixture is excessively moistened by rain, it shall be aerated by means of blade graders, or other suitable equipment, until the moisture content of the material is such that, when the material is compacted, the required density is obtained. The surface of the layer shall be finished by a combination of rolling and blading, and shall be smooth from waves and inequalities.

E. Finishing at Edges of Base Course: Earth or other approved material shall be placed along the edges of the base course in such quantity as will compact to the thickness of the course being constructed, or, when the course is being constructed in two or more layers, to the thickness of each layer of the course, allowing in each operation at least a one-foot width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of each layer of the base course.

F. Maintenance: After construction is completed, the base shall be maintained throughout except where portion of the succeeding course is under construction thereon. Maintenance shall include drainage, rolling, shaping, and watering as necessary to maintain the course in proper condition. Deficiencies in thickness, composition, construction, smoothness, or density, which develop during the maintenance, shall be corrected to conform to the requirements specified hereinbefore. Sufficient moisture shall be maintained at the surface to prevent a dusty condition, by light sprinkling with water. Before the application of the prime

coat, the base course shall be permitted to partially dry until the average moisture content of the full depth of the base is less than 80 percent of the optimum moisture of the material.

3.2 FIELD SAMPLING AND TESTING: Samples shall be supplied by the Contractor, as specified herein, at the expense of the Contractor. Testing will be conducted by the Contractor at his expense. All material and material sources will be approved by the Engineer/Owner's Representative, 7 days prior to the use of such material in the work.

A. Sampling:

1. Aggregates at Source: Prior to production and delivery of aggregates, at least one initial sample shall be taken in accordance with ASTM D75 from each stockpile. Each sample shall be collected by taking three incremental samples at random from the source material to make a composite sample of not less than 50 pounds. Three random samples shall be taken from each 3,000 tons of material, or a day's run, thereafter during the course of the project. A repetition of the above sampling shall be made when the source of material is changed or when unacceptable deficiencies or variations from the specified grading or materials are found in testing.

2. Sample Identification: Each sample shall be placed in a clean container which shall be securely fastened to prevent loss of material. Each sample shall be tagged for identification. The tag shall contain, at a minimum, the following information:

Contract No.
Sample No. Quality
Date of Sample
Sampler
Source
Intended Use
For Testing

B. Testing:

1. Aggregate Testing: Gradation tests shall be made on each sample without delay. All other aggregate test shall be made on the initial source samples, and shall be repeated when there is a change of source. Sieve analyses shall be made from each sample collected during the course of the project. The test shall include an analysis of each grade of material and analysis of the combined material representing the aggregate part of the mix. Sieve analysis shall be in accordance with ASTM C136. Material retained on each sieve shall not vary from the approved job curve by more than 7 percentage points, plus or minus. Sieve analysis on material passing the No. 200 sieve shall be made in accordance with ASTM D1140.

2. Smoothness Test: Deviations in the surface in excess of 3/8 inch when tested with a 10-foot straightedge applied parallel with and at right angles to the centerline of the paved area shall be corrected by loosening, adding or removing material, reshaping, watering, and compacting. When the base course is to be constructed in more than one layer, the smoothness requirements specified above shall apply only to the top layer.

3. Field Density Tests: Field density tests shall be in accordance with ASTM D1556 D2922. There shall be one field density test for each 2,000 square yards of each layer of base material.

4. Laboratory Density Tests: Laboratory density tests shall be performed in accordance

with ASTM D1557, for all material which does not have more than 5 percent retained on the 3/4 inch sieve. Projects having more than 1,000 cubic yards of base material and having more than 5 percent retained on the 3/4 inch sieve shall have the optimum moisture and density determined in the field by test section. The material shall be rolled and compacted using the equipment approved for the project, and density and moisture determinations will be performed in accordance with ASTM D1556 or ASTM D2922 to establish optimum moisture and maximum density.

5. Thickness Test: The thickness of the base course will be measured at intervals such that there will be a depth measurement for at least each 500 square yards of complete base course. The depth measurements shall be made by test holes, at least 3 inches in diameter, through the base course. Where the base course deficiency is more than 1/2 inch, such areas shall be corrected by scarifying, adding mixture of proper gradation, blading, and re-compacting. Where the measure thickness is more than 1/2 inch thicker than shown, it shall be considered as the indicated or specified thickness plus 1/2 inch for determining the average. The average thickness shall be the average of the depth measurements and shall not underrun the thickness indicated by more than 1/4 inch.

END OF SECTION 02203

SECTION 02280

SOIL TREATMENT

PART 1 - GENERAL

1.1 SUMMARY: Provide soil poisoning to control subterranean termites as specified herein and needed for a complete and proper treatment.

1.2 SUBMITTALS:

A. Product data: Submit Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

Manufacturer's recommended installation procedures which, when approved by the Engineer//Owner's, will become the basis for accepting or rejecting actual application procedures used on the work.

1.3 QUALITY ASSURANCE:

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary task and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Qualifications of Subcontractor: Properly licensed to provide such services by the Guam Environmental Protection Agency (GEPA).

Not less than two (2) years successful experience in soil treatment for subterranean termites.

1.4 WARRANTY: Upon completion of the Work, and as a condition of its acceptance, deliver to the Contracting Officer two (2) copies of the Warranty signed by an authorized representative of the installing subcontractor, and co-signed by the Contractor, agreeing:

A. To make an inspection of the Work once each year for a total period of two (2) years following Date of Substantial Completion for the purpose of detecting termite infestation;

B. If termite infestation is found during that 2 year period, to re-treat in accordance with prevailing practices of the trade and within ten (10) calendar days after such infestation is discovered;

C. To repair damage to the Work caused by subterranean termites during that 2 year period;

D. To make such inspections, re-treatment, and repairs at no additional cost to the Owner.

1.5 DELIVERY, STORAGE, AND HANDLING: Comply with the manufacturer's standard procedures for delivery, storage and handling of the chemicals.

PART 2 - PRODUCTS

2.1 MATERIALS: Provide termiticides currently registered by the EPA. Use non-repellant termiticides for maximum effectiveness and duration after application and is suitable for the soil and climatic conditions at the project site and apply at the highest labeled rate. Submit manufacturer's label and Safety Data Sheet (SDS) for termiticides proposed for use.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS: Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 APPLICATION:

Begin soil poisoning only after all preparation for slab or footing placement is completed and inspected by a representative from GEPA.

For horizontal barriers, applications shall be made using a low-pressure spray after grading is completed and prior to the pouring of the slab or footing.

For a 1% rate, apply 1 gallon of dilution per 10 square feet, or use 2-2/3 fluid ounces of the above chemicals per 10 square feet in sufficient water to provide thorough and continuous coverage of the area being treated.

If the fill is washed gravel or other coarse material, it is important that a sufficient amount of dilution be used to reach the soil substrate beneath the coarse fill.

If concrete slabs cannot be poured over the soil the same day it has been treated, a vapor barrier should be placed over the treated soil to prevent disturbance of the termiticide barrier.

For vertical barriers, apply the 1.0% dilution at a rate of 4 gallons per 10 linear feet per foot of depth. Establish vertical barriers in areas such as around the base of foundations, plumbing lines, backfilled soil against foundation walls and other areas, which may warrant more than just a horizontal barrier.

Rodding and or trenching applications should be made to reach the top of the footing. Rod holes should be spaced to provide a continuous barrier.

Trenches need not be wider than 6 inches. Treat soil with the dilution as it is being replaced in the trench. For a 1.0% rate, apply 4 gallons of dilution per 10 linear feet per foot of depth or 10 2/3 fluid ounces of the above chemicals per 10 linear feet per foot of depth from grade to top of footing in sufficient water to ensure complete coverage.

Hollow block foundations or voids of masonry can be treated to make a complete chemical barrier especially if the soil was snot treated prior to pouring the footing. Apply the dilution at a rate of 2 gallons per 10 linear feet so that it reaches the top of the footing.

For crawl spaces, establish a vertical barrier on both sides of the foundation and around all piers and areas where underground utilities exit the soil. Do not apply the dilution to the entire surface area intended as the crawl.

3.3 GEPA INSPECTION: If necessary, two (2) days minimum prior to application of soil poisoning, the contractor shall submit a request for inspection to GEPA.

END OF SECTION 02280

SECTION 02600

PLANT MIX BITUMINOUS PAVEMENT

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The latest issues of the following publications listed below but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto:

A. American Society for Testing and Materials (ASTM):

C131 Test for Abrasion of Coarse Aggregate by the Use of Los Angeles Machine.

D946 Asphalt Cement.

D1188 Test for Bulk Specific Gravity of Compacted Bituminous Mixtures.

D1664 Test for Coating and Stripping of Bitumen- Aggregate Mixtures.

D2726 Test for Bulk Specific Gravity and density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens

D2950 Density of Bituminous Concrete in Place by Nuclear Method.

B. The Asphalt Institute Manuals:

MS-1 Thickness Design (December 1969).

1.2 QUALITY CONTROL: The Quality Control of Division 1, Section 01450, apply to this section. Approvals, except those required for field installations, field applications and field tests, shall be obtained before construction is started and before delivery of materials to the project site.

1.3 SUBMITTALS

A. Samples: Samples of the following materials shall be submitted and approved in accordance with the requirements of the general provisions:

1. Asphalt cement.
2. Course aggregate.
3. Fine aggregate.
4. Mineral filler.

B. Certified test Reports: Before delivery of materials and equipment, five certified copies of the reports of all tests required in referenced publications or specified herein shall be submitted and approved. The testing shall have been performed in a laboratory meeting the requirements specified in the Quality Control Section of Division 1, Section 01450. The tests shall have been performed within 3 years of submittal of the reports for approval. Tests certifying that the tested material and equipment is of the same type, quality, manufacture, and make as that proposed to be supplied. Certified test reports are required for the following:

1. Asphalt cement.

a. Job Mix Formula: A job-mix formula shall be submitted by the Contractor

and shall be approved prior to placing of the bituminous mixture.

The Formula shall indicate the definite percentage of each sieve fraction, the percentage of bitumen, and the temperature of the completed mixture as discharged from the mixer. Variations in the approved job-mix formula shall not exceed the following:

Aggregate passing No. 4 sieve or larger: 5% plus or minus

Aggregate passing No. 10, 40 and 80 sieves: 4% plus or minus

Aggregate passing No. 200 sieves: 1.5% plus or minus

Asphalt: 0.3% plus or minus

Temperature of mixing: 25 degrees F plus or minus

Adjustments of the bitumen content and aggregate gradation, within the limits specified herein, to improve the paving mixtures, shall be made as directed, without adjustment in the contract price.

1.4 DELIVERY, STORAGE, AND HANDLING: All materials shall be delivered to the central mixing plant and stored in their designated areas. Mixed materials shall be hauled directly to the point of use in the site immediate placement.

A. Central Mixing Plant: Sufficient storage space shall be provided at the bituminous mixing plant for each size of aggregate. The different aggregate sizes shall be kept separated until they have been delivered to the cold elevator feeding the drier. The storage yard shall be neat and orderly, and the separate stockpiles readily accessible for sampling. The plant shall include storage bins of sufficient capacity to supply a mixer operating at full capacity. Bins shall be arranged to ensure separate and adequate storage of appropriate fractions of the mineral aggregates.

B. Hauling Equipment: Trucks used for hauling bituminous mixtures shall have tight, clean, smooth metal beds. To prevent the mixture from adhering to them, the beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material.

C. Delivery: Loads shall not be sent out as to interfere with spreading and compacting the mixture. During nighttime operations, artificial light, satisfactory to the Engineer/Owner's Representative, shall be provided. The mixture shall be delivered at a temperature within the tolerance allowed in the approved job formula.

1.5 GENERAL REQUIREMENTS: The bituminous hot-mix pavement course shall be constructed on a previously primed base course on existing pavement. The bituminous pavement course shall consist of mineral aggregate, uniformly mixed with hot bituminous material in Bituminous courses shall be constructed when the underlying course is dry. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be placed in lanes paralleling the centerline of the area to be paved, and suitably spaced for string lining.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregates: The aggregates shall consist of crushed limestone obtained from sources

previously approved for such use, clean, hard, sound and free from deleterious coatings, disintegrated material, lumps of clay, and particles of vegetation. The coarse aggregate retained on the No. 4 sieve shall have a percentage of wear not be exceeding 40 after 500 revolutions as determined by ASTM. Standard, Designation C131. The coarse more than 5 percent materials passing the No. 8 sieve. The fine or coarse aggregate or a composite mixture shall show no detrimental amount of stripping when tested in accordance with ASTM D1664.

B. Bituminous Materials: The bituminous materials to be mixed with the mineral aggregates, unless otherwise specified on the project drawings, shall be asphaltic cement conforming to the requirements of ASTM D946 Penetration Grade 60-70 or Viscosity Grade (VG) AR-8000.

C. Composition of Mixture: The gradation of the mineral aggregate shall be as specified below. The percentage of bituminous material, by weight, used in the bituminous mixtures shall be within the limits specified except that the upper limit shall be increased as necessary, if the mineral aggregate is porous.

Percentage by Weight Passing Square Mesh

Laboratory Sieves

SIEVE	MIXTURE
1 - inch	100
3/4-inch	85 - 100
1/2-inch	72 - 87
No. 4	45 - 60
No. 10	32 - 47
No. 40	16 - 26
No. 80	10 - 18
No. 200	4 - 8
Asphalt	5 - 9

For the bituminous mixture, the stability and flow, as determined by the Marshall method, shall be as follows:

Number of blows of compaction hammer on side of molded specimen	75
Stability (minimum) pounds	2,700
Flow (maximum), hundredths of an inch	8 - 4
Percent voids filled with asphalt	70-85
Voids in Mineral Aggregates (VMA)	13% (Minimum) at ¾ - Inch Sieve

The aggregate shall be graded uniformly from coarse to fine and shall not vary from the low limit on the adjacent sieve. The grading is based on aggregates of uniform specific gravity, and the percentages passing the various sieves are subject to appropriate correction when aggregates of varying specific gravities are used.

PART 3 - EXECUTION

3.1 CONSTRUCTION EQUIPMENT

A. General: All equipment shall be dependable and adequate for the purpose intended and shall be properly maintained in satisfactory and safe operating condition at all times. Calibrated equipment such as asphalt distributors, scales, batching equipment, spreaders and similar equipment, shall have been re-calibrated by a calibration laboratory recommended by the Contractor and approved by the Engineer/Owner's Representative within 12 months of commencing work and every 12 months thereafter, by such laboratory from the date of recalibration, during the term of the contract.

B. Plant Requirements: The mixing plant shall be designed, coordinated, and operated to produce a mixture within the job-mix formula tolerances. The plant may be either a weight-batch type or a rotary-drum type and shall have a minimum capacity of 60 tons per hour. Volumetric-proportioning, continuous mixing type may be substituted for the above types, provided the equipment is suitable for producing finished mixtures complying with the job-mix formula specified herein. The mixing plant and equipment shall remain accessible at all times for checking its adequacy, inspecting its operation, verifying weights, proportions, and character of materials, and checking mixture temperatures.

Prior to the start of the mixing work, the Contractor shall obtain the Engineer's/Owner's Representative's written approval of the mixing plant's capacity, equipment, controls, mixing procedure and other relevant appurtenances.

3.2 MIXING AND TRANSPORTING

A. Mixing: The bituminous mixture shall be produced in an approved plant specified hereinbefore. The fine and coarse aggregates shall be piled in separate piles and fed to the dryer by separate mechanical feeders in a manner to produce a bituminous mixture within the tolerances specified for the job-mix formula. When two or more fine aggregates or two or more coarse aggregates of varying gradation are used, pre-mixing by satisfactory methods may be required prior to being placed in the separate piles. The aggregates shall be heated and dried thoroughly before being placed in the bins. The temperature of the aggregates, determined as they are placed in the mixer, shall be such that the temperature of the finished mixture will be within the tolerances specified.

The heated and dried aggregates shall be screened, separated into the sizes as directed or approved, conveyed to separate bins and held ready for mixing with the bituminous material. Adequate dry storage shall be provided for mineral filler at the mixing plant. After, the aggregates have been prepared properly; they shall be accurately weighed or measured and conveyed into the mixer in the proportionate amounts of each aggregate size required. The required amount of the asphalt for each batch, or calibrated amount for continuous mixing, shall be introduced into the mixer. In batch mixing, the aggregates shall be charged into the mixer and shall be mixed for not less than 15 seconds, the asphalt added, and mixing continued for at least 20 seconds or longer, as may be necessary to obtain a homogeneous mixture.

When a continuous mixer is used, the mixing time shall be not less than 30 seconds, or longer as may be necessary to obtain a homogeneous mixture. The additional mixing time, when required, shall be as directed. The temperature of the asphalt at the time of mixing shall not exceed 325 degrees F. The temperature of the aggregate and mineral filler in the mixer shall not exceed 350 degrees F when the asphalt is added. The temperature of the aggregates and asphalt at the time of mixing shall be as directed. When prepared in a twin pug-mill mixer, the depth of the mixer shall not be greater than the tips of the mixer blades

when the blades are in a vertical position. All overheated and carbonized mixtures, or mixtures that foam or show indication of moisture, will be rejected. When moisture is detected in the finished mixture, all aggregates in the bins shall be removed and placed in their respective stockpile.

B. Transportation of Bituminous Mixture: The bituminous mixture shall be transported from the paving plant to the site in trucks having tight, clean, smooth beds which have been oiled with a minimum amount of approved thin oil to prevent adhesion of the mixture to the truck bodies. Each load shall be covered with canvas or other suitable material of ample size to protect it from weather and to prevent the loss of heat. Deliveries shall be made so that spreading and rolling of all the mixture prepared for a day's run can be completed during daylight, unless satisfactory artificial light is provided. The mixture shall be delivered to the area to be paved in such manner that the temperature at the time of dumping into the spreader will not be less than that specified. Any loads wet excessively by rain will be rejected. Hauling over freshly laid material will not be permitted.

3.3 CONSTRUCTION REQUIREMENTS

A. Equipment: Equipment used in the performance of the work shall be subject to approval, and shall be maintained in a satisfactory working condition at all times.

B. Spreaders. Spreaders shall be the self-propelled type, equipped with hoppers, distributing screws, adjustable screens, and equalizing devices, capable of spreading hot bituminous mixtures without tearing, shoving, or gouging, and of producing a finished surface of specified evenness. Spreaders shall operate, when laying mixtures, at such speed between five and forty-five feet per minute, as may be directed. They shall be equipped with a quick and efficient steering device and shall have a forward and reverse traveling speed of not less than one hundred feet per minute.

Unless operating on fixed side forms, pavers shall employ mechanical devices such as equalizing runners, straight-edge runners, leveler arms, or other compensating devices to adjust to grade and confine the edges of the mixtures to true lines without the use of side forms.

C. Rollers. Rolling equipment shall consist of self-propelled rollers of tandem and pneumatic-tired types; Tandem rollers shall weigh not less than 10 tons. Pneumatic-tired rollers shall be of the double-axle type, equipped with pneumatic tires of equal size and diameter. Tires shall be uniformly inflated so that the air pressure in the several tires will not vary more than 5 pounds per square inch and so arranged that the tires on one axle will cover the gap between the tires on the other axles. Pneumatic-tired rollers shall be varied to produce an operating weight per tire from 1,000 pounds minimum to a maximum of 2,000 pounds as directed. All rollers shall be suitable for rolling hot-mix bituminous pavements and shall be capable of reversing without backlash. Pneumatic-tired rollers shall be capable of being operated both forward and backward without turning on the mat, and without loosening the surface being rolled. Rollers shall be equipped with suitable devices and apparatus to keep the rolling surfaces wet and prevent adherence of bituminous mixture.

D. Hand Tampers. Hand tampers shall weigh not less than 25 pounds and shall have a tamping face of not more than 50 square inches. Pneumatic hand tampers shall be standard commercial type.

E. Blowers and Brooms. Blowers and brooms shall be of the power type and shall be suitable for cleaning the surface to be paved.

F. Scales. Scales shall be standard truck scales of the beam type. The scales shall be of

sufficient size and capacity to accommodate all trucks to be used for handling bituminous mixtures. All scales shall be tested, as directed, and the necessary number of standard weights for testing the scales shall be on hand at all times.

G. Placing: The bituminous mixture shall be spread by self-propelled mechanical spreading and finishing equipment with a screen or strike-off assembly capable of spreading the bituminous material to a uniform thickness and density on the required cross-section without the use of side forms. Thickness of the compacted pavement shall not exceed 3" for any single course. All pavement specified in excess of 3" shall be built up in successive course of 1" to 1/2" compacted thickness. Segregation of the coarse and fine portions of mix shall be prevented. All asphalt with a temperature of less than 225 degrees F when dumped in the mechanical spreaders shall be rejected. Unless directed otherwise, placing shall begin along the centerline of areas to be paved on a crown section and at the high side of a section with a one-way slope. The length of any strip to be laid, before placing the succeeding strip, shall be as directed.

Placing of the mixture shall be as continuous as possible. Experienced shoveler and rakers shall follow the spreading machine, adding hot mixture and raking. Where the use of machine spreading is impractical, the mixture may be spread by hand. The mixture shall be dumped on approved dump boards outside the area to be paved, distributed into place by means of hot shovels, and spread with hot rakes. The finished surface shall not deviate more than 1/4" when tested with a 12-foot straightedge. The loads shall not be dumped faster than can be handled by the shoveler and rakers. Rakers not equipped with stilt sandals shall not stand in the hot mixture while raking the course. Contact surface of previously constructed pavement, curbs, manholes and similar structures shall be painted with a thin coat of hot bituminous material prior to placing the bituminous mixture.

H. Compaction of Mixture: Compaction by rolling shall begin without delay as soon as the mixture will bear the roller without undue displacement. Rolling shall start longitudinally at the extreme sides of the lane, proceeding toward the center of the pavement, overlapping on successive trips by at least one-half the width of the rear wheel of the roller. Alternate trips of the roller shall be slightly different lengths. Initial longitudinal rolling shall completely cover the freshly spread asphalt mixture and shall be performed with a two-axle or three-axle tandem roller. Tests for conformity with the specified crown, grade, and smoothness shall be made by the Contractor immediately after initial compression. Before continuing the rolling, any variations shall be corrected by removing or adding materials as directed. The course shall then be subjected to three complete passes with a pneumatic-tired roller, while the temperature of the mixture is above 150 degrees F.

Final rolling of the uppermost layer shall be performed with a tandem roller. The speed of the rollers shall not exceed 3 miles per hour and shall at all times be slow enough to avoid displacement of the hot mixture.

Any displacement of the mixture shall be corrected at once by the use of rakes and fresh mixture applied or removed as required. Rolling shall be continued until all roller marks are eliminated and the course has a density of at least 96 percent of the density obtained in a laboratory specimen of the same mixture when subjected to 50 blows per side when tested. During rolling, the wheels of the rollers shall be moistened to prevent adhesion of the mixture to the wheels, but an excess of water will not be permitted. One pneumatic-tired roller and one tandem roller shall be provided for each spreading machine in operation on the job. Additional 10-ton rollers shall be provided if the specified pavement density is not obtained by the operation of the minimum number of rollers. In places not accessible to rollers, the mixture shall be compacted with hot hand tampers. Skin patching of an area that has been rolled will not be permitted. Any mixture that become mixed with foreign material or is defective shall be removed, replaced with fresh mixture, and compacted to the required

density. The roller shall pass over the unprotected edge of the course only when the laying of the mixture is to become cold. After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has the required compaction is attained.

I. Joints: All joints shall have the same texture, density, and smoothness as other sections of the course. Joints between old and new pavements or between successive day's work shall be made carefully in a manner to ensure a continuous bond between old and new sections of the course. All contract surfaces of previously constructed pavement shall be coated with a thick, uniform coat of hot bituminous material immediately before the fresh mixture is placed.

Except when a canvas-rope joint cloth is used, the edge of the previously laid course shall be cut back to expose an even, vertical surface for the full thickness of the course. The fresh mixture shall be raked against the joints, thoroughly tamped with hot tampers, and smoothed with hot smoother, followed by rolling.

Longitudinal joints shall be placed so that the joint in the surface layer will not coincide with that of the lower layer course and will break by at least 6 inches. However, the joint in the top layer shall be at centerline of the pavement if the roadway comprises two lanes of width or at lane lines. When the edges of the longitudinal joints are irregular honeycombed, or poorly compacted, all unsatisfactory sections of Joint shall be cut back to expose an even, vertical surface for the full thickness of the course. Where required, fresh mixture shall be raked against the joint, thoroughly tamped with hot tampers, and smoothed with hot smoother, followed by rolling.

3.4 SAMPLING AND TESTING

A. Sampling

1. Materials: All material samples shall be supplied by the Supplier at his expense. All material and material sources shall be approved prior to use of material in the work, and samples, shall be submitted for approval not less than 15 working days before such aggregates are to bed. Additional samples of materials shall be furnished during construction, upon request. Asphaltic materials may be accepted on the basis of a certificate of compliance by the producer that the materials conform to these specifications.

2. Pavement and Mixtures: Suitable sized samples for the determination of thickness and density of the completed pavement shall be removed by the Contractor at his expense. The Contractor shall cut samples and satisfactorily replace the pavement. Samples of the plant mixtures will be taken and tested for each 400 tons or fraction thereof mixed. Pavement that fails to meet the requirements specified shall be removed and replaced as directed.

B. Tests: All tests to determine conformance with the specified requirements will be performed by the Government.

1. Job-Mix Test. Samples of the plant mixtures will be tested for each 400 tons or fraction thereof of finished mixture to determine gradation and bitumen content.

2. Testing of Pavement Course:

a. Density: Density of the pavement shall be determined on cores obtained from the binder or wearing course in accordance with ASTM D1188. Two cores shall be tested for 200 tons, or fraction thereof, of asphalt placed. Cores will be tested by ASTM D2726 or D1188 whichever applies.

b. In lieu of the core method of density determination, acceptance testing may be accomplished with a nuclear device in accordance with ASTM D2950. The nuclear density test shall then be correlated with the density of cored samples. If the mean density determined from cored samples and nuclear density tests is at least 96 percent, the density determination by nuclear device will be accepted but correlation of the device by core shall be done every 400 tons.

3. Thickness: Thickness of the binder and course shall be determined on cores taken for the density test.

4. Surface Test: The compacted surface of the binder course and wearing course shall be straightedge tested as the work progresses. The straightedge shall be applied parallel with and at right angles to the centerline after final rolling. Unevenness of the binder course shall not vary more than plus or minus 1/4 inch in ten feet; variations in the wearing course shall not vary more than plus or minus 1/8 inch in ten feet. Any portion of the pavement showing irregularities greater than that specified shall be corrected as directed by the Engineer/Owner's Representative. The finished surface shall also not vary more than 0.03 foot above or below the plan grade line or elevation at any point. After the completion of final rolling, the smoothness of the course shall again be tested: humps or depressions exceeding the specified tolerances or that retain water on the replacing with new material, as directed by the Engineer/Owner's Representative. This shall be done at the Contractor's expense.

END OF SECTION 02600

SECTION 02601

BITUMINOUS PRIME COAT

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The latest issues of the following publications listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto:

A. American Association of State Highway and Transportation Officials (AASHTO) Publication:

T102 Spot Test of Asphaltic Materials.

B. American Society for Testing and Materials (ASTM) Publications:

D140 Sampling Bituminous Materials.

C. Federal Specification (FS):

SS-A-674C Emulsified Asphalt.

1.2 QUALITY CONTROL: The Quality Control of Division 1, Section 01450, apply to this section. Approvals, except those required for field installations, field applications, and field tests, shall be obtained before delivery of material or equipment to the project site.

1.3 CERTIFIED TEST REPORTS: Before delivery of materials and equipment, five certified copies of the reports of all tests required in referenced publications or specified herein shall be submitted and approved. The testing shall have been performed in a laboratory meeting the requirements specified in the Quality Control Section of Division 1. The tests shall have been performed within three years of submittal of the reports for approval. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the tested material and equipment is of the same type, quality, manufacture, and make as that proposed to be supplied. Certified test reports are required for the following:

a. Asphalt Material

1.4 DELIVERY OF STORAGE: Material delivered to the site shall be inspected for damage, unloaded, and stored with a minimum of handling.

1.5 GENERAL: The bituminous prime coat shall be applied on a previously prepared base course.

PART 2 - PRODUCTS

2.1 MATERIALS: Bituminous materials shall be a slow setting emulsified asphalt conforming to Federal Specification SS-A-674C, Designation SS-1, SS-1H, or CSS-1h. Emulsified Asphalt shall be mixed with water in the proportion of 2 or 3 parts of potable water to one part of emulsified asphalt. The exact quantity of water to be added shall be determined in the field by the Engineer/Owner's Representative.

2.2 QUANTITIES TO BE APPLIED: The rate of application shall be not less than 0.25 gallon or more than 0.50 gallon per square yard. The actual rate of application will be determined in the field.

PART 3 - EXECUTION

3.1 EQUIPMENT, TOOLS, AND MACHINES used in the performance of the work required by this section, shall be subject to approval, and shall be maintained in satisfactory working condition.

A. Bituminous Distributor: Bituminous distributor shall have pneumatic tires of such width and number that the load produced on base surface shall not exceed 650 pounds per inch of tire width. The distributor shall be designed and equipped to distribute the bituminous material uniformly at even heat on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard, with a pressure range of 25 to 75 pounds per square inch and with an allowable variation not to exceed 5 percent from any specified rate. Distributor equipment shall include a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gages, volume-measuring devices, adequate heaters for heating the materials to the proper application temperature, a thermometer to show the temperature of tank contents, and a hose attachment suitable for applying bituminous shall be equipped to circulate and agitate the bituminous material during the heating process.

B. Heating Equipment for Storage Tanks: The equipment for heating bituminous material shall consist of steam coils and equipment for producing material steam, so designed that steam cannot get into the material. An armored thermometer with range from 40 degrees F to 400 degrees F shall be fixed to the tank so that the temperature of the bituminous material may be read at all times.

C. Brooms and Blowers: Brooms and blowers shall be of the power type and shall be suitable for cleaning prepared sub-grade or bases.

3.2 WEATHER LIMITATIONS: The prime coat shall be applied only when the sub-grade, or base course is dry or contains moisture not in excess of the amount that will permit uniform distribution and the desired penetration. The prime coat shall be applied only when the ambient temperature is 55 degrees F or above and when the weather is not foggy or rainy, unless otherwise directed.

3.3 PREPARATION OF SURFACE: Immediately before applying the prime coat to the surface that is to be primed, all loose material, dirt, clay, or other objectionable substance shall be removed from the surface by means of a power broom or blower supplemented with hand brooms. After the cleaning operation and prior to the application of the prime coat, an inspection of the area to be primed will be made by the Engineer/Owner's Representative to determine the fitness of the areas to receive the bituminous priming material. When directed by the Engineer/Owner's Representative, the surface shall be lightly bladed and rolled immediately prior to the application of bituminous material, in which case brooming or blowing will not be required. To assure a uniform spread of the bituminous material, the portion of the sub-grade, or base course prepared for treatment, if excessively dry, shall be lightly sprinkled with water immediately before the application.

3.4 APPLICATION OF BITUMINOUS MATERIAL: Immediately following the preparation of the base course for treatment, the bituminous material shall be applied by means of a bituminous spreader in a uniform, continuous spread. When traffic is maintained, not more than 1/2 of the width of one section shall be traded in one application. The bituminous material shall be applied at a pressure within the range of 25 to 75 pounds per square inch and the amounts directed. The priming material shall be applied with uniform distribution at all points of the surface to be treated. Care shall be taken that the application of bituminous material at the junctions of spreads is not in excess of the specified amount. Excess bituminous material shall be scraped from the surface. Building paper shall be spread on the surface of the applied material for a sufficient distance back from the ends of each application so that flow from the sprays may be started and stopped on the paper, and so that all sprayers will operate at full force on the surfaced to be treated. Immediately after the application, the building paper shall be

removed and destroyed. All sports unavoidably missed by the distributor shall be properly treated with bituminous material.

Following the application of prime material, the surface shall be allowed to dry without being disturbed for a period of not less than 48 hours or longer, as maybe necessary to attain penetration into the foundation course and evaporation of the volatiles from prime material, which period shall be determined by the Engineer/Owner's Representative. The Contractor shall furnish and spread enough approved sand to effectively blot up and cure any excess bituminous material. The Contractor shall maintain the primed surface until the succeeding layer of pavement is placed, by protecting the surface against damage to the Owner. No smoking, fires, or flames other than the heater that are a part of the equipment shall be permitted in the vicinity of heating, distributing, or transferring operations for bituminous materials. When traffic is maintained, one-way traffic shall be permitted on the untreated portion of the roadbed.

Application Temperature for Emulsified Asphalt: Application temperature for emulsified asphalt shall be as directed. Application temperatures shall be within the range of 73 to 130 degrees F.

3.5 FIELD SAMPLING AND TESTING

A. Samples of Bituminous Materials: Samples of bituminous materials shall be furnished by and at the expense of the Contractor. Sampling shall be in accordance with ASTM D140.

B. Tests: All tests of bituminous materials will be made by the Contractor.

1. Spot test for asphalt will be performed in accordance with AASHTO T102.

2. Calibration Test: The Contractor shall furnish such equipment and materials and perform the work to calibrate the tank and measuring devices of the distributor. This shall be done on the job at the beginning of the work.

END OF SECTION 02601

SECTION 02713

EXTERIOR WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The latest issues of the following publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American National Standards Institute (ANSI) Publications.

A21.16	Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings.
B16.26	Cast Copper Alloy Fittings for Flared Copper Tubes.

B. American Society for Testing and Materials (ASTM) Publications:

A47	Specification for Ferritic Malleable Iron Castings
A325	Specification for Structural Bolts, Heat Treated, 120/105 ksi Tensile Strength
A536	Specification for Ductile Iron Castings
B62	Specification for Composition Bronze or Ounce Metal Castings
D1784	Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds
D1785	Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
D2241	Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
D2464	Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
D2564	Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
D2467	Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
D3139	Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
F477	Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipes
D2000	Standard Classifications System for Rubber Products

C. American Water Works Association (AWWA) Publications:

C104	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
C110	Gray-Iron and Ductile-Iron Fittings, 3 In. through 48 In. for Water and Other Liquids.
C111	Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
C115	Flanged Ductile-Iron Pipe with Ductile Ductile-Iron or Gray Iron Threaded Flanges
C116	Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings.
C151	Ductile-Iron Pipe, Centrifically Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
C 153	Ductile Iron Compact Fitting, 3” through 12” for Water and other Liquids.
C503	Wet Barrel Fire Hydrant
C509	Resilient Seated Gate Valves, 3 Through 12 NPS, For Water and Sewage System
C550	Valves and Hydrants Protective Coatings
C600	Installation of Ductile-Iron Water Mains and Their Appurtenances
C651	Disinfecting Water Mains
C800	Underground Service Line valves and Fittings
C900	Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water
M20	Manual of Water Supply Practices, Water Chlorination, Principles and Practices

1.2 DESCRIPTION OF WORK

A. The work includes providing new water piping and connecting to existing water system and related work. Provide each system complete, and ready for operation. Water piping systems, including equipment, materials, installation, and workmanship shall be as specified herein.

1. Water Mains & Stub-outs: Provide and install Polyvinyl Chloride (PVC) piping for underground installation, including fittings, gate valves, air release valves, blow-off valves, concrete thrust blocking, and other related appurtenances in accordance with the drawings, and specifications. Fittings shall be ductile iron mechanical joint.

2. Service Lateral: Provide and install Polyvinyl Chloride (PVC), Schedule 80 pipe

including fittings, connections, valves, and other components in accordance with the drawings, and specifications.

B. Coordination of Work: Coordinate all work under this section, particularly connection to existing systems and other activities which will affect water service, with the Engineer/Owner's Representative and Guam Water Works Authority (GWA).

1.3 SUBMITTALS

A. Layout Drawings: Submit drawings for layout of valving systems, connections to existing systems, water service connections and appurtenances, special transition sections, and hydrants. Indicate locations and configurations of all fittings, valves, and other appurtenances and accessories on layout drawings. Do not have pipe, fittings, appurtenances and accessories delivered to the site until layout drawings have been approved.

B. Manufacturer's Data: Submit manufacturer's standard drawings or catalog cuts of the following items:

1. Pipe, fittings, joints, couplings, and gaskets
2. All Valves, including, but not limited to gate, check, float, and air release valves;
3. Corporation stops
4. Valve boxes
5. Water Meter
6. Fire Hydrants
7. Backflow Preventer

C. Standards Compliance: Submit manufacturer's certificates of conformance or compliance for each of the following items:

1. Pipe & fittings, including shop-applied linings and coatings
2. Pipe joint materials
3. All Valves
4. Corporation Stops
5. Water Meter
6. Fire Hydrants
7. Backflow Preventer

1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

A. Delivery and Storage: Inspect materials delivered to site for damage; unload and store with minimum handling. Store materials in enclosures or under protective covering; store rubber gaskets not to be installed immediately under cover, out of direct sunlight. Do not store directly on the ground. Keep interior of pipes and fittings free of dirt and debris.

B. Handling: Handle pipe, fittings, valves, and other accessories and appurtenances in such manner as to ensure delivery to the trench in sound, undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make satisfactory repairs if coatings or linings are damaged. Carry pipe to the trench; do not drag it.

PART 2 - PRODUCTS

2.1 MATERIALS FOR WATER LINE PIPING

A. Water Main: For below ground, Polyvinyl Chloride (PVC) Plastic Water Pipe and Associated

Fittings: Pipe shall conform to AWWA C900, Pressure Class 235 (DR 18), and will be either plain end or gasket bell end with cast-iron-pipe-equivalent outside diameter. For above ground, Ductile Iron Pipe (DIP), Pressure Class 250, Thickness Class 52, AWWA C151. Fittings shall conform to AWWA C110, gray-iron or ductile-iron with a pressure rating not less than that of the pipe. Pipe and fittings shall have cement-mortar lining, conforming to AWWA C104.

Joints for PVC pipe shall be push-on joints conforming to ASTM D3139 or compression-type mechanical joints conforming to ASTM D3139 and AWWA C111. Provide ASTM F477 gaskets for push-on joints for pipe and AWWA C111 gaskets for push-on joints and mechanical joints for joint connections between pipe and metal fittings, valves and other accessories. Joints for DIP shall be either mechanical or flanged or as indicated

B. Service Laterals: Shall be Poly (Vinyl Chloride) (PVC), Schedule 80, conforming to ASTM D-1785. Socket-type fittings shall be polyvinyl chloride (PVC) schedule 80 conforming to ASTM D-2467. Threaded fittings shall conform to ASTM D-2464 and joint compound shall conform to ASTM D-1784.

2.2 CONNECTORS

A. Flexible Couplings: Provide flexible couplings where called for on the drawings or where necessary in sizes and working pressure equal to the design pressure for the pipe for which they are to be installed. For buried pipes, they shall have cast-iron sleeves with flange and bolts of high-strength ductile iron. Gaskets shall be neoprene or natural rubber.

B. Transition Couplings shall be of ductile iron, meeting or exceed the requirements of ASTM A536, Grade 65. Gaskets shall be virgin SBR compounded for water in accordance with ASTM D2000 MBA 710. Bolts and nuts shall be high strength, low alloy steel trackhead bolts. National coarse rolled thread and heavy hex nuts. Steel meets AWWA C111 composition specifications. Coatings shall be fusion bonded or liquid epoxy.

C. Where flexible couplings are used as expansion joints, the ends of the pipes shall be separated 1 inch to allow for expansion. Couplings shall be centered on pipe ends. Runs of pipe containing flexible couplings shall be properly blocked, anchored or tied to the structure to prevent joints from pulling apart.

D. Flanged Coupling Adapters: Flanged adapters shall have at least four (4) anchor studs per coupling or equivalent. Bolts and nuts shall be Type 18-8 stainless steel.

E. Clamp-Type Couplings: Clamp-type couplings shall be designed for a water working pressure equal to the design pressure for the pipe on which they are to be installed, and shall be equipped with rubber gaskets for water service. Band shall be Stainless Steel Type 304 with high strength malleable iron ASTM A47 Grade 32510 or ductile iron ASTM A536 lugs.

F. Insulating Flanges: Insulating flanges shall be used with couplings to connect pipes of dissimilar material or when indicated on the drawings. The insulating flanges shall consist of a central gasket, bolt sleeve and insulating washer with steel washers. The central gasket shall be glass reinforced. The insulating flanges shall be designed to operate at the ASA rating of the flange on which installed.

G. Bolts and Nuts: Unless otherwise specified elsewhere, all bolts, washers, and nuts not specified to be Type 18-8 stainless steel. The material for steel bolts and nuts shall conform to the requirements of the current ASTM A325. If washers are used, they shall be of forged or rolled steel. All bolts shall be furnished with hexagonal or square heads and semi-finished hexagonal nuts. The dimensions of all heads and nuts shall be not less than those required

for the American Standard regular, and the height shall be sufficient to break the bolt in the body portion when tested. Threads shall be American Standard Screw Thread, coarse thread series.

2.3 VALVES

A. Gate Valves on Buried Piping: Unless otherwise specified, valves conforming to AWWA C509. External and internal surfaces of the valve body and bonnet shall have a fusion bonded epoxy coating, complying with ANSI/AWWA C550, applied before assembly. Valves shall have non-rising stem type with mechanical-joint ends, with operating nut, double-disc or split-wedge type gate, designed for pressure rating of not less than 150 psi. Valves shall open by counterclockwise rotation of the valve stem. Valves shall have O-ring stem seals. Stuffing boxes shall be bolted and constructed so as to permit easy removal of parts for repairs.

Valves 3.5 inch and smaller shall be the wedge disc type with non-rising stem, screw ends and brass or bronze body. Metal composition of the body, centerpiece and other cast parts shall be bronze meeting the requirements of ASTM B62. All packing shall have each ring cut to fit with staggered joints. Valves shall be provided with hand wheels and stuffing box glands. Valves shall be for minimum 150 psi water service. Hand wheels shall be of malleable iron. Valves shall be of one manufacturer.

B. Gate Valves in Valve Pits and Aboveground Location: Unless otherwise specified, valves conforming to AWWA C509. External and internal surfaces of the valve body and bonnet shall have a fusion bonded epoxy coating, complying with ANSI/AWWA C550, applied before assembly. Valves shall have non-rising stem type with flanged ends, shall have double-disc or split-wedge type gate, and designed for pressure rating of not less than 150 psi. Valves shall open by counterclockwise rotation of the valve stem. Stuffing boxes shall be bolted and constructed so as to permit easy removal of parts for repair. Hand wheels shall be of malleable iron. Valves shall be of one manufacturer.

C. Valve Boxes: Each gate valve on buried piping shall be provided with an adjustable cast-iron box of a size suitable for the valve on which it is to be used. The head shall be round and the lid shall have the word "WATER" cast on it. The least diameter of the shaft of the box shall be 10.25 inches for waterlines greater than 6 inches in diameter and 5.25 inches for waterlines 6 inches or less in diameter. Each box shall be given a heavy coat of bituminous paint.

D. Corporation Stops: Corporation stops shall be ground key type; shall be made of bronze conforming to ASTM B62; and shall be suitable for the working pressure of the system. Ends shall be suitable for solder-joint, or flared tube compression type joint. Threaded ends for inlet and outlet of corporation stops shall conform to AWWA C800, coupling nut for connection to flared copper tubing shall conform to ANSI B16.26.

E. Air Relief Valves (If Applicable): Air relief valve shall be of type suitable for the system's design pressure of 150 psi. The valve shall be painted with two coats of asphalt varnish. Fittings and nipples for connections of air relief valves shall be cast bronze or "Standard" brass (Grade A) screwed joint with metal conforming to ASTM B62. Corporation stop shall be as specified under Subparagraph 2.3 (B) entitled "Corporation Stops."

1. They shall have an inlet of not less than 3/4 inch and an outlet orifice size of not less than 3/16 inch. The valves shall automatically remove air from the lines when the lines are being filled with water, shall admit air into the lines when water is being withdrawn in excess of the inflow, and shall allow accumulating air to escape while the line is in operation and under pressure. Sizes shall be as shown on the

drawings. Valve and valve seat shall be of bronze, conforming to ASTM B62, high quality stainless steel, heat-treated chrome steel or Buna-n-rubber; however, no stainless steel to stainless steel or Buna-n-rubber to Buna-n-rubber shall be allowed.

2. The levers, float arms, pins and vent cocks shall be bronze conforming to ASTM B62. Floats shall be of the highest quality stainless steel and shall operate with adequate force to insure positive valve action.

F. Shop Painting: All iron body valves shall be given two (2) coats of coal tar paint on the interior cast iron surfaces, and on the exterior two (2) coats of coal tar paint for valves in other locations. Solid brass valves and brass and bronze trim on iron body valves shall not be painted. All finished surfaces shall be given a coating for protection against corrosion and damage during shipment and installation.

G. Backflow Preventer: Shall be Reduced Pressure Principle Backflow Preventer (RPPBP) of size as indicated in the drawings for domestic use. The RPPBP assembly shall consist of two independent “Y” configured check valves and one differential relief valve. For hydrant and fire protection lines, use Double Check Detector Check Backflow Assembly (DCDCBA) with ¾-inch by-pass line, meter, and backflow preventer. The assemblies shall be in compliance with the Foundation for Cross Connection Control and Hydraulic Research (FCCCHR) and shall be equipped with shut-off valves on both ends.

H. Water Meter: Water meters are Radio Read (R.R.) and shall have registers equipped for read data to be collected by walk or drive by radio read system. Meter shall be compatible with GWA’s Radio Read Meter Reading System. Coordinate with GWA for the type of water meter to be used or that are acceptable. Meters and boxes are to be purchased from GWA, as part of a new account set up.

I. Water Meter Box and Cover: Meters from ¾” to 2” shall be installed in Ford Meter Box. Meters 3” and larger must be installed in a meter vault no more than 4 feet deep.

2.4 APPURTENANCES/SPECIAL FITTINGS

A. Fire Hydrants: Hydrants shall conform to AWWA C503, "Wet Barrel" design. Hydrants shall be 6-inch diameter with a minimum 5-inch clear inlet valve opening, and provided with one 4-1/2 inch pumper connection and two 2-1/2 inch hose connections. Hydrants shall be of the non-flooding post type that shall not flood in the hydrant when the valve is closed, and shall be repairable without digging. Provide for a safety flange for post type hydrants. The hydrants shall be designed for a working pressure of not less than 150 psi. Working parts shall be bronze. Hose and pumper connections threads and operating nut shall be National Standard male hose threads with cap and chain. Each hydrant shall be preceded in the piping by a 6-inch gate valve. Provide with at least two (2) coat of primer and two coats of yellow enamel.

B. Water Main Warning Tape: Metallic impregnated warning tape shall be blue color for domestic (Potable) waterline and red color for fire protection waterline with "Caution Buried Water Line Below" printed on it continuously. Tape shall be made by a company regularly engaged in making metallic warning tapes.

C. Tracer Wire for Nonmetallic Piping: Provide bare copper or aluminum wire not less than 0.10 inch in diameter in sufficient length to be continuous over each separate run on nonmetallic pipe. Terminate tracer wire at ductile iron fittings and other metallic components.

D. Cast Iron Manhole Frame and Cover: Frame and cover shall be cast iron, heavy duty type and rated for at least H20 loading. Cover shall be as indicated and marked “WATER”

stamped or cast into cover so that it is plainly visible.

2.5 CONCRETE: Concrete for pipe thrust blocks, supports and anchorage conforming to the requirements of Section 03300, entitled “Cast-In-Place Concrete”.

PART 3 - EXECUTION

3.1 GENERAL: These requirements shall apply to all piping except as specified otherwise.

A. Location of Waterline Improvements: The location of water mains, laterals and appurtenances are shown on the drawings. All mains and laterals shall be installed to the grades and elevations shown on the drawings and, unless otherwise indicated on the drawings, shall be provided with a minimum cover of 3 feet from the top of pipe to existing ground or paved surface. The allowable angle of deflection and bending radius at any point shall not exceed that recommended by the pipe manufacturer for the particular pipe used.

B. Mechanical joint pipe and push-on restrained joint pipe shall be marked in such a manner that it can be determined after installation that the pipe is properly seated.

C. Existing Utilities and Structures: The Contractor shall familiarize himself with the locations of existing utilities and structures. The location of underground utilities where shown on the plans are based upon information obtained from as-built drawings and shall not be taken as final and all-conclusive. The Contractor shall, as part of his basic work, verify with DPW, GWA, GPA, GTA, DOCOMO, etc., the location and configuration of existing utilities and structures which may affect or be affected by work under this project and shall be responsible for their adjustment, removal or relocation. The Contractor shall obtain clearances from all utility agencies prior to excavation for water system work.

D. Pipe Laying and Jointing: Pipe, fittings, valves and accessories will be carefully inspected by the Engineer before and after installation and those found defective will be rejected. Pipe and fittings shall be free from fins and burrs.

Before placing in position, clean pipe fittings, valves, and accessories, and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Do not drop or dump pipe, fittings, valves, or any other piping material into trenches. Cut pipe accurately to measurements established at the site and work into place without springing or forcing. Replace pipe or fitting that does not allow sufficient space for proper installation of jointing material with new pipe or fittings of proper dimensions. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying. Grade the pipe in straight lines; avoid the formation of any dips or low points. Support pipe at its proper elevations and grade; ensure firm and uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting rests solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings.

Provide anchors and supports where necessary (and where indicated) for fastening work into place. Make proper provision for the expansion and contraction of piping. Keep trenches free of water until joints have been completely assembled. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather are unsuitable.

3.2 INSTALLATION OF BURIED WATER MAIN PIPING

A. Install pipe and fittings in accordance with the general requirements for installation of piping and with the requirements of AWWA C600 for pipe installation, joint assembly, valve-and-

fittings installation, and thrust restraint, except as otherwise specified herein:

B. The pipe shall be protected to prevent entrance of foreign material during laying operations. When laying is not in progress, open pipe ends shall be protected with a watertight plug or other approved means to exclude water or foreign material.

C. Installation of Tracer Wire and Marking Tape: Install a continuous length of tracer wire for the full length of each run or nonmetallic pipe. Attached wire to top of pipe in such a manner that it will not displace during construction operations. Place warning tape 12 inches below finished/existing grade.

D. Earthwork: Perform excavation, sub-grade improvement (as required), bedding and backfilling in accord with the material and construction requirements of Section 02201, entitled "Earthwork for Utilities."

E. Pipe Anchorage: Anchorage shall be by means of concrete thrust blocks (reaction backing), anchor blocks or encasement as indicated on the drawings. All 22.5 Degree (1/16 Bends) and sharper bends, tees, and dead ends of piping shall be securely blocked in the direction of flow with cast-in-place concrete bearing solidly against the piping and affording a minimum of 3.0 square feet of bearing area against a vertical trench face of undisturbed ground for 3- and 4-inch piping, and in accordance with thrust block schedules for piping 6-inch and larger.

F. Valves and Hydrants:

1. Valves: Install Gate Valves in accordance with AWWA C600. Install air release valves in accord with manufacturer's recommendations.

2. Hydrants: Install hydrants in accordance with AWWA C600. Make and assemble joints, as specified or indicated, for making and assembling the same type joints between pipe and fittings. Install hydrants with the 4.5” connection facing the adjacent paved areas. If there are more than one adjacent surface, contact the Engineer for further instructions.

3.3 Special Requirements for Installation of Service Laterals Metallic Piping: Install pipe and fittings in accordance with standard requirements for installation of piping specified herein and with the applicable requirements of AWWA C600 for pipe installation, unless otherwise specified

A. Jointing:

(1) Screwed Joints: Make screwed joints up tight with a stiff mixture of graphite and oil, inert filler and oil, or graphite compound; apply to male threads only. Threads shall be full cut; do not leave more than three threads on the pipe exposed after assembling the joint.

(2) Joints for Copper Tubing: Cut copper tubing with square ends; remove fins and burrs. Handle tubing carefully; replace dented, gouged, or otherwise damaged tubing with undamaged tubing. Make solder joints using 95-5 tin-antimony or Grade Sn96 solder. Solder and flux shall contain not more than 0.2 percent lead. Before making joint, clean ends of tubing and inside of fitting or coupling with wire brush or abrasive. Apply a rosin flux to the tubing end and on recess inside of fitting or coupling. Insert tubing end into fitting or coupling for the full depth of the recess and solder. For compression joints on flared tubing, insert tubing through the coupling nut and flare tubing.

(3) Flanged Joints: Make flanged joints up tight, taking care to avoid undue strain on flanges, valves, fittings, and accessories.

3.3 FLUSHING AND DISINFECTION

A. Flushing: All foreign matter shall be flushed from the pipeline prior to disinfections. Hoses, temporary piping or other devices shall be provided to dispose of flushing water without damage to adjacent property.

B. Disinfections: Disinfect the new potable water piping and existing potable water piping affected by Contractor's operations in accordance with AWWA C651. Fill the piping systems with solution containing a minimum of 50 parts per million of available chlorine, and allow solution to stand for a minimum of 24 hours. Flush the solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million. Allow concrete to cure a minimum of 5 days before testing any section of piping where concrete thrust blocks and anchors have been provided.

All chlorine or chlorine bearing compounds, chlorine dosage equipment, residual chlorine measuring equipment and flow measuring equipment shall be furnished, installed, operated and removed by the Contractor. Samples shall be taken from service outlets or, if none is available, from sample test station to be provided by the Contractor.

Field use of chlorination chemicals and equipment presents particular potential hazards to personnel, and all pertinent safe handling practices must be adhered to. In addition, special precautions should be taken to prevent damage to aquatic life in receiving waters from heavily chlorinated waters. Federal and local regulations regarding toxic wastes shall be followed. If necessary, de-chlorination of wastewater shall be provided prior to discharge. AWWA Manual M20, Water Chlorination, Principles and Practices, shall be used as a basic reference for carrying out disinfections work.

C. Prior to pressure testing or placing waterlines into service, bacteriological samples must be collected from the new water line after flushing and a 24-hour rest period. Coordinate proper procedures with GEPA and GWA for bacteriological testing.

3.4 FIELD TESTS AND INSPECTION

A. General: The Engineer/Owner’s Representative will conduct field inspections and witness all field tests specified in this Section. Perform all field tests, and provide all labor, equipment, and incidentals required for testing, including water and electrical power necessary for the tests. Approval will be by the Engineer/Owner’s Representative. The Contractor shall produce evidence, when required, that any item of work have been constructed properly in accordance with the drawings and specifications. Correct all deficiencies found and retest all affected work at no additional cost.

Do not bury, cover or conceal any piping or appurtenance, thrust blocks or bedding until work has been inspected, tested, and approved. Tests shall be made prior to backfilling of trenches for buried pipe. Tests shall not be made until at least 5 days have elapsed since any concrete thrust blocks in the section have been poured. The pipe shall be filled with water and allowed to stand for a 24-hour period to permit absorption. Each valved section of pipe shall then be slowly filled with water to replace any lost by absorption. Test pressure shall be 150 psi minimum.

B. Testing Procedure: Testing procedure for water mains and water lines shall be in accordance with the applicable requirements of AWWA C600. No leakage will be allowed at pipe joints, except for the special test requirements given hereinafter. Testing procedure and allowable leakage for PVC plastic water main and water service lines shall be in accordance with UNI-B-3, except that no leakage will be allowed at joints made with sleeve-type mechanical couplings.

C. Special Testing Requirements: Hydrostatic pressure for pressure test shall be 125 psi (minimum) at highest elevation and not more than 200 psi (maximum) at the lowest elevation and shall be held for a period of not less than 2 hours. Prior to the pressure test that portion of the water line being tested shall be filled with water for a soaking period of not less than 24 hours. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

D. Testing of Equipment and Control Devices: All equipment and control devices and appurtenances such as valves, etc., shall be tested in operation in a manner approved by the Engineer to demonstrate compliance with the contract requirements.

E. All tests shall be witnessed by the Engineer/Owner's Representative.

END OF SECTION 02713

SECTION 02720

STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The latest issues of the following publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. Federal Specifications (Fed. Spec.):

A-A 60005	Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole

B. American Concrete Institute (ACI) Publications:

ACI 315	Details and Detailing of Concrete Reinforcements

C. American Society for Testing and Materials (ASTM) Publications:

C 29	Standard Test Method for Bulk Density and Voids in Aggregate
C 478	Pre-cast Reinforced Concrete Manhole Sections
D 1248	Specification for Polyethylene Plastics extrusion Materials For Wire and Cable
D 1557	Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
D 1784	Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds
D 2412	Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
D 3034	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings (REV B)
D 3350	Specifications for Polyethylene Plastics Pipe and Fittings Materials
F 477	Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

D. American Association of State Highway and Transportation Officials (AASHTO):

M 294	Corrugated Polyethylene Pipe, 12 to 36-inch Diameter

1.2 DESCRIPTION OF WORK AND GENERAL REQUIREMENTS

A. Storm Drainage System: Drainage system improvements include but not limited to the installation of drainage pipes, drainage manholes, field inlets/catch basins, and other appurtenances for a complete installation, as called for in the plans.

B. Related Sections:

Section 02050 - Demolition and Removal
Section 02201 - Earthwork for Utilities
Section 03300 - Cast-In-Place Concrete

C. Samples: Submit samples of the following materials for approval before work is started:

1. Pipes and Fittings

D. Layout Drawings: Submit drawings for layout of drainage systems. Indicate locations of fittings and other accessories on layout drawings. Do not begin excavation work until layout drawings have been approved by the Engineer.

E. Shop Drawings: Submit shop drawings for the following:

1. Concrete Reinforcement, in accordance with ACI 315
2. Pre-cast concrete manholes
3. Metal Work

F. Manufacturer's Data: Submit manufacturer's standard drawings or catalog cuts of the following items:

1. Pipes
2. Fittings
3. Joints, Couplings and Gaskets
4. Frames, Covers, and Grates

G. Manufacturer's Certificates of Conformance: Submit manufacturer's certificates of conformance or compliance for each of the following materials which are specified to conform to publications referenced under "Products" in this section:

1. Pipe and Fittings
2. Pipe Joint Materials
3. Frames, Covers, and Gratings

All tests required by each applicable referenced publication shall have been performed, whether specified in that publication to be mandatory or otherwise. For tests which are not specified in the referenced publications to be performed at definite intervals during manufacture, the tests shall have been performed within 3 years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

1.3 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

A. Piping: Inspect materials delivered to the site for damage and store with a minimum of handling. Store materials on site in enclosures or under protective coverings. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

B. Cement: Store cement immediately upon receipt at site of work. Cement in ripped bags at the time of delivery shall be rejected. Store bagged cement and in a suitable waterproof structure which has been made as air-tight as practicable, and which has floors elevated at least 12 inches above ground to prevent absorption of moisture. At the time of use, cement and lime shall be free-flowing and free of lumps. Cement that has been in storage longer

than 6 months shall be tested as deemed necessary to determine its suitability for use. Such cement or shall not be used without the approval of the Engineer/Owner's Representative.

C. Metal Items (Except Concrete Reinforcement): Check upon arrival; identify and segregate as to types, functions, and sizes. Store in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

D. Concrete Reinforcement: Store reinforcement in a manner that will avoid excessive rusting or coating with grease, oil, dirt, and other objectionable materials. Store in separate piles or racks so as to avoid confusion or loss of identification after bundles are broken.

E. Handling: Handle pipe, fittings, and accessories in such a manner as to ensure delivery to the trench in sound undamaged condition.

F. Pre-cast Concrete Manholes: Handle pre-cast manhole sections with care to avoid chipping and breakage; store as directed. Protect pre-cast concrete from contact with the earth and exposure to weather; keep dry until used.

PART 2 - PRODUCTS

2.1 PIPING

A. Pipe and Fittings:

1. Pipes larger than 12" diameter shall be Corrugated Polyvinyl Chloride (PVC) pipe, meeting the requirements of AASHTO M294, Type S. Fittings shall conform to AASHTO M294 and MP6-95. Fabricated fittings shall be welded on the interior and exterior at all junctions. Pipe and fitting material shall be high-density polyethylene meeting requirements of ASTM D3350 Cell Classification 335420C, or ASTM D1248 Type III, Class C, Category 4, Grade P33.

2. Pipes 12" diameter and smaller shall be PVC conforming to ASTM D3034 with integral bell gasket joints or approved equal. Rubber gasket shall be factory installed and conform to ASTM F477. Pipe shall be made of PVC plastic having a cell classification of 12454B or 12364B as defined in ASTM D1784 and shall have SDR of 35 and minimum pipe stiffness of 46 psi according to ASTM D2412.

2.2 DRAIN ROCKS: Drain rocks shall consist of washed crushed coral rock, in pieces varying from 1/2" to 2" in any dimension. The drain rocks are assumed to have a void ratio of 35%. The Contractor shall be responsible for analyzing the true voids ratio of the drain rocks proposed to be used in the project. The analyses shall follow standard test method for voids in aggregates, as specified in ASTM C-29.

2.3 PRECAST CONCRETE MANHOLE SECTIONS: Pre-cast concrete manhole risers, base sections, and tops shall conform to ASTM C478. Pre-cast manhole cones shall be suitable for use with 24-inch manhole frames and covers. Exterior surfaces of all manhole components shall be coated with two (2) coats of bituminous paint.

2.4 CONCRETE: Concrete material shall be as specified in Section 03300, entitled "Cast-in-Place Concrete."

2.5 METAL ITEMS: Manhole frames and covers shall conform to Fed. Spec. A-A 60005 and shall be of cast iron as detailed in the drawings. Grate frames and gratings shall be either hot-dipped galvanized after fabrication or cast iron and shall be "Heavy Duty" type or rated for not less than H25 loading.

PART 3 - EXECUTION

3.1 INSTALLATION OF DRAINAGE PIPE AND APPURTENANT CONSTRUCTION

A. General Requirements for Installation: These requirements shall apply to all pipeline installations.

1. Earthwork:Do earthwork in accordance with Section 02201, entitled “Earthwork for Utilities”.

2. Pipe Bedding: A minimum of 6 inches thick, or as indicated, of the material specified in Subparagraph 2.1(C) of Section 02200 shall be placed below the bottom of the storm drainage pipe and compacted to 90% of the maximum density obtained at optimum moisture as determined by ASTM D1557.

   If Contractor uses manufactured sand (Commonly know as Hammer Mill Sand, which is 100% passing 3/8” Sieve) for pipe bedding, the material shall be compacted until it is dense and non-yielding.

3. Up to sub-grade above the pipe: The materials as specified in Subparagraph 2.1(C) of Section 02201, shall be used to fill the trench to a compacted depth of 12 inches minimum above the pipe which shall conform to the details provided on the drawings. The material shall be deposited in loose layers not exceeding 10 inches in thickness and compacted to 95 percent of the maximum density.

4. Pipe laying and jointing: Each pipe and fitting will be inspected before and after installation and those found defective will be rejected. Provide proper facilities for lowering sections of pipe into trenches. Lay pipe with the bell to groove ends in the upgrade direction. Adjust spigots in bells and tongues in grooves to give a uniform space all around. Blocking or wedging between bells and spigots or tongues and grooves will not be permitted. Replace by one of the proper dimensions any pipe or fitting that does not allow sufficient space for proper caulking or installation of joint material. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulkheads.

3.2 CONCRETE WORK: Refer to Section 03300, entitled “Cast-in-Place Concrete”.

3.3 MANHOLE CONSTRUCTION: Construct base slab of cast-in-place concrete or use pre-cast concrete base sections. Make inverts in cast-in-place concrete and pre-cast concrete bases with a semi-circular bottom conforming to the inside contour of the adjacent inlet and outlet pipe sections. Shapes invert accurately and provide a smooth finish. For changes in direction of the drainage line and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit.

3.4 METAL WORK: Workmanship and Finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blowholes that may impair their strength or appearance.

Field Painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in masonry or concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and give a coat of bituminous paint. Do not paint surfaces subject to abrasion.

3.5 RESTORATION TO EXISTING CONDITIONS: Existing road and drainage facilities and other

improvements damaged or adversely affected by construction of drainage system improvements shall be restored to original or better conditions satisfactory to the Engineer/Owner's Representative.

3.6 FIELD TESTS AND INSPECTIONS

A. Field tests and Inspections, General: The Engineer/Owner's Representative will conduct field inspections, if necessary. The Contractor shall perform all field tests, if required, to perform such test. The Contractor shall be able to produce evidence, when required, that any item of work have been constructed properly in accordance with the drawings and specifications.

B. Pipeline Testing: Check each straight runs of pipeline for gross deficiencies by holding a light in an inlet or manhole (also called "lamping"); it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line. Alternative pipeline testing methods may be used subject to the review and written approval of the Engineer/Owner's Representative.

C. Leakage Tests: As directed by the Engineer/Owner's Representative, test lines for leakage by exfiltration tests. Prior to testing for leakage, backfill trench up to at least the lower half of pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. Make exfiltration test by filling the line to be tested with water so that the head will be at least 4 feet above the top of the pipe at upper end of pipeline section being tested. Allow filled pipeline to stand until the pipe has reached its maximum absorption, but not less than four (4) hours. After absorption, re-establish the head and measure the amount of water needed to maintain this water level during a 2-hour test period. Amount of leakage, as measured shall not exceed 500 gallons per inch of diameter per day per mile of pipe. When leakage exceeds the amount specified, make satisfactory correction and retest pipeline section in the same manner as previously specified. Correct all visible leaks regardless of leakage test results.

The Engineer/Owner's Representative may waive exfiltration testing for large diameter pipes (pipes of 24 inches or larger diameter) in favor of careful visual inspection.

D. Field Tests for Concrete: Field-testing requirements are covered in Section 03300, entitled "Cast-in-Place Concrete".

END OF SECTION 02720

SECTION 02722

EXTERIOR SANITARY SEWER SYSTEM

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS

The latest issues of the following publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Concrete Institute (ACI) Publications:

ACI 315 Details and Detailing of Concrete Reinforcements

B. American Society for Testing and Materials (ASTM) Publications:

C 443 Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

C478 Pre-cast Reinforced Concrete Manhole Sections

C 923 Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

D2321 Underground Installation of Thermoplastic Pipes for Sewers and other Gravity-Flow Applications.

D3033 Type PSP Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

D3034 Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings (REV B)

D3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe (ANSI/ASTM F477)

C. American Water Works Association (AWWA) Publications:

C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings

D. Uni-Bell Plastic Pipe Association (UNI) Publication:

UNI-B-5 Installation of Polyvinyl Chloride (PVC) Sewer Pipe

E. Japanese Industrial Standards:

JIS R5210 Japanese Portland Cement

1.2 GENERAL REQUIREMENTS

Work under this section shall include construction of sewer lines, manholes, adjustments of existing manholes, service laterals and connections to existing mains and manholes in general conformance with published material and construction standards of the Guam Waterworks

Authority (GWA).

A. Sanitary Sewer System: The system shall include gravity pipelines, service laterals, manholes and appurtenances, and connections to existing sewer main(s).

1. Pipelines: Unless otherwise specified on the drawings for special sections, provide gravity and pressure sewer mains and laterals of polyvinyl chloride (PVC) plastic pipe.

2. Manholes: Provide manholes at the locations indicated and constructed as shown on the drawings.

B. Layout Drawings: Submit drawings for layout of piping systems. Indicate locations of fittings and others accessories on layout drawings; detail clean outs. Do not begin excavation work until layout drawings have been approved by the Engineer/Owner's Representative.

C. Shop Drawings: Submit shop drawings for the following:

1. Pre-cast concrete manholes
2. Metal work
3. Concrete reinforcement in accordance with ACI 315 as specified in Section 03300 entitled, "Cast-in-place Concrete".

D. Manufacturer's Data: Submit manufacturer's standard drawings or catalog cuts of the following items:

1. Fittings
2. Joints and Couplings
3. Pipe Materials
4. Frames and Covers

E. Standards Compliance: Submit manufacturer's certificates of conformance or compliance for each of the following materials which are specified to conform to publications referenced under paragraph, "Materials" in this section:

1. Pipe and fittings, including factory-applied linings
2. Pipe joint materials
3. Cast iron frames, covers, and gratings
4. Pre-cast concrete manhole sections
5. Concrete aggregates
6. Concrete admixtures (if used)

All tests required by applicable referenced publications shall have been performed, whether specified in those publications to be mandatory or otherwise. For tests which are not specified in referenced publications to be performed at definite intervals during manufacture, the tests shall have been performed within three years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

1.3 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

A. Delivery and Storage:

1. Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site, in enclosures, or under protective coverings. Store plastic piping and rubber gaskets under cover and out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

2. Pre-cast Concrete Manholes: Handle Pre-cast manhole sections with care to avoid chipping and breakage; store as directed. Protect Pre-cast concrete from contact with the earth and exposure to weather; keep dry until used.

3. Metal Items (Except Concrete Reinforcement): Check upon arrival; identify and segregate as to types, functions, and sizes. Store in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

B. Handling: Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. Take special care not to injure linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry pipe to trench; do not drag it. Do not leave rubber gaskets and plastic piping that are not to be installed immediately in the sunlight, but store under cover out of direct sunlight.

PART 2 - PRODUCTS

2.1 SEWER PIPING

A. Gravity Sewer Piping:

1. Pipe and Fittings: Pipe and fittings shall conform to ASTM D3033 or D3034, shall be SDR 35, with ends suitable for elastomeric gasket joints.

2. Joints and Jointing Material: Joints shall conform to ASTM D3212. Gaskets shall conform to ASTM F477.

2.2 CONCRETE MATERIALS

Concrete materials shall be as specified in Section 03300, entitled "Cast-in-Place Concrete", except that cement used for manhole construction shall be Portland Cement, Type II or JIS R5210.

2.3 PRE-CAST CONCRETE MANHOLE SECTIONS

Pre-cast concrete manhole risers, base sections, and tops shall conform to ASTM C478 and shall be subject to the approval of the Engineer. Pre-cast manhole cones shall be suitable for use with 30-inch diameter manhole frame and cover. Exterior of all manhole components shall be coated with approved bituminous coating per GWA Standards.

2.4 METAL ITEMS

Manhole Frame and Cover: Frame and cover shall be cast iron, heavy duty type and rated for at least H25 loading. Cover shall be as indicated and marked “SEWER” stamped or cast into cover so that it is plainly visible.

2.5 Gaskets and Connectors: Gaskets for joints between manhole sections shall conform to ASTM C443. Resilient connectors for making joints between manhole and pipes entering manhole shall

conform to ASTM C923. Bands, expanders, and wedges shall be made from 300 Series Stainless Steel.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPELINES AND APPURTENANT CONSTRUCTION

A. General Requirements for Installation of Pipelines: These requirements shall apply to all pipeline installation except where specified elsewhere:

1. Location: The work covered by this section shall be as shown on the drawings.

2. Earthwork: Do earthwork in accordance with Section 02201, “Earthwork for Utilities”.

3. Pipe Laying and Jointing: Each pipe and fitting will be inspected before and after installation and those found defective will be rejected. Provide proper facilities for lowering sections of pipe into trenches. Lay non-pressure pipe with the bell or groove ends in the upgrade direction. Adjust spigots in bells and tongues in grooves to give a uniform space all around. Blocking or wedging between bells and spigots or tongues and grooves will not be permitted. Replace by one of the proper dimensions any pipe or fitting that does not allow sufficient space for proper caulking or installation of joint material. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulk-heads.

4. Connection to Existing Lines: Make connections to existing lines in an approved manner. Conduct work so as to avoid interruption of the existing level of waste-water services within and adjacent to the project area. Coordinate all temporary services with the Guam Water Works Authority, for wastewater services.

5. Gravity Sewer Piping: PVC Piping: Install pipe and fittings in accordance with the general requirements for installation of pipelines and with the requirements of ASTM D2321 for laying and joining gravity pipe and fittings. Make joints with the gaskets previously specified for joints with this piping; assemble these joints in accordance with the requirements of ASTM D2321 for assembly of joints. Make joints to other pipe materials in accordance with the recommendations of the plastic pipe manufacturer.

6. Clean-outs: Sewer system clean-outs shall be assembled and installed as shown on the drawings. Piping and fittings shall conform to the requirements of Paragraph 2.1A1. Covers for clean-outs shall be bronze as approved by the Engineer.

7. Concrete Work: Concrete work shall conform to the requirements of Section 03300 entitled “Cast-in-Place Concrete”.

8. Manhole Construction and Adjustments:

a. Manhole Construction: Construct base slab of cast-in-place concrete or use Pre-cast concrete base sections. Make inverts in cast-in-place concrete and Pre-cast concrete bases with a semi-circular bottom conforming to the inside contour of the adjacent sewer sections. Shape inverts accurately and give the bottom a smooth finish. For changes in direction of the sewer and entering branches into the manhole, make a

circular curve in the manhole invert of as large a radius as manhole size will permit. For cast-in-place concrete construction, pour bottom slabs and walls and bond.

b. Manhole Adjustments: Adjust tops of existing manholes to conform to new, finish pavement elevations per details set forth on the drawings.

9. Metal Work:

a. Workmanship and Finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blow holes that may impair their strength or appearance.

b. Field Painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in masonry or concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and give a coat of bituminous paint. Do not paint surfaces subject to abrasion.

10. Pipe Anchorage:

a. For pressure sewer piping, provide concrete thrust block for pipe anchorage. Size and position thrust block as per schedule and as indicated.

3.2 FIELD TESTS AND INSPECTIONS

A. General: The Engineer/Owner's Representative will conduct field inspections and witness all field tests specified in this section. The Contractor shall perform all field tests and provide all labor, equipment, and incidentals required for testing.

The Contractor shall be able to produce evidence, when required, that any item of work has been constructed properly in accordance with the drawings and specifications.

B. Test Procedure for Non-Pressure Lines:

1. Non-Pressure Lines: Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line.

2. Leakage Tests: Test lines for leakage by either infiltration tests or exfiltration tests, as specified in this paragraph. Prior to testing for leakage, backfill trench up to at least lower half of pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. When the water table is 2 feet or more above top of pipe at upper end of pipeline section to be tested, measure infiltration using a suitable weir or other acceptable device. When the water table is less than 2 feet above top of pipe at upper end of pipeline section to be tested, make exfiltration test by filling the line to be tested with water so that the head will be at least 4 feet above top of pipe at upper end of pipeline section being tested. Allow filled pipeline to stand until the pipe has reached its maximum absorption as recommended by the pipe manufacturer.

After absorption, re-establish the head and measure amount of water needed to maintain this water level during a two-hour test period. Amount of leakage as measured by either infiltration or exfiltration test shall not exceed the 50 gallons per inch of pipe diameter per mile of pipeline. When leakage exceeds the amount specified, make satisfactory correction and retest pipeline section in the same manner as previously specified. Correct all visible leaks regardless of leakage test results.

3. Alternative Leak Testing Procedure: Air testing subject to the approval of the Engineer may be conducted in lieu of water exfiltration testing. This will establish the minimum requirements for use of air testing.

4. Deflection Testing: At the direction of the Engineer/Owner's Representative, make a deflection test on individual lengths of installed plastic pipeline on completion of all work adjacent to and over the pipeline, including leakage tests, backfilling, placement of fill, grading, paving, concreting, and any other superimposed loads. Deflection of pipe in the installed pipeline under all external loads shall not exceed 4.5 percent of the normal inside diameter of pipe. Determine whether the allowable deflection has been exceeded by use of (a) a pull-through device, or (b) a deflection measuring device.

5. Testing Devices:

    a. Pull-Through Device: Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under the same conditions as previously specified.

    b. Deflection Measuring Device: Measure deflections through each run of installed pipe. If the deflection readings in excess of 4.5 percent of normal inside diameter of pipe are obtained, retest pipe by a run form the opposite direction. If retest continues to show a deflection in excess of 4.5 percent of normal diameter of pipe, replace pipe which has excessive deflection and completely retest in same manner and under same conditions as previously specified.

    c. Warranty Period Test: Pipe found to have deflection of greater than 5 percent when deflection test is performed just prior to end of one-year warranty period shall be replaced and tested as previously specified for leakage and deflection.

C. Field Tests for Concrete:

Field testing requirements are covered in Section 03300, entitled "Cast-in-Place Concrete".

END OF SECTION 02722

SECTION 02810

LANDSCAPE IRRIGATION

PART 1- GENERAL

1.1 DESCRIPTION OF WORK:

Work Included: Provide landscape irrigation system complete, including but not limited to the following:

Excavation and backfilling.
Pipe sleeves, fittings, and sprinkler heads.
Valves and cross connection devices.
Automatic controller, remote control valves, and control wire.

Related Work Specified in other Sections (or Elsewhere):

Water stub outs: DIVISION 15 - PLUMBING
Electrical stub outs: DIVISION 16 - ELECTRICAL

1.2 CODES AND STANDARDS:

Perform work in accordance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work. Nothing in these Drawings or Specifications is to be construed as permitting work not conforming to these codes.

When the Specifications call for materials or construction of a better quality or larger size that required by the aforementioned rules and regulations, the Specifications take precedence over the requirements of the said rules and regulations.

1.3 FEES AND PERMITS: Provide for all fees, inspections, and permits required by Federal, State, and local authorities in furnishing, transporting, and installing materials.

1.4 SUBMITTALS:

Materials List:

Submit a complete list of materials proposed for installation.
List all materials by manufacturer's name and model number.
Attach copies of supportive data in the form of catalog sheets, manufacturer's specifications, or brochures.
Once the Materials List has been accepted, items other than those listed will not be allowed, unless otherwise directed by written approval from the Landscape Architect.
Substitutions:

Pre-bid requests for substitutions of any equipment or material specified or indicated will be considered if the proposed substitution is judged to be equal or superior for the particular purpose or application specified; or if proof is established that the materials specified or indicated are not available.
Submit written requests to the Landscape Architect in accordance with requirements specified in DIVISION 1.

Construction Schedule: Submit in accordance with SUBMITTALS Section. (or) At the pre-construction meeting, provide a written copy of the projected construction schedule noting the estimated completion date, number of working days required, and any special coordination requirements.

Shop Drawings: Submit in accordance with SUBMITTALS Section. (or) Submit shop drawings drafted by a competent draftsperson.

Manuals: Submit in accordance with SUBMITTALS Section. (or) Prior to the final inspection of the irrigation systems, furnish 3 individually bound Service Manuals in 3-ring, hard cover type binders containing the following items, to the Landscape Architect for use by the Owner.

Index sheet indicating Contractor's name, address, and telephone number.
Copies of equipment and material warranties and certificates.
List of equipment and materials with names, addresses and telephone numbers of local manufacturer's representatives.
Complete exploded drawings and diagrams.
Spare parts lists of equipment, showing components and catalog numbers.
Complete operating and maintenance instructions in sufficient detail to permit operating personnel to understand, operate and maintain all equipment.

As-Built Drawings: Prepare an "As-Built" drawing on a print of the Irrigation Plan(s) showing deviations and changes in the layout with accurately dimensioned locations of mains, points of connection, valves, control wires, electrical boxes, controllers, sprinkler heads, and caps for future connections. Deliver as-built drawing to the Landscape Architect prior to final acceptance of the work.

Update as-built drawing daily and maintain an updated copy on the site at all times.
Dimension the revised locations from a permanent point of reference (e.g., building, sidewalk, curb, pavement, monuments, etc.) Take dimensions prior to backfill.
Indicate all changes in red.
Upon completion of the irrigation systems, submit the marked-up as-built print(s) and 1 copy of reproducible to the Landscape Architect.

Controller Chart: Prepare a map diagram showing the location and identifying all valves, mainlines and control wiring. Identify control valves as to size, station number and type of planting irrigated. Submit diagram to the Landscape Architect.

Provide one chart for each automatic controller installed, showing the zone covered by the controller. Provide maximum size that will fit inside of controller door. Use a reduced drawing of the actual as-built systems for the chart. However, in the event the controller sequence is not legible when the drawing is reduced, enlarge it to a size that will be readable.
Use a blackline print for chart and a different color to show area of coverage for each valve circuit. When completed and approved, hermetically seal the chart between 2 pieces of minimum 10 mil thick clear plastic. Chart must be completed and approved prior to final inspection of the irrigation systems.

Certificates of Warranty: Provide all certificates of warranty from the irrigation equipment manufacturers.

1.5 QUALITY ASSURANCE:

Supervision: During the progress of the work, maintain a competent superintendent and any assistants necessary on site, all satisfactory to the Landscape Architect and Owner. Do not change this superintendent, except with the consent of the Landscape Architect, unless he proves unsatisfactory and ceases to be employed. All directions given to or by the Superintendent are binding to the Contractor.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING:

Deliver materials in timely manner to ensure uninterrupted progress of the work. Store in a manner to preclude damage and permit ready access for inspection and identification of each shipment.

Deliver manufactured materials in original containers with brand and maker's names marked thereon. Materials in broken containers or showing evidence of damage will be rejected and must be immediately removed from the site.

Store plastic pipe on flat pallets and protect from sunlight.

1.7 VERIFICATION OF LINES AND LEVELS:

Scaled dimensions are approximate. Before proceeding with any work, carefully check and verify all dimensions on the site. The drawings are diagrammatic in that swing joints, offsets and all fittings are not shown.

Space sprinkler heads, stake out, and locate valves as indicated on the Drawings and specified herein. For any deviation from Drawings or Specifications, obtain written approval from the Landscape Architect.

Check grades to determine that work may safely proceed, keeping within the specified material depths. The irrigation layout plan is based on horizontal plane dimensions, and therefore measurements taken on the surface of slopes will differ from those indicated.

1.8 JOB CONDITIONS:

Acceptance of Previous Work: Inspect and accept the condition of the site relative to this work before commencing. If not acceptable, notify the Landscape Architect in writing. By proceeding with the work, the Contractor indicates his acceptance of all previous related work.

Meet on Site: Prior to commencing work, meet with the Landscape Architect, the Owner's representative, and other concerned parties on the site to review the work. Request this meeting one week prior to desired meeting time.

Underground Utilities and Obstructions: Verify the location of underground utilities and other obstructions that may affect the work. Report any obstructions encountered to the Landscape Architect. Repair all damage to any known utility line or other underground obstruction at Contractor's expense. Report damage to any unknown utilities to the Landscape Architect.

Protection:

Comply with all governing safety regulations.

Provide necessary safeguards and exercise caution against injury or defacement of existing site improvements. Prevent vehicles of any kind from passing over sidewalks, curbs, and similar items, unless adequate protection is provided. Do not store materials or equipment or operate equipment near or under the branches of any existing plants that are to remain, except as actually required for construction in those areas.

Be responsible for damages caused by leaks in the piping systems being installed or during the Warranty period due to failure of workmanship or materials. Repair all damage to return the area to the previous condition.

Securely cover openings into the system and cover apparatus, equipment and appliances, both before and after being set in place, to prevent breakage, misuse, or disfigurement, and also prevent obstruction of pipes.

1.9 COORDINATION: Schedule and coordinate the work to facilitate the most expeditious completion of the project in a workmanlike manner.

Consult all other relevant Specification sections to determine the extent and character of related work specified elsewhere.

Schedule and coordinate required irrigation utility connections with other project trades and utility companies.

Obtain information pertaining to location of existing and proposed lines and appurtenances prior to irrigation installation.

Verify static pressure at irrigation point of connection prior to any irrigation installation. Report to the Landscape Architect any discrepancies from that listed on the Drawings.

Coordinate with appropriate associated trade the placement of pipe, sleeves, and conduit in, through or under structures, walls, and paving.

Give at least 72 hours' notice to the Landscape Architect prior to inspections and observations.

1.10 GUARANTEE:

Guarantee the entire irrigation system for 1 year from the date of final acceptance against defects in materials, equipment, and workmanship, including repair of damage to any part of the premises resulting from defects, leaks, or settling of trenches. Promptly repair defects and damage, including the restoration of planting, paving, structures, and other improvements.

Manufacturer's warranties will not relieve liability under the guarantee. Such warranties only supplement the guarantee.

The Owner reserves the right to make temporary repairs as necessary to keep equipment in operating condition without voiding the Contractor's guarantee or bond.

PART 2 - PRODUCTS

2.1 MATERIALS:

Use new materials in perfect condition throughout the system, without flaws or defects, and of quality and performance specified. Material overages at the completion of the installation are the property of the Contractor; remove from the site.

See Legend, Notes and Construction Details on Drawings for project materials.

2.2 PIPES:

Pressure Mains:

2-1/2 inches and larger - Class 200 PVC, SDR 21, ASTM D 2241-84 with integral gasket bell end.

2 inches or less - Sch 40 PVC, ASTM D-1784-87 with solvent weld bell end.

Laterals: Class 200 PVC, SDR 21, ASTM D 2241-84 with solvent weld bell end.

Visible Pipe and Fittings: Integral gray color or painted as directed on Drawings or in Specifications.

Threaded Risers and Nipples: Schedule 80 PVC.

Other Risers and Fittings: Schedule 40 PVC, Type 1, solvent weld.

Cement: ASTM D 2564-84 or as recommended by the manufacturer.

Flexible Tubing: Toro 850-01 thick wall pipe or equal for flexible swing joints.

Sleeves: Schedule 40 PVC.

Conduit: Schedule 40 PVC, UL approved.

2.3 GATE VALVES: American made 200 WOG brass, with non-rising stem and threaded ends.

2.4 VALVE BOXES: Plastic box with locking lid. Ametek, Brooks, Carson, or acceptable equal. Rectangular for remote control valves. Round for gate valves.

2.5 SWING JOINTS: Dura or Lasco or acceptable equal.

2.6 FLEX RISERS: King Brothers, Global Water System, Excaliber, or acceptable equal.

2.7 STAKES: #4 rebar - length as noted or required.

2.8 CLAMPS: Stainless steel screw clamps.

2.0 CONTROL WIRE:

Specifically designed for direct burial use, Type UF with copper conductor, #14 minimum size.

Use yellow jacket for common and different color-coded wires (as available) for individual control lines.

Provide size of conductor to meet all the requirements of the installation instructions of the manufacturer of the valves and controllers.

2.9 WIRE CONNECTORS: Spears Dry-Splice, Snap-Tite, or acceptable equal.

2.10 THRUST BLOCKS: One cubic foot of redi-mix concrete or minimum 1 cubic foot of 2,500 psi/28-day concrete.

PART 3 - EXECUTION

3.1 GENERAL:

Install all equipment and material where indicated, as noted and detailed, and in accordance with the manufacturer's published instructions.

Wherever the term "as per manufacturer's specifications and/or instructions" is used, it means in strict accordance with the manufacturer's printed directions. If these directions conflict with this Specification, bring the matter to the Landscape Architect's attention and obtain his instructions before proceeding with the work.

3.2 LAYOUT:

Stake out locations of all pipes, valves, and sprinkler heads as accurately as possible in accordance with the Drawings. Coordinate irrigation plan with intent of construction detailing sheets.

Where site conditions do not permit locating piping, valves, and heads where indicated, notify the Landscape Architect immediately and determine relocation in joint conference. Correct immediately at the Contractor's sole expense unacceptable revision work carried out without prior approval of the Landscape Architect.

Do not install the sprinkler systems as indicated on the drawings when it is obvious in the field that previously unknown obstructions or grade differences exist, or if discrepancies in construction details, legend, or specific note are discovered. Bring all obstructions or discrepancies to the attention of the Landscape Architect, or the Contractor assumes full responsibility for any revisions that may be necessary.

When discrepancies exist between drawings and specifications, and no specific interpretation is issued prior to bidding, the decision regarding this interpretation rests with the Landscape Architect. The discrepancy must be clarified before proceeding, and the Contractor will be compelled to act on the clarification as directed.

3.3 CONNECTION TO PROJECT UTILITIES:

Connect to water source as noted on the Drawings.

Make connections to electric power supply as noted on the drawings. Provide all conduit and boxes as required by codes governing this work.

3.4 EXCAVATING AND TRENCHING:

Perform trenching and excavations required for the installation of the work including shoring of earth banks to prevent cave-ins.

Make excavations ample in size to permit the pipes to be laid at the elevations intended, and to permit ample space for jointing. Make trenches for pipelines deep enough to provide at least the minimum cover from finish grade as noted on the Drawing(s). Trench depth shall be:

18 inches minimum cover over mains.
10 inches minimum cover over laterals.
24 inches minimum cover over sleeves under paving.

Entirely remove boulders, roots and other obstructions or cut out to the width of the trench and a depth of 6 inches below the trench bottom. Dispose of such debris off-site.

Remove rocks over 2 inches in largest dimension excavated during trenching and dispose of off-site.

Backfill over-excavation and carefully tamp to provide a smooth and firm-bearing surface for laying the pipe.

Where possible, mainlines may occupy the same trench as sprinkler lines, provided specified minimum clearances are maintained.

Barricade and/or light the excavated area to prevent undue hazard to the public.

3.5 ASSEMBLING PIPEWORK:

Assemble pipe in accordance with manufacturer's published instructions and in consideration of prevailing site and weather conditions.

Install irrigation lines under existing paving by appropriate method acceptable to the Landscape Architect.

Install no irrigation lines before subgrade for roadways has been completed and notice to proceed has been given.

Plastic Threaded Joints:

Field threading of plastic pipe or fittings is not permitted - use only factory-molded material.
Make plastic to metal threaded connections by means of female plastic threads.

Make metallic threaded joints with proper tools and joint compounds. Caulking is not permitted. No more than 3 full threads shall show when joint is made up. Field cuts are permissible only where absolutely necessary.

Use approved gaskets and bolt sets for flanged connections. Tighten assembly bolts to proper torque.

Install concrete thrust blocks where required to resist system pressure on belled-joint pipework. Form blocks in such a way that concrete does not come in direct contact with the pipe; set blocks between solid soil and pipe fitting.

Provide removable, non-decaying plug at ends of pipe sleeves and control wire conduit.

For copper pipe assembly instructions, see PLUMBING section.

3.6 LAYING OF PIPE:

Install all pipes as dimensioned or approximately in the location shown and of the sizes indicated. (Refer to the Planting Plan for precise routing relative to plant locations.)

Parallel piping indicated on the Drawings may be installed in the same trench with all pipe at the same depth and 2 inches minimum horizontal separation between pipes. Parallel piping shall not cross in the trench.

Lay piping accurately to the line and grade required, with full bearing on the trench bottom. Do not lay pipe on soft fill or other unstable material.

Do not lay pipe when there is water in the trench.

Except where necessary in making connections with other lines, lay pipe with the bells facing in the direction of laying.

Provide 2 inches minimum vertical separation for crossing pipes. No direct contact between other pipes or structures will be permitted.

Perform work in strict accordance with the manufacturer's installation instructions for the various types of pipe specified.

Flush out pipes thoroughly to remove debris and foreign matter.

Conduct all testing and repairs to lines that will be rendered inaccessible by paving, prior to the installation of paving materials.

Inspect pipes for leaks at the joints and fittings, and repair or replace as required prior to backfilling.

3.7 IRRIGATION HEADS AND SPRINKLERS:

Install all irrigation heads and sprinklers in conformance with the manufacturer's recommendations. Do not install heads in a manner which will not permit required performance. In the event that job conditions will not permit this, contact the Landscape Architect immediately for a decision before proceeding with the work.

Set heads plumb and level (or as detailed for slope conditions) at the locations indicated on the Drawings.

Thoroughly clean, adjust and inspect heads for proper operation and performance.

In turf areas, initially install heads on the risers 1/2 inch above grade level. Prior to final inspection of the landscape planting, adjust heads as necessary.

Install flex risers on heads adjacent to paved surfaces, walks, or curbs.

Adjust spray patterns of irrigation heads and sprinklers to eliminate overspray onto building, windows, and walks. See testing section.

3.8 EQUIPMENT INSTALLATION:

Valves:

Thoroughly flush mainline before installing valves.

Install valves connected directly to the main line plumb, with sufficient clearance for service and operation. Install valves no farther than 12 inches from mainline unless Landscape Architect approves installation at a greater distance prior to construction.

Install manual control valves and gate valves in the location indicated on the Drawings and accessible for proper use.

Locate valve box edges no closer than 12 inches from walk edges, buildings walls, and header boards.

Place control valves in valve boxes; use extensions as necessary to keep soil away from valves and solenoids. Install one valve per box. Set top of box parallel and flush with finish grade, unless directed otherwise by the Landscape Architect. Set box parallel to adjacent paving as well.

Valve Boxes:

Centrally locate remote control valves among the sprinklers in accordance with the Drawings. Adjust the flow control for proper operation of the sprinklers.

Where feasible, group several valves together in a large valve box with 4 inches minimum clearance between valves and from the box. Position over the valves so all parts can be reached for service.

Install above a 6 inches deep gravel pit for drainage. Keep the box reasonably free from dirt and debris.

Set with the top level or following the adjacent finish grade as detailed. Permanently label boxes with valve number and controller letter in manner approved by the Landscape Architect.

Automatic Control Wiring:

Run wire within a protective conduit for pavement crossings, and where other conditions make it necessary.

Run wiring along mains wherever practical. Tie wire bundles with pipe wrapping tape at 10-foot intervals and allow slack for contraction between strappings.

For both control wire and ground wire, loop a minimum of 2 feet of extra wire at each valve box, at each splice, at each change of direction, at every 500 feet of straight run, and at each controller for expansion and servicing. Coil excess wire neatly in valve boxes.

Make connections with approved connectors.

Splicing will be permitted only on runs exceeding 2,500 feet. Locate splices at valve locations or in separate electrical splice box. Accurately and clearly label splice box Make splices and connections watertight.

Controllers: Connect control lines to controllers in sequential arrangement according to assigned identification number of valve shown on Drawing(s): Label control lines at the controller with permanent non-fading labels indicating identification number of valve controlled.

3.9 FLUSHING: Thoroughly flush out lines before installing valves and sprinkler heads. After flushing, mainline pipe may be partially back filled. Keep butt joints, fittings, and connections free and visible.

3.10 TESTING:

Center load pipe with sufficient backfill in accordance with paragraph 3.11 to anchor pipe before testing. Do not cover fittings or joints

Notify the Landscape Architect at least 3 days in advance of testing.

Purge air from lines prior to applying test procedures.

Perform testing and furnish necessary equipment.

Apply the following tests after solvent weld plastic pipe joints have cured for at least 24 hours.

Test mainlines hydrostatically at 150 PSI minimum. Lines will be approved if test pressure is maintained for 6 hours. Make tests and repairs as necessary until test conditions are met. Install valves prior to pressure testing.

During the test, stop detectable leaks and correct defects regardless of the amount of leakage. Use materials and installation procedure identical to those specified herein for making corrections.

Perform tests and repairs before paving is installed and while pipes are still accessible.

Apply the following coverage tests after solvent weld plastic pipe joints have cured for at least 24 hours and section E above has been fully complied with.

Perform a coverage test in the presence of the Landscape Architect and/or owners' representative to determine if coverage of water afforded to planting areas is complete.

Change heads, nozzles, orifices, or arcs as may be required to provide satisfactory coverage.

Prior to any recommendation of final acceptance of the irrigation system, test the automatic sprinkler controllers through all their cycles in the presence of the Landscape Architect and the Owner's representative.

3.11 BACKFILLING AND COMPACTION:

Do not backfill until pipe has been tested and results reported to the Landscape Architect.

Keep initial 4 inches of backfill for mainlines free of debris and rocks larger than 1 inch diameter. Use clean soil free of rubbish, for remaining backfill.

Compact backfill for trenching to dry density equal to the adjacent undisturbed soil, and conform to adjacent grades without dips, sunken areas, humps or other irregularities. Adequately compact installations above structural slabs to support the piping being installed.

Truck wheels are not permitted for compacting soil.

Provide clean sand backfill as noted on the Drawings.

Restore surfaces, existing underground installations, and other items damaged or cut as a result of excavations, to original conditions in manner consistent with these Specifications and as approved by the Landscape Architect.

Reseed, resod, or replant the trenched areas as needed. Should the soil level of the trenches settle during the Warranty period, refill the trenches as needed.

3.12 ADJUSTING THE SYSTEM:

If it is determined that adjustments in the irrigation equipment will provide proper and more adequate coverage, including changes to the nozzle, make such changes, or make

arrangements with the manufacturer to have adjustments made, prior to any planting. Pay all additional costs associated with these changes or adjustments.

The entire system in a given phased construction area shall be operating properly before any lawn or ground cover planting operations begin in that area.

Periodically check operation of the system and adjust it as necessary for the duration of the Contract, including the guarantee period.

3.13 CONTROLLER CHARTS: Affix a non-fading copy of the irrigation diagram on the inside cabinet door of the controller showing valve locations, numbers, and wire routing.

3.14 MAINTENANCE PERIOD:

The maintenance period for the irrigation system shall be exactly concurrent with the maintenance period for the planting as described in Section 02900. Mechanism for establishing this period is the same as for the planting maintenance period.

No partial approvals will be given relative to the commencement of maintenance periods without the consent of the Owner.

3.15 REPAIR OF LEAKS: Remake leaking joints using new materials, whether discovered at time of installation or at any time during the Warranty period. Use of caulking or cement to repair leaks is prohibited.

3.16 CLEAN UP: Keep all areas of work clean, neat, and orderly at all times. Clean construction areas at the end of each day. Remove surplus material and other debris generated from this work from the site. Neatly return to proper grade all disturbed areas. Flush all paving, walks, and similar areas to achieve a "broom clean" appearance.

3.17 FINAL INSPECTION:

At the completion of all irrigation work request a final inspection. Notify the Landscape Architect 5 working days prior to the inspection, so a mutually agreeable time for inspection may be arranged.

The Landscape Architect, Landscape Planting and Irrigation Contractor, and Owner, or their representatives, shall be present at the inspection.

If, after the inspection, the Landscape Architect and the Owner are of the opinion all work has been performed in accordance with the Drawings and Specifications, written notice of acceptance and completion of the Project will be given. If portions of the work are not acceptable, a reasonable amount will be retained from the final payment until the defects are corrected and the work is accepted by the Landscape Architect and the Owner.

END OF SECTION

SECTION 02831

CHAIN LINK FENCES

PART 1 - GENERAL

1.1 SUMMARY: Provide chain link fence system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.2 APPLICABLE PUBLICATIONS: The latest issues of the following publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Society for Testing and Materials (ASTM)

A392	Standard specification for zinc-coated Steel Chain-Link Fence Fabric.
D1187	Standard specification for Asphalt-Base Emulsion for use as protective coating for metals.
F626	Standard Specification for Fence Fittings
F1083	Standard Specification for Pipe, Steel, Hot-dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.3 RELATED SECTIONS

A. SECTION 02200 - EARTHWORK
B. SECTION 03300 - CAST-IN-PLACE CONCRETE

1.4 SUBMITTALS

A. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;

4. Manufacturer's recommended installation procedures which, when approved by the Contractor, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.5 QUALITY ASSURANCE: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.6 DELIVERY, STORAGE, AND HANDLING: Deliver materials to the site in an undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

PART 2 - PRODUCTS

2.1 DIMENSIONAL DATA

A. General: Pipe sizes indicated are commercial pipe sizes.

2.2 GALVANIZING

A. On steel framework and appurtenances, provide galvanized finish with not less than the following weight of zinc per square feet.

1. Pipe: 1.8 oz/square feet, complying with ASTM F1083.

2. Hardware and accessories: Comply with Table I of ASTM F626.

3. Fabric: 1.20 oz/square feet, complying with Class 1 of ASTM A392.

2.3 FABRIC

A. Provide number 9 gage or 0.148" wires in 2" mesh.

B. Provide fabric in one-piece widths.

C. Fence heights less than 6 feet shall be knuckled at both top and bottom selvages.

D. Fence heights 6 feet and over shall be twisted at top selvage and knuckled at the bottom selvage.

2.4 POSTS, RAILS, AND ASSOCIATED ITEMS

A. End, corner, slope, and pull posts: Provide the following minimum sizes and weights as indicated on the plan.

Material and dimensions:	Lbs per linear ft:
Pipe, 2.875" outside Dimension	5.79
Pipe, 3.50" outside Dimension	7.58
Pipe, 4.00" outside Dimension	9.11

B. Line posts: Provide minimum sizes and weights as follows:

Material and dimensions:	Lbs per linear ft:
Pipe, 2.37" outside Dimension	3.65
Pipe, 2.87" outside Dimension	5.79
Pipe, 3.50" outside Dimension	7.58

C. Gate posts: Provide gate posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:

Material and dimension:	Lbs per linear ft:
Pipe, 4" outside dimension	9.11

1. Over 13 feet wide, and up to 18 feet wide: Use 6.62" outside diameter pipe weighing 18.97 lbs per linear ft.

2. Over 18 feet side: Use 8.62" outside diameter pipe weighing 28.55 lbs per linear ft.

D. Top rails:

1. Use 1.90" outside diameter pipe weighing 2.72 lbs per linear ft; or

2. Provide in manufacturer's longest lengths, with expansion type couplings approximately 6" long for each joint.

3. Provide means for attaching top rail securely to each gate, corner, pull, slope, and end post.

E. Post brace assemblies:

1. Provide at end and gate posts, and at both sides of corner, slope, and pull posts, with the horizontal brace located at mid-height of the fabric.

2. Use 1.90" outside diameter pipe weighing 2.72 lbs per linear ft for horizontal brace.

3. Use 3/8" diameter rod with turnbuckle for diagonal truss.

F. Tension wire: Provide number 7 gage galvanized tension wire at bottom of fabric.

G. Post tops:

1. Provide steel, wrought iron, or malleable iron, designed as watertight closure cap.

2. Provide one cap for each post.

3. Provide caps with openings to permit through passage of top rail.

H. Stretcher bars:

1. Provide one-piece lengths equal to full height of fabric, with a minimum cross-section of 3/16" x 3/4".

2. Provide one stretcher bar for each gate and end post, and two for each corner, slope, and pull post, except where baric is woven integrally into the post.

I. Stretcher bar bands:

1. Provide steel, wrought iron, or malleable iron, spaced not over 15" on centers, to secure stretcher bars to end, corner, pull, slope, and gateposts, with a minimum cross-section of 1/8" x 3/4".

2. Bands may be used also with special fittings for securing rails to end, corner, pull, slope, and gateposts.

2.5 GATES

A. General:

1. Fabricate gate perimeter frames of tubular members.

2. Provide additional horizontal and vertical members to assure proper operation of the gate, and for attachment of fabric, hardware, and accessories.

3. Space so frame members are not more than 8 feet apart.

4. Fabricate gate frames from:

Material and dimensions:		Lbs per linear ft:
a.	Pipe 1.90" outside diameter:	2.72

B. Fabrication:

1. Assemble gate frames by welding with special malleable or pressed steel fittings and rivets for rigid connections.

2. Use same fabric as used in the fence.

3. Install fabric with stretcher bars at vertical edges as a minimum.

4. Attach stretchers to gate frame at not more than 15" on centers.

5. Attach hardware with rivets or by other means which will provide security against removal and breakage.

6. Provide diagonal cross bracing consisting of 3/8" diameter adjustable length truss rods on gates where required to provide frame rigidity without sag or twist.

C. Gate hardware: Provide following for each gate:

1. Hinges:

a. Pressed or forged steel or malleable iron, to suit the gate size; non-lift-off type, offset to permit 180 degree opening.

b. Provide 1-1/2 pair of hinges for each leaf over 6 feet in nominal heights.

2. Latches:

a. Provide forked type or plunger-bar type to permit operation from either side of the gate.

b. Provide padlock eye as integral part of latch.

3. Keeper: Provide keeper for vehicle gates, which automatically engages the gate leaf and holds it in the open position until manually released.

4. Double gates:

a. Provide gate stops for double gates consisting of mushroom or flush plate, with anchors.

b. Set in concrete to engage the center drop rod or plunger bar.

c. Provide locking device and padlock eyes as an integral part of the latch, requiring one padlock for locking both gate leaves.

2.6 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Wire ties:

1. For tying fabric to line posts, use number 9-gage wire ties spaced 12" on centers.

2. For tying fabric to rails and braces, use number 9-gage wire ties spaced 24" on centers.

3. For tying fabric to tension wire, use number 9 gage hog rings spaced 24" on centers.

4. Manufacturer's standard wire ties will be acceptable if of equal strength and durability.

5. Concrete: Comply with provisions of Section 03300, entitled “Cast-in-Place Concrete”.

B. Bituminous Coatings: Fence post and hardwares embedded in concrete shall receive two (2) coats of bituminous material as per ASTM D1187.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS: Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:

1. Install posts at a maximum spacing of 10 feet on centers.

2. Install corner or slope posts where changes in line or grade exceed a 30-degree deflection.

B. Excavating:

1. Drill holes for post footings in firm, undisturbed or compacted soil, strictly adhering to the dimensions and spacing shown.

2. Post hole dimensions:(unless otherwise specified)

a. Provide 30" deep by 12" diameter foundations for line posts for 5 foot fabric height and less.

b. Provide 36" deep by 12" diameter foundations for line posts for fabric

heights exceeding 5 feet.

c. Provide 42" deep by 12" diameter foundations for all other posts or as specified on plan.

C. Spread soil from excavations uniformly adjacent to the fence line, or on adjacent areas of the site if so directed.

D. When solid rock is encountered near the surface, drill into rock at least 12" for line posts and at least 18" for end, pull, gate, and corner posts. Drill holes at least 1" greater diameter than the largest dimension of the post to be placed.

E. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths specified above.

F. Setting posts:

1. Remove loose and foreign materials from sides and bottoms of holes, and moisten soil prior to placing concrete.

2. Center and align posts in holes.

3. Place concrete around posts in a continuous pour, and vibrate or tamp for consolidation.

4. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.

5. Trowel tops of footings, and slope or dome to direct water away from posts.

6. Extend footings for gateposts to the underside of bottom hinge.

7. Set keeps, stops, sleeves, and other accessories into concrete as required.

8. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing material or other curing method approved by the Engineer/Owner’s Representative.

9. Grout-in those posts that are set into sleeved holes, concrete constructions, or rock excavations, using non-shrink Portland cement grout or other grouting material approved by the Engineer/Owner’s Representative.

G. Concrete strength:

1. Allow concrete to attain at least 75% of its minimum 28-day strength before rails, tension wires, and/or fabric is installed.

2. Do not, in any case, install such items in less than seven days after placement of concrete.

3. Do not stretch and tension fabric and wire, and do not hang gates, until concrete has attained its full design strength.

H. Rails and bracing:

1. Install fence with a top rail and bottom tension wire.

2. Install top rails continuously through post caps or extension arms, bending to radius for curved runs.

3. Provide expansion couplings as recommended by the fencing manufacturer.

4. Provide bracing to the midpoint of the nearest line post or posts at all end, corner, slope, pull, and gateposts.

5. Install tension wires parallel to the line of fabric by weaving through the fabric, and tying to each post with not less than number 6 gage galvanized wire, or by securing the wire to the fabric.

I. Installing fabric:

1. Leave approximately 2" between finish grade and bottom selvage.

2. Excavate high points in the ground to clear the bottom of the fence.

3. Place and compact fill to within 1" of the bottom of the fabric in depressions.

4. Pull fabric taut and tie to posts, rails, and tension wires.

5. Install fabric on outward side facing side of fence, and anchor to framework so that the fabric remains in tension after pulling force is removed.

6. Install stretcher bars by threading through or clamping to fabric on 4" centers, and secure to posts with metal bands spaced 15" on centers.

7. Install fence fabric to provide approximately 2-inch deflection at center of fabric span between two posts, when a force of approximately 30 pounds is applied perpendicular to the fabric. Fabric should return to its original position when force is removed.

J. Installing gates:

1. Install gates plumb, level, and secure for full opening without interference.

2. Install ground-set items in concrete for anchorage in accordance with the fence manufacturer's recommendations as approved by the Engineer/Owner’s Representative.

3. Lubricate and adjust the hardware for smooth operation.

K. Clearing Fence Line: All trees, brush, stumps, logs, and other debris which would interfere with the proper construction of the fence in the indicated locations shall be removed to a minimum width of 5 feet on each side of the fence centerline before starting fencing operations. The cost of removing and disposing of the materials shall not constitute a pay item but shall be considered incidental to the fence construction.

L. Miscellaneous:

1. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns.

2. Bend ends of wire to minimize hazards to persons and clothing.

3. Fasteners:

   a. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.

   b. Peen the ends of bolts to prevent removal of nuts.

4. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as approved by the Engineer/Owner’s Representative.

END OF SECTION 02831

SECTION 02900

LANDSCAPE PLANTING

PART 1 - GENERAL

1.1 SCOPE OF WORK

Work Included: Provide planting work complete, including:
- Imported soil.
- Pre-planting weed control.
- Soil preparation and conditioning.
- Plant materials.
- Planting operations.
- Maintenance.
- Warranty.

Related Work Specified in Other Sections:
- Section 02810 - Irrigation

Plant Material Quantities:
Provide sufficient quantities of plant materials needed to complete the work as indicated on the Drawings. Quantities indicated on the Plant List are approximate only. The unit price list reflects the approximate quantities the Landscape Architect has established for the work, subject to availability. These quantities may vary.

Adjustments to Contract Sum for Imported Soil:
Contract Sum includes the cost of all labor and equipment required to place, amend, and fine grade imported soil. Include the anticipated cost of fertilizers required by the Contract Documents.
Contract Sum does not include the anticipated material cost of fertilizer or amendments not indicated. A Change Order for the costs of any required fertilizers or amendments delivered to site, will be issued based on the soil analysis result.

Utilities: Unless otherwise indicated, sufficient water will be available at no expense for work specified in this section.

Fees and Permits: Provide for all inspections and permits required by Federal, State, and local authorities in furnishing, transporting, and installing materials.

1.2 REFERENCES

Grades and Standards:
Grades and Standards for Container-grown Landscape Plants prepared by Landscape Industry Council of Hawaii.
Soil Chemistry Testing: US Department of Agriculture Handbook #60, Diagnosis and Improvement of Saline and Alkali Soils, 1954. (USDA #60)

Nomenclature: In Gardens of Hawaii by Marie C. Neal, or generally accepted in the local nursery trade.

1.3 SUBMITTALS

Submit duplicate samples and certificates for the following items:
- Soil Amendments: Samples and manufacturer's certificates.
- Fertilizers: Manufacturer's certificate.

Material certificates for material delivered to the site, both in containers and in bulk. State source, quantity or weight, type and analysis, and date of delivery.

Imported Soil:

After the Contract is awarded, submit documentation on the source of imported soil. Submit test results on imported soil and proposed schedule of fertilizers.

Substitutions:

If any plant specified is not obtainable, submit a written substitution request. Present either a different size of the same species or a similar alternate species with the proposed adjustments to the Contract Sum for each.

Substitutions of plant materials will not be permitted unless authorized in writing by Landscape Architect.

Construction Schedule: At the pre-construction meeting, provide a written projected planting schedule noting the estimated completion date, number of working days required and any special coordination requirements.

1.4 QUALITY ASSURANCE

Inspection: Right of inspection for approval or rejection is reserved at the place of growth or on the project site at any time. Plants will be inspected for size, variety, condition, defects, or injury.

Codes and Standards: Perform work in accordance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work.

Pre-Installation Meeting: Prior to commencing work, meet with the Owner or the Owner's representative and all other concerned parties on the site to review project conditions and the work required by this section. Request this meeting in writing five (5) working days prior to desired meeting time.

1.5 DELIVERY AND STORAGE

Deliver manufactured materials in original containers with brand and manufacturer's name clearly indicated. Materials in broken containers or showing evidence of damage will be rejected and must be immediately removed from the Project Site. Do not bring odorous materials to the site until they are to be used.

Protect plants in transit and after delivery to the site. Plants in broken containers and plants with broken branches or injured trunks will be rejected. Remove rejected material from the site immediately.

1.6 PROJECT CONDITIONS

Underground Utilities and Obstructions:

Verify the location of all underground utilities and other obstructions that may affect the work.

Report any obstructions encountered to the Landscape Architect.

Repair all damage to any known utility line or other underground obstruction. Report damage to any unrecorded utilities to the Landscape Architect.

Notify the Landscape Architect in writing of any other underground obstructions, either geological or manmade, encountered that may affect the work. Include a cost proposal for the correction of the problem for approval before proceeding with work.

Clean Up:

Keep all areas of work clean, neat and orderly at all times during the period of Contract.

Clean all construction areas at the end of each day.

1.7 WARRANTY

Plant Material:

Warrant in writing plant materials furnished or relocated (25 gal. or larger) for a period of one (1) calendar year; lawn and container plants up to 15 gal. size, for ninety (90) days from the date of final acceptance against improper installation and defective, unsound, or diseased conditions that may appear.

The Contractor, in protecting his own interest, is obligated to periodically check work areas during this warranty period to ensure proper maintenance procedures are being implemented. In case of negligent or improper maintenance, the Contractor shall state in writing to the Owner and the Landscape Architect his observation and recommendations. All claims not in writing will not be considered.

Upon receipt of written notice from the Landscape Architect of the death of any warranted plant materials during the warranty period, promptly replace the subject plant materials with same species as originally planted and of a size closely approximating the size of the plant if normal growth had occurred since the original planting. Replaced materials are subject to all contract requirements.

When plants are replaced, advise the Owner in writing of the necessary establishment maintenance which must be performed.

Expense of replacement shall be borne by the Contractor if replacement is necessary through no fault of the Owner during the maintenance period.

The Contractor shall not be held liable for loss of plant materials due to vandalism, acts of God, accident, or damages by others.

Special Warranty: Warrant all plant materials furnished as to the species, hybrid, flower color, or variety specified.

Liability: The liability under the warranty includes the repair of damage to the work of other contractors, or damage to the Owner's property caused by the failure of the work of this section. All requirement of this section applies to work performed to satisfy the requirements of the warranty.

PART 2 - PRODUCTS

2.1 IMPORTED SOIL

General:

Texture: As near as practical to the native subgrade texture.

Nutrients: Provide imported soil with sufficient quantities of available nitrogen, phosphorus, potassium, calcium and magnesium to support normal plant growth or amendable to support normal plant growth in accordance to the soil analysis recommendations.

Physical Properties:

Designation: Sandy loam or loamy sand; USDA classification of fraction passing sieves:

Class	Particle Size Range	Maximum Percentage	Minimum Percentage

Coarse Sand	0.5 - 2.0 mm	1	
Silt plus Clay	<0.05 mm	5	
Gravel	2 - 13 mm	2	
Rock	1/2 - 1 inch	10% by volume	Organic
15			

Chemistry: Comply with USDA #60 for the following:

Salinity: Saturation Extract Conductivity (ECe) of less than 3.0 Millimhos per cm at 25 degrees C.

Sodium: Sodium Absorption Rate (SAR) of less than 1.0 ppm.

Boron: Saturation Extraction Concentration of less than 1.0 ppm.

Reaction: pH of saturated paste: 5.5 - 7.5.

2.2 SOIL AMENDMENTS

Chemical Fertilizers:

N-P-K as recommended by soil analysis, uniform in composition, free-flowing and suitable for application with approved equipment.

Plant Tablet: Agriform 21-gram tablet or acceptable substitute.

Organic Soil Conditioner:

Burnt Bagasse, shredded mulch, or other acceptable equal organic matters.

Redwood Shavings: Nitrogen stabilized and passing through a 1/2-inch screen.

2.3 PLANT MATERIAL

General:

Comply with nomenclature, grades, and standards indicated in Contract Documents. Provide trees, shrubs, vines, and ground covers with a normal habit of growth, sound, healthy, vigorous, and free from disease and insect infestations.

Trees and Shrubs:

General: Comply with minimum measurements indicated on the Plant List. Measure trees and shrubs after pruning, with branches in normal positions. Plants that meet the measurements specified, but do not possess a normal configuration or balance of height and spread will be rejected.

Caliper Measurement:

Container-grown Materials 4 Inches or Less in Caliper: Measure at a point on the trunk 6 inches above natural ground line.

Container-grown Materials More than 4 Inches in Caliper: Measure at a point 12 inches above the natural ground line.

Field Stock Materials: Measure 4-1/2 feet above the natural ground line.

Trees: Straight and uniform shape without damage unless a unique or special character is specified.

Container-Grown Material: Provide material grown in containers of the size stated on Drawings, with sufficient roots to hold the root ball together after removal from containers without being rootbound.
Specimen, Field Grown, and Field Stock Palms and Trees: Provide with a rootball or roots of sufficient size to support the plant's recovery from transplanting. Palms and trees delivered with small or inadequate root balls will be rejected.

Rooted Cuttings: Healthy, vegetative material with well established roots at one or more nodes.

Stolons: Healthy vegetative material free from other foreign grasses.
Provide coarse grass and ground-cover stolons of 4-inch minimum length.
Provide hybrid bermuda stolons of 2 inches minimum length.

Seed:
USDA Fancy Grade.
50 percent hulled from the most recent harvest.
Provide seed passing a certified germination test.
Deliver to the site in unopened, sealed containers, labeled with brand name and percent purity, and germination test certification.

2.4 MISCELLANEOUS MATERIALS

Water: Potable.

Herbicides and Weed Control:
Pre-Planting Herbicide: Round-Up or acceptable substitute.
Pre-Emergent Weed Control:
Ronstar-G, Treflan, Eptam, Vegitex or acceptable substitute.
Verify compatibility with proposed plant list.

Tree Stakes: 2 inches by 2 inches by 8 feet rough construction grade redwood, or eucalyptus with no paint or stain, or acceptable substitute.

Hose and Wire Ties: 1/2-inch diameter hose with Number 12 gage galvanized iron wire, or acceptable substitute.

Guy Wire:
Number 12 gage galvanized iron wire for 15- and 25-gallon trees or palms
Number 9 gage galvanized iron for field grown trees or palms.

Anchors:
Number 4 steel reinforcing bars, 24 inches minimum length for 15- and 25-gallon trees, or acceptable substitute.
Number 7 steel reinforcing bars, 36 inches minimum length for larger trees, or acceptable substitute.

Plastic Header: "Black Diamond" flexible 6 inches polyethylene bed divider or acceptable substitutes.

Marker: Plastic surveyor tape. Bright color, minimum 18 inches long. Use same color throughout project.

Sand: Natural or man-made sand, size from number 16 to number 100, free from debris.

2.5 HYDROMULCH

Specially processed fiber containing no growth or germination inhibiting factors.

Provide material which will form a homogenous slurry and will not be detrimental to plant growth after agitation in the hydraulic equipment with seed, fertilizer, water and other additives.

Provide material which will form a blotter-like ground cover which readily absorbs water and allows filtration to the underlying soil when hydraulically sprayed on the soil.

2.6 SOURCE QUALITY CONTROL

Soil Analysis for Imported Soil: Take representative soil samples from the proposed source area. Submit samples to approved soil laboratory for analysis for required fertilizers.

Clearly label samples with the project name, date of sampling, sample numbers, and source on site.

Perform tests on each individual sample unit for conformance to the specifications, pH, soil fertility, and salinity.

Provide a written analysis on each individual sample as well as fertility recommendations or corrective measures, if required, to provide the specified plant material a healthy growing medium.

Selection, Tagging and Ordering Plant Material:

Plants are subject to inspection by Landscape Architect at place of growth and after deliver. Plants which do not conform to the requirements of the Contract Documents may be rejected.

Submit a request for inspection and documentation to Landscape Architect not less than one month prior to start of work under this Section that all plant materials have been ordered.

Plants identified as specimen, field grown, field stock, and all palms with a trunk greater than 10 feet may be inspected at place of growth.

Container Stock:

Grow for at least 6 months, but no longer than 2 years in the delivery containers.

Root bound plants are not acceptable, nor are plants with cracked or broken root balls. Remove such material from the site and replace with acceptable plant material.

PART 3 - EXECUTION

3.1 EXAMINATION

Inspect and accept the condition of the site relative to this Section before commencing with the work required in this section. If not acceptable, notify the Landscape Architect in writing.

By proceeding with the work required in this section, the Contractor accepts site conditions.

3.2 PREPARATION

Protection:

Provide necessary safeguards and exercise caution against damage or defacement of existing site improvements. Prevent vehicles of any kind from passing over sidewalks, curbs, etc., unless adequate protection is provided. Do not store materials or equipment or operate equipment near or under the branches of any existing plants that are to remain, except as actually required for construction in those areas.

Be responsible for damage resulting from landscape planting operations. Repair damage to return the area to the previous condition at Contractor's expense.

Clearing:

Clear all planting areas of existing vegetation not specified to remain and all other debris and foreign material considered a hindrance to planting operations and/or unsightly in appearance.

Maintain previously established grades and swales.

Pre-Planting Weed Control:

Apply pre-planting herbicides to all visible weeds, before and after soil placement.

Protect all existing plants from damage.

Imported Soil: Provide an even 6 inches layer (after settlement) of imported soil over all planting areas. All planting areas will be left at sub-grade.

Soil Preparation:

Uniformly distribute 1-inch organic soil conditioner and apply fertilizer specified by the soil analysis over all planting areas as noted on the Drawings.

Roto-till the top 6 inches of compacted soil area adjacent to the highway and all planting areas to evenly incorporate the amendments in the soil.

At the Contractor's option, soil amendment and fertilizer can be pre-mixed with the imported soil prior to installation.

Finish Grading of Planting Areas:

Adjust finish grading with imported soil or sand as necessary. Grade planting areas smooth and even on a uniform plane, with no abrupt changes or pockets. Slope away from all buildings.

Verify the surface drainage of all planting areas, and notify the Landscape Architect of any discrepancies, obstructions, or other conditions considered detrimental to proper execution of the work. Maintain lateral drainage in ditch adjacent to the highway.

After initial settlement the planting surface shall be lower than adjacent walks, curbs, and headers:

Bermuda and Other Fine Grasses: 1/4 inch to 1/2 inch.

Buffalo and Other Coarse Grasses: 1/2 inch to 3/4 inch.

Shrubs and Ground Covers: 1 inch to 1-1/2 inches.

Immediately prior to planting operations, clean all planting areas of weeds, debris, rocks over 1 inch in diameter, and clumps of earth that will not break up.

3.3 PLANTING OPERATIONS

Soil and Drainage Conditions:

Notify Landscape Architect in writing of all soil or drainage conditions encountered during planting operations which the Contractor considers detrimental to growth of plant material. Include a cost proposal for the correction of the problem for approval before proceeding with work.

If drainage conditions of plant pits appear unsatisfactory, test drainage by filling with water. Conditions permitting the retention of water in planting pit for an excessive period of time shall be brought to the attention of Landscape Architect.

Handling Plants:

Handle plants in a manner to avoid any damage to the plant.

Notify Landscape Architect in writing where environmental or planting conditions are adverse to installation per normal industry practice.

Protect plants at all times from sun or drying winds. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected, and adequately watered.

Plant specimen, field grown and field stock palms and trees not later than 24 hours after they are delivered to the site.

Trees and Shrubs:

Plant Pits:

Install trees and shrubs in pits with 1-1/2 the diameter and the same depth of the root ball or container.

Use of tree spades in planting operations is acceptable.

Setting Container and Larger Plants:

Set plants set with the soil level, even with the finish grade, and planted to give the best appearance in relationship to adjacent structures or surroundings.

Use appropriate excavated material to continue filling plant pits. Set plant plumb and brace rigidly in position until material has been tamped solidly around root ball. When 3/4 of the pit is backfilled, water thoroughly, saturating the root ball.

Evenly distribute planting tablets or comparable fertilizer in accordance with manufacturer's instructions. Continue filling pit to finish grade with backfill mix.

When the plant pit is filled, form saucer berm around plants as necessary or as noted on details.

Water all plants immediately after planting.

Staking and Guying: Immediately after planting, stake all 15-gallon and smaller trees as needed. Guy all larger trees as detailed. At Contractor's option, staking or guying may be omitted. However, Contractor retains all liability for failure of plant materials.

Ground Cover: Install plant material in moist soil in the areas and at the spacings shown, in neat rows, ensuring complete coverage of all planting areas including under and around trees and shrubs. Spacings shown in the Plant List or on the Drawings are triangular spacing, unless otherwise noted.

Pre-Emergent Weed Control: Immediately after planting, apply pre-emergent weed control material to all planted areas which will not be seeded.

Stolonizing

On the prepared surface, evenly distribute at the rate shown on the Drawings and dice stolons into the soil in such a manner that at least 75 percent of the stolons are buried.

Upon completion of discing operation, roll the planted area with a lawn roller to firm the ground and insure close contact of the soil and stolons.

Seeding:

Planting Surface Preparation: Moist, even, smooth, and free of rocks prior to seeding.

Application: Broadcast seed uniformly at the rate shown on the Drawings. Rake seeds into the top 1/4 inch of the amended imported screened soil.

Compacting: Immediately after seeding, compact the entire area with a cultipacker or roller weighing 60 to 90 lbs. per lineal foot. If a combination seeder and cultipacker is used during seeding operation, additional compaction is not required.

Irrigation: Water seedbeds immediately after compacting and keep moist as needed for optimum plant growth. Apply water for short periods to prevent erosion or gullying.

Hydromulching:

Surface Preparation: Bring areas to be hydromulched to a smooth even surface.

Fertilizer: Determine the proper fertilizer required, for both planting and on-going maintenance, for the plant materials. Determine the quality, analysis and ratio; method of application; and frequency of the fertilizer, to insure sufficient nutrients for the sustained growth of the plant material.

Application:

Apply mulch at the rate of 1,500 lbs. per acre. In every application, completely cover the soil.

Hydromulching Operations:

Seeded Lawn Areas: Mixing the required seeds at the specified rate with the hydromulch slurry and spray the mixture over the soil.

Grass or Ground Cover Stolons: Broadcasting the vegetative parts evenly over the areas at the rates specified, with a minimum of 90 percent coverage over the entire area and capping with hydromulch.

Plant areas not accessible to hydromulching applications by hand methods as required.

Irrigation: Apply water following mulching in such quantities as to moisten the soil and mulch, and to ensure proper growth, yet prevent erosion damage to the planted areas.

3.4 PRE-MAINTENANCE INSPECTION AND FINAL INSPECTION

Conduct the Pre-Maintenance Inspection at the completion of all landscape planting operations or phased landscape planting operation, and prior to the beginning of the formal maintenance period.

Conduct the Final Inspection at the completion of the Formal Maintenance period.

Request these inspections of the Landscape Architect five (5) working days prior to the completion of work in order that a mutually agreeable time for inspection may be arranged. Such request shall be responded to and scheduled within five working days.

The Landscape Architect, Contractor, and Owner, or their representatives, shall be present at the Inspection.

At the time of inspection, have all landscaped areas a minimum of 90 percent free of weeds, dead leaves and trash, neatly cultivated and raked with all stakes, guys and plant basins in good order. At the Final Inspection, cut lawns to be neat and presentable.

After the Pre-Maintenance Inspection, if the Landscape Architect and the Owner are of the opinion that all work has been performed in accordance with contract requirements, written notice of preliminary acceptance will be given. This report will note any items which must be corrected and state the date of commencement and completion of the formal maintenance period.

After the Final Inspection, if the Landscape Architect and the Owner or his representative are of the opinion that all work has been performed in accordance with contract requirements, written notice of acceptance and completion of the Project will be given. If all or certain portions of the work do not comply with contract requirements, a reasonable amount will be retained and the final payment and the formal maintenance period for the unaccepted work and any related items shall be extended at no cost to the Owner until the defects in the work have been corrected and the work is accepted by the Landscape Architect and the Owner.

3.5 PROTECTION AND MAINTENANCE

General: Maintain all plants and planted areas in optimum growing condition and appearance.

Begin maintenance with the delivery of the first plant materials to the site and continue 90 days after commencement of the Formal Maintenance Period or until the approval of the Final Inspection. Care of plant materials during installation is not considered part of the Formal Maintenance Period.

Maintenance includes:

Protection: The Contractor, at his option, may set up barricades to keep traffic out of newly planted areas, as needed and where safety allows.

Irrigation: Irrigate planting areas as required to ensure active growth keeping areas moist but not saturated. Regulate irrigation as necessary to avoid erosion and gullying.

Fertilizing: Fertilize as needed in accordance with the manufacturer's recommendations. Exercise proper caution and take measures necessary to avoid plant burn.

Weed Control: Keep planting areas a minimum of 90 percent free of weeds and undesirable grasses through daily weeding if required. Remove the entire root system. Dispose of all weeds in appropriate trash containers. Approved methods of chemical weed control may be implemented at the Contractor's option.

Disease and Insect Damage:

Inspect all plants, including lawn, for disease or insect damage weekly. Treat affected material immediately.

Remove damaged or diseased growth from trees and shrubs.

Dead or Dying Plant Materials: Immediately remove any plants not in a vigorous thriving condition. Replacement shall be the same species and size as originally planted.

Guys and Stakes: Restake, tighten, repair guys, and reset to proper grades or upright position any plants that are not in their proper growing position.

Ground Covers and Lawns:

Mow lawn to appropriate height.

As it becomes evident that certain seeded, stolonized, or hydromulched lawns and ground covers have not uniformly or properly established, replant the areas immediately with the same plants and quantity as specified for the initial planting and maintain as specified for 90 percent coverage of healthy, actively growing grass and ground covers for approval during the final inspection.

END OF SECTION

SECTION 02920

LAWNS AND GRASSES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seed.

2. Sod.

3. Sprigs.

4. Mulches.

5. Water.

6. Erosion Control Material.

7. Topsoil.

8. pH Adjusters.

9. Fertilizer.

10. Pre-Emergent Weed Control (Herbicide).

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 02120 - Earthwork: Topsoil and grading; restoration.

2. Section 02930 - Exterior Plants: Planting materials.

1.2 DESCRIPTION OF WORK

A. The extent of lawns and grass work is indicated on the Drawings and as specified herein, and includes providing and placing top soil, soil preparation, fine grading, weed control, grass planting operations, maintenance, and warranty.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Sod Producers Association (ASPA):

1. ASPA STSMT - Specification for Turfgrass Sod Materials and Transplanting / Installing.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Topsoil. Submit an analysis of the topsoil composition.

2. Assurance / Control Submittals:

a. Certificates:

1) Submit a certificate from the seed supplier for each grass seed mixture stating the botanical and common name and the percentage by weight of each species and variety, and the percentage of purity, germination, and weed seed; year of production and date of packaging.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Maintenance Data: Include maintenance instructions; cutting method and maximum grass height; types of application, frequency and recommended coverage of fertilizer for one full growing cycle.

1.5 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the suppliers original packaging.

PART 2 PRODUCTS

2.1 SEED

A. Classification:

1. Certification that the seeds are from the latest seasons crop, delivered in original, sealed packages, bearing the producer's guaranteed analysis for percentages of mixtures, purity, germination, weed seed content, and inert material.

2. Label in conformance with applicable local seed laws, if any.

3. Wet, moldy and damaged seed shall not be used.

2.2 SOD

A. Classification:

1. Field as classified in ASPA STSMT.

2. Machine cut sod at a uniform thickness of 1" with a tolerance of 1/4", excluding top growth and thatch. Each individual sod piece must be capable of supporting its own weight when lifted by its ends.

3. Broken pads, irregularly shaped pieces, torn and uneven ends will not be accepted.

2.3 SPRIGS

A. Healthy living stems, stolons, or rhizomes with attached roots of locally adapted grass, without adhering soil, including two to three nodes from 4" - 6" long, obtained from heavy and dense sod.

1. Provide sprigs which have been grown under climatic conditions similar to those in the locality of the Project.

2. Coordinate harvesting and planting operations to prevent the exposure of sprigs to the sun for more than 30 minutes before covering and moistening.

3. Sprigs containing weeds or other detrimental material or that are heat damaged shall be rejected.

2.4 MULCHES

A. Provide mulch free of noxious weeds, mold and other deleterious materials.

B. Straw: Stalks from oats, wheat, rye, barley or rice. Air-dry condition of proper consistency for placing with commercial mulch blowing equipment.

C. Hay: Use only marsh hay for lawn areas. Air-dry condition of proper consistency for placing with commercial mulch blowing equipment.

D. Wood Cellulose Fiber:

1. Processed to contain no growth or germination inhibiting factors, dyed an appropriate color to facilitate visual metering of the materials application.

2. Composition on air-dry weight basis: 9 to 15% moisture, pH range from 3.5 to 5.0.

3. Use with hydraulic application of grass seed and fertilizer.

2.5 WATER

A. Quality suitable for irrigation.

2.6 EROSION CONTROL MATERIAL

A. Net: Heavy, twisted jute mesh, plastic mesh, biodegradable paper fabric with knitted yarns or standard weave burlap.

B. Blanket: Fiber or excelsior.

2.7 TOPSOIL

A. On-Site topsoil may be used if in compliance with the composition requirements below.

B. Topsoil:

1. Containing from 5 to 20% organic matter as determined by a soil testing service. Maximum particle size, 3/4", with a maximum of 3 percent retained on a 1/4" screen.

2. Component Percentages:

a. Silt: 25 to 50

b. Clay: 10 to 30

c. Sand: 20 to 30

d. pH: 5.5 to 7.0

e. Soluble Salts: 600 ppm maximum.

2.8 pH ADJUSTERS

A. Lime:

1. Material: ASTM C 602, Class T, commercial agricultural grade ground limestone containing not less than 50 percent total oxides.

2. Gradation: Minimum 75% passing 100 mesh sieve and 100% passing 20 mesh sieve.

B. Ferrous Sulfate: Commercial Grade.

2.9 FERTILIZER

A. Bonemeal: Commercial, raw, finely ground; minimum 4% nitrogen and 20% phosphoric acid.

B. Superphosphate: Commercial grade complete fertilizer of neutral character consisting of fast-and-slow-release nitrogen, 50% derived from natural organic sources of urea-form, phosphorous and potassium.

C. Slow-Release Fertilizer: Granular fertilizer consisting of 50% water-insoluble nitrogen, phosphorous, and potassium.

2.10 PRE-EMERGENCE WEED CONTROL (HERBICIDE)

A. Chipco Ronstar G.

B. Eptam 8-E.

C. Vegitex.

D. Approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until unsatisfactory conditions have been corrected.

D. Refer to the Drawings for the types and locations of plants. Use the method indicated.

3.2 TOPSOIL

A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in the grade gradual. Blend slopes into level areas. Remove foreign materials, weeds, and undesirable plants and their roots. Remove contaminated subsoil. Scarify the subsoil in areas where the subsoil has been compacted by construction activities.

B. Topsoil Thickness. 3" minimum.

C. Place topsoil on finish graded areas, uniform and smooth, free of rocks, debris and irregular surface changes with a maximum tolerance of 0.10 feet above or below established finish subgrade elevations. Provide graded surfaces sloping uniformly between indicated elevations.

D. Provide drainage ditches graded with uniform slopes to allow drainage without ponding; minimizing potential for erosion. Institute procedures to protect slopes and control erosion.

E. Weed eradication. Apply pre-emergent weed control in accordance with the manufacturer=s directions.

3.3 FERTILIZING

A. Apply fertilizer in accordance with the manufacturer's published instructions.

B. Apply after smooth raking of the topsoil and prior to roller compaction.

C. Do not apply fertilizer at same time or with the same machine used to apply seeds.

D. Mix thoroughly into the upper 2" of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.4 SEEDING AND HYDROSEEDING

A. Sow one-half of the seeds in one direction and the remainder at right angles to the first sowing.

B. Cover seeds to an average depth of 1/2@ by means of spike-tooth harrow, cultipacker or other recommended device.

C. Hydroseeding:

1. Mix the seed, fertilizer and wood cellulose fiber in the required amount of water to product a homogeneous slurry. Add wood cellulose fiber after the seeds, water and fertilizer have been thoroughly mixed, and apply at the rate of 200 pounds per acre, dry weight.

2. Hydraulically spray the material on the ground to form a blotter-like cover impregnated uniformly with grass seeds.

3. Immediately following application of the slurry mix, make a separate application of wood cellulose mulch at the rate of 800 pounds per acre, dry weight.

4. Apply the cover so that rainfall or applied water will percolate to the underlying soil.

D. Mulch:

1. Spread evenly.

2. Anchor by crimping mulch with a serrated disc or by spraying asphalt emulsion on the mulched surface.

3. Take precautionary measures to prevent asphalt materials from marking or defacing structures, paving, utilities and plantings.

E. Rolling:

1. Immediately after seeding, firm up the entire area, except for slopes in excess of 3:1, with a roller not exceeding 90 pounds per foot of roller width.

2. If seeding is performed with a cultipacker-type seeder or hydroseeding, rolling may be eliminated.

F. Erosion Control Material: Install in accordance with the manufacturer's instructions.

3.5 SODDING

A. Placing:

1. Place within a maximum of 20 hours after initial harvesting, in accordance with ASPA GSS, as modified herein.

2. Thoroughly moisten the areas immediately prior to placing sod.

B. Spot Sodding:

1. Cut sod into plugs 2" square or 2" in diameter. Place the individual pieces on 6" centers and press firmly into the soil by foot pressure or by tamping.

2. Overseed for erosion control on 3:1 or greater slopes and drainage ways in spot sodded areas.

C. Full Sodding:

1. Scarify subsurfaces to receive sod.

2. Place sod blankets with tight edges and a level surface, lightly proof roll.

D. Slopes and Ditches:

1. For slopes 2:1 and greater, lay with long edge parallel to the slope.

2. In AV@ and flat bottomed ditches, lay with the long edge perpendicular to the flow of water.

3. On sloped areas, start sodding at the bottom of the slope.

E. Finishing: After completing sodding, blend the edges of sodded area smoothly into the surrounding area.

F. Watering: Start immediately after the sodding work each day. Apply at a rate sufficient to ensure thorough wetting of the soil to a minimum depth of 4".

3.6 SPRIGGING

A. Rate:

1. Perform within a maximum of 36 hours after initial harvesting. Inspect sprigs for heat damage during planting.

2. Plant groups of sprigs at 12" intervals, maximum. Limit the interval between dropping sprigs and covering with soil to 10 minutes.

B. Planting:

1. Plant to a depth of approximately 4" and cover sprigs so that the surface is flush with the designated grade and a live portion of each sprig is exposed.

C. Rolling: Immediately after the completion of sprigging and additional seeding, if required, roll the planted area with a cultipacker or roller not exceeding 90 pounds per foot of roller width.

D. Watering: Apply at the time of sprigging at a rate sufficient to ensure thorough wetting of the soil to a depth of 4".

3.7 CLEANING AND PROTECTION

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove soil and debris created by the lawn work from paved areas. Clean the wheels of vehicles before leaving the Site to avoid tracking soil onto the surface of streets, roads, walks and other paved areas.

C. Immediately after seeding, sodding or sprigging, protect the area from traffic and other use.

D. Restore existing lawn and grass areas damaged during execution of the work of this Section to its original condition.

E. Keep one paved pedestrian access route and one paved vehicular access route to each building clean at all times. Clean other paving after the work in adjacent areas has been completed.

3.8 ESTABLISHMENT PERIOD

A. Definitions:

1. Lawns and grasses establishment period will be in effect for 90 days from the date of substantial completion of the landscaping or until lawns and grasses have been mowed 3 times, which ever occurs the latest.

2. Stand of lawn and grass shall be 95 percent ground cover of the established species.

B. Maintenance During the Establishment Period:

1. Mow lawns and grassed areas to an average height of 1-1/2@ whenever the average height of the grass becomes 3".
2. Promotion of growth: Mow, remove excess clippings, eradicate weeds, water, fertilize, overseed, and perform other operations necessary to promote growth.

3. Post-fertilize areas with a commercial grade fertilizer approximately 30 days after planting and at intervals of 6 weeks thereafter until accepted.

3.9 FINAL INSPECTION AND ACCEPTANCE

A. Final Inspection and Acceptance:

1. Final inspection will be made upon a written request from the Contractor and at least 10 days prior to the last day of the lawn and grasses establishment period.

2 Final acceptance will be based upon a satisfactory stand of lawns and grasses as defined in the paragraph above entitled, "Establishment Period."

B. Re-planting: Re-plant areas which do not have a satisfactory stand of lawn and grass.

END OF SECTION

SECTION 02930

EXTERIOR PLANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plants, trees and shrubs.

2. Antidesicants.

3. Pesticides.

4. Fertilizer.

5. Planting soil mixtures.

6. Membrane ground cover.

7. Bedding.

8. Mulches.

9. Edging material.

10. Trunk wrapping material.

11. Staking and guying material.

12. Water.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 02120 - Earthwork: Topsoil and grading.

2. Section 02920 - Lawns and Grasses: Grass, sod and sprigs.

1.2 DESCRIPTION OF WORK

A. The extent of the exterior plants work is as indicated on the Drawings and as specified herein, and includes providing and installing plants, trees, shrubs, ground cover, pesticides and fertilizer, planting operations and plant maintenance.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American National Standards Institute (ANSI):

1. ANSI Z60.1 - American Standard for Nursery stock.

C. National Arborist Association (NAA):

1. NAA PSST - Pruning Standards for Shade Trees.

D. University of Guam:

1. APruning Trees and Shrubs in Micronesia@ by M. V. Mickelbart.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Submit product data including installation and storage instructions for the following:

a. Edging.

b. Antidesicants.

c. Pesticides.

d. Metal anchors.

2. Assurance / Control Submittals:

a. Delivery Schedule: Submit schedule of delivery of trees, plants and ground covers a minimum of 10 days prior to the first scheduled delivery.

b. Pesticide Control Plan:

1) Submit a plan for the proposed sequence of pesticide application including common name, chemical composition, formulation, concentration rate and method of application for each type of pesticide.

2) Submit the names of Certified Applicators in the appropriate categories.

c. Certificates: Submit a certificate from the nursery or tree, plant and groundcover supplier for the items supplied indicating the name of the plants, trees, shrubs and groundcovers in accordance with ATropica@ by A.B. Graf; include type, quantity and size.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Maintenance Data: Include maintenance instructions recommending procedures to be established for the maintenance of trees, plants, and ground covers. Include the cutting and trimming method and types, application frequency, and recommended coverage of fertilizer. Submit before the expiration of maintenance during the plant establishment period.

1.5 QUALITY ASSURANCE

A. Horticultural Standards:

1. Names conform to "Standardized Plant Names" by the American Joint Committee on Horticultural Nomenclature.

2. Material selection, sizing, transportation, protection and planting in accordance with "American Standard for Nursery Stock" by American Association of Nurserymen and American National Standard Institute (ANSI), Publication Z60.1.

B. Plant, tree and shrub materials must be inspected at the growing site, tagged for size and quality, and approved for delivery to the Project Site.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Delivery:

1. Branched Plants: Branches tied and exposed branches covered with a material that allows air circulation. Prevent damage to root balls and desication of leaves.

2. Fertilizer and Lime: In original, unopened containers, bearing manufacturer's chemical analysis, name, trade name or trademark, and indication of conformance with federal and local laws and regulations. May be furnished in bulk with a certificate indicating the above information.

3. Labels: Durable waterproof labels in weather-resistant ink, legible for a minimum of 60 days after delivery to the Project Site, stating correct name and size as specified in the list of required plants. Attach to the plants, bundles and containers of plants. Groups of plants may be labeled by tagging one plant.

4. Pesticides: In original, unopened containers with legible label indicating the manufacturer's registered uses and the U.S. Environmental Protection Agency (EPA) federal registration number.

C. Storage:

1. Plants, Trees and Shrubs: Store and protect plants not planted on the day of arrival at the Project Site as follows:

a. Shade and protect the plants in outdoor storage areas; protect from wind and direct sunlight until planted.

b. Heel-in bare root plants.

c. Protect balled and burlapped plants from drying out by covering balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss or other approved material. Provide a covering which allows for air circulation.

d. Keep all plants in a moist condition by watering with a fine mist spray until planted.

2. Lime, Fertilizers, Mulch: Store in a dry location away from contaminants.

3. Pesticides, Antidesicants: Do not store with other landscape materials.

D. Handling: Do not drop or dump materials from vehicles. Handle plants by root balls or containers. Do not lift or carry by stems or crowns.

1.7 PROJECT CONDITIONS

A. Environmental Requirements:

1. Protection of Personnel and Property: Apply pesticides to prevent damage to personnel and property from either direct spray or drifting of chemicals both on and off-site.

2. Disposal of Excess Chemicals and Containers: In accordance with laws and regulations of federal and local authorities having jurisdiction.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Submit a written Warranty signed by the material supplier and the installer agreeing that they will:

1. Warrant plants, trees and shrubs unconditionally for 1 year from the date of Substantial Completion of the landscaping.

2. Replace any material diseased or 25 percent dead or more at no additional cost to the Owner.

3. Provide replacement materials as required.

PART 2 PRODUCTS

2.1 SUBSTITUTIONS

A. Pre-Bid: If any plant specified is not obtainable, submit a written request for substitution during the bid period.

B. Substitution of planting materials will not be permitted unless approved.

2.2 PLANTS, TREES AND SHRUBS

A. Varieties: Furnish nursery stock in accordance with ANSI Z60.1, except as otherwise specified or indicated. Furnish plants grown under climatic conditions similar to those in the locality of the Project Site. Spray plants budding into leaf or having soft growth with an antidesicant before digging. Provide plants of the same specified species in uniform size and character of growth.

B. Shape: Well branched, well formed, sound, vigorous, healthy planting stock free of disease, sunscald, windburn, abrasion and harmful insects and insect eggs and having a healthy, normal and unbroken root system.

C. Deciduous Trees and Shrubs: Symmetrical tops with a typical spread of branches for each particular species or variety.

D. Ground Covers and Vines: Number and length of runners and clump sizes indicated,

and of the proper age for the grade of plants indicated. Furnish in removable containers, integral containers or formed homogeneous soil section.

E. Size: Minimum sizes measured before pruning and with branches in normal position, conform to the measurements indicated based on the average width or height of the plant for the species specified in ANSI Z60.1. Plants of larger size than specified may be used with
approval. When larger plants are used, increase the ball of earth size or the spread of roots in accordance with ANSI Z60.1.

F. Balled and Burlapped (B&B) and Balled and Potted (B&P) Plants: Ball size and ratios, conform to ANSI Z60.1. Ball the plants with firm, natural soil. Wrap B&B plants firmly with burlap or strong cloth and tie securely.

G. Balled and Platformed (BP) Plants: Wrap and ball in the same manner as B&B plants and fasten securely to strong platforms.

H. Bare-Root Plants: Dig with root system substantially intact but with the earth carefully removed. Cover roots with a thick coating of mud by puddling after plants are dug or wrap with a moist material immediately after digging.

I. Container Grown Plants: Sufficient root growth to hold earth intact when removed from the container. Root bound plants will not be accepted.

2.3 TOPSOIL

A. Refer to Section 02920 for topsoil to be used as backfill.

2.4 ANTIDESICANTS

A. Antidesicants: Subject to compliance with the requirements, manufacturers offering the specified items which may be incorporated into the work include the following:

1. "Vapor Guard" - Miller Chemicals & Fertilizer Corp., Hanover, PA.

2.5 PESTICIDES

A. Soil fumigant, herbicide, insecticide and fungicide: EPA registered and locally approved. Furnish for re-emergence and post-emergence applications.

2.6 FERTILIZERS

A. Commercial Grade Fertilizer: Granular, free flowing and uniform in composition, nitrogen-phosphorus-potash ratio.

B. Controlled Release Fertilizer: Magnesium ammonia phosphate and magnesium potassium phosphate, nitrogen-phosphorus-potassium ratio granulated to pass 1/8" screen.

2.7 MEMBRANE GROUND COVERS

A. Sheet Polyethylene: Black, conforming to ASTM D 2103, minimum thickness 4 mils.

B. Asphalt Glass Felt: ASTM D 2178; Types I, III or IV.

C. Roll Type Fiberglass Mats: 100 percent lime borosilicate glass fibers with an average fiber diameter of 8" - 12" and 2" - 4" strands of fiber bonded with phenol formaldehyde

resin, water permeable, having a minimum of 1/4" and a maximum of 1/2@ thickness with a density of not less than 3/4 pound per cubic foot.

2.8 MULCHES

A. Free of noxious weeds, mold and other deleterious materials.

B. Inert Mulch Materials: Crushed bricks or volcanic rock ranging in size from 1/2@ - 1".

C. Organic Mulch Materials: Ground or shredded bark, shredded hardwood Cypress ranging in size from 1" - 2".

2.9 EDGING

A. Plastic Edging: Minimum 6" high with galvanized metal anchoring stakes at 4 ft. o.c.

2.10 TRUNK WRAPPING

A. Two thicknesses of burlap, minimum 4" width.

B. Tying Material: 3-ply, lightly tarred, medium or coarse sisal yarn twine.

2.11 STAKING AND GUYING

A. Tree Support Stakes: Rough sawn hardwood, free of knots, rot, cross grain, bark, long slivers and other defects that impair strength. Minimum 2" square or 2-1/2@ diameter by 8 feet long, pointed at one end. Paint or stain wood stakes a dark brown color.

B. Guying Wire: 12 gauge galvanized steel.

C. Hose Chafing Guards: New or used 2-ply, 3/4" diameter, reinforced rubber or plastic hose, black or dark green color; use only one color.

D. Flags: White surveyor's plastic tape, 6" long, fastened to guying wires or cables.

E Driven Anchors: May be used instead of guy stakes for trees with 3" - 6" caliper, malleable iron, arrow shaped, galvanized.

2.12 WATER

A. Quality suitable for irrigation.

PART 3 EXECUTION

3.1 PREPARATION

A. Layout: Stake out all approved plant material locations and bed outlines on the Project Site before digging plant pits or beds. The Owner=s representative reserves the right to adjust the plant material locations to meet field conditions at no additional cost to the Owner.

B. Verify the location of underground utilities prior to excavation. Protect existing adjacent turf before excavations are made. Where planting beds occur in existing turf areas, remove the turf to a depth that will ensure removal of the entire root system. Measure the depth of pits from finished grade. Depth of excavation shall provide proper relation between the top of the ball and the finished grade as specified in the paragraph

"Handling", below.

3.2 PLANTING

A. Handling: Move balled, burlapped and container-grown plants only by supporting the ball or container. Set plants on a hand compacted layer of planting soil 6" thick and hold in position until soil has been firmly placed around the roots or ball. Set plants with 1/8 to 1/4 of the ball depth above the surrounding grade. Replace balled plants whose balls are cracked or broken either before or during the planting process.

1. Ball diameter 12" or less. Balled or potted items: Excavate pits at least 16" larger in diameter and 6" deeper than the ball or container.

2. Ball diameter greater than 12". Balled or potted items: Excavate pits at least 24" larger in diameter and 6" deeper than the ball or container.

3. Mulch: Provide 3" deep mulching material over the entire earth saucer and berm surface around trees and shrubs. Keep mulch out of the crowns of shrubs.

B. Balled and Burlapped Stock: Backfill with topsoil to approximately half the depth of the ball, tamp and water. Carefully remove or fold back excess burlap and tying materials. Tamp and complete the backfill, place mulch and water.

C. Bare-Root Stock: Plant so roots are arranged in a natural position. Apply tree wound dressing to cuts larger than 1/2A in diameter. Carefully work topsoil between the roots. Tamp the remainder of the backfill, place mulch and water.

D. Container Grown Stock: Remove from container to prevent damage to the plant and root system. Cut the root ball vertically in 3 to 5 places with a sharp knife before planting.

E. Ground Covers and Vines: Plant after placing mulch. Do not remove from flats or containers until immediately before planting. Space at intervals indicated, sufficiently deep to cover all roots. Immediately sprinkle with water until the entire area is soaked. Smooth the areas after planting to provide an even, smooth finish. Mulch as indicated.

F. Fertilization: After establishment of the finished grade around plants, top dress all pit and bed areas with fertilizer. If fertilizer adheres to plants, carefully remove by flushing.

G. Application of Pesticides:

1. Hydraulic Application:

a. Hydraulic equipment for liquid application of chemicals shall have leakproof tanks and a positive agitation method, with gauges and valves capable of maintaining a constant application pressure.

b. Calibrate and meter equipment so the application of chemicals in specified amounts can be determined.

2. Restrictions:

a. Apply herbicides and other chemicals in accordance with EPA label restrictions and recommendations, and federal and local laws and regulations.

b. Prepare daily reports stating the areas treated with each chemical, quantity applied and spray mixture of formulation used. Provide a copy

upon request.

c. Apply at each location under the supervision of a Certified Applicator.

3. Safety and Protective Measures:

a. Apply in well ventilated areas. Avoid inhalation, injection and spilling on clothing and skin.

b. Wear protective clothing in accordance with the manufacturer's material safety data sheet recommendations.

c. Personnel shall not be exposed to pesticides exceeding the exposure levels
recommended in the most stringent of the following: (OSHA), 29 Code of Federal Regulations (CFR) 1910.1000, SUBPART Z, or manufacturer's material safety data sheet.

d. If excessive exposures are unavoidable, use respirators approved by the National Institute for Occupational Safety and Health (OSHA) for protection from pesticides, fumigants, herbicides and fungicides.

e. Conform to the selection and usage guidelines in ANSI Z88.2.

3.3 FINISHING

A. Root Saucer: Properly shape a topsoil sauce around trees and plants to retain water and avoid erosion.

B. Edging: Uniformly edge beds of individual plants with a 3" - 4" deep "Vee" cut to provide a clear division line between planted areas and adjacent lawn. Form bed shapes as indicated. Install edging materials as specified. Mulch to the bottom edge of the cut.

C. Mulching: Provide mulching materials at other indicated locations. Keep mulch off of buildings, sidewalks, light standards and other structures.

1. Placing Inert Materials: Lay the membrane with edges lapped 6" - 12" to receive inert mulch material. Punch a grid of 1/4" holes at 12" o.c., both ways, over the entire area for drainage. Spread the mulch.

2. Placing Mulching Materials: Spread to a uniform thickness of 3".

D. Wrapping: Tie trunk wrapping material to the trunks of deciduous trees with the specified material within one day after planting. The trunks of deciduous trees will be inspected for physical damage, insect infestation and disease, and a determination of required treatment or rejection made prior to the wrapping operation. Begin wrapping at the base and extend up to the first branches. Overlap wrapping half the width of the underlying wrap and securely tie at the top, bottom, and at 18" intervals, maximum, with twine.

E. Staking and Guying:

1. Deadmen: Stake, guy and place deadmen for plantings as indicated.

2. Chafing Guards: Hold the plants firmly between stakes with a double-strand of 12 gauge guying wire. Use hose chafing guards where wire will contact the plants. Provide turnbuckles as indicated.

3. Stakes: Drive vertically into the ground 3 feet deep outside of the plant balls. Do not injure balls or roots.

4. Ground Stakes: Drive into firm ground outside of the plant pit with the top of the stakes flush with the ground.

5. Deadmen: Place a minimum of 18" below the ground surface.

6. Iron Anchors: Drive a minimum of 30" below the ground surface.

7. Steel Anchors: Insert steel screw anchors as recommended in the manufacturer's data.

8. Flags: Securely fasten flags on each guy wire at approximately 2/3 of the distance from the ground.

F. Pruning: NAA DSST; prune in accordance with the safety requirements of ANSI Z133.1.

1. Trees and Shrubs: Remove dead and broken branches. Prune deciduous trees and shrubs to reduce the total amount of branching structure by a maximum of one-third. Retain the typical grown habit of individual plants with as much height and spread as practical. Make cuts with sharp instruments, flush with the trunk or adjacent branch, above node.

2. Wound Dressing: Apply tree wound dressing to cuts 1/2A in diameter and larger, immediately after pruning.

3.4 MAINTENANCE

A. Commencement: Begin maintenance immediately after each item has been planted.

B. Inspection: Inspect plants at least once a week during the installation period and perform needed maintenance promptly.

3.5 PLANT ESTABLISHMENT AND MAINTENANCE PERIOD

A. Commencement: On the date that inspection shows that all new plants have been satisfactorily installed.

B. Plant Establishment Period: 90 days from the date of Substantial Completion of the landscaping.

C. Maintenance During the Plant Establishment Period:

1. Promote Plant Growth: Water, prune, mulch, re-guy, re-wrap and perform other operations necessary to promote plant growth.

2. Fertilizing Plants: At least once during the plant establishment period. Fertilize by top dressing the plant pit or bed area or by tablet or packet form with controlled release fertilizer.

3. Remove Dead Plants: Remove and replace dead plants and replace stakes, guys, wraps and eroded plant saucers. No additional plant establishment period will be required for replacement plants.

4. Tracking Unhealthy Plants: Plants not in a healthy growing condition will be noted, removed immediately and replaced with plants of the same species and

sizes originally specified. Make replacements in the manner specified for the original plantings.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect plant conditions, placement and soil conditions.

3.7 FINAL INSPECTION AND ACCEPTANCE

A. Final Inspection: Upon written request from the Contractor and at least 10 days prior to the last day of the plant establishment period. Prior to final inspection, fertilize all plants by top dressing the plant pit or bed area or by tablet or packet form with controlled release fertilizer.

B. Final Acceptance: Base on compliance with the following:

1. Total Plants on Site: Plants have been accepted and the required number of replacements are planted.

2. Mulching and Weeding: Plant beds and saucers are properly mulched and free of weeds.

3. Supports: Stakes and guys are in good condition.

4. Remedial Work: Remedial measures directed by the Owner=s representative have been carried out to ensure plant survival.

5. Fertilizing: Plant materials have been fertilized as required.

END OF SECTION

SECTION 03210

CONCRETE FIBER REINFORCEMENT

PART 1- GENERAL

1.1 WORK INCLUDED

A. Furnish and place all fiber reinforcing for cast-in-place concrete for metal deck concrete topping only.

1.2 REINFORCEMENT

A. The concrete spacers shall be reinforced with 100% new collated, fibrillated polypropylene fibers containing no reprocessed olefin materials, and with the following physical properties:

- Specific Gravity: 0.91
- Modulus of Elasticity: 500 to 700 ksi
- Tensile Strength: 70 to 110 ksi
- Length: 0.25 to 2.5 inches

B. The contractor shall provide certification that all fibers furnished meet the physical properties listed in Subsection 1.2.A of this specification.

1.3 CONCENTRATION OF REINFORCEMENT FIBER:

One and one-half pounds of fiber shall be homogeneously mixed into each cubic yard of concrete furnished. The fiber shall be added to and mixed into the concrete at the batch plant to ensure uniform and complete dispersion of the collated-fibrillated fiber bundles into single monofilaments within the concrete.

PART 2 - PRODUCTS

2.1 GENERAL:

The proportion of cement, fiber reinforcement, and fine and coarse aggregates shall be such that it shall produce a maximum strength mixture which is consistent with the requirements of workability. The concrete must be tested to maintain an alkalinity content of 13 or higher. Refer to Section 03300 for concrete minimum compressive strength.

2.2 CONSISTENCY AND WORKABLITY:

A. The consistency of the concrete mix shall be such that it is plastic and workable. The consistency shall be determined in advance of placing concrete by the standard slump test. The concrete mix shall have a slump of 4 inches, ± 1 inch (ASME C-143).

B. The workability of the concrete shall not be increased by adding water to the mixture. Whenever necessary, the workability shall be varied by changing the mix proportions while

maintaining the required water-cement ratio. An increase in workability may be obtained by increasing the ratio of fine-to-coarse aggregate, or by increasing the cement content, or both.

2.3 PLACING:

Contractor shall install a 4-inch thick minimum concrete pad or as noted on the contract drawings. The new spacer slab is to follow the existing slope of the existing tank bottom.

PART 3 – EXECUTION (See 03300)

END OF SECTION 03210

SECTION 03217

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes painted markings applied to asphalt and concrete pavement.

B. Related Requirements:

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to marking pavement including, but not limited to, the following:

a. Pavement aging period before application of pavement markings.

b. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.

B. Shop Drawings: For pavement markings.

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.

2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the Department of Public Works for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 ^{o}F for water-based materials, and not exceeding 95 ^{o}F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with project requirements. Available manufacturers offering products that may be incorporated into the Work include, but are not limited to products approved by the Department of Public Works for Pavement markings.

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N; colors complying with FS TT-P-1952.

1. Color: As indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Engineer.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond the stencil. Apply paint so that it cannot run beneath the stencil.

2. Broadcast glass beads uniformly into wet markings at a rate of 6 lbs./gal.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 03217

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. Work Included: Provide all cast-in-place concrete, including reinforcing steel.

B. Related Work Specified in Other Sections:

1. Exposed aggregate paving: Section 02510.

1.2 CODES AND STANDARDS:

A. Perform work in accordance with applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for all inspections and permits required by Federal, State, and local authorities in furnishing, transporting, and installing materials. Nothing in these Drawings or Specifications is to be construed as permitting work not conforming to these codes.

B. Except where different requirements are accepted, comply with the following standards by American Concrete Institute (ACI):

1. ACI 301-84(85) "Specifications for Structural Concrete for Buildings."

2. ACI 304-85 "Recommended Practice for Measuring, Mixing and Placing Concrete."

3. ACI 304.2R-71(82) "Placing Concrete by Pumping Methods."

4. ACI 308-81(86) "Recommended Practice for Curing Concrete."

5. ACI 318-83(86) "Building Code Requirements for Reinforced Concrete."

C. Comply with the referenced ASTM standards for materials and testing.

D. Concrete Testing and Inspection:

1. Testing laboratory will be hired and paid for by Owner to:

a. Test all concrete ingredients upon request.

b. Be responsible for and test all cylinders.

c. Review concrete mix designs.

2. Assist testing laboratory in making cylinders and slump tests.

3. Provide the testing laboratory free access to places where concrete materials are stored, proportioned, or mixed. All materials, equipment and methods used shall be subject to its inspection, test, and approval.

4. The following tests will be taken. Provide all materials to be tested.

   a. Compressive Test Cylinder: Take 4 identical standard 6-inch by 12-inch cylinders from each 10 cubic yards of concrete or fraction thereof placed in each day. Make, store, and cure cylinders in accordance with ASTM C 172 and C 31. Test cylinders in accordance with ASTM C 39, one at 7 days and two at 28 days. Keep 1 cylinder as spare for test at later date as directed.

   b. Slump test: Take 1 for each batch.

E. Reinforcing Steel Standards: Comply with the following:

1. ACI 316-83(86) "Manual of Standard Practice for Detailing Reinforced Concrete Structures".

2. Concrete Reinforcing Steel Institute "Manual of Standard Practice, 1984."

F. When provisions of pertinent codes and standards conflict with this Specification, the more stringent provision governs.

1.3 SUBMITTALS:

A. Shop Drawings: Submit in accordance with Section 01300.

1. Before any concrete reinforcement materials are fabricated, submit Shop Drawings of all concrete reinforcing.

2. The minimum format is 8 1/2 inches by 11 inches. Drawings shall be drafted by a competent draftsperson in conformance with paragraph 1.02 B.

3. Do not order concrete reinforcement to the job site until receipt of Shop Drawings acceptance from Landscape Architect.

B. Samples and Certificates:

1. All steel materials shall bear mill tags with heat number identification and with mill analysis and report available. Material not so labeled and identifiable may be required by the Landscape Architect to be tested by a laboratory selected by the Owner, in which case random samples will be taken by the Landscape Architect for one series of tests from each 2-1/2 tons or fraction thereof each size and kind of reinforcement steel.

2. Submit concrete finish and color sample for exposed aggregate concrete for acceptance by Landscape Architect. Minimum size 2' x 2'.

C. Submit design mixes from the batch plant as evidence that the design requirements have been met. Substantiate with copies of recent lab tests of same mixes.

D. Transit-mix concrete delivery slips:

1. Keep records showing time and place of each pour of concrete, together with transit-mix delivery slips certifying contents of the pour.

2. Make the records available to the Landscape Architect for his inspection upon request.

3. Upon completion of this portion of the work, deliver the records and the delivery slips to the Landscape Architect.

1.4 QUALITY ASSURANCE:

A. Supervision: Provide at least one supervisor on site at all times during the execution of this Work, who is thoroughly familiar with the type of materials being used, the best methods for their application, and who directs the work.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials in timely manner to ensure uninterrupted progress of the work; store in such a manner as will preclude damage and permit ready access for inspection and identification of each shipment.

B. Protection:

1. Use all means necessary to protect concrete reinforcement before, during, and after installation and to protect the installed work and materials of other trades.

2. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.

3. Use all necessary precautions to maintain identification after bundles are broken.

C. Replacement: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Landscape Architect.

1.6 VERIFICATION OF LINES AND LEVELS:

A. Scaled dimensions are approximate. Before proceeding with any work, carefully check and verify dimensions on the site.

B. Check grades and slab elevations to determine that work may safely proceed, keeping within the specified material depths. The layout plan is based on horizontal plane dimensions, and therefore measurements taken on the surface of slopes will differ from those indicated.

1.7 JOB CONDITIONS:

A. Acceptance of Previous Work: Inspect and accept the condition of the site relative to this work before commencing. If not acceptable, notify the Landscape Architect in writing. By proceeding with the work, the Contractor indicates his acceptance of all previous related work.

B. Meet on Site: Prior to commencing work, meet with the Landscape Architect, the Owner's representative, and other concerned parties on the site to review the work. Request this meeting one week prior to desired meeting time.

C. Protection:

1. Comply with governing safety regulations.

2. Provide necessary safeguards and exercise caution against injury or defacement of existing site improvements. Prevent vehicles of any kind from passing over sidewalks, curbs, and similar items, unless adequate protection is provided. Do not

store materials or equipment or operate equipment near or under the branches of any existing plants that are to remain, except as actually required for construction in those areas.

3. Be responsible for damages caused by failure of workmanship or materials. Repair all damage to return the area to the previous condition.

D. Clean Up: Keep areas of work clean, neat, and orderly at all times. Clean construction areas at the end of each day. Remove surplus material and other debris generated from this work from the site. Neatly return to proper grade any disturbed areas. Flush paving walks and similar areas to achieve a "broom clean" appearance.

1.8 COORDINATION: Schedule and coordinate to facilitate the most expeditious completion of the project.

A. Consult other relevant Specification sections to determine the extent and character of related work specified elsewhere.

B. Take precautions to maintain alignment and prevent damage of such items during placement of concrete.

C. Perform cutting and patching made necessary by failure or delay in complying with these requirements.

D. Give at least 48 hours notice to the Landscape Architect prior to inspections and observations.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS:

A. Cement: ASTM C 150-86, Type II. Use only one manufacturer for all cement unless otherwise accepted by the Landscape Architect.

B. Aggregates: Clean and free from salt, organics, soil, and other deleterious materials.

1. Fine aggregate: ASTM C 33-86. (Limestone sand for exposed aggregate concrete.)

2. Coarse aggregate: ASTM C 33-86. (#4 blue rock and limestone chips for exposed aggregate concrete.)

C. Water: Clean and potable.

D. Water Reducing/Retarding: ASTM C 494-86, Type A, B, or D. Calcium Chloride is not permitted.

E. Coloring Admixture: By L.M. Scofield Chromix.

2.2 DESIGN MIXES:

A. Design concrete mix in accordance with ACI 301 and ACI 318. Proportion design mixes by weight in accordance with ACI 211.1-81(85), to meet the following requirements:

1. Strength fc. 3,000 PSI

2. Min. Sacks/Yd. 6.00 Sacks

3. Max. Slump 3 Inches

B. Mix components for exposed aggregate concrete (to match landscape paving):

688# cement
369# limestone sand
1079# #4 blue rock aggregate
1795# limestone chips
16-1/2# color as selected
36 gal. water

C. The quantity of cement and admixture required per cubic yard of concrete is given for estimating purposes. The exact amount of cement, fine and coarse aggregate, admixture, and water to be used shall be determined by the batch plant, subject to the review testing laboratory. The actual slump produced may not exceed amounts listed. These proportions shall produce concrete of maximum density, minimum shrinkage and required minimum strength.

D. Design the concrete mix to work readily into the corners and angles of the forms and reinforcement without excessive puddling, spading or vibration and without permitting the materials to segregate or free water to collect on the surface. Use the minimum amount of water consistent with these requirements. In general, accomplish the workability by grading rather than by adding water.

E. Test cylinders shall be prepared and tested as specified, to verify compliance of the concrete with the specifications. All concrete shall develop the specified minimum strength. Adjustments will be made if test results warrant changes.

2.3 REINFORCING STEEL:

A. Bar Reinforcement: Conform to "Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement", ASTM A 615-87a, grade 60.

B. Wire Reinforcement: Conform to "Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement", ASTM A 82-88, galvanized.

2.4 FORMS:

A. Form Materials: Either steel or wood, of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use forms that are clean, straight, smooth, dense, and free of distortion, rust, and defects. Use flexible spring-steel forms or laminated boards to form radius bends as required.

B. Form Coating: Non staining form-releasing agent that will not discolor or deface the surface of the concrete, nor prevent bonding of finishes to its surface.

2.5 MISCELLANEOUS:

A. Curing and Sealing Compounds: ASTM C 309-81, Type 1, Class B clear, non-yellowing resin based, as manufactured by W.R. Meadows AR-30, Burke Res-X, or acceptable equal.

B. Grout: Non-shrink nonmetallic; Five Star Grout, Master Builder, Thoro-Grip, Burke, or acceptable equal. Do not use grout in exposed conditions.

C. Waterstops: PVC or rubber dumbbell or centerbulb type as indicated of proper size to fit joint; Burke, Greenstreak, Hunts, W.R. Meadows, or acceptable equal.

D. Expansion Joint Filler: ASTM D 1751-83 non-extruding premolded 1/2" thick asphalt-impregnated fiberboard, unless otherwise indicated.

E. Vapor Barrier: Polyethylene film, .006" thick.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Thoroughly clean the areas to ensure proper placement and bonding of concrete.

B. Verify that reinforcement, when placed, will permit placement of concrete in the design indicated on the Drawings.

C. Make sure that steel reinforcement is free of rust, scale, and bond-inhibiting coatings.

D. Verify that all waterproofing materials are adequately protected from damage by the installation of the reinforcing materials.

E. Notify the Landscape Architect and Owner at least 48 hours before concrete will be placed.

3.2 STEEL FABRICATION:

A. Fabricate reinforcement in strict accordance with Shop Drawings.

B. Do not use bars with kinks or bends not indicated on the Drawings or the reviewed Shop Drawings.

C. Do not bend or straighten steel in a manner that will injure the material.

D. Bend bars cold.

E. Make bends for stirrups and ties around a pin having a diameter not less than 2 times the minimum thickness of the bar.

F. Make bends for other bars, including hooks, around a pin having a diameter not less than 6 times that minimum thickness of the bar.

3.3 PLACING REINFORCEMENT:

A. Before starting concrete placement, accurately place concrete reinforcement, positively secure and support by concrete blocks, spacers, or metal hangers. Over vulnerable waterproofing materials do not allow steel reinforcement to touch waterproofing directly; protect surface with compressible filler or fiberboard.

B. Clearance:

1. Preserve clear space between bars of not less than 1-1/2 times the nominal diameter of round bars.

2. In no case let the clear distance be less than 1-1/2" nor less than 1-1/3 times the maximum size of aggregate.

3. Provide at least 2" of concrete covering over reinforcement.

C. Splicing: Horizontal bars:

1. Place bars in horizontal members, with minimum lap at splices sufficient to develop the strength of the bars.

2. Bars may be wired together at laps except at points of support of the member, at which points preserve clear space described above.

3. Whenever possible, stagger splices of adjacent bars.

4. Splice 40 bar diameters minimum.

D. Dowels: Place required steel dowels and securely anchor into position before concrete is placed.

E. Obstructions: In the even conduits, piping, inserts, sleeves, or any other items interfere with placing reinforcement as indicated or otherwise required, immediately consult the Landscape Architect and obtain approval of new procedure before placing concrete.

3.4 CONCRETE MIXING:

A. Provide ready mixed concrete in compliance with the referenced ACI standards and ASTM C 94-86b.

B. Mix concrete in a transit mixer at a peripheral drum speed of 200 ft. per minute for a period of not less than 10 minutes, including at least 3 minutes at the job site.

C. Start the discharge of concrete not more than 45 minutes after the introduction of mixing water. Complete placing of concrete within 90 minutes of the first introduction of water into the mix, except when air temperature is between 85° F. and 95° F., reduce time to 75 minutes.

D. Do not add water to the mix after leaving the plant without the specific approval of the Landscape Architect.

E. Upon his approval, water may be added as long as slump does not exceed that specified and the designed water/cement ratio is not exceeded.

3.5 TEMPERATURE CONTROLS:

A. Temperature delivered at plant not to exceed 150° F.

B. Comply with the following temperature limitations:

1. Maximum temperature of concrete at time of placement: 75° F.

2. Minimum temperature of concrete at time of placement: 50° F.

3.6 PLACING:

A. Keep a record of the time and date of placing concrete in each portion of the project. Make this record open for inspection by the Landscape Architect at any time.

B. Compact concrete thoroughly, using approved mechanical vibrators.

1. Use mechanical vibrator at each point of dump, and keep a standby vibrator in good working condition, but not in use, on the job until all concrete is placed.

2. Internal vibration must be direct action in the concrete and not against forms or reinforcement. Vibrate each pour until the water shows indications of rising, but not until the water has risen.

3. Use suitable tools along the faces of the forms during the pour, to force large aggregate away from the forms and bring mortar to the surface of the forms. Take appropriate means to provide fully filled out, smooth, clean, and properly aligned surfaces, free from pockets and blemishes.

3.7 CONSTRUCTION AND CONTROL JOINTS:

A. Construction Joints:

1. Form construction pour joints as detailed or as accepted by the Landscape Architect.

2. Sandblast the entire top surface of construction joints with coarse sand to clean and roughen the joint for bond to next pour. Expose coarse aggregate solidly embedded in mortar matrix. Clean away drippings, sand, and debris, so the next pour is placed on clean, solid, rough surface.

3. Waterstops: Install waterstops in construction joints where indicated on the drawings, to form a continuous diaphragm in each joint. Make provisions to support and protect waterstops during the progress of the work. Fabricate waterstop field joints in accordance with manufacturer's printed instructions. Protect waterstop material from damage where it protrudes from any point.

B. Vertical Pour Joints: Form vertical pour joints within walls with beveled 2 x 4 to form continuous key at center of wall.

3.8 SPECIAL REQUIREMENTS:

A. Place slabs and top of walls to the following tolerances:

1. Unless otherwise noted: 1/8 inch in 10 feet.

2. Not more than 1/8-inch maximum deviation above or below the established datum lines.

B. Areas with Drains: Unless otherwise indicated, pitch carefully to drains so as to afford an even fall from all parts of the fountain, using screen extending from the flow drain in a fan shape.

3.9 PATCHING:

A. Repair defects in exposed concrete work as follows: Chip voids to depth of at least 1" or to remove loose material, with the edges perpendicular to the surface and parallel to form markings. Fill voids, surface irregularities, chipped areas, and similar depressions, by

patching, and rubbing. Prepare a sample of repaired condition for approval by the Landscape Architect before proceeding with this work.

3.10 PROTECTION AND CURING:

A. Protect concrete from injurious action of the elements and defacement during construction operations.

B. Protect slabs and exposed corners of concrete from traffic or use which will damage them.

C. Keep forms sufficiently wet to prevent drying out of the concrete.

D. Lightly sandblast colored concrete walls in landscaped areas to expose aggregate where indicated.

E. Apply curing compound to all freshly poured concrete. Apply uniformly at the rate recommended by the manufacturer.

3.11 CLEANING: As the work progresses, clean concrete drippings or splashings immediately from all surfaces. Dispose of concrete debris legally off the site.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.
4. Suspended slabs.
5. Building frame members.
6. Building walls.

B. Related Sections:
1. Section 31200 "Earth Moving" for drainage fill under slabs-on-grade.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: fly ash; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

F. Samples: For waterstops vapor retarder.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturer testing agency.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Waterstops.
6. Curing compounds.
7. Bonding agents.
8. Joint-filler strips.
9. Repair materials.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

F. Field quality-control reports.

G. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

H. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

    a. Contractor's superintendent.
    b. Independent testing agency responsible for concrete design mixtures.
    c. Ready-mix concrete manufacturer.
    d. Concrete subcontractor.
    e. Special concrete finish subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

    a. High-density overlay, Class 1 or better.
    b. Medium-density overlay, Class 1 or better; mill-release agent treated, and edge sealed.
    c. Structural 1, B-B or better; mill oiled, and edge sealed.
    d. B-B (Concrete Form), Class 1 or better; mill oiled, and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

I. Form Ties: Factory-fabricated, removable, or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive damp proofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 706, Grade 60, ASTM A 615/A 615M, Grade 60, deformed shall be permitted if:
1. The actual yield strength based on Mil tests does not exceed f_y by more than 18,000 psi, and
2. The ratio of the actual Tensile Strength to the actual Yield Strength is not less than 1.25.

B. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from galvanized-steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar support contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I or Type II.

a. Fly Ash: ASTM C618, Class F.

B. Normal-Weight Aggregates: ASTM C 33, Class 1N coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 WATERSTOPS

A. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.

1. Products: Subject to compliance with requirements, provide one of the following :

    a. JP Specialties, Inc.; Earth Shield TPE-Rubber.
    b. Vinylex Corp.; PetroStop.
    c. WESTEC Barrier Technologies, Inc.; 600 Series TPE-R.
    d. .

2. Profile: Flat, dumbbell with center bulb.
3. Dimensions: 6 inches by 3/16 inch thick; non-tapered.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. BASF Construction Chemicals - Building Systems; Confilm.
    b. ChemMasters, Inc; SprayFilm.
    c. Sika Corporation; SikaFilm.
    d. Unitex; PRO-FILM.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Construction Chemicals - Building Systems; Kure 200.
b. ChemMasters, Inc; Safe-Cure Clear.
c. SpecChem, LLC; Spec Rez Clear.
d. .

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork, or self-expanding cork.

B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.

4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

Pump Mix Slump Limits: 8 inches for concrete with verified base slump noted below before adding high-range water-reducing admixture or plasticizing admixture.

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

B. Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.

4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 470 lb/cu. yd.
3. Maximum Water-Cementitious Materials Ratio: 0.45.
4. Slump Limit: 4 inches plus or minus 1 inch.
5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
6. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
7. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

D. Suspended Slabs: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 540 lb/cu. yd.
3. Maximum Water-Cementitious Materials Ratio: 0.45.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
6. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
7. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

E. Building Frame Members: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches plus or minus 1 inch.
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

F. Building Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

G. Metal Deck Topping: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 540 lb/cu. yd.
3. Maximum Water-Cementitious Materials Ratio: 0.45.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
6. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
7. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
8. Fiber Reinforcement: Refer to Section 03210.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Refer to architectural details for chamfer requirements of exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 72 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 80 percent its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.8 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to be covered with a coating or covering material applied directly to concrete.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.

1. Apply scratch finish to surfaces indicated and to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated to receive trowel finish.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:

a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:

1. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
2. After broadcasting and tamping, apply float finish.
3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:

1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacturer.
2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling, and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

B. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.

b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three-consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 within 24 hours of finishing.

END OF SECTION 03300

SECTION 03301

MISCELLANEOUS CONCRETE STRUCTURES

PART 1 - GENERAL

1.1 QUALITY CONTROL: The Quality Control of Division 1, apply to this section.

1.2 GENERAL REQUIREMENTS: The construction requirements of this section apply to concrete sidewalks, driveways, concrete-paved drainage swales/ditches, concrete thrust blocks, fence post footings, concrete curbs, and concrete curb and gutter, conforming to the lines and grades shown on the plans.

A. Earthwork: Unless otherwise specified in this section or on the plans, the earthwork requirements of Section 02200, entitled “Earthwork”, shall also apply to this section.

B. Concrete Construction: Unless otherwise specified in this section, or on the plans, the concrete construction requirements of Section 03300, entitled “Cast-in-Place Concrete”, shall also apply to this section.

C. Concrete Compressive Strength: Minimum 3,000 psi at 28 days.

PART 2 - PRODUCTS

2.1 General: Products mentioned in Section 03300, Cast-in-Place Concrete shall also apply to this section.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Concrete Walkways: This work shall consist of the construction of concrete walkways, sidewalks, or concrete slabs in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established by the Engineer.

1. Excavation: Excavation shall be made to the required depth and to a width that will permit the installation and bracing of the forms. The foundation shall be shaped and compacted to an even surface conforming to the section shown on the plan. All soft and yielding material shall be removed and replaced with acceptable material, which shall be thoroughly compacted to the degree indicated on the plans.

2. Forms: Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.

3. Placing Concrete: The foundation shall be thoroughly moistened immediately prior to the placing of the concrete. The proportioning, mixing and placing of the concrete shall be in accordance with the requirements of Section 03300, entitled “Cast-in-Place Concrete”.

4. Finishing: The surface shall be finished with a wooden float. No plastering of the surface will be permitted. All outside edges of the slab and all joints shall be edged with a 1/4 inch radius edging tool.

5. Joints: Expansion joints shall be of the dimensions specified, and shall be filled with

the type of pre-molded expansion joint filler. The sidewalk shall be divided into sections by dummy joints formed by a jointing tool or other acceptable means as directed. These dummy joints shall extend into the concrete for at least 1/3 of the depth and shall be approximately 1/8 inch wide.

6. Construction joints shall be formed around all appurtenances such as manholes, utility poles, etc., extending into and through the installed in these joints. Expansion joint filler of the thickness indicated shall be installed between concrete sidewalks and any fixed structure such as a building or bridge. This expansion joint material shall extend for the full depth of the sidewalk.

7. Curing: Concrete shall be cured for at least 72 hours. Curing shall be by means of moist burlap or mats or by other approved methods.

8. Base Course Material: Base Course Material for sidewalks and driveways shall conform to the requirements for base course in Section 02203, entitled “Base Course”.

B. Concrete Curbing: This work shall consist of the construction of curb, gutter or combination curb and gutter in accord with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established by the Architect.

1. Excavation: Excavation shall be made to the required depth, and based upon which the curb is to be set shall be compacted to an even surface. All soft and unsuitable material shall be removed and replaced with suitable material which shall be thoroughly compacted to the degree indicated on the plans.

2. Forms: Forms shall be of wood, metal, or other suitable material and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without displacement. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal. All forms shall be cleaned and coated with an approved form release agent before concrete is placed. Divider plates shall be of metal.

3. Mixing and Placing: Concrete shall be proportioned, mixed and placed in accordance with the requirements of Section 03300, entitled “Cast-In-Place Concrete”. Consolidation of concrete placed in the forms shall be by vibration or other acceptable methods. Forms shall be left in place for 24 hours or until the concrete has set sufficiently so that they can be removed without injury to the curbing. The concrete shall be struck off to the cross-section specified, after which it shall be finished smooth and even by means of a wood float.

   For the purpose of matching adjacent concrete finishes or for other reasons, the Architect may permit other methods of finishing. No plastering will be permitted.

4. Sections: Curbing shall be constructed in sections having a uniform length as shown on the plans unless otherwise directed by the Engineer/Owner’s Representative. Sections shall be separated by open joints 1/8 inch wide except at expansion joints. Where the curb is constructed adjacent to concrete pavement, the construction or open joints in the curb shall match the contraction joints in the pavement.

5. Expansion Joints: Expansion joints shall be formed at the intervals shown on the plans using a pre-formed expansion joint filler having a thickness of 1/2 inch. When the curb is constructed adjacent to or on concrete pavement, expansion joints shall be located opposite or at expansion joints in the pavement.

6. Curing: Immediately upon completion of the finishing, the curbing shall be moistened and kept moist for three (3) days, or the curbing shall be cured by the use of membrane forming material. The method and details of curing shall be subject to the approval of the Architect.

7. Backfilling: After the concrete has set sufficiently, the spaces in from and back of the curb shall be refilled to the required elevation with suitable material, which shall be thoroughly tamped, in layers of not more than eight inches thick.

C. Drainage Swales/Ditches: This work shall consist of paving swales/ditches or other similar waterways with concrete constructed on a prepared bed in reasonably close conformity with these specifications and with the lines, grades and dimensions shown on the plans or established by theEngineer.

1. Excavation: Excavation shall be made to the required depth, and the base upon which the curb is to be set shall be compacted to an even surface. All soft and unsuitable material shall be removed and replaced with suitable which shall be thoroughly compacted to the degree indicated on the plans.

2. Forms: Forms shall be of wood, metal, or other suitable material and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without displacement. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal. All forms shall be cleaned and coated with an approved form release agent before concrete is placed.

3. Mixing and Placing: Concrete shall be proportioned, mixed and placed in accordance with the requirements of Section 03300, entitled “Cast-in-Place Concrete”. Consolidation of concrete placed in the forms shall be by vibration other acceptable methods. Forms shall be left in place for 24 hours or until the concrete has set sufficiently so that they can be removed without injury to the structure. The concrete shall be struck off to the cross-section specified, after which it shall be finished smooth and even.

4. Sections: Swales shall be constructed in sections as shown on the plans unless otherwise ordered.

5. Curing: Immediately upon completion of the finishing, the structure shall be moistened and kept moist for three days. The method and details of curing shall be subject to the approval of theEngineer/Owner’s Representative.

6. Backfilling: After the concrete has set sufficiently, the spaces shall be refilled to the required elevation with suitable material, which shall be thoroughly tamped, in layers of not more than eight inches thick.

7. Base Course Material: Base course material for concrete curbing shall conform to the requirements Section 02203, entitled “Base Course”.

END OF SECTION 03301

SECTION 03350

CONCRETE FINISHES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Finishes for cast-in-place concrete.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 – Cast-in-Place Concrete: Substrate for finishing.

2. Section 07190 - Water Repellents (Sealer): Substrate waterproof sealer.

3. Section 09900 – Painting: Finishing.

1.2 DESCRIPTION OF WORK

A. The extent of the concrete finishes work is indicated on the Drawings and Schedules and as specified herein, and includes providing materials and applying to in-place concrete surfaces.

B. Materials and work specified herein, are in addition to the work under Division 3 – CONCRETE, and are required to achieve the specified finishes.

1.3 REFERENCES

A. American Concrete Institute (ACI):

1. Applicable provisions.

B. American Society for Testing and Materials (ASTM):

1. ASTM E 1155 - Test Method for Determining FF Floor Flatness and FL Floor Level Numbers.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Building Elements Designed for Children’s Use.

1.4 SUBMITTALS

A. Section 01330 – Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer’s technical information and application instructions for the materials required.

2. Shop Drawings (if requested): Layout drawings and details for proper installation of the work.

3. Mock-Up: Construct a Mock-Up of 4' x 8', minimum size, not as part of work, to be reviewed for quality of workmanship and finish. Prior to beginning the Mock-Up, secure the Owner representative's general approval of the application technique to be used.

4. Assurance / Control Submittals:

a. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 COORDINATION

A. Concrete Characteristics. Without changing the design intent, it is required that the concrete characteristics, such as moisture content, pH levels, finish texture, and any materials used in conjunction with the concrete work meet the requirements of other work to be applied to and into it and whose performance, in part or whole, depends upon the concrete work provided. Verify and coordinate requirements with other Installers providing such work prior to the construction of each structure affecting such Installers.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Applicator / Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements. Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, new and unopened packages or containers with seals and labels intact; dry and undamaged, bearing the product name, and precautionary labels.

C. Store materials not in actual use, in tightly enclosed containers. Maintain containers used in the storage of materials, in a clean condition, free of foreign materials and residue.

D. Store materials in a well-ventilated area, and in compliance with the manufacturer's published instructions.

E. Store and handle materials to prevent deterioration and damage due to moisture, temperature changes, contaminants, and other causes.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. In addition to materials required to achieve the finishes specified herein, comply with

Division 3 - CONCRETE Sections.

B. Form Coatings: Form coatings shall not bond with, stain, or adversely affect concrete surfaces, and shall not impair subsequent treatment of concrete surfaces.

2.2 CONCRETE MATERIALS

A. In addition to materials required to achieve the finishes specified herein, comply with Division 3 - CONCRETE Sections.

B. Skim Coat Cement Finish: (CF-3) Cement based polymer modified, quick setting concrete finishing material; dry powder blend of Portland Cement and acrylic additives designed specifically for application to concrete surfaces for a Class A finish. Fine finish texture. LAHABRA ACRYLIC FINISH, PRO-FINISH by Bonded Materials Co., or approved equal.

C. Hardening / Sealing Agent for polished finish (CF-9)

1. Advanced Floor Products; Retro-Plate 99

2. Eloco: Ironshine HG

2.3 RELATED MATERIALS

A. Salt: Coarse salt, 100% passing 3/8" sieve and 85% remaining on #8 sieve. Morton Softener Salt, Somat Water Softener Salt, North American Salt or approved product by another company.

B. Curing Materials: Comply with Division 3. - CONCRETE Sections.

2.4 MIXES

A. Comply with Division 3 - Concrete Sections.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 FINISH OF FORMED SURFACES

A. (CF-1) Rough Formed Finish: Formed concrete surfaces not exposed-to-view in the finished work or by other construction, unless otherwise indicated. Concrete surfaces having texture imparted by the form facing material used, with tile holes and defective areas repaired and patched, and fins and other projections, exceeding 1/4" in height, rubbed down or chipped off.

D. (CF-2) Smooth Form Finish: Formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to the concrete, or a covering material applied directly to the concrete, such as waterproofing, dampproofing, veneer plaster, paint, wall covering or other similar materials. As-cast concrete surfaces resulting from selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and ground smooth.

C. (CF-3) Skim Coat Finish: Formed surfaces exposed-to-view, provided with a skim coat finish, smooth or textured as indicated or selected by owner's representative. Apply over all contiguous surfaces.

D. Related Un-formed Surfaces: Tops of walls, horizontal offsets, and similar un-formed surfaces adjacent to formed surfaces. Strike-off smooth and finish with a texture matching the adjacent formed surfaces. Continue final surface treatment of the formed surfaces uniformly across adjacent un-formed surfaces, unless otherwise indicated.

3.3 MONOLITHIC SLAB FINISHES

A. Floor Flatness Standard: ASTM E1155, with "F" number requirements as specified herein.

B. (CF-4) Float Finish:

1. Location: Apply on surfaces to receive a trowel finish, and as otherwise indicated.

2. Installation: After screeding, consolidating, and leveling concrete slabs, do not work the surface until ready for floating.

3. Begin floating when surface water has disappeared or when the concrete has stiffened sufficiently to permit operation of power driven floats, or both. Consolidate surface with power driven floats or by hand floating if the area is small or inaccessible to power units. Check and level the surface plane and uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.

C. (CF-5) Trowel Finish:

1. Location: Apply to the following surfaces, and as otherwise indicated.

a. In general, apply to all exposed-to-view surfaces with no tile or stone finishes scheduled to be applied.

b. Surfaces to receive water repellent sealer.

c. Surfaces to receive carpet.

d. Surfaces to receive resilient flooring.

e. Surfaces to receive paint coatings.

2. Installation: After floating, begin first finish operation using a power driven trowel. Begin final toweling when surfaces produce a ringing sound as trowel is moved over the surface. Consolidate concrete surfaces by final hand toweling, free of trowel marks, uniform in texture and appearance, and with the surfaces leveled. Grind smooth surface defects that will telegraph through an applied floor finish.

D. (CF-6) Trowel with Fine Broom Finish:

1. Location: Apply to the following surfaces, and as otherwise indicated.

   a. Vehicular traffic surfaces which are not ramps.

   b. Pedestrian (foot trafficked) concrete surfaces, such as walkways, ramps, and stairs.

   c. Surfaces to receive mortarbed or thinset tile or stone.

2. Installation: Apply trowel finish as specified herein, then immediately follow by slightly scarifying the surface to a 1/16" maximum profile with a fiber bristle broom or brush.

3. Profile, Texture, and Pattern:

   a. Vehicular and Pedestrian Traffic Surfaces: Verify profile, texture, and pattern with the Owner's representative, and provide in accordance with directions. Apply perpendicular to the direction of traffic, or as otherwise instructed.

   b. Tile / Stone and Waterproofed Surfaces: Verify scarifying profile with the Installer of the final exposed finish.

E. (CF-7) Scored (Rib) Finish:

1. Location: Apply to vehicular and pedestrian ramps, and as otherwise indicated.

2. Installation: Apply trowel finish as specified herein, then immediately follow with a scoring machine or tool leaving raked ribs perpendicular to the vehicular traffic direction, nominal 1/8" x 1/8" profile, at 2" o.c., or such other pattern and profile, as approved.

F. (CF-8) Salt Finish:

1. Location: As indicated.

2. Installation: Distribute at the rate of not less than 5 lb / 100 sf, or as otherwise approved by the Owner's representative, or as determined by an approved Mock-Up. Washout salt when concrete has set.

G. Water Repellent Sealer Finish:

1. Location: Apply to the following surfaces, and as otherwise indicated.

   a. In general, apply to all surfaces in which concrete is scheduled to be exposed to view and not scheduled to receive a tile, stone, carpet, or resilient floor finish.

   b. Pedestrian (foot trafficked) concrete surfaces, such as walkways and stairs.

3. Installation: Apply sealer / hardener after complete curing and drying of concrete surfaces. Apply proprietary materials in strict accordance with the manufacturer's printed instructions.

H. (CF-9) Polished Finish:

1. Apply to floors where indicated.

2. Performance Criteria:

a. Abrasion Resistance: ASTM C779

b. Impact Strength: ASTM C805

c. Ultra Violet Light and Water Spray: ASTM G23

4. Sealing, Hardening and Polishing of Concrete Surface

a. Concrete must be in place a minimum of 45 days or as directed by the manufacturer before application can begin.

b. Only a certified applicator shall apply sealer and hardener. Applicable procedures must be followed as recommended by the product manufacturer and as required to match approved test sample.

c. Achieve water repellency, hardening, dust proofing, and abrasion resistance of the surface without changing the natural appearance of the concrete, except for the sheen.

d. The Sealing, Hardening and Polishing procedures shall be in strict accordance with the manufacturer's Standard Installation Methods for the product.

e. Upon completion of concrete finish application, clean areas to be striped to remove any debris and residue,

f. Provide Lust value test results.

3.4 CONCRETE SURFACE REPAIRS

A. Non-Structural Defects: Repair the following types of defects.

1. Exposed-to-View Surfaces.

2. Cracks: Repair and fill all cracks, which affect durability of the concrete.

3. Voids: Repair all spalls, air bubbles, honeycomb, rock pockets, bug holes, tile holes, and other voids larger than a pinhole (1/16").

4. Projections: Remove fins and other projections from surfaces.

5. Color / Texture Irregularities: Remove stains and other discolorations.

6. High Areas on Slabs: Correct surfaces by grinding after the concrete has cured at least fourteen (14) days.

7. Low Areas on Slabs: Correct surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when approved by the Owner's representative.

8. Concealed Surfaces: Repair defects that affect durability of the concrete. If defects cannot be repaired, remove and replace with new concrete. Where waterproofing materials are indicated, remove projections and defects necessary for proper waterproofing of the surfaces in conformance with instructions of the waterproofing manufacturer.

9. Non-Structural Repairs: Utilize polymer-reinforced mortar patching materials in strict accordance with the material manufacturer's written instructions. Provide appropriate aggregate sizes for the depth of the area to be repaired. Finish smooth to blend with adjacent surfaces.

10. Structural Repairs: Perform structural repairs with prior approval of the Owner's representative for method and procedure, using epoxy adhesive and mortar.

E. Color / Texture Repair: Even out the color / texture appearance of all exposed-to-view formed surfaces with a wash finish where not required to be opaque painted or where irregularities can telegraph through the final finish.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Upon completion of the finishing work, clean all surfaces free of foreign matter.

C. Clean surfaces with acid solutions only when permitted by the Owner's representative. Protect metal surfaces and cast iron from the effects of acid cleaning. Flush surfaces with clean water before and after cleaning.

D. Leave finished installations clean and free of cracks, chips, and otherwise defective work.

3.6 PROTECTION

A. Protect finish work with Kraft paper or other heavy covering to prevent staining, damage and wear.

B. Immediately before final inspection, remove the protective coverings and rinse with clean, potable water.

END OF SECTION

SECTION 03410

PRECAST STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Precast structural concrete.

B. Related Sections:

1. Section 03300 "Cast-in-Place Concrete" for concrete panels and placing connection anchors in concrete.
2. Section 05120 "Structural Steel Framing" for furnishing and installing connections attached to structural-steel framing.
3. Section 05500 "Metal Fabrications" for kickers and other miscellaneous steel shapes.
4. Section 07840 "Firestopping" for joint-filler materials for fire-resistance-rated construction.
5. Section 07920 "Joint Sealants" for elastomeric joint sealants and sealant backings.

1.3 DEFINITION

A. Design Reference Sample: Sample of approved precast structural concrete color, finish, and texture, preapproved by Architect.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design precast structural concrete, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Precast structural concrete units and connections shall withstand design loads indicated within limits and under conditions indicated.

C. Structural Performance: Provide precast structural concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:

1. Dead Loads: Refer to drawings.

2. Concrete Load: Refer to drawings.
3. Live Loads: Refer to drawings.
4. Roof Loads: Refer to drawings.
5. Seismic Loads: Refer to drawings.
6. Wind Loads: Refer to drawings.

7. Design precast structural concrete framing system and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live-load deflection, shrinkage and creep of primary building structure, and other building movements. Maintain precast structural concrete deflections within limits of ACI 318 (ACI 318M).

8. Fire-Resistance Rating: Select material and minimum thicknesses to provide indicated

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.

C. Shop Drawings: Include member locations, plans, elevations, dimensions, shapes and sections, openings, support conditions, and types of reinforcement, including special reinforcement. Detail fabrication and installation of precast structural concrete units.

1. Indicate joints, reveals, and extent and location of each surface finish.
2. Indicate separate face and backup mixture locations and thicknesses.
3. Indicate welded connections by AWS standard symbols. Show size, length, and type of each weld.
4. Detail loose and cast-in hardware, lifting and erection inserts, connections, and joints.
5. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
6. Include and locate openings larger than by 10 inches.
7. Indicate location of each precast structural concrete unit by same identification mark placed on panel.
8. Indicate relationship of precast structural concrete units to adjacent materials.
9. Indicate locations and details of corner units and special shapes, and joint treatment.
10. Indicate locations and details of stone facings, anchors, and joint widths.
11. Indicate shim sizes and grouting sequence.
12. Design Modifications: If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.

D. Delegated-Design Submittal: For precast structural concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator and testing agency.

B. Welding certificates.

C. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Reinforcing materials
3. Admixtures.
4. Bearing pads.
5. Structural-steel shapes and hollow structural sections.

D. Material Test Reports: For aggregates.

E. Source quality-control reports.

F. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm that assumes responsibility for engineering precast structural concrete units to comply with performance requirements. Responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Installer Qualifications: A precast concrete erector qualified to erect Category S1 - Simple Structural Systems.

C. Installer Qualifications: An experienced precast concrete erector who performs work in accordance with PCI MNL 127, "PCI Erector's Manual - Standards and Guidelines for the Erection of Precast Concrete Products."

D. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

E. Design Standards: Comply with ACI 318 and design recommendations in PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of precast structural concrete units indicated.

F. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 116, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products."

G. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D.1.1M, "Structural Welding Code - Steel."
2. AWS D1.4, "Structural Welding Code - Reinforcing Steel."

H. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Support units during shipment on nonstaining shock-absorbing material in same position as during storage.

B. Store units with adequate bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.

1. Store units with dunnage across full width of each bearing point unless otherwise indicated.
2. Place adequate dunnage of even thickness between each unit.
3. Place stored units so identification marks are clearly visible, and units can be inspected.

C. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses that would cause cracking or damage.

D. Lift and support units only at designated points shown on Shop Drawings.

1.9 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction before starting that Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Fabricators: Subject to compliance with requirements, available fabricators offering products that may be incorporated into the Work include.

2.2 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that will provide continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

1. Mold-Release Agent: Commercially produced liquid-release agent that will not bond with, stain or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.

B. Surface Retarder: Chemical set retarder, capable of temporarily delaying final hardening of newly placed concrete mixture to depth of reveal specified.

2.3 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars in place according to PCI MNL 116.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II, gray, unless otherwise indicated.

1. For surfaces exposed to view in finished structure, mix gray with white cement, of same type, brand, and mill source.

B. Supplementary Cementitious Materials:

1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
2. Metakaolin Admixture: ASTM C 618, Class N.
3. Silica Fume Admixture: ASTM C 1240, with optional chemical and physical requirement.
4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

C. Normal-Weight Aggregates: Except as modified by PCI MNL 116, ASTM C 33, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.

1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.

    a. Gradation: To match design reference sample.

2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand of same material as coarse aggregate unless otherwise approved by Architect.

D. Coloring Admixture: ASTM C 979, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.

E. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 116.

F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

1. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
5. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
6. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
7. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M.

2.5 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.

B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or B, with arc shields and with minimum mechanical properties of PCI MNL 116.

C. Carbon-Steel Plate: ASTM A 283/A 283M.

D. Malleable-Iron Castings: ASTM A 47/A 47M.

E. Carbon-Steel Castings: ASTM A 27/A 27M, Grade 60-30.

F. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.

G. Carbon-Steel Structural Tubing: ASTM A 500, Grade B.

H. Wrought Carbon-Steel Bars: ASTM A 675/A 675M, Grade 65.

I. Deformed-Steel Wire or Bar Anchors: ASTM A 496 or ASTM A 706/A 706M.

J. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A; carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563; and flat, unhardened steel washers, ASTM F 844.

K. High-Strength Bolts and Nuts: ASTM A 325 or ASTM A 490, Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563; and hardened carbon-steel washers, ASTM F 436.

   1. Do not zinc coat ASTM A 490 bolts.

L. Shop-Primed Finish: Prepare surfaces of nongalvanized-steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3, and shop apply lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79 according to SSPC-PA 1.

M. Welding Electrodes: Comply with AWS standards.

N. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install precast structural concrete units.

2.6 BEARING PADS

A. Provide one of the following bearing pads for precast structural concrete units as recommended by precast fabricator for application:

   1. Elastomeric Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, 50 to 70 Shore, Type A durometer hardness, ASTM D 2240; minimum tensile strength 2250 psi, ASTM D 412.

2.7 GROUT MATERIALS

A. Sand-Cement Grout: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.

C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C 881/C 881M, of type, grade, and class to suit requirements.

2.8 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.

1. Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
2. Limit use of fly ash to 25 percent replacement of portland cement by weight and granulated blast-furnace slag to 40 percent of portland cement by weight; metakaolin and silica fume to 10 percent of portland cement by weight.

B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at precast structural concrete fabricator's option.

C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 116 when tested according to ASTM C 1218/C 1218M.

D. Normal-Weight Concrete Mixtures: Proportion face and backup mixtures or full-depth mixtures, at fabricator's option by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi, unless noted otherwise.
2. Maximum Water-Cementitious Materials Ratio: 0.45.

E. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to PCI MNL 116.

F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 116.

G. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

H. Concrete Mix Adjustments: Concrete mix design adjustments may be proposed if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant.

2.9 MOLD FABRICATION

A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.

1. Place form liners accurately to provide finished surface texture indicated. Provide solid backing and supports to maintain stability of liners during concrete placement. Coat form liner with form-release agent.

B. Maintain molds to provide completed precast structural concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.

1. Form joints are not permitted on faces exposed to view in the finished work.
2. Edge and Corner Treatment: Uniformly chamfered.

2.10 FABRICATION

A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

1. Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."

B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing precast structural concrete units to supporting and adjacent construction.

C. Cast-in reglets, slots, holes, and other accessories in precast structural concrete units as indicated on the Contract Drawings.

D. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.

E. Reinforcement: Comply with recommendations in PCI MNL 116 for fabricating, placing, and supporting reinforcement.

1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete.
2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.

3. Place reinforcement to maintain at least 3/4-inch minimum coverage. Increase cover requirements according to ACI 318 when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
4. Place reinforcing steel to maintain at least 1-inch minimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches (38 mm) when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
5. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.

F. Reinforce precast structural concrete units to resist handling, transportation, and erection stresses.

G. Comply with requirements in PCI MNL 116 and in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

H. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.

I. Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast concrete units.

1. Place backup concrete mixture to ensure bond with face-mixture concrete.

J. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air on surfaces. Use equipment and procedures complying with PCI MNL 116.

1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants."

K. Comply with PCI MNL 116 procedures for hot-weather concrete placement.

L. Identify pickup points of precast structural concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each precast structural concrete unit on a surface that will not show in finished structure.

M. Cure concrete, according to requirements in PCI MNL 116, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

N. Discard and replace precast structural concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 116 and meet Architect's approval.

2.11 CASTING INSULATED WALL PANELS

A. Cast and screed wythe supported by mold.

B. Place insulation boards abutting edges and ends of adjacent boards. Insert wythe connectors through insulation, and consolidate concrete around connectors according to connector manufacturer's written instructions.

C. Cast and screed top wythe to meet required finish.

2.12 FABRICATION TOLERANCES

A. Fabricate precast structural concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished unit complies with PCI MNL 116 product dimension tolerances.

2.13 COMMERCIAL FINISHES

A. Commercial Grade: Remove fins and large protrusions and fill large holes. Rub or grind ragged edges. Faces must have true, well-defined surfaces. Air holes, water marks, and color variations are permitted. Limit form joint offsets to 3/16 inch.

B. Standard Grade: Normal plant-run finish produced in molds that impart a smooth finish to concrete. Surface holes smaller than 1/2 inch caused by air bubbles, normal color variations, form joint marks, and minor chips and spalls are permitted. Fill air holes greater than 1/4 inch in width that occur more than once per 2 sq. in. Major or unsightly imperfections, honeycombs, or structural defects are not permitted. Limit joint offsets to 1/8 inch.

C. Grade B Finish: Fill air pockets and holes larger than 1/4 inch in diameter with sand-cement paste matching color of adjacent surfaces. Fill air holes greater than 1/8 inch in width that occur more than once per 2 sq. in. Grind smooth form offsets or fins larger than 1/8 inch. Repair surface blemishes due to holes or dents in molds. Discoloration at form joints is permitted.

D. Grade A Finish: Fill surface blemishes with the exception of air holes 1/16 inch in width or smaller, and form marks where the surface deviation is less than 1/16 inch. Float apply a neat cement-paste coating to exposed surfaces. Rub dried paste coat with burlap to remove loose particles. Discoloration at form joints is permitted. Grind smooth all form joints.

E. Screed or float finish unformed surfaces. Strike off and consolidate concrete with vibrating screeds to a uniform finish. Hand screed at projections. Normal color variations, minor indentations, minor chips, and spalls are permitted. Major imperfections, honeycombing, or defects are not permitted.

F. Smooth, steel trowel finish unformed surfaces. Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth, uniform finish.

G. Apply roughened surface finish according to ACI 318 to precast concrete units that will receive concrete topping after installation.

2.14 COMMERCIAL ARCHITECTURAL FINISHES

A. Manufacture member faces free of joint marks, grain, and other obvious defects with corners, including false joints, uniform, straight, and sharp. Finish exposed-face surfaces of precast concrete units to per the Architect's approval and as follows:
   1. PCI's "Architectural Precast Concrete - Color and Texture Selection Guide," of plate numbers indicated.
   2. Smooth-Surface Finish: Provide surfaces free of excessive air voids, sand streaks, and honeycombs, with uniform color and texture.
   3. Textured-Surface Finish: Impart by form liners or inserts to provide surfaces free of pockets, streaks, and honeycombs, with uniform color and texture.
   4. Bushhammer Finish: Use power or hand tools to remove matrix and fracture coarse aggregates.
   5. Exposed-Aggregate Finish: Use chemical-retarding agents applied to concrete molds and washing and brushing procedures to expose aggregate and surrounding matrix surfaces after form removal.
   6. Abrasive-Blast Finish: Use abrasive grit, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces.
   7. Acid-Etched Finish: Use acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Protect hardware, connections, and insulation from acid attach.
   8. Honed Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures.
   9. Polished Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures.
   10. Sand-Embedment Finish: Use selected stones placed in a sand bed in bottom of mold, with sand removed after curing.

2.15 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate precast structural concrete fabricator's quality-control and testing methods.

   1. Allow testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.

B. Testing: Test and inspect precast structural concrete according to PCI MNL 116 requirements.

   1. Test and inspect self-consolidating concrete according to PCI TR-6.

C. Strength of precast structural concrete units will be considered deficient if units fail to comply with ACI 318 requirements for concrete strength.

D. If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 requirements, employ a qualified testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42/C 42M.

1. A minimum of three representative cores will be taken from units of suspect strength, from locations directed by Architect.
2. Cores will be tested in an air-dry condition or, if units will be wet under service conditions, test cores after immersion in water in a wet condition.
3. Strength of concrete for each series of 3 cores will be considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
4. Test results will be made in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports will include the following:

    a. Project identification name and number.
    b. Date when tests were performed.
    c. Name of precast concrete fabricator.
    d. Name of concrete testing agency.
    e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.

E. Patching: If core test results are satisfactory and precast structural concrete units comply with requirements, clean and dampen core holes and solidly fill with same precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.

F. Defective Units: Discard and replace precast structural concrete units that do not comply with requirements, including strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Do not install precast concrete units until supporting, cast-in-place, building structural framing has attained minimum allowable design compressive strength or until supporting steel or other structure is complete.

3.2 INSTALLATION

A. Install clips, hangers, bearing pads, and other accessories required for connecting precast structural concrete units to supporting members and backup materials.

B. Erect precast structural concrete level, plumb, and square within specified allowable tolerances. Provide temporary structural framing, supports, and bracing as required to maintain position, stability, and alignment of units until permanent connection.

1. Install temporary steel or plastic spacing shims or bearing pads as precast structural concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
3. Remove projecting lifting devices and grout fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.
4. For hollow-core slab voids used as electrical raceways or mechanical ducts, align voids between units and tape butt joint at end of slabs.

C. Connect precast structural concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.

1. Do not permit connections to disrupt continuity of roof flashing.

D. Field cutting of precast units is not permitted without approval of the Architect.

E. Fasteners: Do not use drilled or powder-actuated fasteners for attaching accessory items to precast, prestressed concrete units.

F. Welding: Comply with applicable AWS D1.1/D1.1M and AWS D1.4 for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.

1. Protect precast structural concrete units and bearing pads from damage by field welding or cutting operations, and provide noncombustible shields as required.
2. Clean weld-affected steel surfaces with chipping hammer followed by brushing, and apply a minimum 4.0-mil- thick coat of galvanized repair paint to galvanized surfaces according to ASTM A 780.
3. Clean weld-affected steel surfaces with chipping hammer followed by brushing, and reprime damaged painted surfaces.
4. Remove, reweld, or repair incomplete and defective welds.

G. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.

1. Where slotted connections are used, verify bolt position and tightness. For sliding connections, properly secure bolt but allow bolt to move within connection slot. For friction connections, apply specified bolt torque and check 25 percent of bolts at random by calibrated torque wrench.

H. Grouting: Grout connections and joints and open spaces at keyways, connections, and joints where required or indicated on Shop Drawings. Retain grout in place until hard enough to support itself. Pack spaces with stiff grout material, tamping until voids are completely filled.

1. Place grout to finish smooth, level, and plumb with adjacent concrete surfaces.
2. Fill joints completely without seepage to other surfaces.

3. Trowel top of grout joints on roofs smooth and uniform. Finish transitions between different surface levels not steeper than 1 to 12.
4. Place grout end cap or dam in voids at ends of hollow-core slabs.
5. Promptly remove grout material from exposed surfaces before it affects finishes or hardens.
6. Keep grouted joints damp for not less than 24 hours after initial set.

3.3 ERECTION TOLERANCES

A. Erect precast structural concrete units level, plumb, square, true, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 135.

B. Minimize variations between adjacent slab members by jacking, loading, or other method recommended by fabricator and approved by Architect.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:

1. Erection of precast structural concrete members.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Field welds will be visually inspected and nondestructive tested according to ASTM E 165 or ASTM E 709. High-strength bolted connections will be subject to inspections.

D. Testing agency will report test results promptly and in writing to Contractor and Architect.

E. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.

F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

G. Prepare test and inspection reports.

3.5 REPAIRS

A. Repair precast structural concrete units if permitted by Architect.

1. Repairs may be permitted if structural adequacy, serviceability, durability, and appearance of units has not been impaired.

B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.

C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780.

D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.

E. Remove and replace damaged precast structural concrete units that cannot be repaired or when repairs do not comply with requirements as determined by Architect.

3.6 CLEANING

A. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.

B. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.

1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's written recommendations. Clean soiled precast concrete surfaces with detergent and water, using stiff fiber brushes and sponges, and rinse with clean water. Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 034100

SECTION 03732

CONCRETE REPAIRS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cementitious materials.

2. Reinforcement.

3. Epoxy mortar.

B. Related Documents:

1. The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section maybe found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-in-Place Concrete: Substrate for plaster.

1.2 DESCRIPTION OF WORK

A. The extent of concrete repair work is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing reinforcement, mortar, injection of epoxy, and finishing of repairs and patches in defective concrete, for a complete and finished installation.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials:

1. ASTM A 615 - Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

2 ASTM C 33 - Specification for Concrete Aggregates.

2. ASTM C 150 - Specification for Portland Cement.

3. ASTM C 882 - Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete By Slant Shear.

4. ASTM D 638 - Test Method for Tensile Properties of Plastics.

5. ASTM D 695 - Test Method for Compressive Properties of Rigid Plastics.

6. ASTM D 790 - Test Method for Flexural Properties of Unreinforced and

Reinforced Plastics and Electrical Insulating Materials.

C. Americans with Disabilities Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings an Facilities.

2. Accessibility Guidelines for Building Elements Designed for Children=s Use..

D. American Welding Society (AWS):

1. AWS D 1.4 **-** Structural Welding Code - Reinforcing Steel.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer's product specifications and application instructions for each material.

1.5 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

B. Applicator: Company experienced in concrete repairs with a minimum of five (5) years documented experience.

C. Single Source Responsibility: To the greatest extent possible, obtain cement plaster materials from a single manufacturer and source.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in the manufacturer=s original, new, unopened packages or containers, bearing the manufacturer=s name, and brand name.

B. Store materials inside, under cover, and in manner to keep dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, damage from construction traffic and other causes, and away from damp floors, walls and other surfaces.

1.7 JOB CONDITIONS

A. Protect adjacent work from soiling, spattering, moisture deterioration and other harmful effects which might result from the repair work.

B. Protect plaster from uneven and excessive evaporation during hot, dry weather, and strong wind currents.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cleaning Agent: Commercial muriatic acid.

B. Bonding Agent: Polyvinyl acetate emulsion, dispersed in water while mixing, non-coagulant in mix, water resistant when cured.

C. Portland Cement: ASTM C 150, Type II, gray color.

D. Sand: ASTM C 33, clean.

E. Water: Potable, with no brackishness.

F. Epoxy Resin: Two-part epoxy adhesive containing 100% solids, meeting the following minimum characteristics:

Characteristics	Test Method	Results
Bond Strength	ANSI / ASTM C 882	2,700 psi
Tensile Strength	ASTM D 638	6,600 psi
Elongation	ASTM D 638	2% at 7 days at 70E F
Flexural Strength	ASTM D 790	8,000 psi
Compressive Strength	ASTM D 695	6,500 psi

2.2 REINFORCEMENT

A. Reinforcing Steel: 60 ksi yield grade, deformed billet-steel bars, un-coated, ASTM A 615.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 GENERAL REQUIREMENTS

A. Defects in the work due to defective workmanship and / or materials furnished and installed hereunder, shall be repaired and refinished with materials and in a manner to meet the requirements of this Section.

3.3 PREPARATION

A. Clean concrete surfaces of dirt, laitance, corrosion and other contaminants. Wire brush using water. Rinse surfaces and allow to dry.

B. Flush out cracks and voids with water to remove laitance and dirt.

C. Provide temporary entry ports spaced to accomplish movements of fluids between ports no deeper than the depth of the crack to be filled. Limit port size diameter to no greater than the thickness of the crack. Provide a temporary seal at the concrete surface to prevent leakage of the adhesive.

D. For areas patched with epoxy mortar, remove broken and soft concrete to a depth of 1/4". Remove corrosion from steel. Clean surfaces mechanically and rinse with water.

E. Sandblast clean exposed reinforcement steel surfaces. Mechanically cut away damaged portions of the reinforcement.

F. Repair reinforcement by welding new bar reinforcement to the existing reinforcement with sleeve splices. The strength of welded splices and reinforcement to exceed the original stress values.

3.4 MIXING CEMENTITIOUS MATERIALS

A. Mix cementitious mortar in accordance with the manufacturer=s instructions for the purpose intended. Include bonding agent as an additive to the mix.

3.5 APPLICATION, CEMENTITIOUS MORTAR

A. Apply a coat of bonding agent to dry concrete surfaces; provide full surface coverage.

B. Apply cementitious mortar by steel trowel to an average thickness of 3/8". Tamp into place filling voids at spalled areas. Work the mix into thickness.

C. Damp cure cementitious mortar and grout for four (4) days.

3.6 MIXING EPOXY MORTARS

A. Mix epoxy mortars in accordance with the manufacturer=s instructions for the purpose intended. Mix components in clean equipment or containers. Do not exceed the pot life and workability limits.

3.7 APPLICATION, EPOXY MORTAR

A. Trowel apply mortar mix to an average thickness of 1/2". Tamp into place filling voids at spalled areas.

B. For patching honeycombs, trowel mortar onto the surface and work into the honeycomb to bring the surface flush with the surrounding areas. Finish trowel patched surfaces to match the surrounding surfaces.

C. Cover exposed steel reinforcement with epoxy mortar, feather edges to flush with the adjacent surfaces.

3.8 INJECTION, EPOXY RESIN ADHESIVE

A. Inject adhesive into prepared ports under pressure using equipment appropriate for the particular application.

B. Begin injection at lower entry port and continue until adhesive appears in the adjacent entry port. Continue from port to port until the entire crack has been filled.

C. Remove the temporary seal and excessive adhesive.

D. Clean surfaces adjacent to the repair and blend the finish to match the adjacent surfaces.

3.9 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Make adjustments necessary to eliminate high spots and depressions.

3.10 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the applied work for level, plumb, flush, and secure bond to substrates.

3.8 FINISH

A. Finished repaired surfaces must match the finish, texture and plane of adjacent surfaces.

END OF SECTION

SECTION 05120

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

B. Related Sections:

1. Section 01400 "Quality Requirements" for independent testing agency procedures and administrative requirements.
2. Section 05310 "Steel Decking" for field installation of shear connectors through deck.
3. Section 05500 "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.
4. Section 09900 "Painting" for surface-preparation and priming requirements.

1.3 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using details indicated.
2. Use LRFD; data are given at factored-load level.

B. Moment Connections: Type FR, fully restrained.

C. Construction: Shear wall system.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
5. Identify members and connections of the seismic-load-resisting system.
6. Indicate locations and dimensions of protected zones.
7. Identify demand critical welds.
8. For structural-steel connections indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and testing agency.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Mill test reports for structural steel, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength bolt-nut-washer assemblies.
4. Shear stud connectors.
5. Shop primers.
6. Nonshrink grout.

F. Source quality-control reports.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.

C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P2 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

E. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 341 and AISC 341s1.
3. AISC 360.
4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

F. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.9 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. Angles Shapes: ASTM A 36/A 36M

B. Plate and Bar: ASTM A 36/A 36M Retain first paragraph below for corrosion-resisting (weathering) structural steel and indicate locations on Drawings.

C. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.

1. Weight Class: Extra strong
2. Finish: Galvanized

D. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating
2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with mechanically deposited zinc coating finish.

B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hexhead assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Mechanically deposited zinc coating.

C. Headed Anchor Rods: ASTM F 1554, Grade 55, weldable straight.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C

D. Threaded Rods: ASTM A 36/A 36M

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
3. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C

2.3 PRIMER

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Primer: Comply with Section 09900 "Painting". Primer in first paragraph below requires SSPC-SP 2 surface preparation or better and 24 hours' drying before recoating. Type II has lower VOC content than Type I.

C. Primer: SSPC-Paint 25, Type II, zinc oxide, alkyd, linseed oil primer.

D. Primer: SSPC-Paint 25 BCS Type II, zinc oxide, alkyd, linseed oil primer.

E. Primer: SSPC-Paint 23, latex primer.

F. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

G. Galvanizing Repair Paint: ASTM A 780

2.4 GROUT

A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning" Retain first paragraph below if shear connectors are shop installed to structural steel.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened

B. Weld Connections: Comply with AWS D1.1/D1.1Mand AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."

2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
5. SSPC-SP 14/NACE No. 8, "Industrial Blast Cleaning."
6. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
7. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."
8. SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning."
9. SSPC-SP 8, "Pickling."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Prepare steel and apply a one-coat, non-asphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.

2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedment for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedment showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.

4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 PREFABRICATED BUILDING COLUMNS

A. Install prefabricated building columns to comply with AISC 360, manufacturer's written recommendations, and requirements of testing and inspecting agency that apply to the fire-resistance rating indicated.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds.

B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.

1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

    a. Liquid Penetrant Inspection: ASTM E 165.
    b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    c. Ultrasonic Inspection: ASTM E 164.
    d. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.7 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 09900 "Painting ".

END OF SECTION 05120

SECTION 05210

STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. LH- series long-span steel joists.
   2. Joist girders.
   3. Joist accessories.

B. Related Requirements:

   1. Section 03300 "Cast-in-Place Concrete" for installing bearing plates in concrete.
   2. Section 05120 "Structural Steel Framing" for field-welded shear connectors.

1.3 DEFINITIONS

A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of joist, accessory, and product.

B. Shop Drawings:

   1. Include layout, designation, number, type, location, and spacing of joists.
   2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
   3. Indicate locations and details of bearing plates to be embedded in other construction.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer

B. Welding certificates.

C. Manufacturer certificates.

D. Mill Certificates: For each type of bolt.

E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications"]

1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications[."]

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.8 SEQUENCING

A. Deliver steel bearing plates to be built into cast-in-place concrete construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

1. Use ASD; data are given at service-load level
2. Design special joists to withstand design loads with live-load deflections no greater than the following:
   a. Roof Joists: Vertical deflection of 1/240 of the span.

2.2 LONG-SPAN STEEL JOISTS

A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series " in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows:

1. Joist Type: LH-series steel joists
2. End Arrangement: Square.
3. Top-Chord Arrangement: Parallel

B. Provide holes in chord members for connecting and securing other construction to joists.

C. Camber long-span steel joists according to SJI's "Specifications."

D. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.3 JOIST GIRDERS

A. Manufacture joist girders according to "Standard Specifications for Joist Girders" in SJI's "Specifications," with steel-angle top- and bottom-chord members; with end and top-chord arrangements as follows

1. End Arrangement: Square.
2. Top-Chord Arrangement: Parallel

B. Provide holes in chord members for connecting and securing other construction to joist girders.

C. Camber joist girders according to SJI's "Specifications

D. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.4 PRIMERS

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

C. Primer: Provide shop primer that complies with Section 09900 "Painting."

2.5 JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated. Shop prime paint

C. Steel bearing plates with integral anchorages are specified in Section 05500 "Metal Fabrications."

D. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface unless otherwise indicated.

E. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts, and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C

F. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

G. Welding Electrodes: Comply with AWS standards.

H. Galvanizing Repair Paint: ASTM A 780.

I. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.6 CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2power-tool cleaning, SSPC-SP 3

B. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

C. Shop priming of joists and joist accessories is specified in Painting" and Section 09900 "Painting."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's “Specifications” joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads are applied.

C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts.

E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with Research Council on Structural Connection's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

F. Install and connect bridging concurrently with joist erection before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and to perform field tests and inspections and prepare test and inspection reports.

B. Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, as applicable:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709.
c. Ultrasonic Testing: ASTM E 164.

C. Visually inspect bolted connections.

D. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

E. Perform additional testing to determine compliance of corrected Work with specified requirements.

3.4 PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists bearing plates, abutting structural steel, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2, or power-tool cleaning according to SSPC-SP 3.
2. Apply a compatible primer of same type as primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 099123 "Interior Painting."

D. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 05210

SECTION 05310

STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. .
   2. Composite Roof deck.

B. Related Requirements:

   1. Section 03300 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.
   2. Section 05120 "Structural Steel Framing" for shop- and field-welded shear connectors.
   3. Section 05500 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
   4. Section 09900 "Painting" for repair painting of primed deck and finish painting of deck.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings:

   1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product Certificates: For steel deck.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

   1. Power-actuated mechanical fasteners.

D. Evaluation Reports: For steel deck.

E. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ROOF DECK

A. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ASC Profiles, Inc.; a Blue Scope Steel company.
2. Canam United States; Canam Group Inc.
3. CMC Joist & Deck.
4. Consolidated Systems, Inc.; Metal Dek Group.
5. Cordeck.
6. DACS, Inc.
7. Epic Metals Corporation.
8. Marlyn Steel Decks, Inc.
9. New Millennium Building Systems, LLC.
10. Nucor Corp.; Vulcraft Group.

11. Roof Deck, Inc.
12. Valley Joist; Subsidiary of EBSCO Industries, Inc.
13. Verco Manufacturing Co.
14. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

2.3 COMPOSITE ROOFDECK

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ASC Profiles, Inc.; a Blue Scope Steel company.
2. Canam United States; Canam Group Inc.
3. CMC Joist & Deck.
4. Consolidated Systems, Inc.; Metal Dek Group.
5. Cordeck.
6. DACS, Inc.
7. Epic Metals Corporation.
8. Marlyn Steel Decks, Inc.
9. New Millennium Building Systems, LLC.
10. Nucor Corp.; Vulcraft Group.
11. Roof Deck, Inc.
12. Verco Manufacturing Co.
13. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

B. Composite Roof Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G90 (Z275) zinc coating.
2. Profile Depth: 1-1/2 inches (38 mm)
3. Design Uncoated-Steel Thickness: 0.0358 inch (0.91 mm)
4. Span Condition: Triple span or more.

2.4 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.

I. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0747 inch (1.90 mm) thick, with factory-punched hole of 3/8-inch (9.5-mm) minimum diameter.

J. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.

K. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3-inch- (76-mm-) wide flanges and level recessed pans of 1-1/2-inch (38-mm) minimum depth. For drains, cut holes in the field.

L. Galvanizing Repair Paint: ASTM A 780

M. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by mechanical fasteners or arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows:

1. Weld Diameter: 5/8-inch (16 mm) Hilti:-X-EDN 19 Deck pin at each rib to frame nominal.
2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space fasteners or welds as indicated.
3. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 18 inches (457 mm) [and as follows:

1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
2. Mechanically clinch or button punch.
3. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (51 mm) minimum

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld or [mechanically fasten flanges to top of deck. Space welds or mechanical fasteners not more than 12 inches (305 mm) apart with at least one weld or fastener at each corner.

1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FIELD QUALITY CONTROL

A. Testing Agency - Engage a qualified testing agency to perform tests and inspections.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.5 PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation and apply repair paint.

1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Section 09900 "Painting".

C. Repair Painting: Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Section 09900 "Painting".

D. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05310

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Steel framing and supports for applications where framing and supports are not specified in other Sections.

B. Products furnished, but not installed, under this Section:
   1. Post installed anchor bolts for cast-in-place concrete.,
   2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Sections:

   1. Section 03300 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.

D. Shop Drawings: Show fabrication and installation details for metal fabrications.

   1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.6 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A 500, cold-formed steel tubing.

2.3 FASTENERS

A. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers.

B. Post-Installed Anchors: Torque-controlled expansion anchors.
   1. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Primers: Provide primers that comply with Section 09900 "Painting."

D. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 03300 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated, coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.7 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.8 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

1. Shop prime with primers specified in Section 09900 "Painting”.

C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09900 "Painting”.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05500

SECTION 05500

METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rough hardware.

2. Miscellaneous framing and supports.

3. Loose bearing and leveling plates.

4. Counters and equipment supports.

5. Miscellaneous steel trim.

6. Shelf and relieving angles.

7. Steel ladders.

8. Aluminum ladders.

9. Pipe bollards.

10. Metal bar gratings.

11. Cast-in-place stair nosings and thresholds.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachments.

2. Section 04230 - Reinforced Unit Masonry: Substrate for attachments.

3. Section 05520 - Steel Handrails and Railings: Inserts and anchorage for.

4. Section 05600 - Ornamental Metal Work: Inserts and anchorage for.

5. Section 07724 - Roof Hatch: Safety ladder post.

6. Section 09900 - Painting: Metal finishes.

7. Products Furnished But Not Installed Under this Section: Inserts and anchors preset in masonry and concrete for anchorage of metal work.

1.2 DESCRIPTION OF WORK

A. The extent of metal fabrications is indicated on the Drawings, schedules and as specified

herein, and includes providing, fabricating and installing items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not structural steel or other metal systems specified elsewhere herein.

B. All light iron and miscellaneous metal work not specified under another Section, but required for the work shall be provided under this Section whether or not specifically referred to herein.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Institute of Steel Construction (AISC):

1. Specification for Structural Steel for Buildings.

C. American National Standards Institute (ANSI):

1. ANSI B18.5 - Round Head Bolts (Inch Series).

2. ANSI B18.6.1 - Wood Screws (Inch Series).

D American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

E. American Society for Testing and Materials (ASTM):

1. ASTM A 27 / A 27M - Specification for Steel Castings, Carbon, for General Application.

2. ASTM A 47 / A 47M - Specification for Ferritic Malleable Iron Castings.

3. ASTM A 48 / A 48M - Specification for Gray Iron Castings.

4. ASTM A 36 / A 36M - Specification for Carbon Structural Steel.

5. ASTM A 53 / A 53M - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

6. ASTM A 123 / A 123M - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

7. ASTM A 134 - Specification for Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and Over).

8. ASTM A 153 / A 153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

9. ASTM A 167 - Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

10. ASTM A 176 - Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip.

11. ASTM A 276 - Specification for Stainless Steel Bars and Shapes.

12. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

13. ASTM A 500 / A 500M - Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

14. ASTM A 501 - Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

15. ASTM A 568 / A 568M - Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

16. ASTM A 653 / A 653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

17. ASTM A 780 - Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

18. ASTM C 1107 / C 1107M - Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

19. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

20. ASTM E 935 - Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.

21. ASTM E 936 - Practice for Roof System Assemblies Employing Steel Deck, Preformed Roof Insulation, and Bituminous Built-Up Roofing.

F. American Welding Society (AWS):

1. AWS D1.1 / D1.1M - Structural Welding Code - Steel.

G. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

H. International Code Council:

1. International Building Code (IBC), 2009.

I. National Association of Architectural Metal Manufacturers (NAAMM):

1. Metal Finishes Manual for Architectural and Metal Products.

2. MBG 531 - Metal Bar Grating Manual.

3. MBG 532 - Heavy Duty Metal Bar Grating Manual.

4. MBG 533 - Welding Specification for Fabrication of Steel, Aluminum and Stainless Steel Bar Grating.

J. SSPC: The Society for Protective Coatings (formerly Structural Steel Painting Council):

1. SSPC Painting Manual.

2. SSPC PA 1 - Specification Procedure for Shop, Field and Maintenance Painting of Steel.

3. Paint 20 - Specification of Zinc-Rich Coating Type 1 - Inorganic and Type II - Organic.

4. SSPC SP 2 - Requirements for Hand Tool Cleaning of Steel Surfaces.

5. SSPC SP 3 - Requirements for Power Tool Cleaning of Steel Surfaces.

6. SSPC SP 6 - Standard for Commercial Blast Cleaning of Steel Surfaces.

7. SSPC SP 7 - Standard for Brush-Off Blast Cleaning of Steel Surfaces.

8. VIS 3 - Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand-Tool Cleaning.

1.4 DEFINITIONS

A. Custom Metal Fabrications: Metal fabrications custom built for a specific Project purpose.

B. Pre-Manufactured Metal Fabrications: Metal fabrications which are factory-fabricated for a specific architectural purpose. These products may require modification to meet the Project requirements, but their primary manufactured purpose is not altered.

C. Non-Structural Metal Fabrications: Metal work which has not been designed by the Project Structural Engineer, and which is not part of the Structural Engineer=s documents.

1.5 SYSTEM PERFORMANCE

A. Structural Performance: Provide assemblies which, when installed, comply with the following minimum requirements for structural performance, unless otherwise indicated.

1.6 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s specifications, anchor details and installation instructions for pre-manufactured products. Submit data indicting materials used in miscellaneous metal fabrications, including paint products and grout.

2. Shop Drawings:

a. Drawings for fabrication and erection of miscellaneous metal fabrications; including plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installations by others.

b. Where materials or fabrications are required to comply with requirements for design loadings, include structural computations, materials properties and other information for structural analysis. Prepare under the seal of a professional structural engineer for products requiring structural engineering to meet the Performance Requirements.

c. Include profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories, erection drawings, elevations,

welded connections using standard AWS welding symbols with net weld lengths.

d. Take field measurements prior to the preparation of Shop Drawings and prefabrication when possible. Allow for trimming and fitting where taking of field measurements before fabrication might delay construction.

3. Samples:

a. Submit representative samples of materials and finished products as requested by the Architect.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Fabricator: Company specializing in fabricating the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Performance Requirements:

1. Provide the capacity to withstand the following loading requirements for exterior units:

a. Design, fabricate and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D] and importance factor [1.0] [1.25] [1.5], as applicable per ASCE 7.

2. Provide assemblies which, when installed, comply with the following minimum requirements for structural performance, unless otherwise indicated.

a. Treads and Platforms of Steel Stairs: Capable of withstanding a uniform load of 100 pounds per square foot, or a concentrated load of 300 pounds so locates as to produce maximum stress conditions.

C. Take field measurements prior to the preparation of Shop Drawings and fabrication, where possible. Do not delay the construction. Allow for trimming and fitting when the taking of field measurements before fabrication might delay the work.

D. Pre-assemble items in the shop to the greatest extent possible, to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and a coordinated installation.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Protect materials from corrosion, deformation and other damage during delivery, storage and handling.

C. Deliver product to the Project Site in the fabricator=s original, unopened packages, containers or bundles.

D. Store and protect the materials with a weatherproof covering; ventilate to avoid condensation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness for fabrication of miscellaneous metal work which will be exposed to view.

B. Steel Plates, Angles, and Other Structural Shapes: ASTM A 36 / A 36M.

C. Steel Pipe: ASTM A 53 / A 53M. Type and grade (if applicable), as selected by the fabricator and as required for the design loading. Black finish, unless galvanizing is indicated. Standard weight (Schedule 40), unless otherwise indicated.

D. Galvanized Steel Pipe and Tube: ASTM A 53 / A 53M.

E. Steel Tubing: Cold-formed, ASTM A 500 / A 500M or hot-rolled, ASTM A 501.

F. Sheet Steel, Galvanized: ASTM A 123 / A 123M.

G. Sheet and Strip Steel, Hot-Rolled: ASTM A 568 / A 568M.

H. Structural Steel Sheet: Hot-rolled, ASTM A 134 or cold-rolled ASTM E 936, Class 1; of grade required for the design loading.

I. Galvanized Structural Steel Sheet: ASTM A 653 / A 653M, of grade required for the design loading. Coating designation as indicated, or if not indicated, G90.

J. Stainless Steel: AISI Type 304 for fumed and welded products. ASTM A 276 for base shapes and forging; ASTM A 167 or A 176 as best suited for plates, sheets and strip. Satin finish typical.

K. Gray Iron Castings: ASTM A 48, Class 30.

L. Malleable Iron Castings: ASTM A 47, grade as selected by the fabricator.

M. Steel Bar Grating: ASTM A 36 / A 36M or NAAMM MBG 531.

N. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as the supported fabrications.

O. Concrete Inserts. Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims, as required, hot-dip galvanized, ASTM A 153.

P. Non-Shrink, Non-Metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107 (formerly CE CRD-C621). POR-ROK Anchoring Cement by Minwax Co. division of Eastman Kodak Co., or approved equal. Comply with the manufacturer=s printed instructions.

Q. Welding Materials: AWS D1.1 / D1.1M. Type required for the materials being welded.

R. Anchors:

1. Threaded Type, Concrete Inserts: Galvanized malleable iron or cast steel capable of receiving 3/4" diameter machine bolts.

2. Slotted Type, Concrete Inserts: Welded box type, fabricated with a minimum 1/8" thick galvanized pressed steel plate with slots to receive 3/4" diameter square head bolts, and knockout cover.

3. Expansion Shield, Masonry Anchorage: FS FF-2-325.

4. Toggle Bolts: FS FF-B-588, type, class and style as required.

S. Fasteners:

1. Provide zinc-coated fasteners for exterior use or where built into exterior walls, Select fasteners for the type, grade and class required.

2. Bolts, Nuts and Washers at Interior Locations: ASTM A 307, Grade A, regular hexagon head.

3. Bolts, Nuts and Washers at Exterior Locations: ASTM A 307, galvanized per ASTM A 153.

4. Bolts, Round Head: ANSI B18.5.

5. Lag Bolts: Square head type, FS FF-B-561.

6. Plain Washers: Round, carbon steel, FS FF-W-92.

7. Lock Washers: Helical spring type, carbon steel, FS FF-W-84.

8. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.

9. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.

10. Machine Screws: Cadmium plated steel, FS FF-S-92.

11. Wood Screws: Flat head carbon steel, FS FF-S-111.

T. Primers:

1. Primer for Field Painting: Provide one of the following:

a. No. 99 Red Primer by Tnemec Co.

b. Ceco No. 15 Primox by Chessman-Elliot Company.

c. No. 7-C-19 by Rowe Products, Inc.

2. Touch-Up Primer for Galvanized Surfaces: High zinc dust content paint for re-galvanizing welds in galvanized steel, complying with SSPC-Paint-20 and ASTM A 780.

3. Section 01600 - Product Requirements: Product options and substitutions: Substitutions: Permitted.

U. Concrete Fill:

1. Concrete Materials and Properties: Comply with the requirements of Division 3 Sections for normal weight, ready-mix concrete with minimum 28-day compressive strength of 4,000 psi, 440 pounds cement per cubic yard, minimum, and a W/C ration of 0.65, maximum, unless higher strength is indicated.

2. Non-Slip Aggregate Finish: Factory-graded, packaged material containing fused aluminum oxide grits or crushed emery as abrasive aggregate; rust-proof and non-glazing; unaffected by moisture and cleaning materials.

2.2 ROUGH HARDWARE

A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Sections of Division 6.

B. Fabricate items to the sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.3 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports for the applications indicated, or which are not a part of the structural steel framework, as required to complete the work.

B. Fabricate miscellaneous units to the sizes, shapes, and profiles indicated or, if not indicated, of the required dimensions to receive adjacent other construction retained by framing and supports. Except as otherwise indicated, fabricate from structural steel shapes, plates, and steel bars, of welded construction using mitered joints for field connections. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Equip units with integrally welded anchors for casting into concrete or building into masonry.

2. Furnish inserts if units must be installed after concrete has been placed.

3. Except as otherwise indicated, space anchors and inserts 16" o.c., and provide the minimum number of anchor units in the form of steel straps 1-1/4" wide x 8" long.

2.4 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on concrete or masonry construction, made flat, free from warp and twist, and of the required thickness and bearing area. Drill plats to receive anchor bolts and for grouting, as required. Galvanize after fabrication.

2.5 MISCELLANEOUS STEEL TRIM

A. Provide shapes and sizes indicated for the profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages as required for the coordination of assembly and installation with other work.

B. Hot-dip galvanize miscellaneous framing and supports in exterior locations and where indicated.

2.6 SHELF AND RELIEVING ANGLES

A. Provide structural steel shelf and relieving angles of the sizes indicated for attachment to concrete farming. Provide slotted holes to receive 3/4" bolts, spaced not more than 6" from the ends and at not more than 24" o.c., unless otherwise indicated.

B. Hot-dip galvanize shelf angles to be installed on exterior concrete framing.

C. Furnish wedge-type concrete inserts, complete with fasteners, for attachment of shelf and angles to cast-in-place concrete.

2.7 STEEL LADDERS

A. Comply with OSHA, and the requirements of other agencies having jurisdiction.

B. Fabricate ladders for the locations shown, with dimensions, spacings, details and anchorages as indicated.

C. Wall Ladders: All steps / rungs shall be non-slip serrated treads or by coating of the rungs with aluminum oxide granules set in epoxy resin adhesive, or by using a manufactured rung filled with aluminum oxide grout. Hot-dip galvanize all ladders, brackets, and fasteners. Adhesive-applied coating strips are not acceptable.

1. Siderails: Continuous steel flat bars, with eased edges, 1/2@ x 2-1/2"; 18" apart.

2. Bar Rungs: Round steel bars, 3/4"diameter, spaced 12" o.c., unless otherwise noted.

3. Fit rungs at the centerline of side rails, plug weld and grind smooth on the outer rail faces.

4. Support ladders at the top and bottom, and at intermediate points spaced not more than 5'-0" o.c. by means of welded or bolted steel brackets.

5. Size brackets to support the design dead and live loads required, and to hold the centerline of the ladder rungs clear of the wall surface by not less than 7".

D. Provide safety post in accordance with Section 07724 - Roof Hatch.

2.8 ALUMINUM LADDERS

A. Wall Ladders: Aluminum, all welded; standard duty channel or tube shape rails; rungs 24" wide, spaced at 12" o.c., deep serrated aluminum, carry 1,000 pounds load without deformation or failure; aluminum pipe handrails not less than 1-1/2" in diameter with end caps; mill finish; standard wall mounting brackets.. OSHA / ANSI A14.3 compliant. Model 500 as manufactured by O=Keeffe=s Inc. or approved equal.

B. Ship Ladder: Aluminum, all welded; standard duty channel or tube shape rails; rungs 24" wide, spaced at 12" o.c., deep serrated aluminum, carry 1,000 pounds load without deformation or failure; aluminum pipe handrails not less than 1-1/2" in diameter with end caps; mill finish; standard wall mounting brackets; incline as shown on the Drawings. OSHA / ANSI A14.3 compliant. Model 520 as manufactured by O=Keeffe=s Inc. or approved equal.

2.9 PIPE BOLLARDS

A. Fabricate pipe bollards from Schedule 80 galvanized steel pipe.

B. Fabricate sleeves for bollard anchorage from galvanized steel pipe with 1/4" thick steel plate welded to the bottom of the sleeve.

2.10 METAL BAR GRATINGS

A. Provide close mesh bar gratings using bars of the type, material, sizes, spacing and construction indicated, or if not indicated, to support the truck loadings indicated. Comply with the AStandard Specifications for Metal Bar Grating and Metal Bar Grating Treads@ portion of the NAAMM, AMetal Bar Grating Manual@.

B. Material: Steel.

C. Type Grating: Welded.

D. Bearing Bars: Size and shape as required by the anticipated loading.

E. Cross Bars: Rectangular. Provide true alignment and equal spacing of the cross bars by notching the bearing bars prior to welding. Do not notch the bearing bars at supports to maintain elevation.

F. Traffic Surface: Plain.

G. Edge Band openings in the grating which interrupt four or more bearing bars with bars of the same size and material as the bearing bars.

H. Steel Finish: Hot-dip galvanized with a coating of not less than 1.5 oz. per square foot of coated surface.

2.11 METAL STAIR NOSINGS

A. Material: Cast aluminum with hatched aluminum abrasive surface, 1/4" nosing lip x 3" minimum depth, embedded; one piece the full width of stair treads and landings.

B. Manufacturers:

1. DSA3 by American Safety Technologies.

2. Style 3511 by American Safety Tread Co.

3. Type 231 by Wooster Products Inc.

4. Section 01600 - Product Requirements: Product options and substitutions: Substitutions: Permitted.

2.12 FABRICATION

A. Fabricate steel items according to the approved Shop Drawings and to the applicable portions of AISC Specifications.

B. Pre-assemble products in the shop to the greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assemble and installation.

C. For fabrications exposed to view, use materials which are smooth and free of surface

blemishes including pitting, seam marks, roller marks, roller trade names and roughness. Remove blemishes by grinding or by welding and grinding prior to cleaning, treating and the application of surface finishes, including zinc coating.

D. Workmanship: Use materials of the size and thickness indicated or, if not indicated, as required to produce the strength and durability in the finished products for the intended use. Work to the dimensions indicated or accepted on the Shop Drawings, using proven details of fabrication and support. Use the type of materials indicated or specified.

E. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Fabricate items with joints tightly fitted and secured. Make exposed joints butt tight, flush and hairline. Ease exposed edges to a radius of approximately 1/32", unless otherwise indicated. Form bent-metal corners to the smallest radius possible, without causing grain separation or otherwise impairing the work.

F. Conceal welds where possible. Weld corners and seams continuously, complying with AWS and the Building Code. At exposed connections, grind the exposed welds smooth and flush to match and blend with the adjoining surfaces.

G. Form exposed connections with hairline joints, flush and smooth using concealed fasteners wherever possible. Use exposed fasteners of the type indicated or, if not indicated, Phillips flat-head (countersunk) screws, or bolts.

H. Exposed Mechanical Fastenings: Flush countersunk screws and bolts, unobtrusively located, except where specifically noted otherwise; consistent with the design.

I. Provide anchorage of the type indicated, coordinated with the supporting structure. Fabricate and space anchoring devices to provide adequate support for the intended use. Fabricate anchorage and related components of the same material and finish as the metal fabrication, unless indicated otherwise.

J. Cut, reinforce, drill and tap miscellaneous metal work, as indicated, to receive the finish hardware and similar items.

K. Fabricate joints which will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

L. Galvanizing: For items indicated to be galvanized, apply zinc-coating by the hot-dip process in compliance with the following requirements:

1. ASTM A 153 / A 153M for galvanizing iron and steel hardware.

2. ASTM A 123 / A 123M for galvanizing both fabricated and un-fabricated iron and steel products made of un-coated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299" thick and heavier.

3. ASTM A 123 / A 123M for galvanizing assembled steel products.

2.13 FINISHES, GENERAL

A. Comply with NAAMM, Metal Finishes Manual for Architectural and Metal Products, for recommendations relative to the application and designation of finishes.

B. Finish metal fabrications after assembly.

2.14 SHOP PAINTING AND PROTECTIVE COATING

A. Conform to SSPC-PA 1, including preparation for painting.

B. Apply shop primer to un-coated surfaces of metal fabrications, except those with a galvanized finish or to be embedded in concrete, masonry, or sprayed-on fireproofing, unless otherwise indicated. Comply with the requirements of SSPC-PA 1, "Paint Application Standards, Guides and Specifications No. 1", for shop painting.

C. Preparation for Shop Priming: Prepare un-coated ferrous metal surfaces to comply with the minimum requirements indicated below for SSPC surface preparation specifications and the environmental exposure conditions of the installed metal fabrications:

1. Interiors (SSPC Zone 1A): SSPC-VIS 3.

2. Exteriors (SSPC Zone 1B): SSPC-SP 6.

D. Shop primer for Ferrous Metal: Fast-curing, lead-free, abrasion-resistant, rust-inhibitive primer selected for compatibility with the substrates and with the types of alkyd-type paint systems indicated, and for compatibility to provide a sound foundation for field-applied topcoats, despite prolonged exposure; complying with the performance requirements of FS TT-P-86, Types I, II and III.

E. Hot-Dip galvanizing and zinc coatings applied on products fabricated from rolled, pressed, and forged steel shapes, plates, bars and strips shall comply with ASTM A 123 / A 123M. Galvanized surfaces, for which a shop coat of paint is specified, shall be chemically treated to provide a bond for the paint. Except for bolts and nuts, all galvanizing shall be done after fabrication.

F. Clean surfaces of rust, scale, grease and foreign matter in accordance with SSPC-SP 1 Solvent Cleaning, prior to finishing. Prepare surfaces for painting in accordance with SSPC-SP 2, SSPC-VIS 3 or SSPC-SP 7.

G. Do not prime surfaces that will be in direct contact with concrete, or where field welding is required.

H. Prime paint items scheduled, with one coat.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for the installation of anchorages, such as concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors to be embedded in concrete or masonry.

B. Coordinate the delivery of such items to the Project Site.

3.3 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners, where necessary, for securing miscellaneous metal fabrications to in-place construction, including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors, as required.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for the installation of miscellaneous metal fabrications. Set fabrications accurately in location, alignment, and elevation with edges and surfaces level, plumb, true, and free of rack; measured from established lines and levels.

C. Setting Loose Plates: Clean concrete or masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to the surfaces. Clean the bottom surface of bearing plates.

D. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned an plumbed, tighten the anchor bolts. Do not remove the wedges or shims, but if protruding , cut-of flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic, non-shrink grout in exposed locations, unless otherwise indicated. Pack grout solidly between bearing surfaces and pates to ensure that no voids
remain.

E. Provide temporary bracing or anchors in the formwork for items to be built into concrete, masonry or similar construction.

F. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joins smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

G. Bollards:

1. Anchor bollards in concrete by means of pipe sleeves preset and anchored into a concrete footing. After bollards have been inserted into sleeves, fill the annular space between the bollard and the sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with the grout manufacturer=s directions.

2. Fill bollards with concrete and round off the top.

H. Metal Bar Gratings:

1. Comply with the recommendations of NAAMM, AMetal Bar Gratings Manual@, for the installation of gratings, including installation clearances and standard anchoring details.

2. Secure removable units to supporting members with the type and size clips and fasteners indicated, of if not indicated, as recommended by the grating manufacturer for the type of installation conditions shown.

3. Secure non-removable units to supporting members by welding where both materials are the same, otherwise fasten by bolting, as indicated.

I. Field Welding: Comply with the AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of the welds made and methods used in correcting

welding work, and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion-resistance of the base metal.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and the contour of the welded surface matches the adjacent surfaces.

J. Touch-Up For Galvanized Surfaces: Clean the welds, bolted connections and abraded areas, and apply two (2) coats of galvanizing repair paint in compliance with SSPC Paint 20 and ASTM A 780.

K. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting; comply with SSPC-PA 1 requirements for touch-up of field painted surfaces.

1. Apply by brush or spray and provide a minimum dry film thickness of 2.0 mils.

3.4. ISOLATION REQUIREMENTS

A. Dissimilar Metals:

1. Where metal surfaces are in contact with, or fastened to dissimilar metals except stainless steel, zinc or zinc coating, the metal shall be protected from the dissimilar metal.

2. Where drainage from a dissimilar metal passes over the metal, paint the dissimilar metal with a non-lead pigmented paint.

B. Cementitious Materials: Paint metal where in contact with mortar, concrete, masonry or other cementitious material, with an alkali-resistant coating such as heavy-bodied bituminous paint or epoxy paint.

C. Wood Contact: Isolate metal from cedar, redwood, oak and acid-treated lumber by means of unbroken 6-mil polyethylene construction sheet or a heavy coating of metal-protective paint.

D. Surfaces in contact with sealants after installation need not be coated with any type of protective material.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect fabrications and installations for alignment, attachment to the structure, and secure and rigid installation.

3.6 ADJUSTING AND CLEANING

A. Section 01700 - Execution Requirements: Adjusting the installed work

END OF SECTION

SECTION 05520

STEEL HANDRAILS AND GUARDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel handrails and guards.

2. Stainless guardrails.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for anchoring handrails and guards.

2. Section 04230 - Reinforced Unit Masonry: Substrate for anchoring handrails and guards.

3. Section 05500 - Metal Fabrications: Inserts and anchors for handrails and guards.

4. Section 09900 - Painting: Finishing of handrails and guards.

D. Products Furnished By But Not Installed Under this Section: Inserts and anchors preset in concrete and masonry for anchorage.

1.2 DESCRIPTION OF WORK

A. The extent of handrails and guards work is indicated on the Drawings and as specified herein, and includes providing, fabricating and installing miscellaneous steel handrails and guards not included in other Sections of these Specifications.

B. Handrails and guards shall comply with the applicable Building Code, ADAAG, and other Codes and standards which apply to this work of this Section.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Institute of Steel Construction (AISC):

1. Specification for Structural Steel for Buildings.

C. American National Standards Institute (ANSI):

1. ANSI B18.5 - Round Head Bolts (Inch Series).

2. ANSI B18.6.1 - Wood Screws (Inch Series).

D. American Society for Testing and Materials (ASTM):
1. ASTM A 36 / A 36M - Specification for Carbon Structural Steel.

2. ASTM A 53 / A 53M - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

3. ASTM A 123 / A 123M - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

4. ASTM A 136 - Specification for Pipe, Steel, Electric-Fusion (ARC)-Welded (Sizes NPS 16 and Over).

5. ASTM A 153 / A 153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

6. ASTM A 167 - Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

7. ASTM A 176 - Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet and Strip.

8. ASTM A 276 - Specification for Stainless Steel Bars and Shapes.

9. ASTM A 500 / A 500M - Specification for Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

10. ASTM A 501 - Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

11. ASTM A 568 / A 568M - Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

12. ASTM A 780 - Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

13. ASTM C 1107 - Specification for Dry, Hydraulic-Cement Grout (Nonshrink).

E. American Welding Society (AWS):

1. AWS D1.1 / D1.1M - Structural Welding Code - Steel.

F. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

G. International Code Council:

1. International Building Code (IBC), 2009.

H. SSPC: The Society for Protective Coatings (formerly Structural Steel Painting Council):

1. SSPC Painting Manual.

2. SSPC-PA 1- Shop, Field, and Maintenance Painting of Steel.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Submit manufacturer=s product specifications and installation instructions for the products and processes used in handrails and guards, including grouting and finishing.

2. Shop Drawings: Submit for fabrication and erection of handrails and guards, including plans, elevations and details of fittings, connections, joining methods, sizes and shapes, anchorage, and relationship to other work. Provide templates for anchors and bolts installation by others.

3. Samples: Submit for each type of metal finish indicated. Prepare samples on metal of the same gage and alloy to be used in the work. Include 6" long samples of stainless steel railing members including handrails, toprails, posts, and rail coverings, if any. Include samples of fittings and brackets.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the product meet or exceed the specified requirements.

b. Calculations indicating that the system and anchorage satisfies the performance requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Performance Requirements: Handrails and guards shall be designed, fabricated and installed to meet the structural loading conditions below, unless otherwise indicated:

1. Handrails and guards shall be designed to resist a load of 50 pounds per linear foot applied in any direction at the top and to transfer the load through the supports to the structure.

2. Handrails and guards shall be able to resist a single concentrated load of 200 pounds, applied in any direction, at any point along the top, and to transfer the load through the supports to the structure. This load need not be assumed to act concurrently with the loads specified above.

3. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot, including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of the above loads.

C. Engineering of each handrail and guard assembly is the responsibility of the manufacturer of the assembly.

D. Shop Assembly: Preassemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only, as necessary, for shipping and handling limitations. Clearly mark the units for reassembly and coordinated installation.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Protect the materials from corrosion, deformation and other damage during delivery, storage and handling.

C. Deliver products to the Project Site in the fabricator=s original, unopened packages, containers or bundles.

D. Store and protect the materials with a weatherproof covering; ventilate to avoid condensation.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: Comply with the standards indicated for shapes and types of metals indicated, or required for the handrail and guards components. For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

B. Steel:

1. Steel Plates, Shapes and Bars: ASTM A 36.

2. Steel Tubing: Cold-formed, ASTM A 500; or hot-rolled, ASTM A 501.

3. Structural Steel Sheet: Hot-rolled and cold-rolled ASTM A 568 / A 568M, Class 1; of the grade required for the design loading.

4. Steel Pipe: ASTM A 53; type and grade as selected by the manufacturer, and as required for the design loading; black finish unless galvanizing is indicated; standard weight (Schedule 40).

5. Stainless Steel: AISC, Type 304 for fumed and welded products; ASTM A 276 for base shapes and forging; ASTM A 167 or A 176, as best suited for plates sheets and strip. Satin finish typical.

6. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as the supported rails.

C. Non-Shrink, Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous, complying with ASTM C 1107 (formerly CE CRD-C621). Provide grout specifically recommended by the manufacturer for interior and exterior applications of the type specified in this Section.

D. Welding Electrodes and Filler Metal: Provide the type and alloy of filler metal and

electrodes recommended by the producer of the metal to be welded, and as required for color match, strength and compatibility in fabricated items.

E. Fasteners: Use fasteners of the same basic metal as the fastened metal. Do not use metals which are corrosive or incompatible with the materials joined.

F. Provide concealed fasteners for the interconnection of handrail and guard components, and for their attachment to other work.

1. Provide Phillips flat-head machine screws for exposed fasteners.

G. Anchors and Inserts: Provide anchors of the proper type, size, and material for the type of loading and installation condition shown, as recommended by the manufacturer, unless otherwise indicated. Use stainless steel anchors and inserts. Use lead expansion shield devices for drilled-in anchors. Furnish inserts required to be set into concrete and masonry work.

2.2 FABRICATION

A. General: Fabricate handrails and guards to the design, dimensions and details shown.

1. Provide handrail and guard members in the sizes, profiles and wall thickness indicated, with supporting posts and brackets of the size and spacing shown, but not less than required to support the design loads indicated.

2. The gripping portion of handrails with a circular cross section shall be as shown on the Drawings, but shall have an outside diameter of at least 1-1/4" but not greater than 2".

3. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run.

4. Handrails shall extend horizontally at least 12" beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser.

5. At ramps where the handrails are not continuous between runs, handrails shall extend horizontally above landings 12" minimum beyond the top and bottom of ramp runs.

6. Handrail extensions shall be in the same direction of stair flights at stairways and ramp runs at ramps.

7. Comply with ADAAG for additional extension requirements.

B. Steel Fabrication: Form exposed connections with hairline joints, flush and smooth. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind welds smooth and flush to match and blend with the adjoining surfaces.

1. Join steel handrail and guard members by butt-welding or welding with internal connectors, at the fabricator=s option. At tee and cross intersections, provide coped joints.

2. At bends, join pipes by means of prefabricated elbow fittings or flush radius bends, of the radiuses indicated. Form bends by the use of prefabricated elbow fittings and radius bends, or by bending the pipe at the fabricator=s option. Form simple and compound curves by bending pipe in jigs to produce a uniform curvature. Maintain the cylindrical cross section of the pipe throughout the entire

bend without buckling, twisting or otherwise deforming exposed surfaces of the pipe.

3. Close exposed ends of pipes by welding 3/16" thick steel plate in place, or by the use of prefabricated fittings.

4. Provide wall returns at the ends of wall-mounted handrails.

A. Brackets, Flanges, Fittings and Anchors: Provide the manufacturer's standard brackets, flanges, end closures, miscellaneous fittings and anchors for the connection of handrail and guard members to other work. Furnish inserts and other anchorage devices for connecting handrails and guards to concrete and masonry. Fabricate and space anchorage devices, as indicated, and as required to provide adequate support. Coordinate anchorage devices with the supporting structure.

C. Toe Boards: Where indicated, provide toe boards at guards around openings and the edge of open-sided floors and platforms. Fabricate to the dimensions and details indicated, or if not indicated, use a 4" high x 1/8" plate welded to, and centered between, each guard post.

G. Weeps: For exterior exposed units, fabricate joints which will be exposed to weather, to exclude water, or provide weep holes where water may accumulate.

2.3 FINISHES

A. Steel Finish: Paint finish per Section 09900 - Painting for galvanized and plain steel. Apply shop primer to the surfaces of metal fabrications, except those which are galvanized, or as indicated to be embedded in concrete or masonry, and in compliance with the requirements of SSPC-PA 1 for shop painting. Apply an extra coat at exposed welds.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section -01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry. Coordinate the delivery of such items to the Project Site.

B. Field Measurements: Take field measurements prior to the preparation of Shop Drawings and fabrication, where possible. Do not delay job progress. Allow for adjustments during installation where the taking of field measurements before fabrication might delay the work.

3.3 INSTALLATION

A. Fit exposed connections accurately together to form tight, hairline joints.

B. Perform cutting, drilling and fitting required for the installation of handrails and guards. Set work accurately in location, alignment and elevation, plumb, level, true to line and free of rack, measured from established lines and levels. Do not weld, cut or abrade surfaces of handrail and guard components which have been coated or finished after fabrication, and are intended for field connection by mechanical means without further cutting or fitting.

C. Corrosion Protection: Paint metal surfaces where in contact with mortar, concrete or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint or epoxy paint.

D. Adjust handrails and guards prior to anchoring to ensure matching alignment at abutting joints. Space posts at the interval indicated, or if not indicated, as required by the design loadings.

E. Plumb posts in each direction. Secure posts and railing ends as follows:

1. Anchor posts in concrete by means of sleeves pre-set and anchored into concrete. After posts have been inserted into sleeves, fill the space between the posts and sleeves solid with non-shrink, non-metallic grout, mixed and placed to comply with the grout manufacturer's instructions.

2. Leave anchorage joint exposed; wipe off excess grout and leave 1/8" build-up sloped away from the posts. For installations exposed on the exterior or to the flow of water, seal the grout to comply with the grout manufacturer's directions.

3. Anchor posts to metal surfaces with the manufacturer's standard fittings designed for the purpose.

F. Anchoring Guard Ends:

1. Anchor guards into concrete or masonry with the manufacturer's standard fittings designed for the purpose.

2. Anchor guards to metal surfaces with the manufacturer's standard fittings using concealed fasteners.

H. Attachment of Handrails and Guards to Walls:

1. Secure handrails and guards to walls with the manufacturer's standard wall brackets and end fittings. Provide brackets with 1-1/2" clearance between the wall and the inside face of handrails. Locate brackets as indicated or, if not indicated, at spacings required by the design loading.

2. Secure wall brackets and wall return fitting as follows:

a. Use the type of bracket with flanges tapped for concealed anchorage to threaded hanger bolts.

b. For concrete and solid masonry anchorage, use drilled-in expansion shields and concealed hanger bolts.

c. For hollow masonry anchorage, use toggle bolts with square heads.

d. For stud partitions anchorage, use lag bolts fastened to treated wood blocking between studs. Coordinate with the stud spacing for the accurate location of blocking members.

3.4. ISOLATION REQUIREMENTS

A. Dissimilar Metals: Where metal surfaces are in contact with, or fastened to dissimilar metals except stainless steel, zinc or zinc coating, the metal shall be protected from the dissimilar metal. Where drainage from a dissimilar metal passes over the metal, paint the dissimilar metal with a non-lead pigmented paint.

B. Cementitious Materials: Paint metal where in contact with mortar, concrete, masonry or other cementitious material, with an alkali-resistant coating such as heavy-bodied bituminous paint or epoxy paint.

C. Wood Contact: Isolate metal from cedar, redwood, oak and acid-treated lumber by means of unbroken 6-mil polyethylene construction sheet or a heavy coating of metal-protective paint.

D. Surfaces in contact with sealants after installation need not be coated with any type of protective material.

3.5 CONSTRUCTION

A. Site Tolerances:

1. Maximum Variation from Plumb: 1/4".

2. Maximum Offset From True Alignment: 1/4".

3. Maximum Out-of-Position: 1/4".

3.6 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Remove protective covering at completion of the Project, or when directed by the Owner=s representative.

C. Restore finishes damaged during installation and construction so no evidence of the corrective work is noticeable.

D. Return items which cannot be refinished in the field to the shop, make the required alterations and refinish the entire unit, or provide a new unit.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for accurate location, alignment, elevation, plumb, level, true and free of rack.

3.8 PROTECTION

A. Protect finishes of handrails and guards from damage during construction by use of temporary protective coverings, approved by guard manufacturer.

END OF SECTION

SECTION 05720

ALUMINUM HANDRAILS AND GUARDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum handrails.

2. Aluminum guardrails.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-in-Place Concrete: Substrate for attachment of handrails and guards.

2. Section 04230 - Concrete Unit Masonry: Substrate for attachment of handrails and guards.

D. Products Furnished By But Not Installed Under this Section: Inserts and anchors preset in concrete and masonry for anchorage.

1.2 DESCRIPTION OF WORK

A. The extent of handrails and guards work is indicated on the Drawings and as specified herein, and includes providing, fabricating and installing miscellaneous aluminum handrails and guards not included in other Sections of these Specifications.

B. Handrails and guards shall comply with the Building Code, ADAAG, and other Codes and standards which apply to this work of this Section.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. The Aluminum Association, Inc. (AA):

C. American Society for Testing and Materials (ASTM):

1. ASTM B 26 / B 26M - Specification for Aluminum-Alloy Sand Castings.

2. ASTM B 209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

3. ASTM B 221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.

4. ASTM B 429 / B 429M - Specification for Aluminum-Alloy Extruded Structural Pipe

and Tube.

5. ASTM C 1107 - Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

E. International Code Council:

1. International Building Code (IBC), 2009.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product specifications, anchor details and installation instructions for the products and processes used, including finishing and grouting.

2. Shop Drawings: For the fabrication and installation of handrails and guards, including plans, elevations and details of fittings, connections, joining methods, sizes and shapes, anchorage and relationship to other work. Provide templates for anchor and bolt installations by others.

3. Samples: For each type of metal finish indicated. Prepare samples on metal of the same gage and alloy to be used in the work. Where normal color and texture variations are to be expected, provide "range" samples showing the limits of such variations.

a. 6" long samples of distinctly different railing members, including handrails, toprails, posts, and rail coverings, if any.

b. Include samples of fittings and brackets.

4. Assurance / Control Submittals:

a. Fabricator=s certificate that the products meet or exceed the specified requirements.

b. Calculations indicating that the system and anchorage satisfies the performance requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in fabricating the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Performances Requirements: Handrails and guards shall be designed, fabricated and installed to meet the structural loading conditions below, unless otherwise indicated:

1. Handrails and guards shall be designed to resist a load of 50 pounds per linear foot applied in any direction at the top and to transfer the load through the supports to the structure.

2. Handrails and guards shall be able to resist a single concentrated load of 200 pounds, applied in any direction, at any point along the top, and to transfer the load through the supports to the structure. This load need not be assumed to act concurrently with the loads specified above.

3. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot, including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of the above loads.

C. Engineering: Engineering of each assembly is the responsibility of the manufacturer of the assembly.

D. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Protect finished aluminum surfaces with a strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

C. Pack, box, ship, unload, store and protect the products in a manner to avoid abuse, damage and defacement.

D. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging.

E. Store inside, protected from weather.

F. Store to provide for water drainage and air circulation.

1.7 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Provide the Owner with two (2) gallons, minimum, of touch-up paint to match the finish.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Newman Brothers, Inc.
2. Poma Construction Corp.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Metals: Comply with the standards indicated for shapes and types of metals indicated or required for handrail and railing components.

B. Aluminum: Alloy and Temper: Provide alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper, designated below for each aluminum form required.

1. Extruded Bar and Shape: ASTM B 221, 6063-T6.

2. Extruded Pipe and Tube: ASTM B 429 / B 429M, 6063-T6.

1. Plate and Sheet: ASTM B 209, 6061-T6.

2. Castings: ASTM B 26 / B 26M, 356-T6.

C. Non-Shrink, Non-Metallic Grout: Premixed, factory-packaged, non- staining, non-corrosive, non-gaseous grout complying with ASTM C 1107 (formerly CE CRD-C621). Provide grout specifically recommended by the manufacturer for interior and exterior applications of the type specified in this Section, POR-ROK Anchoring Cement by Minwax Co. division of Eastman Kodak Co., or approved equal.

D. Welding Electrodes and Filler Metal: Provide the type and alloy of filler metal and electrodes recommended by the producer of the metal to be welded, and as required for color match, strength and compatibility in the fabricated items.

E. Fasteners: Use fasteners of the same basic metal as the fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with materials joined.

1. Provide concealed fasteners for the interconnection of handrail and railing components, and for their attachment to other work, except where otherwise indicated.

2. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.

F. Anchors and Inserts: Provide anchors of the proper type, size, and material for the type of loading and installation condition shown, as recommended by manufacturer, unless otherwise indicated. Use stainless steel anchors and inserts. Use lead expansion bolt devices for drilled-in anchors. Furnish inserts, as required, to be set into concrete and masonry work.

2.3 FABRICATION

A. General:

1. Fabricate handrails and guards to the design, dimensions and details shown. Provide handrail and guard members in the sizes and profiles indicated, with supporting posts and brackets of the size and spacing shown, but not less than required to support the design loads indicated.

2. The gripping portion of handrails with a circular cross section shall be as shown

on the Drawings, but shall have an outside diameter of at least 1-1/4" but not greater than 2".

3. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run.

4. Handrails shall extend horizontally at least 12" beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser.

5. At ramps where the handrails are not continuous between runs, handrails shall extend horizontally above landings 12" minimum beyond the top and bottom of ramp runs.

6. Handrail extensions shall be in the same direction of stair flights at stairways and ramp runs at ramps.

7. Comply with ADAAG for additional extension requirements.

B. Non-welded Connections: Fabricate for the interconnection of members by means of the manufacturer's standard concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline mitered joints.

1. Fabricate splice joints for field connection using epoxy structural adhesive where this represents the manufacturer's standard splicing method.

C. Welded Connections: Fabricate for the interconnection of members by concealed internal welds to eliminate surface grinding, using the manufacturer's standard system of sleeve and socket fittings.

D. Radius Bends: Form to a uniform radius with smooth finished surfaces free from buckles and twists.

E. Provide wall returns at the ends of wall-mounted handrails.

F. Close exposed ends of handrail and railing members by use of the manufacturer's standard prefabricated end fittings.

G. Brackets, Flanges, Fittings and Anchors: Provide the manufacturer's standard brackets, flanges, end closures, miscellaneous fittings and anchors for the connection of members to other work. Furnish inserts and other anchorage devices for connecting to concrete and masonry. Fabricate and space anchorage devices, as indicated and as required to provide adequate support. Coordinate anchorage devices with the supporting structure.

H. Toe Boards: Where indicated, provide toe boards at guards around openings and the edge of open-sided floors and platforms. Fabricate to the dimensions and details indicated, or if not indicated, use a 4" high x 1/8" plate welded to, and centered between, each guard post.

I. Weeps: For exterior exposed units, fabricate joints which will be exposed to weather so as to exclude water, or provide weep holes where water may accumulate.

2.4 ALUMINUM FINISH

A. Siliconized powder coating: Kynar or approved equal.

B. Anodized.

C. Powder coat.

D. Color as selected from manufacturer=s standards.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for the installation of anchorages, such as sleeves, concrete inserts, anchor bolts and miscellaneous items having integral anchors to be embedded in concrete or masonry. Coordinate the delivery of such items to the Project Site.

B. Field Measurements: Take field measurements prior to the preparation of Shop Drawings and fabrication, where possible. Do not delay job progress. Allow for adjustments during installation where the taking of field measurements before fabrication might delay the work.

3.3 INSTALLATION

A. Fit exposed connections accurately together to form tight, hairline joints.

B. Perform cutting, drilling and fitting required for the installation. Set work accurately in location, alignment and elevation, plumb, level, true to line and free of rack, measured from established lines and levels. Do not weld, cut or abrade surfaces of components which have been coated or finished after fabrication, and are intended for field connection by mechanical means without further cutting or fitting.

C. Corrosion Protection: Coat concealed surfaces of aluminum, which will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of epoxy paint.

D. Adjust prior to anchoring to ensure matching alignment at abutting joints. Space posts at the intervals indicated, or if not indicated, as required by the design loads.

E. Anchoring Posts:

1. Anchor posts by means of sleeves preset and anchored into concrete. After posts have been inserted into the sleeves, fill the space between the posts and sleeves solid with non-shrink, non-metallic grout, mixed and placed to comply with the grout manufacturer's directions.

2. Leave anchorage joints exposed. Wipe off excess grout and leave 1/8" build-up, sloped away from the post. For installations exposed on the exterior, or to the flow

of water, seal the grout in compliance with the grout manufacturer's instructions.

3. Anchor posts to metal surfaces with the manufacturer's standard fittings designed for the purpose, unless otherwise indicated.

F. Railing Connections:

1. Permanently connect components together using the manufacturer's standard mechanical or adhesive joiner method and fittings, unless otherwise indicated. Use wood blocks and padding to prevent damage to members and fittings. Seal recessed holes of exposed locking screws using plastic filler, colored to match the finish of the handrails and guards.

G. Anchoring Handrails and Guards Ends:

1. Anchor ends into concrete and masonry with the manufacturer's standard fittings designed for the purpose, unless otherwise indicated.

2. Anchor ends to metal surfaces with the manufacturer's standard fittings using concealed fasteners, unless otherwise indicated.

H. Attachment of Handrails and Guards to Walls:

1. Secure to walls with the manufacturer's standard wall brackets and end fittings; maintain 1-1/2" clearance between walls and the rail.

2. For anchorage to concrete and solid masonry, use drilled-in expansion shields and concealed hanger bolts, unless otherwise indicated.

3. For hollow masonry anchorage, use toggle bolts with square heads, unless otherwise indicated.

4. For anchorage to stud partitions use lag bolts fastened to treated wood blocking between the studs. Coordinate with the spacing of studs for accurate location of the blocking.

3.4 ISOLATION REQUIREMENTS

A. Dissimilar Metals: Where aluminum surfaces are in contact with, or fastened to dissimilar metals except stainless steel, zinc or zinc coating, the aluminum shall be protected from the dissimilar metal. Where aluminum contacts another metal, paint the dissimilar metal with epoxy paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

B. Cementitious Materials: Paint aluminum where in contact with mortar, concrete, masonry or other cementitious material, with an alkali-resistant coating such as heavy-bodied bituminous paint or epoxy paint.

C. Wood Contract: Isolate aluminum from cedar, redwood, oak and acid-treated lumber by means of unbroken 6-mil polyethylene construction sheet or a heavy coating of metal-protective paint.

D. Surfaces in contact with sealants after installation need not be coated with any type of protective material.

3.5 CONSTRUCTION

A. Site Tolerances:

1. Maximum Variation from Plumb: 1/4".

2. Maximum Offset From True Alignment: 1/4".

3. Maximum Out-of-Position: 1/4".

3.6 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Protect finishes of guards and handrails from damage during construction by use of temporary protective coverings approved by the railing manufacturer.

C. Remove protective covering at project completion.

D. Restore finishes damaged during installation and construction so no evidence of the corrective work remains.

E. Return items which cannot be refinished in the field to the shop, make the necessary alterations, and refinish the entire unit, or provide a new unit, as required.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installations for correct location, alignment and elevation, plumb, level, true to line, free of rack and secure attachment and anchorage.

3.8 PROTECTION

A. Protect the finishes of the handrails and guards from damage during construction by the use of temporary protective coverings approved by the manufacturer.

END OF SECTION

SECTION 05800

EXPANSION CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior expansion joint sealing systems at junctures of buildings above and below grade.

2. Interior expansion joint cover assemblies.

3. Fire-rated joint sealing assemblies.

4. Pre-molded joint fillers.

5. Roof expansion joints.

6. Accessories.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment.

2. Section 07120 - Fluid-Applied Urethane Roofing: Adjacent roof finish material.

3. Section 07620 - Sheet Metal Flashing and Trim: Flashing and trim.

4. Section 07900 - Joint Sealers: Caulking and sealants.

1.2 DESCRIPTION OF WORK

A. The extent of the expansion control work is indicated on the Drawings and as specified herein, and includes providing and installing expansion and contraction joints and accessories required for complete systems installation.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

2. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods. Wire, Shapes and Tubes.

3. ASTM C 920 - Standard Specifications for Elastomeric Joint Sealants.

4. ASTM E 1399 - Standard Test Methods for Cyclic Movement and Measuring the Minimum Joint Widths of Architectural Systems.

C. American Iron and Steel Institute (AISI).

D. International Code Council:

1. International Building Code (IBC), 2009.

E. Copper Development Association (CDA).

F. Federal Specifications (FS):

1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

G. National Association of Architectural Metal Manufacturers (NAAMM).

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer's product specifications, installation instructions and general recommendations for each specified material and fabricated product.

2. Shop Drawings: Indicate layout, joining, profiles, and anchorages of expansion and contraction joint products.

3. Samples: 8" long samples of the specified materials to be exposed as finished surfaces, when requested.

4. Assurance / Control Submittals:

a. Manufacturer's certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain all expansion joint cover assemblies from a single manufacturer.

B. Coordinate compatibility with expansion joint cover assemblies specified in other Sections.

C. Fire-Test-Response Characteristics: Where indicated, provide expansion joint cover assemblies whose fire resistance has been determined per ANSI / UL 263, NFPA 251, UBC 43-1 or ASTM E 119, including hose stream test of vertical wall assemblies, by a nationally recognized testing and inspecting agency acceptable to the government authorities having jurisdiction.

1. Fire-Resistance Rating: Not less than the rating of the adjacent construction.

D. Qualifications:

1. Manufacturer: Company specializing in fabricating the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

E. Performance Requirements:

1. Design and install to withstand the following loading requirements, where applicable:

a. Design, fabricate and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D] and importance factor [1.0] [1.25] [1.5], as applicable per ASCE 7.

b. In no case shall the combined loading be less than 75 psf.

c. Comply with requirements of the applicable Building Code, if more stringent than the requirements stated above.

F. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging.

C. Stack the materials to prevent twisting, bending and abrasion. Slope metal sheets to ensure drainage. Provide ventilation.

D. Prevent contact with materials which may cause corrosion or discoloration.

1.7 JOB CONDITIONS

A. Coordinate the work of this Section with interfacing and adjoining work for the proper sequencing of each installation. Ensure the best possible weather resistance, appearance and durability of the work, and protection of the materials and finishes.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty jointly signed by the manufacturer and the installer certifying that the products and the installation is free of defective materials and workmanship and will replace or repair any defective component or the system, in whole or in part, as necessary to provide an installation meeting its intended purpose and integrity.

2. Warranty Period: One (1) year for labor, materials and installation; two (2) years against leaks from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Balco, Inc.

2. C/S Group.

3. Metalines, Inc.

4. MM Systems Corp.

5. Watson Bowman Acme Corp.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Aluminum: ASTM B 221, alloy 6063-T5 for extrusions; ASTM B 209, alloy 6061-T6 for sheet and plates.

1. Protect aluminum surfaces to be placed in contact with cementitious materials with a protective coating.

B. Bronze: ASTM B 455, alloy C38500 for extrusions; alloy C28000 Muntz Metal for plates.

C. Brass: UNS alloy C26000 for half hard sheet and coil.

D. Stainless Steel: ASTM A 167, Type 304 with non-slip finish, unless indicated otherwise, for plates, sheets, and strips. Finish as selected from the manufacturer=s standards..

E. Extruded Preformed Seals: Single or multicellular elastomeric profiles as classified under ASTM D 2000, designed with or without continuous, longitudinal, internal baffles. Formed to fit compatible frames. Color as selected from the manufacturer=s standards.

F. Preformed Sealant: Manufacturer's standard elastomeric sealant complying with ASTM C 920, Use AT@, factory-formed and bonded to metal frames or anchor members. Color as selected from the manufacturer's standards.

1. Joints 2" Wide and Less: Withstand plus or minus 35% movement of the joint width without failure.

2. Joints 2" to 4" Wide: Withstand plus or minus 50% movement of the joint width without failure.

G. Seismic Seals: Typical for exterior applications; two single-layered elastomeric profiles, one interior and one exterior, as classified under ASTM D 2000; retained in a set of compatible frames. Color as selected from the manufacturer=s standards.

H. Fire Barriers: Designed for the indicated or required dynamic structural movement without material degradation or fatigue when tested in accordance with ASTM E 1399. Tested in maximum joint width condition with a field splice as a component of an expansion joint cover per ANSI / UL 263, NFPA 251, UBC 43-1, or ASTM E 119, including hose stream test of vertical wall assemblies by a nationally recognized testing and inspection agency acceptable to the government authorities having jurisdiction.

I. Accessories: Manufacturer's standard anchors, fasteners, set screws, spacers, flexible moisture barriers and filler materials, drain tubes, lubricants, adhesive, and other accessories compatible with the material in contact, as indicated or as required for a complete installation.

2.3 EXPANSION JOINT COVER ASSEMBLIES

A. General: Provide expansion joint cover assemblies of the design, basic profile, materials, and operation indicated. Provide units comparable to those indicated or as required to accommodate the joint size, variations in adjacent surfaces, and dynamic structural movement without material degradation or fatigue when tested in accordance with ASTM E 1399. Furnish units in the longest practicable lengths to minimize the number of end joints. Provide hairline mitered corners where joints change directions or abuts other materials. Include closure materials and transition pieces, tee-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous joint cover assemblies.

B. Moisture Barrier: Provide manufacturer's continuous, standard, flexible vinyl moisture barrier under covers at roofs, exterior walls and locations indicated.

C. Fire-Rated Joint Covers: Proved expansion joint cover assemblies with manufacturer=s standard continuous flexible fire barrier seals under covers at locations indicated, to provide a fire-resistive rating not less than the rating of the adjacent construction.

D. Coverless Fire Barrier: Provide manufacturer=s standard continuous flexible fire barrier seals at locations indicated, to provide a fire-resistive rating not less than the rating of the adjacent construction.

E. Metal Floor-to-Floor Joint Cover Assemblies: Provide continuous extruded metal frames of the profile indicated with seating surface and raised floor rim or exposed trim strip to accommodate the flooring and concealed bolt and anchors embedded in concrete. Provide assemblies formed to receive cover plates of the design indicated and to receive filler materials, if any, between the raised rim of the frame and edge of the plate. Furnish depth and configuration to suit the type of construction and to produce a continuous non-slip wearing surface flush with the adjoining finish floor surface.

1. Partially Concealed Cover: Provide one frame on each side of the joint, designed to accommodated the manufacturer=s floor cover plate and filler.

2. Exposed Cover: Provide one frame on each side of the joint, designed to support the floor plate and filler.

3. Flat Cover Plates: Provide cover plates of the profile and wearing surface indicated. Extend flat plates to lap each side of the joint.

a. Filler Insert: Furnish abrasive-resistant flexible gasket filler between the edge of the cover plate and the raised rim of the frame to accommodate the required movement.

4. Fixed Cover Plates: Attach one side of the cover plate to a frame or finished

wearing surface with the other side resting on the other frame or finished wearing surface to allow free movement.

5. Self-Centering Cover Plates: Concealed centering device with the cover plate secured in or on top of the frames so as to have free movement on both sides.
6. Floor Cover Plate Wearing Surfaces: Provide cover plates with the following type of wearing surface:

    a. [Plain.]

    b. [Fluted.]

    c. [Recessed to receive full thickness of the flooring material.]

    d. [Abrasive plate.]

    e. [Adhesive filled plate.]

    f. [Adhesive strip plate.]

7. Ceiling infill, if required, as detailed.

F. Floor-to-Wall Joints: Provide one frame on the floor side of the joint only. Provide wall side frame where required by the manufacturer=s design.

1. Angle Cover Plates: Attach angle cover plates for floor-to-wall joints to the wall with countersunk, flat-head exposed fasteners secured to drilled-in-place anchor shields, unless otherwise indicated, at the spacing recommended by the joint cover manufacturer.

G. Metal Wall Joint Cover Assemblies: Provide continuous extruded metal frames of the profile indicated. Concealed anchors embedded in concrete. Provide assemblies formed to receive cover plates of the design indicated.

1. Cover plates: Provide cover plates of the profile indicated. Extend plate to lap each side of the joint. L000-82-11 and 000-92-11 by Architectural Art Manufacturing or approved equal.

H. Wall, Ceiling and Soffit Joint Cover Assemblies: Provide interior wall and ceiling expansion joint cover assemblies of the same design and appearance. Provide exterior wall and soffit expansion joint cover assemblies of the same design and appearance. Provide wall expansion joint cover assemblies compatible with the floor expansion joint cover assemblies design and appearance.

1. Fixed Metal Cover Plates: Provide a concealed, continuously anchored frame fastened to the wall, ceiling, or soffit only on one side of the joint. Extend the cover to lap each side of the joint to permit free movement on one side. Attach the cover to the frame with the cover in close contact with adjacent finish surfaces.

2. Floating Metal Cover Plates: Cover plate secured in or on top of the frames to permit free movement on both sides.

3. Self-Centering Cover Plates: Concealed centering device with the cover plate secured in or on top of the frame to permit free movement on both sides.

4. Flexible Filler: Secure the approved flexible filler between the frames to compress and expand with movement.

I. Joint Cover Assemblies with Preformed Seals: Provide joint cover assemblies consisting of continuously anchored aluminum extrusions and continuous extruded preformed seals of the profile indicated or as required to suit the types of installation conditions shown. Furnish extrusions designed to be embedded in or attached to concrete with lugs. Vulcanize or heat-weld splice, if any, to ensure hermetic joint conditions.

1. Cover Plate: Include extruded aluminum cover plate fastened to one side of the joint and extend the plate to lap each side of the joint to permit free movement with the cover in close contact with the adjacent surfaces.

J. Joint Cover Assemblies with Elastomeric Sealant: Provide continuous joint cover assemblies consisting of elastomeric sealant, factory-bonded to extruded aluminum frames of the profile indicated or required to suit the types of installation conditions shown. Provide frames for floor joints with means for embedding in or anchoring to concrete without using exposed fasteners and that will result in exposed surfaces of sealant and aluminum frames finishing flush with adjacent finished floor surfaces without exposing the anchors.

K. Compression Seals: Preformed, elastomeric extrusions having an internal baffle system in sized and profiles shown or as recommended by the manufacturer. Provide lubricant and adhesive for installation as recommended by the manufacturer.

L. Foam Seal: Non-extruded, low-density, cross-linked, nitrogen-blown ethylene vinyl acetate polyethylene copolymer foam; Evazote 380 E.S.P. by Royston or approved equal. Provide adhesive for the installation as recommended by the manufacturer.

2.4 METAL FINISHES

A. General: Comply with NAAMM, AMetal Finishes Manual@ for finish designations and application recommendations, except as otherwise indicated. Apply finishes to products in the factory after fabrication. Protect finishes on exposed surfaces before shipment.

B. Aluminum Finishes: Medium Bronze, Anodized.

C. Bronze Finish: Comply with NAAMM, AMetal Finishes Manual@ for recommendations relative to application and designations for finishes.

D. Natural Satin Finish: CDA Designation M32, mechanical finish, directional textured, medium satin.

E. Stainless Steel Finishes: Comply with NAAMM, AMetal Finishes Manual@ for recommendations relative to application and designations of finishes.

1. [Bright, Cold-Rolled Unpolished Finish: AISI, No. 2B finish.]

2. [Bright, Directional Polish: AISI, No. 3 finish.]

F. Factory Finish: Manufacturer=s standard factory finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and

conditions are as required, and ready to receive the work.

1. Verify that roofing terminations and base flashings are in place, sealed, and secure.

C. Report in, writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

. Manufacturer's Instructions: In addition to the requirements herein, comply with the manufacturer's instructions and recommendations for the phases of work, including the preparation of substrates, application of materials, and protection of the installed work.

B. Coordinate and furnish anchorages, setting drawings, templates, and instructions for the installation of expansion joint cover assemblies to be embedded in or anchored to concrete or to have recesses formed into the edges of concrete slabs for later placement and grouting-in of frames.

C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary to secure expansion joint cover assemblies to in-place construction, including threaded fasteners with drilled-in expansion shields for masonry and concrete where anchoring members are not embedded in concrete. Provide fasteners of metal, type and size to suit the type of construction indicated and to provide for the secure attachment of expansion joint cover assemblies.

3.3 INSTALLATION

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting as required to install expansion joint covers. Install joint cover assemblies in true alignment and in proper relationship to the expansion joints and adjoining finished surfaces, measured from established lines and levels. Allow adequate free movement for thermal expansion and contraction of the metal to avoid buckling. Set floor covers at elevations to be flush with adjacent finished floor materials. Locate wall, ceiling and soffit covers in continuous contact with adjacent surfaces. Securely attach in place with the required accessories. Locate anchors at intervals recommended by the manufacturer, but not less than 3" from each end and at not more than 24" on center.

B. Continuity: Maintain continuity of the expansion joint cover assemblies with a minimum number of end joints. Align metal members mechanically using splice joints. Cut and fit ends to produce joints that will accommodate thermal expansion and contraction of the metal to avoid buckling of the frames. Adhere flexible filler materials, if any, to the frames with adhesive or pressure-sensitive tape as recommended by the manufacturer.

C. Extruded Preformed Seals: Install seals complying with the manufacturer=s instructions and with a minimum number of end joints. For straight sections, provide preformed seals in continuous lengths. Vulcanize or heat-weld field splice joints in preformed seal material to provide watertight joints using procedures recommended by the manufacturer. Apply adhesive, epoxy, or lubricant-adhesive approved by the manufacturer to both frame interfaces before installing the preformed seal. Seal transitions according to the manufacturer=s instructions.

D. Elastomeric Sealant Joint Assemblies: Seal end joints within continuous runs and joints at transitions according to the manufacturer's directions, to provide a watertight installation.

E. Seismic Seals: Install interior seals in continuous lengths; vulcanize or heat-weld field splice joints in interior seal material to provide watertight joints using the manufacturer=s recommended procedures. Install exterior seals in standard lengths. Seal transitions and end joints in accordance with the manufacturer=s instructions.

F. Moisture Barriers: Install moisture gutters with a tight fit and sealed ends. Drain as required.

G. Fire Barriers: Install fire barriers, including transitions and end joints, according to the manufacturer=s instructions so that the adjacent fire-rated construction is continuous.

3.4 ISOLATION REQUIREMENTS

A. Wood Contact: Isolate from cedar, redwood, oak and acid-treated lumber with an unbroken 6-mil polyethylene construction sheet or a heavy coating of metal-protective paint.

B. Aluminum Surfaces: Shall not directly contact other metals except stainless steel, zinc, or zinc coated. Where aluminum contacts another metal, paint the dissimilar metal with a primer followed by two coats of aluminum paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

C. Metal Surfaces: Paint where in contact with mortar, concrete, or masonry materials with an alkali-resistant coating such as heavy-bodied bituminous paint.

3.5 REPAIRS TO FINISH

A. Scratches, Abrasions and Minor Surface Defects: May be repaired in accordance with the manufacturer=s printed instructions. Replace items which cannot be repaired to the satisfaction of the Owner=s representative.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field testing and inspection.

B. Inspect the floor slab, roof slab and wall construction, alignment and attachment to the structure.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Do not remove protective coverings until the finish work in adjacent areas is complete. When the protective coverings are removed, clean the exposed metal surfaces in compliance with the manufacturer's instructions.

C. Remove substances which might cause corrosion of metal or deterioration of finishes.

3.8 PROTECTION

A. The installer shall advise the Contractor of required procedures for surveillance and protection of the work during construction to ensure that all work will be without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing lumber and construction.

2. Miscellaneous wood blocking, supports and rough-in.

3. Plywood.

4. Moisture Barriers.

5. Anchors and connectors.

6. Preservative and fire-resistive treatment.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03100 - Concrete Formwork: Cast-in inserts and attachment substrate.

2. Section - 03300 - Cast-In-Place Concrete: Substrate for attachment.

3. Section - 04230 - Reinforced Unit Masonry: Substrate for attachment.

4. Section 06200 - Finish Carpentry: Finish work to be anchored.

5. Section 06400 - Architectural Woodwork: Finish work to be secured.

6. Section 09110 - Non-Load Bearing Steel Framing: Substrate for attachment.

D. Work furnished under other Sections but installed in whole, or in part under this Section:

1. Section 05500 - Metal Fabrications.

2. Section 08210 - Wood Doors.

3. Section 08710 - Door Hardware.

4. Division 10 - Applicable Sections.

1.2 DESCRIPTION OF WORK

A. The extent of the rough carpentry work is indicated on the Drawings and as specified herein, and includes providing and installing wood framing and construction, anchors and

connectors, miscellaneous blocking, supports and wood rough-in as required by the Project conditions.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Lumber Standards Committee (ALSC):

1. Softwood Lumber Standards.

C. American Plywood Association (APA):

1. Grades and Standards.

D. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Facilities.

E. American Society for Testing and Materials (ASTM):

1. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

2. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

F. American Wood Preservers Association(AWPA):

1. AWPA - C1 - All Timber Products - Preservative Treatment by Pressure Process.

2. AWPA - C15 - Wood for Commercial-Residential Construction Preservative Treatment by Pressure Processes.

3. AWPA - C20 - Structural Lumber - Fire-Retardant Treatment by Pressure Processes.

4. AWPA - C27 - Plywood - Fire-Retardant Treatment by Pressure Processes.

5. AWPA - P5 - Water Borne Preservatives.

G. International Code Council:

1. International Building Code (IBC):

H. Underwriters' Laboratories, Inc. (UL):

1. UL FR S - Fire-Rated Treated Wood with Flame Spread and Smoke Developed Ratings of 25 or less in accordance with ASTM E 84.

2. UL 723 - Test for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Shop Drawings: Dimensioned plans, elevations, sections, large scale details, attachment devices, anchors and other components.

2. Assurance / Control Submittals:

   a. Wood Treatment: Treatment manufacturer=s instructions for the proper use of each type of treated material.

   b. Certificates:

      1) Pressure Treatment and Termite Treatment: Certification from the treating plant identifying the chemicals and process used, net amount of preservative retained; conformance with applicable standards.

      2) Water-borne Preservatives: Certification from the treating plant stating that the moisture content of treated materials was reduced to a maximum of fifteen percent (15%) prior to shipment to the Project Site.

      3) Fire Retardant Treatment: Certification from the treating plant stating that the type of chemicals used and the fire performance characteristics achieved; that the fire-retardant treatment materials comply with the governing code, ordinances and requirements of local authorities having jurisdiction; that treatment will not bleed through finished surfaces.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with the following agencies:

   1. Lumber Grading Agency: Certified by ALSC.

   2. Plywood Grading Agency: Certified by APA.

B. Regulatory Requirements: Conform to the applicable codes for fire-retardant treatment of wood surfaces for flame / smoke ratings.

C. Performance Requirements: For exterior uses, design, fabricate, reinforce, install and anchor to withstand the following windload requirements:

   1. Combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0, exposure [B] [C] [D], and importance factor of [1.0] [1.25] [1.5], as applicable per ASCE 7.

D. Evidence of Grade:

   1. Stamp each piece of lumber and plywood with a grade mark and trademark of the Association having jurisdiction, or accompany each shipment with an official certificate of inspection. Stamp on concealed surfaces or surfaces scheduled for opaque paint finish.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

1. Inspect wood materials for conformance with the specified grades, species and treatment at the time of delivery to the Project Site.

2. Reject and return unsatisfactory wood materials.

B. Provide facilities for the handling and storage of materials to prevent damage to edges, ends and surfaces.

C. Keep materials dry. Stack materials off the ground a minimum of 12A or, if on a concrete slab-on-grade, a minimum of 1-1/2"; fully protected from the weather. Provide for air circulation within and around stacks, and under temporary coverings.

D. For materials pressure treated with waterborne chemicals, place spacers between each bundle to provide for air circulation.

PART 2 PRODUCTS

2.1 FRAMING LUMBER

A. General:

1. Use Douglas Fir or Southern Pine where concealed; Redwood where exposed.

2. Pressure and termite treated.

3. Sizes shown are nominal. Actual sizes shall conform to American Lumber Standard, PS 20-70.

4. Dimensioned lumber shall be S4S to standard dimensions.

5. Moisture content shall be fifteen percent (15%) or less, unless otherwise noted.

6. All lumber shall bear the grade mark of Western Wood Products Association (WWPA) standard grading rules, latest edition. Grades called out below are minimum. Use appearance grade where exposed to view.

B. Non-Load Bearing, Blocking, Bridging and Miscellaneous Framing: Standard Grade, Table 1.

C. Load-Bearing and Non-Load Bearing Studs (8' long or less), Related Plates and Sills: No. 2 Grade, Table 3.

D. Load-Bearing Studs (over 8' long), Related Plates and Sills: Select No. 1 or better grade, Table 3. Knots, pitch pockets, checks, splits, or bark shall not be allowed at full length of board edges.

E. Roof, Ceiling and Floor Joists, Purlins, Rafters, Posts: No. 1 Grade, Table 3.

F. Load-Bearing Beams, Headers, Stair Stringers, Truss Members: Select Structural Grade, Table 3.

G. Boards: Construction Grade.

2.2 NAILERS, BLOCKING, FURRING AND SLEEPERS

A. Wood for nailers, blocking, furring and sleepers: Construction grade, finished 4 sides, 15 percent maximum moisture content. Pressure preservative treat items in contact with roofing, flashing, waterproofing, concrete, masonry or the ground.

2.3 PLYWOOD

A General: Grading Rules in accordance with American Plywood Association (APA), Plywood Specification & Grade Guide, 1978 edition. All plywood with pressure and termite treatment shall bear appropriate grade trademark of the APA.

B. Wall / Roof Sheathing: 3/4", C-D 48/24, INT-APA Grade, Group 1; exterior glue, unsanded, T&G all edges - full face, 48" x 96" panels.

C. Roof / Floor Sheathing: 1-1/8", 2-4-1, C-D, INT-APA grade, Group 1; exterior glue, unsanded, T&G all edges - full face, 48" x 96" panels.

D. Subfloor Over Concrete: 3/4", CDX Ext Grade; exterior glue, 48" x 96" panels.

E. Plywood Backing Plates (for mounting electrical and telephone equipment): Fire-retardant treated panels with grade designation, APA C-D PLUGGED INT; exterior glue, in thickness indicated, or if not indicated, not less than 2".

2.4 MOISTURE BARRIERS

A. Install where shown on the Drawings or where required.

B. Place under wood plates bearing directly on earth supported concrete slabs and at subfloors over concrete slabs.

C. 15 pound asphalt saturated roofing felt, non-perforated.

2.5 ROUGH HARDWARE

A. All necessary hardware for installation of the work specified herein, of the sizes and quantities required by Building Code or herein after specified. Hardware shall be hot-dip galvanized steel or approved type of non-ferrous metal.

2.6 FRAMING CONNECTORS AND ACCESSORIES

A. Provide connectors and accessories where indicated or as required by conditions; zinc-coated steel, Code approved, as manufactured by Simpson Company, Silver Metal Products, Inc., or as approved. If a specific type is not shown, use type recommended by the connector manufacturer for the conditions of installation. Secure with nails, screws, or bolts provided or recommended by the manufacturer.

2.7 CONSTRUCTION ADHESIVE

A. Conform to APA performance specification AFG-01 and specific application recommendations of the manufacturer.

B. Products as manufactured by Bostik, Inc., Henkel, Sovereign Specialty Chemicals, Inc. or approved equal.

2.8 FASTENERS

A. General: Hot-dip galvanized steel, typical.

1. Nails and Staples: Federal Spec FF-N-105B.

2. Bolts: Federal Spec FF-B-575.

3. Nuts: Federal Spec FF-N-836.

4. Lag Screws and Bolts: Federal Spec FF-B-561.

5. Toggle Bolts: Federal Spec FF-B-588.

6. Wood Screws: Federal Spec FF-S-111.

7. Expansion Shields: Federal Spec FF-S-325.

B. Fasteners:

1. Bolts, Nuts, Lag Screws, Wood Screws and Washers: ASTM A 307, medium carbon steel; size and type to suit the application, unless otherwise noted.

2. Expansion Shield Fasteners: For anchorage of non-structural items to solid concrete and masonry.

3. Powder or Pneumatically Activated Fasteners: For anchorage of non-structural items to steel.

4. Fasteners for Non-Structural Wood Members to Masonry: 1/4" diameter x 3-1/4", Phillips, flat head.

C. Provide necessary installation of the work required; sizes and quantities of fasteners noted herein or as required by Code.

D. Tools: Provide the manufacturers recommended power tool for installing each type of fastener.

2.9 WOOD TREATMENT

A. General:

1. Treatment material shall provide protection against termites and fungal decay and shall be approved for use as a wood preservative for its intended use by the U. S. Environmental Protection Agency.

2. For all lumber and plywood above the ground and in ground contact, comply with the applicable requirements of AWPA, Standards C2 for Lumber, C9 for Plywood and of the AWPB standards referenced below.

3. Treated material shall meet the interior Type A requirements in AWPA, Standard C-20 for lumber and C-27 for plywood.

4. Pressure treat above ground items with water-borne preservatives complying with AWPA LP-2.

5. After treatment, kiln dry to a maximum moisture content of fifteen percent (15%).

6. Mark each treated item with AWPB Quality Mark Requirements.

7. Chemicals used to treat materials shall be free of halogens, sulfates, ammonium phosphate and formaldehyde.

B. Wood Requiring Treatment:

1. Lumber, Preservative Treated: All interior and exterior wood including nailers, blocking, stripping and similar items in conjunction with roofing, flashing and other construction; sills, blocking, furring, stripping, ledgers, supports and similar items in contact with concrete or masonry.

2. Lumber, Fire-Retardant Treated: Interior framing, blocking, furring, stripping, ledgers, supports, nailers, and miscellaneous exposed wood. Do not use fire-treated wood in contact with concrete or masonry.

3. Interior Plywood, Fire-Retardant Treated: Plywood backing for electrical and telephone equipment.

C. Preservative Pressure Treated Lumber:

1. Products:

a. Ammoniacal Copper Zinc Arsenate (ACZA).

b. Chromated Copper Arsenate (CCA).

c. Fluor Chrome Arsenate Phenol (FCAP).

d. Pentachlorophenol (Penta).

2. Comply with EPA and OSHA requirements and regulation and in accordance with AWPA, P-9. Type C treatment shall not discolor the wood used for exposed finish.

3. Incising is not permitted for appearance grade lumber or where materials are exposed to view.

4. Impregnate lumber with a preservative treatment conforming to AWPA, Standard C1 and P5. Apply preservative in a closed cylinder by the pressure process in accordance with AWPA, Standard C15.

5. Retention of dry salts:

a. Moderate service conditions (weather exposure): 0.25 pounds per cubic foot (oxide basis).

b. Severe conditions (constant contact with the ground or water): 0.40 pounds per cubic foot (oxide basis).

6. Remove excess moisture where shrinkage is a serious fault and where treated lumber will be in contact with concrete, masonry or plaster, and where water-borne treated lumber is to be painted or stained.

7. Lumber to be painted or stained shall have knots and pitch streaks sealed the same as for untreated wood.

8. Liberally brush freshly cut surfaces, bolt holes and machined areas with the same preservative, in accordance with AWPA, Standard M4.

D. Fire-Retardant Treatment:

1. Where fire-retardant lumber or plywood is specified, otherwise indicated or required by the Building Code, provide materials which comply with AWPA standards for pressure impregnation. Use fire-retardant chemicals which have a flame spread rating of not more than 25 when tested in accordance with UL Test 723 or ASTM E 84, and show no increase in flame spread and significant progressive combustion upon continuation of the test for an additional twenty (20) minutes.

2. Where treated items are exposed at the exterior or high humidities or are to have a transparent finish, provide appearance grade materials which show no change in fire hazard classification when subjected to standard rain test UL 790 or ASTM B 2898.

3. Use fire-retardant treatment which will not bleed through or adversely affect the type of finish indicated and which does not require brush treatment of field made cuts to maintain the fire hazard classification.

4. Where transparent finish is indicated, use the type of treatment and species which permits milling of the lumber after treatment without altering the indicated fire hazard classification, as determined by fire testing.

5. Kiln dry treated items to a moisture content of fifteen percent (15%), maximum.

6. Provide UL label on each piece of fire-retardant lumber and plywood.

7. Inspect each piece of treated lumber and plywood after drying. Discard damaged and defective pieces.

8. Products:

a. "Dricon" by Arch Wood Protection.

b. "Pyro-Guard" by Hoover Treated Wood Products.

c. Section 01600 - Product Requirements: Product options and substitutions. Substitutions: Permitted.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that spacing, direction and details of supports are correct to accommodate the installation of blocking, backing, stripping, furring and nailing strips.

2. Verify that surfaces to receive work are rigid, secure, accurately sized and located and otherwise properly prepared.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 COORDINATION

A. Fit carpentry work to other work. Scribe and cope as required for accurate fit.

B. Coordinate the location of furring, nailers, blocking, grounds and similar supports to allow for the proper attachment of other work.

3.3 GENERAL

A. Field Measurements:

1. Verify field measurements prior to fabrication.

2. If field measurements differ slightly from Drawing dimensions, modify the work as required for accurate fit.

3. If measurements differ substantially, notify the Owner=s representative prior to fabrication.

B. Workmanship:

1. Carefully layout, cut, fit and install rough carpentry items.

2. Use sufficient number of nails, spikes, screws and bolts to insure rigidity and permanence.

3. Drive nails perpendicular to the grain of wood in lieu of toenailing, where feasible.

4. Provide for installation and support of plumbing, air conditioning and ventilation work.

5. Install work true to lines, plumb and level, unless indicated or required otherwise.

C. Installation:

1. Install proprietary products in accordance with the manufacturer=s directions.

2. Provide washers under nuts and heads when making bolted or lag screwed connections.

3. Except as otherwise specified herein, machine nail or staple with written approval only.

4. Install framing connectors where indicated; secure with fasteners recommended by the manufacturer.

D. Protecting Other Work and Existing Facilities: Protect against damage and discoloration caused by the work of this Section.

3.4 PLATES

A. Provide single plates at floors and bottoms of openings; double plates face nailed together at ceilings and heads of openings.

B. Provide headers, as specified herein, over openings more than 2'-6" wide.

C. Splice single plates; stagger ends of double plates at least 48"; splice plates abutting corners. Locate plate splices directly over studs.

D. Unless shown otherwise on the Drawings, anchor plates resting on concrete or masonry with 1/2" diameter bolts at 48" o.c., maximum, or as required by windload.

3.5 JOISTS AND RAFTERS

A. Set with crown side up; lap and spike together over bearings utilizing joist hangers proper for the application. Minimum bearings on wood or metal: 1-1/2"; on masonry: 3".

B. Spike studs to joists resting on ribbon boards, block ends between studs where joists and studs are not in contact.

C. Double joists under partitions running parallel to the joists; space to provide clearance for pipes in partitions.

D. Double headers and trimmers; spike beams with ledgers to the ends of joists.

3.6 BRIDGING

A. Cross Bridging:

1. Nominal 2" x 3" wood, or approved type metal.

2. Provide at not more than 8 feet apart in joist spans. Do not anchor until dead loads are in place.

3. Space cross bridging members 1/4" apart to avoid rubbing against each other.

B. Solid Bridging:

1. Provide nominal 2" solid bridging over bearings, full depth of the joists, unless noted otherwise.

3.7 PLYWOOD SUBFLOORING

A. Apply face grain perpendicular to and continuous over joists or sleepers with end joints on bearings; stagger end joints.

B. Leave 1/16" space at all edge and end joints; 3/32" at T&G edges.

C. Before panels are placed, apply a bead of construction adhesive to the joists and T&G joints with a caulking gun.

D. Secure panels to joists with 8d deformed shank nails at 6" o.c. at edges and 10" o.c. at intermediate supports.

E. Complete all nailing within the adhesive manufacturer=s specified assembly time.

F. Protect from moisture and other damage during construction.

G. Place 15 pound asphalt roofing felt over concrete subfloors and concrete slabs with plywood, secured to the floor with 1-1/2" screws in expansion shields.

3.8 ROOF SHEATHING

A. Apply face grain perpendicular to and continuous over supports with end joints on bearings; stagger end joints.

B. Leave 1/16" space at all square edges; 1/32" at T&G joints.

C. Secure 1-1/8" panels with 10d ring shank nails at 6" o.c. at edges and intermediate supports, unless noted otherwise.

D. Protect from moisture and other damage until roofing is applied.

3.9 DOOR & WINDOW BUCKS, FRAMING BLOCKING

A. Provide treated wood, cut to size at locations against concrete and masonry.

B. Provide fire-retardant treated bucks and framing in fire-rated partitions.

3.10 SITE TREATMENT OF WOOD MATERIALS

A. Apply preservative treatment in accordance with the manufacturer's published instructions.

B. Brush apply two coats of preservative treatment on wood in contact with cementitious materials and roofing and related metal flashings.

C. Treat site-sawn cuts.

D. Allow preservative to dry prior to erecting members.

3.11 CONSTRUCTION

A. Site Tolerances: Framing Members: 1/4" from true position, maximum.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior wood paneling.

2. Wood door frames.

3. Standing and running trim.

4. Plastic laminate.

5. Adjustable shelving.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Blocking and backing plates for anchorage.

2. Section 06400 - Architectural Woodwork: Cabinetry.

3. Section 08710 - Door Hardware: Hardware for wood doors.

4. Section 09110 - Non-Load Bearing Steel Framing: Substrate framing.

5. Section 09900 - Painting: Finishes.

1.2 DESCRIPTION OF WORK

A. The extent of finish carpentry work is indicated on the Drawings and as specified herein, and includes providing and installing all finish woodwork, wood trim for bases, wall rails, crown moldings, ceiling battens, wood door and window frames, jambs and moldings and wood veneer paneling as required to complete the Project.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American National Standards Institute (ANSI):

1. ANSI A135.4 - Basic Hardboard.

2. ANSI A208.1 - Mat Formed Wood Particleboard.

C. Architectural Woodwork Institute (AWI):

1. AWI AWQS - Architectural Woodwork Quality Standards, 8th Edition, Version 2.0.

D. American Society for Testing and Materials (ASTM):

1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

E. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools.

F. National Electric Manufacturer=s Association (NEMA):

1. NEMA LD3 - High Pressure Decorative Laminates.

G. United States Department of Commerce Product Standard (PS):

1. PS 20 - American Softwood Lumber Standard.

H. Western Wood Products Association (WWPA):

1. WWPA - Quality Standards.

1.4 DESIGN INTENT

A. It is the design intent that similar woodwork throughout the Project match. Coordinate work between the separate installers providing similar woodwork to ensure that the design intent is achieved to the satisfaction of the Owner=s representative.

1.5 SUBMITTALS

A Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s specifications and installation instructions for each item of factory-fabricated paneling, wood veneer, finish hardware, anchorage devices and finish coating products.

2. Shop Drawings: Show the location of each item, dimensioned plans and elevations, large scale details, attachment, anchorage and related components.

3. Samples: For each species and cut or pattern of finish carpentry. Label each sample according to species, grade, grain cut and finish type.

a. Treated Wood: 12" long sample of termite, preservative and fire-retardant treated wood items.

b. Interior standing and running trim: 24" long x full board or molding width, unfinished.

c. Factory-Finished Plywood Veneer and Wood Paneling: 24" long x panel width.

d. Worked (Shaped) Pieces, Unfinished: Profile size x 12" lengths. For work requiring eased edges, submit samples of each size of eased edge

required. Samples for each species, grade, and grain cut need not be submitted.

e. Finished Samples: Representative board samples of 3/4" x 8-1/2" x 11" size with transparent finishes of each type, color and texture required; finished by the Paint applicator.

f. Hardware: One (1) complete unit of each type and finish required.

4. Wood Treatment Data: Chemical treatment manufacturer=s instructions for handling, storage, installation and finishing treated materials.

a. Pressure Treatment and Termite Treatment: For each type specified, include certification by the treating plant stating the chemicals and process used, net amount of preservative retained and conformance with applicable standards.

b. Dip Treatment: For each type specified, include certification by the treating plant stating the chemical solutions used, submersion period and conformance with applicable standards.

c. Fire-Retardant Treatment: Include certification by the treating plant indicating the type of chemicals used and fire performance characteristics achieved.

5. Assurance / Control Submittals:

a. Manufacturer=s certification that the fabricated woodwork complies with the quality grades and other requirements indicated.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.6 COORDINATION

A. Pre-Installation Meeting: Convene a Pre-Installation Meeting at the Project Site prior to the delivery of finish carpentry materials to the Site.

1. Require attendance of the Contractor, Architect, Owner=s representative and representatives of the installer of architectural woodwork, other finishes, painting and related mechanical and electrical work.

2. Review coordination and environmental controls required for proper installation and ambient conditions in areas to receive the work.

3. Review preparation and installation procedures, and the coordination and scheduling required with related work.

B. Support Work:

1. For support work not indicated in the Contract Documents, coordinate requirements with other installers, in a timely manner.

2. Provide work as necessary to ensure that all work has proper framing and reinforcing supports to ensure secure and solid installations.

1.7 QUALITY ASSURANCE

A. Perform the work in accordance with AWI, Premium quality where designated, Custom quality all others

B. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

C. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Material and Equipment: Transport, handle, store and protect to prevent damage.

B. Deliver products to the Project Site in the manufacturer=s original, unopened packaging.

C. Do not deliver products to the Project Site until wet work, grinding, painting and similar operations which could damage, soil or deteriorate the finish carpentry has been completed in the installation areas, and humidity has been stabilized.

D. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting the requirements specified for the installation areas.

E. Protect installed finish carpentry from damage and excessive relative humidity until final acceptance.

1.9 JOB CONDITIONS

A. Fabricator of the finish carpentry shall determine the optimum moisture content and the required temperature and humidity conditions.

B. The installer shall advise the Contractor of the temperature and humidity requirements for the finish carpentry installation areas. Do not store or install finish carpentry until the required temperature and relative humidity has been stabilized and will be maintained in the installation areas.

C. Stabilize temperature and humidity in installation areas as necessary to maintain the moisture content of the installed finish carpentry within a 1.0% tolerance of optimum moisture content, from the date of installation throughout the remainder of the construction period.

PART 2 PRODUCTS

2.1 GENERAL

A. Finish Carpentry Standards:

1. Comply with AWI, Premium quality where designated, Custom quality grade for trim, jambs, frames and detailing.

2. Lumber shall be best grade for clear finishes.

3. Moisture content of lumber shall be no more than 13%.

4. Minimum lengths for trim and frames shall be:

a. One continuous piece for openings.

b. Joints no closer than 12 feet apart in running trim.

5. Sizes and profiles as called for on the Drawings.

B. Backpriming:

1. Back prime work immediately upon arrival of the units at the Project Site with a single coat of spar varnish or other acceptable sealer for fabricated units to be installed as an exterior component or where against portland cement plaster, gypsum plaster, or against exterior facing walls of concrete or masonry.

2. Ensure that the sealer does not contaminate surfaces requiring a transparent finish.

2.2 MATERIALS

A. Millwork:

1. Wood door and window frames, trim and plywood, ceiling frames and panels, and solid paneling shall be the species and cut designated in finish schedules, drawings and details; best clear Premium quality where designated, Custom quality grade, for transparent finish; sized and fabricated as detailed.

2. Exterior wood fascia boards, [screens], [trellis frames], shall be clear, all heart Redwood.

B. Panels: Fiberboard or fiberboard core plywood, construction balanced.

C. Plywood: For exterior use and interior use exposed to moisture shall be marine grade.

D. Veneers: Species, cut and matching as indicated or selected, grade 1, factory-finished.

2.3 WOOD TREATMENT

A. Preservative Treatment: For all exterior and interior wood, comply with applicable requirements of AWPA, Standards C2 (Lumber), C9 (Plywood), and of AWPB, Quality Marks Requirements.

B. Preservative Treatment Types:

1. Ammoniacal Copper Zinc Arsenate (ACZA).

2. Pentachlorophenol (Penta).

3. Fluor Chrome Arsenate Phenol (FCAP).

C. Pressure-treat above ground items with water-borne preservatives complying with AWPB LP-2.

D. Dip-treat interior wood.

E. Apply in accordance with OSHA and EPA requirements and regulations and in accordance with AWPA, P-9. Treatment shall not discolor finished wood exposed to view.

F. Fire-Retardant Treatment:

1. Where fire-retardant wood is specified or required, provide materials which comply with AWPA standards for pressure impregnation with fire-retardant chemicals, and which have a flame spread rating of not more than 25 when tested in accordance with UL Test 723 or ASTM E 84, and shows no increase in flame spread and significant progressive combustion upon continuation of the test for an additional twenty (20) minutes.

2. Where treated items are exposed to the exterior or to high humidity or are to have a transparent stain or sealer finish, provide appearance grade materials which show no change in the fire-hazard classification when subjected to standard rain test in accordance with UL 790 or ASTM B 2898.

3. Use fire-retardant treatment which will not bleed through or adversely affect the type of finish indicated, and which does not require brush treatment of field made cuts to maintain the fire-hazard classification.

G. Products Scheduled for Transparent Finish:

1. Treatment color shall be compatible with products scheduled for a transparent finish. Provide samples of treatment with finish applied for review.

2. Where a transparent finish is indicated, use the type of treatment and species which permits milling of the lumber after treatment without altering the indicated fire-hazard classification, as determined by fire testing.

H. Incised Materials: Do not use incised materials where finished work will be exposed to view.

2.4 INTERIOR WOOD PANELING

A. Veneer plywood for transparent finish, clear plain cut Mahogany, color and grain matched for consistency between panels and with the trim.

B. Stain and transparent finish.

2.5 WOOD DOOR FRAMES

A. Grade:

1. Opaque Painted: AWI, Custom.

2. Transparent: AWI, Premium.

B. Wood: Same species as the wood door face veneer. Ease edges.

2.6 STANDING AND RUNNING TRIM

A. Grade:

1. Opaque Painted: AWI, Custom.

2. Transparent: AWI, Premium.

B. Trim, boards and plywood for painted finish: Softwood suitable for the exposure and use.

C. Trim and boards for transparent finish: Wood species as selected.

D. Back Construction: Rout or groove the backs of flat trim members, kerf backs of other wide flat members, except for members with ends exposed in finish work.

2.7 PLASTIC LAMINATE

A. Manufacturers: Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Formica Corp.

2. Nevamar Corp.

3. Wilsonart International.

B. High-Pressure Laminate: NEMA LD3, Grade 50, General Purpose, fire-rated, 0.048" thick.

C. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.8 ADJUSTABLE SHELVING

A. Shelving: Softwood plywood; PS 1, graded in accordance with AWI; veneer cover core sides, edges and ends with plastic laminate; cover medium density particle board with factory-applied finish, as selected. 3/4" thick x depth shown on the Drawings x maximum possible length.

B. Standards: Heavy-duty, 2" slot adjustments, length as required. Knape & Vogt # 87 or comparable product as approved. Color as selected.

C. Brackets: Heavy-duty, for 2" slots, nylon cam lock lever, length as required. Knape & Vogt # 186 / 187 or comparable product as approved. Color as selected.

2.9 RELATED MATERIALS

A. Closet Rod: 1-1/16" diameter stainless steel round tubing with chrome-plated mounting end flanges, Knape & Vogt # 660 or comparable product as approved. Provide support brackets when required by the manufacturer; of the same material and finish.

B. Anchorage Devices, General: Nails, screws, toggle bolts, expansion shields, and other devices, of type, size and finish required for each use to ensure strong connections. Where products are subject to moisture, provide hot-dipped galvanized products, otherwise electroplated zinc or cadmium anchorage devices are acceptable.

2.10 FABRICATION, GENERAL

A. Field Measurements:

1. Before proceeding with the fabrication of finish carpentry products, obtain field measurements and verify dimensions.

B. Wood Products:

1. Fabricate finish carpentry products to the dimensions, profiles and details indicated with the construction and materials complying with referenced standards of the specified AWI grades.

2. Where necessary for fitting at the Project Site, provide reasonable allowance for scribing, trimming and fitting. Pre-cut openings, where possible, to receive hardware, and mechanical and electrical work.

3. Ease edges of rectangular solid wood components to a 1/16" radius for members less than 1" in nominal thickness; 1/8" radius for edges of members over 1" in nominal thickness.

4. Conceal all anchorage devices except where decorative fasteners are approved.

2.11 OTHER

A. General: Where the quality of workmanship may not be specifically indicated, comply with the applicable provisions of AWI as follows as applicable to the grade of material, construction and finish:

1. Scheduled for Opaque Painting: AWI, Custom Grade.

2. Scheduled for Transparent Finish: AWI, Premium Grade.

B. Finish: Exposed wood surfaces (except resawn surfaces) shall be sanded and free of tool marks and similar blemishes. Hand sand inside the building after installation until all defects have been entirely removed. Any material showing machinery, tool, sandpaper or other defacing marks will be rejected.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 FABRICATION

A. Fabricate trim, moldings, bases and frames to the dimensions and profiles shown. Route and groove the backside of members to be applied to flat surfaces, except for members with ends exposed in the finished work.

B. Condition wood materials to the average prevailing humidity conditions in the installation areas prior to installing.

C. Backprime wood with scheduled finish material exposed on the exterior or, to high the moisture and high relative humidities on the interior.

D. Comply with the requirements of Section 09900 for primers and their application.

3.3 INSTALLATION

A. Discard items which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or are too small to fabricate work with a minimum number of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.

B. Install work in accordance with AWI, AWQS, Section 1700 - Installation of Woodwork.

C. Install the work plumb, level and straight without distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/64" maximum offset in flush adjoining surfaces; 1/32" maximum offsets in revealed adjoining surfaces.

D. Scribe and cut the work to fit adjoining work. Refinish cut surfaces or repair damaged finish at cuts. Provide a neat, tight joint where work specified in this Section adjoins other work.

E. Anchor work items to nailers or blocking or directly to the substrate using concealed fasteners, to the extent possible.

F. Install standing and running trim with the minimum number of joints possible, using full-length pieces (from maximum length lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners to produce tight fitting joints with full surface contact throughout the length of joints. Use scarf joints for end-to-end jointing.

G. Secure finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nail as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersink and fill flush with the finished surface. Match the final finish where a transparent finish is indicated.

H. Apply sealant at all joints between finish carpentry work and adjacent walls and flooring to prevent intrusion by vermin and moisture into concealed spaces.

I. Install hardware in accordance with the manufacturer's published instructions.

J. Install shelving units, standards and brackets at locations indicated on the Drawings.

K. Finish: AWI quality standard. Leave finish carpentry in a paint-ready condition for final finishing by the painting applicator.

3.4 ADJUSTING AND TESTING

A. Section 01700 - Execution Requirements: Adjusting and testing the installed work.

B. Adjust installed work.

C. Test the installed work for rigidity and ability to support loads.

D. Adjust joinery for uniform appearance.

E. Touch-up shop-applied finishes to restore damaged and soiled areas.

F. Repair damaged and defective work wherever possible to eliminate defects functionally and visually; where repairs cannot be made to the satisfaction of the Owner=s representative, replace the finish cabinetry.

G. Adjust moving or operating parts to function smoothly and correctly.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect finish carpentry work for plumb, level, alignment and secure attachment.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean exposed and semi-exposed surfaces.

3.7 PROTECTION

A. Installer shall advise the Contractor and painting applicator of procedures required to protect the finish carpentry during the remainder of the construction period to ensure that the work will be without damage and deterioration at the time of final acceptance, and will be comparable to the final finish scheduled for the work.

B. Installer shall return to the Project prior to substantial completion, repair any damage to the work, and readjust the hardware.

END OF SECTION

SECTION 06400

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood faced casework and trim.

2. Plastic laminate faced casework and shelving.

3. Plastic laminate countertops.

4. Solid polymer fabrications.

5. Marble and Granite countertops.

6. Wood shelving.

7. Preparation for installation and connection of utilities.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Blocking and backing plates in walls for anchorage.

2. Section 06200 - Finish Carpentry: Adjustable shelving.

3. Section 06640 - Solid Polymer Fabrications: Countertops.

4. Section 09110 - Non-Load Bearing Steel Framing: Blocking and backing plates.

5. Section 09900 - Painting: Woodwork finishes.

6. DIVISIONS 15 and 16: Service fittings and connections.

1.2 DESCRIPTION OF WORK

A. The extent of architectural woodwork is indicated on the Drawings and as specified herein, and includes providing, fabricating and installing all wood faced and plastic laminate faced architectural woodwork, trim and countertops, wood shelving, installations and utility connections.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American National Standards Institute (ANSI):

1. ANSI A135.4 - Basic Hardboard.

2. ANSI A208.1 - Mat Formed Wood Particleboard.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Building and Facilities.

2. Accessibility Guidelines for Schools.

D. Architectural Woodwork Institute (AWI):

1. AWI AWQS - Architectural Woodwork Quality Standards, 6th Edition,

[Premium] [Custom] Grade, except as otherwise indicated.

E. National Electric Manufacturer's Association (NEMA):

1. NEMA LD3 - High Pressure Decorative Laminates.

F. United States Department of Commerce Product Standard (PS):

1. PS 1 - Construction and Industrial Plywood.

2. PS 20 - American Softwood Lumber Standard.

1.4 DESIGN INTENT

A. It is the design intent that similar woodwork throughout the Project match. Coordinate work between the separate installers providing similar woodwork to ensure that the design intent is achieved to the satisfaction of the Owner=s representative.

1.5 DEFINITIONS

A. Exposed Surfaces: The exposed portions of woodwork, including surfaces visible when doors and drawers are closed. Bottoms of woodwork more than 4'-0" above the floor shall be considered as exposed. Visible members in open cases or behind glass doors also shall be considered as exposed. The front and both sides of all storage cabinets shall be considered as exposed, even when one or both side panels are against a wall or an adjacent cabinet.

B. Semi-exposed Surfaces: Semi-exposed portions of woodwork includes members behind opaque doors, such as shelves, dividers, interior face of ends, wood back, drawer sides, backs and bottoms, and the inside face of doors. Tops of woodwork 6'-6" or more above the floor shall be considered as semi-exposed.

C. Unexposed Surfaces: Unexposed portions of woodwork includes sleepers, web frames, dust panels and other surfaces not usually visible after installation.

1.6 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Fabricator=s specifications and installation instructions for each item of factory-fabricated woodwork, wood veneer counter tops, finish hardware and finish coating products.

    a. Wood veneers and finishes.

    b. Data for hardware and accessories indicating the material, type, function, attachment and finish.

2. Shop Drawings: Show the location of each item on dimensioned plans, sections, elevations, and large scale details. Indicate materials used, wood species, component profiles, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes. Submit for the following:

    a. Cabinet work, base and overhead.

    b. Counter work, base and overhead.

    c. Shelving units.

    d. Vanities.

    e. Submit fabricators product information including Shop Drawings for fabricator=s standard units.

3. Samples: For each species and cut or pattern of architectural woodwork:

    a. General:

        1). Two 12" x 12" solid wood and plywood or hard board samples with factory-applied transparent or opaque finish for each finish system and color required.

        2). Two samples of each countertop material.

        3). One unit of each type and finish of cabinet hardware.

    b. Initial Samples: Unless specific products are scheduled, submit 2" x 2", minimum, size samples of the complete range of colors, patterns, and finishes available for initial selection.

    c. Final Samples:

        1). Color, Pattern and Finish Samples: Submit 6" x 6" final samples matching those initially selected.

        2). Fused Joint Sample: On project products that would least likely obscure joints, submit 6" x 10" samples showing fused joint work.

4. Assurance / Control Submittals:

    a. Fabricator=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written Warranty with forms completed in the name of the Owner and registered with the fabricator.

1.7 COORDINATION

A. Pre-Installation Meeting: Convene a Pre-Installation Meeting at the Project Site prior to the delivery of architectural woodwork materials to the Site.

1. Require attendance of the Contractor, Architect, Owner=s representative, and representatives of the installer of finish carpentry, other finishes, painting and related mechanical and electrical work.

2. Review coordination and environmental controls required for proper installation, and ambient conditions in areas to receive the work.

3. Review preparation and installation procedures, and the coordination and scheduling required with related work.

B. Support Work:

1. For support work not indicated in the Contact Documents, coordinate the requirements with other installers, in a timely manner.

2. Provide work as necessary to ensure that all work has proper framing, backing and reinforcing supports to ensure secure and solid installations.

1.8 QUALITY ASSURANCE

A. Qualifications:

1. Fabricator: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Quality Standards:

1. Woodwork shall comply with the requirements of AWI AArchitectural Woodwork Quality Standards Illustrated@, Eighth Edition, 200, except where more stringent requirements are specified herein.

C. Style: Fabricate, as indicated, utilizing the following:

1. [Conventional Flush Construction with face frame.]

2. [Conventional Flush Construction without face frame.]

3. [Flush Overlay Construction.]

4. [Reveal Overly Construction.]

5. Wood faced casework - [Premium] [Custom] grade.

6. Countertop, casework and shelving - [Premium] [Custom] grade.

7. Wood shelving - [Premium] [Custom] grade.

1.9 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Package architectural woodwork in water-tight containers for transport to the Project Site to prevent damage, water damage, soiling and deterioration and for storage in a location other than inside the building, if necessary.

C. Do not store woodwork on the Project Site for a long period of time. If, due to unforseen circumstances, the woodwork must be stored in other than the installation areas, store only in areas meeting the requirements specified for the installation areas.

D. Do not deliver woodwork until wet work, grinding, painting and similar operations which could damage, soil or deteriorate the woodwork has been completed in the installation areas, and humidity has been stabilized.

E. Deliver products to the Project Site in the fabricator=s original, new, unopened packaging, crates or containers.

1.10 JOB CONDITIONS

A. The fabricator of woodwork shall determine the optimum moisture content and required temperature and humidity conditions.

B. The installer shall advise the Contractor of the temperature and humidity requirements for the architectural woodwork installation areas. Do not install woodwork until the required temperature and relative humidity has been stabilized and will be maintained in the installation areas.

C. Stabilize temperature and humidity in installation areas, as necessary, to maintain the moisture content of the installed woodwork within a 1.0% tolerance of optimum, from the date of installation throughout the remainder of the construction period.

D. Unless instructed otherwise by the Installer, maintain the spaces to receive woodwork between 65E F and 80E F, with a relative humidity of 50% or less for 72 hours prior to, during and after installation until the date of Substantial Completion.

1.11 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Fabricator=s Warranty: Provide fabricator=s standard Warranty against defects in product materials and workmanship.

PART 2 PRODUCTS

2.1 WOOD FACED CASEWORK AND TRIM

A. AWI, [premium] [custom] grade, natural finish.

B. Trim and Solid Stock: Solid, kiln dried, [premium] [custom] grad, wood species as selected.

C. Core Stock: 3/4" plywood or medium density melamine particleboard, veneer finish at exposed faces, melamine or matching veneer finish at semi-exposed faces, outside and inside drawers, cabinet backs, shelves, etc.

D. Species and Cut: Lumber and veneer for transparent and opaque finish shall be as indicated herein or in the Finish Schedule, interior drawings and details, or as selected.

E. Factory Finished: Casework shall be factory finished per AWI 1500, System #5, catalyzed polyurethane, satin medium rubbed effect, filled finish.

F. Backpriming: Back prime the work with a single coat of spar varnish or other acceptable sealer for fabricated units to be installed as an exterior component or where against portland cement plaster, gypsum plaster or against an exterior facing wall of concrete or masonry. Ensure that the sealer does not contaminate surfaces requiring a transparent finish.

2.2 PLASTIC LAMINATE FACED CASEWORK AND SHELVING

A. Core Stock: Material shall be 45 pound density hard board, industrial grade.

1. Minimum core thickness shall be 3/4" except:

a. Hidden cabinet backs may be 1/4" thick hardboard.

b. Exposed backs and drawer bottoms may be 1/4" thick.

c. Drawer sides may be 1/2" thick.

d. Backs of free standing cabinets may be 1/2", 5/8" or 3/4" thick, as indicated or required.

e. Cabinet bases (toe spaces) may be solid kiln-dried wood, unfinished for finish applications by others.

f. Shelf thickness shall be 1" for any shelf over 36" long.

2. Laminated Plastic. Where Plam is indicated for exterior cabinet finish, all visible exposed faces and edges shall be covered with laminated plastic, unless otherwise specified herein. Provide backer as necessary to balance plastic laminate installation at concealed locations.

a. Fabricators: Subject to compliance with the Project requirements, fabricators offering products which may be incorporated into the work include the following:

1). Formica Corporation.

2). Nevamar Corporation.

3). Wilsonart International.

b. High-Pressure Decorative Laminate: NEMA LD-3, GP-50, General Purpose:

1). Nominal 0.050" thick for horizontal and high usage exposures.

2). 0.028" thick for vertical and medium usage exposures.

3). 0.020" thick, liner grade, for all semi-exposed faces inside drawers, doors, backs, shelves, etc.

4). Color(s) as selected.

c. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

3. Laminated Plastic Adhesive: Type recommended by the laminated plastic manufacturer; bonded by machine application and pressure of not less than 100 pounds per square inch.

4. Edge Treatment: Top edges of drawer sides and drawer backs; edge of doors, fixed panels, visible frame parts and drawer face tops and edges shall be matching laminate faced or shall be resilient polyvinylchloride 0.024" thick, machine bonded with hot melt glue, factory edges trimmed, superfinished, buffed and polished.

2.3 PLASTIC LAMINATE COUNTERTOPS

A. Plastic Laminate Tops:

1. Core thickness of countertop substrate shall be 3/4" or 1" as indicated. Backsplash core shall be 3/4" or 1/2" in two-piece countertop applications.

2. Finish wear surfaces, including all edges, shall be 0.050" plastic; velvet or satin finish, pattern or solid color, as selected from the manufacturer=s standards.

3. Underside of decks and back side of backsplashes shall have 0.02" balance sheet bonded to the substrate whether or not the countertop is in Awet@ or Adry@ usage.

4. Backsplash to deck joints shall be shoulder rabbited, glued, mechanically fastened, and sealed during assembly with a silicone compound; backsplash color shall be compatible with the deck color.

5. Transverse deck joints shall be spaced as far apart as material limitations allow, shall be job sealed during installation with silicone compound, and shall be securely drawn together with concealed mechanical joint fasteners.

6. Where noted on the Drawings, chemical-resistant countertop surfacing with solid-core edge banding shall be used when severe resistance to reagents is required.

7. Use acid-resistant plastic laminate at Science Laboratories, Art Rooms and adjacent Storage Room counters.

2.4 SOLID POLYMER FABRICATIONS

A. Provide fabrications of cast solid polymer material composed of acrylic polymer with mineral fillers and pigments where indicated. Material shall not be coated or laminate to substrates. Superficial damage to a depth of 1/64" shall be repairable by sanding or polishing. Products by:

1. Avonite Surfaces.

2. DuPont Corian.

B. Size:

1. Width / Height: Fabricator=s standards of size best meeting the project requirements. Backsplash to be 4" in height, unless otherwise indicated.

2. Thickness:

a. Horizontal surfaces - 3/4" minimum.

b. Vertical surfaces - 1/2" minimum; backsplashes - 3/4".

C. Finish: Polished, unless otherwise indicated. Top, backsplash and fascia shall be one-piece. Color, edge detail and pattern shall be as selected from the fabricator=s standards.

D. Color / Pattern: The basis of design is products by Avonite or approved comparable color / pattern.

E. Related Materials:

1. Panel Adhesive: Fabricator=s standard specifically recommended for the Project application. Adhesives used at installations exposed to water or high humidity conditions to be water-resistant type.

2. Joint Adhesive: Fabricator=s standard capable of fusing each joint and creating inconspicuous and non-porous joints.

3. Sealant: Fabricator=s recommended mildew resistant, FDA / UL recognized silicone sealant, in colors custom matched to each component where sealant is required.

4. Mounting Hardware: Provide mounting hardware including sink / bowl clips, inserts and fasteners for the attachment of undermount sinks and lavatories.

5. Anchorage Devices: Fabricator=s approved clips, inserts, and anchorage devices . Ferrous products to be hot-dipped galvanized. Do not use metal types not specifically approved by the fabricator for their products.

F. Fabrication:

1. Factory fabricate components to the greatest extent possible, to the sizes and shapes indicated, in accordance with the approved Shop Drawings. Where indicated, factory fabricate side and back splashes with 1/2" cove at intersections.

2. Form joints between components using the fabricator=s standard acrylic joint adhesive. Joints shall be inconspicuous, non-porous, and reinforced with strips of

solid polymer material in accordance with the fabricator=s printed instructions.

3. Tolerances:

   a. Variation of component size: +/- 1/8".

   b. Location of openings: +/- 1/8" from the required location.

4. Provide factory cutouts for plumbing and accessories as indicated. Reinforce heated or cooled cutouts in accordance with the Approved Shop Drawings and the fabricator=s printed instructions.

5. Cut an finish components edges with clean returns. Round edges of cutouts to 1/8" radius. Round corners of cutouts with 1/2" minimum radius. Use router to form all cutouts. Provide thick edges where indicated using strips of solid polymer material and fabricator=s acrylic joint adhesive. All joints to be inconspicuous and non-porous. All exposed surfaces to have a uniform finish and gloss.

6. Countertop Joint Layout: Provide a monolithic look to the greatest extent possible. Where joints in the work is required due to fabrication limitations or required for proper performance of the product, work with the Owner=s representative to establish satisfactory joint locations.

2.5 MARBLE AND GRANITE COUNTERTOPS

A. Thickness shall be 3/4", minimum.

B. Edge detail shall be as selected.

C. Top, backsplash and fascia shall be a color and pattern selected from the fabricator=s standards. Location of joints shall be shown on shop drawings.

2.6 WOOD SHELVING

A. Softwood plywood, PS 1, graded in accordance with AWI.

B. Veneer cover core sides and ends with plastic laminate, color as selected.

C. Cover medium density particleboard with factory-applied finish, as selected.

D. Dimensions: 3/4" thick x depth shown on the Drawings x maximum possible length.

2.7 CABINET HARDWARE AND ACCESSORY MATERIALS

A. General: Provide complete cabinet hardware and accessory materials associated with the architectural woodwork, except for units specified as Adoor hardware@ in other Sections of these Specifications.

B. Hardware References: Except as otherwise indicated, comply with ANSI A156.9 AAmerican National Standard for Cabinet Hardware@.

C. Cabinet Door Hardware: Provide hinges and pulls of the types indicated, to accommodate each door size and style. Hinges concealed AEuropean@ style; Pulls - EPCO DP-418 x 3-
1/2@ wire pull or as indicated or approved.

1. Each cabinet door up to 36" in height shall have one pair of hinges; up to 48" in height, 1-1/2 pair hinges; over 48" in height, two pair of hinges. Each cabinet shall be equipped with sound dampening cushions to minimize noise.

D. Drawer Hardware: Provide slides and pulls of the types indicated, to accommodate each drawer size and style.

1. Equip each drawer with side-mounted, full-extension, ball-bearing, nylon roller drawer slides with a load capacity of 75 pounds per pair; provide Astay-closed@ feature for lift out removal.

E. Locks: Provide standard pin-type or disc-type (five pins or discs) tumbler locks, keyed individually, except as otherwise indicated.

F. Shelf Supports: Where shelving is indicated as Aadjustable@, provide pin-type or slotted-type standards and brackets of a type required to support shelves with a uniform load of 40 pounds per square foot; recessed for premium construction, surface-mounted for custom and economy construction.

2.8 ACCESSORIES

A. Adhesive: Type recommended by AWI to suit the application.

B. Fasteners: Size and type to suit the application.

C. Bolts, Nuts, Washers, Lags, Pins and Screws: Of the size and type to suit the application.

D. Concealed Joint Fasteners: Threaded, hot-dipped galvanized steel.

E. Sealant: Manufacturer=s recommended mildew resistant, FDA / UL recognized silicone sealant in colors custom matched to each component where sealant is required.

F. Anchorage Devices: Fabricator=s project approved clips, inserts, and anchorage devices. Ferrous products to be hot-dipped galvanized. Do not use metal types not specifically approved by the fabricator for their products.

2.9 FABRICATION

A. Field Measurements:

1. Before proceeding with the fabrication of architectural woodwork products, obtain field measurements and verify dimensions.

B. Wood Products:

1. Fabricate architectural woodwork products to the dimensions, profiles and details indicated, with construction and materials complying with the referenced standards of the specified AWI grades. Where necessary for fitting at the Project Site, provide reasonable allowance for scribing, trimming and fitting. Pre-cut openings, where possible, to receive hardware and mechanical and electrical work.

2. Conceal all anchorage devices, except where decorative fasteners are approved.

C. Fire-Retardant Treatment:

1. Where fire-retardant wood is specified or otherwise indicated, provide materials which comply with AWPA standards for pressure impregnation with fire-retardant chemicals, and which have a flame spread rating of not more than 25 when tested in accordance with UL 723 or ASTM E 84, and show no increase in flame spread and significant progressive combustion upon continuation of the test for an additional twenty (20) minutes.

2. Where treated items are exposed to the exterior or to high humidity or are to have a transparent stain or sealer finish, provide appearance grade materials which show no change in the fire hazard classification when subjected to standard rain test per UL 790 or ASTM B 2898.

3. Use fire-retardant treatment which will not bleed through or adversely affect the type of finish indicated, and which does not require brush treatment of field made end cuts to maintain the fire-hazard classification.

D. Products Scheduled for Transparent Finish:

1. Treatment color shall be compatible with products scheduled for a transparent finish. Provide samples of treatment with finish applied for review.

2. Where a transparent finish is indicated, use the type of treatment and species which permits milling of the lumber after treatment without altering the indicated fire-hazard classification, as determined by fire testing.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Condition woodwork to the average prevailing humidity conditions in the installation areas before installing.

B. Install concrete inserts and similar anchoring devices to be built into substrates well in advance of the time the substrates are to be built.

C. Prior to the installation of architectural woodwork, examine shop fabricated units for completion, and complete work as required, including back priming and removal of packing.

3.3 INSTALLATION

A. Set and secure fixtures in place at the locations indicated on the Drawings.

B. Cabinets and countertops shall be installed by factory-trained personnel, or by personnel experienced in installing the type of countertops and splashes required.

C. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims.

D. Scribe and cut work to fit adjoining work; refinish cut surfaces or repair damaged finishes at cuts in strict accordance with the fabricator=s instructions.

E. Secure woodwork to anchorage devices or blocking built-in or directly attach to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nail as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersink and fill flush with the woodwork surface. Match the final finish where transparent finish is indicated.

F. Casework: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain the indicated veneer sequence matching of casework with transparent finish.

G. Secure fixtures to the floor using appropriate angles and anchorages.

H. Countertops: Anchor securely to base units and other supports as indicated, in strict accordance with the fabricator=s instructions.

I. Wood Storage Shelving: Complete the assembly of units and install in the locations indicated, including hardware and accessories, as indicated.

J. Finish: AWI quality standard. Leave woodwork in paint ready condition for final finishing by the painting applicator.

K. Apply sealant at all joints between architectural woodwork and adjacent floor and walls.

3.4 CONSTRUCTION

A. Interface with Other Work:

1. Coordinate the installation sequence of fixtures with the trades providing utilities to the units.

B. Tolerances:

1. Fabrication: Variation of Components Size: + 1/8". Location of Openings: + 1/8" from the required location.

2. Installation: 1/8" in 8'-0" for plumb and level, including countertops, and with 1/64", maximum, offset in flush adjoining surfaces; 1/32" maximum offsets in revealed adjoining surfaces.

C. Finishing:

1. Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually. Where not possible to repair to the satisfaction of the Owner=s representative, replace the woodwork.

2. Touch-up shop applied finishes to restore damaged and soiled areas.

3. Adjust joiner for a uniform appearance.

4. Complete the finishing work specified as work of this Section, to whatever extent not completed in the shop or prior to installation of the woodwork.

3.5 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Lubricate and make final adjustment of moving and operating parts for smooth and correct operation.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect woodwork installations for flush, plumb, level, alignment and secure attachment to substrates.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning and protection of installed work.

B. Clean casework, counters, shelves, hardware, fittings and fixtures.

C. Clean woodwork on exposed and semi-exposed surfaces.

3.8 PROTECTION

A. Installer shall advise the Contractor and paint applicator of the procedures required to protect the woodwork during the remainder of the construction to ensure that the work will be without damage and deterioration at the time of final acceptance.

B. Installer shall return to the Project prior to substantial completion, repair any damage to the work and readjust the hardware.

END OF SECTION

SECTION 06650

SOLID POLYMER FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Countertops.

2. Work surfaces.

3. Vanities.

4. Window sills.

5. Preparation for installation and connection of utilities.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06400 - Architectural Woodwork: Support for countertops, work surfaces and vanities.

2. Section 07900 - Joint Sealers: Sealants for joints.

3. Section 09110 - Non-Load Bearing Steel Framing: Blocking and backing plates in walls.

4. Section 09250 - Gypsum Board: Adjacent wall substrate.

5. Section 12305 - Science Casework and Laboratory Equipment: Support for countertops.

6. Division 15 - Plumbing Fixtures.

7. Division 16 - Wiring Devices.

1.2 DESCRIPTION OF WORK

A. The extent of Solid polymer fabrications work is indicated on the Drawings and as specified herein, and includes providing, fabricating and installing cast synthetic polymer fabrications, splashes, inlays, adhesive, sealant, mounting accessories and preparation for installation of plumbing fixtures, and mechanical and electrical services by other trades.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced.

Publications are referred to in the text by basic designation only. Comply with the applicable standards of the following, as referenced herein.

B. American National Standards Institute (ANSI):

1. ANSI Z124.3 - Plastic Lavatories.

2. ANSI Z124.6 - Plastic Sinks.

C. American Society for Testing and Materials (ASTM):

1. ASTM C 501 - Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.

2. ASTM D 256 - Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.

3. ASTM D 570 - Test Method for Water Absorption of Plastics.

4. ASTM D 638 - Test Method for Tensile Properties of Plastics.

5. ASTM D 696 - Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30E C and 30E C With a Vitreous Silica Dilatometer.

6. ASTM D 785 - Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.

7. ASTM D 790 - Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

8. ASTM D 2583 - Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

9. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

10. ASTM G 21 - Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

11. ASTM G 155 - Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools

E. National Electrical Manufacturers Association (NEMA)@:

1. NEMA LD3 - High Pressure Decorative Laminates.

F. National Fire Protection Association (NFPA):

1. NFPA 255 - Method of Test for Surface Burning Characteristics of Building Materials.

G. Underwriters Laboratories, Inc. (UL):

1. UL 723 - Test for Surface Burning Characteristics of Building Materials.

H. U. S. Environmental Protection Agency (EPA):

1. Method 24 - Determination of Volatile Matter Content.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s current product literature for each product indicated.

2. Shop Drawings: Show the location of each item, dimensioned plans, elevations, large scale details, construction joint locations, termination points, attachment devices and other components. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in Section 09110. Show locations and sizes of cutouts and hole for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items to be installed in the solid surface.

3. Samples:

a. Initial Samples: Unless specific products are scheduled, submit 2" x 2", minimum, size samples of the manufacturer=s complete range of colors, patterns, and glosses for initial selection.

a. Final Samples:

1). Submit two (2) 6" x 6" final samples matching the color, patten and gloss of those initially selected.

2). Fused Joint Sample: Submit 6" x 10" samples showing fused joint work.

3). One sample or each will be retained at the Project Site as the standard for the work.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Manufacturer's Material Safety Data Sheets (MSDS).

c. Manufacturer=s / Fabricator=s certification that the products supplied comply with applicable federal and local regulations controlling the use of volatile organic compounds (VOC).

d. Manufacturer's Instructions indicating procedures and conditions

requiring special attention, and cautionary procedures required during fabrication.

e. Documentation of experience indicating compliance with the specified qualifications requirements.

f. Signed copy of the Fabricator=s certificate, acknowledging that he / she has been trained and approved by the manufacturer.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Provide a written special Warranty with forms completed in the name of the Owner and registered with the fabricator.

C. Maintenance Data: Submit Manufacturer=s care and maintenance data, including repair and cleaning instructions.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Fabricator / Installer: Certified by the manufacturer, and has successfully completed fabrications of the type required for this Project, and has been continuously engaged in this type of work for not less than five (5) years.

B. Field Measurements: When possible, take field measurements prior to the preparation of Shop Drawings and fabrication to ensure proper fitting of the work, otherwise, indicate field measurements on the final Shop Drawings.

C. Installation to be by the Fabricator of the products, for single source responsibility.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Package products in packages, crates or containers for transport to the Project Site to prevent damage, water damage, soiling and deterioration.

C. Deliver sheets, fabricated items, materials and components to the Project Site in the fabricator=s original, new, unopened, undamaged packages, crates or containers with identification labels intact.

D. Do not deliver products until wet work, grinding, painting and similar operations have been completed in the installation areas.

E. If, due to unforeseen circumstances, the fabrications must be stored in other than the installation areas, store only in areas meeting the requirements specified for the installation areas.

1.7 JOB CONDITIONS

A. The Installer shall advise the Contractor of the temperature requirements for the installation areas.

B. Do not install the fabrications until the required temperature has been stabilized and will be maintained in the installation areas.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Submit a written Warranty jointly signed by the solid polymer manufacturer and the fabricator certifying that the products and the installation is free of defective materials and workmanship, and will repair or replace any defective component or the fabrication, in whole or in part, as necessary to restore the product to its original intended state and integrity.

2. Warranty Period: Ten (10) years from the date of Substantial Completion.

1.9 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Provide manufacturer=s maintenance kit for finishes.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Avonite Surfaces by Aristech Acrylics LLC..

2. Corian by DuPont, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions: Not permitted.

2.2 MATERIALS

A. General:

1. Studio Collection by Avonite.

2. D Series Corian by DuPont.

B. Description:

1. Non-porous, homogeneous material maintaining the same composition throughout, with a composition of polyester or acrylic polymer, aluminum trihydrate filler and pigment.

2. Thickness: 3/4", unless shown otherwise specified.

3. Colors and patterns, as selected, from the manufacturer=s full line of standard colors and patterns

4. Adhesive: Water-based adhesive as recommended by the polymer manufacturer for the substrate and conditions.

5. Sealant: Mildew-resistant, FDA-compliant as recommended by the manufacturer; color to match the solid surface material.

2.3 FABRICATION

A. General:

1. Factory fabricate by a solid polymer manufacturer=s certified fabricator.

2. Comply with the details shown for profile and construction of fabrications. Where not otherwise shown, comply with the manufacturer=s written instructions.

3. Provide separate countertops for installation on casework or other support systems, as indicated.

3. Measurements: Before proceeding with fabrications required to be fitted to other construction, obtain measurements and verify the dimensions and Shop Drawings details, as required for an accurate fit. Where measuring substrates before fabrication would delay the project, proceed with the fabrication and provide sufficient borders and edges to allow for subsequent scribing and trimming for an accurate fit.

4. Fabricate from single piece material, except where the required length exceeds the maximum length produced by the manufacturer. Locate joints at even intervals through the material, aligned with other adjacent joints, and as approved on the final Shop Drawings. Form joints using the manufacturer=s recommended adhesives for a smooth even appearance with matching color for an inconspicuous appearance. Provide joints of an equal or greater strength than the material being joined.

5. Pre-Cut Openings: Pre-cut openings in fabrications, wherever possible, to receive plumbing fixtures, electrical work and similar items. Locate the openings accurately, and use templates or roughing-in diagrams for the proper size and shape. Smooth edges of cutouts and, where located in countertops and similar exposures, seal the edges of cutouts with a water-resistant material.

6. Cutouts for sinks and lavatories shall be smooth and uniform without saw marks. The top and bottom of openings shall be finished smooth. Where edges are exposed, fabricate with 1/16" radius; 1/4" radius at cutouts, or as indicated.

7. Fabricate to accommodate plumbing fixtures, trim and drains.

A. Countertops and Work Surfaces:

1. Fabricate tops from 3/4" thick material with 1/2" thick x 6" high splashes and 2" skirts, unless otherwise indicated. Include 3/4" thick solid support braces with aluminum angle clips for interconnection of components.

C. Vanities:

1. Fabricate tops from 3/4" thick material with 1/2" thick x 6" high splashes and 4" skirt, unless otherwise indicated.

D. Window Sills:

1. Provide sizes and profiles as detailed. Where joints are required, locate at the center of openings or at the center line of window mullions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:

1. Comply with manufacturer=s recommendations.

2. Cure fabrications for 24 hours, minimum, before exposure to moisture or pressure.

3. Install the work plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Install to a tolerance of 1/64" in 8'-0" for plumb and level; and with 1/32" maximum offsets in revealed adjoining surfaces.

4. Scribe and cut work to fit adjoining work. Refinish cut surfaces and repair damaged finish at cuts.

B. Anchorage:

1. Anchor fabrications to anchors or blocking built-in or directly attached to substrates as detailed. Secure to grounds, stripping and blocking with concealed fasteners as required for a complete installation.

2. Securely anchor countertops to base units and other support systems as indicated.

C. Countertops, Work Surfaces and Vanities:

1. Anchor units to supports using concealed fasteners. Do not use continuous adhesive application. Field cut as required for plumbing fixtures and fittings. Plumbing fixtures, trim, drains, and connections are specified in Division 15. At recesses, install loose splashes with adhesive. Seal joints and perimeter with matching acrylic sealant as specified in Section 07900 - Joint Sealers, except at Vanities, use matching mildew-resistant silicone sealant as specified in Section 07900.

D. Window Sills:

1. Anchor window sills to substrate with non-staining adhesive as recommended by both stool and adhesive manufacturer. Cut and trim to fit with joints only at approved locations. Make seamless joints. Fill joints between stools and other materials with acrylic sealant as specified in Section 07900.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Repair soiled, damaged and defective fabrications wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace the fabrications.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for level, inconspicious joints, tight fit to adjacent surfaces and secure attachment to substrates.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean exposed and semi-exposed surfaces.

C. Remove adhesives, sealants and other stains.

3.6 PROTECTION

A. The Fabricator / Installer shall advise the Contractor of the protection and maintained conditions necessary to ensure that the work will be without damage or deterioration at the time of final acceptance.

END OF SECTION

SECTION 07110

WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Below grade walls waterproofing.

2. Existing below grade walls affected by new construction waterproofing.

3. Planters waterproofing.

4. Concrete parking and traffic decks waterproofing.

5. Horizontal roof slabs supporting earth waterproofing.

6. Split concrete slabs waterproofing.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for waterproofing.

2. Section 04230 - Reinforced Unit Masonry: Substrate for waterproofing.

3. Section 04400 - Natural Stone: Damnproofing under natural stone.

4. Section 07190 - Water Repellents (Sealer): Water repellents and slurry coat dampproofing.

5. Section 09300 - Tile: Dampproofing under ceramic and quarry tile flooring.

1.2 DESCRIPTION OF WORK

A. The extent of each type of waterproofing is indicated on the Drawings and as specified herein, and includes providing and installing all waterproofing materials. Similar work used as an exposed finish is excluded by definition and, if required, is specified as roofing, flooring, special coating or other appropriate category.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 642 - Test Method for Water Absorption.

2. ASTM D 56 - Test Method for Flash Point by Closed Cup Tester.

3. ASTM D 3960 - Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

4. ASTM E 514 - Test Method for Water Penetration and Leakage Through Masonry.

C. U. S. Environmental Protection Agency (EPA):

1. Method 24 - Determination of Volatile Matter Content.

1.4 SUBMITTALS

A. Section 01330 - Submittals: Procedures for submittals.

1. Product Data: Submit manufacturer=s specifications, recommendations for water repellents for each surface specified, performance data, surface preparation and application instructions, precautions for materials which can contaminate the system**,** limitations to coating, protection and cleaning instructions and VOC content. Include recommendations for sealing penetrations, cracks and control, construction and expansion joints. Submit color charts for products required to be integrally colored.

2. Shop Drawings: Indicate details critical to water tightness of the membrane, including, but not necessarily limited to, membrane transitions / terminations at perimeters, drains, sleeves and other penetrating elements.

3. Samples: For each type of waterproofing system, submit a 8-1/2" x 11" board sample of each complete system. Where the membrane is a layered system, expose at least 1" of each succeeding layer. Top coats to be provided with Project required colors as selected.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Manufacturer's Material Safety Data Sheets (MSDS).

c. Manufacturer=s certification that the products supplied comply with applicable federal and local regulations controlling the use of volatile organic compounds (VOC).

d. Manufacturer's Instructions indicating procedures and conditions requiring special attention, and cautionary procedures required during application.

e. Documentation of experience indicating compliance with the specified qualifications requirements.

C. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience, and has a record of successful in-service performance.

2. Applicator: Company experienced in applying the types of waterproofing required for this Project for not less than five (5) years, and is acceptable to the primary waterproofing materials manufacturer. Employees assigned to the Project shall have been trained by an approved waterproofing materials manufacturer.

B. Mockup: Apply water repellent to a mockup, either partial or full coverage, as directed, before proceeding with the application. Comply with the application requirements contained herein.

C. Regulatory Requirements: Comply with applicable rules and regulations of the pollution-control regulatory agency having jurisdiction regarding volatile organic compounds (VOC) and use of hydrocarbon solvents.

D. General: Obtain the primary materials from a single manufacturer. Provide secondary materials only as recommended by the manufacturer of the primary materials.

E. Manufacturer=s Technical Representative:

1. The primary waterproofing materials manufacturer to make a Technical Representative available to monitor the on-going work to ensure proper application of the waterproofing system. The manufacturer must maintain the same Technical Representative for the duration of the Project.

2. Pre-Application Review: Prior to the start of work and the purchase of any materials, the Manufacturer=s Technical Representative, who is to certify each application, shall visit the Project Site, review existing conditions, and review the Contract Document for appropriateness of the requirements with the specified manufacturer=s system including, but not necessarily limited to membrane requirements, substrate preparation, membrane terminations, reinforcements, flashing conditions, penetrations, including multiple penetration requirements, joints required and treatment and protection of the membrane.

3. Certification: After the Manufacturer=s Technical Representative=s review, submit written certification of the appropriateness of the requirements, or submit other or additional specific recommendations, if any, to assure that the specified system is appropriate for the use intended and complete in scope to assure its intended performance. This should be coordinated with the Shop Drawing Submittal.

4. Substrate Certification: Submit the Technical Representative=s written certification of compliance that the prepared substrate is in conformance with requirements necessary for the system installation. Certification of the substrate is to be accomplished just prior to the start of application of the membrane system.

5. Technical Representative=s Field Review of Work:

a. Number of Site Visits: Submit the manufacturer=s recommended minimum number of times the Technical Representative is to field review the work to ensure success of the installation. Indicate when such visits are to be made.

b. Field Reports: For each visit, the Technical Representative shall submit a detailed Field Report assessing each application. Field Reports to indicate the date, time of day, length of each visit, weather condition during the visit, condition of the substrate at the time of application, application procedures, and other important aspects that affect success of the application. Submit Reports within seven (7) days after each Site visit.

F. Performance Requirements: It is required that the waterproofing membrane be watertight, and not deteriorate in excess of the limits published by the membrane manufacturer.

1.6 COORDINATION

A. Pre-Application Conference: Prior to start of the application of materials, meet at the Project Site with the Owner=s representative, Architect, Contractor, Applicator and subcontractors whose work penetrates the surfaces to be waterproofed. Review the conditions, methods and procedures necessary for application of the work, including inspections of the areas of work, requirements of the Specifications and the manufacturer=s literature; review submittals and schedules.

B. Tolerances / Finish of Substrates: Coordinate with other trades providing substrates over which the waterproofing is scheduled for the required tolerances, conditions and finish of the substrates necessary to ensure successful application of the work of this Section. Coordinate in a timely manner so other trades can implement their requirements in accordance with the Job Schedule. Submit documentation of the coordination, including the date of the coordination, with whom coordinated, and the requirements specified.

C. Control Joints: Control joints are indicated on the Drawings. Where additional or other configuration for control joints is required in substrates other than what is currently required to ensure success of each membrane application, submit the requirements to the Owner=s representative for review, and arrange with the substrate installer for installation of such control joints.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements. Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, new and unopened packages or containers with seals and labels intact; dry and undamaged, bearing the product name, color, manufacturer=s lot number, directions for use and precautionary labels.

C. Store materials not in actual use, in tightly covered containers. Maintain containers used in the storage of materials, in a clean condition, free of foreign materials and residue.

D. Store materials in a well ventilated area, and in compliance with the manufacturer=s published instructions.

E. Store and handle materials to prevent deterioration and damage due to moisture,

temperature changes, contaminants, and other causes.

F. Protect against fire hazards and spontaneous combustion.

G. Keep storage areas neat and orderly. Remove waste daily.

H. Take all precautions to ensure that workmen and the work areas are adequately protected from health hazards resulting from handling, mixing and application of the materials.

1.8 JOB CONDITIONS

A. Proceed with the waterproofing work only after the substrate construction and penetrating work has been completed.

B. Environmental Requirements: Do not apply products under any of the following conditions, except with the written recommendation of the manufacturer:

1. Substrate surfaces cured less than thirty (30) days.

2. Surfaces not dry for a minimum of 24 hours.

3. Rain predicted within 24 hours.

1.9 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a joint and severable written Warranty signed by the waterproofing materials manufacturer, Contractor and the Applicator, agreeing to repair or replace defective materials and workmanship, defined to include leakage of water, ruptures caused by cracking substrate up to 1/16", abnormal aging or deterioration of materials, and other failures of membranes to perform as required within the warranty period. Warranty shall include responsibility for removal and replacement of other work which conceals the waterproofing membrane.

2. During the warranty period, repairs and replacements required because of acts of God and other events beyond the Contractor=s / Applicator=s control, and which exceed the performance requirements, shall be completed by the Contractor / Applicator and paid for by the Owner at the prevailing rates.

3. Warranty Period: Five (5) years from the date of Substantial Completion of the waterproofing work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Urethane Polymers International (UPI).

2. Carlisle Coatings and Waterproofing, Inc. (CCW).

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 SYSTEM

A. The following specifications are based on Urethane Polymers International products to establish quality.

B. Other acceptable manufacturer=s systems shall be equivalent.

2.3 WATERPROOFING MATERIALS

A. WP-1 (for vertical and horizontal surfaces below grade, masonry backer walls and inside planters): Single component, fluid-applied, modified elastomeric waterproof membrane, UPI System BG-7011-90 Mil by Urethane Polymers or approved equal; 90 mils thickness for walls and vertical surfaces.

B. WP-2 (for horizontal roof slabs supporting earth or paving and split slab construction): UPI System BG-7011-R-90 Mil or approved equal.

C. WP-3 (for exposed concrete parking and vehicular traffic decks): Single component, moisture-curing, polyurethane elastomeric membrane UPI Uradek System #70-S for parking stalls; Uradek System #70-H or approved equal for entrances, ramps and drives.

D. Caulking Compound: Single component, polyurethane as recommended by the primary waterproofing materials manufacturer.

E. Aggregate: As recommended by the manufacturer and approved by the Owner=s representative.

F. Other materials as recommended by the manufacturer of the prime materials.

2.4 PROTECTION / DRAINAGE BOARD

A. Composite structure of a molded, three-dimensional, high impact-resistant polymeric sheet with a filter fabric bonded to the open side. ACCW MiraDRAIN 6000" as manufactured by Carlisle Coatings or approved equal.

1. Attach panels to the substrate with an adhesive recommended by the manufacturer.

2.5 MISCELLANEOUS MATERIALS

A. Parge Coat: Where the manufacturer requires a portland cement parge coat over rough or porous substrates, the Contractor shall provide such parge coat as required at no additional cost. Failure of the parge coat or the absence of a parge coat will be considered as failure of the membrane system to perform as the parge coat is a required condition for the membrane=s success over substrates requiring a parge coat.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before

starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that joint sealants are installed and cured.

2. Verify that surfaces to be coated are dry, clean, and free of efflorescence, oil, and other matter detrimental to application of the coating.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate surfaces of projections and substances detrimental to the work, acid etch smooth surfaces, fill all voids to comply with recommendations of the prime materials manufacturer. Stripe coat all cracks up to 1/16" wide, rout and patch cracks larger than 1/16".

B. Moisture Content Testing: Just prior to application, test substrates with an electronic moisture meter. Do not proceed until the moisture content is within the manufacturer's acceptable tolerances.

C. Protection of Other Work: Do not allow liquid or mastic compounds to enter and clog drains, sleeves or conductors. Prevent spillage and migration onto other surfaces of the work by masking or otherwise protecting the adjoining work.

3.3 INSTALLATION

A. General: Comply with the manufacturer's instructions, except where more stringent requirements are shown or specified, and except where Project conditions require extra precautions or provisions to ensure satisfactory performance of the work.

B. Thickness Testing: Monitor mil thickness application by a monitoring method recommended by the Manufacturer=s Technical Representative for each specific system.

C. Reinforcement: Unless otherwise acceptable, or as otherwise recommended, in writing, by the Manufacturer=s Technical Representative, reinforcement is to be provided as follows and in the manner indicated:

1. Material: Manufacturer=s recommended elastomeric sheet and / or polyester fabric fully encapsulated in the primary membrane coating of a thickness equal to the total thickness required for the primary membrane, unless otherwise recommended by the manufacturer, and has been reviewed and approved on submittals.

2. Transitions: At transitions from vertical to horizontal, at inside and outside corners, and at other similar transitions that are not expansion / control joints, penetrations, or cracks, embed reinforcement of a width that extends 6", minimum, onto each surface on each side of the intersection.

3. Expansion / Control Joints: Embed reinforcement of a width necessary to extend the material 6", minimum, on each side of the joint, plus additional materials, as necessary, to accommodate movement of the joint. Small joints are to be bridged

over backer rods placed in the joints. Reinforcement is to be looped down into the joints with backer rod placed in the loop.

4. Penetrations: 36" square reinforcement, but not less than necessary to extend out in all directions from the penetration a distance of 12", minimum, beyond the flange of each penetration.

a. Pipes, Conduits, and Similar Components: Construct a form fitting elastomeric boot 6", minimum, in height and with an integral elastomeric flange extending 6", minimum, onto the wall or deck. The boot shall be fully adhered to the penetrating element and fully encapsulated at the interface with the wall or deck. Apply 36" square reinforcement material over this, fully encapsulated in the primary membrane material.

b. Cracks: Encapsulated reinforcement of a width necessary to extend the material 6", minimum, on each side of the crack.

3.4 APPLICATION

A. WP-1: Prime coat the substrate surface at the rate of 250 - 300 sq. ft. / gallon. Apply with rollers, two or more coats of (30 dry mils) at the rate of 4.5 gallons / 100 sq. ft. to produce 90 dry mils total thickness at vertical surfaces. Allow 18 hours curing time between coats.

1. Attach Protection / Drainage Boards to all vertical and horizontal surfaces with adhesive per the manufacturer=s recommendations. Set panels with the fabric toward the earth side. Lap fabric a minimum of 2". Install at below grade walls and retaining walls. Lap fabric at the top of the highest course and embed in waterproofing to ensure that loose material cannot enter and accumulate behind the protection / drainage board. Backfill against boards with approved material.

B. WP-2: Apply a surface conditioner to concrete substrates in accordance with the manufacturer=s instructions. Apply membrane in three (3) applications at a rate to provide a continuous monolithic coating of 30 dry mils, average thickness per coat, and 90 mils total thickness. Provide flashing in accordance with the manufacturer=s standard details. Where protection board is required, embed into the membrane to ensure good bond. Place protection boards in a staggered pattern and butt boards tightly together.

C. WP-3: Prime and apply a 30 mil thick coating to cover and overlap shrinkage cracks, integral flashings, caulked expansion joints and construction joints. Apply a 25 mil base coat, 25 mil intermediate coat, and two (2) 10 mil top coats to produce 70 mils total thickness, exclusive of aggregate. Broadcast aggregate in the first top coat.

3.5 MEMBRANE TESTING

A. Water Test: Conduct water containment tests to ensure that the membranes are watertight.

B. Horizontal Membranes: For installations where the primary membrane is horizontal, contain waterproofed areas in a manner to prevent 2", minimum, depth of water from escaping by damming any open perimeters and sealing the drains.

C. Pan Membranes: For installations where the primary membrane forms a continuous container with the bottom and all vertical sides enclosed, such as planters, seal the drains and fill the container to within 1@ of the top termination of the membrane.

D. Method of Containment: Dams, seals, and other methods used to contain water should be

capable of fully containing water for the period of time required. The method of containment should not damage the adjacent work.

E. Period of Containment: 48 hours without loss of water, except for that by natural evaporation, and without evidence of failure in the membrane in any manner.

F. Report: Submit a report of tests to the Owner=s representative indicting the location of the test, date and time of the test, weather conditions and results.

3.6 PROTECTION

A. Contractor=s Operations: The Contractor to verify the kinds of operations that will be conducted around or over installed membranes. The Owner=s representative will advise the Contractor of the measures that must be implemented to ensure that the membranes will be without damage at the time of Substantial Completion.

B. Buried Installations: At the time of backfill / fill, at the time of installation of irrigation and landscaping over buried membranes, and at any other time where the Contractor=s operations may have an adverse effect on a buried membrane system, the Manufacturer=s Technical Representative shall observe to ensure that the Contractor=s operations are being conducted in a manner that will protect the membranes from damage.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for tight and waterproof joints and proper thickness of membrane applications.

3.8 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean all spills. Do not leave splatters or drips.

C. Do not allow seepage of waterproofing through joints.

END OF SECTION

SECTION 07120

FLUID-APPLIED URETHANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fluid-applied, elastomeric polyurethane membrane roofing system for new and existing, exposed concrete roof slabs.

2. Walking surfaces over concrete roof slabs.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for roofing materials.

1.2 DESCRIPTION OF WORK

A. The extent of fluid-applied waterproofing over new and existing concrete roof slabs, including walking surfaces is indicated on the Drawings and as specified herein, and includes providing and applying all the required products.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 501 - Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.

2. ASTM C 957 - Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface.

3. ASTM D 412 - Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.

4. ASTM D 624 - Test Methods for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

5. ASTM D 822 - Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

6. ASTM D 903 - Test Method for Peel or Stripping Strength of Adhesive Bonds.

7. ASTM D 1004 - Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.

8. ASTM D 2240 - Test Method for Rubber Property - Durometer Hardness.

9. ASTM E 96 - Test Methods for Water Vapor Transmission of Materials.

C. National Roofing Contractors Association (NRCA):

1. Roofing and Waterproofing Manual.

D. Underwriters Laboratories Inc.:

1. UL 790 - Test Method for Fire Test of Roof Coverings.

E. U. S. Environmental Protection Agency (EPA):

1. Method 24 - Determination of Volatile Matter Content.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Provide data for primer, membrane roofing, flexible flashings, joint and crack sealants and temperature range for application of the waterproofing membrane.

2. Shop Drawings: Sequence drawings and details for special conditions not covered by the manufacturer’s standard details.

3. Samples: Not less than 6" x 6" in size showing the applied thickness, texture and color.

4. Manufacturer’s Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

5. Assurance / Control Submittals:

a. Manufacturer’s certificate that the products meet or exceed the specified requirements.

b. Manufacturer's Material Safety Data Sheets (MSDS).

c. Manufacturer’s certification that the products supplied comply with applicable federal and local regulations controlling the use of volatile organic compounds (VOC).

d. Manufacturer's instructions indicating procedures and conditions requiring special attention, and cautionary procedures required during application.

e. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing aromatic and aliphatic urethane roofing systems materials with a minimum of five (5) years documented experience in high temperature, high UV and high humidity environments.

2. Authorized Applicator: Company specialized in, and has successfully completed applications of the same or similar type of materials for not less than five (5) years.

   a. Applicator shall be specifically approved as a factory-authorized Applicator, in writing, by the roofing system manufacturer.

   b. Submit the manufacturer's written approval and certification of the Applicator.

   c. Applicator's equipment and training shall conform to the manufacturer's standards.

   d. As applicable, assign work closely associated with waterproofing, including, but not limited to, waterproofing accessories, flashing in connection with waterproofing, expansion joints in membranes, and insulation and protection courses in membranes, to the waterproofing Applicator for undivided responsibility.

   e. Applicator shall conform strictly to the manufacturer's Quality Assurance Program requirements.

B. Source Quality Control: Obtain the primary waterproofing materials from a single manufacturer. Provide secondary materials only as recommended by the primary materials manufacturer.

C. Manufacturer's Technical Representative:

1. The primary waterproofing materials manufacturer to make a Technical Representative available to monitor the on-going work to ensure proper application of the roofing system. The manufacturer must maintain the same Technical Representative for the duration of the Project.

2. Pre-Application Review: Prior to the start of work and the purchase of any materials, the Manufacturer's Technical Representative, who is to certify each application, shall visit the Project Site, review existing conditions, and review the Contract Document for appropriateness of the requirements with the specified manufacturer's system including, but not necessarily limited to, the substrate and application conditions.

3. Certification: After the Manufacturer's Technical Representative's review, submit written certification of the appropriateness of the requirements, or submit other or additional specific recommendations, if any, to assure that the specified system is appropriate for the use intended and complete in scope to ensure its intended performance. This should be coordinated with the Shop Drawing Submittal.

4. Substrate Certification: Submit the Technical Representative's written certification of compliance that the prepared substrate is in conformance with requirements necessary for application of the system. Inspection and certification of the substrate is to be accomplished just prior to the start of application of the membrane system.

5. Technical Representative's Field Review of Work:

a. Number of Site Visits: Submit the manufacturer's recommended minimum number of times the Technical Representative is to field review the work to ensure success of the application. Indicate the stages of work when such visits are to be made.

b. Field Reports: For each visit, the Technical Representative shall submit a detailed Field Report assessing each application. Field Reports to indicate the date, time of day, length of each visit, weather conditions during the visit, condition of the substrate at the time of application, application procedures, and other important aspects that affect success of the application. Submit Reports within seven (7) days after each Site visit.

D. Regulatory Requirements: Comply with the applicable rules and regulations of the EPA and the local pollution control regulatory agency having jurisdiction regarding volatile organic compounds (VOC) and the use of hydrocarbon solvents.

E. Performance Requirements: It is required that the fluid-applied waterproofing membrane be watertight, and not deteriorate in excess of the limits published by the membrane manufacturer.

F. Caution: Do not apply fluid-applied waterproofing membrane to on-grade slabs, split slabs with buried membrane or on slabs over unvented metal pans without prior approval of the roofing membrane manufacturer.

1.6 COORDINATION

A. Pre-Application Conference: Prior to start of the application of materials, meet at the Project Site with the Owner's representative, Architect, Contractor, Applicator and subcontractors whose work penetrates the surfaces to be roofed. Review the conditions, methods and procedures necessary for application of the work, including inspection of the areas of work, requirements of the Specifications and the manufacturer's literature; review submittals and schedules.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, new and unopened packages and containers with seals and labels intact; dry and undamaged, bearing the product name, color, manufacturer's lot number, directions for use and precautionary labels.

C. Store materials not in actual use, in tightly covered containers. Maintain containers used in the storage of materials, in a clean condition, free of foreign materials and residue.

D. Store materials in a well ventilated area, and in compliance with the manufacturer's written instructions.

E. Keep storage areas neat and orderly. Remove waste daily.

F. Protect against fire hazards and spontaneous combustion.

G. Take all precautions to ensure that workmen and the work areas are adequately protected from health hazards resulting from handling, mixing and application of the materials.

1.8 JOB CONDITIONS

A. Proceed with the work only after the substrate construction and penetrating work has been

completed.

B. Proceed with the work only when existing and forecasted weather conditions will permit work to be performed in accordance with the manufacturer's recommendations. Do not apply products under the following conditions:

1. Substrate surfaces have cured less than thirty (30) days.

2. Rain is predicted within 24 hours.

3. Surfaces have not been dry for a minimum of 24 hours.

C. Provide adequate ventilation to prevent the accumulation of hazardous fumes during the application of solvent-based components in enclosed spaces; maintain ventilation until the coatings have thoroughly cured.

D. Warn personnel against breathing vapors and contact of materials with the skin and eyes.

E. Ensure that workmen wear the appropriate approved respiratory gear and protective clothing.

F. Ensure that all gas flames and electrical apparatus are shut down during the coating application and curing.

1.9 SAFETY / COORDINATION

A. All application, material handling and associated equipment shall conform to, and be operated in conformance with OSHA safety requirements.

B. Manufacturer's Material Safety Data Sheets (MSDS) shall be read, understood and the instructions adhered to.

C. A sufficient number of filled and operating fire extinguishers meeting current standards must be on the roof deck at all times during application of the roofing materials.

1.10 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written joint and severable Warranty signed by the roofing materials manufacturer, Contractor and Applicator, agreeing to repair or replace defective materials and workmanship, defined to include leakage of water, ruptures caused by cracking substrate up to 1/16", abnormal aging or deterioration of materials, and other failures of the membrane to perform as required within the warranty period. Warranty shall include responsibility for removal and replacement of other work which conceals the membrane waterproofing.

2. During the warranty period, repairs and replacements required because of acts of God and other events beyond the Contractor's / Applicator's control, and those which exceed the performance requirements, shall be completed by the Contractor / Applicator and paid for by the Owner at the prevailing rates.

3. Warranty Period: Five (5) years from the date of Substantial Completion of the roofing work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Urethane Polymers International, Inc.

2. Carlisle Coatings & Waterproofing.

B. Section 01600 - Product Requirements: Product Options: Substitutions not permitted.

2.2 SYSTEM

A. The following specifications are based on Urethane Polymers International, AM-C-Thane 4556 - 60 Mil@ system to establish quality.

B. Other acceptable manufacturer's systems shall be equivalent.

2.3 ELASTOMERIC ROOFING MATERIALS

A. Primer: UI-7012 water-based, or UI-7112 solvent-based, Epoxy-Polyamide, low viscosity, two-component primer / sealer; as recommended by the membrane manufacturer.

B. Base Membrane: UI-7013 single-component, high-adhesion, moisture-cured, polyurethane membrane. Meet or exceed the following typical properties:

Property	Typical Value	Test Method
Composition	Aromatic Urethane	
Weight Solids	86 +/- 2%	
VOC Content	Less than 200 gm / l	
Hardness, Shore A	65 +/- 5	ASTM D 2240
Tensile Strength	900 +/- 100 psi	ASTM D 412
Ultimate Elongation	650 +/- 100%	ASTM D 412
Tear Resistance	150 +/- 25 lbs / in.	ASTM D 1004
Weather Resistance	Slight checking@ 500 hours	ASTM D 822
Adhesion to Concrete	30 pli	ASTM D 903

C. Elastomeric Membrane: UI-7013-HT, single component, high tensile strength, moisture-cured, liquid elastomeric polyurethane. Meet or exceed the following typical properties:

Property	Typical Value	Test Method
Composition	Aromatic Urethane	
Weight Solids	81 +/- 2%	
VOC Content	Less than 250 gm / l	
Hardness, Shore A	80 +/- 5	ASTM D 2240
Tensile Strength	2500 +/- 250 psi	ASTM D 412
Ultimate Elongation	450 +/- 50%	ASTM D 412
Tear Resistance	250 +/- 50 lbs / in.	ASTM D 1004
Weather Resistance	Slight chalk @ 1,000 hrs.	ASTM D 822
Adhesion to Base Coat	30 pli	ASTM D 903

D. Top Coat: UI-7016-HS, single-component, high tensile strength, abrasion-resistant, weather-resistant, aliphatic polyurethane. Meet or exceed the following typical performance properties:

Property	Typical Value	Test Method
Composition	Aliphatic, Saturated Polyester Urethane	
Weight Solids	75 +/- 2%	
VOC Content	Less than 250 gm / l	
Hardness, Shore A	90 +/- 5	ASTM D 2240
Tensile Strength	3500 +/- 300 psi	ASTM D 412
Ultimate Elongation	250 +/- 50%	ASTM D 412
Tear Resistance	300 +/- 50 lbs / in.	ASTM D 1004
Water Permeability	Less than 0.1 Perm	ASTM E 96 / E 96M
Weather Resistance	No chalking @ 2000 hrs.	ASTM D 822
Abrasion Resistance	Negligible change, CS-17 wheels, 1000 cycles, 1,000 gm. load	ASTM C 501
Color	White, or as selected	

2.4 ACCESSORIES

A. Flexible Flashing: 45-60 mils, thickness neoprene sheet or non-woven reinforcing fabric, or as recommended by the roofing materials manufacturer.

B. Embedded Flashing / Reinforcing: Non-woven fabric as recommended by the roofing materials manufacturer.

C. Joint and Crack Sealant: One- or two-component polyurethane compound, as recommended by the roofing membrane manufacturer.

D. Caulking Compound: One- or two-component polyurethane compound as approved by the roofing membrane manufacturer.

E. Aggregate: Rounded, non-angular, pre-blended 20 / 30 mesh, flint shot silica, ground glass, Monterey sand, or equivalent washed and kiln-dried aggregate; free of foreign materials; hard and stable to atmospheric conditions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Roofing Applicator, Manufacturer’s Technical Representative and the Owner’s Representative must jointly examine the substrates and conditions under which the roofing work is to be done.

2. Verify that substrate surfaces are durable, free of matter detrimental to adhesion and application of the roofing materials.

3. Verify that substrate surfaces are smooth, free of honeycomb and pitting, and not detrimental to full contact bond of the waterproofing materials.

4. Verify that items which penetrate surfaces to receive the roofing are installed and secured in-place.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 CONDITION OF CONCRETE SURFACES

A. Concrete surfaces shall have a steel troweled finish, free of fins, ridges, voids and air entraining holes.

B. Cured at least 28 days or until completely dry by the water curing method. Curing compounds or chemical curing agents shall not be used without prior approval of the roofing manufacturer.

C. Surfaces shall be sloped for proper drainage.

D. Saw-cut control joints and / or expansion joints shall have been properly installed at strategic locations throughout the field of the deck.

E. Required crickets and drains shall be cast monolithic with the main roof deck.

F. Concrete decks poured over precast T's, planks or slabs, shall have control joints placed directly over all corresponding joints and openings in the precast units.

G. Coordinate with Section 03300 - Cast-In-Place Concrete.

3.3 PREPARATION

A. Finish voids, rock pockets and excessively rough surfaces with epoxy grout or grind to match the unrepaired areas.

B. Apply bond breaker per the manufacturer's recommendations, fill voids and seal joints with polyurethane sealant; pay particular attention to construction joints.

C. Clean, prime, install backing rod and caulk all expansion and contraction joints with elastomeric polyurethane sealant.

D. Repair of concrete cracks and spalls:

1. All cracks over 1/16" in width and all moving cracks less than 1/16" in width shall be routed out to 1/4" minimum, width and depth, and filled flush with polyurethane elastomeric sealant.

2. Joints less than 1/2" in width and all caulked cracks shall be stripe-coated with a 30 mil preparatory coat of Base Membrane for a width of 3" on either side of the crack.

3. Apply 45 to 60 mil thick neoprene flashing or non-woven reinforcing fabric over all cracks as recommended by the membrane manufacturer.

E. Treatment of Roof Penetrations:

1. Caulk around and along the perimeters of duct and pipe penetrations with

polyurethane elastomeric sealant.

2. Apply a 3/4" cant of sealant around all pipes, drains and vertical junctions.

3. Apply 30 mils of polyurethane membrane coating 6" vertically, 6" horizontally on surfaces around roof penetrations.

F. Correct ponding water locations for smooth flow into roof drains; use epoxy topping where required to build up slopes.

G. Clean concrete substrate of projections and substances detrimental to the work.

H. Thoroughly clean and dry concrete surfaces free of laitance, surface contaminants and cleaning residue. Clean and prepare surfaces to receive roofing in accordance with the manufacturer's published instructions.

I. Protect adjacent surfaces not scheduled to receive roofing. Mask off surfaces to effectively prevent spillage and overspray of liquid materials outside the membrane area.

J. Protect landscaping, property, personnel and vehicles from over spray and drift.

3.4 FLASHING REINFORCEMENT

A. Install all required metal and neoprene flashings and fabric flashing reinforcement; install all sealant cants.

B. Deliver all metal shop primed, then field prime with Epoxy Primer prior to coating with the Base Membrane. Prime metal surfaces which exhibit adhesion difficulties first with a zinc chromate type of epoxy primer.

C. Base Membrane is used as an adhesive for polyester reinforcing fabric. Reinforcing fabric shall be laid into wet Base Membrane with roller, brush or broad blade knife. Fabric shall be laid relaxed, smooth and wrinkle-free; over-coat with Base Membrane.

D. Coat flashings and polyester reinforcing fabric with Base Coat and Top Coat with each application.

3.5 APPLICATION

A. The roofing Applicator shall have the sole right of access to specific areas of the roof for the time required to complete the application and to effect adequate cure.

B. Comply with the manufacturer’s instructions, except where more stringent requirements are shown or specified, and except where the Project conditions require extra precautions or provisions to ensure satisfactory performance of the work.

C. Start application of the waterproofing membrane only in the presence and with the advice of the Manufacturer’s Technical Representative.

D. Stir and mix separately packaged components using a mixing paddle on a slow speed drill motor, in accordance with the manufacturer’s instructions. Protect the components from sun and rain.

E. Apply uniform coatings of waterproofing to substrates and surfaces indicated to receive membrane.

F. Apply coatings by spray, squeegee or roller.

G. Primer:

1. Apply Primer at the approximate rate of 250 sq. ft. per gallon. Allow primer to dry until tack-free. Within 16 hours of primer application, apply Base Coat. If the base coat cannot be applied within 16 hours then re-prime the surfaces.

H. Base Membrane:

1. Apply Base Membrane in one uniform coat at the rate of 60 to 65 sq. ft. per gallon, minimum, or as needed to obtain a minimum dry film thickness of 20 mils. Allow 16 to 48 hours curing time before applying the next coat. Do not apply coating over joints greater than 1/2" in width.

I. Elastomeric Membrane:

1. Apply in one uniform coat at the approximate rate of 60 to 65 sq. ft. per gallon, minimum, or as needed to obtain an average dry film thickness of 18 mils. Allow 16 hours curing time before applying the next coat.

2. If the preceding layers of membrane become dirty or contaminated or lose their surface tack, wipe clean with xylene immediately before applying the next coating.

3. Apply a second coat of Elastomeric Membrane in one uniform coat at the rate of 100 sq. ft. per gallon, or as needed to obtain an average dry film thickness of 12 mils.

4. At locations shown on the Drawings, or if not shown, as directed, while the second coat is still fluid, uniformly broadcast aggregate onto the coating at the rate of 25 lbs. per 100 sq. ft.

5. Allow 16 to 36 hours curing time before applying the next coat.

J. Top Coat:

1. Apply one uniform coat at the rate of 100 sq. ft. per gallon, minimum, to obtain an average dry film thickness of 10 mils, and to completely encapsulate the aggregate.

2. For walkway surfaces and around roof-mounted equipment, provide aggregate additive for a tough non-slip surface. Apply in colors and patterns as designated by the Architect.

K. Spray coats over flashings; embed with fabric when plastic flashings are spanning voids greater than 3/4".

L. The application of membrane waterproofing materials shall be continued up onto vertical surfaces 6", minimum, and over the tops of fascias and parapets. Apply extra thickness waterproofing material at corners, intersections, angles, cants, penetrations and over cracks.

M. If waterproofing is applied on unscheduled surfaces, remove immediately by a method approved by the membrane manufacturer.

N. The overall dry film thickness of the completed waterproofing system, exclusive of aggregate, shall average 60 mils.

O. Permit the membrane to cure under conditions which will not contaminate or deteriorate the waterproofing materials. Block off all traffic and protect the membrane from physical damage.

P. Remove protective coverings.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection and testing.

B. Inspect the fluid-applied roofing application.

C. Test for required dry film thickness.

3.7 PROTECTION

A. Section 01700 - Execution Requirements: Protection of the applied work.

B. Do not permit traffic on the membrane during the first 24 hours after application and no heavy traffic within four (4) days after the final coat has been applied, or until accepted by the Owner’s representative.

C. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

SECTION 07190

WATER REPELLENTS (SEALER)

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Surface preparation and application of clear penetrating water repellent coating to the following exposed surfaces:

a. WR-1: Exterior and interior concrete walks and floors.

b. WR-2: Slurry coating for dampproofing vertical walls.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-in-Place Concrete: Sealers and curing agents.

2. Section 04400 - Natural Stone: Sealers and curing agents.

3. Section 07900 - Joint Sealers: Joint fillers and sealers.

4. Division 7 Sections - Roofing and Waterproofing.

1.2 DESCRIPTION OF WORK

A. The extent of each type of waterproofing work is indicated on the Drawings and as specified herein, and includes providing and applying waterproofing on concrete surfaces. Similar work used as an exposed finish is excluded by definition and, if required, is specified as roofing, flooring, special coating or other appropriate category.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 642 - Test Method for Water Absorption.

2. ASTM D 56 - Test Method for Flash Point by Closed Cup Tester.

3. ASTM D 3960 - Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

4. ASTM E 514 - Test Method for Water Penetration and Leakage Through
. . Masonry.

C. U. S. Environmental Protection Agency (EPA):

1. Method 24 - Determination of Volatile Matter Content.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s specifications, recommendations for water repellents for each surface specified, surface preparation and application instructions, precautions for materials which can contaminate the system**,** limitations to coating, protection and cleaning instructions. Include recommendations for sealing penetrations, cracks and control, construction and expansion joints. Submit color charts for products required to be integrally colored.

2. Shop Drawings: Indicate details critical to water tightness of the membrane, including, but not necessarily limited to, membrane transitions / terminations at perimeters, drains, sleeves and other penetrating elements.

3. Samples: 16" x 16" samples of each substrate indicated to receive water repellent with the specified repellent treatment applied to half of each sample.

4. Assurance/Control Submittals:

a. Manufacturer=s certification that the materials specified are recommended by the manufacturer for the applications indicated.

b. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Manufacturer's Material Safety Data Sheets (MSDS).

c. Manufacturer=s certification that the products supplied comply with applicable federal and local regulations controlling the use of volatile organic compounds (VOC).

d. Manufacturer's Instructions indicating procedures and conditions requiring special attention, and cautionary procedures required during application.

e. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience, and has a record of successful in-service performance.

2. Applicator: Company experienced in applying the types of waterproofing required for this Project for not less than five (5) years, and is acceptable to the primary waterproofing materials manufacturer.

B. Mockup: Apply water repellent to a mockup, either partial or full coverage, as directed, before proceeding with the application. Comply with the application requirements contained herein.

C. Regulatory Requirements: Comply with applicable rules and regulations of the pollution-control regulatory agency having jurisdiction regarding volatile organic compounds (VOC) and use of hydrocarbon solvents.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, new and unopened packages or containers with seals and labels intact; dry and undamaged, bearing the product name, color, manufacturer=s lot number, directions for use and precautionary labels.

C. Store materials not in actual use, in tightly covered containers. Maintain containers used in the storage of materials, in a clean condition, free of foreign materials and residue.

D. Store materials in a well ventilated area, and in compliance with the manufacturer=s published instructions.

E. Store and handle materials to prevent deterioration and damage due to moisture, temperature changes, contaminants, and other causes.

F. Protect against fire hazards and spontaneous combustion.

G. Keep storage areas neat and orderly. Remove waste daily.

H. Take all precautions to ensure that workmen and the work areas are adequately protected from health hazards resulting from handling, mixing and application of the materials.

1.7 JOB CONDITIONS

A. Environmental Requirements: Do not apply products under any of the following conditions, except with the written recommendation of the manufacturer:

1. Substrate surfaces cured less than thirty (30) days.

2. Surfaces not dry for a minimum of 24 hours.

3. Rain predicted within 24 hours.

4. Windy conditions such that the repellent might be blown onto vegetation or onto substrates not intended to be coated.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a joint and severable written Warranty signed by the water repellent materials manufacturer, Contractor and the Applicator, agreeing to repair or replace defective materials and workmanship, defined to include leakage of water, ruptures caused by cracking substrate up to 1/16", abnormal aging or deterioration of materials, and other failures of membranes to perform as required within the warranty period. Warranty shall include responsibility for removal and replacement of other work which conceals the waterproofing membrane.

2. During the warranty period, repairs and replacements required because of acts of God and other events beyond the Contractor=s / Applicator=s control, and those which exceed the performance requirements, shall be completed by the Contractor / Applicator and paid for by the Owner at the prevailing rates.

3. Warranty Period: Five (5) years from the date of Substantial Completion of the water repellent work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Tamms Industries.

2. Hydrozo, Inc.

3. Thoro System Products.

4. Textured Coatings of America.

5. Pecora Corp.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. WR-1: Silane, clear penetrating water repellent. A monomeric compound containing approximately 40% alkylalkoxysilane with alcohol, ethanol, mineral spirits, water, or other proprietary solvent carrier.

1. Baracade Silane 40 by Tamms Industries.

2. Concrete and Masonry Sealer by Thoro Consumer Products.

3. Hydrozo Silane 40 VOC by Hydrozo, Inc.

4. Klere-Seal 940S VOC by Pecora Corp.

5. Rainstopper RS1750W by Textured Coatings of America.

B. WR-2: Crystalline, applied as a slurry coat.

1. Xypex Concentrate by Xypex Chemical Corp. or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting work.

B. Verification of Conditions: Verify that the field measurements, surfaces, substrates and conditions are as required, and ready to receive work.

1. Verify that joint sealants are installed and cured.

2. Verify that surfaces to be coated are dry, clean, and free of efflorescence, oil, and other matter detrimental to application of the coating.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate surfaces of substances that might interfere with penetration or performance of the water repellent. Remove loose particles and foreign matter. Remove oil and foreign substances with a cleaning agent which will not affect the coating.

B. Scrub surfaces with water, rinse and let dry.

C. Test for moisture content according to the manufacturer=s instructions to ensure that the surfaces are sufficiently dry.

D. Test the pH level according to the manufacturer=s instructions to ensure chemical bond to the silicate minerals.

E. Protect adjacent surfaces not scheduled to receive coating. Protect landscaping, property, and vehicles from over spray and drift. If applied on unscheduled surfaces, remove immediately, by an approved method.

F. Prior to the start of application, properly seal joints and cracks in movement with an elastomeric joint sealant acceptable to the sealant manufacturer. Non-movement cracks greater than 1/64" in width must be filled with a suitable patching material.

G. Do not apply water repellent until sealants in joints adjacent to surfaces to receive water repellent treatment have been installed and cured.

1. Water repellent work may precede sealant application only if the sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those used in the work.

2. Prior tp performing the water repellent work, including bulk purchase or delivery of products to the Project Site, prepare a small application in an unobtrusive location to demonstrate the final visual, physical and chemical effect of the planned application.

3.3 APPLICATION

A. Prepare materials in accordance with the manufacturer=s printed instructions for the Project conditions. Consult a manufacturer=s technical representative if the printed recommendations are not applicable to the Project conditions.

B. Apply coating in accordance with manufacturer's instructions, using the appropriate method and coverage rate.

C. WR-1:

1. Apply a heavy-saturation spray coating of the water repellent on surfaces indicated for treatment using low-pressure spray equipment. Comply with the manufacturer=s instructions and recommendations using airless spraying procedure unless otherwise indicated.

2. Apply a second saturation spray coating, repeating the first application. Comply with the manufacturer=s instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats.

3. Remove protective coverings from adjacent surfaces.

D. WR-2:

1. Mix Xype Concentrate in accordance with the manufacturer=s instructions. Apply with a bristle-brush to a uniform thickness of 1/16".

2. Apply a second coat after the first coat has reached initial set but is still Agreen@.

3. Lightly re-water, as necessary, to counteract drying.

4. Wet cure surfaces in accordance with the manufacturer=s instructions. Do not thoroughly wet concrete surfaces with water to saturate the surfaces; remove excess water before application.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect for complete and consistent coverage and waterproofing capability.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean all spills. Do not leave splatters or drips.

END OF SECTION

SECTION 07210

BUILDING INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Semi-rigid insulation at underside of roofs at interior spaces.

2. Board insulation for split slabs and under decks.

3. Batt insulation at exterior stud walls of air conditioned spaces and at interior stud walls for sound control.

4. Semi-rigid board insulation at shafts and chases.

5. Exposed wall and ceiling insulation at Mechanical Rooms.

6. Spray-applied thermal and acoustical insulation for exposed ceilings.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for installation of insulation.

2. Section 09110 - Non-Load Bearing Steel Framing: Support for installation of insulation.

1.2 DESCRIPTION OF WORK

A. The extent of each type of building insulation is indicated on the Drawings and as specified herein, and includes providing and installing thermal, acoustical and spry-on insulation, and safing and smoke stops.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 518 - Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

2. ASTM C 612 **-** Specification for Mineral Fiber Block and Board Thermal Insulation.

3. ASTM C 665 - Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

4. ASTM D 5113 - Test Method for Determining Adhesion Attack of Rigid Cellular Foam.

5. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

6. ASTM E 119 - Test Method for Fire Tests of Building Construction and Materials.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product specifications and installation instructions for each type of insulation and vapor barrier material required. Indicate product characteristics, performance criteria and limitations.

2. Assurance / Control Submittals:

a. Manufacturer's certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

3. Use adequate number of skilled workmen, thoroughly trained and experienced in the necessary crafts and are completely familiar with the specified requirements and methods for proper performance of the work of this Section.

B. Regulatory Requirements: Conform to the flame spread and smoke developed requirements of the local authority having jurisdiction.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened packages, containers or bundles, bearing brand name, identification of the manufacturer, and material identification.

C. Store inside, under cover, and in a manner to keep dry.

D. Protect from weather, direct sunlight, moisture, surface contamination, and damage from construction traffic and other causes.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. CertainTeed.

2. Owens-Corning.

3. Dow Chemical.

4. Manville-Schuller International.

5. International Cellulose Corporation.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 THERMAL INSULATION

A. Concealed Glass Fiber Insulation Boards: Unfaced glass fiber thermal insulation, semi-rigid boards, friction-fit, 48" x 96" x 2-1/2" thick, R-13 or as indicated, ASTM C 612, Type 1A and 1B. Maximum flame spread rating 25, maximum smoke developed 50 when tested in accordance with ASTM E 84. AType 703" by Owens-Corning or approved equal.

B. Polystyrene Insulation Boards: High density extruded polystyrene foam insulation, 48" x 96" x 1-1/2" thick, R-5.6, square edge, 1/2" x 1/4" drainage channels on bottom long edge, for installation over waterproofing membrane. Plaza Deck STYROFOAM Brand PLAZAMATE Insulation by Dow Chemical Co.

C. Concealed Wall Batt Insulation: Unfaced glass fiber thermal insulation, friction-fit, 16" or 24" widths as required x 3-1/2" thick, ASTM C 665, Type I. R-11 when tested in accordance with ASTM C 518. Maximum flame spread 10, maximum smoke developed 10 when tested in accordance with ASTM E 84. AThermal Batt Insulation@ by Owens-Corning or approved equal.

2.3 ACOUSTICAL INSULATION

A. Concealed Noise Barrier Batt Insulation: Unfaced glass fiber acoustical insulation, friction-fit, 16" or 24" widths as required x 3-1/2" thick, ASTM C 665, Type I. Maximum flame spread 10, maximum smoke developed 10 when tested in accordance with ASTM E 84. ASound Attenuation Batts@ by Owens-Corning or approved equal.

B. Chase Wall Insulation: Unfaced glass fiber acoustical insulation, semi-rigid, friction-fit, 24" x 96" x 1-1/2", ASTM C 665, Type I. R-5.8 when tested in accordance with ASTM C 518. ASTM E 119 for 1-hour fire rated partitions. Maximum flame spread 20, maximum smoke developed 20 when tested in accordance with ASTM E 84 and UL 723. AShaftwall Insulation@ by Owens-Corning or approved equal.

C. Exposed Generator Room Walls and Ceiling: FRK (foil) faced glass fiber thermal insulation, semi-rigid, 1-1/2" thick, ASTM C 612, Type 1A and 1B. Maximum flame spread 25, maximum smoke developed 50 when tested in accordance with ASTM E 84. AType 703@ by Owens-Corning or approved equal.

2.4 SPRAY-ON INSULATION

A. Exposed Thermal-Acoustical Spray-Applied Cellulose: Textured fibered cellulose with chemical binder and adhesives, mildew and mold treated, spray-applied, 3" thick, R-4.5 per inch, NRC of 1.0, Class I. Class AA@ flame spread rating per ASTM E 84. FMRC Category I. AK-13" by International Cellulose Corp. or approved equal. Color as selected.

B. Exposed Acoustical Spray Applied Cellulose: Textured fibered cellulose with chemical binder, mildew and mold treated, spray applied. NRC .90 at 1" thick, AK-13 fc@ by International Cellulose Corp. or approved equal. Color as selected.

2.5 OTHER MATERIALS

A. Insulation Anchors: Impaling pin-type with 2" diameter flat anchor head and wire spindles,
self- locking holding washers; designed for adhesive application to the underside of roof decks. Adhesive as supplied or approved by the insulation manufacturer.

B. Provide other materials, not specifically described but required for a complete and proper installation, as recommended by the insulation manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that the areas, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Board Insulation:

a. Verify that the substrate and adjacent materials are dry and ready to receive the insulation and adhesive.

b. Verify that the insulation boards are dry, unbroken and free of damage.

2. Batt Insulation:

a. Verify that the adjacent materials are dry and ready to receive the installation.

b. Verify that mechanical and electrical services within the walls have been installed, are properly placed, and has been tested.

3. Spray-applied Insulation:

a. Verify that the substrate and adjacent surfaces are dry and ready to receive the insulation.

b. Verify that all equipment is operating properly.

A. Remove or protect against projections in the construction framing which might damage or prevent the proper installation or application of materials.

B. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the original design, requirements of government agencies having jurisdiction, and the manufacturer=s recommended installation procedures as approved. Anchor all components firmly into position.

3.3 INSTALLATION - ROOF INSULATION

A. Apply with stick pins, adhesively secured to the underside of the roof. Provide a minimum of 8 pins per 4' x 8' board and 6 pins per 4' x 4' board, spaced per the manufacturer=s instructions. Butt all edges and ends of insulation tightly.

3.4 INSTALLATION - SPLIT SLABS AND UNDER DECKS

A. Set in an approved waterproof roof coating in accordance with the manufacturer=s recommendations. Protect insulation from weathering, sunlight and traffic until the top deck has been placed.

3.5 INSTALLATION - WALL INSULATION

A. Install batt insulation in accordance with the manufacturer=s instructions, without gaps or voids.

B. Wall Insulation: Friction fit for installation within metal framing. Carry around water and and waste piping, electrical junction boxes, outlets, conduit and other elements to ensure a complete acoustical barrier.

C. Trim insulation neatly to fit the spaces. Use batts free of damage. Fit insulation tight in the spaces and tight to the exterior side of mechanical and electrical services within the plane of the insulation.

D. When faced, install the insulation with the factory-applied membrane facing the warm side of the building space. Lap ends and side flanges of the membrane. Attach insulation in place to the framing. Tape seal butt ends and lapped side flanges. Tape seal tears and cuts in the membrane.

3.6 INSTALLATION - MECHANICAL ROOM WALLS AND CEILINGS

A. Install with impaling pins; bend prongs of pins inward so they are not a hazard. Tape joints. Stop insulation 4" from light fixtures and heat producing equipment.

3.7 INSTALLATION - SPRAY-APPLIED INSULATION

A. Apply by authorized applicator utilizing authorized fiber machines and nozzles for control of the fiber / binder ratio. Prime or seal surfaces before applying as required by the insulation manufacturer. Apply the manufacturer=s standard fire-retardant mildew-resistant overspray.

3.8 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect work for proper thickness, secure attachment to the substrate and in accordance with the manufacturer=s instructions.

END OF SECTION

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal base flashings and counter flashings.

2. Penetration flashing.

3. Built-in metal scuppers.

4. Gutters.

5. Downspouts.

6. Miscellaneous sheet metal accessories.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for securing flashing.

2. Section 04230 - Reinforced Unit Masonry: Substrate for securing flashing.

3. Section 07410 - Preformed Metal Roofing: Substrate for securing flashing.

1.2 DESCRIPTION OF WORK

A. The extent of each type of flashing and sheet metal work is indicated on the Drawings and as specified herein, and includes providing and installing flashings, metal scuppers, gutters, downspouts and miscellaneous accessories.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Iron and Sheet Institute (AISI):

1. North American Specification for the Design of Cold-Formed Steel Structural Members.

C. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

D. American Society for Testing and Materials (ASTM):

1. ASTM A.167 - Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

2. ASTM A 361 - Steel Sheet, Zinc-Coated (galvanized) by the Hot-Dip Process for Roofing and Siding.

3. ASTM A 527 / A 527M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality.

4. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

5. ASTM A 792 / A 792M - Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.

6. ASTM B 32 - Specification for Solder Metal.

7. ASTM B 209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

8. ASTM B 221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.

9. ASTM B 370 - Specification for Copper Sheet and Strip for Building Construction.

10 ASTM B 486 - Specification for Paste Solder.

11. ASTM C 920 - Specification for Elastomeric Joint Sealants.

E. International Code Council:

1. International Building Code (IBC), 2009.

F. Metal Building Manufacturer=s Association (MBMA):

1. Metal Building Systems Manual.

G. National Roofing Contractors Association (NRCA):

1. The NRCA Roofing and Waterproofing Manual.

H. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

1. Architectural Sheet Metal Manual.

I. Society for Protective Coatings (formerly Structural Steel Painting Council):

1. SSPC-Paint 12 - Cold-Applied Asphalt Mastic (Extra Thick Film).

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product specifications, gauges and thickness, installation instructions and general recommendations for each specified sheet

material and fabricated product.

2. Shop Drawings: Show layout, joining, profiles, and anchorage of fabricated work, including valley flashings, major counter flashings, trim / fascia units, gutters, downspouts, scuppers and expansion joint systems; layouts at 1/4" scale, details at 3" scale.

3. Samples: Submit 8" square samples of the specified sheet materials that will be exposed as finished surfaces.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Calculations indicating that the products and anchorage satisfies the performance requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written limited Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Fabricator: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.6 DESIGN AND PERFORMANCE CRITERIA

A. Thermal Movement:

1. The completed metal roofing and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on the structure, anchors or fasteners, or reducing performance ability.

2. The interface between panels and clips shall provide for a minimum of 3" of thermal movement in each direction along the longitudinal direction.

3. The location of metal roofing rigid connectors shall be designed to meet the job conditions by the metal roof system manufacturer.

B. Wind Load Requirements:

1. Provide the capacity to withstand the following loading requirements:

a. Design, fabricate and install to resist combined positive and negative

windloading in accordance with IBC 2009, Section 1609 with a Vmph or 170, qs of 74.0 psf, exposure [B] [C] [D], and importance factor of [1.0] [1.25] [1.5], as applicable per ASCE 7.

1.7 FACTORY TESTS

A. The manufacturer shall have conducted tests on previously manufactured sheets of the same type and finish as proposed for this project to assure conformance. Sheets shall have passed the following tests:

1. Salt Spray: Withstand a salt spray test for a minimum of 1,000 hours in accordance with ASTM B 117, including the scribe requirement in the test. Immediately upon removal of the panel from the test, the coating shall have receive a rating of 10 with no blistering, as determined by ASTM D 1654, Rating Schedule No. 1.

2. Formability: When subjected to a 180 degree bend over a 1/8" diameter mandrel (3/8" diameter mandrel for coatings 4 mils or greater in thickness) in accordance with ASTM D 522, the exterior coating film shall show only slight microchecking of the exterior film, and no loss of adhesion.

3. Accelerated Weathering: Withstand a weathering test of 2,000 hours, minimum, in accordance with ASTM G 152 or ASTM D 2565 without cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal. Protective coating that can be readily removed from the base metal with a penknife blade or similar instrument shall be considered as an indication of the loss of adhesion.

4, Chalking Resistance: After a 2,000 hours weatherometer test, the exterior coating shall not chalk greater than No. 8 rating when measured in accordance with ASTM D 4214.

5. Color Change: After a 2,000 hours weatherometer test, the exterior color change shall not exceed 2 NBS units when measured in accordance with ASTM D 2244.

6. Abrasion Resistance for Color Coating: When subjected to the falling sand test in accordance with ASTM D 968, the coating system shall withstand a minimum of 100 liters of sand before appearance of the base metal.

7. Humidity: When subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1,000 hours, a scored panel shall show no signs of blistering, cracking, creepage, or corrosion.

8. Fire Hazard: Factory-fabricated sheets shall be 30 to 70 at an angle of 60 degrees, when measured in accordance with ASTM D 523.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Protect components during fabrication, shipment, storage, handling, and erection from mechanical abuse, stains, discoloration and corrosion.

C. Inspect materials upon delivery to the Project Site. Reject and remove physically damaged and marred materials.

D. Store materials off the ground, providing for drainage; under cover providing for air circulation; protected from wind, foreign material contamination, mechanical damage, cement, lime and other corrosive substances.

E. Prevent contact with materials which may cause discoloration or staining.

F. Handle materials to prevent damage to surfaces, edges and ends of sheet metal items. Damaged materials shall be rejected and removed from the Project Site.

1.9 JOB CONDITIONS

A. Coordinate the work of this Section with interfacing and adjoining work for the proper sequencing of each installation.

B. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements.

C. Ensure the best possible weather resistance and durability of the work, and protection of materials and finishes.

1.10 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Limited Warranty:

1. Manufacturer's Warranty against checking, crazing, peeling, chalking, fading and adhesion.

2. Warranty Period:

a. Manufacturer=s twenty (20) years Warranty covering refinishing of the finish coating from the date of Substantial Completion.

b. Installer=s two (2) years Warranty covering the installation and watertightness from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 SHEET METAL FLASHING AND TRIM MATERIALS

A. Stainless Steel: AISI Type 302 / 304, #6 satin finish, 24 gauge, soft except where hard temper is required for forming or performance. ASTM 167.

B. Aluminum Sheet: Prefinished aluminum alloy sheet, .032" thickness except as otherwise indicated, temper appropriate to the end use. ASTM B 209. Exposed aluminum shall have a baked-on, factory-applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating per AMA 605.2, applied after the metal substrates have been cleaned and pretreated. Finish coating dry-film thickness shall be 1.0 - 1.3 mils. Color as selected.

C. Zinc-Coated Steel: Commercial quality with 0.20% copper, ASTM A 653, except ASTM A 527 for lock-forming, G90 hot-dip galvanized, mill phosphatized where indicated for painting, 26 gauge except as otherwise indicated.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of the work, matching or compatible with the product material being installed, non-corrosive, size and gauge as required for performance.

B. Reglets: Metal or plastic units of the type and profile indicated, compatible with the flashings indicated, non-corrosive.

C. Fasteners: Same metal as the flashing / sheet metal or stainless steel, as recommended by the sheet manufacturer. Match finish or exposed heads with the material being fastened.

D. Solder: For use with steel; provide 50 - 50 tin / lead solder with rosin flux. ASTM B 32.

E. Adhesives: Type recommended by the flashing sheet manufacturer for waterproof / weather-resistant seaming and adhesive application of flashing sheet and substrate.

F. Elastic Flashing Filler Rods: Closed-cell polyethylene or other soft closed-cell material recommended by the elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on the flashing sheet.

G. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

H. Elastomeric Sealant: Generic type as recommended by the manufacturer of the metal or fabricator of the components being sealed.

I. Gutter and Conductor-Head Guards: .032" aluminum or 20 gauge bronze or non-magnetic stainless steel mesh, or fabricated units, with salvaged edges and non-corrosive fasteners. Select materials for compatibility with the gutters and downspouts.

J. Unit Plumbing Vent: Integral stack pipe flashing with elastomeric base, for flat or pitched roof applications, size as required by the pipe size.

K. Protective Backing Paint: Bituminous.

2.3 FABRICATED UNITS

A. General Material Fabrication: Shop fabricate work to the greatest extent possible. Comply with the details shown, and with the applicable requirements of SMACNA AArchitectural Sheet Metal Manual@, and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work; sufficient to permanently prevent leakage, damage and deterioration of the work. Form work to fit the substrates. Comply with the material manufacturer=s instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Flashings, Counter Flashings, Copings, Expansion Joints, Scuppers: Fabricate from 20 oz. / sq. ft. copper sheet unless otherwise indicated.

C. Aluminum Gutter: .075" conforming to ASTM B 221 with baked-on, factory-applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating per AMA 605.2, applied after the metal substrates have been cleaned and pretreated. Finish coating dry-film thickness shall be 1.0 - 1.3 mils. Color as selected.

D. Downspouts: Fabricate from .032" aluminum; form in continuous lengths.

E. Seams: Fabricate non-moving seams in sheet metal as flat-lock type. For metal other than aluminum, tin the edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

F. Expansion Provisions: Where lapped or bayonet-type expansion provisions cannot be used, or would not be sufficiently water / weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant, concealed within the joints.

G. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of the work, form the metal to provide for proper installation of elastomeric sealant in accordance with SMACNA standards.

H. Separations: Provide for the separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with a bituminous coating or other permanent separation as recommended by the manufacturer / fabricator.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through the roof are solidly set, reglets in place, and nailing strips located.

2. Verify that roofing termination and base flashings are in place, sealed, and secure.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting the installation.

B. Install concrete inserts, reglets and similar anchoring devices to be built into substrates and walls prior to the time the flashing installation is to begin.

C. Install surface-mounted reglets true to lines and levels. Apply sealant along the top of reglets.

3.3 INSTALLATION

A. Comply with the manufacturer=s installation instructions and recommendations, and with SMACNA AArchitectural Sheet Metal Manual@.

B. Fit flashings, gutters, and downspouts tight in place, make corners square, surfaces true and straight in planes, and lines accurate to the profiles.

C. Anchor units securely in place by the methods indicated, providing for thermal expansion of metal units.

D. Secure work in place using concealed fasteners where possible.

E. Set units true to line and level as indicated.

F. Install work with laps, joints and seams to be permanently watertight and weatherproof.

G. Install reglets to receive counter flashings in a manner and by the methods indicated. Where shown in concrete, furnish reglets to the concrete trade for installation as the work of Sections of Division 3. Where shown in masonry, furnish reglets to the masonry trade for installation as the work of Division 4 Sections.

H. Install counterflashings in reglets, either by shape-in seal arrangement, or by wedging in place and filling the reglet with mastic or elastomeric sealant, as indicated, depending on the degree of sealant exposure.

I. Expansion and Contraction: Provide expansion and contraction joints at not more than 30 foot intervals. Space joints evenly and as approved.

J. Install elastic flashings in accordance with the manufacturer=s recommendations. Where required, provide for movement at joints by forming loops or bellows the full width of the flashing. Locate cover or filler strips at joints to facilitate complete drainage of water from the flashings. Seam adjacent flashing sheets with adhesive, seal and anchor edges in accordance with the manufacturer=s recommendations.

K. Install continuous gutter guards on gutters. Provide hinged units to swing open for cleaning the gutters. Install beehive type strainer-guards at conductor heads, removable for cleaning downspouts.

3.4 ISOLATION REQUIREMENTS

A. Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a course of paper slip sheet and a course of polyethylene underlayment.

B. Concrete Contact: Coat the underside of sheet metal over horizontal concrete surfaces, with asphaltum cement.

C. Dissimilar Metals: Insulate the juncture between dissimilar metals with a heavy coat of insulating film. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

D. Wood Contact: Isolate sheet metal from cedar, redwood, oak and acid-treated lumber by means of an unbroken 6 mil polyethylene construction sheet, or a heavy coating of metal protective paint.

3.5 PROTECTION

A. The Installer shall advise the Contractor of required procedures for surveillance and protection of the flashings and sheet metal work during the remainder of the construction, to ensure that the work will be without damage or deterioration, other than natural weathering, at the time of Substantial Completion.

3.6 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Touch-up exposed fasteners using paint furnished by the metal manufacturer, and matching the exposed metal surface finish.

C. Touch-up minor abrasions and scratches in surface finishes.

D. Scratches, abrasions and minor surface defects to the finish may be repaired in accordance with the manufacturer=s printed instructions. Replace items which cannot be repaired.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspection the installations for proper support, alignment, watertight and weatherproof.

3.8 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove excess sealants as approved by the metal manufacturer.

C. Clean exposed metal surfaces to remove all substances which might cause corrosion or metal or deterioration of finishes.

D. Leave the entire installation in a clean condition on the date of Substantial Completion.

END OF SECTION

SECTION 07840

FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Firestop sealant and safing insulation for the following locations:

a. All pipes, ductwork, conduit and other penetrations through a fire-rated walls, floor assemblies and roof assemblies.

b. Head of wall firestopping at full-height, fire-rated partitions.

c. Closure of penetrations for acoustic purposes.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for firestopping.

2. Section 04230 - Reinforced Unit Masonry: Substrate for firestopping.

3. Section 07210 - Building Insulation: Wall and roof insulation.

4. Section 07900 - Joint Sealers: Non-firestopping joint sealers.

5. Section 09250 - Gypsum Board: Substrate for firestopping.

1.2 DESCRIPTION OF WORK

A. The extent of each type of firestopping is indicated on the Drawings and as specified herein, and includes providing and installing fire safing at penetrations thru fire-rated assemblies, roofs and head of wall firestopping at full-height, fire-rated partitions.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 612 - Specification for Mineral Fiber Block and Board Thermal Insulation.

2. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

3. ASTM E 119 - Test Methods for Fire Tests of Building Construction and Materials.

4. ASTM E 136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750E C.

5. ASTM E 814 - Test Method for Fire Tests of Through-Penetration Fire Stops.

6. ASTM E 2307 - Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus.

C. Underwriters' Laboratories, Inc. (UL):

1. UL 1479 - Tests of Through-Penetration Firestops.

2. UL 2079 - Tests for Fire Resistance of Building Joint Systems.

1.4 DEFINITIONS

A. Firestopping: Sealing materials and assemblies installed in spaces between building materials to prevent movement of smoke, heat, gasses, and fire through wall openings.

1.5 SYSTEM DESCRIPTION

A. Firestopping Materials: ASTM E 119, ASTM E 814, UL 1479 to achieve the fire rating indicated on the Drawings.

1.6 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures of submittals.

1. Product Data: Manufacturer=s specifications for each joint firestop sealer, grout and safing insulation product required, including instructions for joint preparation and joint sealer application for insulation installation, product characteristics, performance, and limitations.

2. Assurance / Control Submittals:

a. Manufacturer's certificate that the products meet or exceed the specified requirements and are suitable for the intended use.

b. Certified Test Reports showing compliance with the specified performance values, including r-values (aged values for plastic insulations), densities, compression strengths, fire performance characteristics, perm rating, water absorption ratings an similar properties.

c. Product Test Reports for each type of joint firestop sealer evidencing compliance with requirements.

d. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Provide a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company that has successfully completed at least three (3) sealer applications similar in type and size within the last three (3) years, and is approved by the manufacturer for this type of installation.

B. Pre-Installation Meeting: Prior to beginning the installation of materials, meet at the Project Site with the Owner=s representative, Contractor, Installer and subcontractors of the affected trades. Review conditions, methods and procedures necessary for proper installation of the work, including inspections of areas of work, requirements of theSpecifications, and the manufacturer=s literature; review submittals and the installation schedule.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, unopened containers or packages with labels intact, identifying the manufacturer, product name and designation, expiration date for use, pot life, curing time, and mixing instructions for multi-component materials.

C. Store and handle materials in compliance with the manufacturer=s recommendations to prevent deterioration and damage due to moisture, high or low temperatures, contaminants or other causes.

D. Protect insulations from physical damage from becoming wet or soiled.

1.9 JOB CONDITIONS

A. Environmental Requirements:

1. Maintain the manufacturer=s recommended minimum temperature before, during, and for 3 days after installation of the materials.

2. Keep products away from heat, open flame, sparks, and other sources of ignition until curing is complete.

3. Install only when adequate ventilation is provided.

4. Do not proceed with installation of firestop joint sealers when ambient and substrate conditions are outside the limits permitted by the manufacturer when substrates are wet due to rain, condensation, or other causes.

5. Do not proceed with installation of firestop joint sealers until contaminants capable of interfering with adhesion has been removed from the joint substrates.

1.10 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Contractor to warrant that the firestopping systems will provide a permanent installation.

2. Warranty Period: Life of the building.

PART 2 PRODUCTS

2.1 FIRE-RESISTANT JOINT SEALERS

A. Firestop materials shall have been tested with and shall be in compliance with the minimum requirements of ASTM E 814, UL 1479, and UL 2079, as applicable. Products used shall be as listed below, as suitable for the intended application and as required to produce the fire rating shown on the Drawings and to conform to the Firestopping Schedule at the end of this Section.

B. General: Provide manufacturer=s standard fire-stopping sealants, with the necessary accessory materials, having fire resistance ratings indicated, as established by testing identical assemblies per ASTM E 814 by Underwriters Laboratories Inc. or other testing and inspecting agency acceptable to the authorities having jurisdiction.

2.2 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering firestopping materials which may be incorporated into the work include the following:

1. Nelson Firestop Products.

2. Hilti, Inc.

3. The RectorSeal Corp.

4. Specified Technologies, Inc. (STI).

5. 3M Fire Protection Products.

6. Tremco Firestop Systems.

B. Section 01600 - Product Requirements: Product Options: Substitutions not permitted.

2.3 MATERIALS

A. Intumescent Latex or Acrylic Sealant: Single-component, intumescent, latex or acrylic formulation.

1. LBS by Nelson Firestop.

2. FS ONE or CP 606 by Hilti.

3. Metacaulk 950 or 1000 by RectorSeal.

4. SpecSeal SSS100 by STI.

5. CP 25WB+ by 3M.

6. TREMstop WBM by Tremco.

B. Intumescent Solvent-Release-Curing Sealant: Single component, intumescent, synthetic-polymer based, non-sag grade.

1. CP 25 N/S by 3M.

2. TREMstop WBM by Tremco.

C. Intumescent Wrap / Strip: Single-component, elastomeric sheet with aluminum foil on one face.

1. WRS by Nelson Firestop.

2. CP 645 Wrap Strip by Hilti.

3. Metacaulk Wrap Strip by RectorSeal.

4. SpecSeal SSWRED Wrapstrip by STI.

5. FS-195+ Wrap / Strip by 3M.

6. TREMstop WS by Tremco.

D. Intumescent Putty: Single-component, non-hardening, dielectric.

1. FSP by Nelson Firestop.

2. CP 618 Putty Stick or CP 617/ 617L Putty Pad by Hilti.

3. CP 645 Wrap Strip by Hilti.

4. CP 658 Firestop Plug by Hilti.

5. Metacaulk Fire Rated Putty by RectorSeal.

6. SpecSeal Putty by STI.

7. Moldable Putty+ by 3M.

E. Silicone Sealant: Single-component, moisture-curing, silicone-based elastomeric, non-sag grade.

1. CLK N/S by Nelson Firestop.

2. CP 601S by Hilti.

3. Metacaulk 835 by RectorSeal.

4. SpecSeal PEN 300 by STI.

5. 2000+ Silicone by 3M.

6. FRYE SIL by Tremco.

F. Silicone or Polyurethane Foam: Two-component, liquid elastomer that, when mixed,

expands and cures in place to produce a flexible, non-shrinking foam.

1. SpecSeal PEN 200 by STI.
2. 2001 Silicone RTV Foam by 3M.
3. CP 620 Fire Foam by Hilti.

G. Intumescent Collar: Factory-fabricated, intumescent collar.

1. PCS by Nelson Firestop.
2. CP 642 or CP 643 by Hilti.
3. Metacaulk Pipe Collar by RectorSeal.
4. SpecSeal SSC Collars by STI.
5. Plastic Pipe Device by 3M.
6. TREMstop D by Tremco.

H. Intumescent Composite Sheet, Pillows and Mortar or Blocks: Products used to firestop large openings.

1. CPS by Nelson Firestop.
2. FS 657 Fireblocks by Hilti.
3. CP 637 Firestop Mortar by Hilti.
4. CP 675T Firestop Board by Hilti.
5. SpecSeal SSB Pillows and SpecSeal SSM Firestop Compound by STI.
6. CS-195+ Composite Sheet by 3M.
7. TREMstop PS by Tremco.

I. Sprayable Fire-Rated Mastic: Products used to firestop construction joints.

1. CP 672 Speed Spray by Hilti.
2. SpecSeal Elastomeric Spray by STI.
3. Firedam Spray by 3M.

J. Packing Material: Manufacturer's standard mastic, putty, ceramic fiber blanket, or mineral wool to be used as fill or backing material for firestopping.

1. FSB or Mineral Wool by Nelson Firestop.
2. Mineral Wool by Hilti.
3. Fire Safing or Backer Rod by RectorSeal.

4. Mineral Wool by STI.

5. FireMaster Mastic, FireMaster Putty, or FireMaster Bulk by 3M.

6. Cerablanket by Tremco, Canada.

7. CP 777 Speed Plugs by Hilti (preformed mineral wool designed for top of wall fluted metal deck packing material).

K. Safing and Smoke Stop: Thermafiber Safing Insulation, 4" thick, 4 pcf high melt point, mineral wool, unfaced and thermafiber Smoke Stop System with Smoke Seal compound as required for the use and location.

L. Accessory Materials for Fire-Stopping Sealants: Provide forming, joint fillers, packing and other accessory materials required for installation of fire-stopping sealants as applicable to the installation conditions indicated.

2.4 FIRE INSULATING MATERIALS

A. General: Provide insulating materials which comply with the requirements indicated for materials, compliance with the referenced standards, and other characteristics.

B. Semi-Refractory Fiber Board Safing Insulation: Semi-rigid boards designed for use as a firestop at openings between edge of slab and exterior wall panels at the top of rated walls as shown; produced by combining semi-refractory mineral fiber manufactured from slag with thermosetting resin binders to comply with ASTM C 612, passing ASTM E 136 for combustion characteristics; R-value of 4.0 at 75E F, melting point exceeding 2000 degrees F. Supports to be 26 gage galvanized steel.

1. Manufacturer=s of Semi-Refractory Fiber Insulation:

a. Johns Manville Corp.

b. 3M.

c. United States Gypsum Co.

C. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, and conditions are as required, and ready to receive the work.

C. With the Installer present, examine surfaces to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance.

D. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions

have been corrected.

3.2 PREPARATION

A. Clean joints immediately before installing joint sealers to comply with recommendations of the joint sealer manufacturer and the following requirements:

1. Remove all foreign materials from joint substrates which could interfere with adhesion of the joint sealer, including dust; paint, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by the sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellents; water; and surface dirt.

B. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with the joint sealer.

C. Remove loose particles remaining from the cleaning operations by vacuuming or blowing out the joints with oil-free compressed air.

D. Remove laitance and form release agents from concrete.

E. Prime joint substrates where recommended by the joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer=s recommendations. Confine primers to areas of the joint sealer bond. Do not allow spillage or migration onto adjoining surfaces.

F. Place hangers or damming devices in penetrations to hold firestopping materials in place, where necessary.

3.3 INSTALLATION

A. General:

1. Comply with the manufacturer=s printed installation instructions applicable to the product and application required, except where more stringent requirements apply.

2. Comply with the manufacturer=s recommendations for protection during installation.

B. Install firestopping at penetrations of fire-rated walls by sleeves, piping, ductwork, conduit and other items in accordance with the manufacturer's published instructions. Follow the manufacturer=s chart for the appropriate material for use to achieve the required fire rating in the various locations.

C. Install sealant, including forming, packing, and other accessory materials to fill openings around mechanical and electrical services penetrating walls and floors to provide fire-stops with the fire-resistance ratings indicated for wall and floor assemblies in which the penetrations occur. Comply with the installation requirements established by testing and inspecting agency.

D. At full-height fire-rated walls / partitions: Protect all fire safing insulation by installing a 22 gage galvanized sheet metal closure at the top and bottom, for protection of the fire safing insulation. Tool exposed surfaces of mortar or sealants. Where plastic pipes penetrate

floors, provide a galvanized steel sleeve around the pipes and fire stop sealant within the sleeve.

E. At openings between exterior walls and floors / roofs, install fire safing insulation per the manufacturer=s instructions.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. The Owner=s representative will inspect firestopping installations. Do not cover installations by other construction until the Owner=s representative has completed an inspection.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean excessive fill material and sealants adjacent to openings and joints as the work progresses by methods and with cleaning materials approved by the manufacturers of the firestopping products and of products in which openings and joints occur.

3.6 PROTECTION

A. Protect joint sealers and insulation from contact with contaminating substances and from damage resulting from construction operations or other causes so they are without damage at the time of Substantial Completion.

B. If damage or deterioration does occur, cut out and remove the damaged or deteriorated joint sealers and make repairs indistinguishable from the original installations.

3.9 FIRESTOPPING SCHEDULE

A. Provide firestopping complying with the UL assemblies specified below:

Penetration	Assembly	Nelson	Hilti	RectorSeal	STI	3M	Tremco
Metal Pipe	CMU Wall 8" Thick or Less	CAJ1224 or CAJ1203	CAJ1149 or CAJ1155 or	CAJ1114 or CAJ1115	CAJ1079 or CAJ1217	CAJ1001 or CAJ1009	CAJ1179 or CAJ1187
	Gypsum Board Partition	WL1083 or WL1030	WL1054 or WL1058	WL1026 or WL1034	WL1049 or WL1079	WL1003 or WL1009	WL1020 or WL1051
Non-Metallic Pipe	CMU Wall 8" Thick or Less	CAJ2086	CAJ2110 or CAJ2109	CAJ2021 or WJ2025	CAJ2064 or CAJ2045	CAJ2005	CAJ2082 or FA2024
	Gypsum Board Partition	WL2071	WL2098 or WL2078	WL2015 or WL2104	WL2093 or WL2029	WL2002 or WL2005	WL2083 or WL2082
Cable Tray	CMU Wall 8" Thick or Less	CAJ8049 or CAJ4033	CAJ4035 or CAJ4017	CAJ8043	CAJ4020 or CAJ4029	CAJ4003 or CBJ4020	CAJ4007 or WJA4005

	Gypsum Board Partition	WL4003	WL4011 or WL4019	N/A	WL4005 or WL4008	WL4004	WL3043 or WL3044
Insulated Metal Pipe	CMU Wall 8" Thick or Less	CAJ5008 or CAJ5059	CAJ5090 or CAJ5091	WJ5016 or CAJ5070	CAJ5021 or CAJ5029	CAJ5001 or CAJ5002	CAJ5052 or CBT5005
	Gypsum Board Partition	WL5036	WL5028 or WL5029	WL5057	WL5014 or WL5051	WL5001	WL5034
Construction Gaps - Head of Wall to	CMU Wall to Metal Deck	N/A	HWD0098	TRC/PV120-14	N/A	HWD0013	N/A
	Gypsum Board Partition to Metal Deck	N/A	HWD0042 or HWD0049	HWD0014	N/A	HWS0003	WHPV60.01
Construction Gaps - Wall to Wall	CMU Wall to CMU Wall	N/A	WWD1011 or WWD1012 or WWD1017	N/A	N/A	WWS1001	N/A
	Gypsum Board Partition to Gypsum Board Partition	N/A	N/A	N/A	N/A	WWS0004	N/A

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sealants.

2. Backing.

3. Substrate preparation.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Sealant used in conjunction with concrete work.

2. Section 04230 - Reinforced Unit Masonry: Sealant used in conjunction with masonry work.

3. Section 05800 - Expansion Control : Sealant for waterproofing expansion joints.

4. Section 06400 - Architectural Woodwork: Sealant to prevent vermin and moisture penetration into concealed spaces.

5. Section 06650 - Solid Polymer Fabrications: Sealant to prevent vermin and moisture penetration into concealed spaces.

6. Section 07110 - Waterproofing: Sealant for waterproofing concrete work.

7. Section 07120 - Fluid-Applied Urethane Roofing: Sealant for waterproofing roofing applications.

8. Section 07125 - Fluid-Applied Elastomeric Roofing (Acrylic): Sealant for waterproofing roofing applications.

9. Section 07190 - Water Repellents (Sealer): Sealant for waterproofing concrete walks and floors.

10. Section 07250 - Fireproofing: Sealants used in fireproofing.

11. Section 07410 - Preformed Metal Roofing: Sealant for waterproofing metal roofing systems.

12. Section 07415 - Exterior Wall Panel System: Sealant for waterproofing metal wall systems.

13. Section 07620 - Sheet Metal Flashing and Trim: Sealant for weatherproofing metal roofing and flashings.

14. Section 07724 - Roof Hatch: Sealant for waterproofing roof hatch installations.

15. Section 07840 - Firestopping: Sealants for use in fire-rated assemblies.

16. Section 08100 - Hollow Metal Doors and Frames: Sealants for weatherproofing door and window frame perimeters and thresholds.

17. Section 08310 - Access Doors and Panels: Sealant to close joint where metal edge trim meets adjacent surfaces.

18. Section 08330 - Overhead Coiling Doors: Sealants for weatherproofing door frame perimeters and thresholds.

19. Section 08400 - Entrances, Storefronts and Windows: Sealants for weatherproofing frame perimeters and thresholds.

20. Section 08800 - Glass and Glazing: Sealants and compound for glass and glazing installations.

21. Section 09250 - Gypsum Board: Sealant for back of control joints and to close joint where edge trim meets adjacent surfaces; acoustical sealants.

22. Section 09300 - Tile: Sealants for tile and threshold installations.

23. Section 09510 - Gypsum Board: Sealant to close joint where edge trim meets vertical surfaces.

24. Section 10200 - Louvers and Vents: Sealants to close joint where metal edge trim meets vertical surfaces.

25. Section 10500 - Metal Lockers: Sealant to close joint where metal edge trim meets vertical surfaces.

26. Section 10810 - Toilet Accessories: Sealants to prevent moisture penetration into concealed areas.

27. Section 12305 - Science Casework and Laboratory Equipment: Sealant to prevent vermin and moisture penetration into concealed spaces.

28. Section 14240 - Hydraulic Elevators: Sealant to prevent moisture penetration into concealed spaces.

29. Section 14245 - Traction Elevators: Sealant to prevent moisture penetration into concealed spaces.

30. Section 14560 - Chutes: Sealant to prevent moisture penetration into concealed spaces.

1.2 DESCRIPTION OF WORK

A. The extent of joint sealers work is indicated on the Drawings and as specified herein, and includes providing and installing sealants, complete. The principal item of work is the

sealing of openings and joints indicated, specified, and as required to make the entire building weatherproof and watertight.

B. This Section contains general specifications for sealants throughout the Project. The specific use for joint sealants is indicated in the Sealant Schedule at the end of this Section.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 717 - Terminology of Building Seals and Sealants.

2. ASTM C 834 - Specification for Latex Sealants.

3. ASTM C 920 - Specification for Elastomeric Joint Sealants.

4. ASTM C 1193 - Guide for Use of Joint Sealants.

5. ASTM C 1299 - Guide for Use in Selection of Liquid-Applied Sealants.

6. ASTM D 1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

1.4 SUBMITTALS

A. Section 01330 - Submittals: Procedures for submittals.

1. Product Data: Manufacturer=s specifications, recommendations, handling, installation and curing instructions for each type of sealant and associated miscellaneous material required. Include chemical characteristics, performance criteria, substrate preparation, limitations, color availability and VOC content.

2. Samples: 2" long of each color required for each type of sealant exposed to view.

3. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Manufacturer's Material Safety Data Sheets (MSDS).

c. Manufacturer=s certification that the products supplied comply with applicable federal and local regulations controlling the use of volatile organic compounds (VOC).

d. Manufacturer's Instructions indicating procedures and conditions requiring special attention, and cautionary procedures required during application.

e. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Provide a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, new, unopened packages or containers, dry and undamaged with seals and labels intact, identifying the product and manufacturer, product designation, date of manufacture, lot number, shelf life, curing time, and mixing instructions, if applicable.

C. Handle and store materials to prevent deterioration and damage due to moisture, temperature changes, contaminants and other causes.

D. Store materials not in actual use out of the weather until ready for use. Maintain packages and containers in a clean condition, free of foreign materials and residue.

E. Store materials in a ventilated area, and in compliance with the manufacturer=s printed instructions.

F. Keep storage areas neat and orderly.

G. Protect against fire hazards and spontaneous combustion.

H. Take all necessary precautions to ensure that workmen and the work areas are adequately protected from health hazards resulting from handling, mixing and installation of the materials.

1.7 JOB CONDITIONS

A. Environmental Requirements: Install sealants only during the manufacturer's recommended temperature ranges and weather conditions for proper application and cure. Consult the manufacturer if a sealant cannot be applied under the recommended conditions.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Submit a joint and severable written Warranty signed by the sealant manufacturer and the Installer certifying that the products and installation is free of defective

materials and workmanship and agreeing to repair or replace sealants and accessories which fail because of loss of cohesion or adhesion, which do not cure properly or are improperly installed.

2. Warranty Period: Three (3) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. General Performance Requirements: Select materials for compatibility with the joint surfaces to be encountered and other indicated exposures, and except as otherwise indicated, select modulus of elasticity and hardness or grade recommended by the manufacturer for each application indicated.

B. Where exposed to foot traffic, select materials of sufficient strength and hardness to withstand stiletto heel traffic without damage or deterioration of the sealant system.

C. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Urethanes:

a. Two-Part Urethane: Self-Leveling, ASTM C 920, Type M, Grade P, Class 25.

1) Chem-Calk 550 by Bostik.

2) Vulkem 245 by Tremco (formerly Mameco International, Inc.)

3) Vulkem 255 FM by Tremco.

4) Urexpan NR-200 by Pecora Corporation.

5) Sikaflex 2c SL by Sika Group.

b. Two-Part Urethane: Non-Sag, ASTM C 920, Type M, Grade NS, Class 25.

1) Chem-Calk 500 by Bostik.

2) Sonolastic NP 2 by Sonneborn Building Products

3) Vulkem 227 by Tremco.

4) Dynatrol II by Pecora.

5) Sikaflex-2c NS EX Mix by Sika.

c. One-Part Urethane: Self-Leveling, ASTM C 920, Type S, Grade P, Class 25.

1) Vulkem 45 by Tremco.

2) Sonolastic SL1 by Sonneborn.

3) Urexpan NR-201 by Pecora.

d. One-Part Urethane: Non-Sag, ASTM C 920, Type S, Grade NS, Class 25.

1) Chem-Calk 900 by Bostik.

2) Sonolastic NP 1 by Sonneborn.

3) Vulkem 116 by Tremco.

2. Silicones:

a. One-Part Silicones: ASTM C 920, Type S, Grade NS, Class 25. Vertical Surfaces Only.

1) 795 Silicone Building Sealant Structural Glazing, Glazing and Weatherproofing Sealant by Dow Corning. (colors only)

2) Construction 1200 Sealant by General Electric Company.

3) 999-A Silicone Building and Glazing Sealant by Dow Corning.

4) 864 Architectural Silicone by Pecora.

b. One-Part Silicones: ASTM C 920, Type S, Grade NS, Class 25.

1) 786 Mildew Resistant Silicone Sealant by Dow.

2) Sanitary 1700 Silicone Sealant by General Electric.

3) 898 Sanitary Mildew Resistant Silicone Sealant by Pecora.

3. Acrylics, Latex:

a. One-Part Acrylic Latex, Non-Sag, ASTM C 834.

1) Chem-Calk 600 by Bostik.

2) LC-130 Liquid Nails Caulk Window and Door Acrylic Latex by Macco Adhesives.

3) AC-20 Acrylic Latex Caulking, Non-Sag by Pecora.

4) Sonolac Acrylic Latex Caulk by Sonneborn.

4. Acoustical Sealants:

a. AC-20 FTR Fire and Temperature Rated Acoustical and Insulation Sealant by Pecora.

b. Sheetrock Acoustical Sealant by United States Gypsum Co.

5. Butyls:

a. One-Part Butyl, Non-Sag, FS TT-S-1657.

1) Chem-Calk 300 Butyl Rubber Caulk by Bostik.

2) BC-158 Butyl Rubber Caulk by Pecora.

6. Preformed Compressible & Non-Compressible Fillers:

a. Backer Rod - Closed cell polyethylene foam:

1) Chem-Rod / Closed by Bostik.

2) Expand-O-Foam by Williams Products.

3) HBR Backer Rod by Nomaco, Inc.

4) Sonofoam Closed-Cell Backer Rod by Sonneborn.

b. Backer Rod - Open cell polyurethane foam:

1) Denver Foam by Backer Rod Manufacturing.

2) Foam Pack II by Nomaco.

c. Neoprene compression seals:

1) WA and WE Series by Watson Bowman Acme.

d. Butyl Rod: Kirkhill Rubber Co.

7. Paving Sealants:

a. Two-Part Urethane: Self-Leveling, ASTM C 920, Type M, Grade P, Class 25.

1). Vulkem 202 by Tremco. (Jet Fuel Resistant) (FS SS-S-200E, Type H only).

2). NR-300 Urexpan by Pecora (FS SS-S-200E).

b. One-Part Urethane: Self-Leveling, ASTM C 920, Type S, Grade P, Class 25.

1). SONOMETRIC 1 Sealant by Sonneborn (FS SS-S-200E).

2). Vulkem 45 by Tremco.

D. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MISCELLANEOUS MATERIALS

A. Joint Cleaner: Provide the type of joint cleaning compound recommended by the sealant manufacturer for the joint surfaces to be cleaned.

B. Joint Primer / Sealer: Type of joint primer / sealer recommended by the sealant manufacturer for the joint surfaces to be primed or sealed.

C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by the sealant manufacturer, to be applied to the sealant contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of the sealant. Provide self-adhesive tape where applicable.

D. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorbable material as recommended by the sealant manufacturer for compatibility with the sealant.

E. Masking tape and similar accessories as necessary to protect adjacent surfaces from damage.

2.3 COLORS

A. Generally use sealant colors to match the color of the material in which the joint is located. Select from the manufacturer=s standard colors.

B. Where a joint occurs between two materials of differing colors and the Contractor cannot determine which material to match, contact the Owner=s representative for a decision.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that joint widths are in conformance with the sealant manufacturer=s allowable limits.

2. Verify that contaminants capable of interfering with adhesion have been cleaned from joints.

3. Verify that joints has been properly prepared.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 JOINT PREPARATION

A. Prepare and size joints in accordance with the manufacturer's instructions.

B. Clean joint surfaces immediately before installation of sealant. Remove dust, dirt, laitance, unsecured coatings, mortar, moisture and other substances which could interfere with bond of sealant or caulking compounds using a solvent or abrasion as recommended by the manufacturer. Remove loose materials and foreign matter which could impair adhesion of the sealant.

C. Etch concrete and masonry joint surfaces as recommended by the sealant manufacturer.

D. Roughen vitreous and glazed joint surfaces as recommended by the sealant manufacturer.

E. Prime or seal joint surfaces where indicated, and where recommended by the sealant manufacturer.

F. Verify that the sealant is suitable for the substrate.

G. Verify that joint backing and release tapes are compatible with the sealant.

H. Verify that the sealant is paintable if a paint finish is indicated.

3.3 INSTALLATION

A. Install in accordance with the manufacturer=s printed instructions, except where more stringent requirements are shown or specified, and except where the manufacturer=s technical representative directs otherwise. Perform the work in accordance with ASTM C 1193 for latex base sealants.

B. Prime or seal joint surfaces where recommended by the sealant manufacturer. Do not allow the primer or sealer to spill or migrate onto adjoining surfaces.

A. Set joint filler units at the proper depth or position to coordinate with other work, including the installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between the ends of joint filler units.

B. Install sealant backer rods, except where shown to be omitted or recommended to be omitted by the sealant manufacturer for the application indicated.

C. Install pre-formed compressible and non-compressible fillers in accordance with the manufacturer's published instructions.

D. Install bond breaker tape where indicated and where required by the manufacturer=s recommendations to ensure that elastomeric sealants will perform properly.

E. Employ only proven installation techniques which will ensure that the sealants are deposited in uniform, continuous ribbons without gaps or air pockets, foreign embedded matter, ridges and sags, with complete Awetting@ of joint bond surfaces equally on both sides.

F. Except as otherwise indicated, fill sealant rabbet to a slight concave surface, slightly below the adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill the joint to form a slight cove so the joint will not trap moisture and foreign matter.

G. Dry tool joints. Do not use soap, water or solvent to tool the joints.

H. Seal joints before adjacent surfaces are waterproofed or painted.

I. Install sealants to the depths shown or, if not shown, as recommended by the sealant manufacturer, but within the following general limitations, measured at the center (thin) section of the bead:

1. For sidewalks, pavements and similar joints sealed with elastomeric sealants and subject to traffic and other abrasions and indentation exposures, fill the joints to a

depth equal to 75% of the joint width, but not less than 3/8" deep or more than 1/2" deep.

2. For normal moving joints sealed with elastomeric sealants not subject to traffic, fill joints to a depth equal to 50% of the joint width, but not less than 1/4" deep or more than 2" deep.

3. For joints sealed with non-elastomeric sealants, fill the joints to a depth in the range of 75% to 125% of the joint width.

L. Epoxy Floor Joint Sealant: Install sealant at floor construction and control joints in accordance with the manufacturer's published instructions.

3.4 SPILLAGE

A. Protect materials surrounding the work of this Section from damage and disfigurement. Do not allow sealants to overflow or spill onto adjacent surfaces, or to migrate into the voids of adjoining surfaces.

B. Recess exposed edges of exposed joint fillers slightly behind the adjoining surfaces, unless otherwise shown, so the compressed units will not protrude from the joints.

C. Bond ends of joint fillers together with an adhesive or Aweld@ by other means recommended by the manufacturer to ensure a continuous watertight and airtight installation.

3.5 CURING

A. Cure sealants in compliance with the manufacturer's published instructions.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect sealant work for proper installation, depth and adhesion.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove excess and spillage of sealants promptly as the work progresses using the materials and methods recommended by the sealant and substrate manufacturers.

C. Clean adjoining surfaces to eliminate evidence of spillage without damage to the adjoining surfaces and finishes.

3.8 SEALANT SCHEDULE

A. Exterior Joints:

1. Perimeters of exterior openings where frames and other penetrations meet the exterior face of the building; precast concrete, concrete, concrete masonry, polymer reinforced concrete:

a. Sealant No. 2.1, C.1.b

2. Expansion and control joints in exterior surfaces of cast-in-place concrete walls and precast architectural wall panels:

   a. Sealant No. 2.1, C.1.b

   b. Sealant No. 2.1, C.1.d

   c. Material No. 2.1, C.6.a

3. Expansion and control joints in exterior surfaces of unit masonry walls, polymer reinforced concrete and metal panels:

   a. Sealant No. 2.1, C.1.b

4. Coping joints, coping-to-facade joints, cornice and wash, and horizontal surface joints not subject to foot or vehicular traffic:

   a. Sealant No. 2.1, C.1.b

   b. Sealant No. 2.1, C.1.d

5. Exterior joints in horizontal wearing and non-wearing surfaces:

   a. Sealant No. 2.1, C.1.a

   b. Sealant No. 2.1, C.1.c

   c. Material No. 2.1, C.6.a

6. Paving joints and curb:

   a. Sealant No. 2.1, C.1.d
   b. Sealant No. 2.1, C.2.a

7. Setting bed for thresholds and saddles:

   a. Sealant No. 2.1, C.1.c

8. Painted metal lap and flashing joints:

   a. Sealant No. 2.1, C.2.a

B. Interior Joints:

1. Seal the interior perimeters of exterior openings.

2. Expansion and control joints on the interior of exterior cast-in-place concrete walls.

3. Expansion and control joints on the interior of exterior precast, architectural wall panels.

4. Expansion and control joints on the interior of exterior surfaces of unit masonry walls.

5. Perimeters of interior aluminum and hollow metal frames.

6. Interior masonry vertical control joints and intersecting unit masonry walls; masonry-to-masonry, masonry-to-concrete.

7. For all of the above interior joints:

    a. Sealant No. 2.1, C.1.b

    b. Sealant No. 2.1, C.1.d

    c. Sealant No. 2.1, C.1.a (for pre-finished materials only).

8. Exposed interior control joints in drywall and concealed joints:

    a. Sealant No. 2.1, C.3.a

    b. Sealant No. 2.1, C.4

    c. Sealant No. 2.1, C.4.c

    d. Sealant No. 2.1, C.6.a

9. Joints at the top of non-load-bearing unit masonry walls at the underside of cast-in-place concrete:

    a. Sealant No. 2.1, C.1.b

    b. Sealant No. 2.1, C.1.d

10. Perimeters of architectural woodwork: overhead cabinets, base cabinets, vanities, countertops, shelving, etc.:

    a. Sealant No 2.1, C.2.b

11. Perimeters of suspended acoustical ceilings where edge trim meets vertical surfaces:

    a. Sealant No. 2.1, C.2.b

12. Perimeters of toilet / bath fixtures: mirrors, sinks, urinals, tubs, vanities, waterclosets, accessories, etc.:

    a. Sealant No. 2.1, C.2.b

13. Interior expansion and control joints in floor surfaces exposed to foot traffic:

    a. Sealant No. 2.1, C.1.a

    b. Sealant No. 2.1, C.1.c

    c. Material No. 2.1, C.6.a

14. Interior saw-cut contraction joints in exposed concrete floors exposed to forklift traffic:

    a. Sealant No. 2.1 C.7

15. Interior non-moving joints, including control, contraction, and construction joints in interior floor slabs exposed to heavy duty traffic:

    a. Sealant No. 2.1, C.7

16. Painted metal lap joints:

    a. Sealant No. 2.1, C.2

C. Glass and Glazing:

1. Structural Glazing.

    a. Sealant 2.1, C.2.a

2. General Purpose Glazing.

    a. Sealant 2.1, C.2.b

3. End Damming.

    a. Sealant 2.1, C.5

END OF SECTION

SECTION 08100

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel doors.

2. Steel door frames.

3. Steel window frames.

4. Door vision panels.

5. Louvers.

6. Accessories.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for anchorage.

2. Section 04230 - Reinforced Unit Masonry: Substrate for anchorage.

3. Section 08210 - Wood Doors: Doors installed in steel frames.

4. Section 08710 - Door Hardware: Hardware coordination.

5. Section 08800 - Glass and Glazing: Glass installed in vision panels in doors and steel window frames.

6. Section 09900 - Painting: Field painting and finishing of frames and doors.

1.2 DESCRIPTION OF WORK

A. The extent of standard steel doors and frames work is indicated on the Drawings and Schedule and as specified herein, and includes providing and installing exterior entrance and storefront assemblies, designed and fabricated to comply with the requirements for system performance characteristics below, as demonstrated by testing of the manufacturer=s corresponding stock systems in compliance with the test methods designated.

B. Door hardware is specified in Section 08710.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

C. American Society for Testing and Materials (ASTM):

1. ASTM A 153 / A 153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

2. ASTM A 568 / A 568M - Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

3. ASTM A 653 / A 653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.

4. ASTM A 1008 / A 1008M - Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

5. ASTM A 1011 / A 1011M - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

6. ASTM D 2201 - Practice for Preparation of Zinc-Coated and Zinc-Alloy-Coated Steel Panels for Testing Paint and Related Coating Products.

7. ASTM E 90 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

8. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

9. ASTM E 413 - Classification for Rating Sound Insulation.

D. Americans with Disabilities Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

E. Door Hardware Institute (DHI):

1. DHI - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

F. International Code Council:

1. International Building Code (IBC), 2009.

G. Steel Door Institute (SDI):

1. SDI-100 - Standard Steel Doors and Frames.

2. SDI-105 - Recommended Erection Instructions for Steel Frames.

H. National Fire Protection Association (NFPA):

1. Standard No. 80 - Standard for Fire Doors and Other Opening Protectives.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Identify door and frame materials, gauges, configurations, location of cutouts, hardware reinforcement, fire-rating and finish.

2. Shop Drawings: Include elevations of each door type, details of each frame type, conditions at openings, details of construction, location and installation requirements of reinforcements and finish hardware, and details of joints and connections. Show anchorages and accessory items. Indicate door elevations, internal reinforcement, closure method, sidelights, and cutouts for louvers and vision panels.

3. Schedule: Provide for doors and frames using the same reference numbers for details and openings as those used on the Drawings.

4. Samples: Full range of color samples for selection. Two (2) 6" x 6", minimum, of each color and texture selected from factory-finished doors and frames.

5. Assurance / Control Submittals:

a. Certificates:

1) Manufacturer=s Certificate that the products meet or exceed the specified requirements.

2) Manufacturer=s certification that hot-dip galvanizing for doors and frames comply with the requirements.

3) Manufacturer=s certification that oversized fire-rated frame and door assemblies have been constructed with materials and methods equivalent to the requirements for labeled construction.

b. Calculations indicating that exterior doors, frames and anchorages satisfy the performance requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: procedures for closeout submittals.

1. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing work of this Section with a minimum of five (5) years documented experience.

3. Provide frames and doors complying with Steel Door Institute, SDI-100 ARecommended Specifications: Standard Steel Doors and Frames@ and as specified herein.

B. Performance Requirements:

1. Provide the capacity to withstand the following loading requirements for exterior units:

a. Design and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D],and importance factor [1.0] [1.25] [1.5], as applicable per ASCE 7.

2. Fire-Rated Assemblies: Provide fire-rated doors investigated and tested as fire door assemblies, complete with type of hardware to be used. Identify each fire door with recognized testing laboratory labels indicating the applicable fire-rating. Construct and install assemblies to comply with NFPA, Standard No. 80, and as herein specified.

1.6 DELIVERY, STORAGE AND PROTECTION

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver hollow metal work cartoned or crated for protection during transit and storage.

C. Provide additional sealed plastic wrapping for factor-finished doors.

D. Deliver products to the Project Site in the manufacturer=s original, unopened packages, dry and undamaged with seals and labels intact.

E. Inspect products for damage. Minor damages may be repaired provided the finish items are equal, in all respects, to new work, and acceptable to the Owner=s representative; otherwise remove and replace the damaged items.

F. Store under cover in dry, weathertight conditions. Place units on 4" high wood sills or store otherwise in a manner to prevent rust and damage. Provide 1/4" space between stacked doors to allow for air circulation. Avoid the use of non-ventilated plastic or canvas shelters. If the cardboard wrapper becomes wet, remove the carton immediately.

G. Break seals to permit ventilation.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout.

B. Special Warranty:

1. Provide a written Warranty, signed by the door manufacturer, and the door installer agreeing to repair or replace doors that do not meet the requirements, or that fail in materials or workmanship.

2. Warranty Period: Two (2) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering items which may be incorporated in the work include the following:

1. Amweld Building Products.

2. Ceco Door Products.

3. Republic Doors and Frames.

4. Steelcraft.

5. Curries.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 1011 / A 1011M and ASTM A 568 / A 568M.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 1008 / A 1008M and ASTM A 568 / A 568M.

C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 653 / A 653M, ASTM D 2201, G60 zinc coating, mill phosphatized.

D. Supports and Anchors: Fabricate of not less than 18 gage galvanized sheet steel.

E. Inserts, Bolts and Fasteners: Manufacturer=s standard units, hot-dip galvanized complying with ASTM A 153 / A 153M, Class C or D, as applicable.

2.3 FABRICATION

A. Fabricate units rigid, neat in appearance, and free from defects, warp, twist and buckle. Fit and assemble units in the manufacturer=s plant. Fabricate KD or welded. Clearly identify work that cannot be permanently factory-assembled before shipment to assure proper assembly at the Project Site.

B. Weld the exposed surface of joints continuously; grind, dress, and make joints smooth, flush and invisible. When prime painted, the use of metallic filler to conceal manufacturing defects is not acceptable.

C. Fabricate exposed faces of doors and panels, including stiles and rails of non-flush units

from only cold-rolled steel.

D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and molding from either cold-rolled or hot-rolled steel (fabricator=s option); galvanized.

E. Fabricate doors, panels and frames from galvanized sheet steel. Close top and bottom edges of doors as an integral part of the door construction or by the addition of inverted steel channels.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips head for exposed screws and bolts; galvanized.

G. Sound-Rated (Acoustical) Assemblies:

1. Where shown or scheduled, provide frame and door assemblies which have been fabricated as sound-reducing type, tested in accordance with ASTM E 90 and classified in accordance with ASTM E 413.

2. Unless otherwise indicated, the minimum sound rating for acoustical assemblies shall be STC 33.

H. Door Hardware Preparation:

1. Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by the hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.

2. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in the top rail of doors or heads of frames, as applicable.

3. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at the Project site.

4. Locate finish hardware as shown on final Shop Drawings or, if not shown, in accordance with ARecommended Locations for Builder=s Hardware, Apublished by the Door and Hardware Institute and ADA Accessibility Guidelines.

I. Prepare frame for silencers. Provide three single rubber silencers for single doors; two single silencers on the frame head at double doors without mullions.

J. Equip frames with one welded-in floor anchor in each jamb. Furnish a minimum of three (3) steel jamb anchors and two (2) head anchors for field insertion at a maximum of 24" o.c. Anchors shall be of the proper type for particular construction involved (i.e., masonry, concrete, metal framing, etc).

K. Factory install louvers and vision panels in prepared openings.

L. Shop Painting:

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

2. Clean, treat and paint exposed surfaces of steel doors, louvers and frames including galvanized surfaces.

3. Apply one shop coat of rust-inhibitive enamel or primer paint, either air-dryed or baked-on, of even consistency, and suitable as a base for the specified finish paint.

2.4 STANDARD STEEL FRAMES

A. Provide galvanized steel frames for doors, transoms, sidelights, borrowed lights, windows and other openings of the types and styles shown on the Drawings.

B. Exterior Frames including sidelights, if required:

1. Cold-rolled steel; factory mitered corners and full-welded construction; 2" face, jamb dept as required or as shown on the Drawings; galvanized to ASTM D 2201.

2. 14 gage for exterior frames and other frames wider than 48".

3. 18 gage for all other frames.

C. Interior Frames:

1. Cold-rolled steel; 2" face, jamb depth as required or as shown on the Drawings.

2. 16 gage.

3. Fire-rated frames per NFPA, Standard No. 80.

D. Silencers: Except on weatherstripped frames, drill stops to receive three (3) silencers on the strike jambs of single-swing frames and two (2) silencers on the heads of double-swing frames. Install plastic plugs to keep holes clear during construction.

E. Plaster Guards: Provide 26 gage, steel plaster guards or mortar boxes welded to the frames at the back of door hardware cutouts where mortar or other materials might obstruct hardware operation.

F. Anchors: Equip frames with one welded-in floor anchor in each jamb. Furnish a minimum of three (3) steel jamb anchors and two (2) head anchors for field insertion at a maximum or 24" o.c.. Anchors shall be of the proper type for the particular construction involved, i.e., concrete, masonry, metal framing, etc. Conceal fastenings unless indicated otherwise.

2.5 STANDARD STEEL DOORS

A. Exterior Doors: Extra Heavy-Duty, Grade III per SDI-100, 1-3/4" thick, types and styles as indicated on the Drawings; top edge closed flush; 14 gage cold-rolled steel, galvanized to ASTM D 2201; insulated core.

B. Interior Doors: Standard-duty, Grade I per SDI-100, 1-3/4" thick, types and styles as indicated on the Drawings; top edge closed flush; 16 gage cold-rolled steel. Fire-rated UL labeled where indicated or required by the Building Code.

C. Fire-Rated Doors: Per NFPA, Standard No. 80.

D. Vision Panels: Laminated glass in metal frames as required by the fire-rating. Install removable steel stops on the room side of the doors.

E. Louvers:

1. Exterior: Weatherproof, stationary, where shown on the Drawings. Construct of AZ@ shaped, 16 gage, hot-dip galvanized steel blades. Space blades not more than 1-1/2" o.c.. Provide removable 1/4" stainless steel wire mesh screen at the interior face of doors, in formed metal frame with removable clips. Provide insect screens at lovers in exterior doors.

2. For fire-rated openings, provide tightly fitted, spring-loaded, automatic closing louvers with operable blades equipped with a fusible link; arranged so metal overlaps metal at every joint.

3. Provide louvers complying with UL or NFPA standards only, and factory-applied in doors.

4. Interior (Non-fire-rated): Roll-formed, 20 gage, galvanized steel, inverted AY@ blades; sight-proof; prime painted for field applied finish paint; size as indicated on the Drawings.

2.6 CORE CONSTRUCTION

A. Provide one of the following types of core construction (Contractor=s option):

1. Kraft Honeycomb: Phenolic treated.

2. Polyurethane: Foamed-in-place or laminated. 20 psi strength, 1.8 pcf density, 1/2" maximum voids in any direction. Strength of bond between the core and the steel face sheets shall exceed strength of core so delamination will not occur during operating conditions.

3. Polystyrene: Rigid core of polystyrene foam board, 1500 psf compressive strength, 18 psi shear strength. Strength of the bond between the core and the steel face sheets shall exceed strength of core so that delamination will not occur under operating conditions.

4. Vertical Steel Stiffeners: 22 gage vertical steel stiffeners, spaced 6" apart and spot welded to the face sheets at 6" on center. Insulate the spaces between stiffeners with loose fill insulation the full height of the door.

2.7 PROTECTIVE COATINGS

A. Bituminous Coating: Apply fibered asphalt emulsion at grout filled frames.

B. Primer: Exposed surfaces shall be cleaned, treated with Bonderite chemical and given one baked-on shop coat of grey synthetic primer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install standard steel doors, frames and accessories in accordance with the final Shop Drawings, the manufacturer=s published instructions, as herein specified, and at the locations shown on the Drawings.

B. Door Installations:

1. Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.

2. Install fire-rated doors with the clearances specified in NFPA, Standard No. 80.

C. Frame Installations:

1. Comply with the provisions of SDI-105 ARecommended Erection Instructions for Steel Frames@, unless indicated otherwise.

2. Except for frames located at in-place concrete or masonry and at drywall installations, place frames prior to construction of the enclosing walls. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After the wall construction is completed, remove temporary braces and spreaders leaving the surfaces smooth and undamaged.

3. At in-place concrete construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.

4. In masonry construction, locate wall anchors at the hinge and strike levels. Building-in of anchors and grouting of frames is specified in Division 4 and as shown on the Drawings..

5. In steel framed partitions, install wall anchors at the hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.

6. Install fire-rated frames with clearances specified in NFPA, Standard No. 80.

D. Field Finish: Field paint door, frames, louvers and vision panel frames as specified in Section 09900 - Painting.

3.3 CONSTRUCTION

A. Interface with Other Work:

1. Coordinate frame installations for size, location, and the particular construction involved.

2. Coordinate with the door opening construction, door frames, door hardware, door

louver and vision panel glazing installation.

B. Site Tolerances:

1. Maximum Diagonal Distortion: 1/16" measured with straight edge from corner to corner.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Immediately after installation, sand smooth any rusted or damaged areas of the prime coat and touch-up with a compatible air-drying primer.

C. Check and readjust operating door hardware items. Leave steel doors and frames undamaged and in complete and proper operating condition.

D. Adjust hardware for smooth and balanced door and window movement.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect metal door, frame and window installations, alignment, attachment to structure, and operation.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Cleaning installed Work.

B. Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Wipe down all doors and frames before final acceptance inspection.

END OF SECTION

SECTION 08210

WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flush solid core wood doors with wood veneer.

2. Flush solid core wood doors with plastic laminate face.

3. Flush hollow core wood doors with veneer face.

4. Paneled wood doors with solid wood stiles, rails and panels.

5. Furnishing and installation of louvers in wood doors.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06200 - Finish Carpentry: Wood door frames.

2. Section 08710 - Door Hardware: Hardware coordination for wood doors.

3. Section 08800 - Glass and Glazing: Glass installed in wood doors.

4. Section 09900 - Painting: Field painting of wood doors.

1.2 DESCRIPTION OF WORK

A. The extent of the wood doors work is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing standard hollow core and solid core wood doors, panel doors and louvers.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

D. National Electrical Manufacturers Association (NEMA):

1. NEMA LD-3 - High Pressure Decorative Laminates.

E. Architectural Woodwork Institute (AWI):

1. Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program.

2. AWI 1300 - Architectural Flush Doors.

F. International Code Council:

1. International Building Code (IBC), 2009.

G. National Wood Window and Door Association (NWWDA):

1. I.S.-1. AIndustry Standard for Wood Flush Doors@.

H. National Woodwork Manufacturers Association (NWMA).

1. ACare and Finishing of Wood Doors@.

I. Woodwork Institute (WI):

1. AManual of Millwork@ - Designations for wood door grades and core construction.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Door manufacturer=s product data, specifications and installation instructions for each type of door. Include details of core and edge construction, and louvers, if any, and similar components.

2. Shop Drawings: Indicate locations and size of each door, elevation of each kind, details of construction, locations and extent of hardware blocking, swings, and other pertinent information. Indicate cutouts for vision panels and louvers, if any.

2. Samples: For review and approval of color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor. Submit the following:

a. 8" x 10" representative finished veneer sheet for each available flitch to be used for face veneer of transparent finished doors.

b. 3" x 10" solid wood strips of species to be used for exposed edges, trim and other solid wood components.

3. Assurance / Control Submittals:

c. Manufacturer=s certificate that the products meet or exceed the specified requirements.

d. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Special Warranty: Submit written special Warranty forms completed in the name of the Owner and registered with the manufacturer.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

B. Obtain doors from a single manufacturer to ensure uniformity in quality of appearance and construction, unless approved otherwise.

C. Mark each door with NWWDA, Wood Flush Door Certification Hallmark certifying compliance with applicable requirements of ANSI / NWWDA I.S.-1. For manufacturer=s not participating in the NWWDA Hallmark Program, a certification of compliance may be substituted for marking of the individual doors.

D. Perform Work in accordance with AWI 1300 for Custom Grade doors.

F. Performance Requirements:

1. Fabricate and install to withstand the following loading requirements for exterior units:

a. Combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D], and importance factor of [1.0] [1.25] [1.5}, as applicable per ASCE 7.

1.5 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect doors from damage, soiling and deterioration.

B. Ship doors individually wrapped.

C. Deliver products to the Project Site in the manufacturer=s original, unopened packaging, dry and undamaged with seals and labels intact.

D. Comply with the AOn-Site Care@ recommendations of NWMA pamphlet ACare and Finishing of Wood Doors@ and with the manufacturer=s instructions.

E. Store under cover in dry, weathertight conditions.

1.6 COORDINATION

A. Design Intent: It is the intent of the design that similar woodwork throughout the Project match. Coordinate work between the separate installers providing similar woodwork to ensure that the design intent is achieved to the satisfaction of the Owner=s representative.

B. Pre-Construction Meetings: Prior to the purchase and fabrication of materials and prior to installation of the scheduled work, conduct meetings with the various related woodwork

installers to coordinate efforts to achieve the design intent. Participants to include the Contractor, finish carpentry installer, architectural woodwork installer, painting applicator and the Owner=s representative.

1.7 JOB CONDITIONS

A. Condition doors to the average prevailing humidity in the installation areas prior to installation.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty, signed by the door manufacturer agreeing to repair or replace doors that do not meet the requirements, or that fail due to delamination of veneer, warping beyond the specified installation tolerances, defective materials or telegraphing of the core construction.

2. Warranty Period:

a. Exterior Doors: Two (2) years from the date of Substantial Completion.

b. Interior Doors: Life of the installation.

c. Stile and Rail Doors: Fabricator=s special warranty for two (2) years against defects in materials and workmanship including, but not limited to, defects against warpage and wracking.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Cal-wood Door Div., Timberland Industries.

2. Eggers Industries, Architectural Door Div.

3. Mohawk Flush Doors, Inc.

4. Weyerhaeuser Co.

5. SUN-DOR-CO.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Solid Core Wood Doors (interior doors): AWI 1300.

1. Type: Institutional, flush, solid core wood, AWI, [premium] [custom] grade.

2. Thickness: As indicated on the Drawings.

3. Core: Mat-formed wood particleboard with closed grain hardwood stiles, commercial Standard CS 236-66, Type 1, Density AC@, Class 1. Minimum 30 pounds per cubic foot density. Mineral core with UL label for fire-rated doors.

4. Face Finish: Veneer shall be premium grade sliced hardwood for doors with a transparent finish; custom grade, medium density overlay for doors scheduled for paint finish; conform to commercial standard CS35; minimum, 1/8" thick. Wood species as selected. Plastic laminate where indicated.

5. Stiles and Rails: One piece hardwood stiles and top and bottom rails with wood species to match the face veneer. Where door closers are specified, the top rail width shall be doubled.

   a. The bottom rail of a transom panel shall run the full width of the panel.

6. Plastic Laminate: High pressure laminate. Color and texture as selected.

B. Hollow Core Wood Doors:

1. Type: Institutional, flush hollow core, AWI, [premium] [custom] grade.

2. Thickness: As indicated on the Drawings.

3. Core: Expanded corrugated core with wood lock blocks.

4. Face Finish: Veneer shall be premium grade, plain sliced hardwood for doors with a transparent finish; custom grade, medium density overlay for doors scheduled for paint finish. Wood species as selected.

5. Plastic Laminate: High pressure laminate. Color and texture as selected.

C. Panel Doors:

1. Type: Custom fabricated, solid wood construction. AWI, [premium] [custom] grade.

2. Stiles, Rails and Panels: Fabricated from clear, kiln dried solid lumber core with sliced veneer faces and edges as scheduled and solid trim pieces as required. Wood species as scheduled or selected. Vertical stiles shall be of the same species and color as the face veneer.

D. Louvered / Half-Louvered Doors: Minimum 1-3/8" thick; conform to NWWDA, I.S.-6.

E. Louvers:

1. Wood: Door manufacturer=s standard solid wood louvers of the same species as the door face veneer, unless indicated otherwise and of the size, type and profile shown. Factory install in prepared openings.

F. Transom and Side Panels: Where transom or side panels are shown in the same framing system as wood doors, provide panels which match the quality and appearance of the associated wood doors, unless otherwise indicated. Fabricate matching panels with the same construction, exposed surfaces and finish as specified for the associated doors.

G. Adhesive: Type 1, waterproof bond.

2.3 FABRICATION

A. Fabricate non-fire-rated doors in accordance with AWI 1300.

B. Furnish and install lock blocks at lock edge, and at the top of doors for closer hardware reinforcement.

C. Bond edge banding to the core.

D. Factory machine doors for door hardware in accordance with the hardware requirements and dimensions. Do not machine for surface hardware.

E. Factory install louvers in prepared openings.

F. Factory fit doors for the frame opening dimensions identified on the approved Shop Drawings.

G. Doors may be provided pre-fitting, set in frames and ready for installation in rough openings.

H. Before delivery of doors to the Project Site, shop-prime all wood surfaces per Section 09900 - Painting.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Installer must examine door frames and verify that the frames are the correct type and have been installed as required for the proper hanging of corresponding doors.

D. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Condition doors to average prevailing humidity in the installation areas prior to hanging.

B. Install wood doors in accordance with the manufacturer=s instructions and as shown.

C. Install non-fire-rated doors in accordance with AWI Quality Standards requirements.

D. Job Fit Doors: Align doors to the frames for proper fit and uniform clearance at each edge and machine for hardware. Seal cut surfaces after fitting and machining.

1. Bevel non-fire rated doors 1/8" in 2" at lock and hinge edges.

E. Machine cut doors for the hardware. Install the door hardware specified in Section 08710.

F. Clearance: For non-fire rated doors provide a clearance of 1/8@ at jambs and heads, 1/8" at meeting stiles for pairs of doors, and 3/16" from the bottom of the door to the top of decorative floor finish or covering. Where thresholds are shown or scheduled, provide 1/4" clearance from the bottom of the door to the top of the threshold.

G. Tolerance: Conform to AWI 1300 for requirements for maximum diagonal warp.

H. Install door louvers plumb and level.

I. Job Site Finished Doors: For requirements for finishing wood doors, louvers and vision panel frames see Section 09900 - Painting.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting and cleaning the installed work.

B. Rehang or replace doors which do not swing or operate smoothly.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect door installations for alignment, hardware installations and door operation.

3.5 PROTECTION

A. Section 01700 - Execution Requirements: Protecting the installed work.

B. Implement procedures for the protection of installed wood doors from damage and deterioration until final acceptance.

C. Refinish or replace doors damaged during installation as directed by the Owner=s representative.

END OF SECTION

SECTION 08310

ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Access door and frame units.

2. Wall- and ceiling-mounted locations.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for anchorage.

2. Section 04230 - Reinforced Unit Masonry: Substrate for anchorage.

3. Section 09110 - Non-Load Bearing Steel Framing: Wall and ceiling framing for attachment of units.

4. Section 09250 - Gypsum Board: Adjacent wall and ceiling finish material.

5. Section 09900 - Painting: Field painting of door and frame units.

1.2 DESCRIPTION OF WORK

A. The extent of access door work is indicated on the Architectural, Mechanical, Plumbing and Electrical Drawings and as specified herein, and includes providing and installing access doors where access to mechanical, plumbing and electrical items is required, whether or not the access doors are shown on the Drawings.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 153 / A 153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

2. ASTM A 568 / A 568M - Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

3. ASTM A 653 / A 653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.

4. ASTM A 1008 / A 1008M - Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

5. ASTM A 1011 / A 1011M - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

6. ASTM D 2201 - Practice for Preparation of Zinc-Coated and Zinc-Alloy-Coated Steel Panels for Testing Paint and Related Coating Products.

C. National Fire Protection Association (NFPA):

1. Standard No. 80 - Standard for Fire Doors and Other Opening Protectives.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.

2. Shop Drawings: Indicate the location, size, type, finish, hardware, and details of adjoining work for all access door units.

3. Schedule: Indicate all doors by type, size, rating and location keyed to the Drawings.

4. Assurance / Control Submittals:

a. Manufacturer's certificate that products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Project Record Documents: Accurately record the location of all access units.

2. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

B. Fire-Resistance Ratings: In all Corridor walls, rated partitions and ceilings, provide access door assemblies with panel door, frame, hinge, and latch from a manufacturer listed in Underwriter=s Laboratories, Inc; AClassified Building Materials Index@ for 90 minutes

rating.

1. Provide UL label on each fire-rated access door.

C. Size Variation: The selected manufacturer=s standard units may vary in size slightly from the sizes indicated herein. Secure the Owner representative=s approval for sizes that differ from the units specified.

D. Coordination: Furnish inserts and anchoring devices which must be built into other work for the installation of access doors. Coordinate delivery with other trades to avoid delaying the work.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened packaging, dry and undamaged with seals and labels intact.

C. Handle and store to prevent damage to frames, panels and operating mechanisms.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout.

B. Special Warranty:

1. Provide a written Warranty, signed by the manufacturer, and the Installer agreeing to repair or replace doors and panels that do not meet the requirements, or that fail in materials or workmanship.

2. Warranty Period: Two (2) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. J. L. Industries, Inc.

2. Karp Associates, Inc.

3. Larsen=s Manufacturing Co.

4. Milcor (Gibraltar Building Products).

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 ACCESS DOORS

A. General: Manufacturer=s standard fully-welded steel construction. Provide units with

means for anchoring properly to the adjacent construction.

B. Non-Fire-Rated Units:

1. Doors:

a. Flush Units: 14 gage, minimum.

b. Recessed Units: 18 gage, minimum.

2. Hinges: Stainless steel, piano or pin type, concealed and continuous, 175 degrees opening, constant force closure, spring type.

3. Operation: Flush screw driver slot for quarter turn cam latch with welded steel access sleeves at recessed panel doors.

C. Fire-Rated Units: As required for the fire-rating, but not less than the following:

1. Doors: Steel-faced, insulated core panel, 20 gage minimum.

2. Hinges: Stainless steel, piano or pin type, concealed and continuous, 175 degrees opening, constant force closure with spring or other self-closing mechanism.

3. Operation: Flush screw driver slot for quarter turn cam latch.

D. Unit Construction Types:

1. Non-Fire-Rated:

a. Flush: Flush door with bead to give the unit a frameless appearance.

b. Recessed: Recessed door to allow installation of acoustical tile, gypsum board or similar finish into the recess to provide a concealed appearance. Units for plaster or mortarbed to have integral expanded metal lath.

c. Universal: Flush door with exposed frame, Exposed flange of frame not to exceed 1" in width.

2. Fire-Rated: Flush insulated door with exposed frame. Exposed flange of frame not to exceed 1" in width, unless approved otherwise.

2.3 FABRICATION

A. General: Fabricate each access door assembly as an integral unit, complete, with all necessary parts, and ready for installation.

B. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction. Fill and grind welds smooth and flush with adjacent surfaces. Fabricate units square. Furnish attachment devices and fasteners of the type required to secure the units to the adjacent substrate. All doors in fire-rated assemblies shall have been tested and have a Class B, 1-1/2 hour fire-rating label attached.

C. Frames and Flanges:

1. Fabricate frames from 16 gage steel, minimum, with exposed flanges approximately 1" in width around the perimeter of the frame for units to be installed in the following construction types, except as noted:

    a. Exposed concrete.

    b. Exposed masonry.

    c. Gypsum board.

    d. Plaster.

    e. Ceramic tile.

    f. Wood paneling, flush type with wood inlay to match the adjacent panel.

2. For installation in masonry construction, fabricate frames with adjustable metal masonry anchors.

3. For installation in plaster finish, fabricate frames with galvanized expanded metal lath, and exposed casing bead welded to the perimeter of the frame.

D. Access doors and frames for installation in concrete, masonry, plaster and ceramic tile shall be flush, stainless steel; #4 satin finish: Model DSC-214M by Karp Associates or approved equal.

E. Access doors for installation in gypsum board shall be concealed frame, recessed; finish as selected: Model KDW by Karp Associates or approved equal.

F. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets. Install in a hole cut thru the finish material.

G. Finish: Phosphate treated and shop painted with the manufacturer=s standard rust inhibitive primer.

2.4 ACCESSORIES

A. Anchorage Devices:

1. Devices of the type required to secure units to the abutting structure.

2.5 SCHEDULE

A. General: Where not otherwise indicated, provide access doors in accordance with the following:

1. Size: As required to comfortably achieve the purpose for which access is required.

2. Types:

    a. Flush: In non-public areas that are not restrooms, conference rooms or offices.

    b. Recessed: In all public areas, restrooms, conference rooms and offices.

c. Universal: In exposed concrete and masonry surfaces.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that rough openings for the units are correctly located and properly sized.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install units in accordance with the manufacturer's published instructions, where indicated on Drawings, and where required for access.

B. Coordinate with mechanical, plumbing and electrical trades and other work requiring access.

C. Position units to provide convenient access to concealed work requiring access.

D. Set frames in position accurately and securely attached to supports with face panels plumb and level in relation to the adjacent finish surfaces.

E. Field paint surfaces exposed to view. See Section 09900 - Painting.

F. Built-in anchors and grouting of frames in concrete and masonry is included in Sections of Divisions 3 and 4.

3.3 PROTECTION

A. Institute and maintain protective measures and take other precautions necessary to ensure that all assemblies will be without damage and deterioration at the time of final acceptance.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust hardware and panels after installation for proper operation.

C. Remove and replace panels and frames that are warped, bowed, twisted or otherwise damaged.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installed units for location, alignment, plumb, level, attachment to framing, and operation.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean the units before final acceptance inspection.

END OF SECTION

SECTION 08330

OVERHEAD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Service doors.

2. Counter doors.

3. Fire doors.

4. Grilles.

5. Sectional doors.

6. Electric motors.

7. Accessories.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment of doors.

2. Section 04230 - Reinforced Unit Masonry: Substrate for attachment of doors.

3. Section 09110 - Non-Load Bearing Steel Framing: Framing for attachment and support of doors.

1.2 DESCRIPTION OF WORK

A. The extent of overhead coiling doors work is indicated on the Drawings and as specified herein, and includes providing and installing electrically-operated overhead coiling doors, fire doors, grilles, upward acting sectional doors, manually-operated counter doors, hoods and electric motors. Provide complete operating door assemblies including curtains, guides, counterbalance mechanisms, hardware, operators, motors and all installation accessories.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

C. American Society for Testing and Materials (ASTM):

1. ASTM D 2201 - Practice for Preparation of Zinc-Coated and Zinc-Alloy-Coated Steel Panels for Testing Paint and Related Coating Products.

2. ASTM E 176 - Standard Terminology of Fire Standards.

3. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

4. ASTM E 1996 - Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

D. International Code Council:

1. International Building Code (IBC), 2009.

E. National Fire Protection Association (NFPA):

1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.

2. NFPA 101 - Life Safety Code.

3. NFPA 252 - Standard Methods for Fire Tests of Door Assemblies.

F. Underwriters Laboratories, Inc.

1. UL 10B - Standard for Safety Fire Tests for Door Assemblies.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Submit manufacturer's product data for doors, grilles, motors, and assemblies, roughing-in diagrams, and installation instructions for each type and size of overhead door and grille. Include operating instructions and maintenance information.

2. Shop Drawings: Submit for special components and installations which are not fully dimensioned or detailed in the manufacturers data sheets.

3. Samples: Representative samples of finish, when requested by the Architect.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Calculations indicating that the system and anchorages satisfies the Performance Requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Operation and Maintenance Manual.

2. Warranty: Provide a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience. Installer shall be trained and approved by the fire door manufacturer with trained supervisory personnel observing and directing the work.

B. Furnish each overhead door as a complete unit produced by a single manufacturer, including hardware, accessories, tracks, mountings, and installation components.

C. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for proper installation of the units. Provide setting drawings, templates, instructions and directions for the installation of anchorage devices. Coordinate delivery with other work to avoid Project delay.

1. See Section 03300 - Cast-In-Place Concrete and 04230 - Reinforced Unit Masonry for the installation of inserts and anchorage devices.

D. Performance Requirements:

1. Provide the capacity to withstand the following loading requirements for exterior units:

a. Design and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D], and importance factor of [1.0] [1.25] [1.5], as applicable per ASCE 7.

E. Fire Door Assemblies: Where called for, furnish fire door assemblies which comply with NFPA No. 80, and have been fire tested, rated and labeled in accordance with ANSI / ASTM E 176. Furnish each door with a metal U.L. label as evidence of the rating, with the label indicating the fire rating in hours of duration of exposure to fire, and a letter designation of location for which the assembly is designed.

F. Automatic Closing: Where called for, provide automatic closing, smoke actuated device and governor. Fabricate the governor unit to be inoperative during normal door operations. Design a release mechanism for easy resetting. Fabricate the unit to permit manual lifting of the curtain for emergency exit after automatic closing, with the curtain returning to the closed position when released.

G. Unless otherwise acceptable to the Architect, furnish all overhead door units by one manufacturer for the entire Project.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products cartoned or crated for protection during transit and storage.

C. Provide additional sealed plastic wrapping for factor-finished doors.

D. Deliver products to the Project Site in the manufacturer=s original, unopened, new cartons or crates, dry and undamaged with seals and labels intact.

E. Inspect products for damage. Minor damages may be repaired provided the finish items are equal, in all respects, to new work, and acceptable to the Owner=s representative; otherwise remove and replace the damaged items.

F. Store under cover in dry, weathertight conditions.

G. Break seals to permit ventilation.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout.

B. Special Warranty:

1. Provide a joint and severable written Warranty signed by the door manufacturer, Contractor and the Installer, agreeing to repair or replace defective materials and workmanship within the warranty period. Warranty shall include responsibility for removal and replacement of other work which may conceal overhead coiling door parts.

2. During the warranty period, repairs and replacements required because of acts of God and other events beyond the Contractor=s / Installer=s control, and those which exceed the performance requirements, shall be completed by the Contractor / Installer and paid for by the Owner at prevailing rates.

3. Warranty Period: Twp (2) years from the date of Substantial Completion of the door installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Atlas Door Co. & Solar Screens.

2. The Cookson Co., Inc.

3. Kinnear Div., Harsco Corp.

4. North American Overhead Door.

5. Overhead Door Corp.

6. Southwestern Steel Rolling Door Co.

7. Windsor Door Co., Div. Ceco Corp.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS AND CONSTRUCTION

A. Service Doors: Provide the sizes, and material configurations as shown on the Drawings and as required to meet the Performance Requirements for exterior units. Each door shall be [manually-operated by hand chain operator] [electrically-operated, mechanism fully enclosed, U.L. listed, three button control, of sufficient capacity to operate the door at a speed of 1 foot per second, with emergency hand chain operator and electrical interlock]. Provide a cylinder locking device, master keyable, operable from inside.

B. Counter Doors: Provide sizes, configurations, automatic closing, with label as scheduled. Standard push-up operation with interior slide bolts for locking. Provide for master keyable cylinder locking devices operable from the interior side of the opening.

C. Fire Doors: Provide sizes, material configuration, automatic closing, and with label as scheduled. Standard push-up operation, governor controlled descent.

D. Door Curtain: Fabricate overhead coiling door curtains of interlocking slats designed and fabricated to meet the performance requirements, of continuous length for the full width of the door without splices. Unless otherwise indicated, provide slats of the material gage recommended by the door manufacturer for the size and type of door required, and as follows:

1. Steel Door Curtain Slats: Structural quality, cold-rolled galvanized steel (interior) or stainless steel with #4 finish sheets (exterior), as scheduled, manufacturer's standard "flat-face" slats.

2. Endlocks: Stainless steel or malleable iron castings galvanized after fabrication, secured to the curtain slats with galvanized rivets. Provide locks on alternate curtain slats for curtain alignment and resistance against lateral movement.

3. Windlocks: Stainless steel or malleable iron casting secured to the curtain slats with galvanized rivets. Unless otherwise recommended by the door manufacturer, provide windlocks on doors exceeding 16 feet in width. Space windlocks at approximately 24" o.c. along both edges of the curtain.

4. Bottom Bar: Two angles, each not less than 1-1/2" x 1-1/2" x 1/8" thick, galvanized or stainless steel to suit the type of curtain slats.

5. Weather Seal: Replaceable flexible vinyl or neoprene gasket between angles as a
weather seal and cushion bumper for manually-operated doors, unless shown as an overlapping joint.

6. Curtain Jamb Guides: Fabricate curtain jamb guides of steel angles, or channels and angles with sufficient depth and strength to retain the curtain loading. Build-up units with 3/16" thick stainless steel sections, or steel galvanized after fabrication. Provide slotted bolt holes for track adjustment.

a. Where applicable secure continuous wall angles to wall framing with 3/8" bolts, minimum, at not more than 30" o.c., unless closer spacing is recommended by the door manufacturer. Extend wall angles above the door opening heads to support coil brackets, unless shown otherwise. Locate anchor bolts on exterior wall guides to be concealed when the door is in the closed position. Provide removable stops on guides to prevent over-travel of the curtain, and a continuous bar for holding wind-locks, if provided.

2.3 GRILLES

A. Curtain: Straight grid design, 5/16" solid aluminum rods at approximately 2" o.c. vertically with connecting links at 9" o.c. horizontally.

B. Windlocks and Endlocks: Continuous end links or retainers as standard with the grille manufacturer.

C. Bottom Bar: Aluminum, extruded rectangular tube.

D. Guides: Extruded aluminum channel guides with pile gaskets each side, each guide.

E. Finish: Clear anodized, or as selected.

2.4 SECTIONAL DOORS

A. Door Sections: Fabricate sections of rails and stiles heavy-duty galvanized steel to produce a minimum door thickness of 2", but not less than required to meet the Performance Requirements for exterior units. Provide stiles and rails of the size recommended by the door manufacturer for the size and type of door required. Deflection of doors in the horizontal position shall not to exceed 1/120 of the door width. Panels to be 24 gauge, minimum. Style and design as selected by the Architect.

B. Track: 3", angle-mounted. Secure tracks to meet the Performance Requirements.

C. Hinges and fixtures: 14 gauge galvanized steel; full-floating, ball-bearing rollers with hardened steel races. Roller size shall be adequate for the design requirements.

D. Bottom Weatherstrip: Aluminum.

E. Glass Sections: Glazing sections as indicated on the Drawings.

F. Lock: Galvanized, single-unit, inside mechanism, installed for operation as required by the location.

G. Operation: Electric motor, manufacturer=s standard.

H. Finish: Factory painted with polyester top coat over epoxy primer. Field applied finish coat. Color as selected.

2.5 COUNTERBALANCING MECHANISM

A. Counterbalance doors by means of adjustable steel helical torsion spring, mounted around a steel shaft, in a spring barrel, and connected to the door curtain with the required barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate the spring barrel of hot-formed structural quality carbon steel, welded or seamless pipe, of sufficient diameter and wall thickness to support roll-up of the curtain without distortion of the slats. Limit the barrel deflection to not more than 0.03" per ft. of span under full load.

1. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of the curtain, with uniform adjustment accessible from outside the barrel. Provide cast steel barrel plugs to secure the ends of springs to the barrel and shaft.

2. Fabricate torsion rod for the counterbalance shaft of case-hardened steel, of the required size to hold fixed spring ends, and to carry the torsional load.

C. Brackets: Provide manufacturer's standard design mounting brackets, either cast iron or cold-rolled steel plate with bell mouth guide groove for the curtain.

2.6 HOOD

A. Form to entirely enclose the coiled curtain and operating mechanism at the opening head, and act as a weather seal. Contour to suit the end brackets to which the hood is attached. Roll and reinforce top and bottom edges for stiffness.

B. Provide closed ends for surface-mounted hoods, and any portion of the between-jamb mounting projecting beyond the wall face. Provide intermediate support brackets as required to prevent sag.

C. Fabricate steel hoods of not less than 24 gauge stainless steel for exterior, or hot-dip galvanized steel sheet with G90 zinc coating for interior-mountings, complying with ASTM D 2201. (phosphate treat before fabrications.)

D. Provide automatic drop baffle to prevent passage of smoke and flame.

2.7 ELECTRIC OPERATION

A. Motor Operator:

1. Operation Speed: 1 foot per second operation or other speed recommended by the door manufacturer, as acceptable to the Owner=s representative.

2. Motor Type: High-starting torque, reversible, Class A insulated electric motors with overload protection, sized by the door manufacturer to move the door in both directions, from any position, and including limit switches not affected by motor removal, and disconnection for emergency manual operation. Provide pre-wired units coordinated with the external electrical system.

3. Remote Electrical Control Station: Key control switch. Constant pressure on switch moves door in either controlled direction, including after stopping at any point in travel upon release of pressure on the switch.

4. Enclosure: NEMA 1 enclosures for motor and control.

5. Governor: Type to control door descent when automatic closing mechanism is activated at the rate of 2 feet per second.

6. Automatic Reversing Control: Electrically-actuated automatic bottom bar extending full width of the door.

7. Emergency Manual Release: Manufacturer's standard emergency release to partially open the door for emergency exit.

2.8 SECURITY

A. Motor Operated Assemblies: Self-lock gearing.

B. Locking: Interior-mounted slide bolts, lockable by cylinder, at both jambs on the coil side.

2.9 PAINTING

A. Shop clean and prime ferrous metal and galvanized surfaces, exposed and unexposed, except faying and lubricated surfaces, with the door manufacturer's standard rust inhibitive primer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify all required dimensions, especially the finished floor or counter top to the underside of the overhead support, by actual measurement.

2. Verify track layout, especially the finished floor or counter top to the underside of overhead support, by actual measurement.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install doors and operating equipment complete with all necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports in accordance with the approved Shop Drawings, manufacturer's instructions, and as required to meet the Performance Requirements.

B. Install fire-rated doors to comply with NFPA 80.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Upon completion of the installation, including work by other trades, lubricate, test and adjust the doors to operate easily, free from warp, twist and distortion, and fitting weathertight for the entire perimeter.

C. Test the operation of automatic closing fire doors, including response to the actuation of a smoke detection device.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installations for alignment, level, plumb, secure attachment to the substrates, and operation.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove protective material from pre-finished aluminum surfaces.

C. Clean exposed to view parts as recommended by the manufacturer.

D. Remove excess sealant by a method acceptable to the sealant manufacturer.

END OF SECTION

SECTION 08400

ENTRANCES, STOREFRONTS, DOORS AND WINDOWS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum exterior and interior entrances.
2. Aluminum storefronts.
3. Aluminum sidelites.
4. Aluminum flush doors.
5. Aluminum sliding doors.
6. Tempered glass doors.
7. Aluminum windows, fixed and operable.
8. Glass and glazing in-fill and vision panels.
9. Door hardware.
10. Window hardware.
11. Perimeter sealants.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for anchorage.
2. Section 04230 - Reinforced Unit Masonry: Substrate for anchorage.
3. Section 07900 - Joint Sealers: Sealants for a weatherproof installation.
4. Section 08710 - Door Hardware: Hardware not specified in this Section.
5. Section 08800 - Glass and Glazing: Glazing for entrances, storefronts, sidelites, doors and windows including those specified herein to be factory-glazed.
6. Section 09110 - Non-Load Bearing Steel Framing: Non-structural framing for adjacent wall and ceiling finishes.
7. Section 09250 - Gypsum Board: Adjacent wall and ceiling finish material.

8. Section 09900 - Painting: Field painting of components.

1.2 DESCRIPTION OF WORK

A. The extent of the work of this Section is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing aluminum exterior and interior doors, entrances, storefronts, sidelites, flush doors, tempered glass doors, sliding doors and operable and fixed windows; tubular aluminum sections, shop-fabricated, factory-finished; glass and glazing in-fill; related flashings; anchorage and attachment devices; hardware; sealants.

B. Provide complete operating door assemblies including door curtains, guides, hardware, operators, motors, and installation accessories. Coordinate with other hardware requirements in Section 08700.

C. The systems are standard units to the shapes indicated, combined with extruded sections to create the profiles indicated.

D. Provide assemblies that have been designed and fabricated to comply with requirements of the system performance characteristics below, as demonstrated by testing the manufacturer's corresponding stock systems in accordance with the test methods designated.

E. Preparation of openings, structural support, access panels, finish and trim for openings, construction of storage pockets and painting shall be furnished and installed under other Sections herein.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. Aluminum Association (AA):

1. AA DAF45 - Designation System for Aluminum Finishes.

C. American Architectural Manufacturers Association (AAMA):

1. AAMA 101 - Specification for Windows, Doors and Skylights.

2. AAMA 501.1 - Methods of Test for Exterior Walls.

3. AAMA 605.2 - Specification for High Performance Organic Coating on Architectural Extrusions and Panels.

4. AAMA 607.1 - Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.

5. AAMA 608.1 - Specification and Inspection Methods for Electolytically Deposited Color Anodic Finishes for Architectural Aluminum.

6. AAMA 611 - Specification for Anodized Architectural Aluminum.

7. AAMA 701.2 - Specifications for Pile Weatherstripping and Replaceable Fenestration Weatherseals.

8. AAMA 1503.1 - Test Method for Condensation Resistance of Windows.

9. Manual #10 - Care and Handling of Architectural Aluminum From Shop to Site.

10. SFM-1-87 - Aluminum Storefront and Entrance Manual- AAMA Technical Reference Manual - Volume III.

D. American National Standards Institute (ANSI):

1. ANSI A 117.1 - Safety Standards for the Handicapped.

2. A156.4 **-** Door Controls - Closers.

3. ANSI A 156.5 - Standard for Auxiliary Locks and Associated Products.

4. ANSI Z97.1 - Safety Glazing Materials Used in Buildings - Methods of Test.

E. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

F. American Society for Testing and Materials (ASTM):

1. ASTM A 36 / A 36M - Specification for Carbon Structural Steel.

2. ASTM B 209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

3. ASTM B 221 - Specification for Aluminum and Aluminum-Alloy Extended Bars, Rods, Wire, Profiles, and Tubes.

4. ASTM B 308 / B 308M - Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.

5. ASTM E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Difference Across the Specimen.

6. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

7. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Skylight, Doors, and Curtain Walls by Uniform Static Pressure Difference.

8. ASTM E 547 - Test Method for Water Penetration of Exterior Window, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.

9. ASTM E 1996 - Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

10. ASTM F 588 - Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

11. ASTM F 842 - Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies, Excluding Glazing Impact.

G. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

H. American Welding Society (AWS):

1. AWS A5.10 / A5.10M - Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods.

2. AWS D1.1 / D1.1M - Structural Welding Code - Steel.

I. Code of Federal Regulations:

1. 16 CFR 1201 - Safety Standards for Architectural Glazing Materials.

J. Glass Association of North America:

1. Glazing Manual.

K. International Code Council:

1. International Building Code (IBC), 2009.

L. International Organization for Standards (ISO):

1. ISO 9001 - Quality Management Systems.

M. National Association of Architectural Metal Manufacturers (NAAMM):

1. Metal Finishes Manual for Architectural and Metal Products.

N. SSPC: Society for Protective Coatings (formerly Structural Steel Painting Council):

1. Paint 12 - Cold-Applied Asphalt Mastic (Extra Thick Film).

1.4 PERFORMANCE TESTING

A. General:

1. Perform tests on complete assembly mock-ups. Comply with the requirements indicated below. Perform tests prior to the start of fabrication.

2. Where the manufacturer's standard system complies with the requirements, and has been tested in accordance with the specified tests, provide certification by the manufacturer showing compliance with such tests.

B. Air Infiltration: Air infiltration rate shall not exceed 0.15 cfm / sq. ft. and 0.37 cfm / ft. of crack length when tested at a static air pressure differential of 6.24 psf when tested per ASTM E 283.

C. Static Water Resistance: Specimen shall be subjected to a static pressure of 10.0 psf with a water spray application rate of 5 gph / sq. ft. for a duration of 15 minutes. No uncontrolled leakage is allowed. Tested per ASTM E 331.

D. Seismic Performance at Design Displacement:

1. For buildings 4-stories and higher.

2. The middle row of the anchors shall be shifted parallel to the plane of the wall for a distance of 0.75" in one direction, held for 10 seconds, then back to center, then the other direction 0.75", held for 10 seconds, then back to center. Visual observations shall be made at 1/4" displacements in both directions.

3. The test shall be repeated two additional times with no failure or gross permanent distortion of the anchors, frames or glass. Glazing gaskets may not disengage and weather seals shall not fail.

E. Cyclic Water Resistance: Sliding doors shall be subjected to four (4) test cycles, with each cycle consisting of a static pressure of 12.0 psf with a water spray application of 5 gph / ft for a duration of 5 minutes each, and a 1 minute duration with pressure released but water application continuously applied. No uncontrolled leakage is allowed. Tested per ASTM E 547.

F. Forced Entry Resistance: ASTM F 588 or ASTM F 842, performance level 10.

G. Uniform Load: No deflection in excess of L / 175 of the span of any framing member at a structural test load equal to 1.5 times the specified design windload; no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans with a static air design load of 20 psf applied in the positive and negative directions in accordance with ASTM E 330.

H. Component Structural Tests: Perform operating, hardware, sash rail rigidity and other tests called for by AAMA AVoluntary Guide Specification for Aluminum Architectural Windows".

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer’s technical product data, specifications, standard details, and installation recommendations for the components required. Provide component dimensions; describe components within the assembly, anchorage and fasteners, glass and glazing in-fill, hardware, and internal drainage details.

2. Shop Drawings: Drawings for fabrication and installation of the required systems; indicate the system dimensions, framed opening requirements, tolerances, and affected related work; include plans, elevations, detailed sections of typical composite members, hardware mounting heights, reinforcement, and expansion and contraction joint locations. Show anchors, hardware and other components not included in the manufacturer’s Product Date; include glazing details.

3. Samples:

a. Aluminum Extrusions: Two (2) samples of each required aluminum finish on 12" long sections of the extrusion shapes required for the system.

b. The Architect reserves the right to require additional samples which show fabrication techniques, workmanship of component parts, design of the hardware and other exposed auxiliary items.

c. Glazing: Submit samples per Section 08800 - Glass and Glazing.

4. Assurance / Control Submittals:

a. Manufacturer's certification or test reports certifying that the products have been tested and comply with the performance testing requirements.

b. Calculations indicating that the system and anchorages meet the Performance Requirements and the Building Code indicate anchor spacing. Indicate the number and placement of weld-in anchors and supplemental steel jamb and frame reinforcing, as necessary.

c. Certification that the door system meets the performance design criteria in accordance with the following:

i. ANSI A 156.10.

ii. NFPA 101.

iii. UL 325.

iv. IBC - 2009.

d. Documentation of experience indicating compliance with the specified qualifications requirements.

f. Manufacturer’s Operation and Maintenance Data..

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Manufacturer’s Operation and Maintenance Manual.

2. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.6 COORDINATION

A. Pre-Installation Meeting: Convene a Pre-Installation Meeting at the Project Site prior to beginning the work of this Section.

1. Require attendance of the Contractor, Owner’s representative, Architect, and representative of the Installer.

2. Review the coordination required for proper installation.

3. Review preparation and installation procedures, and the coordination and scheduling required with other related work.

B. Check Shop drawings for other work to confirm that adequate provisions are made for locating and installing doors in compliance with the requirements.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer:

a. Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

b. Company capable of providing field service representation during installation, approving an acceptable installer, and approving the installation.

2. Installer:

a. Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

b. Company with supervisory staff trained and approved by the door manufacturer and with the trained supervisory personnel observing and directing the work.

c. Company capable of providing field service after installation.

B. Performance Requirements:

1. Provide assemblies capable of withstanding the wind loads and thermal movements based on testing of the manufacturer's standard units in assemblies similar to those indicated for this Project.

2. Provide the capacity to withstand the following wind loading requirements:

a. Design, fabricate and install to resist combined positive and negative windloading in accordance with ASCE 7, Chapter 6 with a Vmph of 170, qs of 74.0 psf, exposure C and Importance Factor of 1.0.

3. Thermal Movement:

a. Provide for thermal movement resulting from the following maximum change in ambient and surface temperatures to prevent buckling, opening of joints, over stressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of the materials due to both solar heat gain and nighttime heat loss.

i. Ambient temperature range: 120E F.

ii. Materials surface: 180E F.

C. Furnish complete units produced by a single manufacturer, including hardware, accessories, tracks, mountings, and installation components.

D. Unless otherwise acceptable to the Architect, furnish all units and assemblies for the entire Project by one manufacturer.

E. Design Criteria: The Drawings are based on Kawneer's standard aluminum entrance, storefront, sidelite, sliding door and operable and fixed window systems. Other manufacturer's standard system of similar and equivalent nature may be acceptable when the difference does not materially detract from the design concept or required performance, as judged solely the Architect. The plans, elevations and details show the spacing of members as well as profiles and similar dimensional requirements, and the entrance, storefront, sidelights, and door and windows work.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Protect finished aluminum surfaces with a strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

C. Pack, box, ship, unload, store and protect products in a manner to avoid breakage, abuse, damage and defacement.

D. Deliver products to the Project Site in the manufacturer's original, unopened protective packaging.

E. Store inside, protected from weather.

F. Stack vertically on edge to provide for water drainage and air circulation.

G. Break seals to permit ventilation.

1.9 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a joint and severable written Warranty signed by the manufacturer, Contractor and Installer, certifying that the products and installation is free of defective materials and workmanship, and agreeing to repair or replace any defective component, or the system, in whole or in part, as necessary, to restore the product to its original intended state and integrity. Warranty shall include responsibility for removal and replacement of other work which may conceal door parts.

2. Warranty Period: Two (2) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Kawneer Company, Inc. components are referenced within this Section to establish the level of quality required.

2. Alternate Manufacturers: Subject to compliance with the Project requirements, alternate manufacturers offering the specified items which may be incorporated in the work include the following:

a. Bradham Aluminum Corp.

b. Century Manufacturing.

c. United States Aluminum.

d. Oldcastle Glass Engineered Products.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS AND ACCESSORIES

A. Aluminum Members: Alloy and temper as recommended by the manufacturer for strength, corrosion resistance, and application of the required finish; ASTM B 221 for extrusions, ASTM B 209 for sheets and plates.

B. Steel Sections: ASTM A 36 / A 36M; shaped to suit the mullion sections.

C. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce the interior with aluminum or non-magnetic stainless steel to receive the screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.

D. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible, otherwise, non-magnetic stainless steel. Steel reinforcing shapes to be stainless steel or hot-dip galvanized steel complying with ASTM A 123 / A 123M.

E. Concealed Flashings: Dead-soft stainless steel, 26-gauge minimum, or extruded aluminum, 0.062" minimum, of an alloy and type selected by the manufacturer for compatibility with other components.

F. Anchors: Drill-in expansion bolts or weld-in type with in-place steel anchors welded to steel plates anchoring the frame.

G. Fasteners:

1. Aluminum, non-magnetic stainless steel, or other materials warranted by the manufacturer to be non-corrosive, and compatible with aluminum components.

2. Do not use exposed fasteners for the attachment of hardware, except where unavoidable and where clearly noted on submittal shop drawings.

3. Provide Phillips flat-head machine screws for exposed fasteners. Finish shall match the finish of the adjoining metal.

H. Glass and Glazing Materials: Provide glass and glazing materials which comply with the requirement of Section 08800 - Glass and Glazing, including for doors and windows specified to be factory-glazed.

I. Weatherstripping: Provide compression-type weatherstripping at the perimeter of each operating sash; manufacturer's standard replaceable stripping of either molded neoprene gaskets complying with ASTM D 2000, or molded PVC gaskets complying with ASTM D 2287, or molded neoprene gaskets complying with ASTM C 509, Grade 4.

J. Sealant and Backing Materials: Unless otherwise indicated for sealants required within fabricated window units, provide a type recommended by the product manufacturer for the joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Comply with Section 07900 - Joint Sealers, for installation of sealants and backing materials.

2.3 FABRICATION

A. Sizes and Profiles: The sizes for units, including profile requirements, shall be as indicated and as required to meet the Performance Requirements. Any variable

dimensions are indicated, together with maximum and minimum dimensions required to achieve the design requirements and coordination with other work.

B. Field Measurement: Wherever possible take field measurements prior to the preparation of Shop Drawings and fabrication to ensure proper fitting of the work. Proceed with fabrication and coordination, as necessary, when the taking of field measurements might delay the work.

C. Prefabrication: To the greatest extent possible, complete fabrication, assembly, finishing, hardware application, and other work before shipment to the Project Site. Disassemble components only as necessary for shipping and installation.

1. Pre-glaze door and window units to the greatest extent possible, in coordination with the installation and hardware requirements.

2. Do not drill and tap for surface-mounted hardware items until the time of installation at the Project Site.

3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work in a manner to prevent damage to exposed finish surfaces. For hardware, perform these operations prior to the application of finishes.

4. Fabricate framing for glazing from the inside, except for large plates of glass which may be glazed from the outside.

D. Glazing: Provide for the following edge clearances:

	Single Glazed
Nominal edge cover (bite)	5/16"
Minimum nominal edge clearance	1/8"
Minimum face clearance	1/8"

1. Glass must be edge blocked to prevent contact with the metal framing.

E. Reinforcing: Install reinforcing, as necessary, to meet the Performance Requirements.

F. Welding: Comply with AWS recommendation to avoid discoloration; grind exposed welds smooth and restore mechanical finish.

G. Continuity: Maintain accurate relationship of planes and angles, with hairline fit at contacting members.

H. Fasteners: Conceal fasteners wherever possible.

I. Weatherstripping: For exterior doors and windows, provide compression weatherstripping against fixed stops, at other edges provide sliding weatherstripping retained in adjustable strip mortised into door edges.

J. Structural Silicon Sealant: As recommended by the manufacturer.

2.4 ALUMINUM ENTRANCES

A. Doors: Standard Aluminum Entrance, Series [350 Medium Stile] [500 Wide Stile[swing door by Kawneer. Size as indicated on the Drawings.

1. Vertical Stile: [3-1/2"] [5"], single piece.

2. Top Rail: [3-1/2"] [5"], single piece.

3. Bottom Rail: 6-1/2", single piece.

B. Door Hardware:

1. Section 01310 - Project Management and Coordination: Verification of hardware components specified in Section 08710 - Door Hardware.

2. Door Hinges: Door manufacturer's standard butt hinges, US32D finish.

3. Offset Pivots: Where indicated provide top**,** intermediate and bottom offset pivots; assemblies complying with ANSI A 156.4, Grade 1 requirements; cast aluminum-alloy, baked epoxy finish to match the door finish; door manufacturer's standard.

4. Concealed Overhead Closers: Single-acting manual, with built-in door stop, 105% hold open; door manufacturer's standard. ADAAG compliant.

   a. Force for pushing or pulling open interior doors shall not exceed 5-pounds.

   b. For push button operated openers see 08710.

5. Push / Pulls and Panic Hardware: Standard to the door manufacturer, directly mounted on the glass.

   a. CP-II Push and CO-9 Pull by Kawneer. Finish to match door. Use where an exit device and / or exterior trim is not specified.

6. Deadlocks: Three-point locks, located in the bottom rail.

7. Door Locking Devices (where noted in Section 08710): Adams Rite MS+1890 deadbolt / latch, double cylinder operation. Finish: 628.

8. Exit Devices: Concealed vertical rods with crash bar doggable; exterior mortise trim. Clear #17 finish for exterior / exit doors.

   a. Latch shall release when subject to a 15-pound force.

9. Three-point Lock: #4015 foot bolt and #4085 head bolt by Adams Rite.

10. Flush Bolt: Top and bottom flush; surface-mounted in the nose of the door stile.

11. Automatic Door Bottoms: 3/4" mortise type; Pemko #420 AVL.

12. Floor-Mounted Holder: Rubber cushioned stop with door-mounted holder; door manufacturer's standard.

13. Weatherstripping (Exterior doors only): As selected from the manufacturer's standards.

   a. Head and Jamb: Replaceable wool, polypropylene, or nylon wool pile with aluminum strip backing, recessed in the frame; AAMA 701.2.

b. Sill: Semi-rigid polymeric material on aluminum anodized to match the door; EPDM sweep strip; 38-560 by Kawneer.

14. Thresholds: Weatherproof, 4" or 6", as detailed, mill-finished aluminum, standard for offset pivots; cut as required for carpet or tile adaptation as detailed. ADAAG compliant.

15. Other Hardware: As described in the door manufacturer's literature, as specified or as required.

16. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.5 ALUMINUM STOREFRONTS

A. Provide a system combined with extruded aluminum sections, to the profiles indicated; designed to meet the Performance Requirements.

B. Storefront Framing System: Trifab Versa Glaze 451 / 451T by Kawneer, 2" x dimension shown, extruded aluminum; minimum wall thickness of 0.080"; flush glazed.

C. Column Covers: 0.040" aluminum by Kawneer. Finish to match the storefront system.

D. Receptor Channel: Model No. 450-038 and 65-025 by Kawneer; finish to match the storefront system.

E. Provide aluminum entrances fabricated to comply with the elevations and details shown on the Drawings.

2.6 ALUMINUM FLUSH DOORS

A. Doors: Kawneer Standard Flushline Series.

1. Face Sheets: 0.062" embossed aluminum.

2. Core: 3 lb. / cu. ft. density, foamed-in-place polyurethane, 1/8" thick tempered hardboard backing at each face, bonded to the core.

3. Reinforcement: Internally for the installation of hardware.

4. Trim: Beveled edge aluminum extrusion around the entire door perimeter and the perimeter of glass and louver openings to receive the skin and hardboard.

5. Weatherstripping: Woodpile around the entire door perimeter.

6. Vision lites and Louvers: As indicated on the Drawings.

B. Hardware:

1. See Section 08710 - Door Hardware.

2. Supplemental Flush Door Storm Hardware: Provide intermediate barrel bolts at 30" o.c. to latch doors greater than 7'-0" in height, and at the center of door heads and sills to secure doors greater than 42" in width.

C. Frames: Trifab VG (Versa Glaze) 450 by Kawneer.

2.7 TEMPERED GLASS DOORS

A. Glass doors and framing system; factory-glazed with 1/2" thick tempered glass, minimum, or as required to meet the Performance Requirements.

B. Glass: Brite Vue glass by Oldcastle Glass Co.
C. Hardware: As provided by the door manufacturer.

1. Push / Pulls: Manufacturer’s standard, as selected.

2.8 ALUMINUM WINDOWS AND SLIDING DOORS

A. General: The drawings and following paragraphs define the operating arrangement for the types of sash (ventilators) required in the window units, and specify the minimum provisions for each type. The Drawings indicate which panels of each window unit are operable sash and which are fixed. Where two or more types of operating sash are included in the same window unit, the operation of each is indicated, and the unit is considered a "Combination Window".

Provide the following:

1. High rise sill with subsill sill pan at each sliding door and window.

2. Swing limiters set at 4" at all operating sashes.

3. Insect screens with maximum opening at the lock side of the operating sashes unless indicated otherwise.

B. Fixed Window Units: All joints of frames shall be butt type construction, neatly secured at each corner with integral screw ports; 3-1/8" main frame depth, 0.078" nominal wall thickness. Commercial line 7225 Non-Thermal, HC90 by Kawneer.

C. Casement Window Units: Out-swinging, interior glazed. 7225 Non-Thermal, HC90 by Kawneer.

D. Projecting Window Units: Out-swinging, top-hinged, unless otherwise noted, 2-1/4" frame depth; horizontal pivoting with extruded 360 degree aluminum pivots; concealed limit stop and removable key handle lock at each vent; interior glazed. 7225 Non-Thermal, HC90 by Kawneer.

E. Horizontal Sliding Window Units: Commercial high performance quality, stainless steel roller assemblies, locks and keepers, two-piece compensating head detail; 4" frame depth with interior insect screens; interior glazed. Series 7330 by Kawneer.

F. Vertical Sliding Units: Commercial high performance quality, stainless steel roller assemblies, two factory-installed sash balances for each operating sash, locks and keepers, two-piece compensating head detail; 4" frame depth with interior insect screen; interior glazed. Series 7330 by Kawneer.

G. Sliding Aluminum and Glass Doors: Two-piece compensating channel subheads and jambs; heavy-duty interlocks and horizontal muntins, factory-glazed. HPS High Performance Sliding [60] [80] [100] [120] by Kawneer.

H. Hardware:

1. Locking handles, cases, keepers, catches and fasteners shall be of a corrosion-resistant material compatible with aluminum.

2. Hardware shall meet AAMA tests and be suitable for its intended use.

2.9 GLASS AND GLAZING MATERIALS

A. Glazing: As specified in Section 08800 - Glass and Glazing.

B. Double wet glaze with Dow 995, or approved equal.

2.10 SEALANT

A. Sealant and Backing Materials:

1. Perimeter Sealant: Type as specified in Section 07900 - Joint Sealers.

2. Sealant Used Within the System (Not for Glazing): Type as specified in Section 07900 - Joint Sealers.

2.11 HARDWARE

A. General: Provide the manufacturer's standard heavy-duty hardware units, as indicated, scheduled, or as required for the operation of each door and window, as recommended by the manufacturer for the service required; finish to match the frame unless otherwise indicated.

2.12 FINISHES

A. Exposed Aluminum Surfaces:

1. Clear anodized or as selected from the manufacturer's standard finishes.

2. Polyvinylidine fluoride, (Kynar) or equal as selected from manufacturer's standard colors.

B. Maintain same color range on doors, frames and other components. Do not mix light and dark shades within an assembly.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that related work performed under other Sections has been completed, and is in accordance with approved Shop Drawings.

2. Verify that openings are dimensionally within allowable tolerances, plumb, level,

clean and provide for proper anchoring.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install doors and windows, complete, with all necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports in accordance with approved Shop Drawings, manufacturer's instructions, to meet the Performance Requirements, and as specified herein.

B. Attach to the structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Anchor and weld securely in place; provide alignment attachments and shims to permanently fasten systems and units to the building structure. Anchorages shall be concealed.

D. Comply with AWS recommendation to avoid discoloration; grind exposed welds smooth and restore the mechanical finish.

E. Align assemblies and units plumb, level and true to line, without warp or rack of framing members, doors, windows and panels. Maintain assembly dimensional tolerances; align with adjacent work.

F. Install sill flashings with turned up edges and ends; seal to adjacent work to form a water tight dam.

G. Install compensating channels at door and window heads where indicated.

H. Ensure water drainage away from glazing.

I. Coordinate the attachment and seal of perimeter air and vapor barrier materials.

J. Provide thermal isolation where components penetrate or disrupt the building insulation. Pack fibrous insulation in shim spaces at the perimeter of assemblies and units to maintain continuity of the thermal barrier.

K. Install hardware using templates provided, and in accordance with the installation requirements in Section 08710 - Door Hardware.

L. Drill and tap frames, doors and windows and apply surface-mounted hardware items in compliance with the hardware manufacturer’s instructions and templates. Use concealed fasteners wherever possible.

M. Set sill members, thresholds and other members in a bed of sealant, as indicated, or with joint fillers or gaskets, as indicated, to provide a weathertight installation. Coordinate the installation with wall flashings and other components of the work. Comply with the requirements of Section 07900 - Joint Sealers.

N. Apply sealants to provide a watertight installation at all joints and intersections and at all opening perimeters. Install perimeter sealants and backing materials in accordance with the installation requirements of Section 07900 - Joint Sealers.

O. Set thresholds in a bed of mastic, and secure.

P. Refer to Section 08800 - Glass and Glazing for the installation of glass and other panels shown to be glazed into doors, windows and framing, and not pre-glazed by the manufacturer.

Q. Separate aluminum and other corrodible metal surfaces from sources of corrosion and electrolytic action at points of contact with other metals. Isolation Requirements:

1. Dissimilar Metals: Where aluminum surfaces are in contact with, or fastened to dissimilar metals except stainless steel, zinc or zinc coating, protect aluminum from the dissimilar metal. Where aluminum contacts another metal, paint the dissimilar metal with epoxy paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

2. Cementitious Materials: Paint aluminum where in contact with mortar, concrete or other cementitious material, with an alkali-resistant coating such as heavy-bodied bituminous paint or epoxy paint.

3. Wood Contact: Isolate aluminum from cedar, redwood, oak and acid-treated lumber by means of unbroken 6-mil polyethylene construction sheet or a heavy coating of metal-protective paint.

4. Surfaces in contact with sealants after installation shall not be coated with any type of protective material.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting installed work.

B. Adjust operating hardware to function properly, without binding, and to prevent tight fit at contact points and weatherstripping.

C. Doors operation shall meet ADAAG requirements for opening force.

D. Repair damaged finishes to match the original finish.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field testing and inspection.

B. Inspect installations for alignment, level, plumb, secure attachment to the structure, and smooth and proper operation.

C. On-Site Tests:

1. If the units do not appear to meet air or water infiltration requirements, the Owner, may require on-site tests shall be conducted for both air and water infiltration, with the door manufacturer’s representative present. The Owner’s representative will select the unit(s) to be tested. If such unit(s) fail to meet the specified air and water requirements, the reason for failure shall be jointly determined.

2. Tests shall be conducted in accordance with AAMA 101-88.

3. The responsible Contractor shall correct tested units that do not meet the specified requirements, and all units with similar deficiencies, at no additional cost

to the Owner.

4. The cost for all successful tests, both original and retest shall be paid by the Owner. All unsuccessful tests, both original and retest, shall be paid for by the responsible Contractor.

5. The testing shall be done by an AAMA-accredited testing agency, selected by the Owner's representative and the manufacturer, and shall be employed by the responsible Contractor.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove protective material from pre-finished aluminum surfaces.

C. Promptly after the installation of glass and sealants, clean the completed system, inside and out, exercise care to avoid damage to coatings and finishes.

D. Remove excess glazing and joint sealants, dirt, and other substances from aluminum surfaces by a method acceptable to the sealant manufacturer.

E. Wash down exposed surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean and dry.

3.6 PROTECTION

A. Implement and maintain protective measures, and take other precautions necessary to ensure that all assemblies will be without damage and deterioration at the time of Substantial and Final Completion.

END OF SECTION

SECTION 08560

STORM PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removable storm panels.

2. Accordion shutters.

3. Hinged aluminum shutters.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for supporting storm protection.

2. Section 04230 - Reinforced Unit Masonry: Substrate for supporting storm protection.

1.2 DESCRIPTION OF WORK

A. The extent of storm protection work is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing products applied to exterior doors, windows, storefronts and open areas in buildings.

B. Take field measurements prior to the preparation of Shop Drawings and fabrication of the protection units.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

C. American Society for Testing and Materials (ASTM):

1. ASTM B 633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

2. ASTM B 766 - Specification for Electrodeposited Coatings of Cadmium.

3. ASTM E 330 - Test Method for Structural Performance of Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

4. ASTM E 1996 - Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

D. International Code Council:

1. International Building Code (IBC), 2009.

1.4 SYSTEM PERFORMANCE

A. Provide storm protection units with materials and assemblies to conform to the Building Code, Wind Load requirements for storm panels / shutters for external application, except where more stringent requirements are indicated.

B. Performance Requirements:

1. Provide the capacity to withstand the following loading requirements:.

a. Design and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D], and importance factor of [1.0] [1.25] [1.5], as applicable per ASCE 7.

2. Heights above ground level are indicated on or can be calculated from the Drawings.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer's product literature and specifications describing the storm protection products, including color selections and finishes.

2. Shop Drawings: Show elevations of units, full size profiles of frame and track members; thickness of metal; sizes, types, materials, finishes, and location of fasteners; type, material and location of operating hardware, mullion details; and details of installation, including connection and relationship to other work.

a. Include a schedule showing the location of units for each size and type.

3. Samples: Submit two (2) each pieces of the assemblies, and the required finish on 6" long sections of typical frame members, plus a 12" x 12" sample of the panel itself.

4. Test Reports: Submit certified laboratory test reports evidencing that storm panels of the type indicated comply with the performance requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Seaview Shutters Inc., Miami, FL. (represented by AMS, Guam).

2. Willard Shutter Company, Inc., Miami, FL (represented by KB Enterprises, Guam).

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Provide alloys complying with ANSI / AAMA 1002.10 and as recommended by the aluminum producer for the forming and fabricating process used by the manufacturer and for the type of finish required.

B. Other Materials: Where metals other than aluminum are standard with the manufacturer for concealed reinforcing, concrete inserts, fasteners and hardware, use stainless steel or other non-corrosive materials which are compatible with aluminum. Electroplate steel, if used for reinforcing members, with zinc or cadmium coating complying, respectively, with ASTM B 633 or B 766. For exposed fasteners match the color and finish of the metal material being fastened.

C. Non-Metalic Spacers: Provide the manufacturer's standard vinyl, rubber or high density polyurethane spacers, not less than 1/8" thick, to separate storm shutters from contact with metal prime windows.

2.3 REMOVABLE STORM PANELS

A. Headers and Sills: Slip-in type, and made of extruded aluminum alloy 6063-T5.

B. Structural Panels: Roll-formed from aluminum alloy 3003-H16, of a thickness to withstand the positive and negative forces applied on the spans required, but not less than 0.065". Panels shall be designed to allow nesting for storage with T&G edges for interlocking of erected panels at 12"o.c..

C. Clips and Wing Nuts: Stainless steel, standard with the manufacturer.

D. Reinforcing Tubes and Frames, Door Angel Frames and Stops: Sizes and shapes, and fabricated as detailed, extruded aluminum alloy 6063-T5.

E. Aluminum Mill Finish: For panels, angles, tubes, embedded items, and removable base and head members.

F. Anodized Finish: Match the finish of the adjacent windows for base and head members which are to remain permanently in-place.

2.4 ACCORDION SHUTTERS

A. Headers and Sills: 0.125" thick extruded aluminum alloy 6063-TS.

B. Shutters: Extruded aluminum blades of extruded aluminum alloy 6063-TS with stainless steel carriage, nylon rollers and nylon guides; top and bottom locking rods with stainless steel thumb screws. Provide end closure pieces securely attached to the wall.

C. Finish: All aluminum materials to be finish color as selected by the Architect from the manufacturer=s standards.

2.5 HINGED ALUMINUM SHUTTERS

A. Provide hinged aluminum shutters as indicated and detailed on the Drawings. Aluminum

panel doors shall be custom fabricated for exterior use.

B. Provide two (2) recessed flush bolts at the top and two (2) flush bolts at the bottom for each
panel, with dust proof floor strikes. Track shall be standard to the manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with the manufacturer's instructions for the installation of storm shutters.

B. Set storm units plumb, level and without distortion, securely fastened to, and aligned with the prime windows.

C. Fasten to allow for expansion and contraction without damage to the window members or pullout of fasteners. Fasten members required to be in a fixed position, as detailed; for those that are required to be removable, verify the connectors and inserts, and fabricate accordingly.

D. Position storm panels main frame so it does not contact the prime window frame, or install a non-metallic spacer between the prime window and the storm shutter and frame.

E. Provide weepholes in sill tracks. Size the holes to effectively permit the drainage of rain water collecting between closed storm shutters and the windows they protect.

F. Isolation Requirements:

1. Wood Contact: Isolate sheet metal from cedar, redwood, oak and acid-treated lumber by means of unbroken 6-mil polyethylene construction sheet or a heavy coating of metal-protective paint.

2. Dissimilar Metals: Insulate the juncture between dissimilar metals with a heavy coating of insulating film.

3. Concrete Contact: Coat the underside of sheet metal over horizontal concrete surfaces with an ashpaltum cement.

3.3 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect for plumb, level and secure attachment to substrates, where applicable.

3.4 ADJUSTING AND CLEANING

A. Section 01700 - Execution Requirements: Adjusting and Cleaning the installed work.

B. Adjust inserts, and hardware to provide a tight fit at contact points, for smooth operation, and for a weathertight closure.

C. Clean surfaces promptly after installation, exercising care to avoid damage to the finish of new and existing surfaces.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Finish Hardware items required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same Section as the doors and windows.
2. Hinges.
3. Locks, latches and bolts.
4. Push / Pull units.
5. Exit devices. (Panic Hardware).
6. Closers.
7. Stops, holders and bumpers.
8. Thresholds.
9. Weatherstripping.
10. Miscellaneous hardware.
11. Electronic Access Control.

B. Related Documents: The Contract Documents, as defined in Section 01110 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Rough hardware.
2. Section 06100 - Rough Carpentry: Installation of finish hardware.
3. Section 06400 - Architectural Woodwork: Cabinet hardware.
4. Section 08100 - Hollow Metal Doors and Frames: Hardware for metal doors.
5. Section 08210 - Wood Doors: Hardware for wood doors.
6. Section 08400 - Entrances, Storefronts, Doors, and Windows.

1.2 DESCRIPTION OF WORK

A. The extent of the finish hardware work is indicated on the Drawings and as specified herein, and includes furnishing and installing all finish hardware, trim, attachments and fastenings specified complete and proper. Under this Section include all hardware that is not specified in other Sections, whether or not such hardware is herein scheduled.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American National Standards Institute (ANSI);
1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

2. ANSI A156.1 - National Standard for Butts and Hinges.
3. ANSI A156.2 - National Standard for Locks and Lock Trim.
4. ANSI A156.3 - National Standard for Exit Devices.
5. ANSI A156.4 - National Standard for Closers.
6. ANSI A156.5 - Standard for Auxiliary Locks and Associated Products.
7. ANSI A156.6 - National Standard for Architectural Door Trim.
8. ANSI A156.13 - National Standard for Mortise Locks & Latches.
9. ANSI A156.16 - Standard for Auxiliary Hardware.

C. American Society for Testing and Materials (ASTM):

1. ASTM E 283 - Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

E. Door Hardware Institute (DHI):

1. Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.

F. National Fire Protection Association (NFPA):

1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
2. NFPA 101 - Life Safety Code.
3. NFPA 252 - Standard Methods for Fire Tests of Door Assemblies.

G. Underwriters Laboratories (UL):

1. UL 10B - Standard for Safety Fire Tests for Door Assemblies.
2. UL 305 - Panic Hardware.

1.4 HARDWARE FOR FIRE DOORS AND EXIT DOORS

A. Provide all hardware necessary to meet the requirements of NFPA No. 80 for fire doors and NFPA No. 101 for exit doors, as well as other requirements specified, even if such hardware is not specifically mentioned in the “Hardware Schedule”. Such hardware shall bear a UL label.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer’s technical product data for each item of hardware. Include information necessary to show compliance with requirements, instructions for installation, and maintenance of operating parts and finishes.

2. Hardware List: Prepare and submit three (3) copies of a Hardware List for review. One (1) copy will be returned. The List shall identify each hardware item by manufacturer, manufacturer’s catalog number, and the exact location in the work. Indicate applicable scheduled door data, including the door numbers shown on the Drawings, the number of doors, hand of operation with an explanation of how the hand is determined, and indicate the active leaf where a pair of doors are required. Indicate hardware finishes.

a. Fastening Data: Indicate and clearly highlight “exposed on surface of hardware” fasteners, and through fastenings which would be exposed on the opposite door face when other than Phillips flat-head devices are proposed.

b. The Hardware List shall be in a suitable form to facilitate ready review by the Owner’s representative. Acceptance of the List will not relieve the Hardware Supplier from the responsibility for furnishing the job complete.

3. Catalog Cuts: Submit three (3) catalog cuts of every item to be furnished. One (1) copy will be returned. Show all finishes, sizes, catalog numbers and pictures, include information necessary to show compliance with the requirements, instructions for installation, and maintenance of operating parts and finishes. Explain all abbreviations fully.

4. Mounting Locations: Submit mounting locations data for each type of hardware required.

5. Hardware Schedule: Submit a Hardware Schedule as indicated below. Coordinate hardware with the doors, frames and related work to ensure proper size, thickness, backset, hand, function and finish.

a. Final Hardware Schedule Content: Based on the finish hardware indicated, organize a Hardware Schedule into "Hardware Sets", indicating a complete designation of every item required for each door. Provide the following information:

1). Type, style, function, size and finish of each hardware item.
2). Name and manufacturer of each item.
3). Fastenings and other pertinent information.
4). Location of the hardware set cross-referenced to the Drawings, both on the Floor Plans and Door Schedule.
5). Explanation of all abbreviations, symbols, codes, etc. contained in the Hardware Schedule.
6). Mounting locations for hardware.
7). Door and frame sizes and materials.
8). Keying and master keying information.

b. Submittal Sequence: Submit the Hardware Schedule at the earliest possible date, particularly where acceptance of the Schedule must precede the fabrication of other work (e.g., aluminum frames) critical to maintaining the Project Construction Schedule. Include with the Schedule, product data, samples, Shop Drawings of other work affected by the finish hardware, and other information essential for a coordinated review of the Schedule. Acceptance of the Hardware List does not relieve the Hardware Supplier from the responsibility of furnishing the job complete for its intended purpose.

6. Keying Schedule: Submit with the final Hardware Schedule. Door designations to be the same as those on the Drawings.

7. Samples: Prior to submittal of the Final Hardware Schedule, and prior to ordering of the finish hardware, submit one (1) sample of each type of exposed hardware, as selected, with the required finish, including fasteners, and tagged with a full description for coordination with the Hardware Schedule.

a. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of the operation, be used in the work, within limitations of the keying coordination requirements.

B. Maintenance Related Items: Provide one (1) set of adjusting tools, two (2) sets of Maintenance Manuals, including lubrication requirements, parts list, manufacturers contact for ordering replacement parts and basic installation instructions for locksets, door closers, floor hinges and panic devices to the Owner's representative. Provide four (4) blanks for each key type.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with the following requirements:

1. ANSI A117.1
2. NFPA 80.
3. NFPA 101.
4. NFPA 252.
5. UL 10B.
6. UL 305.
7. ADAAG.

B. Regulatory Requirements:

1. Conform to the Building Code for requirements applicable to fire-rated doors and frames.
2. Conform to ADAAG for operation, mounting heights, and location of accessories.

C. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

D. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

E. Supplier: A recognized architectural finish hardware supplier, who has been furnishing hardware to similar projects for a period of not less than five (5) years, and who employs an experienced architectural hardware consultant (AHC) for the preparation of Hardware Schedules, and consultation about project hardware requirements.

F. Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Supplier to deliver the appropriate hardware, at the proper time and to the proper location (shop or Project Site) for installation.

C. Deliver products to the Project Site in the manufacturer's original, unopened packages, dry and undamaged, bearing the manufacturer's name and identification of the hardware item.

D. Retain the manufacturer's original packaging. Ensure that the products are complete,

including basic installation instructions. Label each product separately to be readily identifiable with the products indicated in the Hardware Schedule.

E. Supplier to identify sets with the appropriate hardware set number.

F. Contractor to catalogue the delivered hardware and store in a secure lockable enclosure, i.e. room, storage cabinet, etc.; store off the ground and on shelving. Set up procedures for limited access to the locked storage.

G. Store products in their original protective packaging to prevent soiling, wetting and physical damage to materials, finishes and operating mechanisms.

H. Handle to prevent damage to finish surfaces.

I. Maintain protective covers on all units until installation has been completed. Remove coverings during final clean-up.

PART 2 PRODUCTS

2.1 HARDWARE, GENERAL

A. Comply with ANSI / BHMA 156 Series standards applicable to the type and grade of hardware required.

B. Hardware Characteristics: Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the Hardware Schedule at the end of this Section.

C. Complete Assemblies: Scheduled hardware indicates the primary types and quality of hardware required and is not necessarily descriptive of all the components required. Provide standard accessory components, as necessary, to complete the assembly for a fully functional unit when installed. Provide finishes matching the primary unit where accessory components are exposed-to-view.

D. Anchorage Devices: Furnish with each hardware type required.

1. Types: Wood and machine screws and other appropriate anchorage devices applicable to the type of substrate the item is to be fastened to. Do not provide exposed through-bolts or nuts unless clearly noted on the Hardware Schedule submittal, and approved by the Architect.
2. Head Style: Phillips flat-head devices.
3. Finish: Match the finish of the primary fastened hardware.

E. Finish of Hardware: The finish of hardware shall be as stated herein below. Special care shall be taken to coordinate the finish of the various manufacturers to insure a uniform acceptable finish throughout. The finish of all hardware shall match the finish of the locksets, unless otherwise specified.

F. Hardware manufacturers are listed, within each item Article below, for each hardware item to establish a standard of quality, and minimum functional requirements.

2.2 HINGES

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. Hager.
2. McKinney.
3. Stanley.
4. Henry Soss.

B. Material:

1. Door Butts: Hinges shall be full mortise, template type, unless half mortise hinges are required; stainless steel. Hinges shall have non-rising loose pins, ball or oilite bearings, and flat button tips with matching plugs, except where otherwise specified. Provide hinges with stainless steel pins; steel pins with steel hinges; non-removable pins (NRP) for exterior and public interior exposures, non-rising for non-security exposure.

2. Where necessary to keep the door leaf clear of walls, casings, jambs or reveals in the door opening, furnish wide throw hinges of an approved type shall be furnished. For out-swinging doors, hinges shall have a set screw in the barrel to prevent removal of the pin when the door is closed. All doors over 7'-6" tall shall have one extra hinge for each additional two (2) feet of height, or fraction thereof.

3. Ball Bearing Type: Swaged, inner leaf beveled, square corners.

4. ANSI 156.1, Grade 1.

2.3 LOCKS, LATCHES AND BOLTS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. Yale.
2. Corbin Russwin.
3. Schlage.
4. Best.
5. Sargent.

B. Materials:

1. Lock Uniformity: Except where otherwise specified, all locksets, latchsets, padlocks, cylinders and component parts, as specified hereinunder, shall be by one manufacturer. All internal parts of locksets, latchsets, padlocks and cylinders shall be brass or stainless steel to resist corrosion, and shall be marine function for exterior doors; US 32D finish.

2. Lockset Style: All hardware shall have lever handles with rose.

3. Locksets: ANSI A156.2, Series 4000 Grade 1, with removable cores.

4. Mortise Locks and Latches: ANSI / BHMA A156.13, Series 1000, Operational Grade 1, Security Grade 2; equip with 6-pin tumbler; 2-3/4" backset; keyed alike, or as approved. Levers and roses shall have screwless shanks, and no exposed fasteners.

5. Bored Locks and Latches: ANSI / BHMA A156.2, Series 4000, Grade 1. Locks for exterior doors shall have threaded roses or concealed machine screws.

6. Latch Sets: Provide release by turning lever, closing door, or turning emergency release key through a hole in the outside knob.

7. Cores: All lockset shall have removable cores to facilitate easy replacement.

   a. To maintain the established existing master key system, all cylinder, locksets and padlocks shall be furnished with keyways to match the keyway of record.

   b. Furnish with construction cores for use during construction and until Substantial Completion, or until a portion of the work has been accepted by the Owner and the Owner's representative has directed the cores to be change out.

8. Hospital Latches: Push / pull latchsets similar and equal to Glynn-Johnson HL6; ½" throw, 2-3/4" backset, to 161 cutout. Cover approximately 2-1/2", covers and handles of stainless steel, BHMA 630 finish, engraved "PUSH" and "PULL" on handles, push handle pointing up, pull handle pointing down.

9. Combination Locks: Heavy-duty, mechanical combination locksets with five pushbuttons, standard sized knobs, 3/4" deadlocking latch, 2-3/4" backset. Lock shall be operated by pressing two or more of the buttons in unison or individually in the proper sequence. The inside knob shall always operate the latch. Provide a keyed cylinder on the interior to permit setting the combination.

10. Strikes: ANSI Strikes, 1-1/4" x 4-7/8". All lock strikes shall have a curved lip of sufficient length to protect the trim and jamb, and shall be furnished with wrought box strikes with extended lip for latch bolts, except open strike plates may be used in wood frames. Provide dustproof strikes for foot bolts.

11. Door Bolts: ANSI / BHMA 156.16. Provide dustproof strikes for bottom bolts, except for doors having metal thresholds. Automatic latching flush bolts: ANSI / BHMA A156.3, Type 25.

12. Door Hardware: Hand of lock shall be as shown on the Drawings. If the door hand is changed during construction, the Contractor shall make the necessary changes in the hardware at no additional cost to the Owner.

13. Lever Handles: All latch and locksets shall have lever handles with a rose. Lever handles for exit devices shall meet the test requirements of ANSI / BHMA A156.13 for mortise locks. Provide knurled or abrasive-coated lever handles for doors accessible to blind persons, and those which lead to dangerous areas.

C. Keying, General:

1. All locksets, padlocks and cylinders shall be keyed, master keyed and grand master keyed at the factory where records shall be established and maintained, as directed.

   a. All master keys and grand master keys shall be identified with a registry number, not stamped with "Master" or the letter "M".

   b. Individual room keys shall not be stamped with a key cut, but with a plain identification number only.

2. Maintain a security system to ensure that keys used during construction will not open doors after occupancy.

3. Provide three (3) keys for each lockset.

4. A Keying Schedule will be provided after the initial Hardware Schedule submittal. Keyed alike and master keying will be finalized at that time.

5. Furnish exterior door lock sets with removable I/C core cylinders and cylinder guards.

6. Restrict the distribution of construction keys. Maintain a record of all persons who receive keys and provide a copy of the record to the Owner's representative upon request.

7. When directed by the Owner's representative, remove the construction cores, install permanent cores, and return the construction cores to the manufacturer.

2.4 PUSH / PULL UNITS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. H. B. Ives.
2. Quality Hardware Manufacturing Co., Inc.
3. Trimco.
4. Rockwood.

B. Materials: ANSI A156.6 for 0.050 inch thickness.

2.5 EXIT DEVICES (PANIC HARDWARE)

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. Corbin Russwin.
2. Yale.
3. Von Duprin.
4. Adams Rite.
5. Monarch.
6. Sargent.

B. Materials:

1. Exit Devices: ANSI / BHMA A156.3,Grade 1. Provide adjustable strikes for rim type and vertical rod devices. Provide open back strikes for pairs of doors with mortise and vertical rod devices.

2. Exit Locks With Alarm: ANSI / BHMA A156.5, Type E0431 (with full-width horizontal actuating bar) for single doors: Type E0431 (with actuating bar) or E0471 (with actuating bar and top and bottom bolts, both leaves active) for pairs of doors, unless otherwise specified. Provide terminals for connection to a remote indicting panel. Provide outside control key. Coordinate with the electrical subcontractor.

3. All exposed metal shall match the hardware.

4. Size and mount the units as indicated or, if not indicated, to comply with the manufacturer's recommendations for the exposure condition. Reinforce the substrate as recommended.

5. ANSI A156.3 Exit Device and Trim, Grade 1, surface-mounted vertical rod device with dust-proof strike at the head and threshold.

2.6 CLOSERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. LCN.
2. Norton.
3. Sargent.
4. Corbin Russwin.
5. Rixon-Firemark.
6. Yale.
7. Dorma.

B. Materials and features:

1. ANSI A156.4, Grade 1.
2. ANSI A117.1.
3. Non-Sized; adjustable 1-5.
4. 180 degree door opening.
5. Heavy-duty parallel arm.
6. Standard cover.
7. Exposed metal to match the hardware.
8. Mounting: Hinge face mounting. Do not mount closers on the exterior side of doors.
9. Size and mount units as indicated or, if not indicated, comply with the manufacturer's recommendations for the exposure condition. Reinforce the substrate as recommended.
10. Provide drop brackets, mortise shoes, and long arms, as required.
11. Closers attached to mineral core or particle filled doors shall be installed with sex bolts.
12. Closers to be installed to allow the door to swing as shown on the Drawings.
13. All closers shall be ADAAG type, adjustable for spring setting, latch and sweep speed, and backcheck.

2.7 STOPS, HOLDERS AND BUMPERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. H. B. Ives.
2. Quality Hardware Manufacturing Co., Inc.
3. Trimco.
4. Dor-O-Matic.
5. Glenn-Johnson.

B. Materials:

1. Dome floor stops, Convex wall stops, Kick-down door holders for each door panel.

2. Door Stop Mounting: Utilize the appropriate anchor method for the substrate encountered (plastic anchor, drywall anchor, expansion shield).
3. Provide resilient grey rubber bumpers.
4. Adjust the height of floor stops to suit the undercut of the adjacent door, and for out-swinging exterior doors.

2.8 THRESHOLDS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. Pemko.
2. National Guard.
3. Reese.
4. Wooster.
5. Zero.

B. Thresholds by type:

1. Type as scheduled or indicated, or where not shown provide a manufacturer's standard aluminum threshold, with standard cast or extruded non-slip profile. For out-swinging exterior doors use vinyl or silicone rubber inserts in the face of the stop. 2005V profile by Pemko, or as approved; non-slip.

2. Thresholds shall be one-piece, continuous the full width of the doorway. Provide latch track thresholds for doors with vertical rod exit devices.

3. Where not indicated, the dept of the flat portion of the threshold to be not less than the door frame depth.

4. End Returns: Mitered and returns where ends would otherwise be exposed; of material / finish to match the primary threshold unit.

5. Height: As indicated, except do not exceed 1/2" in height where handicapped access is required. Comply with ADAAG.

6. Method of fastening: Provide the manufacturer's special concealed fastener system for installation for single units.

7. Sealant: For thresholds, single component, urethane complying with Section 07900 - Joint Sealers.

2.9 WEATHERSTRIPPING

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. Pemko.
2. Reese.
3. Zero.

B. Continuous Adhesive-Applied Jamb & Head Weatherstripping: Continuous at jambs and head. Air leakage of weatherstripped doors shall not exceed 0.5 CFM of air per square foot or door when tested in accordance with ASTM E 283. Pemko PK88BL, or approved equal.

2.10 LIGHT PROOFING AND SOUNDPROOFING

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

1. National Guard.
2. Pemko.
3. Zero.

B. A set shall include adjustable door stops at the head and jambs of doors, and an automatic door bottom of extruded aluminum, anodized finish, surface-applied, with vinyl fin seals between the plunger and housing. Door stops shall have a solid neoprene tube, silicone rubber, or closed-cell sponge gasket. Door bottoms shall have an adjustable operating rod and silicone rubber or closed-cell sponge neoprene gasket. Door stops shall be mitered at the corners.

2.11 MISCELLANEOUS HARDWARE

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the followings, as specified below:

B. Products:

1. Smoke Seals: Fire-tested, continuous at jambs and head; PK 55 by Pemko, or approved equal, color as selected.

2. Bottom Sweep: 307 by Pemko, or approved equal, color as selected.

3. Overlap Astragal: 18 gauge minimum, but not less than required for the tested assembly provided for; 357 by Pemko, or approved equal, color as selected.

4. Split Astragal for doors: 18 gauge minimum, but not less than required for the tested assembly provided for; 309 by Pemko, or approved equal, color as selected.

5. Door Rain Drips: Extruded aluminum, not less than 0.08" thick, approximately 1-1/2" high x 5/8" projection, as selected. Align the bottom with the bottom edge of the door.

6. Overhead Rain Drip: Extruded aluminum, not less than 0.08" thick, approximately 1-1/2" high x 2-1/2" projection, with length equal to the overall door frame width. Align the bottom with the door frame rabbet; 346 by Pemko, or approved equal, color as selected.

2.12 ELECTRONIC ACCESS CONTROL SYSTEM

A. Complete working installation of Wiegand Integrated Centralized Access Control System including control panels; control workstation; cabling, support materials, connectors, hardware; control readers; QC12 ElectroLynx hinges; online and mobile dashboards; and user credentials.

B. Access Control Workstation as required by manufacturer.

C. Access Control Reader & Hardware: UL Listed Exterior Grade Series 4000 Bored lock, Rim Exit Device, and Surface Vertical Rod Exit Device. ANSI/BHMA A156.2, A156.3 Grade 1, Fail Secure, 12VDC, cylinder override, low-profile proximity reader with multi-color LED indicator, Request to Exit sensor, and Door Position Switch, B Lever Trim, and weatherseal gasketing.

D. Credentials: Blank White Printable Proximity Card, 4,000 total.

2.13 SUBSTITUTIONS

A. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.14 FABRICATION

A. Finish and Base Material Designations: Number indicate BHMA Code or nearest traditional U.S. commercial finish.

B. Where base material and quality of the finish are not otherwise indicated, provide at least commercially recognized marine quality as specified in the applicable Federal Specifications.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that doors and frames are ready to receive the work, and that dimensions are as instructed by the manufacturer.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until unsatisfactory the conditions have been corrected.

3.2 INSTALLATION

A. Where not specified under other Sections to be performed by the manufacturer or supplier, machine, fit and drill wood and metal doors, and frames.

B. Prepare doors of the various types to receive hardware, using templates and instructions provided with the hardware items for on-site work.

C. Install each hardware item in compliance with the manufacturer's instructions and recommendations.

D. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate the hardware removal, storage

and reinstallation, or the application of surface protection with the finishing work specified in Section 09900 - Painting. Do not install / reinstall surface-mounted items until the finishes have been completed on the substrates.

E. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units not factory-prepared for anchorage fasteners, flush with the fastened surface. Space fasteners and anchors in accordance with industry standards.

G. Set thresholds for exterior doors in a full bed of sealant to ensure waterproof integrity.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust and check each operating item of hardware and each door to ensure proper operation and function of every unit. Replace units which cannot be adjusted to operate freely and smoothly for their intended application.

C. Adjust door control devices to compensate for the final operation of cooling and ventilating equipment.

D. Door operation shall meet ADAAG requirements for opening force.

E. Adjust operating hardware to provide a tight fit at contact points and weatherstripping, for smooth operation and weathertight closure.

F. Lubricate moving components and hardware.

G. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make a final check and adjustment of all hardware items.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect hardware installations for proper locations, heights, level, plumb, square, attachment to the substrate and opening force.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean adjacent surfaces soiled by the hardware installation.

C. Clean operating items as necessary to restore proper function and finish of the hardware and doors.

3.6 TRAINING

A. Instruct the Owner’s personnel in the proper adjustment and maintenance of hardware items and finishes during final adjustment of the hardware.

3.7 HARDWARE SCHEDULE

A. Door Material Types:

AL	Aluminum	OHC	Overhead Coiling
FLDG	Folding Grille	SCWD	Solid Core Wood
GATE	Chain Link Gate	SLGL	Sliding Glass
HCWD	Hollow Core Wood	WD	Wood
HM	Hollow Metal		

HW-1 Exterior Exit Double Doors

Hinges	3 pairs		
Exit Device	2 ea		
	1 ea	F84 Lever	
	1 ea	Dummy Trim	
Closer	2 ea	Surface mount interior	Alum
Weatherstripping	continuous	By Door Manufacturer	
Threshold	continuous	As indicated	Alum
Astragal			Alum
Rain Drip			Alum

Electronic Access Control

HW-1A Exterior Exit Single Doors

Same as HW-1 but for single doors.

HW-2 Typical Storage / Utility / Private Doors

Hinges	1-1/2 pairs		
Lockset	1	F86 Function	US26D
Closer	1 ea	Surface mount interior	Alum
Weatherstripping	continuous		
Kick Plate			US26D
Threshold	continuous	At Exterior Doors	Alum
Astragal		At Exterior Doors	Alum
Rain Drip		At Exterior Doors	Alum

Electronic Access Control where required

HW-3 Typical Classroom / Office Doors

Hinges	1-1/2 pairs		
Lockset	1	F88 Function	US26D
Closer	1 ea	Surface mount interior	Alum
Weatherstripping	continuous	By Door Manufacturer	
Kick Plate			US26D

HW-3a Typical Shared Classroom Doors

Hinges	1-1/2 pairs	By Manufacturer	
Lockset	1	F80 Function	US26D
Closer	1 ea	Surface mount interior	Alum
Weatherstripping	continuous	By Door Manufacturer	

HW-4 Typical Multiple Occupant Restroom Doors / SPED Restrooms

Hinges	1-1/2 pairs	By Manufacturer	
Deadbolt	1	474 Function	US26D
Closer	1 ea	Surface mount interior	Alum
Weatherstripping	continuous	By Door Manufacturer	
Threshold	continuous	At Exterior Doors	Alum
Astragal		At Exterior Doors	Alum
Rain Drip		At Exterior Doors	

HW-5 Typical Private Restroom Doors

Hinges	1-1/2 pairs		
Lockset	1	F76A Function	US26D
Closer	1 ea	Surface mount interior	Alum
Weatherstripping	continuous	By Door Manufacturer	
Threshold	continuous	As indicated	Alum
Astragal			Alum
Rain Drip			Alum

HW-6 Double-Egress Doors

Hinges	3 pairs		
Exit Device	2 ea		
	2 ea	F84 Lever	
Closer	2 ea	Surface mount interior	Alum
Astragal	2 ea		Alum
Weatherstripping	continuous	By Door Manufacturer	

END OF SECTION

SECTION 08800
GLASS AND GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glazing for entrances and storefronts.

2. Glazing for curtain walls.

3. Glazing for sliding doors.

4. Glazing for window units.

5. Interior partitions relites.

6. Fire-rated glazing.

7. Low-E glazing

8. Glass blocks.

9. Glazing sealant installation.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 01811 - Sustainable Design and Construction Procedures

2. Section 06200 - Finish Carpentry: Wood frames for interior glazing.

3. Section 07900 - Joint Sealers: Sealants for waterproofing glazing installations.

4. Section 08100 - Hollow Metal Doors and Frames: Glazing in metal doors and sidelites.

5. Section 08210 - Wood Doors: Glazing in wood doors, transoms and sidelites.

6. Section 08330 - Overhead Doors: Glazing in sectional doors.

7. Section 08400 - Entrances, Storefronts and Windows: Glazing installations.

8. Section 08420 - Aluminum Doors and Windows: Glazing in doors and windows.

9. Mirrors are specified in Section 10810 - Toilet Accessories.

1.2 DESCRIPTION OF WORK

A. The extent of glass and glazing work is indicated on the Drawings and Schedules and as

specified herein, and includes providing and installing glazing for exterior and interior doors and windows, safety glass, interior relites, glass blocks, sealants and miscellaneous glazing materials.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and other Structures.

C. American National Standards Institute (ANSI):

1. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.

D. American Society for Testing and Materials (ASTM):

1. ASTM C 920 - Specification for Elastomeric Joint Sealants.

2. ASTM C 1036 - Specification for Flat Glass.

3. ASTM C 1048 - Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.

4. ASTM E 1996 - Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

5. ASTM F 1233 - Test Method for Security Glazing Materials and Systems.

E. Flat Glass Marketing Association (FGMA):

1. FGMA - Glazing Manual and Glazing Sealing Systems Manual.

F. National Fire Protection Agency (NFPA):

1. NFPA 257 - Standard on Fire Tests for Window and Glass Block Assemblies.

G. International Code Council:

1. International Building Code (IBC), 2009:

H. U. S. Consumer Product Safety Commission, CPSC 16 CFR, Part 1201 - Safety Standard for Architectural Glazing Materials.

1.4 CONSTRUCTION

A. Interface with Other Work: Coordinate glazing with the installation of exterior aluminum entrances, storefronts, curtain walls, doors and windows as specified in Section 08410 hollow metal doors and windows specified in Section 08100; wood doors and windows specified in Section 08210.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data:

a. Submit two (2) copies of the manufacturer=s catalogs, including specifications and installation instructions for all glass products to be used and for glazing sealant and compound, gasket and miscellaneous materials required.

b. Glass: For each type of glass provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

c. Glazing compound: Provide chemical, functional, and environmental characteristics, limitations and special application requirements.

d. Manufacturer=s engineering design to meet the performance requirements.

2. Calculations indicating glazing satisfaction of performance requirements

3. Samples:

a. Glass: Two (2) samples 6" x 6" in size for each type of glazing, illustrating tinting, and finish of the glazing material. Label each sample indicating kind, quality and manufacturer as follows:

1) Tinted float glass.

2) Laminated glass.

3) Tempered glass.

4) Low-e glass.

5). Patterned glass.

b. Glass Blocks: Two (2) full size units.

c. Glazing Sealants: Three (3) copies of the manufacturer=s standard color selection.

4. Assurance / Control Submittals:

a. Manufacturer's certificate that the products meet or exceed the specified requirements.

b. Calculations indicating that the materials satisfy the performance requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Performance Requirements:

1. Provide the capacity to withstand the following loading requirements for exterior units:

a. Design and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D], and importance factor [1.0] [1.25] [1.5], as applicable per ASCE 7. Size for areas of discontinuity and worst case scenario to be experienced by the building.

b. Height of windows and door units above the ground level are indicated on the Drawings or can be calculated from the Drawings.

C. Identification: Provide labels where safety glazing is required. Each unit of tempered glass shall be permanently identified by the manufacturer. The identification shall be etched or ceramic fired on the glass and shall be visible after the glazing has been installed. Label per NFPA 80.

D. Grading and Labeling: Grade and label each light stating the quality and grade of the glass and the manufacturer=s name and brand designation. Leave labels intact until removal is directed by the Owner=s representative. Label each individual glazing unit for fire-rated doors and windows in accordance with NFPA 80-1-7.4. Listing marks shall be visible after installation.

E. Perform the work in accordance with the FGMA, Glazing Manual.

F. All exterior glazing shall be wet sealed glazing gaskets and permited only for interior work.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Comply with the manufacturer=s instructions for shipping, handling, storing and protecting glass and glazing products.

C. Deliver products to the Project Site in the manufacturer=s original, unopened packaging or crates.

D. Exercise exceptional care to prevent edge damage to the glass, rainbowing, discoloration

and damage to and deterioration of coatings, if any, on the glass.

1.8 JOB CONDITIONS

A. Pre-installation: Meet with the Glazier and other trades affected by the glass installation prior to beginning installation. Do not perform work under adverse weather or job conditions. Install liquid sealants only when the temperature is within the lower or middle one third of the temperature range recommended by the manufacturer.

1.9 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a manufacturer=s written Warranty against cracking, breakage, staining, rainbowing, discoloration and for replacement.

2. Warranty Period: Two (2) years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Falconer Glass Industries, Inc.

2. Guardian Industries.

3. PPG Industries.

4. Libby-Owens-Ford.

5. Pilkington.

6. Viracon, Inc.

7. Oldcastle Glass.

8. National Glass Blocks.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 GLAZING MATERIALS

A. Standards:

4. Prime Glass: FS DD-G-451, ASTM C 1036.

5. Safety Glass: CPSC 16 CFR 1201.

6. Heat-Treated Glass: FS DD-G-1403, ASTM C 1048.

B. Float / Plate Glass: Type 1, quality q3, thickness as required to meet the performance requirements, but not less than 3/16", clear unless otherwise indicated. Curved or straight as indicated.

C. Laminated Safety and Security Glass: Standard two-ply laminated glass with minimum 0.060" Saflex interlayer. Thickness as required to meet the Performance Requirements or security criteria for the location, height and use or as indicated, but not less than 3/8". Where glazing is double pane, the laminate shall be installed as the exterior lite. Tint color as selected.

1. Impact Loads: Comply with South Florida Building Code, Section 2315 and 3513.

D. Tempered Glass: Heat treated to strengthen the glass in bending to not less than 4.5 times the annealed strength, edges seamed, thickness as required to meet the performance requirements (3/16" thick, minimum). Exposed edges in the finished work shall be polished. Tint color as selected.

1. Where indicated as AFree of Tong Marks@, provide tempered glass produced by manufacturer=s special process which eliminates tong marks.

E. Tempered Low-E: Hard coating on surface 4. Tint color as selected from manufacturer=s standards.

F. Polished Wired Glass or Patterned Wire Glass: Type II, minimum 1/4-inch thick, Class 1, Form 1, quality q11, clear and polished both faces. Pattern as selected.

1. Fire Rating: Provide glass listed and labeled by UL Afire resistance@ complete with steel channel stops.

G. Interior Fire Rated: Fire glass/mullion glazing system with pyrostop safety rated glass.

H. Patterned Glass: Tempered glass with screen-printed, ceramic frit fused pattern.

1. PPG / DecoTherm.

2. Viracon, Viraspan.

3. Approved equal.

2.3 GLASS BLOCKS

A. Glass Blocks: 8" x 8" x 4" thick or as indicated, partially evacuated hollow units. Style, pattern and color as selected from the manufacturer=s standards.

:

2.4 GLAZING SEALANT

A. Silicone: Single component, elastomeric, chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining, non-sag; cured Shore A hardness of 15 - 25. Color black.

2.5 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers and Sealers: Type recommended by the glazing sealant or gasket

manufacturer.

B. Setting Blocks: Neoprene of EPDM, 70 to 90 Shore A durometer hardness; compatible with the glazing sealant used.

C. Spacers: Neoprene of EPDM, 40 to 50 Shore A durometer hardness; self adhesive on one side; compatible with the glazing sealant used.

D. Filler Rods: Closed cell or waterproof jacketed foam rod of polyethylene, butyl, neoprene, polyurethane, or vinyl; compatible with the glazing sealant used.

2.6 GLASS BLOCK GLAZING ACCESSORIES

A. Panel reinforcement: Two (2) parallel 9 gage wires either at 1-5/8" or 2" on center with electrically welded cross wires at regular intervals, galvanized after welding.

B. Expansion Strips: Fibrous glass or polyethylene foam, 3/8" thick.

C. Panel Anchors: 20 gage perforated steel strips, 24" long x 1-3/4" wide, galvanized after perforating.

D. Sealant: Sealant No. 1 or No. 3 per Section 07900.

E. Backer Rods: Polyethylene foam, neoprene or equal as approved by the sealant manufacturer.

F. Mortar Materials: Type S in accordance with ASTM C 270 with integral type water-repellant added to the mortar mix.

G. Portland Cement: Type 1 in accordance with ASTM C 150.

H. Lime: Type S in accordance with ASTM C 207.

I. Sand: Clean, white quartzite type, essentially free of iron compounds; for thin joints in accordance with ASTM C 144.

J. Integral Type Water-repellant: Stearate as recommended by the glass block manufacturer.

PART 3 - EXECUTION

3.1 STANDARDS AND PERFORMANCE

A. Watertight and airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, and impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials, and other defects in the work.

B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.

C. Glazing channel dimensions, as indicated and specified, are intended to provide for the necessary bite on the glass, minimum edge clearances, and adequate sealant thickness

with reasonable tolerances. Adjust as required by the job conditions at the time of installation. Do not reduce the manufacturer=s recommended minimum edge bite on the glass.

D. Comply with the combined recommendations and technical reports by manufacturers of the glass and glazing products used in each glazing channel, and with recommendations of the Flat Glass Marketing Association, AGlazing Manual@, except where more stringent requirements are indicated.

E. Inspect each piece of glass just prior to installation, and discard any which have observable edge damage or face imperfections.

F. Provide safety glass for all glazed panels within 48" of a door and where glazed panels are less than 60" above any floor or any walking surface and elsewhere where required by the Building Code, performance data or as indicated.

G. Clean glazing channels and other framing members to receive glass just prior to glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.

H. Apply primer or sealant to joint surfaces where recommended by the sealant manufacture.

3.2 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that openings for glazing are correctly sized and within tolerance.

2. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement and that weeps are clear and ready to receive the glazing.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.4 GLAZING INSTALLATION

A. Place setting blocks of the proper size in sill rabbet; locate at 1/4th the glass width from each corner; set blocks in a thin course of heel and toe compound, if any.

B. Install spacers of the proper size and spacing inside and out for glass sizes larger than 50 united inches, except where gaskets or pre-shimmed tape is used. Provide 1/8", minimum

bite of spacers on the glass and use a thickness slightly less than the final compressed thickness of the tape.

C. Set each unit of glass in each series in uniformity with other pieces in pattern, draw, bow, and other visually perceptible characteristics.

D. Provide for the following edge clearances (bite):

	Single glazed
Nominal edge cover (bite)	5/16"
Minimum nominal edge clearance	3/16"
Minimum face clearance	3/16"

E. Glass must be edge blocked to prevent contact with metal framing.

F. Provide glazing sealant as required for the particular glazing application. Coordinate with other Sections herein for material compatibility. Glazing gaskets are permitted only for interior locations.

G. Prevent exudation of the sealant or compound by forming voids or installing filler rods in channels at the heel of jambs and heads, except as otherwise indicate and depending on the light size, thickness and type of glass, and in compliance with the manufacturer=s recommendations.

H. Provide filler rod where sealants are used in the following locations:

1. Head and jamb channels.

2. Tinted glass over 75 united inches in size.

3. Clear glass over 125 united inches in size.

I. Do not leave voids in sill channels except as specifically indicated or recommended by the glazing manufacturer. Force sealant into the channel to eliminate voids and to ensure complete Awetting@ or bond of the sealant to the glass and channel surfaces.

J. Do not allow the sealant to close the weeps of aluminum framing.

K. Tool exposed surfaces of glazing liquids and compounds to provide a substantial Awash@ away from the glass.

L. Clean and trim excess glazing materials from glass and stops or frames promptly after installation; eliminate stains and discolorations.

M. Install pressurized tape and gaskets to protrude slightly out of the channel to eliminate dirt and moisture pockets.

3.5 GLASS BLOCK INSTALLATION

A. Verify that channels, chases and panel anchors have been provided at heads and jambs for panel support within openings.

B. Cover the sill area with a heavy coat of asphalt emulsion. Allow the emulsion to dry before placing mortar. Adhere expansion strips to jambs and head. Make certain that expansion strips extend to the sill. Maintain a uniform joint width of 1/4" plus or minus 1/8". All mortar

joints must be full and not furrowed. Steel tools should not be used to tap blocks into position.

C. Install reinforcing at 16" o.c. horizontally and in joints immediately above and below all openings within panels. Run the reinforcing continuously from edge to edge of panels. Lap reinforcing not less than 6" where necessary to use more than one length. Do not bridge expansion joints with reinforcing. Install reinforcing as follows:

1. Place lower half of mortar in bed joint. Do not furrow. Press panel reinforcing into place. Cover panel reinforcing with upper half of mortar bed and trowel smooth. Do not furrow.

2. Strike joints smooth while mortar is still plastic and before final set. Rake out all spaces requiring sealant to a depth equal to the width of the spaces. Remove surplus mortar from the faces of glass blocks and wipe dry. Tool joints smooth and concave before mortar takes final set.

3. After final mortar set, install packing tightly between glass block panel and head construction. Apply sealant evenly in the head and jamb recesses in accordance with the manufacturer=s instructions.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the preparation for and installation of glazing.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove non-permanent labels after glazing has been completed and clean glass surfaces.

C. Wash and polish glass on both surfaces not more than four (4) days prior the date scheduled for inspections intended to establish the date of Substantial Completion for each area of the Project. Wash with a solution of mild detergent in warm water applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean and dry.

3.8 PROTECTION

A. Section 01700 - Execution Requirements: Protection of the installed work.

B. Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from the glass. Do not apply markers directly to the glass surface.

C. Remove and replace glass which has been broken, chipped, cracked, abraded or damaged in other ways during the construction period, including by natural causes, accidents and vandalism.

END OF SECTION

SECTION 09110

NON-LOAD-BEARING STEEL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior non-load-bearing steel partition framing.

2. Metal furring.

3. Interior suspended steel ceiling framing.

4. Blocking and backing plates.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 05500 - Metal Fabrications: Backing plates.

2. Section 06100 - Rough Carpentry: Wood blocking.

3. Section 07210 - Building Insulation: Wall insulation.

4. Section 07900 - Joint Sealers: Sealants.

5. Section 09250 - Gypsum Board: Wall finish.

1.2 DESCRIPTION OF WORK

A. The extent of non-load-bearing steel framing work is indicated on the Drawings and as specified herein, and includes providing and installing interior partition framing, suspended ceiling framing, furring and metal blocking and backing plates in walls and ceilings.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

2. ASTM C 645 - Specification for Non-Structural Steel Framing Members.

3. ASTM C 754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

4. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board.

5. ASTM C 954 - Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033-inch (0.84 mm) to 0.112- inch (2.84 mm) in Thickness.

6. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

7. ASTM D 2201 - Standard Practice for Preparation of Zinc-Coated and Zinc-Alloy-Coated Steel Panels for Testing Paint and Related Coating Products.

8. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

9. ASTM E 90 - Standard Test Method for Laboratory Measurements of Airborne Sound Transmission Loss of Building Partitions and Elements.

10. ASTM E 413 - Classification for Rating Sound Insulation.

11. ASTM E 119 - Standard Test Method for Fire Tests of Building Construction and Materials.

C. Gypsum Association

1. GA-600 - Fire Resistance Design Manual.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data:

a. Framing Members: Standard materials and finish, product criteria, sizes and lengths, load charts and limitations.

b. Fasteners and Anchorage Devices: Standard materials and finish, sizes and load charts.

2. Shop Drawings:

a. Indicate prefabricated work, component details, framing layout, framed openings, anchorage to the structure, type and location of fasteners and accessories or items required of other related work.

b. Indicate the method of securing studs and framing to tracks, splicing, suspension, blocking / backing plates for support of items specified in other Sections and reinforcement of framing connections.

c. Indicate details associated with fireproofing and acoustical seals.

d. Indicate location of blocking and backing plates required for installation of other work.

3. Samples:

a. If requested, two (2) 6" long sections of each shape required.

4. Assurance / Control Submittals:

a. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Protect metal framing materials from corrosion, deformation and other damage during delivery, storage and handling.

C. Deliver products to the Project Site in the manufacturer=s original, unopened packages, containers or bundles bearing the brand name and identification of the manufacturer.

D. Store and protect the metal framing with a weatherproof covering; ventilate to avoid condensation.

E. Store, handle and install to prevent bending.

1.7 JOB CONDITIONS

A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by the manufacturer. Do not install products under environmental conditions outside the manufacturer=s absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Unimast Incorporated.

2. Dale Industries.

3. National Gypsum Company (Gold Bond Building Products).

4. Clark Steel Framing Systems.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Unimast Incorporated framing component designations are used within this Section to establish quality and to identify the framing types.

B. Interior Non-Load-Bearing Partition Framing: ASTM C 645 and D 2201; galvanized sheet steel, channel shaped, punched for utility access, depth as indicated on the Drawings, gages as indicated below, unless indicated otherwise on the Drawings.

1. 212ST20 - 2-1/2" Studs - Unbraced Length 13 Feet or Less: Minimum 20 gage; Minimum 18 gage where greater than 13 feet.

2. 358ST22 - 3-5/8" Studs - Unbraced Length 18 Feet or Less: Minimum 22 gage; Minimum 20 gage where greater than 18 feet and for Fiberock or Cement Board.

3. 600ST22 - 6" Studs - Unbraced Length 25 Feet or Less: Minimum 22 gage: Minimum 20 gage where greater than 25 feet and for Fiberock or Cement Board.

4. Bridging - Same depth and gage as the studs.

C. Partition Floor Tracks and Runners: ASTM C 645 and D 2201; galvanized sheet steel, channel shaped, solid web, same depth and gage as the studs.

1. 22 Gage Studs: CR22 x stud size.

2. 20 Gage Studs: CR20 x stud size.

D. Slip-Type Top Tracks: Provide one of the following:

1. Deflection Track: Steel sheet top runner, manufactured to prevent the cracking of finishes applied to interior partition framing resulting from deflection of the structure above; in thickness not less than the studs and in a width to accommodate the depth of the studs.

2. Double Runner System: ASTM C 645 runner; inside runner with 2" deep flanges, in thickness not less than that indicated for the studs and fastened to the studs; outer runner sized to friction fit inside the inside runner.

3. Single Long-Leg Runner System: ASTM C 645 runner with 2" deep flanges, in thickness not less than that indicated for the studs, installed with studs friction fit into the runner and with bridging located within 12" of the top of the studs.

E. Partition Framing Fasteners: Corrosion-resistant, self-drilling, self-tapping steel screws.

1. 22 Gage Framing: ASTM C 1002; 3/8", Type S, pan head.

2. 20 Gage and Heavier Framing: ASTM C 954; 5/8", Types S-12, low-profile head.

F. Partition Floor Track Anchorage Device: Low velocity, powder-actuated drive pins; minimum 0.140" shank diameter x 1-1/2" shank length with 7/8" diameter washer.

1. DX 451 System using X-DNI Pins with R23 washers by Hilti.

2. Ramset / Red Head System using 4700SD Pins by ITW Ramset / Redhead.

G. Wall Furring: ASTM C 645 and D 2201; galvanized sheet steel.

1. Studs: ST22 - 2-1/2" deep, 22 gage.
2. Studs: ST20 - 3-5/8" deep, 20 gage.

3. Hat-Shaped Channels: 7/8" deep x 1-1/2" wide, 25 gage.

4. AZ@ Furring Channels: 1-1/2" deep, 25 gage.

5. Clip Angles: 2" x 2" x 1/4" less than stud width, 16 gage.

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H. Wall Furring to Concrete or Masonry Fasteners: Hex head sleeve anchors; minimum 1/4" diameter x minimum 1-1/8" embedment.

1. Slv Anch H X 5/16 X 2-1/2 by Hilti.

2. Dynabolt HN-1413 by ITW Ramset / Redhead.

I. Furring Channel to Masonry or Concrete Fasteners: Low velocity, powder-actuated drive pins of size to suit the application.

J. Suspended Interior Ceiling and Soffit Framing:

1. Wire Hangers: ASTM A 641 / A 641M, Class 1 zinc coating, soft temper, 0.162" diameter.

2. Flat Hangers: Galvanized steel sheet, 1" x 3/16" x length required.

3. Stud Hangers: ASTM C 645; cold rolled, galvanized sheet steel, channel shaped, cross braced, minimum 20 gage.

4. Carrying Channels: ASTM C 645; cold rolled, galvanized sheet steel, channel shaped, minimum 20 gage.

5. Furring Channels: ASTM C 645; galvanized, hat-shaped, 7/8" deep x 1-1/2" wide, 25 gage.

6. Tie Wire: ASTM A 641 / A 641M, Class 1 zinc coating, soft temper, 0.0625" diameter.

7. Curved Ceiling: Pre-Engineered notched main beam system with Peakform, SuperLock, ScrewStop, SimpleCurve. Provide RC2 clips, XL cross tees, Impact Isolation and Main Beam adapter clips, channel molding, and edge beads.

K. Flat Straps and Backing Plates: ASTM D 2201; galvanized sheet steel, 22 gage, minimum.

L. Isolation Strips at Exterior Walls and Suspended Concrete Floors: ASTM D 226; asphalt-saturated organic felt, Type I (No. 15 asphalt felt), non-perforated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that building framing components are ready to receive the work.

2. Verify that rough-in utilities are in-place and properly located where required.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION - PARTITION FRAMING

A. Install framing and fasteners in accordance with the manufacturer's published instructions and ASTM C 754.

B. Install tracks / runners at floors, ceilings, and structural walls and columns where steel framing abuts.

1. Install asphalt felt between tracks / runners and wall / floor where framing is installed directly against exterior walls and floor slabs.

C. Metal Stud Spacing: 16" on center, maximum.

D. Align stud web openings horizontally; install horizontal bridging at 5' o.c., maximum.

E. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate below suspended ceilings.

F. Install studs so flanges point in the same direction.

G. Splice studs with an 8" nested lap, minimum; fasten each stud flange with a minimum of two (2) screws.

H. Construct corners using a minimum of three (3) studs.

I. Install double studs at wall openings and door jambs, maximum 2" from each side and at the top of openings.

J. Extend vertical jamb studs through suspended ceilings and attach to the underside of the structure above.

K. Frame other openings, in the same manner as for doors.

L. Place studs 2", minimum, from abutting walls.

M. Install intermediate studs above and below openings to match the wall stud spacing.

N. Fasten studs adjacent to door frames, partition intersections and corners to the top and

bottom runner flanges in double-stud fashion.

1. Securely fasten studs to jamb and head anchor clips of doors and borrowed light frames.

2. Place a cut-to-length section of runner horizontally with the web-flange bent at each end; fasten with a minimum of two (2) fasteners per flange.

3. Position a cut-to-length stud (extending to the top runner) at vertical panel joints over door and window headers.

O. Allow for deflection of roof or floor slabs.

1. Leave 1/2" gap between the top end of studs and the top track.

P. Framing Fastening: Fasten framing in accordance with the manufacturer's published instructions and the schedule below, unless indicated otherwise on the Drawings.

Connection	Fasteners
Floor and Top Track to Concrete	1 pin at 32" on center
Partition Stud to Floor Track	1 screw each side, each flange
Partition Stud to Top Track	1 screw each side, each flange in slotted hole to allow slab deflection
Plates and Straps to Studs	2 screws
Stud Web to Stud Web	2 screws
Runner to Header	1 screw at 16" on center, maximum 6" from each end

Q. Install framing, blocking and backing plates between studs for the attachment of work by other trades.

R. Install batt insulation in walls and ceilings, where indicated on the Drawings and as specified in Section 07210 - Building Insulation.

3.3 INSTALLATION - FURRING

A. Furring Channels:

1. Vertically spaced at 16" on center, maximum; attach to concrete and masonry surfaces with hammer set or powder-driven fasteners, staggered 24" o.c. on opposite flanges.

2. Nest channels 8" at splices and anchor with two (2) fasteners in each flange.

B. Wall Furring:

1. Secure top and bottom runners to the structure in a manner to permit minor slab deflection.

2. Space metal furring at 16" on center, maximum.

3.4 INSTALLATION - CEILING AND SOFFIT FRAMING

A. Suspend ceiling hangers directly from the building structure.

1. Install hangers plumb and free from contact with other objects within the ceiling plenum.

2. Where other construction within the ceiling plenum interferes with the typical hanger spacing, install supplemental suspension members and hangers in the form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support the imposed ceiling loads.

3. Secure wire hangers by looping and wire-tying, either directly to the structure or to inserts.

4. Do not suspend framing from ducts, pipes or conduits.

5. Keep hangers and braces 2" clear of ducts, pipes and conduits.

B. Install framing per ASTM C 754.

1. Install framing components in the sizes and spacing indicated on the Drawings, but not less than that required by the referenced standards.

C. Wire-tie furring channels to support the framing.

D. Attach perimeter wall track or angle where the suspension system meets vertical surfaces. Mechanically join the main beam and cross-furring members to each other and fit furring into the wall track.

E. Install compression struts and sway bracing system with tie wires as indicated on the Drawings, and as required by the Building Code.

1. Provide hanger wires splayed 45 degrees within 3" of the intersection between main runners and cross runners, and at each light fixture.

2. Provide compression struts and splayed hanger wire sway bracing as follows:

a. Within 6 feet of walls.

b. At 12 feet on centers, maximum.

F. Install steel framing components for suspended ceilings so members for attachment of finish panels are level to within 1/8" in 12 feet measured lengthwise and transversely.

G. When the ceiling system provides lateral support for permanent or relocatable partitions, the connection, ceiling system and lateral force bracing shall be sized and installed to support the reaction force of the partitions.

3.5 INSTALLATION - BLOCKING AND BRIDGING

A. Screw attach wood blocking / metal backing plates between studs for the support of surface-mounted items for:

1. Plumbing fixtures.

2. Wall cabinets.

3. Toilet accessories.

4. Hardware.

5. Architectural woodwork.

6. Grab bars.

7. Writing / Bulletin boards.

8. Fire extinguishers and fire extinguisher cabinets.

9. Other items requiring backing for attachment.

B. Provide bridging between opposite sides of plumbing cavity walls at a maximum of 36" o.c., vertically.

3.6 CONSTRUCTION

A. Interface with Other Work:

1. Coordinate the erection of studs at openings and with door and window frames.

2. Coordinate the installation of anchors, supports and blocking for mechanical, electrical and building accessory items installed within the framing.

B. Site Tolerances:

1. Maximum Variation From True Position: 1/8" in 10 ft.

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2. Maximum Variation From Plumb: 1/8" in 10 ft.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect metal framing erection, placement, spacing, seismic joints, expansion joints, fasteners and connections.

END OF SECTION

SECTION 09250

GYPSUM BOARD

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gypsum board.

2. Cement board.

3. Gypsum sheathing.

4. Accessories.

5. Joint treatment.

6. Finishing.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Wood framing and blocking for attachment of gypsum board.

2. Section 07210 - Building Insulation: Sound attenuation blankets.

3. Section 07900 - Joint Sealers: Acoustical sealants.

4. Section 09110 - Non-Load Bearing Steel Framing: Metal framing for attachment of gypsum board.

5. Section 09200 - Lath and Plaster: Finish for gypsum sheathing.

6. Section 09300 - Tile: Ceramic wall finish on gypsum board.

7. Section 09900 - Painting: Field paint finish on gypsum board.

1.2 DESCRIPTION OF WORK

A. The extent of gypsum board work is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing gypsum board for all applications, cement fiber board, gypsum sheathing, galvanized and PVC trim, accessories and the finishing of installations exposed to view.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced.

Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 475 - Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

2. ASTM C 630 - Specification for Water-Resistant Gypsum Backing Board.

3. ASTM C 840 - Specification for the Application and Finishing of Gypsum Board.

4. ASTM C 954 - Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 inches (0.84 mm) to 0.112 inches (2.84 mm) in Thickness.

5. ASTM C 919 - Practice for Use of Sealants in Acoustical Applications.

6. ASTM C 1002 - Specification for Steel Self-Piercing Topping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

7. ASTM C 1280 - Specification for Application of Gypsum Sheathing.

8. ASTM C 1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets.

9. ASTM C 1396 - Specification for Gypsum Board.

10. ATM D 3678 - Specification for Rigid Poly (Vinyl Chloride) (PVC) Interior-Profile Extrusions.

11. ASTM E 119 - Test Methods for Fire Tests of Building Construction and Materials.

C. Gypsum Association (GA):

1. GA-201 - Gypsum Board for Walls and Ceilings.

2. GA-214 - Recommended Specification for Levels of Gypsum Board Finish.

3. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

4. GA-600 - Fire Resistance Design Manual.

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D. International Code Council:

1. International Building Code (IBC), 2009.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product specifications and installation instructions for each gypsum drywall component, including other data required to show compliance with these specifications.

12. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

c. Test Reports from recognized testing laboratories, upon request.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Fire-Resistance Ratings: Where gypsum drywall systems with fire-resistance ratings are indicated, provide materials and installations which are identical to those of applicable assemblies tested per ASTM E 119 by a fire testing laboratory acceptable to the authorities having jurisdiction.

1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File No. S in GA AFire Resistance Design Manual@ or to design designations in U.L. AFire Resistance Directory@ or in listing of other testing and agencies acceptable to the authorities having jurisdiction.

C. Single-Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturer=s recommended by the prime manufacturer of the gypsum board.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened, undamaged packages, containers, or bundles bearing the brand name with identification labels intact.

B. Store materials inside and under cover; keep dry; protect from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes.

D. Neatly stack gypsum boards flat to prevent sagging.

E. Handle to prevent damage to edges, ends and surfaces.

F. Protect corner beads and trim from being bent and damaged.

1.7 JOB CONDITIONS

A. Environmental Requirements, General: Comply with requirements of the referenced gypsum board application standards and recommendations of the gypsum board

manufacturer for environmental conditions before, during and after installation.

B. Ventilation: Ventilate building spaces as required to remove water in excess of that required for the drying of joint treatment materials immediately after application. Prevent drafts during hot, dry weather to avoid excessively rapid drying.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. United States Gypsum Co.

2. National Gypsum Company (Gold Bond Building Products).

3. Georgia-Pacific.

4. Domtar Gypsum.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 GYPSUM BOARD MATERIALS

A. General:

1. Provide boards where called for on the Drawings in lengths to minimize the number of end-to-end butt joints.

2. United States Gypsum (Sheetrock) designations are used in this Section to identify gypsum board and accessory types, unless otherwise noted.

B. Standard Gypsum Board: ASTM C 1396; natural finish, paper faces, 1/2" at ceilings and over wall furring, 5/8" thick at walls unless noted otherwise, 48" width, maximum practical length to meet conditions; ends square cut, tapered edges.

1. Provide where gypsum board is called for unless otherwise indicated.

C. Fire-Resistant Gypsum Wallboard: Type X, ASTM C 1396; paper faces, 2" at ceiling, or 5/8" thick at walls, 48" width, maximum practical length to meet conditions; ends square cut, edges tapered; providing at least 1-hour fire-retardant rating when tested in accordance with ASTM E 119.

1. Provide where a fire-resistance rating is required.

D. Water-Resistant Gypsum Backing Board: ASTM C 630; 2" at ceiling and over wall furring, and 5/8" thick at walls, 48" width, maximum practical length to meet conditions; ends square cut; edges tapered; ends and edges straight and solid. Board consisting of a non-combustible water-resistant gypsum core, surfaced on face and back with green treated water-repellent paper bonded to the core. Suitable for receiving paint or wallpaper and in compliance with IBC.

1. Provide at ceilings and walls in showers, toilets and other wet areas not scheduled for tile finish.

E. Impact / Penetration-Resistant Gypsum Board: Type X, ASTM C 1396, 5/8" thick, 48" width, maximum practical length to meet the conditions, ends square cut; edges tapered; gypsum core with additives to enhance fire resistance; 1-hr fire-retardant rating when tested in accordance with ASTM E 119; surfaced with paper on the front, back and long edges; 0.30" GE Lexan film bonded to the back side to enhance impact / penetration resistance without penetration.

1. Provide at Corridor walls where indicated and other locations subject to high abuse.

F. Tile Backing Board: 5/8" thick; inorganic fiberglass mat with moisture-resistant gypsum core; paperless; heat-cured acrylic coating; Fiberock, or approved equal.

1. Provide at shower and toilet room walls scheduled to receive ceramic tile finish and for interior ceiling application at exposed structure locations.

G. Cement Board: High density, glass fiber reinforced, 1/2" thick x 26" or 48" width; Durock Cement Board as manufactured by United States Gypsum or approved equal.

1. Provide at shower and toilet room walls scheduled to receive ceramic tile finish, and
at ceilings and walls exposed to the weather.

H. Gypsum Sheathing: ASTM C 630, 5/8" thick x 48" width x maximum practical length to meet conditions; ends square cut; edges tapered; ends and edges straight and solid. Weather and sag resistant for exterior applications, water repellent paper faces suitable for painting or plastering.

1. Provide at ceilings and walls exposed to the weather.

I. Solid Shaftliner: 1" thick x 23-7/8" or 47-3/4" width, Type X core, ASTM C 1396, moisture-resistant paper faces.

1. Provide at fire-rated shaft and chase walls, as indicated.

2.3 FASTENERS

A. Metal Framing: ASTM C 1002, Type S, Phillips-head recess, bugle head, corrosion-resistant, self-drilling, self-tapping, fine thread steel screws.

1. One Layer 1/2@ board: 1" long.

2. One Layer 5/8" board: 1-1/8" long.

2.4 TRIM ACCESSORIES

A. General: Install vinyl plastic accessories at exterior work and work in high humidity and non-air-conditioned spaces. Use galvanized accessories at interior air conditioned, normally humidity areas.

B. Plastic Accessories: High-Impact PVC plastic; ASTM D 3678, including corner beads, stop beads, casing beads, trim beads, baseboard and ceiling beads; as manufactured by Plastic Components, Inc. or approved equal.

C. Galvanized Accessories:

1. Edge Trim: Galvanized steel casing.

   a. AL@ shape for tight abutment at edges; Sheetrock Brand, No. 200-B.

   b. AJ@ shape at other locations; Sheetrock Brand, No. 200-A.

2. Corner Beads: Galvanized steel corner beads, Sheetrock Brand, Dur-A-Bead Metal Corner Bead.

3. Control Joint: Roll-formed zinc; Sheetrock Brand, Zinc Control Joint.

D. Pre-finished Corners: Pre-finished inside corner reinforcement as manufactured by ULTRAFLEX or approved equal.

2.5 JOINT TREATMENT MATERIALS

A. General: Type recommended by the gypsum board manufacturer for the application, except as otherwise indicated; ASTM C 475.

B. Reinforcing Tape: Cross-fibered paper with high tensile strength, roughened surface, accurate center crease; Sheetrock Brand, Heavy Drywall Joint Tape.

C. Joint Compound:

1. Single Grade: Multi-purpose grade for the entire application.

2. Two Grades:

   a. Interior and Exterior Work: Use chemically-setting, powder compound type for bedding and filling; Sheetrock Brand, Durabond Joint Compound or Easy Sand Lightweight Setting Type Joint Compound.

   b. Topping: Use ready-mixed, lightweight, vinyl formulation or vinyl powder; Sheetrock Brand, Lite Taping Joint Compound.

D. Water-Resistant Joint Compound: Special water-resistant type for treatment of joints, fastener heads and cut edges of water-resistant backing boards.

2.6 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials of the type and grade recommended by the gypsum board manufacturer.

B. Adhesives: Commercial adhesives; ASTM C 557.

1. Laminating: Special adhesive or joint compound specifically recommended by the gypsum board manufacturer for laminating gypsum boards.

2. Water-Resistant: Type I, organic adhesive for ceramic tile; ANSI A136.1.

C. Blocking and backing Plates: Provided by the trade responsible for Section 09110; located by the appropriate trade or as indicated below.

1. Casework and Other Trades: 14 gage galvanized steel, minimum; 3" wide x length required.

2. Plumbing: Size as required for the relevant wall-hung fixture.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates, blocking and backing plates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect the satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PRE-INSTALLATION MEETING

A. Prior to commencing work, meet on-site with the Owner=s representative and all concerned trades to review the work required by this Section.

3.3 GENERAL REQUIREMENTS

A. Install in accordance with reference standards, manufacturer=s instructions, product technical bulletins, product catalog and product carton instructions and as required to comply with seismic requirements.

B. Install supplementary framing, blocking and bracing at terminations in gypsum board assemblies to support fixtures, equipment, heavy trim, grab bars, toilet accessories, cabinetry, furnishings and similar construction.

C. Install metal framing and gypsum board to enclose all pipes, ducts, conduit, etc. which would otherwise be exposed in finished areas, regardless of whether or not furring is shown or indicated on the Drawings.

D. Enclosures to receive recessed light fixtures in fire-rated ceilings shall conform to U.L. requirements for materials and assemblies. Provide U.L. Design No. P251 enclosures over all types of recessed lights.

E. Defects which appear in the work due to faulty workmanship and / or materials, shall be repaired and refinished with materials and in a manner to meet the requirements of this Section.

3.4 GYPSUM BOARD INSTALLATION REQUIREMENTS

A. Application and Finishing Standards: Install in accordance with manufacturer=s published instructions, GA-201, GA-216 and ASTM C 840.

B. Install sound attenuation blankets as indicated, prior to the application of gypsum boards unless the blankets can be readily installed after the boards have been installed.

C. Locate exposed end-to-end butt joints as far as possible from the center of walls and ceilings, and stagger not less than 1'-0" in alternate courses.

D. Install ceiling boards in the direction and in a manner that will minimize the number of end-to-end butt joints and avoid end joints in the central area of each ceilings. Stagger end joints at least 1'-0".

E. Install wall / partition boards vertically to avoid end-to-end butt joints to the extent possible. Use boards of maximum practical lengths; where applicable stagger end joints. Cut and saw all openings; do not core and punch. Apply edge bead to all exposed edges and outside corners.

F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force boards into place.

G. Locate either edge or end joins over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so both tapered edge joints abut, tapered edges against tapered edges and mill-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends.

H. Stagger vertical joint over different studs on opposite sides of partitions.

I. Attach gypsum boards to supplementary framing and blocking provided for additional support at openings and cutouts.

J. Isolate perimeter of non-load bearing gypsum board partitions at structural abutments. Provide 1/4" to 1/2" space and trim edges with AJ@ type, semifinished, edge trim. Seal joints with acoustical sealant.

K. Form control joints and expansion joints with space between edges of boards prepared to receive trim accessories.

L. Space fasteners in boards in accordance with referenced standards and manufacturer=s recommendations, except as otherwise indicated.

3.5 GYPSUM BOARD INSTALLATION METHODS

A. Single Layer Applications:

1. Install single layer gypsum board in the most economical direction, with edges and ends attached to firm bearing surfaces; panel ends aligning and parallel with framing members.

2. Apply gypsum board on walls and partitions vertically unless indicated otherwise, and provide sheet lengths that will minimize the number of end-to-end butt joints.

3. Apply gypsum board on furring with no end joints. Locate edge joints over furring members.

4. Apply gypsum board on ceilings prior to application on walls and partitions, to the greatest extent possible.

5. Treat cut edges, holes, fastener heads and joints, including those at angle intersections in water-resistant gypsum board, cement board and gypsum sheathing at exterior ceilings and soffits with the specified joint compound. Treat prior to installation.

6. Do not align panel joints with edges of openings.

B. Wall Tile Base: Where gypsum board is the base for thin-set ceramic tile and similar rigid applied wall finishes, install paperless tile backing boards.

C. Showers, tubs and similar Awet@ areas: Install paperless tile backing boards. Apply with uncut long edges at the bottom of the work, and space 1/4" above fixture lips. Seal ends, cut edges and penetrations of each piece with water-resistant adhesive or, where recommended by the backing board manufacturer, with water-resistant joint compound.

D. Double Layer Applications: Install gypsum backing board as the base layer and exposed gypsum board for the face layer.

1. Apply base layer on ceilings prior to application of the base layer on walls / partitions; apply face layers in the same sequence. Offset joints between layers at least 10". Apply base layers at right angles to supports unless indicated otherwise.

2. Apply base layer and face layer on walls / partitions [vertically] [horizontally] with joints of the base layer over supports and face layer joints offset at least 10" with base layer joints.

3. Apply base layer on furring members [vertically] [horizontally] and the face layer either [vertically] [horizontally] with vertical joints offset at least one furring member. Locate edge joints of the base layer over furring members.

E. Single Layer Fastening Methods: Secure boards to supports as follows:

1. Install fasteners from the center of the panel field toward the ends and edges. Install fasteners 3/8" from ends and edges of panels, and as follows:

a. Ceiling: 12" on center, perimeter and field.

b. Walls: 12" o.c. in the field of walls and 8" o.c. at vertical joints.

F. Double Layer Fastening Methods: Apply base layer of gypsum board and face layer to the base layer as follows:

1. Fasten both the base layer and face layer to supports separately with screws.

G. One-Hour Fire-Rated Chase Walls: Install framing studs, shaftliner and face layers in strict accordance with the manufacturer=s instructions and the Building Code

H. Sound-Rated Walls: Where work is indicated, including double layer work and work on resilient furring, seal the work at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions.

1. Comply with the manufacturer=s recommendations for location of beads, and close off sound-flanking paths around and through the work, including sealing of partitions above acoustical ceilings. Provide sound insulation at ceilings where walls do not extend to the slab above.

I. Acoustical Sealant Application: Comply with the details indicated or if not indicated, comply with applicable published recommendations of the AGypsum Construction Handbook@ by the United States Gypsum Company.

J. Inspection of Acoustical Partitions: Gypsum board partitions with a STC rating of 52 or higher shall not be closed and finished until inspected and approved by the Owner=s representative.

K. Shower Room Ceilings: Install paperless gypsum board in accordance with the manufacturer=s instructions. Reinforce all joints with glass mesh tape and coat the entire surface with a recommended compound to provide a smooth, even finish over the entire surface.

3.6 GYPSUM BOARD TRIM INSTALLATION

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as used to fasten the gypsum boards to supports. Otherwise, fasten flanges by nailing or stapling in accordance with the manufacturer=s instructions and recommendations.

B. Install plastic corner beads at external corners. Use the longest practical lengths. Place edge trim where panels abut dissimilar materials.

C. Install plastic edge trim wherever the edge of gypsum board would otherwise be exposed or semi-exposed. Provide the type with face flanges to receive joint compound except where semi-finishing type is indicated. Install AL@ trim where work is tightly abutted to other work and install special kerf-type where other work is kerfed to receive the long leg of AL@ trim. Install AJ@ trim where the edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

D. Install semi-finishing trim where indicated, and where exterior gypsum board edges are not covered by applied moldings or indicated to receive trim with face flanges covered with joint compound.

E. Install plastic edge trim or pre-finished internal corners where indicated on wall panels at junctures with ceilings.

F. Install control joints where indicated.

3.7 GYPSUM SHEATHING INSTALLATION

A. Install gypsum sheathing in accordance with the manufacturer=s instructions, GA-201, GA-216 and GA-600.

1. Install single layer gypsum sheathing horizontally, with edges butted tight, tongue up with attachment to firm bearing.

B. Provide construction control joints at a maximum of 30 feet o.c., at inside corners and at all intersections.

1. Install sheathing with 1/4" space between the edge of the sheathing and adjacent walls, beams, columns, and fascia construction.

C. Install screws at 12" o.c., maximum, to secure sheathing to the supporting substrate.

D. Protect all exposed gypsum cores at perimeter edges and penetrations by covering the core with trim.

E. Place edge trim where sheathing abuts dissimilar materials. Use longest practical lengths.

3.8 JOINT TREATMENT

A. Reinforce interior and exterior corners at ceiling and wall surfaces.

B. Apply 2" wide coated glass fiber tape at cement backer board corner joints.

C. Install control joints the full height of partitions consistent with the lines of building spaces, with 1/4" gap between panels. Apply sealant at the back of the joint and a control joint accessory at the face.

D. Apply 3" wide initial coating of joint compound, press tape firmly into the compound; wipe off excess compound. Apply a second coat of joint compound with tools of sufficient width to extend beyond the joint center approximately 4". Draw the joint compound down to a smooth even plane.

E. Sand after the second and third applications of joint compound. Do not raise the nap of the paper when sanding.

F. Feather coats onto adjoining surfaces with a maximum camber of 1/32" in 12".

G. After drying or setting, sand or sponge joints, edges, and corners, eliminating high spots and excessive compound to produce a smooth finish surface.

H. Prepare surfaces to receive subsequent finishes to a height of 6" above the finished ceiling.

3.9 GYPSUM BOARD FINISHING

A. General:

1. Refer to Sections on painting, coatings and interior design documents for decorative finishes to be applied to gypsum board work. Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare the work for decoration.

2. Prefill open joints and rounded or beveled edges, if any; use the type of compound recommended by the manufacturer.

3. Apply joint tape at joints between gypsum boards except where a trim accessory is indicated. Apply joint compound in three (3) coats (not including prefill of openings in the base); sand between the last two coats and after the last coat.

B. Skim Coat: Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, apply a thin skim coat of joint compound over the entire gypsum board surface, after the three-coat joint and fastener treatment has been completed and is dry.

C. Base for Acoustical Tile: Where gypsum board is indicated as the base for adhesively-applied acoustical tile, install tape and two (2) coats compound treatment, without sanding.

D. Paperless Tile Backing Board or Cement Board Base for Ceramic Tile:

1. Comply with recommendations of the backing board manufacturer for the treatment of joints behind ceramic tile.

2. In areas to be tiled, treat fastener heads with water-resistant joint compound. Fill tapered edges in gypsum panels with water-resistant joint compound, embed joint tape firmly and wipe off excess compound; follow immediately with a second coat of water-resistant joint compound over the taping coat; do not crown the joint. Fold and embed tape in all interior corners to form true angles.

3. In areas not to be tiled, treat fastener heads and embed tape as indicated above using water-resistant joint compound but finish with two (2) coats of the joint compound used for regular gypsum board work.

3.10 GYPSUM BOARD FINISH LEVELS

A. Apply finish in accordance with the manufacturer's published instructions and GA-214 Finish Levels.

1. Level 1: All joints and interior angles shall have tape embedded in joint compound. Surfaces shall be free of excess joint compound. Tool marks and ridges are acceptable.

a. Application: In plenum areas above ceilings, in attics, in mechanical rooms, in areas where the assembly is generally concealed and in other areas not normally exposed to view. Accessories not required unless shown or required by the rating. Where a fire-resistance rating is required for the gypsum board assembly, the details of construction shall be in accordance with reports of the fire tests of assemblies that have met the fire-rating requirement.

2. Level 2: Embed tape and apply a separate first coat of joint compound to the tape, fasteners and trim flanges.

a. Application: Where panels are the substrate for tile.

3. Level 3: Embed tape and apply separate first and fill coats of joint compound to the tape, fasteners and trim flanges.

a. Application: At surfaces scheduled to receive medium- or heavy-textured finishes or heavy wall coverings before painting.

4. Level 4: Embed tape and apply separate first, fill and finish coats of joint compound to the tape, fasteners and trim flanges.

a. Application: At panel surfaces in mechanical and electrical spaces not exposed to public view.

5. Level 5: Embed tape in joint compound at all joints and interior angles and apply three (3) separate coats of joint compound over all joints, angles, fastener heads and accessories. A thin skim coat of joint compound or a material manufactured especially for this purpose shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges. Prepared surfaces shall be coated with a primer / sealer prior to the application of finish paint. Refer to Specification Section 09900 - Painting.

a. Application: For use where gloss, semi-gloss, enamel and non-textured flat paints are specified, or where severe lighting conditions occur. Generally in all public areas exposed to view, except where noted otherwise, to provide a uniform surface and minimize the possibility of

joints telegraphing and fasteners showing.

3.11 CONSTRUCTION

A. Interface with Other Work:

1. Coordinate the installation of firestopping materials specified in Section 07840 at penetrations through fire-resistive rated gypsum board walls, partitions and ceilings.

2. Coordinate the installation of joint sealers specified in Section 07900 at penetrations of non-fire-restive rated walls, partitions and ceilings.

3.12 PROTECTION

A. Protect other work and finishes from damage by the gypsum board work.

B. Provide protection and maintain conditions which will ensure that the gypsum board work will be without damage and deterioration at the time of Substantial Completion.

3.13 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installed work for alignment, attachment to the structure, backing plates and openings for installations by other trades.

3.14 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean and remove all debris from the Project Site.

C. Leave the entire Project clean.

END OF SECTION

SECTION 09300

TILE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Floor tile and base tile.

2. Quarry floor and base tile.

3. Ceramic wall tile, shapes and trim units.

4. Porcelain floor tile.

5. Stair tile.

6. Marble threshold.

7. Mortar and grout.

8. Sealer.

9. Metal edge strips.

10. Waterproofing membrane.

11. Tile feature strips and patterns set in paving.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for application.

2. Section 04230 - Reinforced Unit Masonry: Substrate for application.

3. Section 09250 - Gypsum Board: Substrate for application.

4. Section 07900 - Joint Sealers: Sealant at tile penetrations and dissimilar materials.

1.2 DESCRIPTION OF WORK

A. The extent of the tile work is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing floor, base and wall units made from clay and other ceramic materials, marble thresholds, waterproofing membrane under tile, metal edge strips, mortar and grout, sealing of expansion and other joints, and feature strips, patterns and accent tiles.

B. Definition: The term Atile@ includes ceramic surfacing units and trim made from clay or

other ceramic materials.

C. Joint sealants are specified in Section 07900 - Joint Sealers.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American National Standards Institute (ANSI):

1. ANSI A108.4 - Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive.

2. ANSI A108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.

3. ANSI A108.10 - Installation of Grout in Tilework.

4. ANSI A118.1 - Specifications for Dry-Set Portland Cement Mortar.

5. ANSI A118.4 - Specifications for Latex-Portland Cement Mortar.

6. ANSI A118.6 - Specifications for Standard Cement Grouts for Tile Installation.

7. ANSI A136.1 - Organic Adhesives for Latex Portland Cement Mortar.

8. ANSI A137.1 - Specification for Ceramic Tile.

C. American Society for Testing and Materials (ASTM):

1. ASTM C 373 - Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products.

2. ASTM C 482 - Test Method for Bond Strength of Ceramic Tile to Portland Cement Plaster.

3. ASTM C 485 - Test Method for Measuring Warpage of Ceramic Tile.

4. ASTM C 499 - Test Method for Facial Dimensions and Thickness of Flat, Rectangular Ceramic Wall and Floor Tile.

5. ASTM C 501 - Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.

6. ASTM C 502 - Test Method for Wedging of Flat, Rectangular Ceramic Wall and Floor Tile.

7. ASTM C 648 - Test Method for Breaking Strength of Ceramic Tile.

8. ASTM C 650 - Test Method for Resistance of Ceramic Tile to Chemical Substances.

9. ASTM C 1028 - Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

E. Tile Council of America, Inc. (TCA):

1. Handbook for Ceramic Tile Installation.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s technical information and installation instructions for the materials required.

2. Shop Drawings: Layout drawings and details for proper installation of the work.

3. Samples:

a. Initial Selection:

1) Manufacturer=s color charts of actual tiles or sections of tile showing the full range of colors, textures and patterns available for each type of tile indicated.

2) Grout and accessories requiring color selection.

b. Final Selection:

1) Full size samples of each type of tile and each color and texture selected.

2) Full size samples of each type of trim, accessory, and for each color.

3) Marble thresholds, 6" long.

4) Stair tread and nosing, full size.

5) Metal edge strip, 6" long.

4. Mock up:

a. Waterproof membrane.

b. 30 SF of tile for pattern and joint width conformation.

c. Expansion and control joints and metal edge strip installations.

5. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified

qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Extra Products: Provide extra products as specified herein below.

1.5 COORDINATION

A. Pre-Installation Meeting: Convene a Pre-Installation Meeting at the Project Site prior to beginning the work of this Section.

1. Require attendance of the Contractor, Owner=s representative, Architect, and all impacted trades.

2. Review coordination and environmental controls required for proper installation and ambient conditions in the areas to receive tile work.

3. Review preparation and installation procedures, and the coordination and scheduling required with the related work.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Provide materials from a single source for each type and color of tile, grout, setting material and accessory.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver tile and setting material to the Project Site in the manufacturer=s original, unopened cartons, bearing the name of the manufacturer, the certification mark of the Tile Council of America, and ready for use.

C. Store materials under cover in a manner to prevent damage and contamination.

D. Prevent damage and contamination of materials by water, foreign matter and other causes.

1.8 JOB CONDITIONS

A. Environmental Requirements:

1. Maintain adequate lighting for the installation of tile work. Lighting level shall be equal to permanent lighting level designed for areas receiving the tile work.

2. Maintain sufficient ventilation in areas where the work of this Section is being performed to allow the ceramic tile to properly set.

3. Maintain environmental conditions and protect the work during and after installation to comply with the referenced standards and the manufacturer=s printed recommendations.

1.9 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Extra Products: Upon completion of the installation, deliver to the Owner=s representative, replacement materials from the same production run as the installed materials; 2% of the total amount of each size, style and color.

PART 2 PRODUCTS

2.1 GENERAL

A. ANSI Standard For Ceramic Tile: Comply with ANSI A137.1 for the types and grades of tile indicated.

B. ANSI Standard For Tile Installation Materials: Comply with the ANSI Standard referenced with the installation products and materials indicated.

C. Colors, Texture and Patterns: For tile and other products requiring the selection of colors, surface textures and other appearance characteristics, provide products to match the characteristics indicated or, if not otherwise indicated, as selected from the manufacturer=s standards.

D. Mounting:

1. Where factory-mounted tile is required, provide back or edge mounted tile assemblies as standard with the manufacturer, unless another mounting method is indicated.

2. Where tile is indicted for installation in pools, fountains or at exterior or in wet areas, do not use back or edge mounted tile assemblies unless the tile manufacturer specifies that such type of mounting is suitable for that kind of use and has been successfully used on other projects.

E. Trim Units: Provide tile trim units to match the characteristics of the adjoining flat tile and to comply with the following requirements:

1. Size: As indicted, coordinate with the sizes and coursing of the adjoining flat tiles, where applicable.

2. Shapes: As follows, selected from the manufacturer=s standard shapes:

a. Base for Portland Cement Mortar Installations: Coved.

b. Base for Thinset Mortar Installations: Coved.

c. Wainscot Cap for Thinset Mortar Installations: Surface bullnose.

d. External Corners for Thinset Installations: Surface bullnose.

e. Internal Corners: Internal cove with cap angle designed to member with

the stretcher shapes.

f. Stair tread with nosing.

F. Coefficient of Friction (COF): ADAAG recommends a 0.6 or higher coefficient or higher in dry conditions to meet ADAAG requirements. Typically the COF is indicated in a wet and a dry number under those conditions for the average of the test results. In a situation where there is a potential for water, the tile should meet the COF of 0.6 or higher under wet conditions. ADAAG recommendation for COF on a ramped surface is 0.8. Static coefficient of friction tests are performed according to ASTM C 1028.

2.2 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturer's offering products which may be incorporated into the work include the following:

1. Tile:

a. Daltile Median

b. Approved Substitution

2. Mortar and Grout:

a. Hydroment by Bostik.

b. LATICRETE.

c. MAPEI, Corp.

3. Latex-Portland Cement Mortar and Grout:

a. ProSpec (formerly Bonsal).

b. Hydroment by Bostik.

c. LATICRETE.

d. Summitville Tiles, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.3 TILE, GENERAL

A. Tile: ANSI A137.1.

1. Stain Resistance, CTI Stain Test: Unstainable.

2. Surface Water Absorption, ASTM C 373: 0.5% Max.

3. Abrasive Wear, ASTM C 501: 100.

4. Breaking Strength, ASTM C 648: 250 lbs.

5. Bond Strength, ASTM C 482: 50 psi.

6. Facial Dimension (range), ASTM C 499: 1.5% Max.

7. Range of Thickness, ASTM C 499: 0.04" Max.

8. Warpage (Diagonal), ASTM C 485: ∀0.75% Max.

9. Wedging, ASTM C 502: 1% Max.

10. Chemical Resistance, ASTM C 650: Unaffected.

11. Coefficient of Friction, ASTM C 1028:

    a. Dry > 0.7.

    b. Wet > 0.6.

12. Scratch Hardness, Moh's Scale: ≥ 8.

2.4 QUARRY TILE

A. Dal-Tile, quarry tile, 4" x 8", or size and shape as selected.

B. Color as selected.

2.5 PORCELAIN CERAMIC TILE.

A. 12" x 24" porcelain wall and floor tile.

B. Color as selected.

2.6 WATERPROOF MEMBRANE

A. Liquid Applied Membrane: Thin, load-bearing, flexible waterproofing system, self-curing liquid rubber polymer, cold-applied with integral reinforcing fabric to form a seamless membrane.

B. LATICRETE #9235 Waterproofing Membrane by LATICRETE or approved equal.

2.7 MISCELLANEOUS MATERIALS

A. Metal Edge Strip: Brass or stainless steel, as selected; 1/8" wide at the top edge with integral provision for anchorage to mortar bed or substrate, unless otherwise indicated. Style to be as indicated, or appropriate to the use; as manufactured by Schluter Systems, or approved equal. Style to be as appropriate for the use intended

B. Wall Access Panel: Schluter-REMA by Schluter Systems or approved equal.

C. Adhesives: Water-resistant organic; ANSI A136.1.

D. Water: Clean and potable.

E. Reinforcing Mesh: 2" x 2", 16 gauge, galvanized, welded wire.

F. Tile / Grout Sealer: Non-flammable, water-soluble, penetrating methyl siliconate clear solution, stain-resistant, matte sealer.

G. Tile, Grout and Masonry Cleaner: As approved by the tile, grout and sealer manufacturers.

H. Floor Transition Strip: Aluminum Square, Tee, and Reducer shapes as required.

2.10 MORTAR AND GROUT MIX

A. Mix and proportion mortar and grout materials in strict accordance with the manufacturer's instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates slope to drains and conditions are as required, and ready to receive the work.

1. Examine areas to be covered for surface contamination which requires correction before work begins.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Do not use sealers or curing compounds on concrete slabs to be covered with tile. Slabs shall be covered and wet cured for a minimum of seven (7) days. Surfaces to receive tile installed by the thin set method shall have a wood float finish, be true to within 1/8" in 10 feet, and pitched to drains where required.

B. Areas requiring fill, patching or leveling shall be prepared by the General Contractor. Do not use gypsum or asphalt leveling compounds.

C. Seal substrate surface cracks with filler.

D. Clean substrate surfaces to remove dust, dirt, mortar, etc.

E. Surfaces to be covered shall be left clean, free of dust, plaster, sealer or curing compounds and form oil. Any such contamination shall be removed by the responsible trade.

F. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

G. Protect surrounding work from damage or disfiguration.

H. Vacuum clean existing substrate and damp clean.

I. Wet down or wash and remove excess water from dry or dusty concrete or masonry surfaces just prior to the application of pavers.

3.3 INSTALLATION

A. Installation Methods: Install ceramic tile in accordance with the TCA, AHandbook for Ceramic Tile Installation@, ANSI A108.4, and ANSI A108.5.

B. Waterproof Membrane: Install waterproof membrane for all elevated slab floors exposed to water or wind blown rain. For example, install at elevated slabs where Showers, Baths, Kitchens, washing and other wet activities occur; and at terraces and roofs over interior spaces.

1. Contractor shall obtain architect or owner=s representative approval of membrane prior to proceeding with the work.

C. Installation by Thick Bed Method:

1. Spread mortar to approximately one-half the desired bed thickness, then place reinforcing mesh. Lap mesh 3", minimum, and place additional mortar over the mesh to bring the bed to the desired thickness. Rod and compact mortar with a steel trowel. The setting bed shall be, minimum, 1-1/2" thick.

a. Note: The setting bed may be reduced to a nominal 1" thickness and the reinforcing omitted when bonding directly to concrete slabs or a load-bearing membrane.

2. Before placing tile on a green or wet screed bed, apply a slurry of bond coat to the mortar bed using a flat trowel.

3. Tile shall be placed in the wet slurry coat before the surface dries, or apply a slurry bond coat applied to the back of each tile just prior to placing the tile on the bed.

4. Before the mortar takes initial set, place and beat each tile into place with a wooden block or rubber mallet to embed it and to even the surface.

5. Maintain uniform joint widths.

6. The surface shall be pitched to drains, where indicated, or as required.

7. On hardened screed or mortar bed, tiles may be installed by the thin set method if proper tolerances are provided.

D. Installation by Thin Set Method:

1. Apply mortar with a notched trowel using a scraping motion to work the material into good contact with the substrate to be covered. A trowel having notches approximately 1/4" x 3/8" is recommended for pavers. Apply only as much mortar as can be covered within 30 minutes, or while the surface is still tacky.

2. Trowel a small quantity of mortar onto the back of each piece of tile. Set the tile in place and tap with a small beating block to ensure 100% full bedding and a true surface.

3. Align tile to provide uniform joints and then allow to set until firm.

4. Clean excess mortar from the surface of tiles with a wet cloth or sponge while the mortar is still fresh.

E. Mortar:

1. Machine Mixing: Mortar mixer shall be the rotating blade type. Place mixing liquid in the mixer, start the machine and add sand, then cement. Mix only long enough to wet out the batch. Stop the mixer and dump the mortar promptly. Do not overmix.

2. Hand Mixing: Pre-mix the dry ingredients (sand and cement). Place mixing liquid in a clean container or mixing box, add the dry materials and mix. Adjust the amount of liquid or dry materials to obtain the proper consistency.

F. Joints: 1/8" width for tiles less than 12"; 3/16" for tiles to 25"; 1/4" for quarry tile.

G. Expansion and Control Joints:

1. Existing joints in concrete subfloors must be carried through the tile and shall conform to the architectural details.

2. Expansion joints shall be installed where tile abuts restraining surfaces, such as perimeter walls, curbs, columns, corners, etc.

3. Interior installations shall have expansion joints spaced a maximum of 30 feet o.c. in both directions. Exterior areas shall have expansion joints spaced a maximum of 15' in both directions. Expansion joints shall be raked out or cut through the setting bed to the supporting slab or structure below.

H. Edge Strips: Install at transitions to other flooring materials, for control joints, or as indicated.

I. Grouting and Pointing Joints:

1. Joints shall be grouted or pointed with Latex-Portland Cement Grout or Epoxy Grout.

2. Joints shall be packed full and free of voids and pits. Tool or rake as specified.

3. Excess mortar shall be cleaned from the surface of tiles with water and a damp sponge as the work progresses, while the mortar is fresh and before it hardens.

J. Provide a slope in tile setting material as required to slope surfaces at floor transitions and floor drains.

K. Lay tile to the pattern indicated. Do not interrupt the tile pattern through wall openings.

L. Cut and fit tile to penetrations through the tile leaving a sealant joint space. Form corners and bases neatly. Align floor, base, and wall joints.

M. Place tile joints uniform in width, subject to variance in the tolerance allowed in the tile size. Make joints watertight, without voids, cracks, excess mortar or excess grout.

N. Sound the tile after setting. Replace hollow sounding units.

O. Expansion, Contraction, Control Joints and Separation: Install tile and a pair of metal edge strips in accordance with the applicable TCA Handbook methods. Keep joints free of adhesive, mortar, and grout; seal. Refer to Section 07900 - Joint Sealers.

P. Allow tile to set for a minimum of 48 hours prior to grouting.

Q. Grout tile joints in accordance with ANSI A108.10.

R. Caulk plumbing penetrations thru floor tiles and plumbing and electrical penetrations thru wall tiles.

S. Apply sealant to the junction of tile and dissimilar materials and at the junction of dissimilar planes as specified in Section 07900 - Joint Sealers. Apply in strict accordance with the manufacturer=s instructions.

T. Install metal edge strips at transitions to other flooring materials, and where tile edges are exposed. Lock solidly into the setting bed.

3.4 INSTALLATION SCHEDULE

A. Paver Tiles: Install by thick (mortar) bed method. Place waterproof membrane under exterior pavers with occupiable space below. Apply sealer per manufacturer=s instructions.

B. Quarry Tiles: Install by thin set on hardened thick bed method at Freezer floors; thick bed method at Kitchens; thin set at Bars. Place waterproof membrane at Dishwashing, garbage areas and exterior spaces over structural slabs and other wet areas.

C. Ceramic Tiles: Install by thin set or thick (mortar) bed method. Place waterproofing membrane at Baths, Shower Rooms, areas on structural slabs subject to wind blown water and other wet areas.

3.5 TOLERANCE

A. Maintain an even and flat plane with variation not to exceed 1/8" in 8 feet. Adjacent tile shall be flush with no protruding or recessed tile edges. The tiles shall be cut neatly and fit to built-in work, penetrations, corners, changes in elevations and other variations.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for joint widths, alignment, edge treatments, sound bonding to the substrates.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Upon the completion of placement and grouting, clean all ceramic tile surfaces free of foreign matter.

C. Remove excess mortar and grout from floor, base, and wall surfaces without damaging the surfaces.

D. Clean unglazed tiles with acid solutions only when permitted by the tile and grout manufacturer=s printed instructions, but not sooner than fourteen (14) days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from the effects of acid cleaning. Flush surfaces with clean water before and after cleaning.

E. Clean tile only with cleaning materials recommended by tile and grout manufacturers.

F. Remove hardened grout film or haze using Laticrete TC-500, Grout and Masonry Cleaner.

1. Saturate grout joints with water, then dampen the surface with the cleaner.

2. Allow to soak 15 - 30 minutes and then use a power scrubbing machine with a coarse texture nylon pad to remove the grout film.

G. Clean unglazed pavers by sprinkling fine sand (30 - 60 mesh) over the surface before scrubbing.

1. Caution: Do not use sand on soft glazed tiles.

H. Do not use acid type cleaners on colored grout joints.

I. Leave finished installations clean and free of cracked, chipped, broken, un-bonded and otherwise defective work.

3.8 PROTECTION

A. When recommended by the tile manufacturer, apply a protective coat of neutral protective cleaner to the completed floor and wall tiles.

B. Protect installed tile work with kraft paper or other heavy covering to prevent staining, damage and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven (7) days after grouting has been completed.

D. Immediately before final inspection, remove the protective coverings and rinse the neutral cleaner from the tile surfaces.

E. Before final inspection, remove protective coverings and rinse neutral cleaner from the tile surfaces.

END OF SECTION

SECTION 09510

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Suspended metal grid ceiling system.

2. Perimeter trim.

3. Acoustical ceiling panels, suspended.

4. Acoustical ceiling panels, adhered to substrate.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 07900 - Joint Sealers: Caulking of joints between perimeter trim and vertical surfaces.

2. Section 15850 - Air Outlets and Inlets: Air diffusion devices in the ceiling system.

3. Section 16510 - Interior Luminaires: Light fixtures attached to the ceiling system.

1.2 DESCRIPTION OF WORK

A. The extent of acoustical ceilings work is indicated on the Drawings and as specified herein, and includes providing and installing suspended metal ceiling grid, perimeter trim, acoustical panels, hanger devices, sealants and accessories for complete adhered and suspended ceiling systems.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 641 - Specification for Zinc-Coated (Galvanized Carbon Steel Wire.

2. ASTM C 635 - Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

3. ASTM C 636 - Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

4. ASTM D 1779 - Specification for Adhesive for Acoustical Materials.

5. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

6. ASTM E 400 - Test Method for Analysis of Ores, Minerals, and Rocks by the Fire Assay Preconcentration Optical Emission Spectroscopy.

7. ASTM E 413 - Classification for Rating Sound Insulation.

8. ASTM E 580 - Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

9. ASTM E 795 - Practices for Mounting Test Specimens During Sound Absorption Tests.

10. ASTM E 1264 - Classification for Acoustical Ceiling Products.

C. International Building Code (IBC):

1. Applicable edition in the Project jurisdiction.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product specifications and installation instructions for each suspension system and type of seismic brace, and each acoustical ceiling material required; certified laboratory test reports and other data as necessary to show compliance with these Specifications.

2. Shop Drawings: Four (4) sets of accurate layout drawings based on actual field measurements. Indicate all mechanical and electrical items, access panels and other items to be installed in the finished ceiling including seismic bracing locations.

3. Samples:

a. Two 6" x 6" square samples of each acoustical unit required, showing the full range of exposed pattern, texture and color to be expected in the finished work.

b. Two 12" long samples of each exposed runner.

c. Two 12" long samples of each edge molding.

4. Assurance / Control Submittals.

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

5. Maintenance Information: Manufacturer=s recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 COORDINATION

A. Coordinate layout and installation of the suspension system components and acoustical ceilings with other work supported by or penetrating through the ceilings, including light fixtures, HVAC equipment, fire-suppression system components, and partition systems, if any.

B. Furnish layouts for inserts, clips and other supports required to be installed by other trades for support of acoustical ceilings.

1. Furnish concrete inserts, steel deck hanger clips and similar devices to other trades for installation well in advance of the time needed for the coordination of other work.

C. Interface with Other Work:

1. Schedule the installation of acoustical units after all interior wet work has been completed.

2. Install after all major above ceiling work has been completed.

3. Coordinate the location of hangers with other work.

4. Do not install acoustical units until after the building has been enclosed, dust generating activities have ceased, overhead work is complete, tested and approved and the air conditioning system is operational.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience; acceptable to the manufacturer as shown by a current written statement from the suspension system manufacturer.

C. Fire Performance Characteristics: Provide acoustical ceiling components identical to those tested for the following fire performance characteristics, according to the ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify the acoustical ceiling components with appropriate marking by the testing and inspecting agency.

1. Surface Burning characteristics: Tested per ASTM E 84.

a. Flame Spread: 25 or less.

b. Smoke Developed: 50 or less.

D. Fire Resistance Ratings: As indicated by reference to the design designation in UL "Fire Resistance Directory" or "FM Approval Guide" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane, tested per ASTM E 119.

E. Fire-Rated Ceilings: Provide protection materials for lighting fixtures and air ducts to comply with the requirements indicated for a rated assembly; conform to UL requirements for materials and assemblies. Provide UL Design No. P 251 enclosures over all types of recessed lights.

F. Limitations: The ceiling and suspension system shall be installed with vertical and lateral seismic bracing as required by the building code. Ceilings shall not support materials or other building components. Ductwork, grilles, light fixtures, plumbing and like work shall have their own support system and shall not use the ceiling system or ceiling suspension wires for support.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened containers, dry and undamaged, with the brand name and type clearly marked.

C. Store under cover in dry, weathertight conditions.

D. Protect against damage from moisture, direct sunlight, surface contamination and other causes.

E. Handle acoustical ceiling units carefully to prevent chipping of edges and damage to the units in any way.

1.8 JOB CONDITIONS

A. Do not install acoustical ceiling units until the space has been enclosed and weatherproof, wet work in the space is completed and nominally dry, work above the ceiling is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

B. Maintain a uniform temperature range of 60E - 85E F and relative humidity of no more than 70%, continuously, prior to, during and after installation.

1.9 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty jointly signed by the manufacturer and the installer certifying that the products and the installation is free of defective materials and workmanship and will repair or replace any defective component or the system, in whole or in part, as necessary to restore the product to its original intended state and integrity.

2. Warranty Period: Ten (10) years from the date of Substantial Completion, subject to conditions.

1.10 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Extra Materials: Provide not less than 5% of each type, size and color of acoustical ceiling panels, from the same manufacturer as the materials installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Suspension System: Subject to compliance with the Project requirements, manufacturers offering specified items which may be incorporated into the work include the following:

1. Armstrong Building Products (Armstrong World Industries, Inc.).

2. Chicago Metallic Corp.

3. USG Interiors, Inc. (USG Corp.).

B. Acoustical Panels: Subject to compliance with the Project requirements, manufacturers offering the specified items which may be incorporated into the work include the following:

1. Armstrong World Industries, Inc.

2. USG Interiors.

3. Celotex Building Products Division (CertainTeed).

C. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 METAL CEILING GRID SUSPENSION SYSTEMS, GENERAL

A. Standard for Metal Suspension Systems: Intermediate duty, hot-dipped galvanized steel suspension grid of the type and finish indicated; comply with applicable requirements of ASTM C 635.

B. Edge Moldings and Trim: Metal or extruded plastic of the types and profiles indicated, or if not indicated, provide manufacturer=s standard molding for edges and penetrations of the ceiling which fits with the type of edge detail and suspension system indicated.

1. For lay-in panels with reveal edge details, provide a stepped edge molding which forms a reveal of the same depth and width as that formed between the edge of panels and flanges at exposed suspension members.

2. For circular penetrations of the ceiling, provide edge moldings fabricated to the diameter required to fit the penetration exactly.

C. Finishes and Colors: Provide manufacturer=s standard finish for the type of system indicated, unless otherwise required. For exposed suspension members and accessories with painted finish, provide the color indicated or, if not otherwise indicated, as selected from the manufacturer=s full range of standard colors.

1. High Humidity Finish: Comply with ASTM C 635 requirements for ACoating Classification for Severe Environment Performance@.

D. Attachment Devices: Size for five (5) times the design load indicated in ASTM C 635, Table 1, Direct Hung.

1. Concrete Inserts: Inserts formed from hot-dipped galvanized sheet steel and designed for attachment to concrete and for embedment in concrete, with holes or loops for attachment of hanger wires.

2. Surface Devices: Standard, hot-dipped galvanized, angle hangers, shot stud attached to concrete ceilings.

E. Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized for three (3) times the hanger design load indicated in ASTM C 635, Table 1, Direct Hung; not less than 12 gage for vertical hangers and lateral sway bracing.

F. Stiffner Braces: Manufacturer=s standard vertical struts or attachment to hanger wires to hold the suspension system in place during seismic events.

G. Hold-Down Clips for Non-Fire-Rated Ceilings: For exterior ceilings and for interior ceilings with lay-in panels weighing less than one pound per square foot, provide hold-down clips spaced at 2'-0" o.c. on all cross tees.

2.3 EXPOSED METAL CEILING GRID SYSTEM

A. Intermediate duty, hot-dipped galvanized steel, exposed AT@; 15/16" wide; one-hour fire rated; plug-in positive-lock connections, locking tee ends, main tees punched with cross tee and hanger wire holes, stabilizer bars, clips and splices, baked on paint finish; ASTM C 635. Color white, unless selected otherwise.

1. Model:

a. Prelude XL 15/16", Exposed Tee System by Armstrong.

b. 1200 Seismic System by Chicago Metallic Corp.

c. Donn Brand DX / DXL System by USG.

2. Moldings: [Angle] [Shadow] molding with exposed flange to match the grid system. Color to match the grid.

3. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.4 CONCEALED METAL CEILING GRID SYSTEM

A. Intermediate duty, hot-dipped galvanized steel, concealed, 15/16" wide, one-hour fire rated; plug-in positive lock connections, locking tee ends; ASTM C 635.

1. Model:

a. Prelude Concealed Tee System by Armstrong.

b. Donn Brand DXL, Concealed Ceiling Suspension System by USG.

2. Moldings: [Angle] [Shadow].

3. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.5 ACOUSTICAL CEILING UNITS, GENERAL

A. Standard for Acoustical Ceiling Units: Provide manufacturer=s standard units of the configuration indicated which are prepared for the mounting method designated and which comply with the requirements of ASTM E 400, including those indicated by reference to type, form, pattern, grade, noise reduction coefficient (NRC), ceiling attenuation class (CAC), light reflectance (LR), edge detail, and joint detail, if any.

1. Mounting Method for Measuring NRC: No. 7 (mechanically mounted on special metal support), ASTM E 400 mounting per ASTM E 795.

B. Sound Attenuation Performance:

1. Provide acoustical ceiling units with ratings for ceiling attenuation class (CAC) values of the range indicated as determined in accordance with ASTM E 413.

2. Provide acoustical ceiling units with ratings for ceiling sound attenuation class (STC) of the range indicated as determined according to AMA 1-II ACeiling Sound Transmission Test by Two-Room Method@ with ceilings continuous at partitions and supported by a metal suspension system of a type appropriate for ceiling units of the configuration indicated (concealed for tile, exposed for panels).

C. Colors, Textures, and Patterns: Provide products to match the appearance characteristics indicated or, if not otherwise indicated, as selected from the manufacturer=s standard colors, surface textures, and patterns available for acoustical ceiling units and exposed metal suspension system members of the quality designated.

2.6 ACOUSTICAL CEILING UNITS

A. General: The following product type numbers in parenthesis are those used on the Drawings.

B . (ACT-1): Mineral fiber, fire-resistant, Class A: flame spread 25 or less per ASTM E 1264, R-1.6, weight 1.0 lbs / sf, factory-applied vinyl latex paint finish, medium texture, non-directional, NRC .50 -.60, CAC 30 - 40, LR 0.80, angled tegular edge, 24" x 24" x 5/8". Color as selected.

1. Cortega, #816 by Armstrong.

2. Sandrift by USG.

3. Natural Fissured by Celotex.

4. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

C. (ACT-2): Mineral fiber, fire-resistant, Class A: flame spread 25 or less per ASTM E 1264, R-1.6, weight 0.9 lbs / sf, factory-applied vinyl latex paint finish, medium texture, non-directional, NRC .45-.55, CAC 30 - 40, LR 0.80, beveled edge, for concealed spline installations, 12" x 12" x 5/8". Color as selected.

1. Cortega, #745 by Armstrong.

2. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

D. (ACT-3): Ceramic and mineral fabric composite, fire resistant, Class A: flame spread 25 or

less per ASTM E 1264, R-1.4, weight 1.40 lbs / sf, scrubbable factory-applied vinyl plastic paint, sag resistant, fine fissured, perforated, NRC .50 -.60, CAC 35 - 39, LR 0.80, square edge, lay-in, 24" x 24" x 5/8". Color white.

1. Ceramaguard #607 by Armstrong.

2. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.7 MISCELLANEOUS MATERIALS

A. Tile Adhesive: Type recommended by the tile manufacturer, bearing UL label of Class 0 - 25 flame spread; comply with ASTM D 1779.

B. Tile Fasteners: Cadmium plated, type recommended by the tile manufacturer, length for not less than 1/2" penetration of substrate.

C. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints.

1. Tremco Acoustical sealant by Tremco Global Sealants.

2. USG Acoustical Sealant by United States Gypsum Co.

3. Chem-Calk 600 by Bostik.

4. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that the layout of hangers will not interfere with other work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Layout:

1. Locate the system on room axes according to the Reflected Ceiling Plan, as indicated on the Drawings, or establish layout to balance the border tile widths at opposite edges of each ceiling. Avoid the use of less than 1/2 width units at borders.

2. Where the acoustical ceiling continues thru a wall opening, continue the established pattern without interruption. One row of panels may be cut to less than full size, if necessary, to establish the pattern in the adjoining room.

B. Substrate Testing: Before installing adhesively applied tile on wet-placed substrates such as cast-in-place concrete or plaster, test and verify that the moisture level is below the tile manufacturer=s recommended limits.

C. Prior to installation, store acoustical units for 24 hours, minimum, at the same temperature and relative humidity as the space where the materials are to be installed.

3.3 INSTALLATION - GENERAL

A. Install materials in accordance with the manufacturer=s printed instructions, ASTM C 635 and ASTM C 636, in compliance with governing regulations, fire-resistance rating requirements as indicated, and industry standards applicable to the work.

3.4 INSTALLATION - CEILING SUSPENSION SYSTEM

A. General:

1. Install the suspension system with hangers supported only from the building structural members. Locate hangers not less than 6" from each end and spaced at 4'-0" o.c. along each carrying channel or direct-hung runnner, unless otherwise indicated.

2. Install metal hanger tabs and clips attached to the structure above where required for the attachment of suspension wires.

3. Secure wire hangers by looping and wire-tying, either directly to the structure or to inserts, eye-screws, or other devices which are secure, appropriate for the substrate, and which will not deteriorate or fail with age or temperature change.

4. Install hangers plumb and free from contact with insulation, ductwork and other objects within the ceiling plenum which are not part of the supporting structure or ceiling suspension system. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing. Where carrying members are spliced, avoid visible displacement of the face plane of adjacent members.

5. Install edge molding of the type indicated, at the perimeter of acoustical ceiling areas, at the intersection of the ceiling and vertical surfaces and at locations where necessary to conceal the edges of acoustical units. Use the longest practical lengths. Provide edge molding at junctions with other interruptions. Secure at 16" o.c., maximum.

6. Screw-attach moldings to the substrate at intervals not over 16" o.c. and not more than 3" from ends; level with the ceiling suspension system. Miter corners accurately and connect securely.

7. Rivet cross tee's to the edge molding at 48" o.c., typical.

8. In areas larger than 144 sq. ft., rivet the cross tees on two adjacent walls per ASTM E 580.

9. Do not support components on the main runners or cross runners if the weight causes the total dead load to exceed the allowable limits. Do not eccentrically

load the system or produce rotation of runners.

10. Install the system level, in a uniform plane, and free of twists, warp, dents, scratches, stains and other defects. Variation from Flat and Level Surface: 1/8" in 12 feet.

11. Caulk between the edge molding and adjacent vertical surfaces.

B. Vertical Support System:

1. Suspension wires shall be 12 gage, minimum, galvanized, attached to main runners at 4'-0" o.c., maximum, spacing in both directions.

2. Each wire shall be anchored to the structure above with a device capable of supporting 75 pounds, minimum.

3. Wires supporting fixtures shall be capable of supporting four (4) times the fixture weight.

4. Suspension wires shall not hang more than 1:6 out of plumb, unless counter sloping wires are provided.

5. Wires shall not be attached to or bend around interfering work such as piping, conduits or ductwork. Trapeze or equivalent devices shall be used where obstructions interfere with direct suspension. Trapeze shall be suspended back-to-back, 1-1/2" cold formed channels, minimum, for spans up to 6 feet.

C. Horizontal Support System:

1. Lateral support systems for ceilings shall be shown in detail on the Shop Drawings.

2. Adequacy of the system shall be demonstrated by calculations, and / or test results, including adequacy of main runner intersection connections. Tests shall show a capacity of twice the calculated load to provide a safety factor.

3. Provisions shall be made for possible differential movement between ceilings and side walls. The terminal ends of each main and each cross runner shall be wire supported. Wall trim angles shall not provide the primary support for runners.

4. Lateral support of ceilings shall not be provided by the angle trim, and runners shall not be riveted to the wall trim.

D. Lateral Force Bracing: Provide cross-bracing for ceilings greater than 144 sq. ft. in area.

1. Where substantiating calculations are not provided, horizontal restraints shall be provided by four No. 12 gage wires secured to a main runner within 2" of a cross runner intersection and splayed 90 degrees from each other at an angle not exceeding 45 degrees from the plane of the ceiling. A strut fastened to the main runner shall extended up to and be fastened to a structural member supporting the roof or floor above. The strut shall be adequate to resist the vertical force induced by the bracing wires. These horizontal restraint points shall be placed 12 feet o.c. in both directions with the first point within 6 feet of each wall. Attachment of the restraint wires to the structure shall be adequate for the load imposed.

3.5 INSTALLATION - ACOUSTICAL PANELS

A. Arrange acoustical units and orient directionally patterned units, if any, in the manner shown on the Drawings. If not indicated, install units with the pattern running in one direction only, as approved by the Owner=s representative.

B. Fit the acoustical units in place free of damaged edges, dents, scratches, stains and other defects; install level and in a uniform plane.

C. Hold Down Clips: For fire-rated and security areas, install clips spaced at 2'-0" o.c. on all cross tees. Do not install clips at panels for access and at one panel in each corner of a room.

D. Mark access panels with a black adhesive dot.

3.6 INSTALLATION - ACOUSTICAL PANELS ADHERED TO SUBSTRATE

A. Install acoustical panels in accordance with the panel manufacturer=s recommendations.

B. Apply adhesive in accordance with the adhesive manufacturer=s printed directions, unless directed otherwise.

C. Spread only enough adhesive to permit the installation of acoustical panels before initial set.

D. Scribe panels to walls, columns, junction boxes, and other appurtenances as necessary to produce tight joints.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the ceiling grid suspension system installation, connections to the structure, edge moldings and acoustical panel placement.

3.8 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust the grid for alignment and level.

C. Adjust the acoustical panels for proper fit within the grid.

3.9 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean exposed surfaces of the ceiling grid, perimeter trim, and acoustical panels.

C. Comply with the manufacturer=s instructions for cleaning and touch-up of minor finish damage.

D. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09624

FLUID-APPLIED ATHLETIC FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Sections Includes:

1. Fluid-applied athletic flooring.

2. Games lines.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for flooring.

2. Section 11480 - Athletic Equipment: Volleyball floor sleeves.

1.2 DESCRIPTION OF WORK

A. The extent of athletic flooring work is indicated on the Drawings and Schedules and as specified herein, and includes providing and installing fluid-applied flooring materials, transition strips, as necessary, and games striping.

B. Floor inserts for volleyball are to be provided and installed under Section 11480 - Athletic Equipment.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 501 - Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.

2. ASTM D 412 - Test Method for Vulcanized Rubber and Thermoplastic Rubber and Thermoplastic Elastomers - Tension.

3. ASTM D 471 - Test Method for Rubber Property - Effect of Liquids.

4. ASTM D 575 - Test Method for Rubber Properties in Compression.

5. ASTM D 2240 - Test Method for Rubber Property - Durometer Hardness.

6. ASTM D 2632 - Test Method for Rubber Property - Resilience by Vertical Rebound.

7. ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Section 01300 - Submittal Procedures: Procedures for submittals.

1. Product Data: Data describing physical and performance characteristics, textures and colors.

2. Samples: Submit cured samples of adequate size to show the applied thickness, texture, color and game striping.

3. Manufacturer=s Instructions. Complete instruction for application of athletic flooring system including any precautions or special handling instructions required to comply with OSHA 29 CFR 1910 - Subpart Z and the manufacturer=s material safety data sheets.

4. Manufacturer=s Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

5. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

6. Maintenance Data: Printed instructions for cleaning and maintenance.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Provide special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of ten (10) years documented experience.

2. Installer: Installation to be performed by a factory-approved applicator who has completed at least three (3) projects of similar size and complexity. Provide a written statement from the manufacturer that the installer is acceptable.

B. Manufacturer=s Material Safety Data Sheets: Submit manufacturer=s material safety data sheets for coatings, solvents, and other potentially hazardous materials.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements; Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened bags and containers, dry, undamaged, clearly labeled with the name of the manufacturer, type of

material, batch number and the date of manufacture.

C. Store the materials away from fire, sparks and smoking areas, and within temperature and humidity ranges recommended by the manufacturer.

1.7 JOB CONDITIONS

A. Concrete substrate to receive the athletic surfacing shall have cured for a minimum of sixty (60) days and shall have been free of water not less than seven (7) days. The moisture content shall be acceptable to the manufacturer.

B. Temperature in the area of installation must average a minimum of 65E F for one (1) week before, during, and for 72 hours after completion.

1.8 PROTECTION

A. Protect adjacent surfaces not scheduled to receive the athletic flooring by masking or other means to protect those surfaces from the flooring materials.

1.9 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Submit a written Warranty jointly signed by the manufacturer and the installer certifying that the products and the installation is free of defective materials and workmanship and agreeing to replace or repair any defective component or the system, in whole or in part, as necessary to restore the product to its original intended state and integrity.

2. Warranty Period: Three (3) years from the date of Substantial Completion.

1.10 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Maintenance Data: Maintenance procedures, recommended maintenance materials and suggested schedule for cleaning.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Robbins Sports Surfaces: Pulastic and Durathon.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Product shall be a monolithic, fluid-applied, smooth surface, skid-resistant, pigmented finish, interior athletic flooring system. Materials shall be from a single manufacturer.

B. Primer: As recommended by the manufacturer to penetrate into pores of the substrate, and bond with the floor surfacing matrix to form a permanent monolithic bond between the substrate and the matrix.

C. Floor Surfacing: Poured urethane monolithic athletic flooring with a pigmented, flat wear surface. The system shall be designed for application in multiple coats.

D. Physical Properties: After curing, the complete system shall have the following properties when tested in accordance with the test methods listed for each property:

1. Tensile Strength: 860 psi, minimum, per ASTM D 412.

2. Elongation at Break: 300%, minimum, per ASTM D 412.

3. Hardness: 55 - 60 Shore A-2 per ASTM D 2240.

4. Resiliency: 25.0 Impact per ASTM D 2632.

5. Compression Set at 50%: Immediate recovery to 98% or more per ASTM D 575.

6. Compression Modulus at 10%: 120 psi per ASTM D 575.

7. Temperature Stability: No change in resiliency from -3E F to + 120E F per ASTM D 742.

8. Abrasion Resistance: 0.25 gram weight loss per kilo at 5,000 cycles with CS 17 wheel.

9. Moisture Absorption: Less than 1% by weight per ASTM D 471.

10. Fungus Resistance: Completely resistant per MIL-1-31D.

11. Flammability: Less than 150 per ASTM E 84 or 0.66 average watts / cm2 flooring radiant panel test per ASTM E 648.

12. Smoke Generated: 83 flaming per ASTM E 662.

E. Components:

1. Adhesive: Two-component polyurethane.

2. Base Mat (resilient): Granulated rubber mat containing polyurethane binder; 9 mm thickness.

3. Base Mat Sealer: Two-component polyurethane.

4. Elastomeric Resin: Polyurethane elastomeric; 2 mm thickness.

5. Coating: Pigmented finish.

6. Gameline Paint: Polyurethane per flooring manufacturer=s recommendation; compatible with the athletic flooring materials.

F. Transition Strip: Provide an appropriate, continuous transition strip along all edges where the flooring abuts a different floor covering material or unfinished concrete.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrate and conditions are as required, and ready to receive the work.

1. Concrete substrate shall have a steel trowel finish and level tolerance of +/- 1/8" (3 mm) in 10 feet.

2. Verify that moisture content of the substrate meets the flooring manufacturer=s requirements.

C. Report, in writing, prevailing condition that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Apply no curing agents or sealers to the concrete substrate.

B. Fill concrete construction joints with the flooring manufacturer=s approved polyurethane caulking.

C. Remove all dirt, dust, debris, and other loose particles by sweeping or vacuum cleaning.

D. Begin installation only after the work of all other trades, except the bleacher installation, if any, has been completed.

3.3 MIXING

A. Use equipment authorized by the flooring manufacturer to provide mixing and metering of the resin components to the specified ratio.

B. Proportion and mix the athletic floor surfacing components in accordance with the manufacturer=s printed instructions.

3.4 INSTALLATION

A. Apply primer, resin, coatings and game lines in accordance with the manufacturer=s printed instructions and the following requirements:

1. Primer: Apply primer uniformly over the entire area to receive athletic floor surfacing using clean rubber squeegees or clean steel trowels. Do not allow the primer to collect in depressions. Allow the primer to dry thoroughly before the next coat is applied.

2. Resin: Apply one lift of resin to one-half the total surfacing thickness required. Allow proper curing time. Apply a second lift of resin to complete the total thickness. Allow proper curing time. Provide a total finish floor thickness of approximately 11 mm. Each lift of resin shall be placed in one continuous

operation without divider strips or cold joints.

3. Coatings: Apply a top wear coat uniformly covering all surfaces after the resin has cured. Apply at the maximum recommended thickness.

4. Provide transitions as indicated and ensure flush match with adjoining flooring.

5. Game Lines: Apply game lines paint in accordance with the manufacturer=s printed instructions

B. Prohibit smoking, open flames, sparks from electrical equipment or any other source in the area during installation.

C. Clean up and remove unused materials and empty containers from the Project Site.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect flooring for level.

C. Inspect game lines for correct width and alignment.

D. Inspect for correct playing courts sizes.

3.6 PROTECTION

A. The finished surface shall set for a period of one (1) week, minimum, before traffic is allowed on the flooring.

B. Protect the finished flooring from damage by covering with building paper or plywood, when necessary, or other effective means until final acceptance

C. Change the air handling system filters one (1) week after the athletic floor work has been completed.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vinyl composition tile.

2. Sheet vinyl flooring.

3. Resilient edge strip.

4. Rubber base.

5. Accessories.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for resilient flooring.

2. Section 09250 - Gypsum Board: Substrate for rubber base.

3. Section 09680 - Carpet: Floor finish for rubber base.

1.2 DESCRIPTION OF WORK

A. The extent of resilient flooring work is indicated on the Drawings and Schedule and as specified herein, and includes providing and installing adhesively applied vinyl composition tile, sheet vinyl flooring, resilient edge strips, rubber base and resilient accessories.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM E 648 - Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

2. ASTM E 662 - Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

3. ASTM F 1066 - Specification for Vinyl Composition Floor Tile.

4. ASTM F 1303 - Specification for Sheet Vinyl Floor Covering with Backing.

5. ASTM F 1861 - Specification for Resilient Wall Base.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Technical data and installation instructions for each type of resilient flooring and accessory.

a. Two boxes - 2" x 2" samples of each type, color and pattern in the specified group of the manufacturer selected for each type of resilient flooring required.

b. 12" x 12" samples of sheet flooring.

c. Samples of available colors for resilient edge strip.

d. One chain of available colors for rubber base selection.

3. Final Samples: Submit for final selection.

a. 2 - full-size samples of vinyl tile.

b. 2 - 12" x 12" samples of sheet flooring.

c. 2 - 6" long sections of resilient edge strip.

d. 2 - 6" long sections of rubber base.

4. Assurance / Control Submittals:

a. Manufacturer’s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

5. Maintenance Instructions: Submit two (2) copies of the manufacturer’s recommended maintenance practices for each type of resilient flooring and accessory required.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Regulatory Requirements:

1. Critical Radiant Flux in Accordance with ASTM E 648: More than 0.45 watts per square centimeter.

2. Specific Optical Smoke Density in Accordance with ASTM E 662: Less than 450.

C. Where possible, provide each type of resilient flooring and accessories as the products of a single manufacturer, including recommended primers, adhesives, and sealants.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, unopened cartons and containers, each bearing the name of the product and manufacturer, project identification, and shipping and handling instructions.

C. Store the materials in a dry space, protected from the weather, with ambient temperatures maintained between 50E and 90E F.

D. Store on a flat surface.

1.7 JOB CONDITIONS

A. Environmental Requirements:

1. Do not install flooring over concrete slabs until the slabs have been cured and are sufficiently dry to achieve bond with the adhesive, as determined by the manufacturer’s recommended bond and moisture tests.

2. Store materials in the area of installation for at least 48 hours prior to beginning installation.

3. Maintain the ambient temperature required by the adhesive manufacturer, not less than 72E F, for three days prior to, during, and for 48 hours after installation.

4. Install flooring and accessories only after other finishing operations, including painting, have been completed.

5. Provide adequate temporary ventilation during installation.

1.8 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Extra Materials: At completion of the installation deliver to the Project Site extra materials from the same manufactured lot as the materials installed in the following quantities:

1. Not less than 2% of each type, size and color of flooring.

2. Not less than 2% of each type and color of base.

3. Submittal of extra accent tiles is not necessary.

C. Maintenance Data: Submit two (2) copies of manufacturer’s recommended maintenance practices for each type of flooring and accessory required, recommended maintenance materials and suggested schedule for cleaning.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering the specified items which may be incorporated into the work include the following:

1. Tile:

a. Armstrong Floor Products (Armstrong World Industries, Inc.).

b. Azrock.

c. Tarkett.

2. Sheet Vinyl:

a. Armstrong Floor Products (Armstrong World Industries, Inc.).

b. Azrock.

c. Tarkett.

3. Resilient Edge Strip:

a. Armstrong Floor Products.

c. Roppe.

d. Burke Mercer.

4. Rubber Base:

a. Armstrong Floor Products.

b. Roppe.

c. Burke Mercer.

B. Colors, patters and sizes shall be selected from the manufacturer's standards.

C. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Vinyl Composition Tile:12" x 12" x 1/8" gauge composition tile; resistant to alkali, grease and oils and able to withstand static loads of 125 psi; ASTM F 1066; marbleized design as follows:

1. (VCT-1):

a. Standard Excelon, Imperial Texture by Armstrong.

b. Cortina Colors & Classics by Azrock.

c. Standard, Expressions by Tarkett.

2. (VCT - 2):

a. Standard Excelon, Imperial Texture by Armstrong.

b. Cortina Colors & Classics by Azrock.

c. Standard, Expressions by Tarkett.

3. Color: As selected. Accent tile (VCT-2) shall be a color contrasting with the field tile color.

B. Rubber Flooring Tile: 19-11/16” x 19-11/16” Smooth Finish 3/16” thickness.

1. Roppe Marbleized colors per Architect’s selection.
2. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

C. Resilient Edge Strip: Homogeneous vinyl, tapered or bullnose edge, 1/8" thick x not less than 1" wide x length required or roll length. Color as selected.

D. Rubber Base (RB-1): Type TP, 4” high, 1/8" thick, topset; standard coved toe at resilient flooring, toeless at carpet; matching end stops and preformed corner units; roll length; ASTM F 1861. Color as selected.

2.3 ACCESSORIES

A Subfloor Filler: Latex underlayment mixed with undiluted latex liquid, furnished by or as recommended by the resilient flooring manufacturer as follows:

1. Levelayer I by Dayton Superior Corporation.

2. No. 345 by W.W. Henry Company.

3. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

B. Concrete Slab Primer: Non-staining type as recommended by the resilient flooring manufacturer.

C. Adhesive: As recommended by the resilient flooring manufacturer for the specific material and substrate conditions; clear color.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

D. Start of the flooring installation shall indicated acceptance of the subfloor conditions and full responsibility for the completed work.

3.2 PREPARATION

A. Prepare the substrate for product installation in accordance with the manufacturer's published instructions.

B. Remove existing floor finishes and prepare substrate as recommended by the resilient flooring manufacturer.

C. Remove curing compounds not compatible with the adhesive. Avoid organic solvents.

D. Remove ridges, bumps and other irregularities in the substrate.

E. Fill cracks, joints, holes and depressions with a subfloor filler and leveler recommended by the flooring manufacturer to achieve a smooth, flat, hard surface, with no more than 1/8" variation from plane within 10 feet in any direction.

F. Prohibit traffic until the filler has cured.

G. Broom clean and vacuum surfaces to be covered by resilient flooring; inspect the subfloor.

H. Perform bond and moisture tests on concrete slabs to determine that concrete surfaces are sufficiently cured, dried and are ready to receive the flooring Utilize a bond test recommended by the flooring manufacturer. Ensure that moisture content of the concrete substrate does not exceed 3% as measured by the Calcium Carbide Hygrometer Procedure or 5% by normal Protimeter.

I. If bond test is negative, surface the existing floor with latex underlayment as recommended by the manufacturer.

J. Apply concrete slab primer, if recommended by the flooring manufacturer, prior to the application of adhesive. Apply in compliance with the manufacturer’s instructions.

3.3 INSTALLATION - GENERAL

A. Install resilient flooring using the methods indicated, and in strict compliance with the manufacturer’s recommendations.

B. Maintain subfloor reference marks, penetrations, and openings that are in place or plainly marked for future cutting by repeating on the finished flooring. Use chalk or other non-permanent marking device.

C. Cut flooring to and fit around all permanent fixtures, built-in furniture, cabinets, pipes, and outlets. Cut edges, and fit and scribe to walls and partitions after the field flooring has been installed.

D. Extend flooring into toe spaces, door rabbets, closets and similar openings.

E. Tightly cement flooring to the subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.

F. Install flooring on covers for telephone and electrical ducts, and other such items that occur within finished floor areas; maintain overall continuity of colors and patterns with pieces of flooring installed in the covers. Tightly cement edges to the perimeter of the floor around the covers and to the covers.

G. Hand roll flooring at the perimeters of each covered area to ensure proper adhesion.

3.4 INSTALLATION - VINYL COMPOSITION & RUBBER TILE FLOORING

A. Install the resilient tile flooring in accordance with the manufacturer's published instructions.

B. Prime concrete slabs in contact with the ground with cut-back type primer as recommended by the flooring manufacturer. Work the primer with a non-absorptive base completely into the surface. Primer shall be thoroughly dry before applying adhesive.

C. Apply adhesive in accordance with the adhesive manufacturer’s printed directions, unless specified or directed otherwise. Apply only cut-back adhesive to primed concrete surfaces.

D. Spread only enough adhesive to permit the installation of floor materials before initial set.

E. Open only the number of floor tile cartons for the quantity of material required to cover each area. Mix tile pieces to ensure that noticeable shade variations do not occur within any one area.

F. Install tile flooring in a checker board pattern, or as indicated. Start in the center of the room or area and work from the center towards the edges. Vary edge width as necessary to maintain full-size tiles in the field, but no edge tile shall be less than 1/2 the field tile size, except where irregular shaped rooms or conditions make it impossible. Keep tile lines and joints square, symmetrical, tight, and even; keep each floor in a true, level plane, except where indicated as sloped.

G. Locate accent tiles where shown, or if not shown locate per Architect’s instructions.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances accurately for tight joints.

I. Where flooring continues through a wall opening, continue the established pattern without interruption. One row of tiles may be cut to less than full size, if necessary, to establish the pattern in the adjoining room.

J. Where an adjacent floor finish is dissimilar, terminate the resilient flooring at the centerline of openings or centerline of doors in the closed position.

K. Press installed flooring with a 150 pound resilient flooring roller to attain full adhesion.

3.5 INSTALLATION - RESILIENT EDGE STRIP

A. Install edge strips at unprotected and exposed edges where resilient flooring terminates and where flooring terminates at points higher than the contiguous finished flooring, except at doorways where thresholds are located.

B. Place resilient edge strips tightly butted to the resilient flooring. Secure with adhesive to the flooring and substrate.

3.6 INSTALLATION - RUBBER BASE

A. Install rubber base in accordance with the manufacturer's published instructions.

B. Apply rubber base to walls, columns, pilasters, casework and other permanent fixtures in

rooms or areas where base is required. Install the base in lengths as long as practicable. Maintain a minimum measurement of 18" between joints. Install true to line, level and with tight vertical joints. Scribe and fit accurately to and around permanent fixtures, equipment and bases.

C. Use preformed units at external corners and exposed ends. Miter or cope inside corners.

D. Install on solid backing; firmly adhere to walls, floor surfaces and permanent fixtures, except carpet throughout the length of each piece, with continuous contact at horizontal and vertical surfaces.

E. On masonry surfaces, or other similar irregular surfaces, fill voids along the top edge of wall base with the manufacturer's recommended adhesive filler material.

F. Roll the installation per the manufacturer's instructions.

3.7 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the resilient flooring and base installation, pattern, layout and attachment to the substrate.

3.8 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove excess adhesive and other surface blemishes from the floor finish, base and wall surfaces without damage; use neutral type cleaners recommended by the flooring manufacturer.

C. Just prior to final inspection, thoroughly clean the flooring, edge trims and base.

D. Apply polish and buff. Use the type of polish, number of coats, and buffing procedures in compliance with the flooring manufacturer's instructions.

3.9 PROTECTION

A. Protect installed flooring with heavy Kraft paper or other covering until final acceptance inspection.

END OF SECTION

SECTION 09841

ACOUSTICAL WALL TREATMENT

PART 1 GENERAL

1.1 SUMMARY

A. Sections includes:

1. Acoustical wall-mounted panels with factory-applied finish.

2. Concealed mounting hardware.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Wall substrate.

2. Section 04230 - Reinforced Unit Masonry: Wall substrate.

3. Section 09250 - Gypsum Board: Wall substrate.

1.2 DESCRIPTION OF WORK

A. Extent of acoustical wall treatment work is indicated on the Drawings and Schedule and as specified herein, and includes providing and installing acoustical treatment to wall surfaces.

B. The intent of this Section is to outline the requirements for acoustical wall treatment, not to provide complete details for materials and installations. Manufacturer=s approved specifications, details and installation instructions shall govern.

C. The materials and installations shall meet the requirements of the applicable International Building Code and local Fire Code.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Testing and Materials (ASTM):

1. ASTM C 423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

2. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Indicate product characteristics, performance criteria, sound absorption rating and installation instructions.

2. Samples: One (1) 12" x 12" of each type, pattern and color required. Patterned samples shall be of sufficient size to show the complete pattern.

3. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

4. Cleaning and Maintenance Instructions: Two (2) copies of the manufacturer=s printed instructions for cleaning and maintenance.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in installing the work of this Section with a minimum of five (5) years documented experience.

3. Work shall be done by experienced installers working under a qualified supervisor.

B. Regulatory Requirements: Comply with the insulation flame spread and smoke developed requirements of the Environmental Protection Agency (EPA) and local authorities having jurisdiction.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section - 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened packaging, clearly marked with the manufacturer=s name, brand name, size and other relevant information.

C. Storage:

1. In a secure, dry, clean, watertight and well ventilated location.

2. In a flat position, and protected from damage, soiling and accumulation of moisture.

3. Re-seal packaging immediately after completion of verification inspection.

4. Do not re-open packaging until immediately prior to installation.

1.7 JOB CONDITIONS

A. Environmental Requirements: Do not install the wall panels unless a constant temperature of at least 65 degrees F is maintained for 72 hours before, during and for 48 hours after installation.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty, signed by the panel manufacturer and the panel installer agreeing to repair or replace panels that do not meet the requirements or that fail in materials or workmanship.

2. Warranty Period: Five (5) years from the date of Substantial Completions.

1.9 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Maintenance Data: Maintenance procedures, recommended maintenance materials and suggested schedule for cleaning.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Armstrong World Industries.

2. Acoustical Products.

3. Panel Solutions, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Model:

1. Soundsoak 85 by Armstrong.

2. Silentspace W-106 by Acoustical Products.

3. PS-80 by Panel Solutions.

B. Description:

1. Material: Rigid fiberglass; pre-finished with bonded woven fabric face; fabric returned to the back of the panel. Manufacturer must ensure a flat, wrinkle-free surface and tailor-fitted corners.

2. Edge: Resin hardened, square.

3. Size: As shown on the Drawings x 1" thick. Pre-size panels in the manufacturer=s plant as detailed on the Drawings, verified by exact field measurements taken by the Contractor.

4. Density: 6-7 pounds / cubic foot.

5. Fire Rating: Class A Flame Spread rating of 25 or less.

6. NRC: 0.80 on Type AA@; mounting in accordance with ASTM C 423.

7. Insulation Value: R-4.09, minimum.

8. Color and Pattern: As selected.

C. Attachment: As approved and compatible with the substrate.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Prior to starting the work, verify that all fabric materials are free of defects, fading, and stains, and that all required accessories are available.

D. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install panels in accordance with the manufacturer's specifications and installation instructions.

B. Provide all necessary accessories, furring channels, clips, molding, anchors, fasteners and other miscellaneous hardware for a complete installation.

C. Fit panels in place free of damage and other defects.

D. Install panels level, plumb, in a uniform plane, and free from twist, warp, dents and chips.

E. Install without gaps and voids.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust out of alignment panels for plumb, level and flush appearance.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installation for acceptable appearance and secure attachment.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Damaged, soiled or discolored materials installed shall be cleaned to their original condition or replaced at no additional cost to the Owner.

C. Clean exposed surfaces per the manufacturer=s instructions with materials recommended by the panel manufacturer.

3.6 PROTECTION

A. Protect the panels from damage after installation. If damage occurs, remove and replace the entire unit.

END OF SECTION

SECTION 09860

GRAFFITI RESISTANT COATING

PART 1 GENERAL

1.1 SUMMARY

A. Water repellent compounds specified herein are clear, deep-penetrating, non-film forming, non-silicone or urethane, non-yellowing, heavy duty, chemical water repellent solutions. Water repellant is to be applied on exterior walls from grade to top of wall where “Graffiti Resistant coating” is called for on drawings.

B. Related work specified elsewhere includes but may not be limited to:

1. Section 01012: Preferred Purchasing

2. Section 03410: Prestressed/Precast Concrete Hollow Core Walls (if applicable)

3. Section 03470: Tilt Up Panels (if applicable)

4. Section 04230: Reinforced Unit Masonry (if applicable)

5. Section 07180: Water Repellent

6. Section 09836: Textured Surface Coating (if applicable)

7. Section 09900: Painting (if applicable)

1.2 PREFERRED PURCHASING

A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from White Cap Construction Supply. For more information, refer to Section 01012.

1.3 QUALITY ASSURANCE

A. A firm with not less than three (3) years of successful experience in application of water repellents of type required on substrates similar to those of this project. The firm shall be approved by the manufacturer of the repellent for installation of their product.

B. Manufacturers having products similar in function to the one named may request approval of their products for substitution. Approval must be requested 10 days prior to bidding. Any substitution allowed will be by written addendum issued by the Architect of Record.

1.4 JOB CONDITIONS

A. Weather and substrate conditions: Do not proceed with application of water repellent when ambient temperature is less than 50 deg. F. Or when substrate surfaces have been cured for less than a period of 2 months, or when rain or temperatures below 40 deg. F. Are predicted for a period of 24 hours, or earlier than 3 days after surfaces become wet from rainfall or other moisture sources.

B. Inspection by manufacturer's representative of subsurface conditions is required. Obtain written approval from representative before proceeding with work.

1.5 WARRANTY

A. The material and workmanship in this application shall be warranted jointly under a single document to Home Depot, signed by the manufacturer and applicator of materials. The applicator shall warrant workmanship for a period of two (2) years, and the manufacturer shall warrant against water intrusion for a period of five (5) years from date of Grand Opening.

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Rainguard Products Company: VandlGuard Non-Sacrificial Graffiti Coating System

PART 3 EXECUTION

3.1 EXAMINATION

A. Installer and manufacturer's representative are to examine the substrate to which the repellent is to be applied. They are to report any condition that is detrimental to the application and function of the repellent system to the Architect of Record prior to start of application.

3.2 PREPARATION

A. Clean substrate of substances that might interfere with penetration/adhesion of water repellents. Test for moisture content, in accordance with repellent manufacturer's instruction, to ensure that surface is sufficiently dry.

B. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of repellent. Cover adjoining surfaces where possible.

C. Surfaces shall be free of defects such as dirt, dust, grease, efflorescence, paint and any other foreign material. Verify that new concrete surfaces have sufficient cure and moisture content is acceptable.

1. Beginning of application means acceptance of substrate.

D. When applying coating over painted surfaces, paint must be fully chemically cured prior to application of the repellent. Installer shall perform several test patches on each side of the building prior to application. If the test patch turns yellow over a 48-hour period, paint has not fully cured and application of the repellant cannot commence.

3.3 SCAFFOLDING

A. Provide scaffolding and use as necessary to insure all exposed surfaces are completely covered with primer and finish coats to insure the integrity of the wall and so as to provide the specified warranty.

3.4 CONTRACTOR'S RESPONSIBILITY

A. Contractor shall be responsible to insure that ALL surfaces receiving subsequent finish or coatings are prepared in accordance with manufacturer's recommendations. Contractor and his subcontractors shall of the manufacturer inspect and approve the surface preparation prior to application of his product. Contractor shall advise Architect of Record immediately, in writing, of any incompatibilities between materials or surfaces. Commencement of application implies acceptance of the surface and shall constitute waiver by the respective contractor and general contractor to any claim of incompatibility.

3.5 APPLICATION

A. Apply coating material in accordance with the manufacturer’s current technical data sheet for general information, application instructions and coverage rates.

B. Apply coating only when moisture content of surfaces is within manufacturer’s recommended limits.

C. Material shall be applied by high-volume, low-pressure spray equipment at a maximum pressure of 60 psi.

D. Apply 3 coats at rate not exceeding that recommended by manufacturer for surface being coated.

E. Comply with manufacturer’s recommendations for drying time between coats.

F. Finish coats shall be smooth, free of streaks, laps or pile-up of coating, skipped or missed areas.

G. Make edges of coating adjoining other materials or colors clean and sharp without overlapping.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior and exterior paint systems.

2. Schedule of Items to be painted.

3. Painting Treatments Schedule.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

1.2 DESCRIPTION OF WORK

A. The extent of the work of this Section is indicated on the Drawings and Schedules and as specified herein, complete, and includes cleaning and preparation of all interior and exterior surfaces to be painted or finished, and finishing of all interior and exterior surfaces, unless hereinafter excluded.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

1.4 GENERAL

A. The term "Paint" as used herein, means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as primer, intermediate coat or finish coat.

B. The following categories of work are included under other Sections of these Specifications:

1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various Sections of structural steel, metal fabrications, hollow metal doors and frames, and similar items.

2. Unless otherwise specified, shop priming of fabricated components such as architectural woodwork, wood casework and shop-fabricated or factory-built mechanical and electrical equipment or accessories is included under other Sections.

1.5 SUBMITTALS

A. Section 01300 - Submittal Procedure: Procedures for submittals.

1. Product Data: Submit for each type of paint specified.

a. Manufacturer=s technical information including paint analysis, and application instructions for each material proposed for use.

b. Painting Schedule listing the surfaces to be painted with cross reference to the specific painting and finishing system, and application. Identify each paint material by manufacturer's catalog number and general classification.

2. Samples:

a. Prior to beginning the painting work, the Architect will furnish color chips for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples of color and texture only for the Architect=s review. Provide a listing of materials and application for each coat of each finish sample.

b. Provide two (2) samples of each color and material on 8" x 12" hardboard, with texture to simulate actual conditions. Re-submit samples as requested by the Architect until acceptable color, sheen, and texture is achieved.

c. Provide two (2) 8" x 12" samples of natural and stained wood finish on actual wood surfaces. Label and identify each as to location and application.

d. Provide two (2) 8 " x 12" samples of masonry for each type of finish and color on concrete masonry, showing the filler, prime coat and finish coats.

3. Mock-Up: On actual wall surfaces and other interior and exterior building components, duplicate the paint finish of the prepared samples. Provide full-coat finish samples on at least 80 sq. ft. of surface, as directed, until the required color, sheen and texture is obtained; simulate the final lighting conditions for review of the work in-place.

4. Assurance / Control Submittals:

a. Manufacturer's certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

c. Manufacturer's Material Safety Data Sheets (MSDS) for each paint type specified.

1.6 COORDINATION

A. Pre-Application Meeting: Convene a Pre-Application Meeting at the Project Site prior to beginning the painting work.

1. Require attendance of the Contractor, Owner=s representative, Architect, representatives of the paint subcontractor and other finish products, and the mechanical and electrical trades.

2. Review coordination and environmental controls required for the proper application and ambient conditions in the areas to receive paint.

3. Review preparation and installation procedures, and the coordination and scheduling required with the painting work.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Applicator: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Regulatory Requirements:

1. Surface Burning Characteristics in Accordance with ASTM E 84 for Class I or A finish:

a. Flame Spread (Non-Combustible Surfaces): Less than 25.

b. Smoke Density (Non-Combustible Surfaces): Less than 450.

2. Provide paint and coating materials that conform to Federal, and local Government restrictions for volatile organic compounds (VOC) content.

C. Codes and Standards: The work and materials shall conform to regulations of the Fire Department, safety color coding in conformance with OSHA and all other regulatory ordinances having jurisdiction. Conform to the most stringent requirements of the authorities having jurisdiction.

D. Single Source Responsibility: Provide primers and other undercoat paint products by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within the recommended limits.

E. Coordination of Work: Review other Section of these Specifications in which prime paints are to be provided to ensure compatibility of the total coating system for various substrates. Upon the request of other trades, furnish information or characteristic of the finish materials provided for use, to ensure that compatible prime coats are use.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, new and unopened packages and containers bearing the following information:

1. Manufacturer=s name.

2. Name or title of the material.

3. Manufacturer=s lot number and date of manufacture.

4. Contents by volume for major pigment and vehicle constituents.

5. Color name and number.

6. Thinning or reducing instructions.

7. Application instructions including surface preparation and coverage.

8. Drying time.

9. Cleanup requirements.

C. Store products, not in actual use, in tightly covered containers, off the ground and under cover. Maintain containers used in the storage of paint, in a clean condition, free of foreign materials and residue.

D. Store paint materials at a maximum ambient temperature of 90E F, in a ventilated area, and in compliance with the manufacturer's published instructions.

E. Keep storage areas neat and orderly. Remove oily rags and waste daily.

F. Protect against fire hazards and spontaneous combustion.

G. Take all precautions to ensure that workmen and the work areas are adequately protected from health hazards that might result from handling, mixing and application of paints.

1.9 JOB CONDITIONS

A. Environmental Requirements:

1. Do not apply paint during rain, fog or mist when the relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by the paint manufacturer=s printed instructions.

2. Apply paint finishes only when the moisture content of the surfaces to be coated is within the manufacturer's acceptable range for the type of finish to be applied.

3. Painting may be continued during inclement weather if the areas and surfaces to be painted are enclosed and within the humidity limits specified, and allowed by the paint manufacturer=s printed instructions.

4. Do not apply paint in areas where dust is being generated.

5. In areas being painted provide a lighting level of, at least 80 foot-candles, measured at mid-height of the surface being painted.

1.10 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Extra Materials:

1. Upon completion of the work, provide replacement materials from the same production run as the materials applied. Provide 2% of each, but not less than one (1) quart, nor more than ten (10) gallons of each type, color and sheen.

2. Label each container with the color, type and texture, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Frazee Paint & Wallcovering.

2. Benjamin Moore & Co.

3. Sherwin-Williams Co.

4. Olympic Stains.

5. Watco Co.

6. ZAR by United Gilsonite Laboratories.

7. JASCO.

8. Thoro Systems Products.

9. PPG Amercoat (formerly Ameron Protective Coatings).

10. Textured Coatings of America, Inc. (TEX-COTE).

11. Rain Products Company.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Material Quality:

1. Manufacturer=s best quality grade of the various types of coatings, and suitable for the intended purpose, as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer=s identification as a standard, best-grade product will not be acceptable.

a. Proprietary names used to designate colors or materials are not intended to imply that the products of the named manufacturers are required to the exclusion of equivalent products by other manufacturers.

B. Color Pigments:

1. Pure, non-fading, applicable types to suit the substrates and service indicated. Manufacturer shall confirm that exterior applied pigments will not fade when exposed to UV light.

2. All exterior colors and interior deep tone colors shall be ground-in at the factory. Shop mixing is not permitted.

3. Colors to be as selected by the Architect, and subject to modification on the Project Site at the Architect=s discretion.

4. Lead content in pigment, if any, is limited to not more than 0.06%, based on the total non-volatile (dry film) of paint by weight. This limitation extends to interior surfaces and those exterior surfaces, such as stairs, decks, porches, railings, windows, and doors which are readily accessible to children.

C. Paint:

1. Ready-mixed, pigments fully-ground, maintaining a soft paste consistency, capable of readily and uniformly dispersing to a complete homogeneous mixture.

2. Provide good flowing and brushing properties, and capable of drying or curing free of streaks and sags.

D. Primers and Undercoaters: Produced by the same manufacturer as the intermediate and finish coats.

E. Paint Accessory Materials: Linseed oil, shellac, turpentine and other materials not specifically indicated herein, but required to achieve the finishes specified to be of high quality, and by an approved manufacturer.

2.3 PAINT SYSTEMS

A. (EAE) Exterior Acrylic Emulsion: A 100% acrylic latex, water-thinned coating with extra mildewcide, flat finish, #203 Duratec and #266 Epotilt acrylic-epoxy sealer by Frazee, or Loxon acrylic primer with A-100, 100% exterior acrylic latex by Sherwin-Williams.

B. (EAHE) Exterior Acrylic High Build Emulsion: A high-build, heavy-bodied, water-based, acrylic emulsion with 67% solids conforming to Federal Spec # TTC 00555B, paragraph 4.4.7. Thorocoat by Thoro Systems Products, smooth finish. Finish with two (2) coats of Thoroglaze or other sealer recommended by the manufacturer. Primer to be as recommended by the manufacturer for the Project conditions.

C. (TC) Textured Coating: Tex-Cote XL-70 primer and top coat system by Textured Coatings of America. Texture as selected by the Architect.

D. (AFE) Interior Acrylic Flat Emulsion Copolymer: 100% acrylic latex, water thinned, washable, velvet flat finish, #002 Majestic by Frazee.

E. (AEE) Interior Acrylic Eggshell Enamel: 100% acrylic, water thinned, semi-gloss enamel, #022 Lo-Glo by Frazee.

F. (LOAE) No VOC Interior Acrylic Paint: Envirokote Interior Low Odor, flat, eggshell or semi-gloss as noted, with Envirokote primer by Frazee.

G. (AREM) Alkyd Resin Enamel for Interior and Exterior Metal: 628 Aro-plate II SG, semi-gloss with 661 metal primer by Frazee.

H. (AREW) Alkyd Resin Enamel for Exterior Wood: 372 wood undercoat with two coats of 352 Classic House and Trim Gloss Enamel, semi-gloss by Frazee.

I. (EPC) Epoxy Paint for Cementitious Materials: Polyamide epoxy coating system, two-component coating self-priming, semi-gloss, Amerlock 400 by PPG Americoat.

J. (EPM) Epoxy Paint for Metal: 561 acrylic metal primer with Aro-Gard 542 finish coats, two-component coating, semi-gloss by Frazee. Prepare metal with JASCO Prep and Primer.

K. (RIP) Rust Inhibitive Primer: Alkyd mineral spirit thinned, satin finish primer; #661 metal prime, rust preventive alkyd primer by Frazee.

L. (BF) Block Filler: Acrylic block filler; #262 acrylic block filler by Frazee.

M. (PS) Primer Sealer: PVA vinyl acrylic resin, water-thinned, flat finish primer, #061 Aqua Seal interior PVA Sealer by Frazee.

N. (PSU) Polyurethane: Clear finish exterior polyurethane varnish, Satin; ZAR #203.

O. (WS) Wood Stain: Olympic semi-transparent wood stain or ZAR transparent interior stain as selected by the Architect.

P. (CWF) Clear Wood Finish: Oil alkyd resin, satin or hand rub finish, Deft Clear Wood Finish.

Q. (DO) Wood Sealer: Watco Danish Oil finish, exterior formula where exposed to wind blown water.

R. (CS) Concrete Stain: Lithochrome stain in water solution by Scofield Co.

S. (TEC) Cementitious Sealer: Elasto-grip FC, waterborne modified polyamine epoxy by Tnemec.

T. (TEC) Concrete Coating: Enviro-crete 156, modified waterborne acrylate by Tnemec.

U. (GRC) Graffiti Resistant Coating: Water repellant, clear, deep-penetrating, non-film forming, non yellowing, heavy duty chemical water repellant solution. VandiGuard non-sacrificial graffiti coating system.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory and timely execution of the work of this Section. State, in writing, any anticipated problems with using

the specified coating systems on substrates primed by others. Do not proceed with the work until the unsatisfactory conditions have been corrected in a manner acceptable to the Applicator.

D. Starting the painting work will be construed as the Applicator=s acceptance of the surfaces and condition within any particular area.

3.2 SURFACE PREPARATION

A. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

B. Perform preparation and cleaning procedures in accordance with the paint manufacturer's published instructions, and as herein specified, for each substrate condition.

1. Provide barrier coats over incompatible primers, or remove and reprime as necessary.

2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be field painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of the painting of each space or area, reinstall all removed items.

3. Clean surfaces to be painted before applying paint or surface treatment. Remove any oil or grease prior to mechanical cleaning.

4. Program cleaning and painting so contaminants from the cleaning process do not fall onto wet, newly painted surfaces.

C. Ferrous Metals: Clean ferrous surfaces not galvanized or shop-coated, of oil, grease, dirt, loose mill scale, and other foreign substances by solvent or mechanical cleaning.

1. Touch-up shop-applied prime coats where damaged or bare, when required by other Sections of these Specifications. Clean and touch-up with the same type of shop primer.

D. Galvanized Surfaces: Remove oil and other surface contaminants with a non-petroleum based solvent. Apply a coat of etching primer if required by the paint manufacturer.

E. Cementitious Materials: Prepare cementitious surfaces of concrete, concrete blocks, cement plaster and cement-asbestos board to be painted by removing efflorescence, chalk, dust, dirt, grease and oils, and by roughening as required to remove glaze. Wash concrete surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush with clean water to neutralize the acid, and allow to dry before painting.

1. Determine the alkalinity and moisture content of surfaces to be painted by performing the appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of the finish paint, correct the condition before starting the application of paint.

2. Do not paint over surfaces where the moisture content exceeds that permitted in the manufacturer's printed instructions.

3. Clean floor surfaces, scheduled to be painted, with a commercial solution of

muriatic acid, or other etching cleaner. Flush the floor with clean water to neutralize the acid, and allow to dry before painting.

F. Wood: Clean wood surfaces to be painted of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as necessary. Sandpaper smooth, finished surfaces exposed to view, and remove dust. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before application of the prime coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dry.

1. Prime, stain, or seal wood required to be field painted, immediately upon delivery to the Project Site. Prime ends, edges, faces, undersides, and backsides of such wood, including cabinets, counters, cases and paneling.

2. When a transparent finish is required, use spar varnish for backpriming.

3. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on the backside.

4. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to the Job Site.

G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

3.3 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with the manufacturer=s printed instructions.

B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into the material. Remove the film and, if necessary, strain the material before using.

3.4 APPLICATION

A. General:

1. Apply paint products in accordance with the manufacturer's written directions using applicators and techniques best suited for the substrate, type of material being applied, and texture required.

2. Paint finishes are scheduled. Provide prime coats compatible with the finish paints to be used.

3. Apply additional coats, when the undercoats, stains, or other conditions show through the final coat, until the paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment and furniture with prime coat only before final installation of the item.

5. Paint the back sides of access panels, and removable or hinged covers to match the exposed surfaces.

6. Finish exterior doors on tops, bottoms and side edges the same as the exterior faces.

7. Paint tops, edges, and bottoms of wood and hollow metal doors: .

8. Sand lightly between each succeeding enamel and varnish coat.

9. Omit the first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

10. Apply each coat slightly darker than the preceding coat, unless otherwise approved by the Owner=s representative. Sand surfaces lightly between coats, as necessary to achieve the specified finish.

11. Do not apply finishes on surfaces that are not dry.

12. The number of coats and the film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured, as recommended by the paint manufacturer.

13. Paint the interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.

14. Apply block filler to concrete masonry units at the rate necessary to provide complete coverage with pores filled.

B. Scheduling Painting: Apply first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until the paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spread rate to provide a total dry film thickness or, if not indicated, as recommended by the coating manufacturer.

D. Prime Coats: Apply a prime coat of material required to be painted or finished and has not been prime coated by others.

1. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in the first coat, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

E. Stipple Enamel Finish: Roll and re-distribute paint to an even and fine texture. Leave no evidence of rolling such a laps, irregularity in texture, skid marks, or other surface imperfections.

F. Pigmented (Opaque) Finishes: Completely cover surfaces to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness,

spotting, holidays, laps, brush marks, runs, sags, ropiness and other surface imperfections are not acceptable.

G. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of an even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, and other imperfections.

1. Provide a satin finish for final coats, unless otherwise indicated.

H. Surfaces To Be Painted: Except where natural finish of material is specifically noted as a surface to not be painted, paint exposed surfaces whether or not colors are designated. Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials, or areas. If color or finish is not designated, the Architect will select from the manufacturer=s standard colors or finishes.

I. Equipment in Finished Rooms: Unless otherwise authorized, paint wall grilles and diffusers, door louvers, panel board fronts and other equipment having a factory-finish, occurring in rooms other than storage, mechanical and custodial.

J. Do not paint over any code-required labels, such as Underwriter=s Laboratories and Factory Mutual, or any other equipment identification, performance rating name, door label or nomenclature plates.

K. Paint exposed interior and exterior plumbing, heating and electrical equipment, apparatus, conduits, pipes and fittings, supports and hangers and all other unfinished surfaces of the mechanical and electrical work.

1. Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primer or factory-painted metal surfaces of equipment installed under the mechanical and electrical work, except as otherwise indicated.

L. Mechanical and Electrical Work: Painting of mechanical and electrical work includes those items exposed in mechanical equipment rooms, in occupied spaces, and equipment on roofs.

1. Exposed Mechanical: Items to be painted include, but are not limited to, the following:

a. Factory pre-painted diffusers at public spaces.

b. Ductwork insulation.

c. Piping, pipe hangers and supports.

d. Sprinkler covers and piping.

e. Heat exchangers.

f. Motors, mechanical equipment and supports.

g. Tanks.

h Accessory items.

2. Exposed Electrical: Items to be painted include, but are not limited to the following:

a. Panel boards in public spaces.

b. Speaker grilles.

c. Conduit and fittings.

d. Switchgear.

e. Rooftop equipment.

M. Roof Flashings: Paint all exposed roof flashings that are not stainless steel or factory-finished.

N. Completed Work: Match the approved samples for color, sheen, texture and coverage. Remove, re-finish or re-paint work not in conformance with the specified requirements.

O. The following categories of work are not included as part of field-applied painting work.

1. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.

2. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of prefinished aluminum, anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials do not require finish painting.

3. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkage, sinkage, sensing devices, motor and fan shafts will not require finish painting.

3.5 MECHANICAL AND ELECTRICAL EQUIPMENT

A. Replace identification markings on mechanical and electrical equipment, if painted over or spattered.

B. Paint conduit and electrical equipment occurring in finished areas where exposed to public view, color and texture to match the adjacent surfaces.

C. Paint front, back and all edges of plywood backboards for electrical equipment before installing, and mounting the equipment.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. The Owner reserves the right to invoke the following material testing procedures at any time, and any number of times during the field painting work:

1. Engage the services of an independent testing laboratory to sample the paint being used. Samples of materials delivered to the Project Site will be taken, identified and sealed, and certified in the presence of the Contractor.

2. A testing laboratory will perform appropriate tests for any or all of the following characteristics: abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, re-coating, skinning, color retention, alkali resistance and quantitative materials analysis.

3. If the test results show that the material being used does not comply with the specified requirements, the Contractor may be directed to stop the painting work, remove the non-complying paint, pay for the testing, re-paint surfaces where the rejected paint has been applied, and remove the rejected paint from the previously painted surfaces if, upon re-painting with the specified paint, the two coatings are not compatible.

B. Inspect painting and coating applications for the scheduled materials, color, sheen, texture, thickness, and coverage.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. As work proceeds, and upon completion, promptly remove paint where spilled, splashed, and spattered.

C. During progress of the work keep the premises free from any unnecessary accumulation of tools, equipment, surplus materials, and debris.

D. Remove from the site discarded paint materials, rubbish, cans and rags at the end of each work day.

E. Collect waste, cleaning cloths, and materials which may constitute a fire hazard, place in closed metal containers, and remove from the site daily.

F. Upon completion of the work leave the premises neat and clean. Clean metal door and window frames, glass, and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, taking care to not scratch or otherwise damage finished surfaces.

3.8 PROTECTION

A. Protect the work of other trades, whether to be painted or not, against damage by the painting and finishing work.

B. Place AWet Paint@ signs as required as a warning of newly painted surfaces.

C. Remove temporary protective wrappings provided by other trades for the protection of their work, after completion of the painting operations.

D. Upon completion of the work of other trades, touch-up and restore all damaged and defaced painted surfaces.

E. Correct any damage by cleaning, repairing or replacing and re-painting, as acceptable to the Owner=s representative.

F. Repair any damage resulting from inadequate and unsuitable protection.

3.9 SCHEDULE OF ITEMS TO BE PAINTED

A. Refer to the Drawings and Painting and Finishing Schedule at the end of this Section for designated finishes. Paint finish shall be provided for, but not limited to, the following items:

1. Interior: All interior surfaces as scheduled on the Drawings including, but not limited to:

a. Wood and hollow metal doors and frames.

b. Metal opening frames and trim.

c. Gypsum board.

d. Exposed concrete and plaster.

e. Steel rails and guards.

f. Exposed mechanical ductwork , hangers and supports, if the exposed structure is shown on the Drawings to be painted.

g. Exposed piping, hangers and supports, if scheduled on the Drawings to be painted.

h. Exposed conduit, hangers and supports, if scheduled on the Drawings to be painted.

I. Exposed structure including decking, joists, girders, beams, bridging, and miscellaneous metal fabrications, if scheduled on the Drawings to be painted.

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j. Exposed structural columns.

k. Metal stair stringers and handrails.

l. Exposed wood trim.

2. Exterior: All exterior surfaces including, but not limited to:

a. Wood and hollow metal doors and frames.

b. Metal opening frames and trim.

c. Metal flashings, if exposed from ground level, and downspouts, other than stainless steel.

d. Pipe bollards.

e. Steel rails and guards.

f. Roof hatches.

g. Concrete and plaster walls, soffits, fascia, ceilings, beams and columns.

h. Structural steel decking, joists, beams and columns.

B. Do not paint the following Items:

1. Aluminum, brass, bronze, stainless steel and chrome-plated steel.

2. Pre-finished items, such as cabinetry, toilet compartments, acoustical ceiling materials, and mechanical and electrical equipment.

3. UL, FM, and other Code required labels.

4. Equipment identification, performance ratings, and name plates.

5. Finish hardware.

6. Toilet accessories.

3.10 PAINTING TREATMENTS SCHEDULE

General: The paint abbreviations below refer to those noted above in PART 2, MATERIALS.

NO.	LOCATION	MATERIALS
1	Exterior and Interior Metal including factory prefinished items scheduled for field finish	Shop Coat: As specified in other Sections Prime Coat: (RIP) Finish: Two coats (AREM)
2	Exterior Plaster, Concrete and Masonry where noted for paint including: Fascia, Soffits, Walls of Buildings, Exposed Concrete Beams, Exposed Concrete Retaining Walls	Prime Coat: Manufacturer=s Representative Finish: Two coats (EAE)
3	Exterior Plaster and Concrete where noted for Textured Coating (other than Special Coating per Section 09800) including: Fascia, Soffits, Walls of Building, exposed Concrete Beams, exposed Concrete Retaining Walls	Prime Coat: As recommended by manufacturer Finish: (EAHE) system or Prime Coat: XL-70 primer Finish: (TC)
4	Exterior Wood	Wood Stain: Two coats (WS) or Prime and Two coats (AREW)
5	Interior Smooth Concrete and Gypsum Board, where scheduled	Prime Coat: (PS) Finish: Two coats (AEE) or (AFE)

6	Interior Masonry, where scheduled	Prime Coat: (BF) Finish: Two coats (AEE) or (AFE)
7	Interior Wood for opaque finish including Wood Doors	Prime Coat: Manufacturer recommended primer Finish: Two coats (AEE) or (AFE)
8	Interior Hardwood, natural finish, including Doors, Door and Window Frames and Relights, Panels and all Trim, Wood-Faced Casework	Finish: Two coats (DO) or two coats (WS) with sanding sealers Sealer: Two coats (PSU) or Finish: Three coats (CWF)
9	Interior Concrete, Masonry and Gypsum Board, where noted for epoxy.	Prime Coat: As recommended by manufacturer Finish: Two coats (EPC)
10	Maintenance coating for interior smooth Concrete, Masonry, Gypsum Board and Wood	Prime Coat: As recommended by manufacturer Finish: (LOAE) Coats as required for coverage
11	Interior Metal including factory pre-finished items scheduled for painting	Prime Coat: (RIP) except where pre-finished Finish: Two coats (AREM)
12	Interior Metal where noted for epoxy	Prep Coat: JASCO Prep and Primer Prime Coat: Aro-Gard 561 primer Finish: Two coats (EPM)
13	Graffiti Resistant Coating over specified paint system.	Finish: Three coats (GRC)
14	Stained concrete or plaster: (CS) per manufacturer=s recommendation.	
15	Sealed concrete or plaster:	Finish: Three coats (TEC) or per manufacturer=s recommendation

END OF SECTION

SECTION 10125

WRITING / BULLETIN BOARDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal framed writing boards.

2. Metal framed bulletin boards.

3. Metal framed combination writing / bulletin boards.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 09110 - Non-Load Bearing Steel Framing: Framing and plates within walls for attachment of boards.

2. Section 09250 - Gypsum Board: Wall substrate.

1.2 DESCRIPTION OF WORK

A. The extent of the writing and bulleting boards work is indicated on the Drawings and as specified herein, and includes providing and installing marker boards, tack boards and combination marker and tack boards, chalk and map rails, mounting devices and accessories for complete systems.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Testing and Materials (ASTM):

1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

2. ASTM B 221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer’s data substantiating that the board materials comply with the requirements indicated. Provide individual panel weight for board units.

2. Shop Drawings: Indicate each type of writing and bulletin board required, including sections of typical trim members, accessories, and dimensioned elevations; show anchors, grounds reinforcement, accessories, layout, and installation details.

3. Samples: Provide samples of each product for the selection of colors, patterns and textures, and for verification of compliance with the requirements indicated.

a. Manufacturer’s color charts with the full range of colors available for each type of writing board and bulletin board required.

b. Actual sections of the board finish.

4. Assurance / Control Submittals:

a. Manufacturer’s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Design Criteria: The Drawings indicate sizes, profiles, and dimensional requirements of the writing and bulletin boards. Boards by manufacturers other than those listed below having equal performance characteristics with deviations from the indicated dimensions and profiles may be considered provided the deviations do not change the design concept or intended performance.

B. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging.

C. Do not deliver boards to the Project Site until the building has been enclosed, other work within the areas where the boards are to be installed is substantially complete, and the

areas are ready for installation of the boards.

D. Protect the boards from damage during delivery, handling, storage and installation.

1.7 JOB CONDITIONS

A. In the areas to receive boards, maintain a constant temperature of at least 65E F or 72 hours before, during and for 48 hours after completion of the installation.

B. Do not install the boards until the air conditioning system has been put into service.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a manufacturer's written Warranty, agreeing to replace boards that do not retain their original writing and erasing qualities, become slick or shiny, or exhibit crazing, cracking or flaking. Bulletin boards shall not warp or crumble.

2. Warranty Period: Ten (10) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Claridge Products and Equipment, Inc.

2. Greensteel.

3. Best-Rite Manufacturing.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Writing / Bulletin Boards: The design is based on models by Claridge Products and Equipment.

C. Models including the following:

1. Types:
   a. Writing Boards: Durocite Series 2, Type D; framed 1/2" treated hardboard; 48" high x width indicated, by Claridge.

   b. Cork Bulletin Boards: Cork Bulletin Board Series 2, Type CO; 48" high x width indicated, by Claridge.

   c. Combination Writing / Bulletin Boards: Durocite Series 2, Type H; framed 1/2" treated hardboard, 48" high x width indicated; writing board with two (2) 48" x 48" wide cork bulletin boards at each end, by Claridge.

2. Writing Surface: Marker type. Color as selected.

3. Chalk Rail: Required, with end stops.

4. Frame: Aluminum, clear satin anodized.

5. Cork Bulletin Board: 1/8" single-layer mounted, seamless, sanded for natural appearance.

6. Map Rail and Hooks: 2 map hooks for each 4 linear feet of map rail.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that the surfaces, substrates and conditions are as required, and ready to receive the work.

C. Verify that interior moisture and temperature approximates normal occupied conditions.

D. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install boards in accordance with the manufacturer's published instructions and at the locations shown on the Drawings.

B. Secure boards to blocking provided under Section 09110 Non-Load Bearing Steel Framing.

C. Mount boards plumb and level.

3.3 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for square, plumb, level and secure attachment to the structure.

C. Verify that all required accessories have been provided and installed.

3.4 CLEANING

A. Section 01700- Execution Requirements: Cleaning the installed work.

B. Break in writing boards only as recommended by the manufacturer.

C. Clean surfaces in accordance with the manufacturer=s recommendations and with approved materials.

END OF SECTION

SECTION 10156

PHENOLIC TOILET PARTITIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid polymer toilet partitions.

2. Solid polymer urinal screens.

3. Solid polymer dressing compartments.

4. Institutional hardware.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment.

2. Section 04230 - Reinforced Unit Masonry: Substrate for attachment.

3. Section 06100 - Rough Carpentry: Backing plates within walls for partition attachment.

4. Section 09110 - Non-Load Bearing Steel Framing: Framing and plates within walls for partition attachment.

5. Section 10810 - Toilet Accessories: Coordinate compartment installation with subsequent accessories installation.

1.2 DESCRIPTION OF WORK

A. The extent of the phenolic toilet partitions work is indicated on the Drawings and as specified herein, and includes providing and installing floor-mounted / overhead braced toilet compartments, urinal screens, dressing compartments, hardware and accessories necessary for a complete and functional system.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 167 - Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):
   1. Accessibility Guidelines for Buildings and Facilities.

   2. Accessibility Guidelines for Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

   1. Product Data: Manufacturer=s detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings and accessories.

   2. Shop Drawings: Fabrication and erection drawings of toilet partitions, urinal screens, and dressing compartments assemblies not fully described in the manufacturer=s product drawings, templates, and instructions for anchorage devices built into other work; partitions layout plan, elevations, dimensions, door swings, details of floor and wall supports and connections.

   3. Samples: Not less than 2" x 3" of the actual solid polymer material, for selection of finishes, colors and patterns.

   4. Assurance / Control Submittals:

      a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

      b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

   1. Warranty: Provide written limited Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 COORDINATION

A. Coordinate plumbing rough-in locations with Division 15 Installer to ensure proper location and fitting of the work.

B. Furnish inserts and anchorages which must be built into other work for the installation of toilet partitions, screens and related work. Coordinate deliver with other work to avoid delay.

C. Coordinate with the installation of toilet accessories, as scheduled.

1.6 QUALITY ASSURANCE

A. Qualifications:

   1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

   2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Take field measurements prior to the preparation of Shop Drawings and fabrication, where possible, to ensure proper fitting of the work. Allow for adjustments within the specified tolerances whenever taking field measurements before fabrication might delay the work.

C. Conform to ADAAG for access and operation of compartment doors and hardware by the handicapped.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Protect partitions, screens, hardware, accessories and other items during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

C. Do not deliver products until wet work, grinding and similar operations which could damage, soil or deteriorate the materials has been completed in the installation areas.

D. If the partitions and screens must be stored in other than the installation areas, store only in areas meeting the same requirements as specified for the installation areas.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Limited Warranty:

1. Submit manufacturer=s Limited Warranty against breakage and corrosion, and agreeing to replace products which are defective in materials or workmanship.

2. Warranty Period: Fifteen (15) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Bobrick Washroom Equipment, Inc.

2. Accurate Partitions Corp.

3. Sanymetal (Crane Plumbing Co.).

4. Santana Products, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Panels, Doors, Pilasters and Screens:

1. Solid plastic, fabricated from High Density Polyethylene (HDPE) containing a minimum of 50% recycled material manufactured under high pressure forming a single component section.

2. Water-resistant, graffiti-resistant, non-absorbent.

3. 1" thick, unless otherwise indicated.

4. Self-lubricating surface that resists marking by pens, pencils and other writing instruments.

5. All panels, doors, pilasters and screens to be shipped from the manufacturer with a special protective plastic covering.

6. Characteristics:

   a. Dual component compression molded High Density Polyethylene (HDPE) of solid virgin resin materials in colors that extend throughout the material.

   b. Panels, doors, pilasters and screens shall have recycled material (HDPE) as the core material.

   c. Use material that has been selected for surface flatness and smoothness. Exposed surfaces that exhibit seam marks, roller marks, discoloration, telegraphing of core, or other imperfections on the finished units are not acceptable.

B. Pilaster Shoes: Type 302 / 304 stainless steel, 3" high minimum, and 18 gage, No. 4 satin finish, ASTM A 167.

C. Stirrup Brackets: Manufacturer=s heavy-duty design for attaching panels to walls and pilasters, stainless steel, anodized aluminum or chromium-plated non-ferrous cast alloy, to match the hardware finish.

D. Style: Floor-Mounted / Overhead-Braced, 1080 DuraLine Series by Bobrick.

E. Provide colors and patterns as selected from the manufacturer=s full line of standard colors and patterns.

2.3 PARTITIONS AND SCREENS

A. Shall be solid plastic with Type 304 stainless steel hardware throughout. All hardware shall be concealed on the inside of compartments.

B. Style: Floor-Mounted, DuraLine Series 1083 by Bobrick.

2.4 DRESSING COMPARTMENTS

A. Floor-Mounted / Overhead-Braced, solid phenolic partitions. Panels, doors, and pilasters to be 1" thick; Type 304, 18-8 stainless steel hardware, satin finish. DuraLine Series 1080 by Bobrick.

B. Wall-Mounted, 1" thick solid phenolic benches with stainless steel supports, satin finish. Series 1080 by Bobrick.

2.5 HARDWARE AND ACCESSORIES

A. Manufacturer=s heavy-duty operating hardware and accessories;; stainless steel; Institutional Series.

1. Hinges shall be integral hinge system. Pilasters to be machined to accept door and hinge mechanisms. The hinge mechanism to consists of a 2 piece 1/2" diameter nylon pin with ACam Action@ and a 3/16" stainless steel pin inserted into the lower portion of the pilaster and door. A one piece 1/2" diameter, 4" long nylon pin to be inserted into the top portion of the pilaster and door. Door closures to be factory set to accommodate all conditions and to allow for positive opening and closing action, free of impediment.

2. Door Pull and Wall Stop: Type 304 cast stainless steel.

3. Door latch housing fabricated from heavy aluminum extrusion (6364-T5 alloy) with clear anodized finish, surface-mounted and thru-bolted to the door with one-way sex bolts. Slide bolt and button shall be heavy aluminum.

4. Door strike and keeper fabricated from heavy aluminum extrusion (6364-T5 alloy) with clear anodized finish, wrap around flange, surface-mounted and thru-bolted to the pilaster with one-way sex bolts. Strike shall be 6" in length.

5. Coat Hooks: Combination coat hook and bumper fabricated from Type 304 stainless steel.

6. Finish: Stainless steel, No. 4 satin.

B. Overhead Bracing: Continuous extruded heavy-duty; mill finish;18 gauge stainless steel brackets.

C. Anchorage and Fasteners: Manufacturer=s standard exposed fasteners of stainless steel, chromium-plate steel, or brass finished to match the hardware; theft-resistant heads and nuts. Use stainless steel concealed anchors.

1. Steel Plate Reinforcement: Carbon steel, prepared for fasteners; 1/8" thick.

D. Add one (1) additional coat hook on the inside of handicapped accessible stalls and stalls with out-swinging doors.

2.6 FABRICATION

A. General:

1. Comply with the details shown for profile, layout and construction of compartments, screens and other items. Where not otherwise shown, comply with the manufacturer=s written instructions.

2. Furnish standard panels, doors, pilasters and screens fabricated from the partition system specified, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware and accessories, as shown.

3. Pre-Cut Openings: Fabricate with pre-cut openings, wherever possible, to receive hardware and accessories. Locate openings accurately and use templates or roughing-in diagrams for the proper size and shape. Smooth the edges of

cutouts and seal edges of cutouts with a water-resistant material. Provide radiused machined edges and bottom burn strip.

4. Fabricate from single piece material, except where the required length exceeds the maximum length fabricated by the manufacturer. Locate joints at even intervals through the material, aligned with other adjacent joints, and as approved on the final Shop Drawings. Form joints using the manufacturer=s recommended adhesive for a smooth even appearance of matching color and inconspicuous appearance. Provide joints of equal or greater strength than the material being joined.

B. Floor-Mounted / Overhead-Braced Partitions: Partitions, Doors and Pilasters: Flush type, manufacturer=s standard. Stainless steel bracing assembly, manufacturer=s standard, anchored to each pilaster and to the wall. Furnish 3/8" galvanized steel leveling devices to permit structural connection to the floor. Furnish a shoe at each pilaster to conceal the anchorages.

C. Doors: Unless otherwise indicated, furnish 24" wide in-swinging doors for standard toilet stalls and 32" wide (clear opening width) out-swinging doors for stalls equipped for use by the handicapped.

D. Floor-Mounted Urinal Screens: Panels and pilasters of the same construction and finish as the partitions. Furnish 3/8" galvanized steel leveling devices, welded to 11 gauge steel core. Furnish a shoe at each pilaster to conceal the anchorages.

2.7 FINISHES

A. Panels, Doors, Pilasters and Screens: Single color as selected from the manufacturer=s standard colors. Submit for selection as required above.

B. Overhead Bracing: Mill finish.

C. Stainless Steel: No. 4 bright directional polish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work, including spacing of plumbing fixtures, and location of built-in framing and backing plates.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with the manufacturer=s recommended procedures and installation sequence.

B. Install partitions plumb, level, straight, square, secure and rigid in accordance with the manufacturer=s published instructions, and as shown on the Drawings.

C. Floor-Mounted / Overhead-Braced Partitions:

1. Set pilasters with anchorages having not less than 2" penetration into structural floors, unless otherwise recommended by the partition manufacturer.

2. Secure pilasters to the floor with the anchorage devices provided.

3. Level, plumb and tighten the installation with the anchorage devices furnished.

4. Secure overhead braces to pilasters with not less than two (2) fasteners per face.

5. Hang doors and adjust so tops of doors are parallel with the overhead brace when the doors are in the closed position.

D. Floor-Mounted Urinal Screens:

1. Set pilasters with anchorages having not less than 2" penetration into structural floors, unless otherwise recommended by the partition manufacturer.

2. Set units in accordance with the manufacturer=s instructions for secure support, and to resist lateral impact.

3. Anchor panels to walls with two (2) panel brackets and to vertical upright pilasters anchored to the floor.

4. Attach units with heavy-duty concealed anchoring devices, as recommended by the manufacturer, and to suit the wall construction.

5. Secure panels to built-in devices using concealed fasteners.

6. Level, plumb and tighten the installation with the anchorage devices furnished.

E. Secure panels to walls with not less than two (2) stirrup brackets attached near the top and bottom of the panels. Locate wall brackets so holes for wall anchorages occur in masonry or tile joints, where occurs. Secure panels to pilasters with not less than two (2) stirrup brackets located to align with the stirrup brackets at the wall. Secure panels in position with the manufacturer=s recommended anchoring devices.

F. Attach panels and pilasters to brackets with through sleeve, tamper-proof bolts and nuts.

G. Locate head rail joints at the center line of pilasters.

H. Provide adjustment for floor variations with screw jacks through steel saddles integral with the pilaster.

I. Conceal floor fastenings with stainless steel shoes.

J. Provide clearance of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls.

K. Align the hardware to provide uniform clearance at vertical edges of doors, not exceeding 3/16".

L. Install door bumper coat hooks on partitions or walls.

M. Provide hardware at handicapped accessible compartments in compliance with ANSI A117.1.

N. Install one (1) additional wall-mounted bumper at handicapped accessible stall doors and out-swinging doors.

3.3 CONSTRUCTION

A. Interface With Other Work:

1. Coordinate the placement of support framing and backing plates in walls.

B. Site Tolerances:

1. Maximum Variation from True Position: 1/4".

2. Maximum Variation From Plumb: 1/8".

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust and lubricate hardware for proper operation after installation.

C. Adjust hardware for uniform clearance at the vertical edge of doors.

D. Adjust adjacent components for consistency of line and plane.

E. In-Swinging Doors: Adjust hinges to locate doors approximately 30 degrees from the closed position when unlatched.

F. Out-Swinging Doors (and entrance swing doors): Adjust hinges to gently return doors to the fully closed position.

G. Restore damaged and soiled areas per the manufacturer=s recommendations.

H. Repair damaged and defective components, where possible, to eliminate defects functionally and visually. Where not possible to repair to the satisfaction of the Owner=s representative, replace the damaged units.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for plumb, level, alignment, square, secure and rigid.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove protective masking.

C. Clean exposed and semi-exposed surfaces using materials and by methods recommended by the partitions manufacturer.

D. Clean hardware, fittings and accessories.

3.7 PROTECTION

A. Provide protection, as necessary, to prevent damage during the remainder of the construction to ensure that the work will be without damage and deterioration at the time of final acceptance.

END OF SECTION

SECTION 10190

CUBICLE CURTAIN SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes:

1. Cubicle curtain tracks, carriers and curtains.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Blocking.

2. Section 09110 - Non-Load Bearing Steel Framing: Backing plates.

3. Section 09250 - Gypsum Board: Finished walls and ceilings.

4. Section 09510 - Acoustical Ceilings: Finished ceilings.

1.2 DESCRIPTION OF WORK

A. The extent of the cubicle curtain system work is indicated on the Drawings and as specified herein, and includes providing and installing curtain tracks, carriers, hangers, curtains and all accessories necessary for a complete and operational curtain track system.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. National Fire Protection Association (NFPA):

1. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Copies of manufacturer=s detailed technical data for materials, fabrication and installation of cubicle curtain tracks and curtains specified herein.

Include catalog cuts of fittings, anchors, fastenings and accessories.

2. Shop Drawings: Show layout and types of cubicles, sizes of curtains, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions taken from field measurements.

3. Samples: Full-size units of each type of the following products:

   a. Curtain Fabric: 12" square swatch or larger samples as required to show the complete pattern repeat; from the same dye lot used for this Project, with the specified treatments applied. Mark the top and face of the material.

   b. Mesh Top: Not less than 4" square.

   c. Curtain Track: Not less than 4" long.

   d. Curtain Carrier: Full-size units.

4. Cubicle Schedule: Use same room designations as shown on the Drawings.

5. Assurance / Control Submittal:

   a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened packaging.

C. Handle to prevent damage to tracks, carriers and curtains.

D. Store to prevent damage to the materials, finishes and operating mechanisms.

1.7 JOB CONDITIONS

A. Environmental Limitations: Do not install curtains until areas where the products are to be installed are enclosed and weatherproof, wet work in the spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are stabilized and maintained at the levels indicated for the Project when occupied for its intended use.

B. Field Measurements: Where the track is indicated to fit to other construction, verify the dimensions of other construction by field measurements before fabrication and indicate the measurements on the Shop Drawings.

C. Coordinate the fabrication schedule with the construction progress to avoid delaying the work.

1.8 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Maintenance Data: For tracks and curtains; include in the Maintenance Manuals specified in Division 1.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Cubicle Curtain Factory, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 CURTAIN TRACKS

A. Cubicle Curtain Factory designations are used within this Section to establish the quality and to identify the products required.

B. Extruded Aluminum Track, No. 1200: 1-3/8" wide x 3/4" high aluminum track.

C. Suspended Extruded Aluminum Track, No. 1100: 1-3/8" wide x 3/4" high aluminum track.

D. Curved Track: Factory fabricated 12" radius bends, minimum.

E. Finish: White baked enamel, or as selected.

2.3 ACCESSORIES

A. Fabricate connectors, end caps, coupling sleeves, wall brackets, filler caps, ceiling flanges, suspension tubing, studs and other accessories from same material and with the same finish as the track; manufacturer=s standards..

1. Suspended Track Support: Not less than 1" o.d. aluminum tubing.

2. End Stop: Removable.

B. No. 12 Curtain Carriers: Two (2) nylon rollers, nylon axle and tangle free nylon swivel stem with chrome-plated steel hooks.

C. Exposed Fasteners: Stainless steel.

D. Concealed Fasteners: Stainless steel.

2.3 CURTAINS

A. Curtain Fabric: Manufacturer's standard curtain fabric with the following characteristics:

1. Fiber Content: 100% polyester.

2. Launderable to a temperature of not more than 160E F.

3. Inherently and permanently flame resistant, and identical to that which has

passed NFPA 701 when tested by a testing and inspecting agency acceptable to the authorities having jurisdiction.

4. Pattern: As selected from the manufacturer's full range of available fabrics.

5. Color: As selected from the manufacturer's full range of available colors.

B. Mesh: No snag, tightly woven selvedge, 1-1/4" fire-retardant; grommet band at the top edge; white or beige color nylon mesh 70% open (1/2@ diagonal).

E. Curtain Grommets: #2 two-piece, rolled-edge, rustproof, nickel-plated brass; spaced not more than 6" on centers and machined into top hem.

2.5 FABRICATION

A. Fabricate curtains to comply with the following requirements:

1. Width: Equal to track length from which the curtain is hung, plus 20% added fullness.

2. Length: Equal to the floor-to-ceiling height, with 20" mesh top, and 10" above the finished floor at the bottom.

3. Mesh: Mesh serged to the face fabric, turned and stitched with double needle lock stitch no less than 1/2@ in width.

4. Bottom and Side Hems: Double folded 1-1/2@ and sewn with double needle lock stitch.

5. Vertical Seams: Serged together and sewn with double needle lock stitch not less than 1/2@ wide.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install tracks level and plumb, and in compliance with the manufacturer's written instructions. Provide tracks fabricated from one continuous length up to 18 feet.

B. Track: Surface-mounted. Fasten at intervals of not less than 24" o.c. Fasten supports at each splice and tangent point of each corner. Center fasteners in the track to ensure unencumbered carrier operation. Attach track to the ceiling as follows:

1. Mechanically fasten directly to the bottom of concrete decks with anchor screws.

2. Mechanically fasten directly to finished gypsum board ceilings with toggle bolts.

3. Mechanically fasten to suspended ceiling grid with screws.

4. Mechanically fasten to furring through suspended ceiling with screw and tube spacer.

C. Suspended Track Mounting: Install track with suspended supports at intervals of not more than 48". Fasten supports at each splice and tangent point of each corner. Secure ends of track to wall with flanged fittings or brackets.

D. Track Accessories: Install end caps, connectors, end stops, coupling and joining sleeves, and other accessories as required for a secure and operational installation.

E. Curtain Carriers: Provide curtain carriers at 6" o.c. along the full length of the curtain.

F. Curtains: Hang on each track.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust track and carriers for smooth operation.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installation for proper alignment, attachment to backing or structure, and operation.

3.5 DEMONSTRATION

A. Train the Owner's personnel to adjust, operate, and maintain safety (loading of the units).

1. Train Owner's maintenance personnel on procedures and schedules for changing and cleaning the curtains.

END OF SECTION

SECTION 10200

LOUVERS AND VENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fixed aluminum wall louvers.

2. Bird screens.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment of units.

2. Section 04230 - Reinforced Unit Masonry: Substrate for attachment of units.

3. Section 07900 - Joint Sealers: Perimeter sealant at louver and vent frames.

1.2 DESCRIPTION OF WORK

A. The extent of the louvers and vents work is indicated on the Drawings and as specified herein, and includes providing and installing louvers and vents with bird screens, anchor devices, flashings and sealants necessary for complete and weather-tight installations.

B. The work of this Section does not include providing and installing louvers for doors specified in Sections 08100 and 08210.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

C. American Society for Testing and Materials (ASTM):

1. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.

2. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

3. ASTM E 1996 - Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

D. International Code Council:

1. International Building Code (IBC), 2009.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Provide data describing the design characteristics, maximum recommended air velocity, design free area, materials and finishes.

2. Shop Drawings: Indicate louver layout plan and elevations, openings and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas, and frames.

4. Samples: When requested, submit 6" X 6" square of each required finish. Prepare samples on metal of the same gage and alloy as that to be used in the work. Where color variations are to be expected, submit two (2) or more samples showing the limits of such variations.

5. Assurance / Control Submittals:

a. Manufacturer's certificate that the Products meet or exceed the specified requirements.

b. Calculations indicating that the products and anchorages satisfy the performance requirements.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 COORDINATION

A. Verify size, locations and placement of louver units prior to fabrication, wherever possible.

B. Coordinate with the mechanical subcontractor for size and location of required louvers and vents.

C. Where size or location of louvers or vents differ with the Drawings, notify the Owner=s representative.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

B. Performance Requirements:

1. Provide capacity to withstand the following loading requirements for exterior units:

a. Design and install to resist combined positive and negative windloading in accordance with IBC 2009, Section 1609 with a Vmph of 170, qs of 74.0 psf, exposure [B] [C] [D], and importance factor of [1.0] [1.25] [1.5], as

applicable per ASCE 7.

b. Height of louver units above ground level are indicated on or can be calculated from the Drawings.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Protect finished aluminum surfaces with a strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

C. Deliver product to the Project Site in the manufacturer=s original, unopened protective packaging.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. The Airolite Co.

2. Airline Products, Nystrom Building Products.

3. Construction Specialties, C/S Louvers.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Aluminum: ASTM B 221, extruded shapes.

B. Bird Screen: 1/4" x 1/4" mesh, aluminum, set in aluminum frame.

2.3 ACCESSORIES

A. Fasteners and Anchors: Stainless steel.

B. Flashings: Of the same material as the louver frame.

C. Sealants: As specified in Section 07900 - Joint Sealers.

2.4 FABRICATION

A. Louver Panel Thickness: 6" deep; face measurements as shown on the Drawings.

B. Louver Blade Design: Weatherproof, minimum material thickness of 0.081"; integral and lateral rain water stops positioned on the blades.

C. Louver Frame: Channel shape, mechanically fastened corner joints, minimum material thickness of 0.081".

D. Head and Sill Flashings: Extruded to the required shapes, single length, in one piece per

location.

E. Screens: Install screen mesh in shaped frames, reinforce corner construction, shop install to the louvers with non-ferrous fasteners.

2.5 FINISH

A. Exposed Aluminum Surfaces: Clear anodized or as selected from the manufacturer=s standard finishes.

B. Maintain same color range within each unit. Do not mix light and dark shades within an assembly.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install louver assemblies in accordance with the manufacturer's published instructions.

B. Install louvers level, plumb, free of rack and securely attached to the structure.

C. Install flashings and align louver assemblies to ensure that moisture sheds from the flashings, and to the exterior.

D. Secure louvers in opening framing with concealed fasteners as required to meet the Performance Requirements.

E. Install perimeter sealant in accordance with Section 07900 - Joint Sealers.

3.3 ISOLATION REQUIREMENTS

A. Dissimilar Metals: Where aluminum surfaces are in contact with, or fastened to dissimilar metals except stainless steel, zinc or zinc coating, the aluminum shall be protected from the dissimilar metal. Where aluminum contacts another metal, paint the dissimilar metal with epoxy paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

B. Cementitious Materials: Paint aluminum where in contact with mortar, concrete, masonry or other cementitious material, with an alkali-resistant coating such as heavy-bodied bituminous paint or epoxy paint.

C. Wood Contract: Isolate aluminum from cedar, redwood, oak and acid-treated lumber by means of unbroken 6-mil polyethylene construction sheet or a heavy coating of

metal-protective paint.

D. Surfaces in contact with sealants after installation need not be coated with any type of protective material.

3.4 PROTECTION

A. Protect the finish from damage during construction by the use of temporary protective coverings approved by the manufacturer.

3.5 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Remove protective covering at project completion or when directed by the Owner=s representative.

C. Restore finishes damaged during installation and construction so no evidence of the corrective work remains.

D. Return items which cannot be refinished in the field to the shop, make the necessary alterations, and refinish the entire unit, or provide a new unit.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installations for correct location, alignment and elevation, plumb, level, true to line, free of rack and secure attachment and anchorage.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning installed work.

B. Immediately prior to final inspection, remove protective wrappings.

C. Wipe down all louver blades and frames before final acceptance.

END OF SECTION

SECTION 10260

WALL AND CORNER GUARDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall Rails.

2. Corner Guards.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Wall substrate.

2. Section 04230 - Reinforced Unit Masonry: Wall substrate.

3. Section 09250 - Gypsum Board: Wall substrate.

4. Section 09110 - Non-Load Bearing Steel Framing: Substrate framing for attachment of products.

1.2 DESCRIPTION OF WORK

A. The extent of the wall and corner guards work is indicated on the Drawings and as specified herein, and includes providing and installing pre-molded corner guards and wall rails with all mounting accessories for complete installations.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

B. National Fire Protection Association (NFPA):

1. NFPA 101 - Life Safety Code.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product literature; style, texture and color options.

2. Shop Drawings:

a. Indicate layout, terminations, mounting heights, method of attachment and other applicable details.

b. Installation details.

3. Samples: Two (2) 12" long, full-size samples, illustrating type, texture and color.

4. Assurance / Control Submittals:

a. Manufacturer=s Instructions: Include installation template, attachment devices, and procedures for the care of finished surfaces.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written limited Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

B. Single Source Responsibility: Obtain all wall protection system components from a single manufacturer.

1.6 DELIVERY, STORAGE AND HOLDING

A. Section 01600 - Product Requirement: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging.

C. Identify the contents, manufacturer, brand name, and applicable standards.

D. Store in the original packaging, off the ground, and under protective covers.

E. Handle to prevent damage.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Limited Warranty:

1. Provide a written Warranty jointly signed by the manufacturer and the installer certifying that the products and the installation is free of defective materials and workmanship and will repair or replace any defective component, in whole or in part, as necessary to restore the product to its original intended state and

integrity.

2. Warranty Period: Five (5) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Koroseal Wall Protection Systems.

2. Pawling Corp.

3. C/S Acrovyn.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Corner Guard: Surface-mounted, adhesive-applied, 90 degrees, 0.093" rigid vinyl, 3" wings. Class A fire-rating. Color as selected from manufacturer=s standards.

B. Wall Rails: 5-1/2" flat profile, full-length vinyl bumper and continuous aluminum retainer, reinforced rigid plastic returns and inside and outside corners; 3" projection, 1-1/2" gripping area. Class A fire-rating. ADAAG compliant. Color as selected from manufacturer=s standards.

C. Fire Performance Characteristics: Comply with ASTM E 84.

1. Flame Spread: 25 or less.

2. Smoke Developed: 450 or less.

2.3 FASTENERS AND OTHER MATERIALS

A. Provide non-corrosive fasteners as recommended by the manufacturer; clips, and mounting devices compatible with the product material and finish; concealed or of same color and finish as the components they secure where exposed to view.

B. Other materials, not specifically described but required for a complete and proper installation; shall be as selected, and subject to approval.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirement: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates, and conditions are as required, and ready to receive the work.

1. Examine walls, structure, and other areas scheduled to receive the products for conditions that will affect the quality and execution of the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install wall products in accordance with the manufacturer=s published instructions.

B. Install products at locations shown or scheduled. Securely mount with concealed theft-resistant fasteners. Attach to substrates in accordance with the manufacturer=s instructions.

C. Install field-cut corner guard lengths from top of wall base to align with the top of door frames.

D. Cooperate with other trades for attachment to finish surfaces.

E. Install products level and plumb.

F. Comply with ADAAG for wall rail mounting height.

3.3 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect locations, mounting heights and attachments to verify that installations comply with the Drawings and ADAAG.

3.4 ADJUSTING AND CLEANING

A. Section 01700 - Execution Requirements: Adjusting and cleaning of installed work.

B. Remove and dispose of all debris, crates and equipment upon completion of the work.

C. Remove excess adhesive from wall surfaces in accordance with the manufacturer=s instructions.

D. Adjust wall rails for level and alignment.

E. Touch-up surfaces damaged during installation; use matching finish.

F. Wipe down surfaces before final acceptance inspection.

END OF SECTION

SECTION 10350

FLAGPOLES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ground-mounted flagpoles.

2. Truck, halyards, and accessories.

3. Flags.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Concrete bases.

2. Section 07900 - Joint Sealers: Sealant for base.

1.2 DESCRIPTION OF WORK

A. The extent of flag pole work is indicated on the Drawings and as specified herein, and includes providing and installing foundations, ground-mounted flag poles with manually-operated winch, halyards, flags and all necessary accessories for complete flag pole assemblies.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society of Civil Engineers (ASCE):

1. ASCE / SEI 7 - Minimum Design Loads for Buildings and Other Structures.

C. American Society for Testing and Materials (ASTM):

1. ASTM B 241 - Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

D. International Code Council:

1. International Building Code (IBC), 2018:

1.4 SYSTEM DESCRIPTION

A. Performance Requirements. Fabricate and install to withstand the following loading requirements:

1. Wind Loads: According to IBC 2018, Section 1609 and ASCE 7:

   a. Basic Wind Speed: 195 mph; qs of 86.0 psf

   b. Exposure Category: C

   c. Risk Category: Per IBC 2018, Table 1604.5

   d. Occupancy Category: Per IBC 2018, Table 1604.5

   e. Importance Factor: Per ASCE 7

   f. Terrain Factor: Calculated per ASCE 7

2. Seismic Loads: According to IBC 2018, Section 1613 and ASCE 7

   a. Seismic Design Category: D

   b. Seismic Importance Factor: Per ASCE 7

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer's technical data and installation instructions for the type of poles required.

.

2. Shop Drawings: Indicate detailed dimensions, jointing (if any), anchor requirements, imposed loads, and support system.

3. Foundation design drawings and calculations.

4. Samples: Finished metal for poles and accessories, if requested.

5. Assurance / Control Submittals:

   a. Manufacturer's certificate that the products meet or exceed the specified requirements.

   b. Calculations indicating that the system and anchorage satisfies the performance requirements.

   c. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a written standard Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

B. Provide each flagpole as a complete unit, produced by a single manufacturer, including fittings, accessories, bases and anchorage devices.

C. Provide flagpoles and installations to meet the performance requirements herein. Use heavy pipe sizes, if required, for the flagpole type, height and wind load required.

D. Fabricate poles and ship to the Project Site in one piece, if possible. If more than one piece is necessary, provide snug fitting, precision joints with self-aligning, internal splicing sleeve arrangement for weather tight, hairline joints.

E. Design flagpole foundations under direct supervision of a registered Professional Structural Engineer licensed to practice in the jurisdiction where Project is located; experienced in the design of flagpole supports.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Spiral wrap each pole with heavy Kraft paper or other protective covering. Ship in a hard fiber tube or other protective container.

C. Deliver products to the Project Site in the manufacturer’s original packaging.

D. Store flagpoles and accessories to prevent damage to or soiling of the materials, finishes and operating mechanisms.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Manufacturer’s Warranty: Provide manufacturer’s standard warranty against defects in product materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering the specified items which may be incorporated into the work include the following:

1. American Flagpole, Inc., Division of Kearney-National Inc.

2. Eder Flag Manufacturing Company, Inc.

3. Concord Industries, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Flagpole: Commercial, tapered, ground-set, 6063-T6 wrought aluminum alloy, ASTM B 241.

1. Outside Butt Diameter: 6" or as determined by the manufacturer based on the exposure, height and design wind load criteria.

2. Outside Tip Diameter: 3-1/2".

3. Nominal Wall Thickness: As required to resist the wind loading.

4. Nominal Height: 40' - 0" measured from the top of the pole to the ground.

5. Mounting: Ground-mounted to a base and concrete foundation.

B. Truck Assembly: Stainless steel; stainless steel ball bearings, revolving, non-fouling, with cast aluminum cleats.

C. Halyard: Stainless steel aircraft cable with two (2) chrome plated bronze swivel snaphooks, plastic covered counterweight, and beaded sling.

D. Collar: Manufacturer's standard; finish to match the pole.

E. Foundation Sleeve: 16 gauge steel, galvanized corrugated tube with 3/16" thick steelbase plate and support plate, 3/4" diameter x 18" long ground spike, and steel centering wedges.

F. Ball: Manufacturer's standard flush seam ball, size as indicated, or if not indicated, to match the pole butt diameter, gold cast aluminum steel, finish to match the pole shaft or as selected.

G. Flags: One U.S. and one local jurisdiction; size: 4' x 6'.

H. Concrete: Specified in Section 03300 - Cast-in-Place Concrete.

I. Internal Halyard System: Manually-operated, geared winch with control stop device and removable handle. Provide stainless steel braided aircraft cable and concealed revolving truck assembly with plastic coated counter balance and sling; reinforced, flush access door secured with a cylinder lock.

2.3 FINISH

A. Clear satin brush aluminum

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Excavate for concrete foundations to neat, clean lines in undisturbed soil. Provide forms where required due to unstable soil conditions. Remove wood, loose soil, rubbish and other foreign matter from the excavations; moisten the earth before placing concrete.

B. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with a heavy coat of bituminous paint.

3.3 INSTALLATION

A. Install flagpoles in accordance with the manufacturer's written instructions, in compliance with the Shop Drawings, and to meet the performance requirements.

B. Install a foundation plate and centering wedges for flagpole bases; set in concrete base and fasten. Fill foundation tube sleeve with sand and compact.

C. Provide positive lightning ground for each flagpole installation.

3.4 ERECTION

A. Site Tolerances:

1. Maximum Variation From Plumb: 1"

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect flagpole installations and accessories for plumb and proper operation.

3.6 ADJUSTING AND CLEANING

A. Section - 01700 - Execution Requirements: Adjusting and cleaning of the installed work.

B. Clean flagpole surfaces immediately prior to erection.

C. Adjust operating devices for smooth halyard and flag function.

END OF SECTION

SECTION 10436

SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Accessible signage.
2. Directional signage.
3. Tactile exit signs.
4. Elevator signs.
5. Exit enclosure signs.
6. Instructional signage.
7. Room identification signage.
8. Occupant load signs.
9. Fire fighting equipment signs.
10. Fire wall signs.
11. Floor and roof design load signs.
12. Dedication plaque.
13. Exterior signage.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment.
2. Section 04230 - Reinforced Unit Masonry: Substrate for attachment.
3. Section 09250 - Gypsum Board: Substrate for attachment.
4. Sections of DIVISION 16 - Electrical: Requirements for lighted signs.

1.2 DESCRIPTION OF WORK

A. The extent of signage work is indicated on the Drawings and as specified herein, and includes providing and installing all interior and exterior signage, and all attachment

accessories.

B. Signage mounting height shall comply with ADAAG.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product data and mounting details.

2. Shop Drawings:

a. Indicate sign styles, lettering font, foreground and background colors, locations, and overall dimensions of each sign.

b. Provide installation details.

3. Samples: Two (2) signs, full size, illustrating the type, style, letter font, colors and method of attachment, when requested.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Installation templates, attachment devices, and procedures for the care of finished surfaces.

c. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittal.

A. Warranty: Provide a written standard Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, unopened protective packaging bearing the manufacturer=s name, contents, brand name, and applicable standards.

C. Handle to prevent damage to surfaces and edges.

D. Store in the manufacturer=s original packaging, off the ground and under protective covers.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Manufacturer=s standard for materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with project requirements, manufacture's offering products which may be incorporated into the work include the following:

1. Mohawk Sign Systems, Inc.

2. APCO Graphics Inc.

3. ASI-Modulex.

4. Best Sign Systems, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 SIGNAGE

A. Mohawk Sign Systems, Series 200A, is used as the standard for design and quality.

1. Construction: Signs shall be of one-piece construction. Added-on and / or engraved characters are not acceptable. Text shall be accompanied by Grade 2 braille.

2. Design and Location: Comply with ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility.

3. Tactile characters / symbols: Raised 1/32" from the sign plate face.

4. Font: Times Roman Extra Black, upper and lower case.

5. Pictographs: AGA Symbol Signs repro art developed for the U.S. Department of Transportation to be used whenever possible.

2.2.1 ACCESSIBLE SIGNAGE

A. Accessible Signage: Post signage, including the International Symbol of Accessibility at the following locations:

1. Accessible entrances when not all entrances are accessible.

2. Accessible dressing, fitting and locker rooms where not all such rooms are accessible.

3. Accessible areas of refuge.

4. Exterior areas for assisted rescue.

5. Other locations required by the Building Code.

B. Directional Signage: Signage, including the International Symbol of Accessibility, indicating the route to the nearest like accessible element at the following locations:

1. Inaccessible building entrances.

2. Inaccessible public toilets and bathing facilities.

3. Elevators not serving an accessible route.

4. At each toilet and bathing room indicating the location of the nearest family or assisted-use toilet or bathing room, where provided.

5. At exits and exit stairways serving a required accessible space, but not providing an approved accessible means of egress.

C. Tactile Exit Signs: Provide AEXIT@ sign complying with ICC A117.1 adjacent to each door to exit discharge, exit passageway, exit ramp, exit stairway, area of refuge and exterior area for assisted rescue. Text shall read as follows:

a.. At doors providing access to an area of refuge from an adjacent floor area - AAREA OF REFUGE@.

b. At doors proving access to an exterior area for assisted rescue - AEXTERIOR AREA FOR ASSISTED RESCUE@.

D. Elevator Signs: Provide an approved pictorial sign of standard design adjacent to each elevator call station on all floors to read - AIN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS@.

E. Exit Enclosure Signs: Provide at each floor landing in exit enclosures connecting more than three (3) stories. Designate the floor level, terminus of the top and bottom of the enclosure and identification of the stair or ramp. Signage shall state the story of, and direction to, the exit discharge and availability of roof access from the enclosure for the fire department. Comply with the following:

1. Size shall be a minimum 8" X 8".

2. Letters designating the identification of the stair enclosure shall be a minimum of 2" in height.

3. All other lettering and numbers shall be a minimum of 1" in height.

4. Characters and background shall have a non-glare finish. Characters shall contrast in color with their background, with either light characters on a dark background or dark characters on a light background.

5. Locate 5 feet above the floor landing in a position readily visible when the doors are in the open and closed positions.

6. Floor level identification signs in tactile characters complying with ICC A117.1 shall be located at each floor level landing, adjacent to the door leading from the enclosure into the corridor.

F. Instructional Signage: In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. Instructions shall include all of the following:

1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.

2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summons such assistance.

3. Directions for use of the two-way communications system, where provided.

2.2.2 ROOM SIGNS

A Room Identification Signs: Provide wall-mounted signs at each door opening and where indicated on the Drawings.

1. Type A Signs: Size 4A x 6" (typical) at Room entrances indicating room number and name, including braille.

2. Type P Signs: Size 8" x 8" at Toilet Room doors, including the international symbols for Boys / Men, Girls / Women, including braille.

3. Type B Signs: Size 2" x 4" (typical) at secondary spaces, indicating room name only.
4. Type C Signs: Size 10" x 10" (typical) directional signs, including braille.

B Occupant Load Signs: Provide an approved legible permanent sign indicating the occupant load for all assembly occupancies. Post in a conspicuous place, near the main exit or exit access doorway from the room or space.

C. Floor and Roof Design Load Signs: Where live loads for floors or roofs, or portion thereof, have been designed to exceed 50 psf, post such design load signs in a conspicuous place in that part of each story or roof in which they apply.

2.2.3 FIRE SIGNS

A Fire Fighting Equipment Signs: Cabinets containing fire fighting equipment such as standpipes, fire hoses, fire extinguishers or fire department valves shall be identified in an approved manner by a permanently attached sign with letters not less than 2" high in a color that contrasts with the background color, and indicating the equipment contained

therein.

B Fire Wall Signs: Post effective and permanent signs or stenciling along fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions and any other walls required to have protected openings and penetrations. Such identification shall:

1. Be located in accessible concealed floor, floor-ceiling and attic spaces.

2. Be repeated at intervals not exceeding 30 feet horizontally along the wall or partition.

3. Include lettering not less than 1/2" in height to read - AFIRE AND / OR SMOKE BARRIER - PROTECT ALL OPENINGS@ or other similar wording.

2.3 EXTERIOR SIGNAGE

A. Subject to compliance with project requirements, manufacture's offering products which may be incorporated into the work include the following:

1. Gemini, Inc.

2. Metal Arts.

3. Metallic Arts.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

C. Metal Signage:

1. Size: [8"] [12"] [15"] [36"] height; stroke, depth, and average width per manufacturer=s standard for the size and letter style selected.

2. Material: Cast aluminum.

3. Finish: [Satin] [Baked enamel] [Anodized]; color as selected.

4. Letter Style: As selected.

5. Mounting: Projected Spacer Mount with aluminum tube spacers.

6. Lettering / Name: To be provided.

7. Location: Mount in location shown or as directed.

D. Manufacturer to provide layout template.

2.4 DEDICATION PLAQUE

A. Metal Plaque:

1. Size: [16" x 20"] [18" x 18"].

2. Material: Bronze.

3. Letter Style: Times and Times Bold, engraved copy and logo, color filled, satin

finish, straight edge borders.

4. Mounting: Concealed.

5. Locations: Mount in locations, as directed.

B. Owner to provide sample of graphics, Contractor to prepare the artwork.

2.5 FASTENERS AND OTHER MATERIALS

A. Provide non-corrosive fasteners, hangers, and mounting devices compatible with the sign material and finish. Concealed or of the same color and finish as the components they secure where exposed to view.

B. Other materials, not specifically described but required for a complete and proper installation shall be as selected, and subject to approval.

C. Sign face surfaces shall not be deformed, distorted or discolored by the attachment of fasteners.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Examine walls, doors, ceilings and other areas scheduled to receive signs for conditions that would affect quality and execution of the work. Notify the Owner=s representative if a sign will be obscured from view at any location.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install signage in accordance with the manufacturer's published instructions, and with ADAAG.

B. Install sign units and components at the locations shown or scheduled, securely mounted with concealed, theft-resistant fasteners.

C. Install level, plumb, and at the proper height. Cooperate with other trades for the attachment of sign units to finish surfaces.

D. Installations shall withstand normal wear and tear.

E. Exterior installations shall withstand environmental actions of wind and rain, and normal wear and tear.

3.3 CONSTRUCTION

A. Interface with Other Work:

1. Furnish full-size spacing templates for individually bundled letters and numbers for coordination with the work of other trades.

2. Furnish wiring diagrams for illuminated signs for coordination with the electrical trade for service to lighted units.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting installed work.

B. Adjust signage, as necessary, for proper mounting height, plumb, level and secure attachment.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect signage locations, attachments, and messages to verify that the installations conforms to the Drawings or information provided.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove protective materials from surfaces.

C. Wipe clean before final acceptance inspection.

END OF SECTION

SECTION 10500

METAL LOCKERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Double-tier locker units with hinged doors.

2. Benches

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-in-Place Concrete: Base for metal lockers and wall substrate for attachment.

2. Section 04230 - Reinforced Unit Masonry: Wall substrate for attachment.

3. Section 07900 - Joint Sealers: Sealants around perimeter of lockers.

4. Section 09110 - Non-Load Bearing Steel Framing: Wall structure for attachment.

5. Section 09250 - Gypsum Board: Wall finish.

1.2 DESCRIPTION OF WORK

A. The extent of the metal lockers work is indicated on the Drawings and as specified herein, and includes providing and installing double-tier, heavy-duty lockers, trim, sloped tops, locking mechanisms, accessories and benches.

B. Lockers shall provide for accessibility by the handicapped and shall comply with ADAAG.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM D 609 - Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products.

2. ASTM D 2201 - Practice for Preparation of Zinc-Coated and Zinc-Alloy-Coated Steel Panels for Testing Paint and Related Coating Products.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product literature describing locker types, sizes, construction, accessories and colors.

2. Shop Drawings: Show lockers in detail, indicate layout, dimensions, details of fabrication and method of installation, fillers, base and accessories. Include plans, elevations, sections, and attachments to other work. Provide numbering sequence information. Verify critical dimensions affecting installation.

3. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Operation and Maintenance Data: Manufacturer=s recommendations for maintenance and cleaning.

2. Warranty: Provide a written standard Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store, and protect the products.

B. Protect products from water, dust and humidity damage during delivery, handling, storage and installation.

C. Do not deliver products to the Project Site until the building is enclosed and ready for their installation.

D. Deliver products to the Project Site in the manufacturer's original, unopened protective packaging.

E. Identify contents, manufacturer, brand name, and applicable standards.

F. Store products in a location protected from the weather and construction operations.

G. Protect adjacent work and materials from damage during installation of the lockers. Damaged work shall be repaired or replaced as determined by the Owner=s representative.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Warranty:

1. Manufacturer=s standard for materials and workmanship.

2. Warranty Period: Two (2) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturer's offering products which may be incorporated into the work include the following:

1. Lyon Metal Products, Inc.

2. MEDART Locker Co.

3. Penco Products, Inc.

4. Republic Storage Systems, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 STANDARD LOCKERS

A. Type: Double-Tier, Heavy-Duty, ventilated, with tops sloped.

B. Frames: Minimum 16 gauge galvanizes steel channels or 12 gauge galvanized steel angles, with welded corners ground smooth and integral door stops. Provide minimum 16 gauge horizontal members between doors of double tier lockers to ensure rigidity.

C. Backs and Sides: Minimum 20 gauge galvanized steel sheet, except 16 gauge for exposed ends on non-recessed lockers, minimum. Flange back on vertical edges and sides where they intermember with backs, making double flanged rear corners.

D. Tops, Bottoms and Shelving:16 gauge galvanized steel flanged edges.

E. Doors: One-piece, 14 gauge galvanized steel sheet, flanged at all edges, reinforced to prevent springing. Ventilate door with perorations the full height.

F. Hinges: Heavy-duty galvanized, not less than 0.050" thick steel, full loop, five knuckle tight pin, 2" high. Weld to the inside of frame and secure to the door with not less than two (2) factory-installed fasteners, completely concealed and tamperproof when the door is closed.

G. Latching positive, automatic, prelocking, pry-resistant latch and pull with rubber silencers - chrome plated, vandalproof, lift-up handle with strike and hole for padlock and two-point latching.

H. Locks:

1. Type 1 - For padlocks to be furnished by others.

2. Type 2 - For coin-operated locks.

I. Hooks: Cadmium plated steel or cast aluminum. One (1) double prong center hook and three (3) single prong wall hooks.

J. Sloping Tops: 16 gauge galvanized steel sheet, approximately 25 degrees pitch, with closers at exposed ends and finished to match the lockers; at Type 1 only.

K. Trim: Manufacturer=s standard for recessed installations, finish to match the lockers.

L. Fasteners: Cadmium, zinc, or nickel plated steel, vandal-resistant, concealed on the front of lockers and frames; manufacturer=s standard.

M. Base: As shown on the Drawings, or as selected.

N. Number Plates: Manufacturer=s standard non-ferrous metal number plates with numerals not less than 3/8" high; attach to the door with matching fasteners. Number lockers in the sequence directed by the Architect.

O. Size: 15" wide by 15" deep, two tiers high at 36" each.

P. Finish:

1. Corrosion Resistant Finish

a. All doors, frames and parts cleaned and treated with a multi step detergent / iron phosphate coating, cold water rinsed and sealed with an environmentally sound non-chrome treatment.

b. Prime Coat: Modified epoxy applied through a electronically charged dip process.

c. Finish Top Coat: High solids polyester paint applied over the prime coat through an electrostically charged spray process.

2. Finish Color: As selected from the manufacturer=s standard colors.

2.3 ADAAG COMPLIANT LOCKERS

A. Provide lockers designated for handicapped use at a ratio of 5% of the total number of lockers.

B. Lockers for the handicapped shall have recessed handles and shall be single tier, or the lower opening of a double tier locker.

C. Locker bottom shall be a minimum of 9" above the finished floor, or an extra shelf shall be

installed at 9" above the floor.

D. Single tier lockers shall have a shelf 48" above the finished floor.

E. Doors shall have an appropriate symbol sign attached.

2.4 FABRICATION

A. Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents and distortion. Weld frames together, weld, bolt, or rivet other joints and connections as standard with the manufacturer. Grind exposed welds flush.

B. Finish: Chemically pretreat with degreasing and phosphotizing process. Apply baked-on enamel finish to all exposed and concealed surfaces, except plates and non-ferrous metal. Color as selected from the manufacturer=s standard colors.

2.5 BENCHES

A. Type: Laminated wood top with one (1) coat deep penetrating sealer and two (2) coats heigh impact lacquer. Top-mounted to trapezoidal aluminum or stainless steel pedestals with holes for permanent installation.

B. Size: 9-1/2" wide x 1-1/4" thick x length shown on the Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Field Measurements: Take field measurements prior to the preparation of Shop Drawings, and fabrication of special components, when possible, to ensure proper fitting of the work. Allow for adjustment and fitting of trim and filler panels whenever taking of field measurements to prevent fabrication from delaying the work.

3.3 INSTALLATION

A. Install metal lockers and benches at the locations and in the configurations shown on the Drawings. Locate and install ADAAG lockers.

B. Install in strict accordance with the manufacturer=s instruction.

C. Install lockers plumb, level, rigid, and flush.

D. Space fastenings about 48" o.c., unless otherwise recommended by the manufacturer. Install through back-up reinforcing plates where necessary to avoid metal distortion.

Conceal fasteners.

E. Provide metal filler panels for closure to adjacent surfaces factory finished to match the lockers.

F. Install trim where indicated; use concealed fasteners to provide flush, hairline joints with

adjacent surfaces.

G. Anchor benches to the floor with stainless steel bolts.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust doors and latches to operate easily without binding.

C. Verify that integral locking devices operate properly.

D. Touch-up marred finishes. Use only materials and procedures recommended or furnished by the manufacturer. Replace units which cannot be restored to a factory like finish.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installation of lockers, attachment to substrates, and alignment with adjacent finishes.

3.6 CLEANING

A. Section 01700 - Execution requirements: Requirements for cleaning the installed work.

B. Clean locker surfaces prior to final acceptance inspection.

END OF SECTION

SECTION 10520

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire extinguishers.

2. Mounting brackets.

3. Fire hose cabinets.

4. Mounting brackets.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment.

2. Section 04230 - Reinforced Unit Masonry: Substrate for attachment.

3. Section 09110 - Non-Load Bearing Steel Framing: Wall framing for attachment of extinguishers and cabinets .

4. Section 09250 - Gypsum Board: Adjacent wall finish.

1.2 DESCRIPTION OF WORK

A. The extent of the fire protection work is indicated on the Drawings and as specified herein, and includes providing and installing fire extinguisher cabinets, fire extinguishers, fire hose cabinets with hoses, and all mounting brackets, devices and accessories.

B. Fire protection shall comply with the Building Code, and regulations of the governing authorities having jurisdiction.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. National Fire Protection Association (NFPA):

1. NFPA 10 - Portable Fire Extinguishers.

C. Underwriters Laboratories, Inc. (UL):

1. UL 299 - Dry Chemical Fire Extinguishers.

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s specifications, data and list of items.

a. Extinguishers: Type, operational features, color.

b. Extinguisher: Type, materials, construction, features, finish, color and attachment method.

c. Fire Hose Cabinets: Type, materials, construction, features, finish, color and attachment method.

2. Shop Drawings: Show fabrication and installation details including anchorage and interface with adjacent materials.

3. Assurance / Control Submittals:

a. Documentation of experience indicating compliance with the specified qualifications requirements.

1.5 COORDINATION

A. Coordinate support and opening requirements with other trades.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Regulatory Requirements: Conform to NFPA 10 and the local governing authorities having jurisdiction for extinguisher locations and mounting heights.

C. Obtain products from one fire protection specialty manufacturer.

D. Portable fire extinguishers to be UL-listed and bear a UL Alisting mark@ for the type, rating and classification of extinguisher indicated.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section - 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging.

C. Store to prevent damage to materials, finishes and operating mechanisms.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide extinguisher and holder only where AFE@ is shown on the Drawings. Provide cabinet and extinguisher where AFEC@ is shown. Provide hose cabinet where AFHC@ is shown.

2.2 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. J.L. Industries, Inc.

2. Larsen's Manufacturing Company.

3. Potter Roemer - Fire Protection Equipment.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.3 MATERIALS

A. (FE-1) Fire Extinguisher (at light hazard areas): Multipurpose dry chemical, UL 299; UL-rated 4-A:60:B:C; 10 lb. nominal capacity; cylinder with pressure gage and hose. Finish as selected.

1. J.L. Industries: Cosmic Series.

2. Larsen=s: MP Series.

3. Potter Roemer: 3002-3020.

B. (FE-2) Fire Extinguisher (at Kitchens and Mechanical Rooms): Surface-mounted; Halotron; 15-1/2 lbs. nominal capacity; cylinder with pressure gage**,** nozzle and wall mounting bracket. Finish as selected.

1. J.L. Industries: Mercury Series.

2. Larsen=s: HT Series.

3. Potter Roemer: 3101-3115.

C. (FE-3) Fire Extinguisher (at Parking Garages): Surface-mounted; regular dry chemical; 20 lbs. nominal capacity; cylinder with pressure gage, hose and wall mounting bracket. Finish as selected.

1. J.L. Industries: Galaxy Series.

2. Larsen=s: DC Series.

3. Potter Roemer: 3302-3320.

D. Mounting Bracket: Device necessary for holding extinguishers and hoses in place. Designed to prevent the accidental dislodging of extinguisher. Size as required for the type and capacity of extinguisher specified; screw attached to the wall. Fire extinguisher manufacturer=s recommended standard type. Enameled steel finish.

E. Identification Sign. As approved by Fire Department.

F. Fire Extinguisher and Fire Hose Cabinets:

1. General: Manufacturer=s standard fully welded construction with exposed to view (including inside the cabinet) welds ground smooth and blended with the adjacent surfaces. Miter and weld perimeter door frames.

2. Door Lock: Self contained keyed cylinder lock assembly with internal cabinet trip lever. Key cabinets alike and provide ten (10) keys.

3. Pulls: 5/16" diameter x 4" c.c. x 1-1/8" projection wire (rod) aluminum pull.

4. Door Hinge: Continuous piano type.

5. Decal: Instruction decal on face of door.

6. Finishes: Exposed-to-view exterior and interior surfaces of cabinets and doors, interior tub, and door pull. Finish shall be manufacturer=s standard:

a. [Baked enamel coating.]

b. [Polyester coating.]

c. [Stainless steel.]

d. [Anodized aluminum.]

7. Identification: Copy to read AFire Extinguisher@ or AFire Hose@, or such other copy necessary to indicate the primary fire device therein each unit. Letter style to be selected from manufacturer=s standards.

G. (FEC-1) Fire Extinguisher and Cabinet: Fully-recessed, 3/8" flat trim, horizontal duo panel style with 1/8" Solargray glass with block letters. Tub: 9" x 24" x 4" or as approved. ADAAG compliant.

1. J.L. Industries: 1525.

2. Larsen=s: AL-C 2409-R.

3. Potter Roemer: 7340.

H. (FEC-2) Fire Extinguisher and Cabinet: Semi-recessed, 1-1/4" square edge trim; formed

aluminum frame and door with rolled edges; 1/8" thick clear acrylic bubble door with block letters. Tub: 9" x 24" x 4" or as approved. ADAAG compliant.

1. J.L. Industries: Clear VU Series, Model No. 1527.

2. Larsen's: AL-C 2409-6R.

4. Potter Roemer: Loma Series, Model No. 7342.

I. (FEC-3) Fire Extinguisher and Cabinet: Surface-mounted, door / frame, clear acrylic bubble door with block letters. Tub: 11-1/2" W x 26-1/2" H x 4" D or as approved. ADAAG compliant.

1. J.L. Industries: SMB Series.

2. Larsen=s: AL-C 2409-SM.

3. Potter Roemer: 7344.

J. (FHC) Fire Hose Cabinet: Semi-recessed, formed aluminum frame and door, solid door panel; [1-1/4" square edge] [2-1/2" rolled edge]. Cabinet size 38" x 26" x 8" or as approved. Include fire hose and fire department valve. ADAAG accessible.

1. J.L. Industries: [6426] [6427]

2. Larsen=s: AL-HC2638-RK

3. Potter Roemer: 1000 Series;

K Fire Hose Rack Assembly: For one man operation. 1-1/2" FM-approved hose and valve with single jacket lined hose. UL-rated industrial fog nozzle, pin rack and cast brass coupling, angle valve with escutcheon and nipple. Rated 100 GPM at 65 psi at nozzle. Hose length as selected.

1. J.L. Industries: 3000 Series.

2. Guardian Fire Equipment, Inc.: 3000 Series.

3. Potter Roemer: 2500 Series.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that rough openings for cabinets are correctly sized and located.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install brackets, cabinets and extinguishers in accordance with the manufacturer's published instructions.

B. Coordinate anchorage, support and opening requirements with other installers.

C. Install in locations and at the mounting heights indicated and as required by applicable regulations of the governing authorities having jurisdiction.

D. Securely fasten mounting brackets and fire equipment cabinets to the structure; mount square, level and plumb.

E. Mount brackets so the height of the top of extinguishers is in compliance with ADAAG or not more than 60" above the finished floor.

F. Install identification signage approved by Fire Department where not part of equipment.

G. Do not install defective or damaged units that can not be restored or repaired to the satisfaction of the Owner=s representative.

H. Turn over lock keys to the Owner=s representative.

3.3 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect brackets installations for secure attachment and for plumb.

C. Inspect cabinet installations for secure attachment and for plumb, level, square and flush.

3.4 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Touch-up abraded paint coatings with matching paint.

C. Clean units of dirt, stains, and mars without damage to the finishes.

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END OF SECTION

SECTION 10810

TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Toilet accessories.

2. Attachment hardware.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Placement of backing and blocking for attachment of accessories.

2. Section 09110 - Non-Load Bearing Steel Framing: Placement of backing plate reinforcement for attachment of accessories.

3. Section 10156 - Phenolic Toilet Partitions: Substrate for mounting toilet accessories.

4. Section 10165 - Plastic Laminate Toilet Partitions: Substrate for mounting toilet accessories.

1.2 DESCRIPTION OF WORK

A. The extent of toilet accessories work is indicated on the Drawings and as specified herein, and includes providing and installing the various accessory types, locks, keys and miscellaneous attachment hardware.

B. Mounting heights for toilet accessories shall comply with ADAAG, as applicable.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

2. ASTM A 167 - Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

3. ASTM A 366 - Specification for Steel, Carbon, Cold-Rolled, Commercial Quality.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

2. Accessibility Guidelines for Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s catalog and data for each accessory describing size, finish, details of function and attachment method.

2. Samples: Submit one (1) sample of each item and model specified, if requested.

3. Manufacturer=s recommended maintenance and operating instructions, parts manual and keys for each item and lock.

4. Assurance / Control Submittals:

a. Manufacturer's certificate that products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Deliver accessories Schedule, keys and Parts Manual for Owner=s permanent records. Provide two (2) sets of the following items of manufacturer=s literature:

a. Technical Data sheets for each accessory item.

b. Service and Parts Manuals.

c. Name of a local representative to be contacted in the event of need for field service or consultation.

2. Warranty: Submit a manufacturer=s special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Regulatory Requirements: Comply with Americans with Disabilities Act Accessibility Guidelines (ADAAG). Verify mounting heights and clearances prior to installation.

C. All accessories alike shall be the product of a single manufacturer.

D. Keyed (tumbler lock) accessories shall be keyed alike except for coin receiving boxes on vending equipment.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging, labeled bearing the manufacturer's name and the type of accessory.

C. Store materials in their original protective packaging to prevent soiling, wetting and physical damage.

D. Handle to prevent damage to finish surfaces.

E. Maintain protective covers on all units until installation has been completed. Remove coverings during final clean-up.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty signed by the manufacturer certifying that the products are free of defective materials and workmanship and agreeing to replace or repair any defective item, in whole or in part, as necessary to restore the product to its original intended state and integrity.

2. Warranty Period:

a. Stainless Mirror Frames: Fifteen (15) years against corrosion.

b. Plate Glass Mirrors: Fifteen (15) years against silver spoilage.

c. Tempered Glass Mirrors: Five (5) years against silver spoilage.

d. Laminated Glass: Five (5) years against silver spoilage.

e. Hand Dryers: Ten (10) years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering the specified items which may be incorporated into the work include the following:

1. American Specialties, Inc.

2. Bobrick Washroom Equipment, Inc.

3. Bradley Corp.

4. GOJO Corporation

5. San Jamar Oceans Corporation

6. TC Corporation

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Sheet Steel: ASTM A 366.

B. Galvanized Sheet Steel: ASTM A 366, ASTM A 123 to 1.25 ounces per square foot.

C. Stainless Steel Sheet: ASTM A 167, Type 304.

D. Expansion Shields: Fiber, lead or rubber as recommended by the accessory manufacturer for the component and substrate.

E. Fasteners, Screws and Bolts: Hot-dip galvanized, tamper-proof. The finish of exposed fasteners shall match the finish of the item secured.

2.3 MANUFACTURED UNITS

A. TA-1 Liquid Soap Dispenser:

1. Model Numbers:

a. American Specialties: 9343.

b. Bobrick: B-2112.

c. Bradley: 6542.

2. Description: Surface-mounted, horizontal tank-type dispenser for all-purpose liquid soap. 22 gage, Type 304 satin finish stainless steel container; drawn one-piece seamless body; mounting bracket attached to back plate for attachment to wall plate; concealed, vandal-resistant mounting. Unbreakable, clear acrylic refill indicator window; lockable hinged stainless steel lid for top filling; special key. Capacity: minimum, 40 ounces. Molded plastic push button and spout. Corrosion resistant to most soaps and detergents. ADAAG compliant.

TA-1A Touch Free Foam Soap Dispenser

1. Model Number:

a. GoJo TFX 5362.02

b. TC #450017

2. Description: Surface mounted foaming hand soap dispenser. Refillable. Battery operated automatic touch free dispenser, with skylight window. ADA compliant. 1200 mL refills.

3. Refills: Provide two (2) additional refill packets for each soap dispenser

B. TA-2 Mirror with Stainless Steel Frame:

1. Model Numbers:

f. American Specialties: 0600.

g. Bobrick: B-290 Series.

h. Bradley: 780 Series.

2. Description: 1/4" polished, tempered glass mirror. One-piece, roll-formed, 18 gage, Type 304 satin finish stainless steel angle frame; mitered corners welded, ground and polished. Concealed hanging bracket locked into top and bottom of frame with tamper-proof set screws. One piece water-resistant back attached to frame with theft-resistant locking device. Manufacturer=s standard size, as indicated.

C. TA-3 Stainless Steel Mirror:

1. Model Numbers:

a. American Specialties: 0600.

b. Bobrick: B-290 Series.

c. Bradley: 780 Series.

2. Description: Same as TA-2 except with Type 304 polished stainless steel mirror.

D. TA-4 Combination Paper Towel Dispenser and Waste Receptacle:

1. Model Numbers:

a. American Specialties: 0469.

b. Bobrick: B-3944.

c. Bradley: 234.

2. Description: Recessed, 22 gage, Type 304 satin finish stainless steel, all-welded cabinet. 22 gage, satin finish stainless steel, drawn and beveled one-piece seamless flange. 22 gage, Type 304 satin finish stainless steel dispenser door secured to cabinet with full-length stainless steel piano hinge; semi-concealed tumbler lock. 22 gage, Type 304 satin finish stainless steel dispenser; rounded towel tray with hemmed opening. Capacity: 600 C-fold or 800 multi-fold paper towels. 22 gage, Type 304 satin finish stainless steel waste receptacle; all edges hemmed; secured to cabinet with tumbler lock. Capacity: 12 gallons. Interior hooks for optional vinyl liner. ADAAG compliant.

E. TA-5 Paper Towel Dispenser:

1. Model Numbers:

a. American Specialties: 0215.

b. Bobrick: B-2621.

c. Bradley: 252.

2. Description: Surface-mounted, 22 gage, Type 304 satin finish stainless steel, all-welded cabinet. Hemmed opening towel tray. 22 gage, Type 304 satin finish stainless steel door, secured to cabinet with full-length stainless steel piano hinge; tumbler lock. Capacity: 200 C-fold or 275 multi-fold paper towels. ADAAG compliant.

TA-5A Automatic Paper Towel Dispenser

1. Model Numbers:

a. San Jamar Oceans Tear-N-Dry

b. Kimvery KP-02

2. Description: Touchless towel dispensing system with automatic portion control to dispense, adjustable sheet length setting. Battery operated, dispenser automatically operates with user=s motion. For rolls 8" wide x 8 2" diameter and 4" diameter stub roll with lock.

3. Refills: Provide six (6) refill rolls for each towel dispenser.

F. TA-6 Waste Receptacle:

1. Model Numbers:

a. American Specialties: 0828.

b. Bobrick: B-279.

c. Bradley: 357

2. Description: Surface-mounted; 22 gage, Type 304 satin finish stainless steel. Top and bottom edges hemmed. Minimum 6.5 gallons capacity. Hooks for re-useable vinyl liner.

G. TA-7 Electric Hand Dryer:

1. Model Numbers:

a. American Specialties: 0195.

b. Bobrick: B-7507.

c. Bradley: 2899-28.

2. Description: One piece cast-iron housing, high gloss porcelain enamel finish; acid-resistant; automatic sensor. 4" projection, maximum. ADAAG compliant.

H. TA-8 Touchless Paper Towel Dispenser:

1. Model Numbers:

a. Bradley: 2490.

b. Maintex, Inc: enMotion.

2. Description: Surface-mounted, automatic touchless paper towel dispenser. Battery operated; high impact translucent plastic door; roll towels; key-activated spring lock.

I. TA-9 Sanitary Napkin / Tampon Dispenser:

1. Model Numbers:

a. American Specialties: 0468.

a. Bobrick: 3500 Series.

b. Bradley: 4017 Series.

2. Description: Semi-recessed, 18 or 22 gage, Type 304 satin finish stainless steel cabinet. 18 gage, Type 304 satin finish stainless steel door attached to cabinet with full-length stainless steel piano hinge held closed with two (2) tumbler locks keyed alike with manufacturer=s other accessories. 22 gage stainless steel internal coin box secured by separate lock; keyed differently from door locks. Coin mechanism convertible, replaceable in the field without removing cabinet; factory installed coin operation denomination to be determined. Body and door of welded construction with burr-free edges; no exposed fasteners or welded seams. Provide collar, as necessary, for semi-recessed mounting. Capacity: 30 napkins and 27 tampons, minimum. ADAAG compliant.

J. TA-10 Partition-Mounted, Dual Access Sanitary Napkin / Tampon Disposal:

1. Model Numbers:

a. American Specialties: 0472 (for two compartments) / 0473 (for single end compartment).

b. Bradley: 4721-15 (for two compartments) / 4722-15 (for single end compartment).

2. Description: Partition-mounted dual napkin disposal; serves two compartments. 22 gage, Type 304 satin finish stainless steel flanges; one-piece seamless construction, 1" wide with 1/4" return, adjustable for partitions thickness. 22 gage, Type 304 satin finish stainless steel cabinet. All welded construction with one flange welded to cabinet. 22 gage, Type 304 satin finish stainless steel, self-closing push flap door on each side; heavy-duty, full-length, spring loaded, stainless steel piano hinges; doors operate independently. 22 gage, Type 304 stainless steel waste container with tumbler locks keyed alike with manufacturer=s other accessories; hemmed finger grip, removable from one side only. Capacity: 1.5 gallons. Body and doors welded construction; burr-free beveled edges. International graphic waste symbol affixed to doors. ADAAG compliant.

End compartment unit similar but recess-mounted in side wall.

K. TA-11 Toilet Seat Cover Dispenser:

1. Model Numbers:

   a. American Specialties: 0477SM.

   b. Bobrick: B-221.

   c. Bradley: 583.

2. Description: Surface-mounted; 22 gage, Type 304 satin finish stainless steel; all welded construction. Capacity 250 single or half-fold seat covers.

L. TA-12 Multi-Roll Tissue Dispenser:

1. Model Numbers:

   a. American Specialties: 9030.

   b. Bobrick: B-2888.

   c. Bradley: 5402.

2. Description: Surface-mounted; 22 gage, Type 304 satin finish stainless steel cabinet. All welded construction. 18 gage drawn, one-piece, Type 304 satin finish stainless steel door, pivot hinge and tumbler lock. 18 gage stainless steel dispensing mechanism, inner housing and cam. Heavy-duty, one-piece, theft-resistant, molded ABS spindles. Holds 2 standard core 5-1/4" diameter tissue rolls. Reserve roll automatically drops in-place when bottom roll is depleted.

M. TA-13 Toilet Grab Bar:

1. Model Numbers:

   a. American Specialties: 3100 Series, Type - 56.

   b. Bobrick: B-5837.

   c. Bradley: 832 Series.

2. Description: Heavy-duty, 1-1/4" diameter, horizontal, 1-1/2" wall clearance. 18 gage, Type 304 satin finish stainless steel. Concealed screw attached mounting and anchorage. 3" flange; 11 gage, Type 304 satin finish stainless steel. Minimum 900 pounds supporting capacity. Length as indicated, ADAAG compliant.

N. TA-14 Robe Hooks:

1. Model Numbers:

   a. American Specialties: 7345.

   b. Bobrick: B-6727.

   c. Bradley: 9124.

2. Description: Double robe hook, Type 304 satin finish stainless steel. Concealed mounting. 4" wide bar with end hooks. Projects 1-5/8", minimum, from wall.

O. TA-15 Shower Curtain Rod / Hooks / Curtain:

1. Model Numbers:

a. American Specialties: 1214 / 1200-SHU / 1200-V.

b. Bobrick: B-6107 / 204-1 / 204-3.

c. Bradley: 953 / 9536 / 9537.

2. Description: Heavy-duty, 20 gage, 1" diameter, Type 304 satin finish stainless steel rod; screw anchored attachment; length as required. Stainless steel hooks for 1" rod. 8 gage, flame-resistant, anti-bacterial vinyl fabric shower curtain, length as required; color white.

P. TA-16 Soap Dish:

1. Model Numbers:

a. American Specialties: 7404.

b. Bobrick: B-4380.

2. Description: Recessed, heavy-duty, one-piece construction, drawn and seamless. 22 gage, Type 304 satin finish stainless steel.

Q. TA-17 Shower / Tub Grab Bar:

1. Model Numbers:

a. American Specialties: Series 3100, Type-02.

b. Bobrick: B-5806 Series.

c. Bradley: 832 Series.

2. Description: 1-1/4" diameter, diagonal, 1-1/2" wall clearance. 18 gage, Type 304 satin finish stainless steel. Peened grip. Concealed screw attached mounting and anchorage. 3" flange; 11 gage, Type 304 satin finish stainless steel. Minimum 900 pounds supporting capacity. Length as indicated. ADAAG compliant.

R. TA-18 Shower Seat:

1. Model Numbers:

a. American Specialties: 8206.

b. Bobrick: B-5181.

c. Bradley: 9569.

2. Description: Reversable, folding seat. Type 304 satin finish stainless steel frame, legs, flanges and bracket. 1/2" thick solid phenolic slatted seat; self-locking mechanism. Color as selected. ADAAG compliant.

3. Provide one at each accessible Shower.

S. TA-19 Corner Shower Seat:

1. Model Numbers:

a. American Specialties: 0010.

b. Bradley: 954.

2. Description: Folding, corner-mounted; Type 304 satin finish stainless steel seat, support brackets and retainer clip. Secured to one wall with full length stainless steel piano hinge and other wall by bracket. Retainer clips to hold seat upright. Channel formed edges. Size: 15" x 15".

T. TA-20 Mop Holder:

1. Model Numbers:

a. American Specialties: 1315.

b. Bobrick: B-224.

2. Description: 18 gage, Type 304 satin finish stainless steel. 8" deep shelf with return. 36" long. 4 rubber mop holders, 3 rag hooks; rod below shelf.

2.4 MANUFACTURED UNITS FOR APARTMENT BATHROOMS (ATA)

A. ATA-1 Medicine Cabinet, Recessed:

1. Model Number:

a. American Specialties: 0952.

b. Bobrick: B-398.

c. Bradley: 175.

2. Description: Recessed, satin finish stainless steel cabinet. Swing door with 1/4" plate glass mirror. 20 gage cabinet and mirror frame. 3 stainless steel adjustable shelves. Full-length heavy-duty stainless steel piano hinge, magnetic catch. Approximately 16" W x 26" H x 3-5/8" D.

3. One each Bathroom.

B. ATA-2 Towel Bar:

1. Model Number:

a. American Specialties: 7360.

b. Bobrick: B-673.

c. Bradley: 9055.

2. Description: 3/4" square, heavy-gage, Type 304 bright polished stainless steel tubing. 22 gage, Type 304 stainless steel flanges and support arms. 16 gage, concealed stainless steel mounting brackets. All welded construction. Secured with stainless steel locking set-screws. 16 gage, Type 304 stainless steel wall plates. 3-1/4" projection, minimum; length as shown.

3. One each Bathroom.

C. ATA-3 Toilet Tissue Holder:

1. Model Number:

a. American Specialties: 7305.

b. Bobrick: B-685.

c. Bradley: 5085.

2. Description: Surface-mounted, bright polished stainless steel, standard size tissue holder. Chrome-plated plastic spindle.

3. One each watercloset.

D. ATA-4 Toilet Grab Bar:

1. Model Number:

a. American Specialties: 3100 Series, Type 56.

b. Bobrick: B-5837.

c. Bradley: 832 Series.

2. Description: See TA-13.

3. One each watercloset.

E. ATA-5 Shower / Tub Grab Bar:

1. Model Number:

a. American Specialties: 3100 Series, Type-02**.**

b. Bobrick: B-5806 Series.

c. Bradley: 832 Series.

2. Description: See TA-17.

3. One each Shower / Bathtub.

F. ATA-6 Shower Curtain Rod / Hooks / Curtain:

1. Model Number:

   a. American Specialties: 1214 / 1200-SHU / 1200-V.

   b. Bobrick: B-6107 / 204-1 / 204-3.

   c. Bradley: 953 / 9536 / 9537.

2. Description: See TA-15.

3. One each Shower / Bathtub.

G. ATA-7 Towel Pin:

1. Model Number:

   a. American Specialties: 7301.

   b. Bobrick: B-677.

   c. Bradley: 9315.

2. Description: 10 gage, Type 304 stainless steel cap welded to support arm. 22 gage, Type 304 stainless steel flange and support arm. 16 gage concealed stainless steel mounting bracket. All welded construction. Secured with stainless steel set-screws. 16 gage, Type 304 stainless steel wall plate. 3-3/8", minimum projection. Bright polished finish. ADAAG compliant.

3. One each Bathroom.

H. ATA-8 Shower Seat:

1. Model Number:

   a. American Specialties: 8205-R / L.

   b. Bobrick: B-517 / 518.

2. Description: 1-1/2@ thick, foam padded, fold-down seat. White / off-white water-resistant naugahyde cover on enclosed 1/2" thick marine grade plywood base. Stainless steel frame and mounting brackets; self-locking mechanism. Right or left hand to suit conditions. ADAAG compliant.

3. One each Shower.

I. ATA-9 Soap Dish, Recessed:

1. Model Number:

   a. American Specialties: 0398.

   b. Bobrick: B-4390.

   c. Bradley: 940.

2. Description: Recessed, heavy-duty, stainless steel dish with bar. 19 gage, Type 304 stainless steel. Drawn and beveled, one-piece, seamless construction. 22 gage, Type 304 stainless steel retaining clip. 3/16" thick, Type 304 stainless steel bar. Matte polished finish.

3. One each Shower / Bathtub.

2.5 FABRICATION

A. Weld and grind smooth joints of fabricated components.

B. Form exposed surfaces from single sheet of stock, free of joints. Form surfaces flat without distortion. Maintain surfaces without scratches and dents.

C. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges.

D. Shop assemble components and package complete with fittings and anchors.

E. Provide steel anchor plates, adapters and anchor components necessary for secure installation.

F. Back paint components where in contact with building finishes to prevent electrolysis.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that wall openings for recessed accessories are correctly located and of proper dimensions.

2. Verify that attachment blocking and backing plates are in place, plumb and level, and in the correct location for attachment of accessories.

4. Check areas to receive surface-mounted accessories for conditions that would affect quality and execution of the work.

5. Verify spacing of plumbing fixtures and toilet partitions that affect installation of accessories.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to the Project Site for scheduled installation.

B. Provide and use templates and rough-in measurements as required.

3.3 INSTALLATION

A. Install fixtures, accessories, and items in accordance with the manufacturer's instructions, ADAAG and as indicated on the Drawings.

B. Install at the locations and heights indicated or as required, plumb and level, securely and rigidly anchored to the substrate.

C. Install manufacturer=s recommended anchor system for all grab bars.

D. Conceal evidence of drilling, cutting and fitting on adjacent finishes.

E. Fit flanges of accessories snug to wall surfaces. Provide caulking in gaps between 90 degrees return flanges and finish wall surface after accessories are installed.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust accessories for proper operation.

C. Verify that mechanisms function smoothly.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect accessories to ensure secure attachment to the substrates, proper locations and mounting heights in compliance with ADAAG.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces prior to final inspection.

END OF SECTION

SECTION 11061

THEATRE SYSTEMS

PART 1 GENERAL

1.1 REFERENCE TO OWNER'S GENERAL CONDITIONS

A. The Owner's General Conditions shall be considered part of this Specification. Unless this Section contains statements, which are more definitive or more restrictive than those contained in the Owner's General Conditions, this Specification shall not be interpreted as waiving or overruling any requirements expressed in the General Conditions.

1.2 RELATED DOCUMENTS

A. Theater Systems (TS) Drawings.

B. Audio Visual (AV) Drawings.

C. Section 11063 – Orchestra Shell.

D. Division 1 – General Requirements:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

E. Division 5 – Metal Fabrication:

1. The Metal Fabrication Contractor shall provide the work as specified in Division 5 and the Structural Drawings. Including: steel framing and supports for theatrical rigging systems.

2. Steel shown on the Structural drawings will be provided by the Structural Contractor.

F. Division 16 – Electrical:

1. The Electrical Contractor shall provide the work as specified in Division 16, as indicated on the TS drawings, and as specified herein.

2. Electrical infrastructure (electrical j-boxes, conduit, etc.) for Theatre Systems is shown on theatre systems drawings and shall be the responsibility of the Division 16 Electrical Contractor.

1.3 DEFINITIONS

A. The following shall serve as general identifiers as specified herein:

1. Owner – Guam Department of Education.

2. Theatre Consultant – D.L. Adams Associates, Ltd.

3. Architect – Taniguchi Ruth Makio Architects (TRMA).

4. Contractor – The Contractor is the firm submitting a proposal to furnish and install the Work as defined within this Specification.

5. Project – The Project is the Theatre Systems installation in the facilities of the Simon Sanchez High School Auditorium.

6. Work – The term “Work” means all construction and services specified within this document. The Work includes all related labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the proposal’s obligations.

7. Drawings – The term “Drawings” means all Theatre Systems Drawings and associated sketches, details, riser diagrams, etc.

B. As used in the Drawings and Specifications for the Work, certain non-technical words and phrases shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions or other documents governing the Work:

1. “Furnish” – Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the Theatre Systems Work. Purchasing shall include payment of all sales taxes and other surcharges as may be required to assure that purchased items are free of all liens, claims, or encumbrances.

2. “Install” – Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the Work.

3. “New” – Manufactured within the past year and never used.

4. “Provide” – Furnish and Install.

C. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the Drawings or Specifications for the Work, shall be understood to have the specific meanings as described to them in the following list:

1. “Circuit” – Any specific run of circuitry.

2. “Circuitry” – Any Work which consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.

3. “Concealed” (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.

4. “Exposed” (as applied to circuitry) – Not covered in any way by building materials.

5. “NIC” – Not in Contract.

6. “Normal Work Conditions” – Locations within building confines that are not damp, wet, or hazardous and that are not used for air handling.

7. “OFE” – Owner Furnished Equipment.

8. “Patch Panel” – A System of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.

9. “Raceway” – Any pipe, duct, extended enclosure, or conduit (as specified for a particular System) which is used to contain wires, and which is of such nature as to require that the wires be installed by a “pulling in” procedure.

10. “Standard” (as applied to wiring devices) – Not of a separately designated individual type.

11. “Wiring” – see “Circuitry.”

D. Additional Terms:

1. The term “shall” is mandatory; the term “will” is informative; the term “should” is advisory.

2. Where the word “conduit” is used without specific reference to type, it shall be understood to mean “raceway.”

3. The term “custom” indicates systems or components that shall be designed and fabricated by the Contractor based on the drawings and specifications.

4. The term “future” indicates systems or components that will be added to the system later but shall be provisioned for now.

5. The term “equal” indicates systems or equipment that is of the same size, color, design, function, efficiency, etc. as of that specified.

6. Reference to “U.L. (Materials Construction) Standards” shall mean the “Standards for Safety” published by Underwriters Laboratories, Inc.

1.4 SCOPE OF WORK

A. General:

1. The Work as described herein shall be furnished and installed by one (1) firm alone.

2. The Contractor is responsible for furnishing the Theatre Systems in order that a single contractor has the responsibility of coordinating these sub-systems into an integrated theatrical presentation facility. This coordination is a major responsibility of the Contractor.

3. The Contractor shall furnish and install all equipment Theatre Systems described herein.

4. The Contractor shall provide all Work as may be required to make a complete and fully functioning system of that which may not be fully defined in the Contract Documents.

5. The Contractor shall verify the completeness of the parts list and furnish necessary accessories to execute the intent of the plans and specifications.

6. The Specifications and Drawings shall be read and used together; system features which are mentioned in one are not necessarily shown in the others. It shall be understood that the Equipment Lists, Specifications and Drawings are complementary. Where there are conflicts within the documents, request clarification from Architect.

7. The project documentation is, in general, diagrammatic and/or developed to communicate design intent. The Contractor shall coordinate the installation of all devices and/or equipment with the Owner prior to installation based on the existing field conditions.

8. The Contractor shall coordinate all installed items with associated trades (electrical, mechanical, structural, audio visual, telecom, etc.) including all necessary cable pass-thrus and structural needs/requirements.

9. The Contractor shall provide all software programming required to provide fully operational systems.

10. The Contractor shall provide all equipment and software programming required to provide fully operational systems.

11. The Contractor shall coordinate the specific programming requirements of the Theatre Performance Lighting Control System with a designated Owner representative, including touchscreen layouts and page navigation. All programming written for this project shall be the property of the Owner and shall be provided to the Owner upon completion.

B. Related Work by Others:

1. Furnishing and installation of load wiring, raceway, pull-boxes, plywood backboards (provided under Electrical Work).

2. Furnishing and installation of dedicated lighting distribution panels and relay panels.

3. Electrical terminations of relay feeds and relay load wiring.

4. Installation and termination of building network systems.

5. Cutting, patching, and painting of walls, unless damaged performing the Work described herein.

6. Equipment and materials provided and installed by others, unless otherwise shown in this Section or the Drawings, shall include but are not limited to:

a. Electrical Outlets.

b. Load Wiring.

c. Conduit, Raceway and Cable Tray.

d. Junction Boxes.

e. Telecommunications Outlets.

C. Coordinated Work:

1. Contractor shall coordinate with Electrical Contractor on raceway/junction box locations for Theatre Systems equipment and routing of load wiring, and all control and power raceway from equipment, terminal and pull boxes to system equipment racks. Contractor shall coordinate to verify the appropriate raceways are in place.

2. Coordinate control system requirements, relating to house lighting fixtures/drivers/DMX addressing, etc., with Electrical Contractor prior to installation.

3. Coordinate with related trades to schedule the Work and ensure a complete installation in accordance with the schedule outlined by the Owner.

4. Coordinate all IP device requirements with the Telecom Contractor, Owner, and General Contractor.

5. Coordinate all building network connectivity requirements with the Telecom Contractor and Owner.

1.5 GENERAL CONDITIONS

A. The Contractor represents that they are familiar with and have expertise in the Work of this nature and scope.

B. The Contractor shall comply with all the regulations, including safety regulations of national, city, local, and other government agencies having jurisdiction concerning the work of the Contractor. The Contractor shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the Work. If the Contractor performs any work, which is contrary to such laws, ordinances, codes, rules, and regulations, they shall make all changes for compliance and bear all associated costs.

C. The Contractor shall be responsible to provide and maintain a storage facility. If this storage facility is required to be on-site it shall be the Contractor's responsibility to coordinate the size and spatial requirements with the Owner. The Contractor shall assume full responsibility for the storage facility and all contents, unless otherwise indicated by the Owner.

D. The Contractor shall provide all protection necessary to safeguard their work from damage by their operations and the operations of others. Unless the Contractor proves to the Owner’s satisfaction that the Work has been damaged by others, the Contractor shall promptly repair, adjust, and clean all defective installations and bear all associated costs.

E. All the Contractor's work shall be tested and inspected by all authorities having jurisdiction and in accordance with all Specifications. The Contractor shall coordinate and cooperate fully and shall provide at no additional cost to the Owner, manpower, drawings, facilities, scaffolds, etc. to reasonably assist the inspectors.

F. The Owner reserves the right to furnish any materials necessary for the Project.

G. All permits required for any part of the Contractor's work shall be procured and paid for by the Contractor. The Contractor shall determine all permits required and transmit this information to the Owner. If it is determined that the Contractor’s work falls reasonably within another party’s permit (General Contractor, Electrical Contractor, etc.) the Contractor shall not be required to procure additional permits provided written authorization is provided to the Contractor by the party holding the permit.

H. The Contractor, upon receiving notice from Owner that the Contractor has furnished inferior, improper, or unsound work or materials (including equipment), or Work or materials at variance with that which is specified, will, within twenty-four (24) hours, proceed to remove such work or materials and make good all other work or materials damaged thereby, and, at the option of the Owner, the Contractor shall immediately replace such work or materials with work or materials as specified. The removal, replacement, and repair shall be performed at such times and with manpower sufficient, in the judgment of the Owner, to avoid disturbance to occupants, or other ongoing work for the Project.

1. If the Contractor does not remove such unsound Work within a reasonable time, the Owner may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days' time thereafter, the Owner may, upon written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor and all expenses of the sale.

2. The Owner shall always have the authority, until final completion and acceptance of the Work, to inspect and reject work and materials which in its judgment are not in conformity with the Drawings and Details, Room Data Sheets and Specifications, and its decision in regard to character and value of Work shall be final and conclusive on both contracting parties. If the Owner permits said Work or materials to remain, the Owner shall be allowed the difference in value or shall at its election have the right to have said Work or materials repaired or replaced, as well as the damage caused thereby, at the expense of the Contractor, at any time within one (1) year after the completion of the entire project, or within such longer period as may be covered by any guaranty; and neither payments made to the Contractor, nor any other acts of the Owner, shall be construed as evidence of acceptance, waiver, or estoppels.

3. Any expense incurred by the Owner in connection with the foregoing, shall be borne by the Contractor, and the Owner may withhold money due to the Contractor or recover money already paid to the Contractor, to the extent of such expense.

I. The Drawings for the Work utilize symbols and schematic diagrams that have no dimensional significance. The Work shall be installed to fulfill the diagrammatic intent expressed on the Drawings, field layouts, and shop drawings of all trades.

J. The Drawings show diagrammatically the suspension locations, controls, etc. So far as possible, the drawings show the arrangement of the equipment which will fit into the spaces available without interference.

K. The system Drawings generally indicate how the system equipment is to be integrated with other parts of the building. The Contractor shall determine exact locations by job measurements, by checking the requirements of other trades and by reviewing all contract documents.

L. Whenever job measurements, analysis of the drawings and specifications, or progress of other trades indicates that the various systems cannot be installed without significant deviation from the intent of the contract, the Architect/Owner shall be notified immediately.

M. Certain details appear on the Drawings for the Work that are specified with regard to the dimensioning and positioning of the Work. These are intended only for general information purposes. They do not obviate field coordination for individual items of the indicated Work.

N. Information as to general construction and architectural general construction and architectural features and finishes shall be derived from the structural and architectural drawings and specifications and may require ongoing coordination with the Architect and/or Construction Team.

O. The Work called for under this Contract shall be carried on simultaneously with the Work of other trades and Owner functions in such a manner as to not delay the overall progress of the construction project. The Contractor is responsible for all coordination of the Work with other trades.

P. Include in the Work all necessary supervision and issuing of all coordination information to any other trades who are supplying work to accommodate the Theatre Systems installation. For items of equipment which are to be installed but not purchased as part of the Work, the Work shall include:

1. Coordination of delivery. Deliver materials in manufacturer's original unopened containers with manufacturer's labels attached. Do not deliver material until spaces to receive them are clean, dry, and ready for their installation. Ship to jobsite only after roughing-in, painting and other finishing work has been completed, installation areas are ready to accept Work.

2. Unloading from delivery trucks. Do not deliver or install materials until spaces are enclosed and weather tight, wet work in spaces is complete and dry, HVAC system is operating, and maintaining ambient temperature at occupancy levels and normal humidity levels during the remainder of the construction period.

3. Safe handling and field storage up to the time of permanent placement in the project.

4. Correction of any damage to the item(s) caused by the Contractor.

5. Mounting in place and connection(s) as specified.

Q. Items which are to be installed, but not purchased as part of the Work shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the Work will be considered only if presented in writing within one (1) week of the date of delivery to the project of the items in question. The Work includes all procedures necessary to put in satisfactory operation all items for which no claims have been submitted as outlined above.

1.6 SUMMARY

A. This Section includes the following Theatre Systems:

1. Motorized Rigging Systems.

2. Dead-Hung Rigging Systems.

3. Drapery and Tracks.

4. Theatrical Lighting and Control System.

5. Performance Lighting Instruments and Accessories.

1.7 SYSTEMS DESCRIPTIONS AND FUNCTIONS

A. Provide all necessary labor, materials, equipment, accessories, transportation, and services required for the installation of a totally integrated technical Theatre System consisting of the following:

1. Variable speed motorized hoists shall be provided for the following battens including integrated relay power and DMX control:

a. One (1) Front of House Electric.

b. Four (4) Stage Electrics.

c. Three (3) Orchestra Shell Ceiling Panels.

2. Motorized hoists shall be provided for two (2) spare line sets without power and data.

3. Dead-Hung rigging for the following positions in the Stage House including all hanging hardware and fittings required for a complete installation:

a. Grand Valance.

b. Grand Drape.

c. Projection Screen.

d. Border 1-4.

e. Leg Sets 1-6.

f. Midstage Traveler.

g. Upstage Traveler.

h. Scrim.

i. Cyclorama.

4. Drapery and Track:

a. The following drapery shall be provided:

1) Grand Valance.

2) Grand Drape.

3) Borders 1-4.

4) Leg Sets 1-6.

5) Midstage Traveler.

6) Upstage Traveler.

7) Scrim.

8) Cyclorama.

b. The following tracks shall be provided:

1) Grand Drape.

2) Leg Sets 1-6.

3) Midstage Traveler.

4) Upstage Traveler.

5) Scrim.

6) Cyclorama.

B. Theatrical lighting system including house and theatrical lighting dimming and control shall be provided with the following features:

1. Performance lighting relay circuits will be distributed to the following locations and will be terminated into Twistlock connectors for performance lighting equipment and work lights.

a. Front of House Electric (1).

b. Stage Electrics (4).

c. Orchestra Shells (3).

d. Tormentor Positions (2).

e. Stage Floor Boxes (6).

2. Theatrical Lighting Control Network: DMX512/lighting network control interfaces shall be distributed on the lighting pipe battens, distribution boxes, around the stage, and at the control booth position for lighting console and control of LED fixtures, intelligent lights, foggers, etc.

3. A network-based architectural control system shall be provided:

a. Button control panels shall be provided at all main entry and technical booth entry doors. These entry stations will provide simple on/off control of general house lighting and stage batten work lighting. The presets programmed in these stations will be optimized for general daily use.

b. A wall-mounted LCD control panel shall be located downstage left at the Stage Manager's station. The panel will provide preset lighting configurations/set-ups using a combination of house and performance lighting for simple presentations, lectures, or recitals.

1) A minimum of ten (10) presets of programming shall be provided for theatrical use on the LCD control panel, and all lighting circuits will be individually accessible (including a graphic slider and an on/off button for each relay) from the panel for creating/saving user-defined presets. Additionally, twenty (20) preset buttons shall appear on the interface for end user customization.

2) The "splash screen" shall have an image provided by/approved by the Owner and shall be password protected.

3) The record button shall be password protected to prevent unauthorized changes to the programming.

4) The time-of-day clock shall be programmed to shut all lighting off after hours. Time of day programming shall be coordinated with the Owner. Provide override button on the LCD panels that will time-out at 3:00AM, or as coordinated with the Owner

4. A portable, wireless desktop touchscreen LCD control panel with docking station shall be provided in the lighting control booth and can be used at the in-house mix position. This touchscreen shall mirror the features of the Stage Manager's touchscreen.

C. Performance Lighting Console: A professional lighting control console designed for venues using a combination of conventional and LED lighting. In addition to keypad commands, the faders provide hands-on control of intensity and can be used to set manual levels and edit recorded cues and submasters. On demand moving light controls are available to facilitate using conventional accessories like LED fixtures, moving mirror heads, color scrollers, gobo rotators, moving lights, etc.

D. Emergency Lighting: UL1008-rated transfer switches shall be provided for house lighting circuits requiring emergency power. 0-10V or DMX control bypass shall also be provided for these circuits as required.

E. Performance Lighting Fixtures:

1. A professional quality LED performance lighting fixture package, including wash light fixtures, ellipsoidal spotlights, and cyclorama fixtures, shall be provided.

2. All fixtures will be equipped with power cables with Twistlock plugs, c-clamps, safety cables, and color frames, and barn doors (if appropriate).

3. LED work light fixtures shall be provided on stage electric line sets.

1.8 QUALITY ASSURANCE

A. Contractor's Responsibility:

1. The Work of this Section will be contracted to a single firm, referred to herein as the Contractor, for undivided responsibility.

2. The qualification requirements of the Contractor are identified in Article 1.9.

B. Minimum Performance Requirements: To meet the minimum performance requirements, the Contractor shall be responsible for the following:

1. Each component's conformance with the exemplary equipment's published specifications and other requirements as stated herein.

2. Electrical Components: Listed and labeled per NFPA 70, Article 100 by a testing agency acceptable to authorities having jurisdiction.

3. Safety: The Theatre Systems shall conform to all applicable code requirements and shall be in conformance with ESTA and USITT industry standards of operation and practices for Theatre Systems. All materials and arrangements shall comply with applicable performance requirements.

4. Detailed checking of each item of equipment provided, each portion of the installation, and of the complete installation to find and remedy any defects therein.

5. The initial adjustment of all electronic control systems, and, under the direction of the Architect/Owner, making the final adjustment of these items.

6. If so directed by the Architect/Owner, Contractor shall make final adjustments to control systems and alignment of equipment. To establish a definitive standard of performance, the systems and/or related components specified herein shall be as manufactured, supplied, and installed by the contractors listed and the exemplary equipment manufacturers listed in this specification.

C. Drapery Fire-Test-Response Characteristics:

1. Provide stage drapery with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or a testing and inspecting agency acceptable to authorities having jurisdiction.

2. Flame-Resistance Ratings: Passes NFPA 701.

D. Rigging Systems, Minimum Standards of Safety, the following factors shall be used:

1. Cables and Fittings: 8:1 Safety Factor.

2. Cable D/d ratio: Sheave tread diameter is the minimum D/d ratio per the "Wire Rope User Manual" or recommended by the wire rope manufacturer.

3. Steel: 1/5 of yield strength or per AISC Specification.

4. Bolts: Minimum SAE J429 Grade 5 (ISO R898 Class 8.8), zinc plated.

E. Motorized Hoist Systems: To ensure a uniform installation and single responsibility, the motorized hoist systems shall be the product of one (1) manufacturer.

F. Applicable Standards and Codes:

1. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

2. American Standards for Testing and Materials (ASTM):

a. ASTM A 36/A 36M – Standard Specification for Carbon Structural Steel.

b. ASTM 120 – Specification for black and hot dipped zinc coated, (galvanized) steel pipe for ordinary use.

c. ASTM A 500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

d. ASTM A513 – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

e. ASTM A1011 – Standard Specification for Steel, Sheet, and Strip, Hot Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low Alloy with Improved Formability, and Ultra High Strength.

f. ASTM B85 – Standard Specification for Aluminum Alloy Die Castings.

g. ASTM B209 – Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

h. ASTM B221 – Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

i. ASTM B429 – Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

j. ASTM C423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

k. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

l. ASTM E 413 – Classification for Rating Sound Transmission.

3. International Building Code (IBC).

4. American Society of Mechanical Engineers (ASME).

5. United States Institute for Theatre Technology (USITT).

6. National Electric Code (NEC).

7. NFPA International (NFPA): NFPA 701: Fire Tests for Flame-Resistant Textiles and Films.

8. ANSI B18.2.1&2 – Specification for square and hex bolts and nuts.

9. Any and all applicable local governmental codes.

10. ANSI E1.6-1-2021 – Entertainment Technology – Powered Hoist Systems.

G. Code Compliance: All products and work shall be superior or equal to that which is required by governing codes, ordinances, rules, and regulations.

H. All bid proposals shall be based on materials, equipment, and installation as herein specified. All deviations and exceptions to the specifications must be approved by addendum.

I. Contractor's Qualifications:

1. The Contractor shall have at least one (1) full-time senior staff member, having five (5) years minimum experience as a Theatrical Systems installer who will be assigned to this installation. The senior staff member shall:

a. Provide all technical liaison between the Contractor and the Architect/Owner.

b. Be responsible for supervision of all technical and engineering work required to execute the contract, and, in particular, approve and sign all shop drawings.

c. Represent the Contractor at all meetings and conferences and be present at the job site for final inspection.

d. Be at the site during the entire installation period.

e. The Contractor project supervisor shall hold Entertainment Technician Certification Program (ETCP) Certified Rigger – Theatre Certification.

J. Qualifications of Contractors:

1. All Contractors desiring to submit bids for the Work specified herein must be Qualified in writing to the Architect/Owner not less than ten (10) days prior to the bid opening.

2. Bids submitted by Contractors who have not been qualified will not be accepted.

1.9 SUBMITTALS

A. Submittals shall be in accordance with Division 1 requirements.

B. Contractor Qualification Statement: contractors wishing to bid on the Work specified herein shall submit for approval, brochures bound in flexible binders containing a statement of the Contractor's qualifications. As a minimum, this submittal shall include the following:

1. A list of theatres of comparable size and scope (including motorized systems) to that described herein, completed by the Contractor in the last five (5) years. Show project name and address, year of completion and the name and telephone number of a person to contract who is a representative of the Owner or User.

2. A personal resume of formal education and experience of the qualified staff engineer who would direct the work.

3. A description of the Contractor's capabilities and facilities for assembly, shop fabrication, repair, and servicing of theatre equipment.

4. Certification(s) from the lighting control system manufacturer(s) certifying that the Contractor’s software programmers have been factory trained and are qualified to perform the installation.

5. Certification(s) from the motorized rigging hoist system manufacturer(s) certifying that the Contractor’s software programmers have been factory trained and are qualified to perform the installation.

6. The Contractor shall provide proof that the project supervisor holds ETCP Certified Rigger – Theatre Certification.

7. The Contractor must state if they intend to utilize a subcontractor and provide said subcontractor's name and address. The subcontractor shall comply with all the same rules, regulations, laws, codes, licenses, etc., as required by the Contractor and as specified herein. The Owner reserves the right to approve or disapprove any subcontractor proposed by Contractor.

8. Provide a personal resume of formal education and experience of the qualified senior staff member who would direct the Work.

C. Shop Drawing Submittals: Show fabrication and installation details for the performance lighting system, stage drapery, rigging assemblies, motors, etc. At a minimum, shop drawing submittals shall include the following and shall be submitted as a single package:

1. A complete bill of material showing list of equipment to be provided, with quantities, including those items which are to be fabricated by the Contractor.

2. A complete set of manufacturers' equipment specifications with detailed technical information describing and illustrating all components and materials to be used in the installation of the systems. This set shall include items listed by manufacturer and model number and any other components needed to provide a complete functional system.

3. Provide manufacturer's specification sheets for each type of product indicated.

4. Plans, elevations, details, and assembly drawings.

5. Assembly drawings shall include all major components deemed necessary for review. All assemblies shall include weights, dimensions, (where applicable), loads, and structural attachment methods.

6. Include information required for coordination of work by other trades.

7. Operating clearances.

8. Locations of equipment components, switches, and controls. Differentiate between manufacturer-installed and field-installed wiring.

9. Complete rigging schematics including dimensions, weights, capacities, and loads imposed by all components shall be provided.

10. Requirements for supporting all rigging equipment. Verify capacity of each track and rigging component to support loads.

11. One-line diagrams/schematic diagrams shall be submitted for the motorized rigging system and theatrical lighting system. Wiring diagrams shall show power, signal, and control wiring.

12. Lighting Control Systems User interface navigation. This shall include page-by-page graphics and descriptions of functions for each page and each programmable button.

13. The data furnished by the Contractor shall be sufficient to enable the Architect/Owner to determine whether the equipment, materials, and installation the Contractor proposes to furnish comply with the requirements of this specification.

14. Contractor shall provide other information or materials requested by the Architect/Owner when there is question of compliance with the intent of the drawings and specifications.

D. Samples for Initial Selection:

1. The Contractor shall submit samples and color cards of drapery fabrics for color selection and approval.

2. Include color charts showing the full range of colors, textures, and patterns available, together with a 12" square sample (any color) of each type of fabric.

3. All samples shall be tagged, identifying grade, weight, color, manufacturer, and use.

E. Product Certificates and Data:

1. Manufacturer's data sheets on each product to be used, including:

a. Provide test results by certified independent testing laboratory indicating compliance with performance requirements.

b. Rated capacities, construction details, material descriptions, dimensions of individual components, profiles, and finishes.

c. Delivery, storage, handling, installation instructions, and recommendations.

d. Notarized test certificates from the manufacturer on each reel of wire rope documenting the minimum breaking strength.

e. Maintenance instructions and recommendations.

F. Coordination Drawings: Project-specific Coordination Drawings, indicating the following items drawn and coordinated with each other. Include information required by Installers of each item to coordinate the Work. Include the following:

1. Relationship of items shown on separate Shop Drawings.

2. Dimensions and required clearances of adjacent or related work.

3. Order of assembly of separate items.

4. Information required for interface with other trades and components, including mechanical, electrical, and communication work.

G. Warranty: Sample of special warranty.

H. Closeout Submittals:

1. As-Built Drawings:

a. Full size drawings shall be submitted to the Owner after final acceptance. These are to be fully revised by the start-up and installation personnel to reflect the actual finished installation. The as-built drawing set is to be 100% complete including all schematics, details, and bills of material necessary to maintain and repair all the systems.

b. Each drawing shall be stamped and dated "As-Built Drawing."

c. Any revisions or modifications during the warranty period will require that the "As-Built Drawings" be updated.

2. Warranty: Submit manufacturer's warranty.

I. After the final punch list has been completed, submit the following:

1. Operation Manual: Provide the following in a neatly bound binder with tabbed dividers between sections:

a. Title Page.

b. Table of Contents.

c. Description of each system including key features and operational concepts.

d. Setup diagrams and instructions to use in typical situations as directed by the Owner.

e. Single-line block diagrams showing all major system components.

f. Manufacturer's operation manuals and information sheets for equipment intended for operation by system users.

g. A sheet of web links to relevant industry resources such as:

1) Catalog cut sheets of all purchased equipment.

2) Product manufacturer training.

3) Test certificates from manufacturers.

4) Recommended Spare Parts List.

h. Key schedule cross-referencing all keys to their respective functions and extra copies of all keys required to open or operate equipment specified in this section.

2. Maintenance Manual: Provide the following in a neatly bound binder with tabbed dividers between sections:

a. Title Sheet.

b. Table of Contents.

c. Company name, address, telephone number, e-mail address, website, and contact name for system service or maintenance.

d. System Description.

e. Listing of all equipment and materials with names of manufacturers and model numbers or part numbers.

f. Product manufacturer's warranties and a typed one (1) year system warranty explicitly covering all materials and labor.

g. Manufacturer's service manuals for all major equipment items.

h. A recommended preventative maintenance schedule with reference to the applicable pages in the manufacturer's maintenance manuals. Where the manufacturer provides inadequate information, provide the information necessary for proper maintenance.

i. Drapery care, cleaning, and storage instructions.

j. Provide a working copy of the latest version of all software required to operate or configure the systems specified herein.

k. All software shall be fully documented, and that documentation included.

l. Software shall be furnished on a USB solid state memory drive attached to the binder.

m. All user definable software configurations and/or programming shall become the sole property of the Owner. This includes all source code, source code copyrights, and related documentation.

n. PDF drawings of all system assembly drawings necessary to perform maintenance on the systems.

o. PDF manuals shall contain all items listed above with hyperlinks as applicable. Manuals shall be organized with bookmarks and section titles for quick reference.

p. Recommended inspection and maintenance schedules for rigging systems.

3. Provide two (2) copies of the recorded Manuals to document the instruction and training in accordance with Article 3.6, D on thumb drives to the Owner.

4. As-Built Drawings: Maintain a full set of shop drawings at the project site marked up to indicate actual locations of equipment, boxes, and other items called for in this section. After the final site visit, compile the mark-ups into an electronic set of as-built drawings in AutoCAD or Revit and provide to the General Contractor, Architect, and Owner.

J. Field Quality Control Reports: Documenting inspections and demonstrations of installed products and equipment.

1.10 PROJECT CONDITIONS

A. Field Conditions: The Contractor shall examine all attachment areas and conditions under which the theater equipment is to be installed. Notify the General Contractor in writing of any conditions detrimental to the proper and timely completion of the Work.

B. Field Measurements: Verify actual dimensions of openings and construction contiguous with drapery, rigging, and openings by field measurements before fabrication and indicate measurements on Shop Drawings.

C. The drawings show diagrammatically the front-of-house and stage electrics, control panels, etc. So far as possible, the drawings show the arrangement of the equipment which will fit into the spaces available without interference.

1. Coordinate installation and location of blocking and supports as requested.

2. Verify openings, clearances, storage requirements, and other dimensions relevant to the installation and final application.

3. Where applicable, coordinate locations of electrical junction boxes.

D. The system drawings are approximately to scale and generally indicate how they are to be integrated with other parts of the building. The Contractor shall determine exact locations by job measurements, by checking the requirements of other trades and by reviewing all contract documents.

E. The Contractor is responsible for monitoring the progress of other trades to prevent out of sequence installation of equipment.

F. Whenever job measurements, analysis of the drawings and specifications, or progress of other trades indicates that the various systems cannot be installed without significant deviation from the intent of the contract, the Architect/Owner shall be notified immediately. Work in the general area shall cease until a resolution to the question has been approved.

1.11 WARRANTY

A. Provide a written one (1) year warranty, signed by the Contractor, due on the date of the final acceptance.

B. Include the following provisions:

1. Warranty all equipment and the installation to be free of faulty workmanship.

2. Warranty all components and materials to be free of defects for a period of one (1) year from the date of final acceptance.

3. Paint and exterior finishes, fuses, and lamps are excluded from above warranty, except when damage or failure results from defective materials or workmanship covered by the warranty.

C. Any manufacturer's warranties that exceed a period of one (1) year shall be transferred to the Owner for the remaining life of the warranty.

1.12 MAINTENANCE SERVICE CONTRACT WARRANTY

A. Provide a written Maintenance Service Contract that contains the following:

1. Replacement and/or repair of defective materials or faulty workmanship within seventy-two (72) hours of discovery at no cost to the Owner during the period of the warranty.

2. Maintenance Service Contract shall be for a period of one (1) year from the final acceptance date.

3. Service shall consist of at least one (1) visit six (6) months and one (1) visit eleven (11) months after final acceptance for checking the equipment and making any necessary adjustments.

4. If, during this period, any system component is out of service for more than one (1) week due to unavailability of parts or service, Contractor shall supply and install an identical component. If an identical component is not available, an equivalent component shall be substituted, but only with the approval of the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. General:

1. All components shall be fabricated to resist rust and corrosion. Consideration of the job site environment during installation and storage will dictate measures to ensure that all equipment is free of rust at the time of final acceptance. Rust appearing during Warranty period shall be corrected by the Contractor at no expense to the Owner.

2. All metal parts shall be free from rust, dirt, and welding spatter. All new weldments or other metal components shall receive a coat of rust inhibitor primer prior to component assembly. All assemblies shall receive a finish coat of paint.

3. All materials shall be new and of first quality.

4. All equipment shall be of a bolt-up construction whenever possible. Equipment which must be welded in place shall have a welded sub-base which is bolted to the base so that the assembly may be removed for servicing by loosening bolts between the base and sub-base.

B. Manufacturer:

1. For all equipment, materials, and products not identified by part number and manufacturer, performance specifications which are published in the most recent manufacturers' data sheets available at the time of bidding this contract shall be applicable to the present work as though fully written herein.

2. For equipment, materials, and products not identified by part number and manufacturer, Contractor may select items which conform to the functional and/or technical specifications. For all such items, the Contractor shall submit for approval all technical data which is available from the supplier or manufacturer. Acceptability for use in the systems shall be determined by the Architect/Owner. Such items shall be installed only after receipt of written approval.

C. Hardware:

1. All hardware (bolts, nuts, washers, etc.) shall be zinc or similarly plated, manufactured in the United States of America, and SAE J429 Grade 5 or better.

2. All bolts shall be of sufficient length to extend a minimum of two (2) full threads beyond their nut.

3. Self-locking nuts shall be used except where specific engineering reasons dictate the use of other styles. All nuts which are not self-locking shall have an appropriate lock washer.

4. J-bolts shall not be used for any application to the rigging system.

5. Turnbuckles shall be drop forged and galvanized, and conform to ASTM F-1145 Type 1, Grade 1. All turnbuckles shall have jam nuts. Turnbuckles shall be moused after adjustment to prevent loosening.

6. All screw pin anchor shackles shall be drop forged, galvanized, and moused with 18 to 20-gauge copper wire from the eye in the bolt to the body of the shackle.

7. All compressible swage or "Nicopress" fittings shall be crimped exactly according to manufacturer's recommendations. Quantity and spacing of crimps shall be according to manufacturer's recommendations. All swage tools must be calibrated prior to beginning work. A go/no-go type gauge shall be used to measure crimps at the beginning of calibration and after every fifty (50) cables are terminated. Ensure that tool calibration is maintained. The dead ends of cables shall be trimmed within 3/8" of swages. Only copper sleeves shall be used. Aluminum is not acceptable.

8. Acceptability for use in the systems shall be determined by the Architect/Owner. Such items shall be installed only after receipt of written approval.

D. Wire Rope Cables:

1. All wire rope cables shall be 7 x 19 stranded utility cable, meeting Federal Specification RR-W-410E, sized as required, and with breaking strengths as follows:

   a. 1/8” diameter – 2,000 pounds

   b. 3/16” diameter – 4,200 pounds

   c. 1/4” diameter – 7,000 pounds

   d. 5/16” diameter – 9,800 pounds

   e. 3/8” diameter – 14,400 pounds

2. All lift cables shall be new and free of kinks and burrs. All defective runs of cable shall be replaced regardless of what caused the defect. Damaged or deformed cable shall not be used.

3. The Contractor shall secure notarized test certificates from the manufacturer on each reel of cable documenting the minimum breaking strength. These certificates shall be part of the manual catalog.

4. All wire rope rigging shall be installed to prevent abrasion against any part of the building construction or other equipment.

E. Substitutions:

1. Accompany any request for substitution with manufacture-measured data proving the equivalence of the proposed substitute in quality and performance. The Architect and Owner shall be the final judge of the acceptability of submitted substitution.

2. Substitution requests must be submitted in accordance with Section 01605 requirements and will be reviewed after bid award.

2.2 MOTORIZED STAGE RIGGING

A. The motorized stage rigging includes support for the following:

1. Front of House performance lighting electric.

2. Stage performance lighting electrics.

3. Orchestra shell ceiling units.

4. Spare line sets.

B. General:

1. Hoists shall be the Prodigy P1 with Compression Tube as manufactured by Electronic Theatre Controls (ETC).

2. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, drapery, and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical, and safety features of this hoisting and control system shall establish the standard of quality, performance, and safety by which hoisting systems of other manufacture shall be evaluated.

3. Each hoist shall be fully tested under full rated load throughout its full travel distance with all its lift lines terminated to the hoist before the hoist is shipped from the manufacturer. Only hoists that successfully pass the following pre-shipment testing shall be sent to any job site. Hoists that are not tested as a complete system with the wire rope and loft blocks that will install with the hoist in the field shall not be acceptable. Testing shall include:

    a. Hoist operation.

    b. Hoist/motor speed.

    c. Lift line terminations under load.

    d. Braking and stopping under load.

    e. Load cell functions.

    f. Slack line detection.

    g. Position sensing.

    h. Hoist noise.

4. A record of testing and its results shall be available for review at the manufacturer’s facility.

5. A copy of all testing results must be furnished by the Theatre Contractor to the Architect/Owner representative at the time of system commissioning.

6. Paint as required under this section shall be the manufacturer's standard finish and color except as noted.

7. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL), American Standards Association (ASA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) Life Safety Code 01, National Electric Code (NEC) and PLASA.

8. Where acceptable equipment items are specified by catalog number only, device shall meet all published manufacturer's specifications. Where quantities or sizes are not given, refer to drawings. Where two (2) or more products are listed, Contractors may use either, at their discretion. Equipment shall not be substituted without specific written approval by the Architect under the substitution paragraphs of these specifications.

9. All pipe battens shall be fabricated from 1-1/2” I.D. schedule 40 pipe.

10. All turnbuckles and cable clips shall be drop forged.

11. All turnbuckles and clips, tracks, chains, and other items of incidental hardware shall be furnished plated or painted. Wire rope shall be galvanized. Fasteners, chain, and other miscellaneous hardware shall be zinc plated.

12. All materials used in this project shall be new, unused, and of the latest design. Refurbished materials are not permitted.

13. In order to establish minimum standards of safety, a minimum factor of 10 shall be required for all equipment and hardware used on this project. In addition, the following factors shall be used:

    a. Cables and fittings: 10-design factor.

    b. Cable bending ratio: 26-times diameter.

    c. Maximum fleet angle: 2-degrees.

    d. Steel: 1/5 of yield.

    e. Bearings: 2-times required load at full for 2,000 hours.

C. Hoists:

1. Each wire rope lift line shall adhere to a design factor of 10:1 with an ultimate strength of 4,200-pounds. All load path components between the building structure and the batten shall exceed the breaking strength of the wire rope. The motor brake shall be rated at least at 125% of the motor torque.

2. Weight Capacity:

    a. Fixed speed hoists shall be capable of supporting 1,500-pound capacity in standard configuration. Speed of fixed speed hoists shall be 30-fpm.

    b. Variable speed hoists shall be capable of supporting 1,200-pound capacity in standard configuration. Speed of variable speed hoists shall range from 30-fpm to 90-fpm.

    c. See line set schedule in TS drawings for more information.

3. The hoist shall include the following features:

    a. A Powerhead containing the following elements: the gear motor, motor brake, load brake, limit switches operating electronics, load cell, slack line detector, absolute position sensors, cable drum assembly, and wire rope.

    b. A Compression Tube with beam clamps, cable management system, loft blocks, lift line and lift line terminations Right Angle Cable Adjuster (RACA) that prevents hoist system lateral forces from transferring to the building. Hoists or hoisting systems that impose a lateral load on the building shall not be acceptable.

    c. The hoist shall incorporate a built-in load cell.

    d. The hoist shall incorporate a built-in slack line sensor.

    e. The hoist shall include the emergency contactor built into the hoist.

    f. Hoists that do not include built-in load cell, built-in slack line detection, and an emergency contactor shall not be acceptable.

g. Hoists that do not use absolute position encoders shall not be acceptable.

h. Pipe batten and power/control distribution strip.

4. The hoist shall be manufactured from UL Listed components and shall be UL Listed and tested as a complete system (not just UL listed parts).

D. Powerhead:

1. The Powerhead shall be a fully enclosed, powder coated sheet metal housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust, and debris.

2. Hoist assemblies that do not have metal housings prohibiting access to moving parts shall not be acceptable.

3. For setup and maintenance, the following functions shall be available from the Powerhead: power and operating switches, address setting knobs, limit switch setting knobs, limit switch override button, indicators for power, status, and communication. Each of these functions shall be clearly labeled.

E. Gearmotor and Motor Break:

1. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 480 Volt, 60 Hz, 3-phase current.

2. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor full load torque.

3. The motor brake shall be spring actuated to apply and hold braking force.

4. The motor brake shall be magnetically released and held open upon actuation.

F. Load Brake:

1. Fixed Speed Hoists:

a. The rotary disk load brake shall bring the moving load to a complete stop and shall hold the load in position in the event of a mechanical failure of the motor, motor brake, or gearbox.

b. Noise from the load brake shall be minimally audible at any time in the operational cycle.

c. Normal hoist operation shall not be limited by heat or noise caused by the load brake.

d. The load brake shall be electrically released when the load is moving in the up direction. The load brake shall always be engaged when the load has stopped moving either up or down.

2. Variable Speed Hoists:

a. The rotary disk load brake shall open upon activation of hoist movement and shall close after the load has come to a stop; it shall hold the load in position.

b. Noise from the load brake shall be minimally audible at any time in the operational cycle.

c. Normal hoist operation shall not be limited by heat or noise caused by the load brake.

d. The load brake shall be electrically released when the load is moving either up or down. The load brake shall always be engaged when the load has stopped moving either up or down.

G. Wire Rope Drum: The drum shall be capable of wrapping up to eight (8) 3/16” diameter 7 x 19 galvanized aircraft (utility) wire rope lift lines up to 50’-0” long in a compact manner. They shall be managed by a wire rope (cable) keeper integral to the Powerhead. The drum design shall prevent wire rope from tangling or crossing over itself.

H. Limit Switch: A limit switch assembly shall be mounted within the Powerhead for hard “normal” and “ultimate” end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation aided by an indicator light visible on the bottom panel of the Powerhead cover. Any system that indicates that the limit has been set by audible or tactile means only shall not be acceptable.

I. Load Sensor/Load Profiling: A load sensor shall be built into the Powerhead to create a profile of the actual load on the hoist as it travels through its normal cycle. The profile may be changed by “re-training” the profiling system whenever the suspended load is changed on the batten by activating a key-switch operated training cycle on the motor controller. The load sensor shall continuously monitor the load when load sensing is turned on.

1. In cases where an acoustic ceiling piece is in conflict with a border drape and must hold the weight of the drapery while in position, the load sensor shall allow the drapery to be cradled on the ceiling piece and the extra weight shall not prevent the hoist from lifting the piece to the desired position.

J. Position Sensor: A position sensing system shall be built into the Powerhead to provide accurate position information. The system shall consist of two (2) absolute sensor types that provide accurate position information for each batten at power-up of the system. Hoisting systems that require re-homing shall not be acceptable. Incremental encoders shall not be acceptable for position readout purposes.

K. Slack Line Detector: The slack line detector shall be built into the Powerhead. When a slack line condition in excess of 15” develops in a lift line, the slack line detector shall remove power from the hoist. The batten shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault.

L. Local User Interface to Powerhead:

1. User interface at the Powerhead control panel at the rear of the hoist shall include:

a. Hoist Up/Down Control.

b. Limit Switch override buttons (tool accessible).

c. Address switches.

d. Status LED’s.

M. Information Storage Within Powerhead:

1. Record of severe fault conditions with date and time stamp.

2. Record of E-stops, overloads, moves, and power cycles.

3. Record of travel distance and peak loads since installation/inspection

4. Hoist systems that do not record the above data shall not be acceptable.

N. Compression Tube and Beam Clamps:

1. The Compression Tube shall be a continuous channel of extruded aluminum engineered in conjunction with the beam clamps to neutralize rigging-generated lateral forces on the building.

2. The Compression Tube shall support the system loft blocks.

3. Compression Tube sections shall be joined into a continuous assembly by a pair of dedicated splicing plates at each tube joint.

4. The Compression Tube shall be installed only by means of dedicated beam clamps that allow the Compression Tube to snap into place and to fractionally move horizontally under load.

5. Beam clamps shall be capable of attaching to horizontal beams, joists, truss flanges, or flat steel plates measuring from 1/4" thick up to 1” thick and from 4” wide up to 14” wide placed no more than 14’-0” apart.

6. Hoists must be mounted on 3/8” x 6” wide or larger steel if deemed sufficient by a structural engineer. Support structures must be deemed sufficient by a structural engineer to support any forces imposed by the hoisting systems. Beam clamps shall accommodate up to 1/2" vertical misalignment.

7. Mounting brackets as required per manufacturer's standards. Mounting points not to exceed 14’-0” on center.

8. Motorized line sets shall not be mounted to a truss with a 2-degree or higher slope. If mounting plane is 2-degrees or greater from plumb to the floor, leveling brackets shall be added to all beam clamps.

O. Loft Blocks:

1. Each loft block shall be an assembly of steel side plates, a wire rope idler, sheave, bearings, shaft locked against rotation and support hardware. Each loft block shall be inserted into the slot on the bottom of the Compression Tube. The blocks shall be positioned no closer than 4’-0” from each other, unless muled.

2. Loft block sheaves shall measure 5” in diameter and contain a pair of press fit sealed ball bearings. Lift lines shall travel in a groove shaped and sized for 3/16” diameter wire rope per the latest edition of the Wire Rope Users’ Manual as published by the Wire Rope Technical Board. The loft block sheave shall be concentric about the hub and shall be evenly balanced for ease of rotation.

3. An idler shall be incorporated into the top assembly of the loft block to guide and support lift lines as they pass the block.

4. Hoisting systems requiring the loft blocks to be mounted directly to the facility structure shall not be accepted for this project.

P. Lift Line Terminations:

1. Each lift line shall be terminated in the Powerhead via a standard copper oval compression sleeve installed/crimped at the factory.

2. Lift lines shall be terminated at the load hanger with a low-profile Right Angle Cable Adjuster (RACA), thimble, and copper oval compression sleeve. The RACA and cable terminations at the batten shall be installed at the time of hoist installation.

3. Batten trim shall be adjustable up to 6” via the RACA.

4. Systems utilizing turnbuckles or chain to trim the batten shall not be accepted for this installation.

Q. Hangers:

1. Raceway hangers shall be specially shaped flat bar that shall support the wire rope termination hardware and secure the raceway and the pipe batten.

R. Cable Management for Electrics:

1. The load circuits and control wiring shall be fed to the distribution trough by a built-in cable management system that allows flat feeder cable to fold and store along the top of the connector strip.

2. At high trim, the entire system shall be stored in 30” of vertical space from the bottom of the mounting steel to the horizontal centerline of the batten.

3. The cable management system shall be integral to the hoist system.

4. The cable management system shall be UL LISTED.

5. The flat cable shall meet the physical as well as thermal requirements of UL for 20 Amp loads. Up to four (4) flat cables may be fed from each end of the distribution system to provide power for twenty-four (24) circuits from each end of the system for a maximum of forty-eight (48) total circuits.

6. Each flat cable shall include one (1) ground wire and one (1) data cable plus an individually insulated hot and an individually insulated neutral conductor for each of six (6), 120 Volt, 20 Amp circuits.

7. The connector strip shall be built as specified by Theatre Consultant.

8. Flat cable shall pass through a strain relief before entering a termination box at the designated end of the raceway. Within the raceway all wiring shall be attached at the factory to a terminal block. The flat cable, internal wiring and all components shall meet UL requirements and appropriate National Electrical Codes (NEC).

9. Hoisting systems utilizing cable management systems from third-party vendors shall be fully integrated into the hoisting system without additional structural changes or changes to the QuickTouch controller. Electrics line set hoisting systems that do not fully integrate cable management in the hoisting system and controller shall not be acceptable for this installation. Cable management systems that are not UL LISTED shall not be accepted for this installation.

10. A Helix cable management system is acceptable for use in the stage orchestra shell line sets. Any other cable management systems that utilize cable cradles, cable reels, or locate feeder or data cables outside the off-stage edges of the electrics batten shall not be acceptable for this project.

S. Pipe Batten:

1. The pipe batten shall be 1-1/2” I.D. schedule 40 grade A, truss batten, seamless pipe fabricated in the largest possible lengths without splices. Battens of greater length shall be spliced by means of 0.120 x 1 9/16 diameter DOM tube 18” long with 9” of tube inserted into each half of the splice. The tight-fitting splice tube shall be held in place by a pair of 3/8” x 2-1/2” Grade 5 hex bolts on each side of the joint. The bolts shall pass through the pipe at an angle of 90-degrees to each other. There shall be two (2) bolts on each side of the joint spaced 1” and 8” from the joint. Alternatively, one (1) pair of bolts on one (1) side of the joint may be replaced with either plug welds or tight-fitting steel rivets. Pipes shall be straight and painted flat black.

2. A safety-yellow batten cap shall be installed at each end of each pipe batten.

3. The manufacturer shall provide up to four (4) self-adhesive labels for each batten on which the rated batten load shall be written by the installer.

T. Power and Control Distribution (PCD):

1. Each hoist shall receive power and control via a pair of 8’-0”-long cables extending from the Powerhead to the source outlets. Receptacles shall be installed in a sheet metal junction box or trough with outlets. Each outlet shall be located no more than 6’-0” away from the rear face of each hoist.

2. Each Powerhead shall include a power cord hardwired to the hoist with an appropriately sized grounded twist-lock connector at the PCD end and a removable control cable with a circular 9-pin connector at each end. An appropriately rated 3-phase breaker in the PCD is included. The wiring and connectors shall be barriered between high and low voltage.

3. The power/distribution channel shall be UL LISTED for this application.

U. Control System:

1. General:

a. The controller shall be purpose-designed and fabricated to manage and operate motors specifically designed for overhead lifting.

b. The System shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment and shall provide an engineered, efficient device to control the equipment.

c. The controller shall support up to twenty-four (24) motors.

d. The controller shall provide one (1) connection for motor communication, supporting up to twenty-four (24) motors per connection.

e. The control system shall consist of a surface, panel, or rack mounted primary controller and up to three (3) optional external E-stop stations.

f. The controller shall be UL Listed and shall be fabricated from UL Listed components.

g. The Emergency Stop and Hold-To-Run (Dead-Man) signals between the control station and the motor starters or drives in the motors shall be hard wired 24 Volt signals.

1) One (1) physical, industrial heavy-duty pushbuttons shall create a “dead-man” signal. The "dead-man" operation is required, so that the operator must be at the console and pressing a button to initiate and continue motion.

2) Systems that rely on software and bus communications to transmit signals shall not be acceptable.

3) For safety, movement initiated from the touchscreen shall not be permitted.

4) Systems that allow motors to run without an operator actively present at the console shall not be permitted

h. The system shall not contain any permanently moving components (like hard drives or fans) and shall be maintenance free and completely quiet during operation.

i. The control system shall only employ the controller, a power and control distribution infrastructure and the motors. A system that requires separate drive cabinets or motor-starters shall not be acceptable.

2. Mechanical:

a. The controller shall support wall mount installations.

b. The wall mount bracket shall be mountable independently from the control station. It shall be possible to run in and terminate all wires on connectors with the installed wall bracket

1) The entire control panel shall be easy to connect to the wall bracket. All electrical connections shall be made via touch safe connectors.

2) A system that relies on directly terminated building wires to the control system shall not be acceptable.

c. The wall mount bracket shall be flush with the wall.

d. A lockable cover shall be provided.

e. The face panel shall be printed with labeling that identifies the function of each of the buttons on the control station.

f. The face panel shall identify the system as a controller for stage rigging.

3. Electrical:

a. The controller shall require no discrete wiring connections; all wiring shall be terminated into a wall mounted bracket.

b. The controller shall run on 24V DC power.

4. Functional:

a. User Interface:

1) The control system shall include one (1) illuminated and dimmable “GO” button.

b. Emergency Stop (E-Stop):

1) The E-stop shall be an NFPA-79 compliant mushroom head button with an illuminated ring surrounding the button.

2) During normal operation the E-stop button shall be in the out position. An E-stop can be activated via this button by firmly pressing the button in. The button shall latch and immediately cause all motors in the system to stop motion.

3) To continue system operation, the E-stop button must be cleared at the station where it was pressed by twisting the button to release the latch. The E-stop must be acknowledged at the control station where it was activated before any new movement can occur.

4) The operator shall acknowledge the end of an E-stop condition. At that time the control system shall initiate an automatic self-test of the system safety functions including safe opening of all E-stop contactors.

5) The illuminated ring around the E-stop button shall change intensity depending on whether the system is moving or not. The transition between low and high intensity shall be a smooth fade. The intensity levels shall be adjustable at the time of installation or service.

6) The illuminated ring around the E-stop button shall blink in case of an E-stop condition.

7) In addition to the E-stop station at the main control panel, up to six (6) external E-stop stations may be connected to the system. Each external E-stop station shall operate in the same way as the primary E-stop at the control panel.

8) The LCD screen shall report the E-stop as an E-stop condition.

9) The report shall indicate if the activated E-stop was the internal one, the one on the remote control, or one of the external stations.

10) The E-stop system shall be completely hard-wired. A system that relies on software or bus system to transmit E-stop signals shall not be acceptable for this installation.

11) The E-stop signal shall be provided in parallel to all E-stop contactors in the motors. A single E-stop contactor failure shall only affect a single motor.

12) Serial wiring of the E-Stop signal from motor to motor shall not be acceptable.

c. LCD Screen:

1) A 7” industrial grade backlit graphic LCD display shall communicate system information in symbols, colors, and human readable text.

2) The control system shall employ an ambient light sensor and proximity sensor for automatic wakeup of the LCD display.

3) Intensities of all indicator lights and LCD intensity shall be dimmable and shall automatically adjust based on ambient light conditions. Intensity changes shall happen in smooth slow fades.

4) If the control system is not used for a pre-determined time, the intensities shall dim further down. If the proximity sensor is actuated, the intensities shall automatically dim up again.

5) The screen shall employ a multi-touch sensor that allows for gesture control of zooming and scrolling.

6) Display language shall be English.

7) A flexi-channel filter shall support selection of all motors or a subset.

d. User Access Levels:

1) The controller shall provide a minimum of six (6) access levels with differentiated functionality: Power User, Administrator, Panel Preset User, Panel Preset Operator, Installer, and Inspection.

2) These levels shall be unlocked by a username and pin code.

3) It shall be possible to call the manufacturer to retrieve a 3-day temporary access code for Power User, Administrator, Panel Preset User, and Panel Preset Operator.

e. Operation:

1) Upon completion of the startup sequence the display shall indicate that the system is “OK” or shall provide specific information should a fault occur in the self-test.

2) Fault conditions shall be reported in human readable text. Any system that reports fault conditions in a pattern of illuminated lights or a series of blinking lights shall not be acceptable for this installation.

3) The LCD display shall provide the motor name and number, its current position above the floor, the amount of weight suspended from the batten, preset position recorded, as well as a bar graph scale that shows the current position of the motor and the current weight suspended by the motor.

4) Fault conditions shall be displayed in red or orange, depending on the severity of the condition.

5) Position readout and position entry shall be in feet and inches.

6) The weight readout shall be user selectable from pounds.

f. Manual Operation:

1) In manual operation, it shall be possible to select one (1) or multiple motors and then directly move the selected motors by the means of the joystick.

2) The user shall have the ability to change the name of a motor.

3) The user shall have the ability to add a comment for each motor.

4) The user shall have the ability to store trims heights for the following levels: High trim (soft upper limit), Low trim (soft lower limit), eight (8) intermediate trims, and two (2) system-wide trims.

5) These trims shall be usable as references in presets.

6) The user shall have the ability to directly enter a numeric target position.

g. Preset Operation:

1) The system shall provide the capability to store up to 999 presets with numbers ranging from 1 to 999.

2) The user shall be able to add individual motors with specific positions to each preset.

3) Presets shall support user naming from the controller face panel.

4) Presets shall provide a user comments field for free text entry of notes on a per preset basis.

5. System Diagnostics and Monitoring:

a. Upon energization of the control system shall automatically perform a series of diagnostic tests that assures the proper functionality of all system safety functions. Should an error in the safety functions be determined, the controller shall report back a fault condition on the LCD display and shall identify the nature of the fault in human readable text form.

b. Should the controller be continuously energized, the system shall automatically perform a series of diagnostic tests every thirty (30) days to determine if there are any problems with any portion of the motor control system safety features. In the event of a problem, the controller shall report back a fault condition on the LCD display and shall identify the nature of the fault in readable text form.

c. The automatic self-tests shall include a complete test of all Emergency Stop contactors for their respective ability to turn off.

d. Eleven (11) months after a system inspection has been performed, the system shall remind the user to schedule a full system maintenance/inspection. The reminder shall remain visible in the system until it is turned off by the factory authorized and trained inspector.

e. All faults and failures shall be displayed on the control station as a color indication of the respective motor and additionally as clear text.

f. The system inspection reminder shall show the number of days remaining until the system inspection, or the number of days the inspection is overdue.

g. A failure of a hoist's load cell, position encoders or a wiring issue shall be automatically detected during machine standstill and motion.

h. Motor, brake resistor, or drive over-temperature shall be detected and shall stop the hoist.

i. The motor direction shall be detected and the system shall automatically be stopped if the command direction differs from the actual movement direction.

j. A failure of the hoist's chain between the drum and the limits shall create a fault condition and stop the motor.

k. The number of simultaneous moving motors shall be limited in the control system in order to reduce the maximum dynamic load to the building structure:

1) The system shall only allow one (1) motor to move at a time.

2) The system shall trip out the control system if more than the allowed number of motors are about to start to move.

3) This system shall react before the motors start to move to avoid even the initial startup load impact.

4) The setting for this limit shall allow a granularity of one (1) motor increment.

5) This system shall be executed in pure hardware.

6) This system shall have redundant software back up.

7) Systems that solely rely on software to achieve this function shall not be acceptable.

l. Monitoring and Motor History:

1) The system shall automatically track system and motor history.

2) Each fault condition shall be logged with a time and date stamp. Logging of the motor events shall continue to function while the main control station is turned off or while the motor is not connected to the rest of the system.

3) The control system shall keep a record of the distance traveled and peak load for each motor. There shall be separate entries of this data for "Since the last inspection" and "Since time of manufacture."

4) The data shall be accessible during inspection. It shall be downloadable in a Microsoft Excel readable file format.

5) A control system that does not provide logging shall not be acceptable.

6. Configuration:

a. Configuration software shall allow easy and simple configuration of the system by factory trained and authorized installers.

7. Inspection:

a. Configuration software shall allow annual inspection of the control system functions by a factory trained and authorized inspector:

1) The inspection software shall automatically provide inspection relevant data to the inspector, such as peak load and travel distance.

2) The software shall guide the inspector through a number of inspection tasks.

3) The software shall automatically recognize safety relevant signals (E-stop, Limit Switches).

b. The inspection software shall automatically fill in an inspection report and generate a PDF file that can be stored on a USB thumb-drive.

c. The inspection report shall include a 2D barcode that encodes a copy of the inspection data and a checksum that can be utilized to validate the inspection report.

V. The basis of design is:

1. Hoists: ETC Prodigy P1500E and V1000S.

2. Motor Power and Control Interfaces:

a. PCD-F (front of house and stage right boxes).

b. PCD25-4-F-3 R-_ (stage left raceway).

3. Motor Control Station with surface-mount box, and locking cover: ETC QT+12, ETC QT-SBB-LG, and QT-D-LG.

4. E-Stop: ETC ES-BS.

5. Alternate manufacture is approved with proof of equivalence.

2.3 DEAD-HUNG RIGGING SUSPENSION SYSTEM

A. The dead-hung stage rigging suspension system includes support for the following:

1. Grand Valance Batten.

2. Grand Drape Batten.

3. Projection Screen Batten.

4. Border 1-4 Battens.

5. Leg Sets 1-6 Battens.

6. Midstage Traveler Batten.

7. Upstage Traveler Batten.

8. Scrim.

9. Cyclorama.

B. The rigging system is to be suspended from the structure steel in the stagehouse and 1/4", 7 x 19 stranded, galvanized, utility cable or 1/4" black proof coil chain. The cable or chain should be securely fastened to the steel as to support the intended loads with a minimum of 3:1 safety factor. If utility cable is used, it should be fastened to the structure in such a manner as to prevent kinking or damage to the cable. See TS drawings for details of construction.

1. If utility cable is used, it shall be fastened to the structure in such a manner as to prevent kinking or damage to the cable.

2. Refer to line set schedule on TS drawings.

C. Each pipe batten shall have suspension points on a maximum of 10’-0” intervals.

D. Bridle battens shall be used on both off-stage pick points of battens to shorten the distance of cantilever from pick point to end of batten. Maximum cantilever shall be 2’-0”. Bridle battens shall be suspended by a pipe clamp along the center point. Pipe clamps shall be used to suspend the batten from the bridle batten. Refer to detail in TS drawings for more information.

E. Each drapery track shall have suspension points not exceeding maximum allowable intervals per manufacturer’s recommendations.

F. When using utility cable, the load end of the cable shall pass through the end link of a 4/0 passing link trim chain, by means of a properly sized thimble. The load end of the cable shall be swaged with a copper compressible swage or "Nicopress" fitting, spaced as recommended by the manufacturer. The trim chain shall be 36” long, wrapped twice around the batten, and be fitted with a 1/4" bolt-type shackle, Crosby No. G-2130, or attached directly to the batten or track clamp using the 1/4" bolt-type shackle.

G. Pipe Battens:

1. Refer to line set schedule on TS drawings.

2. The pipe material shall be 1-1/2” I.D., schedule 40 black steel pipe.

3. All pipes shall be primed and painted with two (2) coats of flat black paint.

4. A 2” wide, red stripe shall be painted around the pipe at its center and shall be centered on the stage centerline.

5. 2’-0” at each end of the battens shall be painted yellow.

6. Pipes shall be suspended from structural steel of stagehouse requiring the following suspension elements:

a. Rated, adjustable beam clamp.

b. Jaw and jaw moused turnbuckle.

c. 1/4" wire rope thimble, Crosby #G-411.

d. 1/4" 7 x 19 stranded utility cable.

e. 1/4” copper compression sleeve.

f. See TS drawings for details of construction.

7. Pipe Clamp:

a. Shall be sized to hold 1-1/2” I.D., schedule 40 black iron pipe.

b. Shall have a working load of 1,250-pounds.

c. Shall be colored black.

d. Shall fully wrap/enclose pipe.

e. Acceptable products:

1) The Light Source Mega-Batten Clamp, MBATB.

2) Approved equal.

2.4 DRAPERY

A. General:

1. Furnish and install the following in the Stage:

a. Grand Valance.

b. Grand Drape.

c. Borders 1-4.

d. Leg Sets 1-6.

e. Midstage Traveler.

f. Upstage Traveler.

g. Scrim.

h. Cyclorama.

2. Provide drapery per line set schedule included in TS drawings.

3. Provide fabrics of each type and color from same dye lot.

4. The Contractor shall furnish notarized affidavits certifying that such fabrics have been tested in accordance with NFPA 701, Standard Method of Fire Tests for Flame Resistant Textiles and Fibers, and that such fabrics have been used exclusively in the draperies and fabrics furnished, if required by the Architect.

B. Drapery Fabrics:

1. All drapery fabrics shall be inherently flame retardant. The Contractor shall furnish notarized affidavits certifying that such fabrics have been tested in accordance with NFPA 701, Standard Method of Fire Tests for Flame Resistant Textiles and Fibers, and that such fabrics have been used exclusively in the draperies and fabrics furnished, if required by the Architect. Spray processing is not acceptable.

2. Polyester Velour; Grand Valance and Grand Drape:

   a. Napped fabric of 100% polyester weighing not less than 25 oz./linear yard with pile height approximately 75 mils.; inherently and permanently flame resistant; 54” width.

   b. Exemplary Products: KM Fabrics, Inc.; Crescent, or approved equivalent.

   c. Color: to be selected by Architect from manufacturer’s standard color options.

3. Polyester Velour; All Other Drapery:

   a. Napped fabric of 50% polyester weighing not less than 22 oz./linear yd., with pile height approximately 75 mils; inherently and permanently flame resistant; 54” width.

   b. Exemplary Products: Milliken Encore, or approved equivalent.

   c. Color: Black

4. Polyester Lining:

   a. 100% polyester fabric; inherently and permanently flame resistant; 54” minimum width.

   b. Exemplary Products: Avora Lining, or approved equivalent.

   c. Color: per batten schedule

5. Sharkstooth Scrim: Open-weave, seamless, lightweight gauze fabric.

   a. 100% polyester, inherently flame-resistant resin coated scrim: 35’-0” width.

   b. Color: Black

6. Muslin Cyclorama: Sheer plain-woven fabric.

   a. 100% cotton, seamless, weighing 99.2oz./linear yard.; flame resistant, 30’-0” width.

   b. Color: Natural

C. Fabrication:

1. The Contractor shall furnish notarized affidavits certifying that such fabrics have been tested in accordance with NFPA 701, Standard Method of Fire Tests for Flame Resistant Textiles and Fibers, and that such fabrics have been used exclusively in the draperies and fabrics furnished, if required by the Architect.

2. All drapery shall have a permanently attached label in a location that is visible and convenient for identification by the Authority Having Jurisdiction after installation. The label shall include the name of the manufacturer, product or style of fabric, date of manufacture, list of fire tests, testing agency, and identification that the fabric is inherently and permanently flame resistant.

3. Synthetic Velour, Lining, and Scrim: A cloth statement shall be sewn to the hem of each velour drape and lining with the following information printed on it:

> CERTIFICATE OF FLAME RETARDANCE: This is to certify that the total yards of material as supplied by_____, Mill Order No.____, Invoice Number _____, dated ___, consisting of pieces, is inherently flame retardant. The material was tested by the laboratory for satisfactory results before the shipment went forward. Certified by: _____

4. Cyclorama: A cloth statement shall be sewn to the header of the cyclorama drape with the following information printed on it:

> CERTIFICATE OF FLAME RETARDANCE: This is to certify that the total yards of material as supplied by_____, Mill Order No._____, Invoice Number_____, dated _____, consisting of pieces was flameproofed by the immersion process through pressure rollers. The flameproofing chemicals were applied in accordance with the instructions of the manufacturer and tested by the laboratory for satisfactory results before the shipment went forward. Certified by: _____

5. General:

   a. Draperies are to be stitched with thread matching the color of the drapery using a single needle lock stitch.

   b. Provide vertical seams unless otherwise indicated. Arrange vertical seams so they do not fall on faces of pleats. Do not use fabric cuts less than one-half (1/2) width.

   c. Vertical Hems: Provide vertical hems not less than 2” wide, and not less than 4” wide at borders, valance, teasers, and tormentors, with not less than a 1” tuck, and machine sew with no selvage material visible from front of drape. Sew open ends of hems closed.

   d. Leading edge turnbacks at the center and off-stage edges: Provide turnbacks formed by folding back not less than 12” of face fabric, with not less than a 1” tuck, and secure by sewing turnbacks vertically.

   e. Top Hems: Reinforce top hems by double-stitching 3”-wide heavy polyester webbing, to top edge on back side of curtain with not less than 2” of face fabric turned under.

   f. Pleats:

      1) Grand Valance and Grand Drape: Provide 100% fullness in drapery, exclusive of turnbacks and hems, by sewing additional material into 6” double-stitched box pleats sewn flat and spaced at 12” on center along top hem reinforcement.

      2) All other velour drapery: Provide 50% fullness in drapes.

g. Grommets: Brass, No. 4:

1) Grand Drape and Grand Valance (if not black): Provide brass No. 4 grommets.

2) Black Drapery: Provide brass or aluminum grommets with black finish.

3) Scrim and Cyclorama: Place 12” on center and 1” from corner of drapes; for ties, snap hooks, or S-hooks.

4) Pleated Drapes: Centered on each box pleat and 1” from corner of drape; for snap hooks or S-hooks.

h. Bottom Hems:

1) For flat drapes without fullness, provide a 4” lined hem with a pocket that allows the sliding of a pipe or conduit stiffener into the bottom of the drape, and provide a concealing flap of same fabric in front of pocket and made 2” longer than the bottom edge of the pocket.

2) For drapery with fullness:

a) For draperies that do not hang to the floor, provide hems not less than 3” deep with 3/4" weight tape. Sew open ends of hems closed.

b) For floor-length drapery, provide hems not less than 6” deep with separate, interior, heavy canvas weight pockets equipped with #105 tape weights. Stitch weight pockets so tape weight rides 2” above finished bottom edge of curtain. Sew open ends of hems closed. The tape weights shall be tacked to the pocket every 3’-0” and secured at each end to prevent bunching.

i. Velour Drapery: Fabricate with the fabric nap down.

j. Lining:

1) Provie lining per the line set schedule.

2) Lining shall be in the same fullness as the face fabric and finished 2” shorter than face fabric.

3) Sew or otherwise securely attach lining to top hem of face fabric. Attach lining to face fabric along side seams with 4” twill tape.

4) Linings shall hang free at the bottom and shall be weighted with #90S tape weights.

k. S-Hooks: Track Manufacturer's standard heavy-duty plated-wire hooks, not less than 2” long, shall be provided for each grommet of all the track-mounted drapery.

l. Tie Lines: No. 4 or No. 4-1/2 cord or braided soft cotton tape, black or white to best match curtain; not less than 5/8”-wide by 36” long, shall be threaded through grommets of all pipe-hung draperies.

m. Scrim:

1) Fabricate from scrim curtain fabric, seamless, and sewn flat.

2) Provide 6” x 7’-0” pipe pockets at bottom with a 6” gap between sections of pocket for ease of pipe installation, with a 6” flap of same fabric in front of pocket.

3) Provide double-stitched, 3” polyester webbing at top with not less than No. 2 brass grommets spaced at 12” on center and 1” from corner of curtain.

4) Provide not less than a 2” double-folded side hem and a 4” bottom hem.

5) Provide heavy tape-weight in bottom hem.

6) Provide a 3/4" pipe batten, threaded and coupled every 10’-0”, for pipe pocket.

n. Cyclorama:

1) Fabricate from cyclorama curtain fabric, seamless and sewn flat and selvage to the rear.

2) Provide 6” x 7’-0” pipe pockets at bottom with a 6” gap between sections of pocket for ease of pipe installation, with a 6” flap of same fabric in front of pocket.

3) Provide heavy tape-weight in bottom hem.

4) Provide not less than a 2” double-folded side hem and a 4” bottom hem.

5) Along the sides, 4” wide by 18” long sections of jute webbing shall be sewn into turnbacks centered on the location of grommets inserted at 24” on center along each side.

6) Pocket shall contain an interior lining of canvas.

7) Provide a 3/4" pipe batten, threaded and coupled every 10’-0”, for pipe pocket.

2.5 DRAPERY TRACK

A. Stage Traveler Track:

1. The Grand Drape track, Midstage Traveler track, and Upstage Traveler track shall be manually operated, bi-parting and suspended from dead-hung pipe battens.

2. The track lengths shall be as indicated on the line set schedule in the TS drawings.

3. The traveler tracks shall be suspended from the battens by ceiling brackets. The traveler tracks shall be attached to the brackets along its length per the manufacturer's requirements.

4. Bi-parting traveler tracks shall have a 2’-0” minimum overlap at the center of the proscenium opening.

5. The traveler tracks shall be complete with all necessary accessories and hardware, including carriers, pulleys, hand lines, rubber bumpers, pipe or hanging clamps, and adjustable floor blocks to suit curtain fabrication.

6. End and floor block: One (1) dead-end, single-wheel pulley; one (1) live-end, double-wheel pulley; and one (1) adjustable, floor block; each with not less than 6” molded-nylon- or glass-filled-nylon-tired ball-bearing sheave enclosed in steel housing. Provide pulleys with steel housing finished to match track and with bracket for securing off-stage curtain end.

   a. Floor block shall have a minimum of 5” diameter.

7. Operating hand line locations shall be coordinated with the Owner. Provide a heavy-duty detachable floor block that secures to a plate fastened to the stage-left floor to maintain proper tension on operating lines. Steel housing shall be painted black.

8. Provide with cord operating line consisting of manufacturer's standard 3/8” diameter, stretch-resistant operating cord consisting of braided synthetic-fiber jacket over solid, synthetic-fiber, linear filaments.

9. End stops shall be provided at each track end and each carrier shall be equipped with a free-moving swivel and sufficient trim chain to accommodate a drapery clip-hook.

10. ADC Model 380 exemplifies the requirements described herein.

B. Straight Track:

1. The six (6) leg set drapes, scrim, and cyclorama shall be of walk-along type operation.

2. Leg Set Tracks:

   a. Leg Set 1 shall have two (2) track sections as indicated on the line set schedule in the TS drawings. Tracks shall have a 2’-0” minimum overlap at the center of the proscenium opening

   b. Leg Sets 2-6 shall have one (1) track section as indicated on the line set schedule in the TS drawings.

3. The track lengths shall be as indicated on the line set schedule in the TS drawings.

4. The track shall be manually operated, walk-along, and suspended from the batten above. The track shall be suspended from the batten along its entire length at intervals per the manufacturer's requirements.

5. The tracks shall be complete with all necessary accessories and hardware, including carriers, hand lines, rubber bumpers, and pipe or hanging clamps.

6. End stops shall be provided at each track end and each carrier shall be equipped with a free-moving swivel and sufficient trim chain to accommodate a drapery clip-hook.

7. Pull cord shall be provided at leading and trailing edge track carriers to assist with the movement of the drapery without handling the drapery.

8. ADC Model 384-N exemplifies the requirements described herein.

2.6 THEATRICAL LIGHTING AND CONTROL SYSTEM

A. General:

1. Principle items of equipment are identified herein by manufacturer and part number. Alternate manufacturers and part numbers are given in instances where equivalence has been determined.

2. Alternate manufacturers shall provide system equivalent to that described herein, and which meet the same performance capabilities as the equipment listed in this Section.

3. For items identified by manufacturer and part number, performance specifications which are published in the most recent manufacturer's data sheets available at the time of bidding shall be applicable to the present Work as though fully written out herein.

4. For items not identified by manufacturer and part number, Contractor may select items which conform to the functional and/or technical specifications. For all such items, Contractor shall submit for approval all technical data which is available from the manufacturer.

5. Acceptability for use in the relay system shall be determined by the Electrical Engineer. Such items shall be installed only after receipt of written approval by the Electrical Engineer.

B. Architectural Lighting Control System:

1. The Theatrical Lighting Control System shall be reconfigurable through software, requiring no hardware changes, and fully digital in operation.

2. The system shall be capable of controlling individual relays via patchable zones.

3. The system shall support LCD touchscreen and pushbutton stations.

4. The system shall provide “snapshot” recording of lighting control console output data to a preset on stations.

5. The architectural lighting control system shall have capability for uploading and downloading system software configurations.

6. The architectural lighting control system shall interface with a fire alarm system contact closure signal to trigger house lighting to “ON” in an emergency.

C. Relay and Distribution Equipment shall include the following major components:

1. House Light Entry Stations.

2. Backstage Light Entry Stations.

3. Touchscreen Station.

4. Performance Lighting Control Console.

5. DMX Networking Equipment.

6. Performance Lighting Relay Panelboard.

7. Distribution Equipment.

D. Relay and Distribution Equipment: The manufacturers and their products listed below exemplify systems with equipment and components meeting the basic requirements and intent of this specification:

DESCRIPTION	MFR	MODEL	QTY
Relay Panel	ETC	IQ48	1
w/ Surface-mount Door	ETC	IQ Door 120-48S	1
w/ 200A Main Breaker	ETC	IQ-MB200A65K	1
w/ Mains Feed Tap Kit	ETC	IQ-TAP	1
w/ Contact Input	ETC	IQ-CI	1
w/ Ride-Thru Option	ETC	IQ-RTO	2
w/ Intelligent Breaker with Switching	ETC	IQ SM B20	48
Lighting Interface Rack	Middle Atlantic	DWR-35-17	1
w/ Rack-Mount Enclosure	ETC	ERn4-RM-120	1
w/ Architectural Control Processor	ETC	P-ACP	1
w/ Control Station Power Module	ETC	P-SPM	1
w/ 24-port POE Network Switch	Cisco	SG350-28P	1
w/ 24-port Patch Panel	Belden	As required	1
w/ Cable Management Panel	Middle Atlantic	BR1	A/R
w/ Patch Cord, 2 ft.	Belden	C501100002	24
w/ DMX/RDM Network 8-Port Gateway	Pathway Connect.	PWPP-RM-P8-XLR5F-REAR	3
w/ DMX/RDM 8-Port Opto-Splitter	Pathway Connect.	PWREP-RM-P8-XLR5F-REAR-RDMHUB	1
w/ ID Panel	Middle Atlantic	EB1 w/ Custom Finish per Drawings	1
w/ Blank Panel	Middle Atlantic	EB1	A/R
w/ Surge Protection	SurgeX	SA-20	1
w/ Uninterruptible Power Supply	Middle Atlantic	UPS-1000R	1
Lighting Control Console	ETC	Ion Xe 20 - 12K	1
w/ Fader Wing	ETC	Eos FW 20	1
w/ Dust Cover	ETC		1
w/ 19" (min.) LCD Touchscreen Monitor	ETC	Windows 7 Compatible	2
w/ Console Light	Littlite		2
w/ Network Cable, 25’	ETC	CD25-Net	2
w/ DMX Control Cable, 25 feet	ETC	CD25-DMX	2
Plug-In Station, floor mount, flush (RJ45x2, DMXinx2) – C1	ETC	ECPB-Netx2/DMXinx2	1
w/ Floor Box	FSR	FL-400	1
Plug-In Station, wall mount, flush (RJ45x2, DMXinx2) – C2	ETC	ECPB-Netx2/DMXinx2	2
House Light Master Station – TS	ETC	P-TS7-4	1
w/ Flush-Mount Back Box	ETC	P-LCD-FBB	1

DESCRIPTION	MFR	MODEL	QTY
Portable House Light Master Station	ETC	P-TS7-H	1
w/ Wireless Docking Station	ETC	P-LCD-WAS	1
2 Button House Light Preset Station – E2	ETC	PI1002-_	6
4 Button House Light Preset Station – E4	ETC	PI1004-_	3
Batten Distribution Strip, 35'L (20 Twistlock Pigtails/DMXout) – FH-1	ETC	9935-(20CP/5) (1D/1)-L-23	1
Batten Distribution Strip, 40'L (20 Twistlock Pigtails/5 Twistlock Flush/DMXout) – SE-1 through SE-3	ETC	9940-(20CP/5) (5CO) (1D/1)-L-23	3
Batten Distribution Strip, 36'L (20 Twistlock Pigtails/5 Twistlock Flush/DMXout) – SE-4	ETC	9936-(20CP/5) (5CO) (1D/1)-L-23	1
Wall Box (2 Twistlock/DMXout) – T	ETC	9800 Series (2CO/2) (1D1)	2
w/ 12’ schedule 40 black pipe tormentors	SSRC	12x12TP	2
Floor Box (2 Twistlock/DMXout) – FB	ETC	8500 Series (2CO/1) (1D1)	6
8-Channel Zone Controller	ETC	UFMP8	1
2-Channel Zone Controller	ETC	UFR2-LV	1
Emergency DMX Bypass Detection Kit	ETC	EBDK	1
Emergency Lighting DMX Bypass Controller	ETC	DEB-1	2
Emergency Lighting Transfer Device	ETC	SC1008	11

E. Alternate Equipment Manufacturers: The following manufacturers of distribution equipment are approved alternates:

1. SSRC

2. Rigging Innovators

2.7 PERFORMANCE LIGHTING INSTRUMENTS AND ACCESSORIES

A. Provide and install LED performance lighting instruments. Instruments shall be complete with C-clamp, Twistlock-to-powerCON cable, color frames (if appropriate), 5’-0” DMX control cables and safety cables.

B. Performance Lighting Package:

DESCRIPTION	MFR	MODEL	QTY
LED Ellipsoidal (ColorSource)	ETC	CSSPOT-0	36

DESCRIPTION	MFR	MODEL	QTY
w/ 26 Lens Tube	ETC	426EDLT	24
w/ 36 Lens Tube	ETC	436EDLT	6
w/ 50 Lens Tube	ETC	450EDLT	2
w/ Pipe Clamp	ETC	400CC	36
w/ Safety Cable	ETC	400SC	36
w/ Color Frame	ETC	400CF	36
LED Ellipsoidal (Series 2)	ETC	S4LEDS2LS	10
w/ 19 Lens Tube	ETC	419EDLT	10
w/ Pipe Clamp	ETC	400CC	10
w/ Safety Cable	ETC	400SC	10
w/ Color Frame	ETC	400CF	10
LED PAR	ETC	CSPAR	20
w/ Pipe Clamp	ETC	400CC	20
w/ Safety Cable	ETC	400SC	20
w/ Round Field Medium Lens Set Frame	ETC	SELRM-7.5	20
w/ Color Frame	ETC	407CF	20
LED Cyc Light	ETC	CSCYC	16
w/ Pipe Clamp	ETC	400CC	16
w/ Safety Cable	ETC	400SC	16
LED Work Light Fixture	Osram	Kreios FLx	20
w/ Pipe Clamp	ETC	400CC	20
w/ Safety Cable	ETC	400SC	20
LED Follow Spot	Altman	AFS-700-B-PCED	2
w/ Tripod Stand	Altman	PN - AFS-TP	2
w/ powerCON to Edison Cable	Altman	PN-PCL-PBG-12-5	2
w/ Base Plate	Kee-Klamp	M58	2
50lb. Boom Base	Altman	B-50	2
w/ 10’-0” standard schedule 40 1-1/2” pipe with threaded end			2
12” Side Arm	Altman	509-HD-1	16
5’ powerCON Jumper Cable	ETC	DPJ-5	25
10’ powerCON Jumper Cable	ETC	DPJ-10	25
25’ powerCON Jumper Cable	ETC	DPJ-25	10
5’ Twistlock Jumper Cable	Lex	BE7000-5	15
10’ Twistlock Jumper Cable	Lex	BE7000-10	15
25’ Twistlock Jumper Cable	Lex	BE7000-25	3
5' DMX Control Cable	ETC	CD5-DMX	50
10' DMX Control Cable	ETC	CD10-DMX	50
25' DMX Control Cable	ETC	CD25-DMX	5

PART 3 EXECUTION

3.1 COORDINATION

A. The Contractor shall coordinate this work with the other electrical work and the work of other trades

3.2 SITE INSPECTION

A. All site conditions shall be verified before beginning the Work. All work required to properly install and secure items in place shall be provided. Any cutting or drilling of existing structural work shall be done only with prior approval.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 WORKMANSHIP

A. The Contractor shall provide a trained foreman who shall supervise the installation of all Theatre Systems. All Work shall be done by mechanics skilled in their trade and in accordance with accepted shop drawings.

3.4 INSTALLATION

A. Installation of all equipment shall be true to plumb, line, or level. All material, hardware, supports, and other items required for a complete and correct installation shall be supplied.

B. The Contractor shall do all cutting and patching necessary for proper installation of the system and shall repair any damage done by himself or his workmen. Any required penetration of slabs of CMU walls shall be made by a cutting method rather than by a concussive method.

C. Any required penetration of slabs or CMU walls shall be made by a cutting method rather than by a concussive method.

D. Install Work neatly, with boxes, equipment, etc. plumb and square. Keep the job adequately always staffed. Designate a field supervisor to be present on the job site and in responsible charge during all phases of installation and check out. Maintain same supervisor throughout the execution of the Work unless circumstances beyond the control of the Contractor intervene. Install the system in cooperation with other trades to achieve coordinated progress and satisfactory results. Watch for conflicts with work of other trades on the job. Execute without claim for extra payment, moderate moves or changes as are necessary to accommodate other equipment or preserve symmetry and pleasing appearance.

E. Locate all apparatus requiring adjustments, cleaning, or similar attention so that it will be accessible.

F. All supporting structures and enclosures supplied by the Theatre Contractor, not having a standard factory paint finish, shall be painted. Paint specifications and color shall be supplied by the Architect.

G. Clearly, logically, and permanently mark switches, connectors, jacks, receptacles, cables, and cable terminations.

H. Etch, engrave, silk screen, or apply in a similar permanent manner all legends and markings on all custom panels and receptacle plates. Embossed tape, presstype, etc., are not acceptable.

I. The equipment specified herein must be capable of operation in environments of normal humidity, dust, and temperature. Contractor should avoid installing equipment where extreme environmental conditions can occur and shall be responsible for protection of equipment and related wiring from such conditions.

J. The Contractor shall take precautions to prevent electromagnetic and electrostatic hum. Install the equipment to provide safe operation. Provide ventilation as required to maintain equipment within the manufacturer's specified temperature limits.

K. Provide all cables necessary for interconnection of permanently mounted equipment. Use terminations required to achieve full function of equipment as specified herein.

3.5 SYSTEM START UP, OWNER'S INSTRUCTION, AND COMMISSIONING

A. A theatrical lighting system factory representative shall provide initial inspection, troubleshooting, and checkout of the theatrical lighting system prior to its being energized.

B. When all Work is complete and equipment is adjusted for suitable operation, the Contractor shall schedule an inspection by the Architect/Owner. All workmen required to operate the equipment and to perform any adjustments and tests that may be required shall be provided. During the scheduled test period, no other work will be done in the stage, auditorium, or shop areas. Any equipment failing to meet approval shall be repaired or replaced and the inspection rescheduled with complete testing repeated until approval and final acceptance.

3.6 INSTRUCTION AND TRAINING

A. A minimum of six (6) hours of instruction in equipment operations, safety procedures, and maintenance shall be furnished for the motorized rigging. Training shall be divided into two (2), three-hour sessions

B. A minimum of two (2) hours of instruction in equipment use and maintenance shall be furnished for the drapery systems.

C. A minimum of twelve (12) hours of instruction in equipment operation and maintenance shall be furnished for the theatre lighting system. Training shall be divided into four (4), three-hour sessions.

D. All training sessions shall be recorded by the Contractor. Contractor shall provide two (2) thumb drives with copies of the training video to the Owner. Contractor shall supply the equipment necessary to record the training sessions.

E. During the training, the participants shall be given opportunities for "hands-on" experience with operating the controls. There shall be demonstrations using the systems themselves as aids. Personnel for instruction and training for the Theatre Systems shall be designated by the Owner.

END OF SECTION

SECTION 11063

ORCHESTRA SHELL

PART 1 GENERAL

1.1 REFERENCE TO OWNER'S GENERAL CONDITIONS

A. The Owner's General Conditions shall be considered part of this Specification. Unless this Section contains statements, which are more definitive or more restrictive than those contained in the Owner's General Conditions, this Specification shall not be interpreted as waiving or overruling any requirements expressed in the General Conditions.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Theater Systems (TS) Drawings

C. Section 11061 Theatre Systems for rigging requirements for support of the Orchestra Shell Ceiling system specified in this Section

D. Division 16 – Electrical:

1. The Electrical Contractor shall provide the work as specified in Division 16, as indicated on the TS drawings, and as specified herein.

2. Wiring sections for requirements for wiring of integral lighting units mounted in Orchestra Shell ceiling.

1.3 RELATED WORK

A. Architect/Owner shall coordinate with Electrical Contractor on raceway/junction box locations for Orchestra Shell equipment and routing of load wiring, and all control and power raceway from equipment, terminal and pull boxes to system equipment racks.

B. All load wiring terminations shall be provided by Division 16 Electrical Contractor.

C. Structural supports for the Orchestra Shell, as shown on the Structural drawings, shall be the responsibility of the Division 5 Structural Contractor.

D. Equipment and materials provided and installed by others, unless otherwise shown in this Section or the Drawings, shall include but are not limited to:

1. Electrical Outlets.

2. Load Wiring.

3. Conduit, Raceway, and Cable Tray.

4. Junction Boxes.

1.4 DEFINITIONS

A. The following shall serve as general identifiers as specified herein:

1. Owner – Guam Department of Education.

2. Theatre Consultant – D.L. Adams Associates, Ltd.

3. Architect – Taniguchi Ruth Makio Architects (TRMA).

4. Contractor – The Contractor is the firm submitting a proposal to furnish and install the Work as defined within this Specification.

5. Project – The Project is the Orchestra Shell installation in the facilities of the Simon Sanchez High School Auditorium.

6. Work – The term “Work” means all construction and services specified within this document. The Work includes all related labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the proposal’s obligations.

7. Drawings – The term “Drawings” means all Theatre Systems Drawings and associated sketches, details, riser diagrams, etc.

B. As used in the Drawings and Specifications for the Work, certain non-technical words and phrases shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions or other documents governing the Work:

1. “Furnish” – Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the Theatre Systems Work. Purchasing shall include payment of all sales taxes and other surcharges as may be required to assure that purchased items are free of all liens, claims, or encumbrances.

2. “Install” – Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the Work.

3. “New” – Manufactured within the past year and never used.

4. “Provide” – Furnish and Install.

C. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the Drawings or Specifications for the Work, shall be understood to have the specific meanings as described to them in the following list:

1. “Circuit” – Any specific run of circuitry.

2. “Circuitry” – Any Work which consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.

3. “Concealed” (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.

4. “Exposed” (as applied to circuitry) – Not covered in any way by building materials.

5. “NIC” – Not in Contract.

6. “Normal Work Conditions” – Locations within building confines that are not damp, wet, or hazardous and that are not used for air handling.

7. “OFE” – Owner Furnished Equipment.

8. “Patch Panel” – A System of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.

9. “Raceway” – Any pipe, duct, extended enclosure, or conduit (as specified for a particular System) which is used to contain wires, and which is of such nature as to require that the wires be installed by a “pulling in” procedure.

10. “Standard” (as applied to wiring devices) – Not of a separately designated individual type.

11. “Wiring” – see “Circuitry.”

D. Additional Terms:

1. The term “shall” is mandatory; the term “will” is informative; the term “should” is advisory.

2. Where the word “conduit” is used without specific reference to type, it shall be understood to mean “raceway.”

3. The term “custom” indicates systems or components that shall be designed and fabricated based on the drawings and specifications.

4. The term “future” indicates systems or components that will be added to the system later but shall be provisioned for now.

5. The term “equal” indicates systems or equipment that is of the same size, color, design, function, efficiency, etc. as of that specified.

6. Reference to “U.L. (Materials Construction) Standards” shall mean the “Standards for Safety” published by Underwriters Laboratories, Inc.

1.5 SCOPE OF WORK

A. General:

1. The Work as described herein shall be furnished and installed by one (1) firm alone.

2. The Contractor shall furnish and install all equipment described herein, unless noted otherwise.

3. The Contractor shall provide all Work as may be required to make a complete and fully functioning system of that which may not be fully defined in the Contract Documents.

4. The specifications and drawings shall be read and used together, system features which are mentioned in one are not necessarily shown in the others. It shall be understood that the specifications and drawings are complementary.

5. The detailed information contained herein and on the drawings is deemed to be correct and accurate; however, the Contractor is held responsible for installing complete working systems.

6. The Contractor shall verify the completeness of the parts list and furnish necessary accessories to execute the intent of the plans and specifications.

7. The project documentation is, in general, diagrammatic and/or developed to communicate design intent.

8. The Contractor shall coordinate all installed items with associated trades (electrical, mechanical, structural, audio visual, telecom, etc.) including all necessary cable pass-thrus and structural needs/requirements.

B. Coordination Work: Coordinate with related trades to schedule the Work and ensure a complete installation in accordance with the schedule outlined by the Owner.

1.6 GENERAL CONDITIONS

A. The Contractor represents that they are familiar with and have expertise in the Work of this nature and scope.

B. The Contractor shall comply with all the regulations, including safety regulations of national, city, local, and other government agencies having jurisdiction concerning the work of the Contractor. The Contractor shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the Work. If the Contractor performs any work, which is contrary to such laws, ordinances, codes, rules, and regulations, they shall make all changes for compliance and bear all associated costs.

C. The Contractor shall be responsible to provide and maintain a storage facility. If this storage facility is required to be on-site it shall be the Contractor's responsibility to coordinate the size and spatial requirements with the Owner. The Contractor shall assume full responsibility for the storage facility and all contents, unless otherwise indicated by the Owner.

D. The Contractor shall provide all protection necessary to safeguard their work from damage by their operations and the operations of others. Unless the Contractor proves to the Owner’s satisfaction that the Work has been damaged by others, the Contractor shall promptly repair, adjust, and clean all defective installations and bear all associated costs.

E. All the Contractor's work shall be tested and inspected by all authorities having jurisdiction and in accordance with all Specifications. The Contractor shall coordinate and cooperate fully and shall provide at no additional cost to the Owner, manpower, drawings, facilities, scaffolds, etc. to reasonably assist the inspectors.

F. The Owner reserves the right to furnish any materials necessary for the Project.

G. All permits required for any part of the Contractor's work shall be procured and paid for by the Contractor. The Contractor shall determine all permits required and transmit this information to the Owner. If it is determined that the Contractor’s work falls reasonably within another party’s permit (General Contractor, Electrician, etc.) the Contractor shall not be required to procure additional permits provided written authorization is provided to the Contractor by the party holding the permit.

H. The Contractor must state if they intend to utilize a subcontractor and provide said subcontractor's name and address. The subcontractor shall comply with all the same rules, regulations, laws and codes, licenses, etc. as required by the Contractor and as specified herein. The Owner reserves the right to approve or disapprove any subcontractor proposed by Contractor.

I. The Contractor, upon receiving notice from Owner that the Contractor has furnished inferior, improper, or unsound work or materials (including equipment), or work or materials at variance with that which is specified, will, within twenty-four (24) hours, proceed to remove such work or materials and make good all other work or materials damaged thereby, and, at the option of the Owner, the Contractor shall immediately replace such work or materials with work or materials as specified. The removal, replacement, and repair shall be performed at such times and with manpower sufficient, in the judgment of the Owner, to avoid disturbance to occupants, or other ongoing work for the Project.

1. If the Contractor does not remove such unsound Work within a reasonable time, the Owner may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days' time thereafter, the Owner may, upon written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor and all expenses of the sale.

2. The Owner shall have the authority at all times, until final completion and acceptance of the Work, to inspect and reject work and materials which in its judgment are not in conformity with the Drawings and Details, Room Data Sheets and Specifications, and its decision in regard to character and value of Work shall be final and conclusive on both contracting parties. If the Owner permits said Work or materials to remain, the Owner shall be allowed the difference in value or shall at its election have the right to have said Work or materials repaired or replaced, as well as the damage caused thereby, at the expense of the Contractor, at any time within one (1) year after the completion of the entire project, or within such longer period as may be covered by any guaranty; and neither payments made to the Contractor, nor any other acts of the Owner, shall be construed as evidence of acceptance, waiver, or estoppels.

3. Any expense incurred by the Owner in connection with the foregoing, shall be borne by the Contractor, and the Owner may withhold money due to the Contractor or recover money already paid to the Contractor, to the extent of such expense.

J. The Drawings for the Work utilize symbols and schematic diagrams that have no dimensional significance. The Work shall be installed to fulfill the diagrammatic intent expressed on the Drawings, field layouts, and shop drawings of all trades.

K. The system Drawings generally indicate how the system equipment is to be integrated with other parts of the building. The Contractor shall determine exact locations by job measurements, by checking the requirements of other trades and by reviewing all Contract Documents.

L. Whenever job measurements, analysis of the drawings and specifications, or progress of other trades indicates that the various systems cannot be installed without significant deviation from the intent of the contract, the Architect/Owner shall be notified immediately.

M. Certain details appear on the Drawings for the Work that are specified with regard to the dimensioning and positioning of the Work. These are intended only for general information purposes. They do not obviate field coordination for individual items of the indicated Work.

N. Information as to general construction and architectural general construction and architectural features and finishes shall be derived from the structural and architectural drawings and specifications and may require ongoing coordination with the Architect and/or Construction Team.

O. The Work called for under this Contract shall be carried on simultaneously with the Work of other trades and Owner functions in such a manner as to not delay the overall progress of the construction project. The Contractor is responsible for all coordination of the Work with other trades.

P. Coordination of Delivery:

1. Deliver materials in manufacturer's original unopened containers with manufacturer's labels attached. Do not deliver material until spaces to receive them are clean, dry, and ready for their installation. Ship to jobsite only after roughing-in, painting and other finishing work has been completed, and installation areas are ready to accept work

2. Handle and install materials to avoid damages.

3. Unloading from delivery trucks. Do not deliver or install materials until spaces are enclosed and weather tight, wet work in spaces is complete and dry, HVAC system is operating, and maintaining ambient temperature at occupancy levels and normal humidity levels during the remainder of the construction period.

Q. Include in the Work all necessary supervision and issuing of all coordination information to any other trades who are supplying work to accommodate the Orchestra Shell installation. For items of equipment which are to be installed but not purchased as part of the Work, the Work shall include:

1. Unloading from delivery trucks.

2. Safe handling and field storage up to the time of permanent placement in the project.

3. Correction of any damage to the item(s) caused by Contractor.

4. Mounting in place and connection(s) as specified.

R. Items which are to be installed, but not purchased as part of the Work shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the Work will be considered only if presented in writing within one (1) week of the date of delivery to the project of the items in question. The Work includes all procedures necessary to put in satisfactory operation all items for which no claims have been submitted as outlined above.

1.7 SUMMARY

A. Drawings and specifications describe a full stage Orchestra Shell system consisting of mobile orchestra shell towers and adjustable orchestra shell ceilings suspended from motorized battens.

1.8 REFERENCES

A. American Hardboard Association (AHA): AHA A135.4-95: Basic Hardboard.

B. American Plywood Association (APA): Performance Standards and Policies for Structural Use Panels.

C. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

D. Architectural Woodwork Institute (AWI): Quality Manual, 8th Edition.

E. ASTM International (ASTM):

1. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.

2. ASTM A283: Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

3. ASTM A307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

4. ASTM A325: Standard Specification for High-Strength Bolts for Structural Steel Joints.

5. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

6. ASTM A1011 - Standard Specification for Steel, Sheet, and Strip, Hot Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low Alloy with Improved Formability, and Ultra High Strength.

7. ASTM B85 - Standard Specification for Aluminum Alloy Die Castings.

8. ASTM B209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

9. ASTM B221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

10. ASTM B429 - Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

11. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

12. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

13. ASTM E 413 - Classification for Rating Sound Transmission.

F. American Welding Society (AWS):

1. AWS D1.1 Structural Welding Code-Steel.

2. AWS D1.3 Structural Welding Code-Sheet Steel, Second Edition.

G. International Building Code (IBC).

H. United States Institute for Theatre Technology (USITT).

I. National Association of Architectural Metal Manufacturers (NAAMM): Metal Finishes Manual for Architectural and Metal Products.

J. National Electrical Manufacturers Association (NEMA): NEMA LD 3-2000 - High Pressure Decorative Laminates.

K. U.S. Department of Commerce, National Institute of Standards and Technology: DOC PS 1: U.S. Product Standard for Construction and Industrial Plywood.

L. US Green Building Council (USGBC): Leadership in Energy and Environmental Design (LEED).

1.9 PERFORMANCE REQUIREMENTS

A. Acoustical Panel Sound Transmission: Provide Orchestra Shell system comprised of acoustical shell panels having the following sound transmission requirements: Sound Transmission Class (STC): 20 per ASTM E 413:

1.10 QUALITY ASSURANCE

A. Contractor’s Qualifications: The Work of this Section will be contracted to the same firm contracted for Section 11061, referred to herein as the Contractor, for undivided responsibility.

B. Qualification of Contractors:

1. Refer to Specification Section 11061.

2. Experienced in installation of the Work of this section and acceptable to the manufacturer.

C. Minimum Performance Requirements: To meet the minimum performance requirements, the Contractor shall be responsible for the following:

1. Each component's conformance with the exemplary equipment’s published specifications and other requirements as stated herein.

2. Safety: The rigging system shall conform to all applicable code requirements and shall be in conformance with ESTA and USITT industry standards of operation and practices for rigging systems. All materials and arrangements shall comply with applicable performance requirements.

3. Detailed checking of each item of equipment provided, each portion of the installation, and of the complete installation to find and remedy any defects therein.

D. Source Limitations: Obtain all products from a single manufacturer through one (1) source providing a comprehensive material and installation package.

E. Manufacturer Qualifications: Minimum five (5) years' experience in manufacture of similar products in use in similar environments, including project size, complexity, and with the production capacity to meet the construction and installation schedule.

F. Electrical Components: Listed and labeled per NFPA 70, Article 100 by a testing agency acceptable to authorities having jurisdiction.

G. Regulatory Requirements: Where components are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities".

H. Field Welding: Conform to ASME standards. Welders employed to be certified and recertified within previous six (6) months for position, rods, and types of steel used in all rigging systems.

I. All bid proposals shall be based on materials, equipment and installation as herein specified. Any and all deviations and exceptions to the specifications must be approved by addendum.

1.11 SUBMITTALS

A. Submittals shall be in accordance with Division 1 requirements.

B. Contractor Qualification Statement: The Contractor shall be the same as the Contractor selected from Specification Section 11061.

C. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Provide test results by certified independent testing laboratory indicating compliance with performance requirements.

2. Rated capacities, construction details, material descriptions, dimensions of individual components, profiles, and finishes.

3. Delivery, storage, handling, and installation instructions and recommendations.

4. Maintenance instructions and recommendations.

5. Acoustical testing data demonstrating minimal compliance with required acoustical performance criteria.

D. Shop Drawings:

1. A copy of the Bill of Material shall be included with the submission for approval.

2. Submit component and project specific installation drawings, cut sheets, and schedules showing all information necessary to fully explain the design features, appearance, function, fabrication, installation, and use of system components in all phases of operation. Submit for approval before beginning any fabrication, installation, or erection.

3. Include fabrication and installation details. Distinguish between factory and field work.

4. Include plans, elevations, sections, attachments, and work by other trades.

5. Include wiring diagrams when applicable.

6. Indicate seismic bracing and fastening requirements as applicable.

7. Indicate coordination of related overhead components, including structural elements, drapery, rigging, lighting, ductwork, piping, and sprinklers.

8. Contractor shall provide other information or materials requested by the Architect or Owner when there is question of compliance with the intent of the drawings and specifications

E. Verification Samples: Exposed Finishes and Finish Materials: Not less than 4” x 4”, for each type, color, pattern, surface, and material selected.

F. Closeout Submittals:

1. Operation and Maintenance Data: For adjusting, repairing, and replacing components and accessories.

2. Troubleshooting guide.

3. Warranty: Submit manufacturer's warranty.

4. As-Built Drawings:

a. Full size drawings shall be submitted to the Owner after final acceptance. These are to be fully revised by the start-up and installation personnel to reflect the actual finished installation. The as-built drawing set is to be 100% complete including all schematics, details, and bills of material necessary to maintain and repair all of the systems.

b. Each drawing shall be stamped and dated "As-Built Drawing.”

c. Any revisions or modifications during the warranty period will require that the "As-Built Drawings" be updated.

5. Manuals:

a. Instructions and Maintenance manuals shall be submitted prior to final acceptance. These will be checked for accuracy and completeness before delivery of the manuals to the Owner.

b. Manuals shall consist of the following:

1) System Description.

2) User Operating Instructions.

3) User Maintenance Instructions for each of the systems.

4) Regular maintenance requirements and contact information for future service and information.

5) Catalog cut sheets of all purchased equipment.

6) Test certificates from manufacturers.

7) Recommended Spare Parts List.

8) PDF drawings of all system assembly drawings necessary to perform maintenance on the systems.

9) PDF manuals shall contain all items listed above with hyperlinks as applicable. Manuals shall be organized with bookmarks and section titles for quick reference.

6. Provided two (2) copies of the video recorded to document the instruction and training in accordance with Article 3.7.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original unopened containers with manufacturer's labels attached. Do not deliver material until spaces to receive them are clean, dry, and ready for their installation. Ship to jobsite only after roughing-in, painting, and other finishing work has been completed, installation areas are ready to accept work.

B. Handle and install materials to avoid damage.

1.13 PROJECT CONDITIONS

A. Field Conditions: The Contractor shall examine all attachment areas and conditions under which the Orchestra Shell is to be installed. Notify General Contractor in writing of any conditions detrimental to the proper and timely completion of the Work.

B. Field Measurements: Verify actual dimensions of openings and construction contiguous with the rigging and openings by field measurements before fabrication and indicate measurements on Shop Drawings.

C. The system drawings are to scale and generally indicate how they are to be integrated with other parts of the building. The Contractor shall determine exact locations by job measurements, by checking the requirements of other trades and by reviewing all contract documents.

D. The Contractor is responsible for monitoring the progress of other trades to prevent out of sequence installation of equipment.

E. Whenever job measurements, analysis of the drawings and specifications, or progress of other trades indicates that the various systems cannot be installed without significant deviation from the intent of the contract, the Architect and Owner shall be notified immediately.

F. Environmental Limitations: Do not deliver or install materials until spaces are enclosed and weather tight, wet work in spaces is complete and dry, HVAC system is operating and maintaining ambient temperature at occupancy levels during the remainder of the construction period.

1.14 WARRANTY

A. Special Warranty: Manufacturer's written warranty indicating manufacturer’s intent to repair or replace Orchestra Shell system components that fail in materials or workmanship within two (2) years from date of Substantial Completion. Failures are defined to include, but are not limited to, the following:

1. Fracturing or breaking of unit components which results from normal wear and tear and normal use other than vandalism.

2. Delamination or other failures of glue bond of components.

3. Warping of components not resulting from leaks, flooding, or other uncontrolled moisture or humidity.

4. Failure of unit to perform acoustically in accordance with manufacturer's published data

PART 2 PRODUCTS

2.1 ORCHESTRA SHELL SYSTEM

A. Basis of Design: Orchestra Shell system design is based upon product of the manufacturer below. Provide basis of design product, or approved equivalent:

1. Wenger Corporation, Owatonna, MN, USA; Telephone: (800) 493-6437.

2. Basis of design: Maestro Acoustical Shell - Full stage Orchestra Shell system consisting of mobile acoustical shell towers and adjustable acoustical shell ceiling units.

3. Alternates must be submitted for approval prior to bid.

B. Materials:

1. Aluminum Extruded Bars, Profiles, and Tubes: ASTM B 221 (ASTM B 221M), 6063T alloy.

2. Steel Tube: ASTM A 500, hot formed steel tubing.

3. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B.

4. Low pressure laminate (LPL), Thermally fused polyester resin impregnated paper.

5. Veneer-Faced Panel Products (MDF core): Meets all CARB-2 requirements for formaldehyde emissions.

6. Hardboard: AHA A135.4, Class 1 Tempered – formaldehyde free.

7. Thermally-fused polyester surfacing that meets performance requirements of NEMA LD 3 for VGS grade.

8. High-Pressure Decorative Laminate: NEMA LD 3, Grade VGS: HPDL with urea formaldehyde-free adhesive

C. Acoustical Panel Sound Transmission: Provide Orchestra Shell system comprised of acoustical shell panels having the following sound transmission requirements: Sound Transmission Class (STC): Minimum 20 per ASTM E 413.

D. Orchestra Shell Panels, General: Manufacturer's standard stressed-skin composite Orchestra Shell panels, with a minimum of STC 20 to meet performance requirements, designed to mix and blend sound and reflect a maximum range of audible frequencies to both audience and performers.

1. Core: 1-1/2” -thick honeycomb core material shall have an open geometric pattern with cell walls vertical to panel skins and defined by alternating straight and sine wave layers. Height of sine wave shall be 1/2"; wall thickness shall correspond to 60-pound kraft. Bonding of core material to panel faces shall be with permanently cured formaldehyde free urethane adhesive. Foam core materials and contact adhesives shall not be permitted.

2. Face, Wilsonart High Pressure Plastic Laminate-Faced Panel: Material and finish as indicated, with no exposed fasteners. This panel assembly shall have a minimum of STC 20.

3. Back: 1/8”-thick hardboard stressed skin, black.

4. Panel Edge Frame: Straight panel edges are reinforced with extruded aluminum edge frame.

5. Acclimate panel face and back materials in a temperature and humidity-controlled environment so that they reach appropriate equilibrium condition prior to lamination to improve dimensional stability of finished laminated panels.

   a. Documentation of specified process must be available for review.

E. Mobile Orchestra Shell Towers: Free-standing, self-supporting, movable towers for stage back and side walls. Towers consist of acoustical shell panels in rigid, diagonally braced vertical steel frame, with center panel and two (2) hinged wing panels, in nesting configuration minimizing required storage space. Wing panel on tower equipped with latching hardware and stage access door where indicated. Counterweighted tower base with adjustable front leveling pads concealed by removable access panel:

1. Tower Size: 10’-0” wide; consisting of one (1) 4’-0” center panel and two (2) 3’-0” wing panels. Refer to TS drawings for tower heights.

2. Tower Panel Radius: 8’-0”.

3. Tower Panel Face Finish: High-pressure laminate.

4. Door and Wing Panel Hardware:

   a. Hinges: steel tube with self-lubricating sintered bronze bearings which pivot on a 5/16” diameter steel pin that are designed for silent operation and requiring no replacement parts. Metal-on-metal hinges without self-lubricating materials on towers are not acceptable.

   b. Slide-lock mechanism, pull handle, and adjustable wing stay.

5. Tower Frame: Tubular steel vertical tower frames with welded steel structure.

6. Stage Tower Transporter: Wheeled mover shall be a one-stroke lifting design using mechanical leverage to lift the tower. The wheeled mover shall incorporate casters that are a minimum of 6” in diameter. A wheeled mover requiring a hydraulic pump shall not be accepted.

F. Orchestra Shell Adjustable Ceiling: Orchestra Shell ceiling shall consist of adjustable-angle acoustical shell ceiling panels supported by integral steel frame, suspended from motorized stage rigging pipe battens, and stored in fly-loft in vertical position.

1. Ceiling Panel Size and Configuration: As indicated on drawings.

2. Ceiling Panel Radius: 10’-0”.

3. Suspended from motorized truss batten, provided in Section 11061.

4. Hanger Arms: The integral steel frame provides the structure to allow 1” square, 11-gauge steel hanger arms to be located next to the stage rigging cables, which

is the strongest point to support the weight of the ceiling assembly. Hanger arms that are located more than 2” from the rigging cables are not acceptable.

5. Ceiling Performance Angle Adjustment: Poly strap with adjustable length allows the ceiling to be easily set into the performance position. The strap is adjustable to preferred angles in approximately 1-degree increments from 0- to 45-degrees.

6. Provide instructions pertaining to safe handling of overhead panels.

7. Ceiling panels shall not damage drapery (borders) when being raised to performance position.

    a. Downstage ceiling panel shall incorporate a protective cover/barrier on back side of shell, as needed, to prevent frame from damaging border drapery when deployed ceiling panel is raised/lowered.

G. Integrated LED Light Fixture: The fixture shall be the Lieto Acoustic Shell Fixture by the Wenger Corporation.

1. If providing alternate fixture for approval, submit a proposed fixture layout and photometric point by point calculations generated by an industry accepted computer modeling platform e.g. AGI32 that demonstrates a minimum of 100 foot candles and a uniformity ratio no greater than 3:1 (Max:Min) within the shell for review in accordance with Division 1 procedures.

2. The orchestra shell manufacturer shall provide and install lighting required by this section based on its photometric performance, the required characteristics of the lighting fixtures and other features of the installation including interconnections and all requirements as expressed herein.

3. All orchestra shell lighting scope described herein shall be completed by the orchestra shell manufacturer for a complete and operating system.

H. Lighting Layout:

1. Ceiling panels shall include integral, recessed lighting fixtures with attributes as specified below that appropriately spaced across each ceiling row and interconnected providing power and control to each individual lighting fixture. Lighting fixtures layout indicated on drawings is for concept only.

2. The provided array of Orchestra Shell lighting fixtures shall combine to create a uniform, diffuse distribution of lighting across the entirety of the performance area below that is defined as that located within the footprint of the orchestra shell enclosure.

I. Lighting Fixture Attributes:

1. Individual lighting fixtures shall provide the following features and performance characteristics:

    a. Correlated Color Temperature (CCT): 3000 degrees Kelvin.

    b. Color Rendering Index (CRI): 80.

    c. Minimum Rated LED Life (L70): 70,000 Hours.

    d. Cooling Fans: Not Allowed.

e. Noise Criteria (maximum allowed): NC-17.

2. Fixtures must be designed so that they can be independently aimed from below the ceiling panel without requiring the use of tools. The fixture's total adjustable three-axis range of motion shall be a minimum of 30 degrees.

3. Fixtures shall be available with trim rings on the face side of the panels for a clean installation and to shield, cover and limit visibility around the fixture.

4. Fixtures shall use DMX512 (ANSI E1.11) controlled drivers that dim smoothly to 1 percent light output without visible stepping, flash, or flicker.

5. Fixtures shall be individually addressable using - Remote Device Management (RDM - ANSI E1.20) control standards. Fixtures shall maintain all RDM connection and functionality regardless of whether fixtures are in their "playing" position (horizontal orientation) or "storage" position (vertical orientation.)

6. Fixtures shall produce no Ultra-Violet (UV) or Infra-Red (IR) radiation or Radio Frequency Interference (RFI.)

7. Fixtures shall be flicker free and suitable for use with video.

8. Fixtures shall include a safety cable.

9. Fixture depth shall be minimal such that the presence of the lighting fixture(s) does not increase the stored depth of the ceiling row.

10. Fixtures shall be listed, carry the label of a nationally recognized testing laboratory and shall be RoHS compliant.

J. Lighting Performance:

1. Photometric Performance:

a. A minimum intensity level 100 foot-candles* *average illuminance measured 30 inches (762 mm) above the stage floor.

b. Uniformity ratio (max:min): Less than 3.0:1.

c. Uniformity ratio (avg:min): Less than 2.5:1.

2. Each fixture shall be located and aimed so as to minimize light "scalloping" on the tower walls.

3. Lighting Fixture Schedule - Lighting fixture description including fixture manufacturer, fixture model, output wattage, beam spread, lumens produced, produced CCT and CRI, accessories, IES filename, Light Loss Factor (LLF) setting.

K. Control, Wiring and Interconnections:

1. Each fixture shall be equipped with an integral, electronic tilt switch that shall maintain all RDM connection and functionality at all times regardless of whether fixtures are in their "playing" position (horizontal orientation) or "storage" position (vertical orientation.)

2. Lighting Control System Data Cabling (DMX512):

a. DMX512 lighting control system data cables shall be provided by the shell manufacturer to facilitate the interface of the orchestra shell lighting with the stage lighting system infrastructure.

b. DMX512 lighting control system cabling to the ceiling row (provided under another Section) shall be by a theatrically rigged connection direct to the first lighting fixture in that ceiling panel's row.

c. Orchestra shell manufacturers shall provide DMX512 control data system jumper cables of required length(s) using the fixtures' RJ45 or 5-Pin XLR connectors to daisy-chain control to each of the panel's orchestra shell lighting fixtures.

d. Fixtures shall be provided with on-board, software selectable, 120 ohm, DMX512 terminator resistor capability.

e. Secure, dress and organize all data cables to ensure that they do not snag or catch adjacent rigging equipment, scenery, and draperies.

3. Electrical Power:

a. Each ceiling panel's lighting fixture array shall receive its power (provided under another Section) via a theatrically rigged, "strain-relieved" connection terminated at the ceiling panel's junction box.

b. Jumper cables with PowerCon style connectors shall be used to daisy-chain supply of electrical power from the junction box to each fixture in turn, on the ceiling panel.

c. Organize, secure and dress all power cables to ensure that they do not snag or catch adjacent rigging equipment, scenery and drapery.

4. Warranty: The fixture shall carry a five-year warranty against defects in materials and workmanship. Warranty coverage shall commence at project "acceptance," not with factory shipment. See the Wenger warranty card for service contact information, specifics and Integrated Lighting: Manufacturer's standard UL-approved fixtures located as indicated.

L. Stage Rigging and Battens: Rigging and battens supporting orchestra shell ceiling, and all associated hardware are part of the Work of Section 11061.

M. Finishes:

1. Steel Finish: Immediately after cleaning and pretreating, electrostatically apply thermosetting TGIC polyester powder coating or wet paint.

2. Provide a plastic laminate finish.

3. Provide tiles of available colors to for review and selection.

4. Color shall be chosen by Architect/Owner.

PART 3 EXECUTION

3.1 COORDINATION

A. The Contractor shall coordinate this Work with the other electrical work and the work of other trades.

3.2 SITE INSPECTION

A. Examine jobsite conditions for compliance with requirements for installation tolerances, including required overhead clearances, and other existing conditions affecting installation and performance of acoustical shells. Proceed with unit installation upon correction of unsatisfactory conditions.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Proceed with installation only after correction of unsatisfactory conditions.

3.3 WORKMANSHIP

A. The Contractor shall provide a trained foreman who shall supervise the installation of Orchestra Shell system. All work shall be done by mechanics skilled in their trade and in accordance with accepted shop drawings.

3.4 ORCHESTRA SHELL INSTALLATION

A. Orchestra Shell Installation: Install orchestra shell components in accordance with manufacturer's written instructions.

1. Position all components accurately as indicated on Drawings and true, plumb, and level.

2. Note any deviations required to adjust for field obstructions and report to required persons to incorporate changes into as-built drawings.

3. Installation supervisor shall be a currently certified ETCP Rigger for Theatre.

4. Utilize only qualified riggers for installation, trim, and adjustment.

5. Clean and touch up all field welds and abraded paint finishes with matching materials.

6. Erect Orchestra Shell towers in location indicated in coordination with Owner's personnel to verify components are complete and operational.

7. Move tower units to their storage location after approval of assembled Orchestra Shell.

3.5 INSTALLATION OF INTEGRATED CONTROLS FOR LIGHTING

A. Install in accordance with manufacturer's instructions.

B. On-site project management services shall be provided by a direct ETCP certified employee of the Theatre Contractor.

C. On-site turn-on, programming, troubleshooting, and owner instruction services shall be provided by technician(s) trained and certified by each equipment manufacturer.

D. Equipment shall be installed per plans and specifications. Equipment shall be aligned, adjusted, and trimmed for the most efficient operations, the greatest safety, and for the best visual appearance.

E. Inspect installed work to verify compliance with requirements. Verify that electrical work complies with manufacturer's submittals and written installation requirements. Perform installation and startup checks as recommended by manufacturer. Prepare inspection reports and submit to Architect.

3.6 ORCHESTRA SHELL CLEANING INSTALLATION

A. Clean surfaces. Touch up marred finishes or replace damaged components that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by manufacturer.

B. Repair or replace defective work as directed by Architect/Owner upon inspection.

C. Protect installed products from damage, abuse, dust, dirt, stain, or paint until completion of project. Do not permit use during construction.

3.7 INSPECTION AND TESTING

A. Powered rigging shall be tested. Each hoist shall be operated over five full continuous cycles at 1.25 times its full working load at full speed and travel distance. The emergency stop function shall be tested at 100 percent WLL in both the ascending and descending directions.

1. Demonstrate that all over travel limit switches have been correctly set for the actual field conditions of the specific project.

2. If it applies to the project, demonstrate that all position encoders have been correctly set for the actual field conditions of the specific project.

B. Signage with basic operating instructions and warnings shall be posted in the area where the equipment shall be operated. Signage shall be in conformance with ANSI-Z535.

3.8 TRAINING AND DEMONSTRATION

A. When all Work is complete and equipment is adjusted for suitable operation, the Contractor shall schedule an inspection by the Architect/Owner. All workmen required to operate the equipment and to perform any adjustments and tests that may be required shall be provided. During the scheduled test period, no other work will be done in the stage or auditorium areas. Any equipment failing to meet approval shall be repaired or replaced and the inspection rescheduled with complete testing repeated until approval and final acceptance.

B. Train Owner's personnel to assemble, adjust, operate, and maintain Orchestra Shell Towers and Orchestra Shell Ceiling units.

C. Training shall be video recorded and provided by the Contractor. Contractor shall provide two (2) thumb drives to the Owner each with copies of the training video saved on them. Contractor shall supply the equipment necessary to record the training session(s). Training shall include:

1. Specific instruction to safely move towers and ceiling shells in proximity to dead-hung draperies and line sets.

2. To prevent damage to dead-hung draperies, include instruction to fold back and tie off the off-stage sections of Borders #1 and #2 to be even with ceiling shell footprint, allowing for movement of downstage towers into position.

END OF SECTION

SECTION 11132

PROJECTION SCREENS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceiling-mounted, manual roll-down, front projection screens.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 05500 - Metal Fabrications: Structural steel supports.

2. Section 06100 - Rough Carpentry: Blocking for screen support.

3. Section 09110 - Non-Load Bearing Steel Framing: Ceiling framing.

4. Section 09250 - Gypsum Board: Adjacent ceiling and / or wall finish.

5. Section 09510 - Acoustical Ceilings: Adjacent ceiling finish.

1.2 DESCRIPTION OF WORK

A. The extent of projection screens work is indicated on the Drawings and as specified herein, and includes providing and installing front projection, ceiling-mounted, manual roll-down screens, case, mounting accessories and all components for a complete installation.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. Society of Motion Picture and Television Engineers (SMPTE):

1. SMPTE RP 94-2000 - Gain Determination of Front Projection Screens.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s product data and mounting details.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Submit a manufacturer=s standard Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Single Source Responsibility: Obtain all projection screens required from a single manufacturer, as complete units, including the necessary mounting hardware, anchorage and accessories.

C. Mildew-Resistance: Provide mildew-resistant screen fabric as determined by Federal Standard 191A / 5760.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements. Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer=s original, unopened protective packaging.

C. Do not deliver projection screens to the Project Site until the building has been enclosed, other work within the spaces where the screens are to be installed is substantially complete, and installation of the screens is ready to take place.

D. Store screens to prevent damage to the materials, finishes and operating mechanisms.

E. Handle to prevent damage to screen surfaces and operating mechanisms.

1.7 JOB CONDITIONS

A. Environmental Requirements:

1. In the area to receive the screens, maintain a constant temperature of at least 65 degrees F for 72 hours before, during and for 48 hours after completion of the installation.

2. Do not install the screens until the air conditioning system has been put into service.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Manufacturer=s Warranty:

1. Provide a written Warranty, signed by the screen manufacturer agreeing to repair or replace screens that do meet the requirements, or that fail in materials or workmanship.

2. Warranty Period: Two (2) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Model ÂB@ by Da-Lite Screen Co.

3. Luma Series by Draper Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. General: Provide manufacturer=s standard front projection, ceiling-mounted, manual roll-down units consisting of screen, case, mounting accessories and other components as required for a complete installation and complying with the requirements indicated for the screen surface.

B. Viewing Surface of Screen: Comply with the following requirements for the type of viewing surface:

1. Matt white color, mildew-resistant, glass beaded viewing surface with masking borders; seamless.

2. Bottom of the fabric shall be mounted into a metal strip in a tubular steel slat with plastic endcaps, baked enamel finish to match the case. Provide a pull handle.

3. Spring roller with positional catch.

4. Size of viewing surface: [60" x 60"].

5. Mounting: Ceiling surface-mounted.

C. Screen Case: 22 gage steel with flat back and endcaps, white finish. Surface ceiling-mount utilizing the manufacturers recommended system for the Project conditions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that structural blocking and supports, if required, are in place and correctly located.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install projection screens at the locations indicated and in compliance with the screen manufacturer=s instructions.

B. Install screens with screen cases in position and relationship to the adjoining work as indicated, securely anchored to the supporting substrate, and in a manner which provides for smooth operation with plumb and straight vertical edges and a plumb, flat viewing surface when the screen is lowered.

C. Securely anchor to the building structure. Provide alternating diagonal wire bracing at each end of the screen housing. Provide seismic bracing.

3.3 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjust the operating mechanism for smooth operation

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the screen installations for alignment, attachment to the structure, and operation.

3.5 PROTECTION

A. Protect the projection screens from damage after installation. If damage occurs, remove and replace the damaged components or replace the entire unit, as required to restore the unit to it=s original, undamaged condition.

END OF SECTION

SECTION 11134

AUDIO-VIDEO SYSTEMS

PART 1 GENERAL

1.1 REFERENCE TO OWNER'S GENERAL CONDITIONS

A. The Owner's General Conditions s0hall be considered part of this specification. Unless this section contains statements, which are more definitive or more restrictive than those contained in the Owner's General Conditions, this specification shall not be interpreted as waiving or overruling any requirements expressed in the General Conditions.

1.2 RELATED DOCUMENTS

A. Division 1 – General Requirements:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 5 – Metal Fabrication:

1. The Metal Fabrication Contractor shall provide the work as specified in Division 5 and the Structural Drawings. Including: steel framing and supports for AV Systems equipment.

2. Steel shown on the Structural drawings will be provided by the Structural Contractor.

C. Division 16 – Electrical:

1. The Electrical Contractor shall provide the work as specified in Division 16, as indicated on the AV drawings, and as specified herein.

2. Electrical infrastructure (electrical j-boxes, conduit, etc.) for audio-video equipment is shown on AV Systems drawings and shall be the responsibility of the Division 16 Electrical Contractor.

1.3 DEFINITIONS

A. The following shall serve as general identifiers as specified herein.

1. Owner – Guam Department of Education (GDOE).

2. Consultant – D. L. Adams Associates, Ltd.

3. Architect – Taniguchi Ruth Makio Architects (TRMA).

4. Contractor – The Contractor is the firm submitting a proposal to furnish and install the Work as defined within this Specification.

5. Project – The Project is the Audio-Video Systems design and installation for the Simon Sanchez High School Expansion.

6. Work – The term “Work” means all construction and services specified within this document. The Work includes all related labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the proposal’s obligations.

7. Drawings – The term “Drawings” means all Audio-Video Systems Drawings and associated sketches, details, riser diagrams, etc.

B. As used in the Drawings and Specifications for the Work, certain non-technical words and phrases shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions or other documents governing the Work.

1. “Furnish” – Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the Audio-Video Systems Work. Purchasing shall include payment of all sales taxes and other surcharges as may be required to assure that purchased items are free of all liens, claims, or encumbrances.

2. “Install” – Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the Work.

3. “New” – Manufactured within the past year and never used.

4. “Provide” – Furnish and Install.

C. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the drawings or specifications for the Work, shall be understood to have the specific meanings as described to them in the following list:

1. “Audio-Video Closet” – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of Audio-Video Systems cable (i.e. riser cable) to other Audio-Video Systems cable and/or equipment.

2. “AV” – Audio-Video

3. “AVC” – Audio-Video Systems Contractor.

4. “AV System(s)” – Audio-Video System(s), includes all components contained herein that work in conjunction to create and completely integrated and fully functioning system as described within the Drawings and Specifications

5. “AV Systems Control Room” and/or “AV Systems Headend” – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of audio and video system cable (i.e., riser cable) to other audio or video system cable, and/or equipment and racks.

6. “Circuit” – Any specific run of circuitry.

7. “Circuitry” – Any Work which consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.

8. “Concealed” (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.

9. “Exposed” (as applied to circuitry) – Not covered in any way by building materials.

10. “NIC” – Not in Contract

11. “Normal Work Conditions” – Locations within building confines that are not damp, wet, or hazardous and that are not used for air handling.

12. “OFE” – Owner Furnished Equipment

13. “Patch Panel” – A System of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.

14. “Raceway” – Any pipe, duct, extended enclosure, or conduit (as specified for a particular System) which is used to contain wires and which is of such nature as to require that the wires be installed by a “pulling in” procedure.

15. “Riser” – Shall refer to the portion of the installation that transmits between building floors (or between Audio-Video Systems rooms), also referred to as “Backbone Cabling”.

16. “Standard” (as applied to wiring devices) – Not of a separately designated individual type.

17. “System” – See “AV Systems”

18. “Wiring” – see “Circuitry”

D. Additional Terms:

1. The term “shall” is mandatory; the term “will” is informative; the term “should” is advisory; and the term “provide” means furnish and install.

2. Where the word “conduit” is used without specific reference to type, it shall be understood to mean “raceway”.

3. The term “custom” indicates systems or components that shall be designed and fabricated by the Contractor based on the drawings and specifications.

4. The term “future” indicates systems or components that will be added to the system later but shall be provisioned for now.

5. The term “equal” indicates systems or equipment that is of the same size, color, design, function, efficiency, etc. as of that specified.

6. Reference to “U.L. (Materials Construction) Standards” shall mean the “Standards for Safety” published by Underwriters Laboratories, Inc

1.4 SCOPE OF WORK

A. General:

1. The work as described herein shall be furnished and installed by one firm alone, hereafter referred to as the AV Contractor. The AV Contractor shall furnish and install all equipment, and audio/video signal and control wiring for the AV Systems described herein. The Contractor further agrees that they shall provide all Work as may be required to make a complete and fully functioning system of that which may not be fully defined in the Contract Documents.

2. The specifications and drawings shall be read and used together; system features which are mentioned in one are not necessarily shown in the others. In case of conflict between the drawings and specifications, request clarification. It shall be understood that the Equipment Lists, Specifications and Drawings are complementary. Where there are conflicts within the documents, the overall design intent shall govern.

3. The work provided shall be complete and the systems shall be fully operational as shown on audio video system "AV" drawings and described herein.

4. Equipment not mentioned herein nor shown on drawings but necessary to meet the requirements of this section shall be provided without claim for additional payment.

5. The project documentation is, in general, diagrammatic and/or developed to communicate design intent. The Contractor shall coordinate the installation of all devices and/or equipment with the Owner prior to installation based on the existing field conditions.

6. The AV Contractor shall coordinate all installed items with associated trades (electrical, mechanical, Telecom, etc.) including all necessary cable pass-thrus and structural needs/requirements.

7. The AV Contractor shall provide all software programming required to provide fully operational systems.

8. AV Contractor shall conduct a frequency audit of the site prior to selection of wireless operating frequencies. Select frequencies such that systems are free of interference. Include an intermodulation interference analysis. Coordinate frequencies and specific transmitter/receiver selection using professional wireless audio systems software.

9. The AV Contractor shall coordinate the specific programming requirements of the AV Control System with a designated Owner representative. All programming written for this project shall be the property of the Owner and shall be provided to the Owner upon completion.

1.5 GENERAL CONDITIONS

A. The Contractor represents that they are familiar with and have expertise in the Work of this nature and scope.

B. The Contractor shall comply with all the regulations, including safety regulations of national, city, local and other government agencies having jurisdiction concerning the work of the Contractor. The Contractor shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the Work. If the Contractor performs any work, which is contrary to such laws, ordinances, codes, rules and regulations, they shall make all changes for compliance and bear all associated costs.

C. The Contractor shall be responsible to provide and maintain a storage facility as required. If this storage facility is required to be on-site it shall be the Contractor's responsibility to coordinate the size and spatial requirements with the General Contractor. The Contractor shall assume full responsibility for the storage facility and all contents, unless otherwise indicated by the Owner.

D. The Contractor shall provide all protection necessary to safeguard their work from damage by their operations and the operations of others. Unless the Contractor proves to the Owner's satisfaction that the Work has been damaged by others, the Contractor shall promptly repair, adjust, and clean all defective installations and bear all associated costs.

E. All the Contractor's work shall be tested and inspected by all authorities having jurisdiction and in accordance with all specifications. The Contractor shall coordinate and cooperate fully and shall provide at no additional cost to the Owner, manpower, drawings, facilities, scaffolds, etc. to reasonably assist the inspectors.

F. The Owner reserves the right to furnish any materials necessary for the Project.

G. All permits required for any part of the Contractor's work shall be procured and paid for by the Contractor. The Contractor shall determine all permits required and transmit this information to the Owner. If it is determined that the Contractor's work falls reasonably within another party's permit (General Contractor, Electrician, etc.) the Contractor shall not be required to procure additional permits provided written authorization is provided to the Contractor by the party holding the permit.

H. The Contractor must state if they intend to utilize a subcontractor and provide said subcontractor's name and address. The subcontractor shall comply with all the same rules, regulations, laws and codes, licenses, etc. as required by the Contractor and as specified herein. The Owner reserves the right to approve or disapprove any subcontractor proposed by Contractor.

I. The Contractor, upon receiving notice from Owner/Architect that the Contractor has furnished inferior, improper or unsound work or materials (including equipment), or work or materials at variance with that which is specified, will, within 24 hours, proceed to remove such work or materials and make good all other work or materials damaged thereby, and, at the option of the Owner, the Contractor shall immediately replace such work or materials with work or materials as specified. The removal, replacement, and repair shall be performed at such times and with manpower sufficient, in the judgment of the Owner, so as to avoid disturbance to occupants, or other ongoing work for the Project.

1. If the Contractor does not remove such unsound Work within a reasonable time, the Owner may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days' time thereafter, the Owner may, upon written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor and all expenses of the sale.

2. The Owner shall have the authority, at all times, until final completion and acceptance of the Work, to inspect and reject work and materials which in its judgment are not in conformity with the Drawings and Details, Room Data Sheets and Specifications, and its decision in regard to character and value of Work shall be final and conclusive on both contracting parties. If the Owner permits said Work or materials to remain, the Owner shall be allowed the difference in value or shall at its election have the right to have said Work or materials repaired or replaced, as well as the damage caused thereby, at the expense of the Contractor, at any time within one (1) year after the completion of the entire project, or within such longer period as may be covered by any guaranty; and neither payments made to the Contractor, nor any other acts of the Owner, shall be construed as evidence of acceptance, waiver, or estoppels.

3. Any expense incurred by the Owner in connection with the foregoing, shall be borne by the Contractor, and the Owner may withhold money due to the Contractor or recover money already paid to the Contractor, to the extent of such expense.

J. The Drawings for the Work utilize symbols and schematic diagrams that have no dimensional significance. The Work shall be installed to fulfill the diagrammatic intent expressed on the Drawings, field layouts, and shop drawings of all trades.

K. Certain details appear on the Drawings for the Work that are specified with regard to the dimensioning and positioning of the Work. These are intended only for general information purposes. They do not obviate field coordination for individual items of the indicated Work.

L. Information as to general construction and architectural general construction and architectural features and finishes shall be derived from the structural and architectural drawings and specifications and may require ongoing coordination with the Architect and/or Construction Team.

M. The Work called for under this Contract shall be carried on simultaneously with the Work of other trades and Owner functions in such a manner as to not delay the overall progress of the construction project. The Contractor is responsible for all coordination of the Work with other trades and Owner.

N. Include in the Work all necessary supervision and issuing of all coordination information to any other trades who are supplying work to accommodate the Audio-Video Systems installation. For items of equipment which are to be installed but not purchased as part of the Work, the Work shall include:

1. Coordination of delivery

2. Unloading from delivery trucks

3. Safe handling and field storage up to the time of permanent placement in the project

4. Correction of any damage to the item(s) caused by the Contractor

5. Mounting in place and connection(s) as specified

O. Items which are to be installed, but not purchased as part of the Work shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the Work will be considered only if presented in writing within one (1) week of the date of delivery to the project of the items in question. The Work includes all procedures necessary to put in satisfactory operation all items for which no claims have been submitted as outlined above.

1.6 SUMMARY

A. Applicable Locations:

1. Dance Classroom

2. Music Classrooms (Choir and Band)

3. Gymnasium

4. Auditorium

5. Library Media Room

B. System Summary:

1. The audio-video systems included herein shall provide high-quality audio and video playback suitable to support the theatrical and teaching uses while still maintaining user-friendly control interfaces.

1.7 System Descriptions and Functions:

A. Dance Classroom:

1. General:

a. The Dance Classroom system shall be designed for high-fidelity audio playback and an HD capable video system for educational/teaching presentations.

2. Classroom AV Network:

a. A dedicated audio video network shall be provided, to be shared between the Dance Classroom and Music Classrooms. It shall be the responsibility of the AV Contractor to configure the AV network for the optimal transmission of digital audio, digital video, and control system protocols.

b. The network shall have a POE+ network switch located in the AV Classroom Equipment Rack. It shall be the responsibility of the AV Contractor to supply all necessary switch accessories to meet the network and power performance requirements of the AV equipment specified herein.

c. AV Contractor shall coordinate exact network switch with Owner IT and DSP, network video, and control manufacturers before ordering.

d. Network switch included in the equipment list is included as basis of design only. AV Contractor is responsible for providing and install switches that meet or exceed all network equipment requirements.

e. All network cabling provided by the AV Contractor shall adhere to the applicable Category 6A standards. AV Contractor shall provide test reports prior to system checkout documenting compliance with applicable standards for all installed network cables.

3. Audio:

    a. A Digital Signal Processor (DSP) shall be provided in the AV Classroom Equipment Rack, to be shared between the Dance Classroom and Music Classrooms. The DSP shall control audio routing, equalization, and level of the playback loudspeakers in each room.

    b. The Dance Classroom shall have wall mounted loudspeakers to provide stereo playback to the classroom as well as a ceiling-suspended subwoofer to extend the program frequency response. The subwoofer shall be resiliently mounted to reduce structure-borne vibration. AV Contractor to select mounting per subwoofer specifications and exact mounting detail. Submit for review.

    c. The Dance Classroom shall have consumer level stereo inputs as well as a Bluetooth connection for stereo playback of audio sources.

    d. A portable ALS system shall be provided by the Owner to be shared between the Dance and Music Classrooms.

4. Video Presentation System:

    a. A wide screen (WUXGA) laser video projector with a zoom lens shall be mounted from the ceiling in the Dance Classroom and shall have a minimum brightness of 7,000 Lumens.

    b. A motorized, tab-tensioned projection screen shall be provided at the teaching wall of the Dance Classroom. The screen shall be 16:10 format with a 165” diagonal and an ambient light rejecting surface. A low-voltage screen switch shall be located on the wall of a support space adjacent to the Classroom.

    c. The system shall have video inputs for connection of portable video sources, such as laptop computers, via a wall-mounted input plate.

    d. Video shall be transmitted to the video projector via a digital video transmission system.

5. Control System:

    a. A control system shall be provided to integrate and simplify equipment controls and user functions. The central controller shall be located in the AV Classroom Equipment Rack and be shared between the Dance and Music Classrooms.

    b. A 7” touchscreen controller shall be provided on the wall of the Dance Classroom.

    c. The control system shall monitor all equipment that provides bidirectional feedback and report any failures or errors to an Owner designated representative. Coordinate communication method (e-mail, etc.) with Owner.

    d. Provide control app mirroring touchscreen for Owner-provided portable devices, if any. Coordinate use of Owner wireless network and access permissions with Owner IT if desired by Owner.

e. The control system shall accept a contact closure signal from the fire alarm system (provided by others) to mute the audio system. A contact closure signal from the Emergency Paging System (provided by others) shall be connected to the DSP and shall mute audio when the paging system is used for emergency pages.

f. The touchscreen control shall include, but not be limited to the following:

1) Fully develop touchscreen options and layouts through the process described herein.

2) General:

a) Power the system on/off (note: provide shutdown conformation).

b) PIN or password lock, if requested by Owner.

3) Video Page:

a) Video source selection.

b) Video source device remote control.

c) Power the video projector on/off (Note: automatically turn on display when a video source is selected. Turn off display and cool down projector if required when the system is turned off. Provide separate display on/off control).

d) Lower/raise the motorized projection screen (note: automatically lower the screen when a video source is selected. Raise screen when the system is turned off. Provide a separate control to raise/lower/stop screen).

e) Video mute.

4) Audio Page:

a) Classroom audio consumer input line level and Bluetooth volume level and mute.

b) Video program audio level and mute.

5) Service Page (PIN lock service page):

a) Indicate projector hours.

b) Provide service contact information.

c) Display monitored devices errors.

d) Monitor UPS battery replacement schedule.

6. Support Equipment:

a. The shared DSP, amplifier(s), network switch and accessories shall be provided in a central wall-mounted AV Classroom Equipment Rack located in Storage A223E.

B. Music Classroom, Typical of (2):

1. General:

a. Music Classrooms shall include the Band and Choir Classrooms.

b. The Music Classroom systems shall be designed for high-fidelity audio playback, recording, and HD capable video display for educational/teaching presentations. The systems shall include tie lines and interface connections for a portable recording rack.

2. AV Network:

a. A dedicated audio video network shall be provided, to be shared between the Dance Classroom and Music Classrooms. It shall be the responsibility of the AV Contractor to configure the AV network for the optimal transmission of digital audio, digital video, and control system protocols.

b. The network shall have a POE+ network switch located in the AV Classroom Equipment Rack. It shall be the responsibility of the AV Contractor to supply all necessary switch accessories to meet the network and power performance requirements of the AV equipment specified herein.

c. AV Contractor shall coordinate exact network switch with Owner IT and DSP, network video, and control manufacturers before ordering.

d. Network switch included in the equipment list is included as basis of design only. AV Contractor is responsible for providing and install switches that meet or exceed all network equipment requirements.

e. All network cabling provided by the AV Contractor shall adhere to the applicable Category 6A standards. AV Contractor shall provide test reports prior to system checkout documenting compliance with applicable standards for all installed network cables.

3. Audio:

a. A Digital Signal Processor (DSP) shall be provided in the AV Classroom Equipment Rack, to be shared between the Dance Classroom and Music Classrooms. The DSP shall control audio routing, equalization, and level of the playback loudspeakers in each room.

b. The Music Classrooms shall have wall mounted loudspeakers located on the teaching wall to provide stereo playback to the classrooms.

c. The Music Classrooms shall have consumer level stereo inputs as well as a Bluetooth connection for stereo playback of audio sources.

d. Music Classrooms shall have microphone connections in the ceiling. A permanently suspended stereo pair of recording microphones shall be rigged from the ceiling in an XY stereo recording pattern.

e. Tie lines to Practice Rooms associated with each Music Classroom shall be provided to a tie plate in each Music Classroom.

f. A portable ALS system shall be provided by the Owner to be shared between the Dance and Music Classrooms.

4. Video Presentation System:

   a. A wide screen (WUXGA) laser video projector with a zoom lens shall be mounted from the ceiling in each Music Classrooms and shall have a minimum brightness of 7,000 Lumens.

   b. A motorized, tab-tensioned projection screen shall be provided at the teaching wall of each Music Classrooms. The screen shall be 16:10 format with a 165” diagonal and an ambient light rejecting surface. A low-voltage screen switch shall be located on the wall of a support space adjacent to the Classrooms.

   c. The system shall have video inputs for connection of portable video sources, such as laptop computers, via a wall-mounted input plate.

   d. Video shall be transmitted to the video projector via a digital video transmission system.

5. Control System:

   a. A control system shall be provided to integrate and simplify equipment controls and user functions. The central controller shall be located in the AV Classroom Equipment Rack and be shared between the Dance and Music Classrooms.

   b. A 7” touchscreen controller shall be provided on the wall of the Music Classrooms.

   c. The control system shall monitor all equipment that provides bidirectional feedback and report any failures or errors to an Owner designated representative. Coordinate communication method (e-mail, etc.) with Owner.

   d. Provide control app mirroring touchscreen for Owner-provided portable devices, if any. Coordinate use of Owner wireless network and access permissions with Owner IT if desired by Owner.

   e. The control system shall accept a contact closure signal from the fire alarm system (provided by others) to mute the audio system. A contact closure signal from the Emergency Paging System (provided by others) shall be connected to the DSP and shall mute audio when the paging system is used for emergency pages.

   f. The touchscreen control shall include, but not be limited to the following:

      1) Fully develop touchscreen options and layouts through the process described herein.

      2) General:

         a) Power the system on/off (note: provide shutdown conformation).

         b) PIN or password lock, if requested by Owner.

3) Video Page:

a) Video source selection.

b) Video source device remote control.

c) Power the video projector on/off (Note: automatically turn on display when a video source is selected. Turn off display and cool down projector if required when the system is turned off. Provide separate display on/off control).

d) Lower/raise the motorized projection screen (note: automatically lower the screen when a video source is selected. Raise screen when the system is turned off. Provide a separate control to raise/lower/stop screen).

e) Video mute.

4) Audio Page:

a) Classroom audio consumer input line level and Bluetooth volume level and mute.

b) Video program audio level and mute.

5) Service Page (PIN lock service page):

a) Indicate projector hours.

b) Provide service contact information.

c) Display monitored devices errors.

d) Monitor UPS battery replacement schedule.

6. Support Equipment:

a. The shared DSP, amplifier(s), network switch and accessories shall be provided in a central wall-mounted AV Classroom Equipment Rack located in Storage A223E.

7. Portable Recording Rack:

a. A Portable Recording Rack shall allow for recording either stand-alone or interfacing with the Music Classrooms. All recording equipment will be stored within the Portable Recording Rack.

b. The recording system shall be capable simultaneous recording to SD card as well as to USB devices.

c. A 16-channel digital console capable of multitrack recording with a USB interface shall be provided and mounted on the Portable Recording Rack.

d. Connection plates on the Portable Recording Rack will provide all necessary interconnects to easily allow the system to connect with the permanent infrastructure within the Music Classrooms.

e. Tie lines to Practice Rooms associated with each Music Classroom shall be provided to a tie plate in each Music Classroom.

1) Personal headphone system hubs shall be provided in the AV Classroom Equipment Racks for each Music Classroom.

2) A minimum of six (6) personal monitor mixing stations with headphones shall be provided.

f. Two (2) small-diaphragm condenser microphones and 2 large diaphragm condenser microphones shall be provided for recording.

g. An assortment of loose cable shall be provided to connect equipment for standalone or classroom integrated recordings.

C. Gymnasium:

1. General:

a. The Gymnasium AV system shall be designed for high quality audio reinforcement for sporting events, presentations, and ceremonies. The system shall have the ability, through presets, to support multiple room configurations.

b. An AV Gymnasium Equipment Rack located in a support room near the Gymnasium will house all head-end processing, amplification, and network equipment.

c. Power distribution and sequencing shall be provided in the AV Gymnasium Equipment Rack.

2. AV Network:

a. An AV network shall be provided. It shall be the responsibility of the AV Contractor to configure the AV network for the optimal transmission of digital audio and control system protocols.

b. The Gymnasium AV network shall consist of one (1) POE+ network switch located in the AV Gymnasium Equipment Rack. It shall be the responsibility of the AV Contractor to supply all necessary switch accessories to meet the network and power performance requirements of the AV equipment specified herein, including software and licenses.

c. All network cabling provided by the AV Contractor shall adhere to the applicable Category 6A standards. AV Contractor shall provide test report prior to system checkout documenting compliance with applicable standards for all installed network cables.

d. Network jacks shall be distributed to the bleacher input plates in the Gymnasium for connection of the portable touchscreen controller or other networked devices.

3. Control System:

a. A control system using the DSP as the central controller shall provide a graphical user interface for equipment controls and user functions, including flexible routing, control, and monitoring with individual outputs and levels for all loudspeaker zones.

b. Two (2) touchscreen controllers shall be provided. One (1) shall be permanently mounted on the plan north wall of the Gymnasium and one (1) shall be portable. The wall-mounted touchscreen shall have a locking cover.

c. The control system shall monitor all equipment that provides bidirectional feedback and report any failures or errors to an Owner designated representative. Coordinate communication method (e-mail, etc.) with Owner.

d. Provide control app mirroring touchscreen for Owner-provided portable devices. Coordinate use of Owner wireless network and access permissions with Owner IT.

e. The control system shall accept a contact closure signal from the fire alarm system (provided by others) to mute the audio system. A contact closure signal from the Paging System (provided by others) shall be connected to the DSP and shall mute audio when the paging system is used for emergency pages.

f. On system power, all equipment shall be turned on. Provide power sequencing. Generally, audio amplifier shall be turned on last and turned off first. When a power-off command is sent, all equipment shall be powered off, with the exception of network switches and DSP devices. The network switches, DSP, and PoE touchscreens shall remain powered-on through UPS power.

g. Control system functions described herein are minimum requirements and additional controls and control functionality is required to be added upon direction from Owner or consultant.

h. The touchscreen control shall include, but not be limited to the following:

1) Fully develop touchscreen options and layouts through the process described herein.

2) General

a) Power the system on/off (note: provide shutdown confirmation).

b) PIN or password lock, if requested by Owner.

3) Audio Page

a) Loudspeaker zone control and presets.

b) Microphone level control and mute.

c) Wireless Microphone level controls and mute.

d) Bluetooth pairing, level control, and mute.

4) Service Page (PIN lock service page, if requested by Owner)

a) Provide service contact information.

b) Display monitored devices errors. Also display a popup at startup if errors are present.

c) Monitor UPS battery replacement schedule.

4. Audio System:

a. The sound system shall have the ability to be zoned into east and west halves of the Gymnasium, as well as control of individual bleacher and floor zones within each half, per selectable presets. AV Contractor to configure zoning in coordination with Consultant and Owner.

b. Bleacher loudspeakers shall be permanently mounted below the open web ceiling joists and aimed to provide coverage to the bleachers while avoiding energizing the Gymnasium floor.

c. Distributed floor loudspeakers shall be permanently mounted below the open web ceiling joists and provide a uniform coverage of the entire playing area.

d. Ceiling mounted subwoofers shall be permanently mounted below the open web ceiling joists in the Gymnasium.

e. Bleacher input plates with microphone and consumer audio inputs shall be located at the east and west bleacher fronts. A Gymnasium wall input plate with microphone and consumer audio inputs shall be located on the plan north wall.

f. Two (2) announcer microphones with associated PTT microphone bases and announcer headsets shall be provided for connection at the bleacher and wall input plates. Two (2) wired microphones shall be provided with microphone stands and loose cables.

g. A Bluetooth receiver with remote antenna shall be mounted to the Gymnasium ceiling structure above mid-court for full Bluetooth coverage. Device pairing will be handled via the touchscreen control system.

h. Two (2) wireless microphone receivers shall be provided in the AV equipment rack.

1) Bodypack transmitters with lavalier microphones and handheld transmitters with condenser microphone heads shall be provided for all receivers.

2) Two (2) active wireless microphone antennas with mounts shall be mounted to the underside of the Gymnasium structure. Antenna distribution shall be provided in the AV Gymnasium Equipment Rack. Appropriate antenna cable and in-line power supplies shall be provided to minimize cable loss.

i. A digital media player with Bluetooth, auxiliary, and USB inputs will be provided in the AV Gymnasium Equipment Rack for playback of digital media and prerecorded material (national anthem, music, advertisements, etc.).

j. An ADA-compliant assistive listening system (ALS) will be provided. The system will consist of an RF transmitter with an antenna remotely located on the Gymnasium ceiling structure, body pack receivers, earphones, and telecoil neck loops (for use with hearing aids).

D. Auditorium

1. The Auditorium and backstage support area AV systems shall consist of but not be limited to the following subsystems, equipment, and functionality.

a. Dedicated Audio Video Network:

1) A dedicated audio video network shall be provided. It shall be the responsibility of the AV Contractor to configure the AV network for the optimal transmission of digital audio, digital video, and control system protocols. AV Contractor shall coordinate all IP addresses and network protocols with Owner IT staff.

2) The AV network shall consist of a POE+ network switch located in the AV Amplifier Rack. It shall be the responsibility of the AV Contractor to supply all necessary switch accessories to meet the network and power performance requirements of the AV equipment specified herein. AV Contractor shall coordinate exact network switch with Owner IT and DSP, network video, and control manufacturers before ordering network switch. The network switch included in the equipment list is included as basis of design only, AV Contractor is responsible for providing and installing switches that meet or exceed all network equipment requirements.

3) The dedicated AV network shall employ a network video distribution system within the Auditorium allowing all Auditorium network video sources to be routed to all network video outputs.

4) A network connection shall be provided between the Auditorium and Music Classroom switches, allowing video sources Auditorium video sources to be routed to video outputs in the Music Classrooms.

5) The AV Contractor shall coordinate with switch manufacturer for support as required to properly configure the AV network, including remote or on-site manufacturer switch configuration, as necessary.

6) All network cabling provided by the AV Contractor shall adhere to the applicable Category 6A standards. AV Contractor shall provide test reports prior to system checkout documenting compliance with applicable standards for all installed network cables.

b. Video System:

1) A wide screen (WUXGA) video projector with a zoom lens shall be mounted in a motorized projector lift located in the Auditorium house. The projector shall be a laser projector with a minimum brightness of 20,000 lumens. The projector lift shall have a minimum of three stops, a storage position, an optimal projection position, and a service position.

2) A 226” diagonal 16:10 widescreen format video projection screen shall be provided and installed by the AV Contractor in the stage rigging on a dedicated batten. AV Contractor shall coordinate screen location, mounting requirements, and requirements of marked rigging stops for screen height with Theatre Contractor.

3) Include infrastructure for future scenic projection capabilities in the Auditorium Stage area.

4) Video inputs shall be in the downstage left stage floor box, the Stage Manager’s rack, and at the mix position for connection of a portable video source, such as a laptop computer. All Auditorium inputs shall be connected via the Auditorium network video distribution system as sources to all network video destinations.

5) A Blu-Ray player shall be provided at the AV Stage Manager’s Rack.

6) Video shall be transmitted to the video projector and other displays via a digital video transmission system.

7) A PTZ camera shall be located on the rear wall of the Auditorium house. The camera will provide POV video to the Auditorium network video distribution system.

8) Confidence monitors shall be provided at stage left and stage right locations. Confidence monitors shall share a common source from the Auditorium network video distribution system but shall have individual on/off control.

9) Video displays shall be provided in backstage areas. Backstage video displays shall have a common source from the Auditorium network video distribution system. Displays shall be in both dressing rooms and Back Stage.

10) Video displays shall be distributed throughout the Lobby to provide POV camera or program video content to Lobby occupants.

11) Video from the Auditorium shall be distributed to the Music Classrooms and the Lobby digital signage video displays.

c. Audio System:

1) The audio system shall provide high quality dynamic sound reinforcement for theatrical productions, music performances, and presentations. The system shall allow for the playback of prerecorded audio material and the audio recording of events.

2) The main sound reinforcement system shall have a center main loudspeaker array permanently mounted below the forestage canopy, dedicated sub bass loudspeakers permanently mounted above the main cluster, and delay fill loudspeakers permanently mounted below the Auditorium ceiling.

3) Amplifiers and a main central network digital signal processor (DSP) shall be provided in the AV Amplifier rack. The DSP shall provide mixing for the simple system and distribution, equalization, and delay for Auditorium audio systems.

4) Ceiling mounted speakers shall be provided in the back of house areas, including both dressing rooms and Back Stage. Ceiling speakers shall also be located in the Lobby. Local wall mounted volume controls shall provide level control in each space.

5) Ceiling speakers shall be located in the Control Booth for Auditorium audio playback. A local volume control shall be provided at an accessible location for level control.

6) Audio shall be streamed from the main Auditorium DSP to the Music Classroom DSP and be available as a source to allow Auditorium audio playback in each music classroom.

7) A digital mixing console and associated digital snakes shall be provided. Permanent rack-mounted snake heads as well as a portable 16-channel snake head shall be provided. The portable snake head shall be able to connect to the main stage input plates.

8) The digital console shall have a minimum of three admin level presets for console configuration. Presets may include “Theatrical”, “Music”, and other presets making use of various combinations of inputs, to be coordinated with Owner. All admin presets shall require the console admin password to overwrite but shall have all modification savable to other user presets on the user level password.

9) Audio inputs/outputs shall be distributed throughout the Auditorium stage and surrounding areas. The inputs and outputs shall be located on plates at stage right, stage left, and upstage center, as well as in stage-left and stage-right floor boxes. All stage inputs shall be routed to the dedicated rack-mounted digital snake head.

10) Dedicated inputs shall be provided for use in “Presentation Mode”. Inputs shall include the Stage Manager’s consumer inputs, Lectern input in the stage left floor box, video program audio, and the first two wireless microphones auxiliary outputs.

11) Three (3) hanging ceiling microphones and inputs shall be provided above the Stage.

12) Four (4) foldback monitors mixes shall be provided with monitor outputs distributed throughout the stage and in the floor boxes.

13) A CD and solid-state media player shall be provided in the main sound mixing position equipment rack.

14) Consumer inputs shall be provided in the Stage Manager’s rack and the main sound mixing desk.

15) A minimum of sixteen (16) wireless microphone receivers shall be provided. Two (2) shall be shared with all modes. Fourteen (14) shall be dedicated to the performance mode. Twelve (12) handheld transmitters with condenser microphone heads, sixteen (16) bodypack transmitters, sixteen (16) head worn microphones, and two (2) lavalier microphones shall be provided.

16) Portable wired microphones for voice and instruments, direct boxes, microphone cables, and microphone stands will be provided.

17) A solid-state recording device shall be provided at the main mix location.

18) A backstage audio monitoring/paging system shall be provided with a paging microphone and PTT button located in the Stage Manager's rack.

19) An ADA-compliant assistive listening system (ALS) shall be provided. The system shall consist of an RF transmitter with an antenna remotely located on a wall in the auditorium, body pack receivers, earphones, and telecoil neck loops (for use with hearing aids) quantity of all receivers and accessories shall be as required by current ADA requirements. Compliance signage shall be provided. AV Contractor shall coordinate mounting of compliance signage with GC and Architect.

d. Production Intercom:

1) A 2-channel wired production intercom system shall be provided to allow for communication between stage technicians.

2) Beltpack receptacles shall be provided throughout the Auditorium, including vestibules, Dimmer Room, Control Room, and 2nd floor Lobby.

3) Speaker stations shall be provided in back-of-house areas, including dressing rooms, Backstage, Dance and music classrooms.

4) Channel A shall feed the distributed Auditorium receptacles, Channel B shall feed the back of house spaces.

5) Dual and single beltpacks and headsets shall be provided.

e. Support Equipment:

1) A wall-mounted Stage Manager's equipment rack with locking front door shall be located downstage left and will house a Blu-ray player, touchscreen control panel, video transmission/distribution equipment, paging microphone, intercom base station, and the digital snake head.

2) A floor-standing equipment rack with shall be provided in the AV amplifier storage room to house all processing, amplification, and distribution equipment.

3) A countertop "upper" rack shall be provided at the control room mix position to house equipment requiring user adjustment.

4) An undercounter "lower" rack shall be provided at the control room mix position to house wireless microphone equipment.

5) Power sequencing/control shall be provided in each equipment rack.

f. Control System:

1) A control system with a hardware central controller shall be provided to integrate and simplify equipment controls and user functions. The central controller shall be in the Auditorium AV Amplifier rack.

2) Touchscreen controllers shall be provided at the Stage Manager's rack and at the main audio mix position. Video preview equipment shall be provided to view distributed video content on touchscreens, such as PTZ camera feed.

3) The control system shall monitor all equipment that provides bidirectional feedback and report any failures or errors to an Owner designated representative. Coordinate communication method (e-mail, etc.) with Owner.

4) Provide control app mirroring touchscreen for Owner-provided portable devices if any are provided. Coordinate use of Owner wireless network and access permissions with Owner IT if portable devices are provided and control is desired by Owner.

5) The control system shall accept a contact closure signal from the fire alarm system (provided by others) to mute the audio system. A contact closure signal from the Emergency Paging System (provided by others) shall be connected to the central controller and shall mute audio when the paging system is used for emergency pages.

6) The control system shall allow a user to select between two control modes: "Presentation Mode", and "Performance Mode."

7) Presentation Mode shall allow everyday users with little training to operate the system during simple events using the stage. This mode shall be controlled by a touchscreen and not require an operator. This system shall be adequate for lectures, assemblies, movies, community meetings, and simple events where a no more than three microphones will be used for speech or announcements.

8) Performance Mode shall allow an advanced user the ability to provide sound reinforcement for events with multiple microphones, such as amplified performances. This mode will use a mixing console to control audio sources.

9) In Presentation Mode, the touchscreen control shall include, but not be limited to the following:

a) Fully developed touchscreen options and layouts through the process described herein.

b) General:

i) Power the system on/off (note: provide shutdown confirmation).

ii) PIN or password lock, if requested by Owner.

iii) Change modes (note: provide mode change confirmation).

c) Video Page:

i) Video source select.

ii) Video source device remote control.

iii) Power the video projector on/off (Note: automatically turn on display when a video source is selected. Turn off display and cool down projector if required when the system is turned off. Provide separate display on/off control).

iv) Raise and lower the projector lift between storage and operating presets.

v) Deploy screen when projector is powered on. Raise screen when the system is turned off. Provide a separate control to raise/lower/stop screen manually.

vi) Video mute. Provide a splash screen displaying the school logo when video is muted, if desired by Owner.

vii) Power status and source select for stage confidence monitors and BOH monitors.

d) Audio Page:

i) Lectern microphone level control and mute.

ii) Wireless microphone 1 & 2 level and mute.

iii) Stage Manager consumer input level and mute.

iv) Video-related audio level and mute.

v) Audio mix options for both the main speakers as well as monitor channel 1 shall be provided.

e) Service Page (PIN lock service page):

i) Indicate projector lamp hours.

ii) Provide service contact information.

iii) Display monitored devices errors.

iv) Monitor UPS battery replacement schedule.

10) In Performance Mode, available touchscreen control options shall include, but not be limited to the following:

a) Fully developed touchscreen options and layouts through the process described herein.

b) General:

i) Power the system on/off (note: provide shutdown confirmation).

ii) PIN or password lock, if requested by Owner.

iii) Change modes (note: provide mode change confirmation).

c) Video Page:

i) Video source select.

ii) Video source device remote control.

iii) Power the video projector on/off (Note: automatically turn on display when a video source is selected. Turn off display and cool down projector if required when the system is turned off. Provide separate display on/off control).

iv) Raise and lower the projector lift between storage and operating presets.

v) Deploy screen when projector is powered on. Raise screen when the system is turned off. Provide a separate control to raise/lower/stop screen manually.

vi) Video mute. Provide a splash screen displaying the school logo when video is muted, if desired by Owner.

vii) Power status and source select for stage confidence monitors and BOH monitors.

d) Audio Page:

i) Route all audio sources to mixing console in Performance Mode. Provide screen with text note directing users that the mixing console is in control of audio system.

ii) Mute all simple system audio inputs.

iii) Provide audio level meters of DSP inputs from the mixing console with loudspeaker destination labels.

e) Service Page (PIN lock service page):

i) Indicate projector lamp hours.

ii) Provide service contact information.

iii) Display monitored devices errors.

iv) Monitor UPS battery replacement schedule.

v) Control projector lift to service position.

E. Library/Media Room

1. The Media Room shall have a wall-mounted video display.

2. Display control shall be handled via the manufacturer-provided remote controller.

3. Input connectors shall be located on the wall plate below the video display for user-provided video sources such as laptops.

1.8 AV CONTRACTOR'S QUALIFICATIONS:

A. The work of this section will be contracted to a single firm, referred to as the AV Contractor, for undivided responsibility.

B. The AV Contractor shall be experienced in the installation of professional AV systems and have completed within the past five years at least three AV system projects of a size and scope comparable to the project described herein.

C. The AV Contractor shall have factory-certified programmers for the programming of any processing and control equipment used in this project. The AV Contractor shall have a manufacturer certified programmer on staff for Q-SYS, AMX, and any specialized equipment requiring programming for the duration of this project.

D. The AV Contractor shall have capabilities and in-house facilities for installation, shop fabrication and repair service of professional AV systems.

E. The AV Contractor shall have on their full-time payroll at least one staff engineer having a minimum five years of experience as a professional AV designer. In place of a qualified staff engineer, the AV Contractor may retain a consulting engineer to direct the project. Prior to bid acceptance, the qualifications of the consulting engineer shall be submitted for the approval of the Owner. Said staff or consulting engineer shall:

1. Represent the AV Contractor at meetings and conferences and be present at the job site for all inspections.

2. Be responsible for supervision of all technical and engineering work required executing the contract, approving, and signing the shop drawings.

F. All Contractors desiring to submit bids for the installation of the audio-video systems specified herein must attend a pre-bid walkthrough with the Architect.

G. Bids submitted by Contractors who are not qualified will not be accepted.

H. Contractors desiring to bid on this installation shall submit written verification of the required qualifications described above.

I. Minimum Performance Requirements: To meet the minimum performance requirements, the AV Contractor shall be responsible for:

1. Each component's conformance with the manufacturer's published specifications and other requirements as stated herein.

2. Detailed checking of each item of equipment provided each portion of the installation, and of the complete installation to find and remedy any defects therein.

3. Setting the system gain structure, including initial adjustment of digital signal processing, and amplifier gain controls and making the final adjustment of these items.

4. Alignment and focus of video displays adjusting for optimized settings and making the final adjustment of these items.

5. Adjusting/applying EDID management strategy and adjusting color space for all displays in order to display the most optimal image possible for each video source.

J. Applicable Standards and Codes: In addition to all applicable local and state codes, the work shall be in accordance with the latest revisions of all applicable standards and specifications of the following:

1. NAB - National Association of Broadcasters

2. UL - Underwriters Laboratories

3. EIA - Electrical Industries Association

4. NEC - National Electrical Code

K. Final Acceptance: Final acceptance shall be contingent upon issuance by the Owner/Architect of a letter of acceptance stating that the work has been completed and is in accordance with the contract documents.

L. Manufacturers' Qualifications:

1. All electronic products shall be designed and marketed by the manufacturer for application in professional video projection, sound amplifying, reproduction and recording systems.

2. All products proposed by the AV Contractor for use in the systems described herein are subject to approval by the Owner.

1.9 SUBMITTALS

A. Prior to bidding, submit the following:

1. AV Contractor Qualification Statement: Non-pre-qualified AV Contractors shall submit electronic media in PDF format containing a statement of the AV Contractor's qualifications for approval.

2. As a minimum, this submittal shall include the following:

a. A list of AV systems of comparable size and scope to that described herein, completed by the AV Contractor in the last five (5) years. Show project name and address, year of completion and the name, telephone number, and e-mail address of a person to contact who is a representative of the Owner or User.

b. A personal resume of formal education and experience of the qualified staff engineer who would direct the work.

c. A personal resume of the staff member(s) with the required manufacturer certification and control system programming qualifications.

d. A description of the AV Contractor's capabilities and facilities for rack assembly, shop fabrication, software programming, repair and servicing of AV systems.

e. A letter from the processor and control system manufacturer(s) certifying that the AV Contractor’s software programmers have been factory trained and are qualified to provide the proposed installation.

B. During installation but before system testing, submit the following:

1. Control System Submittal

a. Prior to beginning any programming coordinate with the Owner/Architect and User on general expectations.

b. Conduct a programming discovery meeting with the Owner/Architect and User to review the following:

1) General overall layout

2) Expected control functions

3) Organization of basic and advanced functions

4) Detailed expectations for advanced control of individual components or subsystems

5) Expectations for automated or grouped control functions

6) Any other control related functionality as required by the Owner, Architect, and User

C. After installation is complete, submit the following:

1. Testing Report. Provide a report documenting the results of system tests described in this specification. The Owner/Architect will not schedule the initial post-construction site visit until this report has been delivered.

D. After the initial post-construction Owner/Architect site visit, submit the following:

1. A signed copy of the initial post-construction Owner/Architect site visit punch list with each completed item initialed. The Owner/Architect will not schedule the final post-construction or visit until this document has been delivered.

E. After the final Owner/Architect site visit and final punch list has been completed, submit the following:

1. Operation Manual: Provide the following in a neatly bound binder with tabbed dividers between sections. Also, provide a digital copy in PDF format on a CD-ROM or USB solid state memory drive.

    a. Title Page

    b. Table of Contents

    c. Description of each system including key features and operational concepts

    d. Setup diagrams and instructions to use in typical situations as directed by the Owner

    e. Single-line block diagrams showing all major system components`

    f. Manufacturer's operation manuals and information sheets for equipment intended for operation by system users

    g. A sheet of web links to relevant industry resources such as:

        1) The Shure publication Microphone Techniques for Live Sound Reinforcement

        2) The Soundcraft Guide to Mixing

        3) The Electro-Voice PA Bible including Introduction, PA Bible, and Additions two, three, four, five, seven, eight, nine, fourteen, and twenty

    h. Key schedule cross-referencing all keys to their respective functions and extra copies of all keys required to open or operate equipment specified in this section.

2. Maintenance Manual: Provide the following in a neatly bound binder with tabbed dividers between sections. Also, provide a digital copy in PDF format on a CD-ROM or USB solid state memory drive.

    a. Title Sheet

    b. Table of Contents

    c. Company name, address, telephone number, e-mail address, website, and contact name for system service or maintenance

    d. Listing of all equipment and materials with names of manufacturers and model numbers or part numbers

    e. Product manufacturer's warranties and a typed one-year system warranty explicitly covering all materials and labor

f. Manufacturer's service manuals for all major equipment items

g. A recommended preventative maintenance schedule with reference to the applicable pages in the manufacturer's maintenance manuals. Where the manufacturer provides inadequate information, provide the information necessary for proper maintenance.

h. Provide a working copy of the latest version of all software required to operate or configure the systems specified herein.

i. All software shall be fully documented, and that documentation included.

j. Software shall be furnished on a CD-ROM or USB solid state memory drive attached to the binder.

k. All user definable software configurations and/or programming shall become the sole property of the Owner. This includes all source code, source code copyrights, and related documentation.

3. Training Materials as described herein.

4. As-Built Drawings: Maintain a full set of shop drawings at the project site marked up to indicate actual locations of equipment, boxes, and other items called for in this section. After the final Owner/Architect site visit, compile the mark-ups into a set of as-built drawings and provide to the General Contractor, Architect, and Owner.

1.10 WARRANTY

A. Provide a written one (1) year warranty, signed by the Contractor, due on the date of the final acceptance.

B. Include the following provisions:

1. Warranty all equipment and the installation to be free of faulty workmanship.

2. Warranty all components and materials to be free of defects for a period of one (1) year from the date of final acceptance.

3. Paint and exterior finishes, fuses and lamps are excluded from above warranty, except when damage or failure results from defective materials or workmanship covered by the warranty.

C. SERVICE WARRANTY

1. Replace defective materials and repair faulty workmanship within forty-eight (48) hours of discovery at no cost to the Owner during the period of the warranty.

2. The Contractor shall be available on call and on eight (8) hour notice during the first month following acceptance of the system, to assist the Owner's representatives in any problems which may arise during the initial period of operation.

3. At no additional charge, provide maintenance service for a period of one (1) year after final acceptance of installation. This service shall consist of at least one visit six months and one visit eleven months after final acceptance for checking the equipment and making any necessary adjustments.

4. If, during the warranty period, any component is out of service for more than seven (7) days due to unavailability of parts or service, supply and install an identical new component. If an identical component is not available, substitute equivalent equipment, but only with the approval of the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. All materials, equipment and apparatus shall be new and of the latest design or model offered for sale by the manufacturer.

B. Principal items of equipment and apparatus are identified herein by part number and manufacturer. Alternate part numbers and manufacturers are identified in instances in which equivalence has been determined.

C. For all items which are identified by part number and manufacturer, performance specifications which are published in the most recent manufacturer's data sheets available at the time of bidding this contract shall be applicable to the present work as though fully written out herein.

D. For those items which are not identified by part number and manufacturer, the AV Contractor may select items which conform to the functional and/or technical specifications. For all such items, the AV Contractor shall submit exact make and model for approval including all technical data which is available from the supplier or manufacturer.

2.2 EQUIVALENT EQUIPMENT

A. All equipment listed by make/model below represents a minimum standard of performance based on specifications supplied by the manufacturer. All equipment substitutions shall be submitted to the Owner/Architect for review and approval prior to bid. It is the responsibility of the AV Contractor to prove that requested substitutions are equivalent to the specified product and compatible with the overall system design, intent, and electrical infrastructure.

2.3 EQUIPMENT

A. Base Bid: Audio-Video System

DESCRIPTION	MANUFACTURER	MODEL NUMBER	QTY
ROOM: Dance and Music Classrooms			
DISPLAY / VIDEO DEVICES			
Projector, 1920x1200, 3LCD Laser, 8,000 Lumens	Panasonic	PT-RZ790	3
w/ Lens	Panasonic	AR	3
w/ Ceiling Box	Chief	CMS492C	3
w/ Adjustable Column	Chief	CMS Series (As Required)	3
w/ Projector Mount	Chief	VCMUW - White	3
w/ Video Decoder	AMX	NMX-DEC-2322	3

Classroom Projection Screen 165" 16:10 (87.5" x 140") with ALR surface and LVC-IV motor control	Draper	Premier Field Verify Black Drop	3
w/ 3-button low voltage wall switch	Draper		3
AUDIO DEVICES			
Digital Signal Processor	QSC	Core 8 Flex	1
Classroom Power Amplifier	QSC	CX-Q 8K8	1
Band and Choir Classrooms Loudspeakers	Martin	CDD15	4
w/ Mount	Martin	CCDY15	4
Dance Classrooms Loudspeakers	Martin	CDD12	2
w/ Mount	Martin	CCDY12	2
Dance Classroom Subwoofer	Martin	SX112	1
w/ Vibration Isolation Mount	Mason Industries	WHR LDS Ceiling Hangers, Minimum 0.2" static deflection	1
* Submit subwoofer mount for acoustical review			
Classroom Consumer Input	RDL	DD-BTN44	3
Classroom Recording Microphones	Neumann	TLM 102 STUDIO SET	4
w/ X-Y Bar/Custom Mount and Rigging	Custom	Custom	2
Audio Patch Panel	Bittree	B96DC-HNALH/E3	1
w/ 18" Audio Patch Cable	Bittree	BCP1800-110	10
w/ 24" Audio Patch Cable	Bittree	BCP2402-110	10
Portable ALS FM Transmitter	WilliamsAV	PPA T46	AR
w/ 12-Bay Charger	WilliamsAV	CHG 3512	AR
w/ Receiver	WilliamsAV	PPA R38N	
w/ Ear Speakers	WilliamsAV	EAR 022	
w/ Telecoil Neckloop	WilliamsAV	NKL 001	
VIDEO DEVICES			
Music classroom Video Encoder Wall Plate	AMX	NMX-ENC-2315-WP	3
10' HDMI Presentation Cables	Atlona	Link Connect 10'	3

CONTROL DEVICES			
7" Touchscreen	AMX	MD-702	3
RECORDING DEVICES			
Mixer	Allen-Heath	QU-16	1
Solid-state Recorder	Denon	DN-900R	1
Digital Snake Headphone System Hub	Allen & Heath	ME-U	2
Headphone Monitoring Mixer	Allen Heath	ME-500	6
w/ 15' Cable	Custom	Custom	6
Headphones	Sony	MDR-7506	6
Microphone Stand	On-Stage	MS7701B	8
Condensor Microphones	Rode	NT5-MP	4
Vocal Soloist Microphone w/ shockmount	Neumann	TLM-102-STUDIO-SET	2
Microphone Cables (15')	Whirlwind	MK415	2
Microphone Cables (25')	Whirlwind	MK425	2
Microphone Cables (50')	Whirlwind	MK450	2
ACCESSORIES			
Storage Room Rack (AV RK-5) w/ Front Door	Middle Atlantic	DWR-16-22PD	1
w/ ID Panel	Custom	Custom	1
w/ Cable management, blank panels, hardware, and all necessary accessories	Middle Atlantic	As Required	AR
w/ Power distribution, Power Sequencing, and Surge Protection	Middle Atlantic	MPR	1
w/ Brush Grommet	Middle Atlantic	BR1	2
Central Controller	AMX	NX-3200	1
Network Patch Panel, CAT6, Shielded	Bittree	DSKP124B-C6APS	1
24" Network Patch Cables	Bittree	DSP2406-CAT6S	10
36" Network Patch Cables	Bittree	DSP2406-CAT6S	10
10' Network Patch Cables	C2G	00715	10
25' Network Patch Cables	C2G	00720	10

24-Port Network Switch	Netgear	M4250 Series*	1
Complete with all necessary accessories and licenses required to achieve full functionality and performance requirements identified in specifications			
*Coordinate exact network switch model number with DSP, control system, and network video manufacturers prior to ordering.			
Uninterruptable Power Supply	Middle Atlantic	UPX-1000R-2	1
Portable Recording Rack (AV RK-6)	Gator	G-TOUR-GRC12X12	1
w/ ID Panel	Custom	Custom	1
w/ Cable management, blank panels, hardware, and all necessary accessories	Middle Atlantic	As Required	AR
w/ Power distribution, Power Sequencing, and Surge Protection	Middle Atlantic	PD Series	1
w/ Shelf	Middle Atlantic	SS	1
Cable, Connectors, Custom Plates, Hardware, Misc	Custom	Custom	AR

DESCRIPTION	MANUFACTURER	MODEL NUMBER	QTY
ROOM: Auditorium			
DISPLAY / VIDEO DEVICES			
Projector, 1920x1200, 3DLP Laser, 21,000 Lumens	Panasonic	PT-RZ21KU	1
w/ Zoom Lens (Verify Throw)	Panasonic	ET-D75LE30	1
w/ Projector Lift (RS232 control)	Display Devices	DL3W-28	1
w/ Video Decoder	AMX	NMX-DEC-N2322	1
Auditorium Projection Screen 226" 16:10 (120" x 192") with ambient light rejecting surface, LVC motor control, and 3-button switch	Da-Lite	Wireline Advantage 29254G Field Verify Drop	1
Lobby Digital Signage Displays	Panasonic	TH-65CQ1U	4
w/ Wall Mount	Chief	LTM1U	4
w/ Wall Box	Chief	PAC 526	4
w/ Video Decoder	AMX	NMX-DEC-N2322	4
Stage R&L Confidence Monitors	Panasonic	TH-65CQ1U	2
w/ Swing Arm Wall Mount	Chief	PDRUB	2
w/ Wall Box	Chief	PAC 526	2
w/ Video Decoder	AMX	NMX-DEC-N2322	2

DESCRIPTION	MANUFACTURER	MODEL NUMBER	QTY
Dressing Room Display	Panasonic	TH-43EQ1	2
w/ Tilt Wall Mount	Chief	MTM1U	2
w/ Wall Box	Chief	PAC 526	2
w/ Video Decoder	AMX	NMX-DEC-N2322	2
Backstge Display	Panasonic	TH-55EQ1	1
w/ Tilt Wall Mount	Chief	LTM1U	1
w/ Wall Box	Chief	PAC 526	1
w/ Video Decoder	AMX	NMX-DEC-N2322	1
Stage Manager's Video Encoder	AMX	NMX-ENC-N2315-WP	1
Floor Box Video Encoder	AMX	NMX-ENC-N2315-WP	1
Audio Mix Position Video Encoder	AMX	NMX-ENC-N2315-WP	1
Stage Managers Blu-Ray Player	Denon	DN-500BDMKII	1
BlueRay Video Encoder	AMX	NMX-ENC-N2312	1
PTZ Camera	Panasonic	AW-UE40 Coordinate Color with Architect	1
w/ Video Encoder	AMX	NMX-ENC-N2315-WP	1
10' HDMI Presentation Cables	Atlona	Link Connect 10'	3
AUDIO DEVICES			
Wireless Microphone Receiver	Shure	QLXD4	16
w/ Bodypack Transmitter	Shure	QLXD1	16
w/ Over Ear Microphone	Shure	MX153	16
w/ Lavalier Microphone	Shure	WL185	2
w/ Handheld Transmitter	Shure	QLXD2/B87C	8
Wireless Microphone Antenna Distribution	Shure	UA844+SWB	4
w/ Wireless Microphone Antennas w/Amplifiers as Required	Shure	UA874	2
w/ Antenna Mount	PWS	S9826	2
Wired Vocal Microphones	Shure	SM58-LC	8

DESCRIPTION	MANUFACTURER	MODEL NUMBER	QTY
Wired Instrument Microphones	Shure	SM57-LC	5
Drum Microphone Kit	Shure	DMK57-52	1
Choir Microphones	Audix	ADX40	4
w/ Microphone Stand Adapters	Audix	MC-MICRO	4
Lectern Microphone	Shure	MX418/C	1
Wired Condenser Microphones	MXL	603 pair	2
Instrument DI Boxes	Radial	ProDI	4
AV DI Box	Radial	ProAV2	1
Stage Managers Paging Microphone	AKG	DGN99 E	1
w/ Panel Mount	Custom	AR	1
w/ Push To Talk Button	RDL	AMS-TS1	1
Microphone Cables (6')	Whirlwind	MK406	8
Microphone Cables (10')	Whirlwind	MK410	8
Microphone Cables (25')	Whirlwind	MK425	12
Microphone Cables (50')	Whirlwind	MK450	4
Microphone Cables (100')	Whirlwind	MK4100	2
Loudspeaker Cables (15')	Whirlwind	NL4-015	4
Loudspeaker Cables (25')	Whirlwind	NL4-025	4
Loudspeaker Cables (50')	Whirlwind	NL4-050	5
Theatre Mixing Console	Allen & Heath	SQ-6	1
w/ Dante Card	Allen & Heath	SQ-Dante	1
Stage Digital Snake Head	Allen & Heath	GX 4816	1
Portable Snake Head	Allen & Heath	DT168	1
w/ Portable Cable	Allen & Heath	Custom 25'	1
w/ Portable Cable	Allen & Heath	Custom 50'	1
Microphone Stand	On-Stage	MS7701B	4
Short Microphone Stand	On-Stage	MS7311B	2
Kick Drum Microphone Stand	On-Stage	MS7411B	2

DESCRIPTION	MANUFACTURER	MODEL NUMBER	QTY
Media Player (CD/SD/USB with Bluetooth Receiver)	Tascam	CD-400U	1
Recorder	Tascam	SS-R250N	1
Digital Signal Processor	QSC	Core 110f	1
Main Subwoofer Amplifier (Amp 1)	Bose	PM8500N	1
Main Array Amplifier (Amp 2)	Bose	PM8500N	1
Delay Amplifier (Amp 3)	Dynacord	C1800FDI	1
Monitor Amplifier (Amp 4, 5)	Dynacord	C1800FDI	2
Back of House Amplifier (Amp 6)	QSC	CX-Q 2K4	1
Main Speaker Array Subwoofer	Bose	SMS118	2
Main Speaker Array 10-degree Loudspeaker	Bose	SM10	1
Main Speaker Array 20-degree Loudspeaker	Bose	SM20	3
w/ Rigging	Bose	ShowMatch Array Frame	1
Delay Loudspeaker	Bose	AMU208	2
w/ Rigging	Bose	Custom Submit for Review*	AR
* Submit Stamped Engineering Drawing for Loudspeaker Rigging			
Back Of House and Control Room Ceiling Speakers	EV	C8.2	13
Back Of House Volume Controls	Atlas Sound	AT100D	4
Lobby Speakers	EV	C8.2	17
Lobby Volume Control	Atlas Sound	AT100D	5
12" Monitor Loudspeakers	EV	TX1122FM	4
Stage Manager Consumer Input	RDL	DB-CIJ3	1
Mix Position Consumer Input	RDL	DB-CIJ3D	1
Audio Patch Panel	Bittree	B96DC-HNALH/E3	1
w/ 18" Audio Patch Cable	Bittree	BCP1800-110	20
w/ 24" Audio Patch Cable	Bittree	BCP2402-110	20

Assisted Listening Transmitter Kit w/ Signage	Williams AV	FM T55	1
w/ Rack Mount Kit	Williams AV	RPK 005	1
w/ Assisted Listening Transmitter Antenna	Williams AV	ANT 029	1
w/ Receiver with Ear Bud	Williams AV	PPA R37	AR
w/ Neck Loop	Williams AV	NKL 001	AR
CONTROL DEVICES			
Central Controller	AMX	NX-2200	1
Stage Managers Rack 10" Touchscreen	AMX	MD-1002	1
w/ Rack Mount	AMX	MSA-RMK10	1
w/ Power Adapter		AR	
w/ Video Preview	AMX	MXA-MPL	1
w/ Video Decoder	AMX	NMX-DEC-N2322	1
Mix Postion 10" Touchscreen	AMX	MT-1002	1
w/ Power Adapter		AR	
w/ Video Preview	AMX	MXA-MPL	1
w/ Video Decoder	AMX	NMX-DEC-N2322	1
40-Port POE+ Network Switch	Netgear*	M4250 Series*	1
Complete With All Necessary Accessories		Submit for Review	1
*Coordinate exact network switches with owner IT, DSP, Network Video, and control manufacturers before ordering network switches			
Network Patch Panel, CAT6, Shielded	Bittree	DSKP124B-C6APS	1
24" Network Patch Cables	Bittree	DSP2406-CAT6S	10
36" Network Patch Cables	Bittree	DSP2406-CAT6S	10
10' Network Patch Cables	C2G	00715	10
25' Network Patch Cables	C2G	00720	10
INTERCOM DEVICES			
Intercom Base Station	Clear-Com	MS-702	1
w/Additional Power Supplies as Necessary	Clear-Com	AR	
Intercom Speaker Stations	Clear-Com	KB-701	7
Dual-Channel Intercom Belt Pack	Clear-Com	RS-702	3
w/ Intercom Headset	Clear-Com	CC-300	3
w/ 10' 6-Pin Cable	Whirlwind	MK6CC010	3
w/ 25' 6-Pin Cable	Clear-Com	MK6CC025	3

Single-Channel Intercom Belt Pack	Clear-Com	RS-701	6
w/ Intercom Headset	Clear-Com	CC-300	6
w/ 10' 3-Pin Clear-Com Cable	Whirlwind	MK410	6
w/ 25' 3-Pin Clear-Com Cable	Whirlwind	MK425	3
ACCESSORIES			
Stage Manager's Rack (AV RK-1)	Middle Atlantic	SR-40-32	1
w/ Front Door	Middle Atlantic	VFD-40	1
w/ ID Panel	Custom	Custom	1
Complete with all necessary accessories including but not limited to fans, doors, cable management, blank panels, and hardware.	Middle Atlantic	AR	1
w/ Power Distribution	Middle Atlantic	AR	1
w/ Drawer	Middle Atlantic	UD2	1
w/ Sliding Shelf	Middle Atlantic	SS	1
w/ UPS	Middle Atlantic	UPX-1000R-2	1
Amplifier Rack (AV RK-2)	Middle Atlantic	ERK-4028	1
w/ ID Panel	Custom	Custom	1
Complete with all necessary accessories including but not limited to fans, doors, cable management, blank panels, and hardware.	Middle Atlantic	AR	1
w/ Fan Top Kit & Thermostat	Middle Atlantic	Submit for Review	1
w/ Power Distribution	Middle Atlantic	AR	1
w/ Drawer	Middle Atlantic	UD2	1
w/ UPS	Middle Atlantic	UPX-1000R-2	1
Mix Position Upper Rack (AV RK-3)	Middle Atlantic	DTRK - 1218	1
Mix Position Lower Rack (AV RK-4)	Middle Atlantic	DTRK - 1818	1
w/ ID Panel	Custom	Custom	2
w/ Drawer	Middle Atlantic	UD2	1
w/ Vent Panel	Middle Atlantic	EVTA-1	4
Complete with all necessary accessories including but not limited to fans, doors, cable management, blank panels, and hardware.	Middle Atlantic	AR	2
w/ Power Distribution	Middle Atlantic	AR	2
Floor Box	FSR	FL-600P-6	2
w/ Cover	FSR	Submit for Review	2
Projector Surge Protector	SurgeX	EV-20815	1
Cable, Connectors, Custom Plates, Hardware, Misc	Custom	Custom	AR

DESCRIPTION	MANUFACTURER	MODEL NUMBER	QTY
ROOM: Gymnasium			
AUDIO DEVICES			
Wireless Microphone Receiver	Shure	QLXD4	2
w/ Handheld Transmitter	Shure	QLXD2/B57C	2
Wireless Microphone Antennas	Shure	UA864US	2
w/ Passive Antenna Splitter	Shure	UA221	2
w/ Antenna Power Supply	Shure	UABiasT	2
Microphone Stand	Atlas	MS12CE	2
w/ Boom	K&M	211/1	2
Announcer Microphone	EV	ND86	2
w/ Button Stand, Momentary Cough Button	ProCo	SAS2	2
Microphone Cables (10')	Whirlwind	MK410	2
Microphone Cables (25')	Whirlwind	MK425	2
Microphone Cables (50')	Whirlwind	MK450	2
Microphone Cables (100')	Whirlwind	MK4100	2
Media Player	Denon	DN-500CB	1
Bluetooth (Room)	Denon	DN-200BR	1
Mic/Line Consumer Input/Output	RDL	DD-RN31	3
Digital Signal Processor	QSC	Core 110f	1
Power Amplifier - Gym Loudspeakers	EAW	UXA4410	1
Power Amplifier - Gym Subwoofer	EAW	UXA4406	1
Gym Bleacher Loudspeakers	EAW	MK5394	6
w/ Rigging	Custom	AR	6
Gym Floor Loudspeakers	EAW	MK8196	6
w/ Rigging	Custom	AR	6
Gym Subwoofer	EAW	SB1001	2
w/ Rigging	Custom	AR	2

ALS FM Transmitter	WilliamsAV	FM T55	1
w/ Rack Mount Kit	WilliamsAV	RPK 005	1
w/ Remote Antenna	WilliamsAV	ANT 029	1
w/ 12-Bay Charger	WilliamsAV	CHG 3512	1
w/ Receiver	WilliamsAV	PPA R38N	Qty to meet ADA
w/ Ear Speakers	WilliamsAV	EAR 022	
w/ Telecoil Neckloop	WilliamsAV	NKL 001	
CONTROL DEVICES			
7" Wall Mount Touchscreen	QSC	TSC-70-G3	1
w/ Protective Cover	Custom	AR	1
7" Tabletop Touchscreen	QSC	TSC-70-G3	1
w/ Table Top Mount	QSC	TSC-710t-G3	1
24-Port PoE+ Network Switch	Netgear*	M4250 Series*	1
Complete with all necessary accessories and licenses required to achieve full functionality and performance requirements identified in specifications			
*Coordinate exact network switch model number with DSP, control system, and network video manufacturers prior to ordering.			
Network Patch Panel, CAT6, Shielded	Bittree	DSKP124B-C6APS	1
24" Network Patch Cables	Bittree	DSP2406-CAT6S	10
36" Network Patch Cables	Bittree	DSP2406-CAT6S	10
10' Network Patch Cables	C2G	00715	10
25' Network Patch Cables	C2G	00720	10
ACCESSORIES			
Gym Equipment Rack w/ Front Door	Middle Atlantic	DWR-16-22	1
w/ ID Panel	Custom	Custom	1
w/ Complete with all necessary accessories including but not limited to fans, doors, cable management, blank panels, and hardware.	Middle Atlantic	AV Contractor shall select equipment rack and accessories as required to meet performance requirements.	1
w/ Power Distribution	Middle Atlantic	MPR Series - Contractor shall design power sequencing and distribution per performance requirements identified in specifications	1
Brush Grommet Panel	Middle Atlantic	BR1	1

Drawer	Middle Atlantic	UD2	1
Uninterruptible Power Supply	Middle Atlantic	UPX-1000R-2	1
Cable, Connectors, Plates, Hardware, Misc	Custom	Custom	1
DISPLAY / VIDEO DEVICES			
ROOM: Library Media Room			
Media Room - Flat Panel Video Display	Panasonic	TH-75EQ1	1
CONTROL DEVICES AND ACCESSORIES			
Cable, Connectors, Plates, Hardware, Misc	Custom	Custom	AR

2.4 EQUIPMENT PERFORMANCE SPECIFICATIONS

A. The performance specifications for all components shall be as published in the most recent manufacturer's data sheets available at the time of bidding this contract and shall be applicable to the present work as though fully given herein.

2.5 WIRING AND CONDUCTORS

A. Installed microphone and line level cable:

1. Cable shall be 22 AWG stranded tinned copper, UL Listed, NEC Type CM CMR or CMP, PVC jacketed, twisted pair, with 100% coverage overall foil shield. Where required by code installed microphone and line level cables shall be plenum rated.

2. Approved non-plenum cables:

a. Belden 8451, 9451

b. West Penn 77291

c. Liberty 22-1P-EX

d. Clark SPA22GS

e. Submit proposed alternative for approval

3. Approved plenum cables:

a. Belden 9451P

b. West Penn D25291

c. Liberty 22-1P-CMP-EZ

d. Clark SPA22GSP

e. Submit proposed alternative for approval

B. Portable microphone, line level, and single channel analog party line intercom cable:

1. Cable shall be 20 AWG stranded tinned copper, EPDM Jacket, with minimum 85% coverage tinned copper braid shield.

2. Approved portable microphone cable:

a. Belden 8412

b. Clark FF220

c. Submit proposed alternative for approval

C. Loudspeaker cable for low impedance systems, runs less than 150', except 4-ohm dedicated low frequency loudspeakers (subwoofers):

1. Cable shall be copper 12 AWG, UL Listed, NEC Type CL3, PVC jacketed, stranded conductor.

2. Approved non-plenum cables:

a. Belden 8477, 5000UE

b. West Penn 227

c. Liberty 12-2C

d. Clark CW1202

e. Submit proposed alternative for approval

3. Approved plenum cables:

a. Belden 6000UE

b. West Penn 25227B

c. Liberty 12-2C-P

d. Clark CW1202P

e. Submit proposed alternative for approval

D. Loudspeaker cable for low impedance systems, runs greater than 150', and for all 4-ohm dedicated low frequency loudspeakers (subwoofers):

1. Cable shall be copper 10 AWG, UL Listed, NEC Type CL2, PVC jacketed, stranded conductor. Where required by code, loudspeaker cables shall be plenum rated.

2. Approved non-plenum loudspeaker cables:

a. Belden 5T00UP

b. West Penn HA210

c. Clark CW1002

d. Submit proposed alternative for approval

3. Approved plenum loudspeaker cables:

a. Belden 6T00UP

b. West Penn 25210

c. Clark CW1002P

d. Submit proposed alternative for approval

2.6 CONNECTORS

A. 3-pin XLR cable connectors shall be 3-pole XLR type connectors, with solder cups, with black metal housing, and with gold contacts.

1. Approved 3-Pin XLR cable connectors

a. Neutrik NC3FXX-B, NC3MXX-B

b. Submit Proposed Alternative for Approval

2. Approved 3-Pin XLR chassis connectors

a. Neutrik NC3FD-L-B-1, NC3MD-L-B-1

b. Submit proposed alternative for approval

PART 3 EXECUTION

3.1 COORDINATION

A. The AV Contractor shall coordinate this work with the other electrical work and the work of other trades.

B. Locations shown on AV Drawings are approximate. Refer to Architectural drawings for dimensions.

3.2 FABRICATION

A. Design/Engraving:

1. All equipment controls, receptacles and all indicators shall have, unless otherwise noted, lamacoid, permanently engraved, or silk-screened fully descriptive identification labels. The resolution of silk-screened labels shall not be less than 90,000 dots/sq. in.

2. The word "engraved" shall mean that the identification shall be engraved into the indicated panel, plate, or control surface.

3. All engraving shall be with 5/32" high characters, unless otherwise noted, and shall be filled with engraver's enamel of a contrasting color.

B. Custom Plates:

1. Receptacles shall be screwed, bolted or flush-riveted to the plate.

2. Plates shall be marked to indicate function and circuit of the receptacle, for example: MICROPHONE.

C. Terminals and Terminations:

1. Microphone cables shall not be spliced or otherwise interrupted from termination to termination. All cables shall have visible adhesive identifying markers on each end.

2. Wiring in terminal cabinets shall be tied and clamped neatly to backboards or cableforms.

3. Terminals shall, unless otherwise specified, be one of the following types:

4. Wire-wrap type terminal block.

5. Barrier strips with screw terminals.

6. Each terminal strip shall have a legibly marked identification strip.

D. Structural Assemblies:

1. Provide holes required for securing other components or assemblies to structural steel framing and for passage of other components through steel framing members as shown on final shop drawings. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning.

2. In fabricating mounting brackets and other steel components requiring bends, the radii of the bends shall not be less than three times the thickness of the steel being bent.

3. All bolts and nuts used in the fabrication of mounting hardware shall be Grade 5 or better.

3.3 INSTALLATION

A. General:

1. Keep the job adequately staffed at all times. Designate a field supervisor to be present on the job site and in responsible charge during all phases of installation and check out. Maintain same supervisor throughout the execution of the work unless circumstances beyond the control of the AV Contractor intervene.

2. Install the system in cooperation with other trades in order to achieve coordinated progress and satisfactory final results. Watch for conflicts with work of other trades on the job.

3. Execute without claim for extra payment, moderate moves or changes as are necessary to accommodate other equipment or preserve symmetry and pleasing appearance.

4. The AV Contractor shall do all cutting and patching necessary for proper installation of the system and shall repair any damage done by himself or his workmen. Any required penetration of slabs or CMU walls shall be made by a cutting method rather than by a concussive method.

5. On completion, remove all rubbish and unused materials from the premises and clean the premises and all equipment where dirtied by removing all dirt, dust, stains and fingerprints.

B. Equipment Rack:

1. Install rack mounted equipment with black 10-32 star post drive security screws head screws with nylon washers, Middle Atlantic HTX or equivalent.

2. Wiring internal to equipment racks shall be installed neatly and bundled according to function. Separate power cables as far as possible from microphone level and line level signal cables. Provide lacer bars, horizontal cable managers, and vertical cable managers where required. Attach cable bundles every 6” to cable management.

3. Provide security covers for non-user-operated equipment having front panel controls. Where required by equipment manufacturer security covers shall be vented. Install covers at the conclusion of system test, tuning, and equalization.

4. All blank rack panels and connector panels shall be flanged to increase stiffness. Flat panels will not be accepted.

5. All equipment not available with an integral rack mounting kit shall be provided with a rack shelf including custom faceplate that fully covers any open space around the device. Fasten equipment to rack shelf where appropriate.

6. Provide rack slides for all equipment requiring access to side or top panels for routine adjustment or cleaning.

7. All open areas on front faces shall be covered with blank panels. Where obstructions prevent the installation of full rack space blanks, install ½ or 1/3 space blanks.

8. Heavy equipment, such as power amplifiers, shall be supported from rear rack rails in addition to front attachments. All equipment in portable equipment racks shall be supported from rear rails in addition to front attachments.

9. Locate all rack mounted equipment requiring adjustments, cleaning or similar attention so that it will be accessible. Ensure that equipment with sliding shelves, portable device docks, or user interaction functions operate smoothly without obstruction.

C. Equipment, Boxes, Plates:

1. Secure all equipment, except equipment designed to be portable, firmly in place, including loudspeakers, racks, amplifiers, cables, and displays.

2. Install work neatly, with boxes, equipment, etc. plumb and square.

3. Locate all apparatus requiring adjustments, cleaning or similar attention so that it will be accessible.

4. All supporting structures and enclosures supplied by the AV Contractor, not having a standard factory paint finish, shall be painted. Paint specifications and color shall be supplied by the Architect.

5. Color and finish of blank panels and custom assembly panels shall match adjacent equipment panels to the extent possible. Paint all conduit and boxes to match adjacent surfaces. The finish of wall mounted receptacle panels shall be coordinated with the Architect.

6. The equipment specified herein must be capable of operation in environments of normal humidity, dust and temperature. AV Contractor should avoid installing equipment where extreme environmental conditions can occur and shall be responsible for protection of equipment and related wiring from such conditions.

7. The AV Contractor shall take precautions to prevent electromagnetic and electrostatic hum.

8. Install the equipment to provide safe operation. Provide ventilation as required to maintain equipment within the manufacturers specified temperature limits.

9. Any obstructions or conflicts in the rated coverage pattern of loudspeakers not shown on design drawings shall be reported to the Owner. If unreported obstructions are found during testing, the Contractor shall move loudspeakers without claim for extra payment.

D. Installed Cabling & Conduit:

1. Provide all cables necessary for interconnection of permanently mounted equipment. Use terminations required to achieve full function of equipment as specified herein.

2. All cables shall be continuous and only spliced where approved on shop drawings.

3. Exercise care in wiring to avoid damage to the cables and to the equipment. Make all joints and connections with rosin-core solder or with mechanical connectors approved for Class I wiring.

4. Run lines in separate metallic conduits for microphone level circuits (up to -20 MBm), line level circuits (up to +30 dBm), loudspeaker circuits (above +30 dBm) and power circuits. Non-metallic or PVC conduits for AV system wiring are not acceptable unless otherwise noted. Use only cables which are insulated from the conduit and from each other for the entire conduit length.

5. Ground audio cable shields at both ends. Provide green heat shrink tubing for all exposed cable shields or shield drain conductors at termination points.

6. Provide the separation shown in the following chart between conduits carrying the following signal types. Where conduits must cross and separation cannot be maintained, cross at a 90 degree angle.

E. Wire Terminations:

1. Make connections using rosin-core solder or approved mechanical connectors.

2. Terminate three pin XLR connectors according to AES12-1992 (r2004) standard: Pin 1 = Shield, Pin 2 = Audio High (+), Pin 3 = Audio Low (-). Do not connect shields to connector shells.

3. Field terminated Speakon connectors shall be terminated with screw terminals. Do not tin wires or solder connectors. Strip 20mm from cable jacket and 8 mm from conductor insulators as directed by manufacturer. Use only an appropriate Pozidriv bit when tightening screw terminals.

4. Speakon chassis connectors shall be terminated with 4.8mm x 0.5mm Faston crimp connectors.

5. Provide only factory terminated HDMI, DVI, and DisplayPort digital video cables. Field terminated cables shall not be acceptable.

F. Portable Cabling: Provide portable cabling required to connect all portable equipment specified by this section.

G. Labeling:

1. Clearly, logically and permanently mark switches, connectors, jacks, relays, receptacles, cables and cable terminations.

2. Etch, engrave, silk screen or apply in a similar permanent manner all legends and markings on all custom panels and receptacle plates. Embossed tape, press type, etc., are not acceptable.

3.4 TESTING

A. Instrumentation: The AV Contractor shall provide the following test equipment for use during initial tests and adjustments and during acceptance testing and final adjustment of the system:

1. Sound Level Meter: Shall meet ANSI S1.4 specifications for Type I sound level meters. SMAART with a Type I microphone and calibrator is acceptable.

2. Sine Wave Generator: Continuously variable from 20 Hz to 20,000 Hz within +1 dB with less than 0.5% THD.

3. Pink Noise Generator: Generator shall produce at least 1 volt RMS of pink noise.

4. AC Voltmeter: With frequency response of +1 dB from 20 to 20,000 Hz, 0.0001 volts to minimum input impedance of 0.1 megohm.

5. Data Communications Cable Verifier: Fluke MicroScanner2 or equivalent.

6. Polarity checker: Studio Six Digital AudioTools speaker polarity module or equivalent.

7. All other equipment required to conduct tests, equipment setup and checkouts outlined in this specification.

B. System compliance testing and documentation. The Contractor shall perform the following tests and provide a compliance document confirming the results of all tests prior to the final Owner/Architect site visit.

1. Audio System Tests:

a. Emergency Systems Muting: Coordinate with others to test emergency system mute. Document verification of system mute.

b. Cabling:

1) Check each microphone and line level cable for continuity of all conductors. Verify connectors are terminated in accordance with AES12-1992 (r2004). Document compliance on each line.

2) Check each loudspeaker line for continuity. Positive polarity shall be marked with red or white. Negative polarity shall be marked with black.

3) Data communications cabling shall be tested with a cable verifier. Document compliance.

c. Loudspeaker Physical Alignment: Verify the height, vertical angle, and horizontal angle of all loudspeakers with a laser inclinometer. Document the measured aiming angles.

d. Loudspeaker Line Impedance: Measure and document the impedance of each loudspeaker and associated loudspeaker line. Using an audio impedance meter (not DC resistance). Measure full range loudspeaker impedance at 200 Hz and 2000 Hz. Measure subwoofer impedance at 50 Hz and 100 Hz. Measure high frequency driver impedance at 4000 Hz and 8000 Hz. A full range impedance sweep using a software impedance meter is also acceptable.

e. Loudspeaker Polarity: Perform polarity checks on all independent loudspeakers. Loudspeakers utilizing active crossovers shall have polarity checked on all individually amplified components. Results from all polarity checks shall be included in compliance documentation.

f. Freedom from Buzzes, Rattles and Objectionable Distortion:

1) Apply a slow continuous sine wave sweep at a level 3 dB below rated power amplifier output voltage. Listen carefully for buzzes, rattles, and objectionable distortion. Correct any causes of these defects, unless the cause is clearly outside the sound amplification system equipment and installation, in which case, the cause shall be brought to the attention of the Owner/Architect.

2) Listen for audible buzzes or noise in the audio system. Coordinate the operation of other building equipment, including but not limited to dimmers, motors, stage lifts, and HVAC equipment to ensure that normal operation of such devices does not cause audible noise in the sound system.

g. Assistive Listening Systems: Verify that the system is operational.

h. Gain Control Settings: Establish tentative normal settings for all gain controls. All gain controls on rack-mounted equipment shall be adjusted for optimum signal-to-noise ratio and signal balance. After final gain and attenuator settings have been established, mark all control settings with an adhesive indicator dot or arrow.

i. Freedom from Switching Transient Noise: Operate all control switches and relays, while listening for clicks and pops in the system outputs. Eliminate any found.

j. Listening Test: Listen to normal program material to be sure that there are no remaining defects.

k. Reporting: Upon completion of above tests and any necessary adjustments, submit a written report presenting test results for review by the Owner/Architect prior to acceptance testing, final tuning, and demonstration. With this report, submit written certification that the installation conforms to the requirements stated herein, is complete in all respects.

3.5 DOCUMENTATION

A. Project Record:

1. The AV Contractor shall supply clean As-Built prints of the system drawings which show all changes which were made during fabrication and installation.

2. The AV Contractor shall print a full-sized copy of the system one-line diagram on rigid foam core board and post it in a convenient location near the equipment rack.

B. Maintenance Manual:

1. The AV Contractor shall provide technical information for all electronic apparatus, including but not limited to schematic diagrams and parts lists, manufacturer's installation instructions, operating instructions, and technical specifications.

2. The AV Contractor submittal shall include all shop drawings prepared and used by the AV Contractor, as well as those which were not required to be submitted for approval. This shall include, but not be limited to, wiring diagrams, schedules for identification of building wiring and installation details useful to a maintenance technician.

C. Instruction Manuals:

1. Provide two (2) copies of an Instruction Manual to the Owner containing the following:

2. Title Page

3. Table of Contents

4. Description of each system including key features and operational concepts

5. Setup diagrams and instructions to use in typical situations as directed by the Owner

6. Single-line block diagrams showing all major system components

7. Manufacturer’s operation manuals and information sheets for equipment intended for operation by system users

8. Key schedule cross-referencing all keys to their respective functions and extra copies of all keys required to open or operate equipment specified in this section.

3.6 TRAINING AND INSTRUCTION

A. The following training periods shall be provided by the AV Contractor to Owner-designated representatives for all installed systems at a time mutually agreed upon between Owner and AV Contractor. The total training time may require that the training be broken into multiple sessions.

1. Minimum of thirty two (32) hours of training.

B. All training shall be recorded by the AV Contractor. AV Contractor shall provide two (2) copies of the training video on a format suitable to the Owner. AV Contractor will supply the equipment necessary to record the training sessions.

C. During the training, the participants shall be given opportunities for "hands-on" experience with operating the controls. There shall be visual and audible demonstrations using the systems themselves as aids. Personnel for instruction and training for the AV systems shall be designated by the Owner.

END OF SECTION

SECTION 12305

SCIENCE CASEWORK AND LABORATORY EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood-faced casework and trim.

2. Plastic laminate faced casework and shelving.

3. Plastic laminate countertops.

4. Solid polymer fabrication.

5. Wood shelving.

6. Preparation for installation, and connection of utilities.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other documents.

C. Related Sections:

1. Section 06100 - Rough Carpentry: Blocking and backing plates for anchorage.

2. Section 06200 - Finish Carpentry: Adjustable shelving.

3. Section 06400 - Architectural Woodwork: Finish cabinetry.

4. Section 06640 - Solid Polymer Fabrications: Countertops.

5. Section 07900 - Joint Sealers: Sealants for closing perimeter joints between casework and adjacent walls and flooring.

6. Section 09110 - Non-Load Bearing Steel Framing: Blocking and backing plates.

7. Section 09900 - Painting: Woodwork finishes.

8. DIVISIONS 15 and 16: Service fittings and connections.

1.2 DESCRIPTION OF WORK

A. The extent of the work of this Section is indicated on the Drawings and as specified herein, and includes providing and installing factory-fabricated science and laboratory casework and preparation for installation of mechanical and electrical services by other trades.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only. Comply with the applicable standards of the following, as referenced herein.

B. American Hardboard Association (AHA).

C. American National Standards Institute (ANSI):

1. ANSI A135.4 - Basic Hardboard.

2. ANSI A208.1 - Mat Formed Wood Particleboard.

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

E. Architectural Woodwork Institute (AWI):

1. AWI AWQS - Architectural Woodwork Quality Standards, 6th Edition, Version 1.0, Premium Grade, except as otherwise indicated.

F. Hardwood Plywood & Veneer Association (HPVA).

G. National Electric Manufacturer's Association (NEMA):

1. NEMA LD3 - High Pressure Decorative Laminates.

H. Scientific Equipment and Furniture Association (SEFA).

I. United States Department of Commerce Product Standard (PS):

1. PS 1 - Construction and Industrial Plywood.

2. PS 20 - American Softwood Lumber Standard.

3. Products Standards of the National Institute of Standards and Technology (NIST).

1.4 DEFINITIONS

A. Exposed Surfaces: The exposed portions of casework, including surfaces visible when doors and drawers are closed. Bottoms of casework more than 4'-0" above the floor shall be considered as exposed. Visible members in open cases or behind glass doors also shall be considered as exposed. The front and both sides of all storage cabinets shall be considered as exposed, even when one or both side panels are against a wall or an adjacent cabinet.

B. Semi-exposed Surfaces: Semi-exposed portions of casework includes members behind opaque doors, such as shelves, dividers, interior face of ends, case back, drawer sides, backs and bottoms, and the inside face of doors. Tops of casework 6'-6" or more above the floor shall be considered as semi-exposed.

C. Unexposed Surfaces: Unexposed portions of casework includes sleepers, web frames, dust panels and other surfaces not usually visible after installation.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s specifications and installation instructions for each item of factory-fabricated woodwork, wood veneer, finish hardware and finish coating products.

   a. Wood veneers and finishes.

   b. Data for hardware and accessories indicating the material, type, function, attachment and finish.

2. Shop Drawings: Show the location of each item on dimensioned plans, sections, elevations, and large scale details. Indicate materials used, wood species, component profiles, assembly methods, thickness of parts, joint details, fastening methods, accessory listings, hardware locations, location and type of cut-outs for related work, service fixtures, fittings and accessories and schedule of finishes. Submit for the following:

   a. Cabinet work, base and overhead.

   b. Counter work, base and overhead.

   c. Shelving units.

   d. With submit of manufacturers product information, include Shop Drawings for manufacturer=s standard units.

3. Samples: For each species and cut or pattern of architectural woodwork:

   a. General:

      1). Two (2) 12" x 12" solid wood and plywood or particle board samples with factory-applied transparent or opaque finish for each finish system and color required.

      2). Two (2) samples of each countertop material.

      3). One (1) unit of each type and finish of cabinet hardware.

   b. Initial Samples: Unless specific products are scheduled, submit 2" x 2", minimum, size samples of the complete range of colors, patterns, and finishes available for initial selection.

   c. Final Samples:

      1). Color, Pattern and Finish Samples: Submit 6" x 6" final samples matching those initially selected.

      2). Fused Joint Sample: On project products that would least likely obscure joints, submit 6" x 10" samples showing fused joint work.

   d. Laboratory Countertops: Unless specific products are scheduled, submit 2" x 2" size samples of the complete range of colors, patterns, and finishes available for each type of laboratory counter top material proposed for use.

4. Assurance / Control Submittals:

a. Manufacturer=s certificate that the products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

5. Certification: Submit manufacturer=s certification that the products furnished are lead free. All faucets and other components in direct contact with potable water shall be constructed entirely of lead-free materials including, but not limited to, pipes, tubing and solders.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Provide a written standard Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.6 COORDINATION

A. Pre-Installation Meeting: Convene a Pre-Installation Meeting at the Project Site prior to the delivery of casework to the Site.

1. Require attendance of the Contractor, Architect, Owner=s representative, and representatives of the installer of finish carpentry, other finishes, painting and related mechanical and electrical work.

2. Review coordination and environmental controls required for proper installation, and ambient conditions in areas to receive the work.

3. Review preparation and installation procedures, and the coordination and scheduling required with related work.

B. Support Work:

1. For support work not indicated in the Contact Documents, coordinate the requirements with other installers, in a timely manner.

2. Provide work as necessary to ensure that all work has proper framing, backing and reinforcing supports to ensure secure and solid installations.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minium of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Quality Standards:

1. Casework shall comply with the requirements of AWI ÄArchitectural Woodwork Quality Standards Illustrated@, Eight Edition, 200, except where more stringent requirements are specified herein. Provide custom quality.

2. Comply with SEFA standards as follows for the design, fabrication and installation of casework and laboratory equipment:

   a. SEFA 8-1999, ÄLaboratory Furniture, Casework, Shelving and Tables Recommended Practices.@

   b. SEFA 7-1996, ÄLaboratory and Hospital Fixtures Recommended Practices.@

   c. SEFA 2.3-1997, ÄInstallation of Scientific Laboratory Furniture and Equipment Recommended Practices.@

C. All wood casework and laboratory equipment shall be the product of a single manufacturer.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Package casework in water-tight containers for transport to the Project Site to prevent damage, water damage, soiling and deterioration and for storage in a location other than inside the building, if necessary.

C. If casework must be stored in other than the installation areas, store only in areas meeting the requirements specified for the installation areas.

D. Do not deliver casework until wet work, grinding, painting and similar operations which could damage, soil or deteriorate the casework has been completed in the installation areas, and humidity has been stabilized.

E. Deliver products to the Project Site in the manufacturer=s original, new, unopened packaging, crates or containers.

1.9 JOB CONDITIONS

A. The fabricator of the casework shall determine the optimum moisture content and required temperature and humidity conditions.

B. The Installer shall advise the Contractor of the temperature and humidity requirements for the casework installation areas. Do not install casework until the required temperature and relative humidity has been stabilized and will be maintained in the installation areas.

C. Stabilize temperature and humidity in the installation areas, as necessary, to maintain the moisture content of the installed casework within a 1.0% tolerance of optimum, from the start of installation throughout the remainder of the construction period.

D. Unless instructed otherwise by the Installer, maintain the spaces to receive casework between 65E and 80E F, with a relative humidity of 60% or less for 72 hours prior to, during and after installation until the date of Substantial Completion.

1.10 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Manufacturer=s Warranty: Provide fabricator=s standard Warranty against defects in product materials and workmanship.

PART 2PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Collegedale Casework, LLC.

2. Kewaunee Scientific Corporation

3. Sheldon Laboratory Systems

4. Fisher Scientific / Hamilton Medical Products.

5. Leonard Peterson & Co., Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 BASIS OF DESIGN

A. Product numbers scheduled on the Drawings are those of Collegedale, Collegiate unless specifically noted otherwise.

1. Products of similar design and construction by other acceptable manufacturers may be submitted to the Architect for review and approval. Acceptance is subject to compliance with the specified requirements as evidenced by submittal of the specified product data and Shop Drawings.

2. The product specified, as the basis of design, shall serve as the standard of quality in determining comparable construction of casework by other specified manufacturers. The Owner=s representative and the Architect shall be the sole judge in determining the comparable quality of casework products submitted by other manufacturers.

3. AWI Custom grade with factory-applied clear finish.

2.3 LUMBER

A. For Exposed Applications: Custom grade, plain cut natural birch. Lumber shall be clear, kiln dried, grade FAS or better and of similar grain and color for the entire installation.

B. For Semi-Exposed Applications: Hardwood, of the manufacturer=s selection. Lumber shall be kiln dried, without surface defects where exposed.

C. For Unexposed Applications: Manufacturer=s option.

2.4 SHEET MATERIALS

A. Plywood:

1. Exposed Applications: Minimum seven-ply softwood or hardwood core construction hardwood plywood meeting ANSI / HPVA HP-1-2004. Face veneers shall be AA, Custom grade, plain cut natural birch with the same, color and graining as the exposed lumber; book match veneers.

2. Semi-Exposed Applications: Minimum five-ply softwood or hardwood core construction hardwood plywood meeting ANSI / HPMA HP-1983, hardwood face veneers of the same species, color and graining to match exposed members.

3. Unexposed Applications: Minimum five-ply softwood or hardwood plywood.

B. Particleboard for Unexposed Applications: Mat formed, manufactured with long fibered cuttings, bonded with water-resistant adhesive; weighing a minimum of 42.5 lbs. / cu. ft.; complying with ANSI A208.1-1999, Grade M-2, exterior glue.

C. Hardboard: 1/4" thickness, tempered; meeting AHA 135.4-2004.

D. Plastic Laminates:

1. Type: Manufacturer=s standard plastic laminate conforming to NEMA Standard LD 3-2005, as follows:

a. Horizontal Applications: Grade HGS (0.048" nominal thickness).

b. Vertical Application: Grade VGS (0.028" nominal thickness).

c. Backing Sheets: Grade BKL (0.020" nominal thickness).

d. Cabinet Liner: Grade CLS (0.020" nominal thickness).

2. Color and Patterns: As selected by the Architect from the manufacturer=s standard colors, unless indicated otherwise in the Finish Schedule.

E. Glass: Clear, double-strength, AA@ grade, safety glass.

F. Stainless Steel: Type 302 / 304 alloy; #3 or #4 satin finish.

2.5 COUNTER TOPS

A. Casework Countertops: Manufacturer=s standard plastic laminate over particleboard core with backing sheet and matching plastic laminate edgebanding; laminate to the core with water-resistant adhesive.

B. Laboratory Tops: Manufacturer=s standard chemical-resistant, solid, 1" thick material of monolithic molded modified epoxy resins with a surface coating; black color.

2.6 HARDWARE

A. Hinges: Fabricate of, minimum, 0.093" thickness stainless steel, five knuckle, satin finish. Provide one pair of hinges for doors 4'-0" high or less; 1-1/2 pairs of hinges for doors over 4'-0" high.

B. Pulls for Drawers and Swinging Doors: Solid die-cast metal, manufacturer=s standard design, satin chrome finish. Provide two pulls for drawers over 2'-0" wide.

C. Pulls for Sliding Doors: Recessed finger pull type, minimum 2" diameter, satin chrome finish.

D. Catches: Nylon roller or friction type.

E. Shelf Standards and Supports: Manufacturer=s standard adjustable type, wrought steel, mortise mounted in cabinet end panels. Provide supports for each shelf at each standard. All surfaces shall be nickel plated.

F. Drawer Stops: Designed to permit easy drawer removal but not inadvertent drawer removal. Furnish stops for all drawers.

G. Sliding Door Assemblies: Double, overhead metal track with adjustable, nylon roller hangers and bottom guide; of size recommended by the manufacturer for the door size.

H. Locks: Half mortise design with only round cylinder exposed, five pin tumbler cylinder; satin chrome finish. All base and wall cabinet doors and drawers are to receive locks. Key all locks within a room alike. All casework locks shall be under one master key for the entire Project.

I. Label Holders: Size to receive 1" x 2" cards; satin chrome finish. Furnish one label holder per drawer.

J. Resilient Base: Extruded rubber or vinyl, black color, 4" high with pre-molded internal and external corners, coved type.

K. Leg Shoes: Extruded rubber or vinyl, black color, complete with hold down clips.

L. Drawer Glides: Heavy-duty, side mounted type, 75 lbs. capacity, zinc-plated steel; equip with heavy-duty ball bearing nylon wheels. Glides shall have automatic positive stops.

M. Toe Space Ventilator and Door Louvers: Manufacturer=s standard.

N. Rod Sockets: Die cast aluminum, surface-mounted insert with tapered rod hole to receive support rods; anodized finish.

O. Support Rods: Aluminum alloy, 3/4" diameter x 3'-0" length, rounded at top and tapered at the bottom to fit rod sockets; anodized finish.

P. Tote Tray: Vacuum formed polystyrene in the manufacturer=s standard color.

2.7 MECHANICAL SERVICE FIXTURES

A. Fixtures for water, gas, steam and other services shall be heavy-duty construction, especially fabricated for laboratory use. All fixtures shall be triple chrome-plated brass.

1. Water Faucets: Hot and cold water fixtures shall be case red brass, compression type with removable and replaceable seats. All fixtures shall have color coded

indexes and shall be equipped with serrated hose and a vacuum breaker nozzle, unless otherwise specified.

2. Gas, Air and Vacuum: Ground key cocks for gas, air, and vacuum shall be high grade brass forgings. Handles shall be one-piece construction. Core shall be spring-loaded for constant pressure and automatic take-up, and shall open full at one quarter turn. Cocks shall have integral, tenserration, non-slip hose ends and color coded indexes. Provide ground key cocks for low pressure service. Provide needle point valves for high pressures and oxygen service.

3. Electrical Fixtures: Flush-mounted electrical boxes shall be cadmium-plated steel. Pedestal type boxes shall be polished, cast aluminum with nipple and lock nuts. All boxes shall be equipped with stainless steel cover plates. Receptacles shall be 3-wire grounded type, 15A, 125V.

4. Other Mechanical Fixtures: Other fixtures shall be laboratory grade as approved by the laboratory casework manufacturer, designed for laboratory use and meeting all Codes.

5. Plastic Traps and Fittings: Plastic traps and fittings shall be made from chemical-resistant, flame-retardant, polypropylene material with schedule 40 wall thickness. Connections shall be made mechanical type. Traps shall be 1-1/2" size.

6. Sinks: Manufacturer=s standard types as follows:

   a. One-piece modified epoxy resin specially compounded and cured for optimum physical and chemical resistant properties. Provide with 1-1/2" diameter tailpiece and acid-resistant lined solids interceptor. Tailpiece shall be for connecting by mechanical joint to a trap or pipe only.

   b. Modified epoxy resin type sinks, approximate size: 24" long x 16" wide x 8" deep.

7. Sink Accessories: Stops, strainers, supports, straps and accessories for a complete installation.

2.8 FABRICATION

A. Field measure spaces where each casework item is to be placed, prior to the preparation of Shop Drawings and fabrication to insure proper fit of the work.

B. Factory fabricate casework components in accordance with the product data and approved Shop Drawings. Fabricate units to the sizes and configurations indicated.

C. Construct units square with plumb vertical lines. Fabricate with mortise and tenon joints, all joints glued, and screwed together.

D. Edgeband all edges of exposed plywood components and exposed edges of semi-exposed plywood components with hardwood edge strips and matching faces in species, color and graining.

E. No exposed edge grain will be allowable in the finished work.

F. Construct swinging pairs of doors with doors hinged to end panels; mount catches on the meeting rail.

G. Construct drawers with dovetail joints at drawer fronts and sides.

H. Doors shall be lipped type, overlapping the face frame at all edges.

I. Provide filler panels in the same material and finish as the casework.

J. Provide 1" high ledges (seismic lips) on all sides of all shelving consisting of a 2" high x 1/8" thick PVC band applied to the outside shelf face with hot melt glue. Contact cement is not acceptable.

2.9 FINISHES

A. Completely factory-finish casework components in accordance with the manufacturer=s standard procedures. Sand exposed and semi-exposed components to remove machine marks, surface blemishes and stains prior to finishing.

B. Exposed surfaces: Apply the following, in sequence; sand between each coat:

1. Sanding sealer.

2. Stain, matching the color selected.

3. Wood filler.

4. Finish, minimum two (2) coats of chemical-resistant, satin finish varnish, heat dried.

C. Semi-Exposed Surfaces: Apply the following, in sequence; sand between each coat:

1. Sanding sealer.

2. Stain, matching the casework exterior.

3. Finish, minimum of one (1) coat of chemical-resistant, satin finish varnish, heat dried.

D. Unexposed Surfaces: One (1) coat of sealer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates, and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Condition casework to the average prevailing humidity conditions in the installation areas before installing.

B. Install concrete inserts and similar anchoring devices to be built into substrates well in advance of the time the substrates are to be installed.

C. Prior to installation of the casework, examine the shop-fabricated units for completion as required, including back priming.

3.3 INSTALLATION

A. Uncrate and set casework items in place at the locations shown on the Drawings. Secure as indicated on the approved Shop Drawings. Units shall be plumb and level within 1/8" in 20'-0". Provide concealed shims as indicated on the approved Shop Drawings.

B. Install casework, fixtures and equipment in compliance with the manufacturer=s instructions and SEFA 2.3 standard.

C. Where casework abuts other finished work, scribe and cut for accurate fit. Provide matching fillers where required.

D. Trim: Install in single unjointed lengths for openings and runs less than 10'-0" in length. For longer runs, use only one piece shorter than 10'-0" in straight runs.

E. Coordinate the installation of casework with related work for the proper placement of anchors, mechanical, plumbing and electrical items, and accessories.

F. Install laboratory equipment in accordance with the manufacturer=s product data and the approved Shop Drawings.

G. Adjust operating hardware for proper operation. Repair damaged items to their original condition. Replace damaged items which cannot be repaired to the satisfaction of the Owner=s representative.

H. Ensure that doors and drawers operate smoothly and easily without sticking or binding.

I. Touch-up damages to factory-finished casework, as required. Replace items if the touch-up work is not satisfactory to the Owner=s representative.

3.4 CONSTRUCTION

A. Interface with Other Work:

1. Coordinate the installation sequence of fixtures with the trades providing utilities to the fixtures.

B. Tolerances:

1. Fabrication: Variation of Components Size: + 1/8". Location of Openings + 1/8" from the required location.

2. Installation: 1/8" in 8'-0" for plumb and level, including countertops and with 1/64" maximum offset in flush adjoining surfaces; 1/32" maximum offsets in revealed adjoining surfaces.

C. Finishing:

1. Repair damaged and defective casework wherever possible to eliminate defects functionally and visually. Where not possible to repair to the satisfaction of the Owner=s representative, replace the casework.

2. Adjust joiner for a uniform appearance.

3. Touch-up shop-applied finishes to restore damaged and soiled areas.

4. Complete the finishing work specified as work of this Section, to whatever extent not completed in the shop or prior to installation of the casework.

3.5 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Lubricate and make final adjustment of moving and operating parts for smooth and correct operation.

C. Installer shall return to the Project prior to Substantial Completion, repair any damage to the work and readjust the hardware.

3.6 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect installations for flush, plumb, level, alignment and secure attachment to substrates.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Clean all exposed and semi-exposed surfaces of the casework, counters, shelves, hardware, fittings, and fixtures.

3.8 PROTECTION

A. The Installer shall advise the Contractor of the procedures required to protect the casework and equipment during the remainder of the construction to ensure that the work will be without damage and deterioration at the time of final acceptance.

B. Protect the installed casework from soiling, damage and excessive relative humidity until Substantial Completion. Cover with polyethylene or other approved protective material.

END OF SECTION

SECTION 12484

FLOOR MATS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reversable floor mats.

2. Recessed mat frames.

3. Accessories.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03302 - Cast-in-Place Concrete: Floor substitute.

2. Section 08400 - Entrances, Storefronts and Windows: Entrance doors.

3. Section 09300 - Tile: Floor finish.

4. Section 09650 - Resilient Flooring: Floor finish.

1.2 DESCRIPTION OF WORK

A. The extent of the floor mats and frames work is as indicated on the Drawings and specified herein, and includes providing and installing reversable mats, recessed stainless steel frames and accessories necessary for proper installation.

B. Mat and frame installations shall comply with the Building Code and ADAAG.

1.3 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. Publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM B 117 - Practice for Operating Salt Spray (Fog) Apparatus.

2. ASTM D 2047 - Test Method for Static Coefficient of Friction of Polish - Coated Flooring Surfaces as Measured by the James Machine.

3. ASTM E 648 - Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

C. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Schools.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Manufacturer=s published descriptive literature, complete specifications, installation instructions, method of installation, and substrate preparation.

2. Shop Drawings: Show layout, profiles and product components, include details, direction of traffic, spline locations, anchorage, accessories, finish colors, patterns and textures.

3. Samples: For each type and color of exposed mat, frame and accessory required, two (2) - 12" x 12" samples of the mat material and frame.

4. Assurance / Control Submittals:

a. Certified test reports showing compliance with the specified performance characteristics and physical properties.

b. Documentation of experience indicating compliance with the specified qualifications requirements.

5. Maintenance Data: Manufacturer=s printed instructions for cleaning and maintaining the mats.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Special Warranty: Submit a written special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing Products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

B. Flammability: Minimum 0.45 watts / sq. m. in accordance with ASTM E 648, Class 1.

C. Slip Resistance: Minimum 0.60 for assembled routes in accordance with ASTM D 2047.

D. Single Source Responsibility: Obtain all floor grids and frames from a single manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle store and protect Products.

B. Protect metal framing from corrosion, deformation and other damage during delivery,

storage and handling.

C. Deliver materials to the Job Site ready for use and fabricated in sections and assemblies as large as practical.

D. Protect finished aluminum surfaces with strippable coating. Do not use adhesive paper or sprayed coating which bond when exposed to sunlight or weather.

E. Deliver materials to the Project Site in the manufacturer=s original, unopened packages, containers or bundles bearing the brand name and identification of manufacturer.

F. Storage and protection: Store mats and metal frames under weatherproof covering, in a dry and protected location until ready for installation; ventilate to avoid condensation.

1.7 COORDINATION

A. Coordinate the frame installation with the concrete construction to ensure that the recess and frame anchorage are accurately located, and the base is level and flat. Defer frame installation until the building enclosure is complete and interior finish work is in progress.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty that the products are free of defective materials and workmanship, and will repair or replace any defective component or the system, in whole or part, as necessary to restore the product to its original intended state and integrity.

2. Warranty Period: Five (5) years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. MATS, Inc.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. MATS, Inc. component designations are used within this Section to identify mat and frame types.

1. Recessed Foot Grid: Nuway Tuftguard by Mats, Inc.

2. Frame: Aluminum, ADeep Frame@, 1-1/4" mat and frame depth.

3. Mats: Alternating aluminum and unbuffed rubber strips with PVC spacers to allow for the passage of water and debris; reversible.

B. Fabrication:

1. Fabricate mats to the greatest extent possible, in single units for each installation, but do not exceed the manufacturer=s maximum size recommendation for units to be removed for cleaning and reversal. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Size as shown on Drawings.

2. Provide frames in single lengths. When frame dimensions exceed the maximum lengths available, use the least number of pieces possible, with hairline joints equally spaced, and spliced with straight connection pins.

3. Miter corners and join with corner gusset and plates for hairline joints.

4. Coat the surfaces of frames to be installed in contact with cementitious material, with a zinc chromate primer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates, and conditions are as required, and ready to receive the work.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Manufacturer shall provide assistance and guidance, and provide a template for irregular shaped grid assemblies to ensure proper installation.

3.3 INSTALLATION

A. Strictly comply with the manufacturer=s installation instructions and recommendations.

B. Set the mat height as recommended by the manufacturer for the most effective cleaning action.

C. Coordinate the top of mat surfaces with the bottom of doors that swing across to provide ample clearance between the door bottom and top of the mat.

D. Coordinate the installation with adjacent work to avoid a tripping hazard.

1. The installation shall comply with ADAAG.

3.4 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field inspection.

B. Inspect the installation and relationship to adjacent floor finishes to ensure avoidance of trip hazards.

3.5 CLEANING

A. Section 01700 - Execution Requirements: Cleaning the installed work.

B. Refer to the Manufacturer=s Cleaning and Maintenance Instructions.

3.6 PROTECTION

A. After completing the frame installation and concrete work, provide a temporary filler of plywood or fiberboard in the recess, and cover the frames with plywood protective flooring. Install mats for Substantial Completion of the Project.

B. Maintain the temporary protection until construction traffic has ended and the Project is near Substantial Completion.

END OF SECTION

SECTION 12492

BLINDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Horizontal metal slat louver blinds.

2. Mounting system.

3. Operating hardware.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-In-Place Concrete: Substrate for attachment.

2. Section 04230 - Reinforced Unit Masonry: Substrate for attachment.

3. Section 09110 - Non-Load Bearing Steel Framing: Structure for attachment.

4. Section 09250 - Gypsum Board: Adjacent wall finish.

1.2 DESCRIPTION OF WORK

A. The extent of the horizontal metal blinds work is indicated on the Drawings and as specified herein, and includes providing and installing slat louver blinds, mounting systems and operating hardware and devices.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Data indicating the physical and dimensional characteristics and operating features.

2. Shop Drawings: Indicate opening sizes, quantities of each size, location of each size, tolerances required, method of attachment, clearances and operation.

3. Samples: Two each, 12" long illustrating slat material, finish and color.

4. Assurance / Control Submittals:

a. Manufacturer's certificate that products meet or exceed the specified requirements.

b. Documentation of experience indicating compliance with the specified

qualifications requirements.

c. Manufacturer's Installation Instructions: Indicate special procedures and any perimeter conditions requiring special attention.

B. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Operation and Maintenance Data: Manufacturer's recommendations for maintenance and cleaning.

2. Warranty: Submit a manufacturer=s special Warranty with forms completed in the name of the Owner and registered with the manufacturer.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Company experienced in performing the work of this Section with a minimum of five (5) years documented experience.

1.5 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products.

B. Deliver products to the Project Site in the manufacturer's original, unopened protective packaging.

C. Store blinds to prevent damage to the materials, finishes and operating mechanisms.

D. Handle to prevent damage to the slats and operating mechanisms.

1.6 JOB CONDITIONS

A. Existing Conditions: Take field measurements of the openings to determine the exact size required for each opening.

1.7 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Provide a written Warranty, signed by the blinds manufacturer agreeing to repair or replace blinds that do not meet the requirement, or that fail in materials or workmanship.

2. Warranty Period: Lifetime.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Springs Window Fashions (Bali).

2. Hunter Douglas Contract.

3. Levolor.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.2 MATERIALS

A. Model / Color:

1. Springs Window Fashions: The Bali Classics Mini Blinds, 1", AMatte White@ color or as approved.

2. Hunter Douglas: 1" Mini Aluminum Blinds, Model CD80, ALinen Flirt@ color or as approved.

3. Levelor: Mark I DustGuard, 1" Blind, Model MARK 1, "Dover" color or as approved.

B. Blinds: Horizontal slat louvers, hung from a full-width headrail with full-width bottom rail; manual control for raising and lowering by a cord with full-range locking; open and closed point locking; blade angle adjustable by a control wand.

C. Metal Slats: Spring-tempered, pre-finished aluminum, radiused slat corners with manufacturing burrs removed.

1. Width: 1".

2. Thickness: 0.008", minimum.

D. Slat Support: Braded polyester yarn, ladder configuration.

E. Headrail: Pre-finished, formed steel box with end caps; internally fitted with hardware, pulleys and bearings for operation; same depth as the width of the slats.

1. Color: Same as the slats.

F. Bottom Rail: Pre-finished, formed steel with top side shaped to match the slat curvature; end caps.

1. Color: Same as the slats.

G. Lift Cord: Braided polyester, continuous loop.

1. Free end looped through a wall-mounted, spring tensioned pulley.

2. Color: White.

H. Control Wand: Extruded solid transparent plastic, ribbed or hexagonal shape.

1. Non-removable type.

2. Length of window opening height less 3".

3. Color: Clear.

I. Headrail Attachment: Wall brackets.

J. Accessory Hardware: Type recommended by the blind manufacturer.

2.3 FABRICATION

A. Fabricate blinds to cover the window frames completely.

B. At openings requiring multiple blind units, provide separate blind assemblies with a 1" space between assemblies; located at window mullion centers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that structural blocking and supports, if required, are in place and correctly located.

C. Report, in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install blinds in accordance with the manufacturer's published instructions, at each window and where shown on the Drawings.

B. Secure in place with concealed fasteners.

3.3 CONSTRUCTION

A. Interface with other Work: Coordinate the work of this Section with the window installation and placement of concealed blocking to support the blinds.

B. Site Tolerances:

1. Maximum Variation of Gap at Window Opening Perimeter: 1/4".

2. Maximum Offset From Level: 1/8".

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Adjusting the installed work.

B. Adjusting blinds to hang level and plumb.

C. Adjust operating hardware for smooth operation.

3.5 FIELD QUALITY CONTROL

A. Section 01450 - Quality Control: Field testing and inspection.

B. Inspect the installation, attachment and operation of the blinds.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Requirements for adjusting and cleaning.

B. Clean blinds surfaces prior to the Final Acceptance inspection.

END OF SECTION

SECTION 14240

ELEVATOR, HYDRAULIC

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hydraulic elevator system.

2. Elevator cab.

3. Elevator equipment.

4. All related work and materials.

B. Related Documents: The Contract Documents, as defined in Section 01010 - Summary of Work, apply to the work of this Section. Additional requirements and information necessary to complete the work of this Section may be found in other Documents.

C. Related Sections:

1. Section 03300 - Cast-in-Place Concrete: Hoistway structure.

2. Section 05500 - Metal Fabrications: Sills.

3. Section 07900 - Joint Sealers: Sealant around door frames.

1.2 DESCRIPTION OF WORK

A. The extent of elevator work is indicated on the Drawings and as specified herein, and includes providing and installing elevator plant(s), complete, in a first-class workmanlike manner and all related work and materials. All work and material shall conform to the requirements of American National Standards Institute (ANSI), Safety Code for Elevators and Escalators, latest edition, the National Electric Code, and local codes which govern the installation for elevators.

B. In all cases where a device or part of equipment is herein referred to in the singular number, it is intended that such references shall apply to as many such devices as are required.

1.3 RELATED WORK

A. Refer to other Sections of these Specifications for related work that is required but is not the work of this Section, including electrical service with fused disconnect switches for the elevator system, hoistway, pit, and Machine Room; access lighting, air conditioning and services.

B. Preparatory work required in conjunction with the elevator installation shall consist of the following:

1. A legal hoistway, properly framed and enclosed, which shall withstand the forces

and loads resulting from use of the elevator; a pit of proper depth with pit ladder, pit screens, lighting, drains, waterproofing and sump pump, as required.

2. A clear and plumb hoistway. Bevel cants (15 degrees from vertical) over any rear or side wall ledges and beams that project 2" or more into the hoistway.

3. A Machine Room, properly lighted, isolated from outside atmosphere, fire-resistant, including concrete floors and foundations with adequate ladders and guards, self closing and locking access door; cooled to maintain a maximum temperature of
85E F; fire extinguisher, lighting and communications.

C. Furnish in place, as shown on the Drawings and as required, all supports for guide rail brackets. The Elevator Contractor shall provide inserts to the General Contractor for setting as required. Guard and protect the hoistway while equipment is being installed. Do all cutting and patching of beams, walls and masonry work required, including repairs to plaster.

D. Provide all chases and openings as required by the Elevator Contractor and as shown on the Elevator Drawings.

E. Provide proper electrical conductors to the elevator control panel terminals; include necessary mainline switches, circuit breakers or fuses. Provide all necessary outlets in the Machine Room for the elevator signal equipment and in the pit for a pit light; power of the necessary characteristics during installation to provide illumination, operation of the required tools and hoist and power for starting, testing and adjusting the elevator.

F. Provide divider beams between adjacent elevators at each floor, pit and overhead. Provide car intermediate rail supports where floor heights exceed 14' - 0".

G. Install guide rail bracket supports set in concrete, as required.

H. Provide wall blockouts for pushbutton stations, hall lanterns, position indicators and other signal fixtures.

I. Provide three-phase, mainline electrical power feeders to terminals of the elevator controller unit in the Machine Room. Include protected, lockable "off" disconnect switch. Provide single-phase power feeders to the elevator controller for lighting and exhaust blower. Provide temporary power and illumination needed to install, test and adjust the elevator equipment.

J. Provide venting means to prevent the accumulation of smoke and gasses in the hoistway; minimum 3'-0" sq. ft. per hoistway or 3.5% of the total hoistway area, whichever is greater.

K. Provide a 3'-0" square hole in the pit floor to install a protective casing. Fill the hole with concrete after jack installation. Provide pit support framing for jack cylinder and buffer loads. Provide opening in the hoistway wall for the passage of hydraulic piping.

L. Furnish and install sill support angles; material to run the full-width of the hoistway.

M. Furnish Lobby finishes after installing the elevator entrance.

N. Furnish and install emergency power through the same conductors used for normal power and through the elevator company’s controller terminals switch.

O. Install: Wiring for the communications (intercom) system.

P. Maintain elevator vertical alignment within a tolerance of +/- 1" throughout.

Q. Furnish elevator cab finishes as designated.

1.4 REFERENCES

A. American National Standards Institute (ANSI):

1. ANSI A 17.1 - Safety Code for Elevators and Escalators.

2. ANSI A 17.2 - Guide for Inspection of Elevators, Escalators and Moving Walks.

3. ANSI A 117.1 - Accessible and Useable Buildings and Facilities.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 53 / A 53M - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

2. ASTM E 176 - Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip.

C. American Welding Society (AWS):

1. AWS D1.1/ D1.1M - Structural Welding Code - Steel.

D. Americans with Disabilities Act Accessibility Guidelines (ADAAG):

1. Accessibility Guidelines for Buildings and Facilities.

E. National Fire Protection Association (NFPA):

1. NFPA 70: National Electrical Code.

2. Standard No. 80 - Standard for Fire Doors and Other Opening Protectives.

F. National Elevator Industry, Inc. (NEII):

1. Suggested Minimum Passenger Elevator Requirements for the Handicapped.

G. Society for Protective Coatings (formerly Structural Steel Painting Council):

1. SSPC SP 5 - White Metal Blast Cleaning.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Product Data: Indicate required performances, controls, capacities, features and finishes for the elevator.

2. Shop Drawings: Submit for approval. Include enough detailed information to determine that the equipment conforms to the requirements of this Specification but not less than the following:

a. Location of machinery and controls in the Machine Room.

b. Shop Drawings and catalog cuts for all Contractor-furnished materials and equipment, including a complete layout of the hoistway in plan and elevation and all other layout information and clearance dimensions.

c. Complete information on the motors, pumps, gauges, tanks, piping, valves, control system and buffers.

d. Seismic Zone No. 3 and 4: Include details of rail brackets, method of fastening brackets to the structure and the details of earthquake protection.

3. Operation and Maintenance Instructions: Three (3) sets of neatly bound operating and maintenance instructions shall be furnished, specific to the installation. The operation portion shall be bound separately from the maintenance portion. Operating instructions shall include detailed information relative to the type, method, and sequence of operation. Maintenance instructions shall include the complete system, repairing, and ordering of all replacement parts, and shall be fully illustrated for clarity. Any components or methods peculiar to the particular system shall be included in detail.

4. Wiring Diagrams: Complete wiring and single line diagrams showing the electrical connections, functions, and sequence of operation of all apparatus associated with the elevator, both in the Machine Room and in the hoistway, shall be furnished in duplicate. One set shall be plastic or glass covered, framed and mounted in the Machine Room. The other set shall be given to the Owner's representative.

5. Lubrication Chart: One plastic or glass covered and framed lubrication chart shall be furnished and mounted, as directed, in the Machine Room. The chart shall identify lubricants as well as lubrication points and the required frequency of lubrication.

6. Certificates and Permits: Provide a copy of all inspection / acceptance certificates and operating permits required by the governing authorities having jurisdiction to allow normal, unrestricted use of the elevator.

a. The Elevator Contractor shall obtain and pay for all necessary inspections and permits and make tests as called for by regulations of the governing authorities.

7. Service Contract: Provide a 1 year Continuing Maintenance Service Contract for service after the date of final acceptance, at no additional cost to the owner.

B. Elevator Schedules indicate the required performances, controls, capacities, features and finishes for each elevator, or group of elevators, and are to be submitted on the forms provided as attachments A - D.

C. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

1. Warranty: Provide a written Warranty with forms completed in the name of the Owner and registered with the manufacturer.

2. Service Contract: Provide owner with a signed copy.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing the products specified with a minimum of five (5) years documented experience.

2. Installer: Either the elevator manufacturer, or a licensee of the manufacturer, who has not less than five (5) years of successful experience installing similar type elevators.

B. Regulatory Requirements:

1. Elevator Code: Except for more stringent requirements as indicated or imposed by required governing regulations, comply with the applicable requirements of ANSI / ASME A17.1, Safety Code for Elevators and Escalators, except indirect hydraulic elevators, which is based on ANSI and J.I.S. Code (hereinafter referred to as the "Code").

2. Fire Resistance of Entrances: Comply with NFPA No. 80 and provide units bearing UL labels with thirty minutes temperature rise on the labels, or comply with ANSI A17.1.

3. NEII, Standards for the Handicapped: Except as otherwise indicated, comply with NEII "Suggested Minimum Passenger Elevator Requirements For The Handicapped", including clearances, handrails, locations for signal equipment and similar provisions.

4. Conform to Americans with Disabilities Act Accessibility Guidelines (ADAAG).

5. Document Verification: In order to discover and resolve any conflicts or lack of definition which might create construction problems, the elevator supplier shall review the documents for compatibility with their respective products. Review and verification shall include, but not be limited to, architectural, structural, mechanical, and electrical Drawings, and the Specifications.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01600 - Product Requirements: Transport, handle, store and protect the products

B. Protect the products from water, dust and humidity damage during delivery, handling, storage and installation.

C. Deliver products to the Project Site in the manufacturer’s original, unopened packaging, dry and undamaged with seals and labels intact.

D. Store under cover in dry, weathertight conditions. Place units on 4" high wood sills or store otherwise in a manner to prevent rust and damage.

E. Store products in a location protected from the weather and construction operations.

F. Inspect the products for damage. Minor damages may be repaired provided the finish items are equal, in all respects, to new work, and acceptable to the Owner’s representative; otherwise remove and replace the damaged items.

G. Protect adjacent work and materials from damage during installation of the bleachers.

Damaged work shall be repaired or replaced, as determined by the Owner's representative.

1.8 WARRANTY

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Special Warranty:

1. Submit a written Warranty jointly signed by the Contractor, Installer and manufacturer, certifying that the products and installation is free of defective materials and workmanship, and agreeing to repair, replace, and / or restore defective materials and workmanship during the warranty period. "Defective" is hereby defined to include operation or control systems performance below the required minimums, excessive wear, unusual deterioration or aging of materials and finishes, unsafe conditions, need for excessive maintenance, abnormal noise or vibration, and similar unusual, unexpected and unsatisfactory conditions.

2. The elevator manufacturer has no responsibility for work done by others, or defects brought about by abuse, misuse, neglect or cause beyond the manufacturer's control.

3. Warranty Period: One (1) year from the date of final acceptance.

1.9 MAINTENANCE

A. Section 01780 - Closeout Submittals: Procedures for closeout submittals.

B. Regular Maintenance Service: Regular maintenance on the elevator shall be provided and paid for by the Contractor for a period of twelve (12) months after the date of final acceptance. The maintenance service shall include regular examinations of the installation by competent and trained personnel and shall include all necessary adjustments, greasing, oiling, equipment cleaning, and supplies and parts to keep the equipment in good operating condition.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. The completed elevator installation shall conform to ANSI A17.1 and A17.2, the handicap requirements of ANSI A 117.1, and ADAAG. The installation, including equipment, materials, workmanship, design, and tests shall be in accordance with the standards, rules and specifications referenced.

B. All material and equipment shall be new.

C. The equipment shall be the product of a company regularly engaged in the manufacture of this type of equipment.

D. Working parts shall be accessible for inspection, servicing, and repair. Adequate means shall be provided for servicing all wearing parts that require lubrication.

E. Electrical materials shall meet, and bear evidence of meeting the requirements of Underwriter's Laboratories or Factory Mutual Systems.

2.2 MANUFACTURERS

A. Subject to compliance with project requirements, manufacturers offering products which may be incorporated into the work include the following:

1. Otis Elevator Company (United Technologies).

2. Montgomery Elevator Co.

3. Dover Elevator Co.

4. Shindler Elevator Corp.

5. Fujitec.

B. Section 01600 - Product Requirements: Product Options: Substitutions permitted.

2.3 ELEVATOR DESCRIPTION

A. Otis Elevator Co. components are referenced within this Section to establish quality and to identify components. Other manufacturer's acceptable system shall be equivalent.

B. General: Twin direct-acting hydraulic cylinder, holeless, Otis Model # LVM 2000L.

Type of Machine	Hydraulic with valves in tank, submerged pump and motor
Load (Capacity)	[2000 pounds]
Car Speed	[125] feet per minute
Operation	Simplex Collective
Control	Microprocessor
Rise	[12' - 0"]
Number of Stops & Openings	[Two (2) at front of hoistway]
Maintenance Period	12 months
Power Supply	[208] volts, 3 phase, 60 hertz
Lighting Supply	120 volts, 1 phase, 15 amp, 60 hertz
Inside Clear Car Dimension	[5' - 8" wide x 4' - 3" deep]
Inside Cab Height	[8']
Height Under Suspended Ceiling	[8' - 11-1/2"]
Type of Doors for Car and Hoistway Entrances	[Side Opening]
Hoistway Entrance and Car Opening Size	3' - 0" Wide x 7' - 0" High
Car Operating Panel	[One (1) at front]
Finishes	See 2.10, 2.11 and 2.12

C. Performance:

1. Speed: Full-load "UP" shall be not less than 90% of the rated speed. Full-load "DOWN" shall be not more than 125% of the rated speed. No-load "UP" or "DOWN" shall be within 5% of the rated speed.

2. Capacity: Safely lower, stop and hold 125% of the rated load.

3. Doors shall start to open while the elevator is leveling and shall be 75% open when the car is level with the landing. Leveling accuracy shall be 1/4" plus or minus under all load conditions and regardless of the direction of travel. There shall be no appreciable time lag between starting of the pump and upward movement of the elevator.

D. Welding: All welding shall conform with AWS D1.1.

E. Painting: Field painting shall conform to the requirements of Division 9 of these Specifications. Shop painting shall include one coat of primer applied by the manufacturer at the factory.

2.4 CAR OPERATION AND CONTROL

A. Emergency Stop Switch and Alarm Button: Provide an emergency stop switch and alarm button in the car operating panel. Operation of the stop switch shall interrupt the power supply and stop the elevator travel independently of the regular operating device. The emergency stop switch and emergency alarm button shall be connected to one alarm bell to serve as emergency signal. The alarm bell, including conduit and wiring, shall be located in the hoistway.

1. The alarm button shall be a double contact type. One contact shall operate an AC bell from the normal AC power supply. The other contact shall operate a different bell powered from the car emergency lighting power supply. Both bells shall be 6" in size. Bells and their locations shall conform to ANSI A117.1.

B. Top of Car Operating Device: Provide an operating device, mounted on or from the car crosshead, which will permit slow speed car operation for purposes of adjustment, maintenance and repair. The control shall consist of five buttons listed "UP", "DOWN", "SAFETY", "EMERGENCY STOP SWITCH" (red in color), and "INSPECTION SWITCH". The transfer switch shall be provided in the top-of-car operating device fixture which will disconnect the hoistway access switch or switches and render the top-of-car operating device operative. The device shall include an emergency stop switch but will not require additional means for operation of the power door operators or automatic car leveling devices. A safety shall be provided so that operation of "UP" and "DOWN" buttons will only occur when the safety button is held in. The device shall be mounted in a metal box and shall be rigidly secured in a position readily accessible to workmen on top of the car. Operating buttons and control handles shall be shrouded or otherwise protected in an approved manner to preclude movement.

C. Hoistway Access: Provide key-operated hoistway access switches which shall permit limited movement of the car at terminal floors, car door opening and car positioning. The switches shall be operative only when the inspection switch in the car operating panel is in the "INSPECTION" position. Automatic operation of the elevator, and car hoistway doors shall be inoperative when the hoistway access switch is in use. The switch shall be a cylinder type having at least five pins or discs and shall spring return to the "OFF" position. The key shall be different from all other building keys except the elevator inspection switch key.

D. Selective Collective Automatic Operation: Provision shall be made for operation "Without Attendant". Operation of the elevator shall be from push buttons at the landing and in the car. An “UP” and a “DOWN” button shall be provided at each intermediate landing and a single button at the terminal landings. Pressure on a car button or a landing button shall dispatch or call the car to the desired landing, provided the interlock circuits have been established.

1. If, while the car is making an upward trip, a lower landing button is pressed, it shall not interrupt completion of the upward trip. After the interlock circuits have been re-established, the car shall automatically reverse and respond to the lower landing call.

2. The elevator shall operate similarly for the downward direction of travel. A time limit shall be provided, arranged to hold the car at the landing where it has stopped for a predetermined period. After all car and landing calls have been answered, the car shall automatically park at the ground level landing until another call is made.

3. The landing button pressed at the same floor where the car is parked shall open the car and hoistway doors.

4. Operation of the "EMERGENCY STOP" switch shall not cancel the registered calls, and after the switch is again released, the car shall resume answering registered calls.

5. Door safety edge and safety light ray devices shall operate for any door opened.

2.5 ELEVATOR MACHINE

A. General: The elevator machine shall be an electric motor-driven hydraulic pump, with direct plunger. The elevator machine shall have a maximum acoustic output of 60 dbA within a range of 20 Hz to 20 KHz measured within the Machine Room. The tank and all machinery shall be properly balanced to eliminate vibration and shall be provided with restraining devices to prevent movement due to earthquakes. Machines and controller frames in the Machine Room shall be finished in accordance with the manufacturer's standard practice. All iron work, metal fittings, and other un-coated ferrous surfaces exposed in the hoistway, Machine Room and areas adjacent thereto shall be cleaned and painted with one coat of approved rust-inhibitive paint and one coat of black paint conforming to the requirements of Division 9 of these Specifications.

B. Power Unit: The power unit (oil pumping and control mechanism) shall include an oil-hydraulic pump, an electric motor, a drive assembly, an oil strainer in the suction line, a structural steel outer base with tank supports, an oil-tight drip pan, an inner base for mounting a motor pump assembly, all combined in a compact and neatly designed self-contained unit. The power unit shall be quiet in operation. Maximum acoustical output level shall not exceed 86 decibels within a frequency range of 20 to 10,000 Hertz, measured within the Machine Room.

The elevator power unit and piping shall be installed with vibration absorption mountings and connections to prevent the transfer of machine noise to the building structure.

1. Pump: Shall be specially designed and manufactured for oil-hydraulic elevator service. It shall be of the positive displacement screw type, inherently designed for smooth operation and steady discharge with minimum pulsations. Pump speed shall not exceed 3500 revolutions per minute. A screened inlet shall be provided at the suction end.

2. Motor: Shall be manufacturer’s standard alternating current, polyphase squirrel cage induction type, designed for oil-hydraulic elevator service. It shall have a duty rating to comply with the speed and load herein specified. The drive shall be multiple V-belts with sheaves. Drive belts shall be provided as a factory balanced set and shall be installed strictly in accordance with the manufacturer’s instructions. Provide guards for the belt drive.

3. Storage Tank: Shall be constructed of steel and shall be provided with a removable oil dip stick. The pump and submergible motor shall be mounted on a special reinforced isolation mount in the bottom of the tank. The control valve shall be mounted in the discharge line above the oil level and easily accessible

from the top of the tank.

4. An initial supply of oil sufficient for proper operation shall be provided.

C. Oil Control: Unit shall consist of an integrated unit valve, including an “up” valve, a “down” valve, “up and down” leveling valves, a check valve, a high pressure relief valve, a tank shut-off valve and a manually-operated lowering valve. Operation of the manual lowering valve shall not require removal of any covers or shrouds.

1. All adjustments shall be readily accessible and shall be made without removing the assembly from the oil line.

2. The oil reservoir shall be a reinforced tank with tank cover. A strainer that can be readily cleaned shall be provided to prevent foreign materials from the fill reservoir from entering the pump and control systems. The tank shall provide capacity for full plunger displacement plus 25%.

3. A blowout-proof muffler shall be provided in the oil line to damp pulsations from the pump.

4. Provide Schedule 80, minimum, grooved end piping conforming to ASTM A 53, and fittings conforming to MIL-P-10388, rated for use with the maximum fluid pressure proposed for the specific elevator design. Gasket materials shall be suitable for use in the fluids provided. Provide a dielectric union at each end of a pipe run: one in the Machine Room and one in the pit. Provide seismic supports for all piping.

5. Provide Schedule 80 piping from the hoistway to the most remote location of the pumping plant. Piping shall be exposed and installed with hangers and supports. Tap both ends of the run for pressure gauges and supply plugs.

6. No hoses or screwed or flanged fittings will be permitted. Tap pipe for pressure gauges near the pump and cylinder and provide plugs.

7. A low oil condition shall automatically cause the car to descend to the lowest landing, open the car door, and shut down the elevator operation except for door control circuits. An indicator on the Machine Room control panel shall indicate the cause of the shutdown. Service shall be restored by replenishing the oil and pushing a manual reset or by recycling the main disconnect switch.

8. Provide devices to maintain the oil temperature between 45E and 95E F, regardless of the ambient temperature.

D. Cylinder-Plunger Unit: The cylinder-plunger unit shall be designed and constructed in accordance with ANSI A117.1. It shall be of sufficient size to lift the gross load the height specified, at the rated speed specified, and shall be factory tested to insure adequate strength and freedom from leakage. The plunger finish shall be 16 micro inches or finer. Packing shall inhibit oil leakage. Provide a scavenger pump to return leakage oil in the system to the tank with copper tubing.

1. Plunger couplings, if used, shall be internal type, shop assembled. The diameter of the plunger shall not vary more than .01" throughout its length, including the coupling area. Protect the plunger during shipment and handling. If gouged or scored to the extent of damaging the packing, it shall be replaced.

2. Provide a drip ring on the cylinder to capture excess oil. Provide packing which

inhibits oil leakage.

3. The cylinder shall be seamless steel pipe or tubing of thickness to withstand the maximum pressure and shall be at least 1-1/2" (nominally) greater in diameter than the plunger to permit future sleeving if necessary. The bottom shall be dished and provided with a baffle. Wire brush or sandblast the inside. Provide packing gland, packing and drip ring.

E. Cylinder Protection: The cylinder shall be protected by first sandblasting the exterior in accordance with SSPC-SP5, removing all rust and foreign substances and then immediately applying a coating system consisting of three coats of epoxy polyamide conforming to MIL-P-244441. Each coat to provide a dry film thickness of 3 mils. The first coat shall conform to MIL-P-244441/1, formula 150, the second coat to MIL-P-244441/2, formula 151 and the third coat to MIL-P-244441/3, formula 156 to provide a total dry film thickness of 9 mils. Apply one wrapping of self-adhesive 20 mil thickness tape applied 1/3 lap to provide a total tape thickness of 60 mils. Apply a complete covering of 75 lb. Kraft paper overall.

F. Motors: Electric motors shall be continuous rated 208 volts, 3 phase, 60 hertz, with speed no greater than 1800 rpm, having 50 degree C rise; class "A" insulation.

2.6 CONTROL EQUIPMENT

A. Self-Leveling Feature: Provide each elevator with a two-way, self-leveling feature that will automatically bring the car floor to within 1/4" of level with the floor landing regardless of load, or direction of travel. The car shall level into the floor at all times, not overrun and level back. This self-leveling shall, within its zone, be entirely automatic and independent of the operating service, and shall be designed to prevent or correct overtravel as well as undertravel of the car with respect to the landing sill level and shall re-level the car in case the elevator leaves the floor due to defective hydraulic operation.

B. Hydraulic Control System: The hydraulic control system shall be compact design suitable for operation under the required pressure and shall be mounted in the storage tank. The control valve shall be a manifold type with up, down and check valve sections. A control section including solenoid valves will direct the main valve and control up and down starting, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. Down speed and up and down leveling shall be controlled at the main valve sections. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions.

1. The manual lowering feature shall permit lowering the elevator at a slow speed in the event of a power failure or for adjusting purposes.

C. Controller: The elevator motor controller shall be magnetic reduced voltage resistance start with overload relays for each phase, and reverse phase relay driving a pump supplying oil to the piston for the "UP" direction only. The controller shall provide the required electrical operation of the elevator control system. A panel integral with the pumping unit is preferred.

1. The controller shall be designed to control the sequential starting, stopping, and speed of the elevator, and to provide the operation specified herein.

2. A microprocessor-based controller shall be provided including the necessary starting switches, all relays, switches, solid state components and hardware required for operation, including the door operation described herein. A three phase overload device shall be provided to protect the motor against

overloading.

3. The controller shall contain electromagnetic contactors mounted on a panel designed for mounting on a substantial steel frame. The bottom edge of the controller panel shall clear the floor by at least 6".

4. All control equipment shall be enclosed in sheet metal cabinets with removable or hinged door(s) provided with ventilation louvers. The doors and covers shall not ploy open during an earthquake.

D. Stopping shall be accomplished by sequentially throttling and stopping the oil flow. Leveling shall be accomplished by restricting the oil flow, bypassing a measured quantity of oil. “DOWN” operation shall be accomplished by opening a “DOWN” valve and allowing oil to return to the storage tank.

E. Switch and Relay Contacts: Provide switch and relay contacts designed to prevent sticking due to fusing. Design the controller circuit to minimize arcing across contacts. Mount wiring on the rear of the panel, neatly formed, either vertical or horizontally, and cleated. Wiring in the panel shall have flame-resistant insulation. Field connections shall be made at clearly designated junction blocks or studs. (Printed circuit boards in lieu of relays are permitted.)

F. All control systems shall be pre-adjusted at the factory.

2.7 OPERATING PANELS AND SIGNAL FIXTURES

A. Panels: The face plates of all car operating panels and landing push buttons stations shall be designed for flush mounting, shall be of stainless steel, round edge design, and not less than 1/8" thick. The car operating panels and landing push buttons stations shall be installed at approved locations. Attach faceplates with spanner type security screws. Indicator lamps shall be rated for 5000 hours of operation. Digital indications are permitted.

B. Push Buttons: Push buttons in the car operating panels and push buttons stations shall have contacts and wearing parts of material sized to meet the requirements of elevator service. The buttons shall be so designed that a spring will take up the initial pressure from which contact is made and further pressing shall sear the button on or in the faceplate. Landing call buttons and designed car buttons shall also serve as registered call signal indicators, and shall have their function indelibly and legibly identified by legend or arrow. When a landing call button is pushed, the button shall illuminate to indicate that the call has been registered. The illumination shall be extinguished when the car has served the registered call. Car and hall buttons shall be tamperproof type.

1. A key lockout switch shall disable activating car floor buttons and hall buttons.

2. Key operated hoistway access switches shall be incorporated into the hall button faceplates at terminal floors.

C. Car Operating Panel: The car shall be equipped with one car operating panel containing all controls for the type of operation specified in the paragraph "Car Operation and Control". The panel shall meet the handicap requirements of ANSI A117.1 and ADAAG. The faceplate shall be one piece, containing, in addition to all necessary operating buttons, a locked service cabinet and a telephone cabinet. The top operating buttons, shall be not more than 48" inches above the finished floor, and the bottom button shall not be less than 35" above the car floor. All designations shall be engraved and backfilled. No attached signs may be used. The car panel shall contain the following

devices:

1. In the exposed section:

   a. Illuminated operating buttons identified to correspond to the landings served by the elevator car.

   b. Emergency STOP button; red with engraved legend.

   c. Door OPEN and CLOSE buttons.

   d. Door HOLD button.

   e. Engraved designations in letters 1/4" high:
   Car Number _____
   Capacity _____
   Number of Passengers _____
   "NO SMOKING" in 1" letters.

2. In the service cabinet:

   a. Key operated inspection switch which will transfer car control to the top-of-car inspection operating controls and prevent operation of the car from the in-car control panel.

   b. Key operated Independent Service switch, with "UP" and DOWN" operating buttons and jewels.

   c. Car light switches for light in the car.

   d. Fan switch; three speed.

   e. Light ray cutout switch.

   f. Buzzer.

D. Switches and Devices: Provide the elevator manufacturer's standard grade of switches and devices on the car operating panel. Each device and its operating positions shall be legibly and indelibly identified.

E. Car Position Indicator: A horizontal electrical position indicator shall be provided over the entrance inside the car. The faceplate shall be flush mounted and the indicator shall be arranged to show the floor position of the car in the hoistway and its direction of travel. As the car travels through the hoistway, its position shall be indicated by illumination of the numeral corresponding to the landing at which the car is stopped or is passing. Change of illumination shall be instantaneous and shall be accomplished approximately midway between floors.

   1. The indicator shall consist of a finished faceplate with plastic numerals and arrows not less than 1" in height, broached thru the plate. Behind each designation shall be a small shielded light bulb of sufficient intensity to permit easy reading of the indicator. The light for each indication shall be enclosed in a light-tight compartment and arranged to illuminate only one indicator.

F. Landing Position Indicator: A horizontal electric position and direction of travel indicator, similar to the car position indicator, shall be provided in the wall above the frame of the

elevator hoistway door on the hall side at all landings. (Digital indicators are permitted.)

G. Car Direction Indicator: Provide, in the car entrance column, a direction indicator consisting of 2" to 2-1/2", minimum, equilateral triangle arrows; white for up and red for down. (Digital indicators are permitted.) Include a single stroke gong. The appropriate arrow shall illuminate when the car stops at a landing and shall indicate the direction in which the car will travel next. The gong shall sound once if the car is to go up and twice if it is to go down next.

2.8 HOISTWAY AND CAR EQUIPMENT

A. Guide Rails and Fastenings: Guide rails for cars shall be accurately machined, standard "T" sections with tongue and groove joints. The rails shall be installed plumb within 1/8" of true vertical and fastened to brackets having a maximum spacing of 14 feet. All shimming required shall be done with metal, securely held in place. Splice plates shall be located so as not to interfere with supporting clamps and brackets. Each splice plate bolt shall be fitted with a split spring steel lock washer.

1. Brackets and other supports shall be fastened to the hoistway walls by bolting or welding. Guide rail supports shall be provided as required to prevent guide rail deflection and stresses exceeding the limits prescribed by ANSI A17.1. Fastenings shall be made to suit cast-in-place inserts or by means of anchor bolts of an approved type and size. The inserts and all information relative to their location and placement shall be furnished. Anchor bolts, when used in lieu of inserts, shall be of the self-drilling tubular, externally split steel expansion shell with single cone expander.

2. The anchor shall develop the strength of the bolt after installation. Anchors shall
. be flush-mounted. Guide rails shall be firmly bottomed in the pit floor. When the building is complete, the guide rails shall be checked for alignment and shall be clean, free of rust and any signs of abrasion prior to acceptance.

B. Buffers: Spring buffers shall be provided as required by ANSI A17.1. Permanently fasten a plate giving the stroke and load rating to each buffer. Buffer anchorage shall not puncture the pit waterproofing.

C. Pit Equipment: Provide a pit switch accessible from the bottom terminal opening or from the pit access opening, in the pit, arranged to interrupt the power supply to the elevator motor and stop the elevator, independently of the regular operating device, to permit safe access to the pit. The location of the pit switch and pit light switch shall be in the shaft near the pit access door. The light shall be located 6 feet above the pit floor and shall provide at least 5 foot-candles of light at the pit floor.

D. Ladders: Ladders shall be steel, fixed-rail type. Ladders and accessories shall be hot-dip galvanized after fabrication. Rungs shall be solid-section rods, fitted into punched holes in the rails, welded, and ground smooth. Splices and connections shall have a smooth transition with the original members without sharp projections or more extensive than required for joint strength. Rails shall be fitted with brackets at the spacing indicated for anchorage.

E. Automatic Terminal Stops: Upper and lower normal terminal stopping devices shall be provided in the hoistway, and shall be arranged to automatically stop the car from any speed attained in normal operation within the top and bottom overtravels, independently of the operating device. Final terminal stopping devices shall be provided for the elevator and shall be arranged to automatically stop the car within the top clearance

independently of the operation of the normal terminal stopping devices. The final terminal stopping device, when operated, shall prevent further normal operation.

F. Wiring: Provide wiring in the hoistway and Machine Room adequate for proper operation of the equipment. Wires for light, and signal circuits in the Machine Room and hoistway shall conform to the elevator traveling cable specified in the National Electric Code for the particular type of location.

1. Wires shall be copper. The minimum size of wires, exclusive of those which form an integral part of control devices, shall be No. 14 for lighting circuits and No. 18 for operating, control and signal circuits, except that for lighting wires in traveling cable, No. 18 wires may be used in parallel to provide a current capacity equivalent to not less than No. 14 size. In no case shall the maximum current carried exceed that specified by the National Electric Code for the wire size used. All wiring between the various items of elevator equipment and external wiring, and wiring methods shall conform to the National Electric Code.

2. Wiring shall be run in zinc-coated rigid steel conduit, intermediate electrical conduit, electrical metallic tubing, raceway, and fittings, except for traveling cables. Flexible conduit may be used for short connections not subject to moisture, oil or embedment in concrete, but such runs shall contain a green equipment grounding conductor. Connections to the controller shall be made in a manner to minimize transmission of vibration and noise to the building. Hoistway raceway may be in rigid steel wiring duct. Threadless fittings shall not be used with rigid galvanized steel conduit.

3. Electrical connections to machinery shall allow for one foot of lateral motion.

G. Provide a working light circuit and switch for lampholder outlets, including porcelain medium base lamp holders fitted with wire lamp guards on the car crosshead and under the car platform. In addition, a duplex receptacle shall be provided on top of the car. A separate car light switch in the car panel shall control the lamps and plug receptacle on the exterior of the car.

H. Traveling cables shall be designed for elevators in service in accordance with the National Electric Code, shall be sufficiently flexible to readily adapt to all changes in the position of the elevator car and hang straight without twist. The cables shall be capable of bending 360 degrees with an inside radius of one foot without any permanent set and without cracking of the outer covering. The open loop shall show no tendency to twist upon itself. Traveling cables shall have non-metallic fillers and shall be suspended by looping the cable around supports. Terminal boxes shall have approved connection strips for connecting conductors, devices for connecting conductors, approved strain devices for connecting supporting strands and relieving the conductors of the traveling cables shall not be less than two feet long, unless otherwise approved. The traveling cables and the corresponding groups of conductors connecting these cables to the control, signal and car conductors shall have not less than 2 spare conductors of the same size and type. Each traveling cable conductor shall have a distinctive color coded outer covering for identification. Terminal blocks shall have indelible identification numbers for each terminal connection. Provide shielded wires for telephone and intercom.

2.9 CAR AND HOISTWAY DOOR ACCESSORIES

A. Power Operators for Passenger Elevators: Horizontal sliding door operators shall be moderate speed electric operators designed to operate the car and hoistway doors simultaneously. The doors shall operate smoothly without vibration, slam or shock. The electrical operator shall open the car and the hoistway doors at the landing where the car

has stopped or is in the leveling zone and shall close the doors before the car can leave the landing as specified under, "Car Operation and Control". The door operator shall permit the doors to be opened readily by hand from within the car when the electric power fails or is interrupted. An automatic torsion spring closer shall be provided for each hoistway door. The door mechanism shall not create hoistway interference.

B. Hoistway Door Interlocks and Car Door Contact: Each hoistway entrance shall be equipped with an approved type interlock. An electrical interlocking device separate from the mechanical interlock will not be approved. The interlock shall prevent operation of the car until the hoistway doors are locked in the closed position and shall prevent opening the doors at any landing from the landing side except by special key, unless the car is at rest at that landing, or is in the leveling zone and stopping at the landing. Accidental ground in the electric interlocks shall be so located as to have a ready, unobstructed access for periodic maintenance inspection and repairs. The car doors shall be equipped with a contact which will prevent operation of the car unless the doors are closed.

1. Contacts shall not be accessible from the landing side when the doors are closed.

C. Safety Light Ray Devices: A solid state light ray device shall be provided projecting at least two rays at approved heights across the car entrance in the space between the car and the horizontal sliding hoistway doors. The interruption of either ray by a person or object shall prevent the doors from closing, and if the doors are in the process of closing, shall cause the doors to reopen. The doors shall close a short time after the light rays are re-established. The design of the device shall include means that will make it inoperative after a prolonged interruption of either ray beyond a predetermined interval, or the duration of operation of the device itself may be limited to that interval. In either case, at the end of the predetermined interval, the doors shall begin to close in the normal manner.

D. Safety Edge: The car door shall be provided with a protective device extending the full height of the door and projecting beyond the front edge of the door. The protective device shall retract to a position flush with the front edge of the door when the door is fully open. The device shall be so arranged that should it touch a person or obstruction in its path while the door is closing, it shall automatically cause the car and hoistway doors to return to the open position. The door shall remain open until the expiration of the time interval and then close automatically.

2.10 PASSENGER CAR FRAME, PLATFORM AND ENCLOSURE

A. Car Frame: Provide a car frame made of steel channels and angles securely riveted, welded, or bolted, and substantially reinforced and braced. The car frame shall be effectively sound isolated from the plunger.

B. Guide Shoes: Guide shoes shall be provided in adjustable mountings on each side of the car. They shall be rigidly secured in accurate alignment at the top and bottom of the car frame. Roller guide shoes shall run on dry un-lubricated guide rails.

1. Shoes shall be roller type with at least three 1/2” rollers, spring or rubber backed, with auxiliary restraints spanning the full rail tongue under the top shoe mounting to protect against dislocation by earthquakes.

2. Flexible type sliding guide shoes shall consist of a swivel type shoe assembled on a metal base in such a manner as to permit self-alignment. Each shoe shall be provided with approved renewable bibs, 6" minimum length. The car guide

shoes shall be provided with spring takeup for side play between guide rails. Renewable wearing gibs shall be fabricated from an approved durable plastic compound material having a low coefficient of friction and long wearing qualities. The gibs shall be the type requiring minimum rail lubrication. Before the shoes are set, the car shall be balanced and the shoes must be doweled immediately after setting.

C. Platform: Provide a platform consisting of rigid structural steel members reinforced with intermediate steel stringers and designed for concentrated and eccentric type loading. The floor shall be double thick 3/4" exterior grade plywood. The under side of the platform shall be covered with sheet steel not less than 0.0179“ thick with exposed edges and joints folded. The platform shall be equipped with a fluted metal threshold plate of approved finish with grooves for door guides for sliding doors. The platform on the car shall be provided on the entrance side with a metal fascia of not less than 10 gauge steel extending beyond the underside of the platform to act as a toe guard for a vertical distance equal to, at least, the length of the leveling zone plus 3", with the lower portion bent back at least 60 degrees but not more than 75 degrees.

D. Cars: The entrance columns, shall be of stainless steel, Type 302 or 304, annealed, ground and number 4 polish finish, containing a maximum of 0.15 percent carbon and shall be not less than 0.0747" in thickness. Adjoining members of the soffit, grille, and canopy shall be welded together to form one-piece construction. The ceiling shall be reinforced to withstand the weight of 300 pounds on any square area 2 feet on a side.

1. Wainscoting shall be welded securely so as to form one panel from the top of the base to the underside of the soffit. Adequate reinforcement, secured by welding, shall be provided at all cutouts. The base shall be 5" high stainless steel with concealed vents. Vertical corners and the base shall be coved to not less than 1/2” radius. A solid, single bar type handrail of approved design shall be provided around the closed sides of the car about 32" above the floor. Interior surfaces shall be given a rust inhibitive paint adhering shop treatment prior to application of the finish. The interiors, except corrosion resisting steel, bronze, or aluminum, shall be finished in plastic laminate having a rated flame spread not exceeding 25 when tested in accordance with ASTM E 84.

2. Doors shall be provided for entrance to the car. The width and height of the opening shall be not less than that provided by the hoistway doors. The car door shall be the same type as the hoistway door and shall be equipped with a safety edge on each single slide, car side supported at the top with heavy-duty hangers, with not less than two 2" ball bearing sheaves for each hanger. Hangers shall be designed for as near noiseless operation as possible. The bottom of the door shall be guided by two (2) non-metallic gibs on each door panel. Gibs shall be replaceable without removing the door from the hanger rail.

3. Passenger car lighting shall be fluorescent type having bare F40T8 lamp fixtures with electronic ballasts, fitted with safety lamp guard clamps mounted above a suspended ceiling of lay-in translucent acrylic panels. Fixture placement shall provide a uniform illumination of at least 10 foot candles at the car floor.

4. A certificate frame shall be provided and mounted in the car in an approved location.

E. Passenger Car Emergency Lighting: Passenger car emergency lighting shall be provided by a power package containing a rechargeable battery and a battery charger. In the event of a power failure, power shall be immediately supplied to enough fixtures provided

with power packages to provide 0.2 foot-candles of illumination at the car floor for 4 hours. Provide each fixture, so equipped, with an un-switched 120 volt AC circuit. In addition, the power unit shall have the capacity to operate an alarm bell for 1 hour.

F. Provide a motor-driven ventilation fan located on the top of the cab, above a neat appearing grille and inlet vent slots in the wainscot more than 12" above the base. The fan shall have a capacity of not less than 400 cubic feet per minute. A switch shall be provided on the air panel to control the fan.

G. Pads and Hooks: Stainless steel pad hooks shall be provided in the car and shall be placed above the suspended ceiling line. Provide one complete set of protective pads.

H. Emergency Exit: Provide an emergency exit in the top of each car. The exit shall be hinged, unobstructed when open, shall have a mechanical stop rather than chain stop, and shall be arranged to open only from outside of the car without the use of tools. The exit shall be equipped with a non-self-resetting contact which shall prevent operation of the car unless the exit panel is fully closed.

I. Telephone: Provide a telephone recess with a hinged door in the car panel at an approved location suitable for use by the handicapped. The recess shall be equipped with an outlet box assembly, approved by the local telephone authorities for installation in elevators. The telephone recess door shall be equipped with an approved type latch and concealed hinges, and shall be designed to swing open not less than 90 degrees. A clear cast or etched inscription reading "Telephone" shall be provided on the frame or door of the telephone recess. Coordinate the telephone equipment with the telephone company. Install only at the time of acceptance.

2.11 PASSENGER CAR HOISTWAY DOORS AND ENTRANCES

A. General: Provide door and entrance assembly for horizontal sliding doors at each hoistway entrance.

1. Hoistway doors shall meet the requirements of ASTM E 176 for a 1-1/2 hour rating. All work shall be set from the center line of the aligned car guide rails and shall be in perfect alignment with the elevator car opening and car platform. Before the parts are assembled all steel surfaces shall be thoroughly cleaned of all rust, oil, grease, and dirt by benzine wash or otherwise, and shall then immediately be given a coat of approved rust-inhibitive paint. Surfaces which will be concealed shall be cleaned and coated prior to assembly or installation.

B. Assemblies for Horizontally Sliding Doors: Horizontal doors shall be power-operated and shall be single speed. Hoistway entrance door assemblies shall be complete including frames, doors, sills, fascia plates, hardware, struts, and accessories necessary for proper operation. Door casings shall have the floor number embossed in Braille symbols and raised Arabic numerals on each side of the doorway at a height of 42" above the finished floor.

1. Entrance frames shall be fabricated of corrosion-resisting sheet steel of not less than 0.747" nominal thickness. The component members constituting the unit frame shall include header, struts and frame of the door opening. The frame hoistway side shall be carried far enough back to present a neat appearance and shall be secured to the sill and header. Provide three suitable anchors on each side of the frame. Paint the inside of frames with 3/16" thick sound isolating material. Reinforce frames more than 8" wide. Grout frames after installation.

2. Both the car and hoistway doors shall open automatically while the car is in the

leveling zone and shall be 75% open when the car has completed the leveling operation. The doors shall close after a predetermined time unless a "DOOR CLOSE" button is pressed to immediately close the doors. Pressure on a landing button at the floor at which a car is standing with closed doors shall open the doors. The doors may be re-opened from the car by pressing the "DOOR OPEN" button.

3. Sills shall be narrow, one-piece extruded aluminum extending from strut to strut and securely fastened to the floor or sill supports. Include all necessary supports and brackets. Fastening screws shall not be visible. Grooves for door guides shall be not less than 1/2" wide. Grout sills solidly their full length after installation.

4. The hoistway entrance shall be of hollow metal, non-vision construction with flush surfaces on the car and landing sides. Doors shall be 0.598" nominal thickness sheet steel reinforced by formed vertical steel sections running the full height of the door and spaced not over 9" apart, designed to paste front and rear plates together securely. Each door panel shall be reinforced for the mounting of interlock and door operator accessories. The bottom of doors shall be guided by non-metallic gibs sliding in a machine grooves in the sill, with at least two gibs for each door panel. Hoistway doors shall be constructed in accordance with ANSI A17.1 and Underwriter's Laboratories requirements for 1-1/2 hour fire-rating and carry a U.L. label so indicating. Door panels shall be faced with 16 gauge stainless steel.

5. Hoistway doors shall be supported at the top with heavy-duty hangers equipped with 2-1/2", minimum, resilient tired ball bearing sheaves. Hangers shall operate quietly on the tracks. Each hanger shall be designed for an upward thrust against the underside of the track by a ball bearing roller on an adjustable eccentric stud. The tracks and track supports shall be fastened to the header plate. Provide a method for lubrication. Provide torsion spring type mechanical closing devices for hoistway doors.

2.12 INTERIOR CAB FINISHES

A. Provide the following finishes:

1. Floor Finish: The platform floor shall be finished with [1/8" thick vinyl tile securely adhered to the subfloor.] [1/4" thick quarry tile laid on 1/16" thick asphalt felt securely cemented to the subfloor.] [carpet glued down to the subfloor.] Tile shall match the Lobby floor.

2. Base: From manufacturer's standard options.

3. Wainscoat: From manufacturer's standard options.

4. Walls: From manufacturer's standard options.

5. Ceiling: From manufacturer's standard options.

6. Doors: From manufacturer's standard options.

7. Railing: From manufacturer's standard options.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution Requirements: Verification of existing conditions before starting the work.

B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive the work.

1. Verify that the hoistway inside clear dimensions are within allowable tolerances, walls are plumb, clean and structurally adequate for proper anchoring of guiderails.

2. Verify that the pit depth and other dimensions are within allowable tolerances.

2. Verify that openings dimensions are within allowable tolerances, plumb, level, clean and provide for proper anchoring of door frames.

C. Report in writing, prevailing conditions that will adversely affect satisfactory execution of the work of this Section. Do not proceed with the work until the unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with the manufacturer's instructions and recommendations for the work required.

B. Welded Construction: Provide welded connections for the installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance and replacement of worn parts. Welding work shall be done by welders whom the Owner’s representative considers capable of and qualified to do such welding.

C. Coordination: Coordinate elevator work with the work of other trades for proper time and sequence to avoid construction delays. Use benchmarks, lines and levels designated by the Contractor to ensure dimensional coordination of the work.

D. Sound Isolation: Mount rotating and vibrating equipment and components on vibration-absorption mounts designed to effectively prevent transmission of vibrations to the structure and eliminate a source of structure-borne noise from the elevator system.

1. Install piping without routing underground where possible; where not possible cover underground piping with permanent protective wrapping before backfilling.

2. Lubricate operating parts of systems, including ropes if any, as recommended by the manufacturer.

E. Alignment: Coordinate the installation of hoistway entrances with installation of the elevator guide rails for accurate alignment of the entrance with the car. Where possible, delay final adjustment of sills and doors until the car is operable. Reduce clearances to a minimum, safe, workable dimension at each landing.

F. Leveling Tolerance: +1/4"(6 mm) for the elevator, regardless of load and direction of travel.

G. Grout sills with non-staining, non-shrink grout. Set units accurately aligned with and slightly above the finished floor at landings. Grouting shall be by the General Contractor.

3.3 FIELD TESTING AND INSPECTION

A. General: When the elevator work included in the Contract Specifications is fully complete, the Contractor shall notify the Owner's representative that the elevator is ready for final inspection and acceptance tests. The Contractor shall coordinate the final inspection and testing with the local government elevator inspector. The Contractor shall perform all tests and demonstrate the proper operation of all parts and provisions of the equipment and shall prove, to the satisfaction of the government inspector, that the elevator, as installed, complies with the requirements of this Contract and all applicable requirements of ANSI A17.1 and ADAAG. The inspection procedure and practice outlined in ANSI A17.2 shall form a part of the inspection.

B. Test Instruments: The Contractor shall furnish all test instruments, test weights, thermometers, gauges, and materials required for the final inspection to determine compliance of the work with the Contract requirements.

C. Final Inspection: The following tests shall be made at the time of final inspection:

1. The elevator shall be subject to test for a period of one hour continuous run, with the full specified rated load in the car. During the test run, the car shall be stopped at all floors in both directions of travel for a standing period of 10 seconds per floor.

2. The actual measured speed of the elevator car shall be determined in both directions of travel with both full-rated load in the car and with no-load in the car. The speed of the car in the "UP" direction with full-rated load shall be not less than 90% of the rated speed. The speed of the car in the "DOWN" direction with full- rated load shall not exceed 125% of the rated speed. Speed tests shall be made before the full-load run test.

3. Elevator car leveling devices shall be tested for the accuracy of landing at all floors with no-load in the car, and with full-load in the car, in both directions of travel. Accuracy of the floor landing shall be determined both before and after the full-load run test.

4. The complete wiring system of the elevator shall be free from short circuits and grounds; the insulation resistance of conductors shall be determined by the use of a "Megger". Conductors shall have an insulation resistance of not less than one megohm between each conductor and ground and between each conductor and all other conductors.

5. Operating pressure shall be checked at the pump and at the cylinder head for no-load and full-load. Check the pressure at which the relief valve operates.

6. Remote piping exceeding 15 feet in length shall be tested prior to final connection as follows:

a. Plug both ends and fill with fluid.

b. Install a pressure gauge at one end and apply a pressure of 400 psi at the other.

c. Allow to stand under pressure for 12 hours.

d. There shall be no loss of pressure.

D. Re-Inspection: If any equipment is found to be damaged, defective or if the performance does not conform to the requirements of these Specifications or the Safety Code, no certificate of approval shall be issued until the defects have been corrected. When the repairs or adjustments have been completed, the Owner's representative shall be notified and the elevator re-inspected. Any tests with unsatisfactory results shall be repeated, and no final approval will be issued until satisfactory compliance is assured. A rejected elevator may not be used prior to re-inspection and approval.

3.4 PROTECTION

A. At the time of Substantial Completion of the elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs or such other methods or procedures to protect the work from damage and deterioration. Maintain the protective measures throughout the remainder of the construction period.

B. Provide similar protective measures for elevator units which will be placed into temporary service, including inspection and maintenance service during the period of temporary service.

3.5 INSTRUCTION AND MAINTENANCE

A. Instruct the Owner's personnel in the proper use, operation and daily maintenance of the elevators. Review emergency provisions, including emergency access and procedures to be followed at the time of failure in the operation and other building emergencies. Train the Owner's personnel in the normal procedures to follow in checking for causes of operational failures and malfunctions. Confer with the Owner on requirements for a complete elevator maintenance program.

1. Make a final check of each elevator operation with the Owner's personnel present, and just prior to the date of Substantial Completion. Determine that the control systems and operating devices are functioning properly.

B. Continuing Maintenance: The Installer shall provide, and the Contractor shall pay for, continuing maintenance for a period of one year, starting on the date of final acceptance by the Owner. The maintenance service shall include regular examinations of the installation by competent and trained personnel, and shall include all necessary adjustments, greasing, oiling, equipment cleaning and supplies and parts to keep the equipment in good operating condition.

END OF SECTION

APPENDIX A LOW-RISE PASSENGER ELEVATORS

NUMBER:

CAPACITY:

SPEED:

OPERATIONAL CONTROL:

MOTOR CONTROL:

STOPS:

OPENINGS:

LEVELS SERVED:

TRAVEL:

PLATFORM SIZE:

INSIDE CLEAR SIZE:

ENTRANCE SIZE:

ENTRANCE TYPE:

DOOR OPERATION:

DOOR PROTECTION:

MACHINE:

GUIDE RAILS:

BUFFERS:

CAR ENCLOSURE:

ENTRANCES:

SIGNALS:

- REGISTRATION LIGHTS:
- POSITION INDICATORS:
- HALL LANTERNS:

COMMUNICATION SYSTEM:

APPENDIX B LOW-RISE SERVICE ELEVATORS

NUMBER:

CAPACITY:

SPEED:

OPERATIONAL CONTROL:

MOTOR CONTROL:

STOPS:

OPENINGS:

LEVELS SERVED:

TRAVEL:

PLATFORM SIZE:

INSIDE CLEAR SIZE:

ENTRANCE SIZE:

ENTRANCE TYPE:

DOOR OPERATION:

DOOR PROTECTION:

MACHINE:

GUIDE RAILS:

BUFFERS:

CAR ENCLOSURE:

ENTRANCES:

SIGNALS:

REGISTRATION LIGHTS:

POSITION INDICATORS:

HALL LANTERNS:

COMMUNICATION SYSTEM:

SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following basic mechanical materials and methods to complement other Division 15 Sections.

1. Piping materials and installation instructions common to most piping systems.
2. Concrete base construction requirements.
3. Escutcheons.
4. Dielectric fittings.
5. Flexible connectors.
6. Mechanical sleeve seals.
7. Equipment nameplate data requirements.
8. Labeling and identifying mechanical systems and equipment is specified in Division 15 Section "Mechanical Identification."
9. Non-shrink grout for equipment installations.
10. Field-fabricated metal and wood equipment supports.
11. Installation requirements common to equipment specification sections.
12. Mechanical demolition.
13. Cutting and patching.
14. Touchup painting and finishing.

B. Pipe and pipe fitting materials are specified in Division 15 piping system Sections.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. The following are industry abbreviations for plastic materials:

1. ABS: Acrylonitrile-butadiene-styrene plastic.

2. CPVC: Chlorinated polyvinyl chloride plastic.

3. NP: Nylon plastic.

4. PE: Polyethylene plastic.

5. PVC: Polyvinyl chloride plastic.

G. The following are industry abbreviations for rubber materials:

1. CR: Chlorosulfonated polyethylene synthetic rubber.

2. EPDM: Ethylene propylene diene terpolymer rubber.

1.4 SUBMITTALS

A. Product Data: For dielectric fittings, flexible connectors, mechanical sleeve seals, and identification materials and devices.

B. Shop Drawings: Detail fabrication and installation for metal and wood supports and anchorage for mechanical materials and equipment.

C. Coordination Drawings: For access panel and door locations.

D. Coordination Drawings: Detail major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Show space requirements for installation and access. Indicate if sequence and coordination of installations are important to efficient flow of the Work. Include the following:

1. Planned piping layout, including valve and specialty locations and valve-stem movement.

2. Clearances for installing and maintaining insulation.

3. Clearances for servicing and maintaining equipment, accessories, and specialties, including space for disassembly required for periodic maintenance.

4. Equipment and accessory service connections and support details.

5. Exterior wall and foundation penetrations.

6. Fire-rated wall and floor penetrations.

7. Sizes and location of required concrete pads and bases.

8. Scheduling, sequencing, movement, and positioning of large equipment into building during construction.

9. Floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

10. Reflected ceiling plans to coordinate and integrate installation of air outlets and inlets, light fixtures, communication system components, sprinklers, and other ceiling-mounted items.

E. Samples: Of color, lettering style, and other graphic representation required for each identification material and device.

1.5 QUALITY ASSURANCE

A. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

B. Equipment Selection: Equipment of higher electrical characteristics, physical dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. Additional costs shall be approved in advance by appropriate Contract Modification for these increases. If minimum energy ratings or efficiencies of equipment are specified, equipment must meet design and commissioning requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and prevent entrance of dirt, debris, and moisture.

B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor, if stored inside.

C. Protect flanges, fittings, and piping specialties from moisture and dirt.

D. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate mechanical equipment installation with other building components.

B. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.

C. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components, as they are constructed.

D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning be-fore closing in building.

E. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

F. Coordinate requirements for access panels and doors if mechanical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in Division 8 Section "Access Doors."

G. Coordinate installation of identifying devices after completing covering and painting, if devices are applied to surfaces. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 PRODUCTS

2.1 PIPE AND PIPE FITTINGS

A. Refer to individual Division 15 piping Sections for pipe and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 15 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness, unless thickness or specific material is indicated.

    a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.

    b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

E. Solder Filler Metals: ASTM B 32.

1. Alloy Sn95 or Alloy Sn94: Approximately 95 percent tin and 5 percent silver, with 0.10 percent lead content.

2. Alloy E: Approximately 95 percent tin and 5 percent copper, with 0.10 percent maximum lead content.

3. Alloy HA: Tin-antimony-silver-copper zinc, with 0.10 percent maximum lead content.

4. Alloy HB: Tin-antimony-silver-copper nickel, with 0.10 percent maximum lead content.

5. Alloy Sb5: 95 percent tin and 5 percent antimony, with 0.20 percent maximum lead content.

F. Brazing Filler Metals: AWS A5.8.

1. BCuP Series: Copper-phosphorus alloys.

2. BAg1: Silver alloy.

G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

H. Solvent Cements: Manufacturer's standard solvent cements for the following:

1. ABS Piping: ASTM D 2235.

2. CPVC Piping: ASTM F 493.

3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

4. PVC to ABS Piping Transition: ASTM D 3138.

I. Plastic Pipe Seals: ASTM F 477, elastomeric gasket.

J. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon-steel bolts and nuts.

K. Couplings: Iron-body sleeve assembly, fabricated to match OD of plain-end, pressure pipes.

1. Sleeve: ASTM A 126, Class B, gray iron.

2. Followers: ASTM A 47 (ASTM A 47M) malleable iron or ASTM A 536 ductile iron.

3. Gaskets: Rubber.

4. Bolts and Nuts: AWWA C111.

5. Finish: Enamel paint.

2.3 DIELECTRIC FITTINGS

A. General: Assembly or fitting with insulating material isolating joined dissimilar metals, to pre-vent galvanic action and stop corrosion.

B. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld-neck end types and matching piping system materials.

C. Insulating Material: Suitable for system fluid, pressure, and temperature.

D. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg. F (82 deg. C).

E. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.

F. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

1. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure as required to suit system pressures.

G. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg. F (107 deg. C).

H. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg. F (107 deg. C).

2.4 FLEXIBLE CONNECTORS

A. General: Fabricated from materials suitable for system fluid and that will provide flexible pipe connections. Include 125-psig minimum working-pressure rating, unless higher working pressure is indicated, and ends according to the following:

1. 2-Inch NPS (DN50) and Smaller: Threaded.

2. 2-1/2-Inch NPS (DN65) and Larger: Flanged.

3. Option for 2-1/2-Inch NPS (DN65) and Larger: Grooved for use with keyed couplings.

B. Bronze-Hose, Flexible Connectors: Corrugated, bronze, inner tubing covered with bronze wire braid. Include copper-tube ends or bronze flanged ends, braze welded to hose.

C. Stainless-Steel-Hose/Steel Pipe, Flexible Connectors: Corrugated, stainless-steel, inner tubing covered with stainless-steel wire braid. Include steel nipples or flanges, welded to hose.

D. Stainless-Steel-Hose/Stainless-Steel Pipe, Flexible Connectors: Corrugated, stainless-steel, inner tubing covered with stainless-steel wire braid. Include stainless-steel nipples or flanges, welded to hose.

E. Rubber, Flexible Connectors: CR or EPDM elastomer rubber construction, with multiple plies of NP fabric, molded and cured in hydraulic presses. Include 125-psig minimum working-pressure rating at 220 deg. F (104 deg. C). Units may be straight or elbow type, unless otherwise indicated.

2.5 MECHANICAL SLEEVE SEALS

A. Description: Modular design, with interlocking rubber links shaped to continuously fill annular space between pipe and sleeve. Include connecting bolts and pressure plates.

2.6 PIPING SPECIALTIES

A. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:

1. Steel Sheet Metal: 0.0239-inch (0.6-mm) minimum thickness, galvanized, round tube closed with welded longitudinal joint.

2. Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.

3. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral water-stop, unless otherwise indicated.

4. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

   a. Underdeck Clamp: Clamping ring with set screws.

5. PVC: Manufactured, permanent, with nailing flange for attaching to wooden forms.

6. PVC Pipe: ASTM D 1785, Schedule 40.

7. PE: Manufactured, reusable, tapered, cup shaped, smooth outer surface, with nailing flange for attaching to wooden forms.

B. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type if required to conceal protruding fittings and sleeves.

1. ID: Closely fit around pipe, tube, and insulation of insulated piping.

2. OD: Completely cover opening.

3. Cast Brass: One piece, with set screw.

   a. Finish: Rough brass.

   b. Finish: Polished chrome-plate.

4. Cast Brass: Split casting, with concealed hinge and set screw.

   a. Finish: Rough brass.

   b. Finish: Polished chrome-plate.

5. Stamped Steel: One piece, with set screw and chrome-plated finish.

6. Stamped Steel: One piece, with spring clips and chrome-plated finish.

7. Stamped Steel: Split plate, with concealed hinge, set screw, and chrome-plated finish.

8. Stamped Steel: Split plate, with concealed hinge, spring clips, and chrome-plated finish.

9. Stamped Steel: Split plate, with exposed-rivet hinge, set screw, and chrome-plated finish.

10. Stamped Steel: Split plate, with exposed-rivet hinge, spring clips, and chrome-plated finish.

11. Cast-Iron Floor Plate: One-piece casting.

2.7 IDENTIFYING DEVICES AND LABELS

A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections. If more than one type is specified for application, selection is Installer's option, but provide one selection for each product category.

B. Equipment Nameplates: Metal nameplate with operational data engraved or stamped; permanently fastened to equipment.

1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.

2. Location: Accessible and visible location.

C. Stencils: Standard stencils, prepared for required applications with letter sizes complying with recommendations of ASME A13.1 for piping and similar applications, but not less than 1-1/4-inch- (30-mm-) high letters for ductwork and not less than 3/4-inch- (19-mm-) high letters for access door signs and similar operational instructions.

1. Material: Fiberboard.

2. Material: Brass.

3. Stencil Paint: Standard exterior-type stenciling enamel; black, unless otherwise indicated; either brushing grade or pressurized spray-can form and grade.

4. Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ASME A13.1 for colors.

D. Snap-on Plastic Pipe Markers: Manufacturer's standard preprinted, semi-rigid, snap on, color-coded, complying with ASME A13.1.

E. Pressure-Sensitive Pipe Markers: Manufacturer's standard preprinted, permanent adhesive, color-coded, pressure-sensitive vinyl, complying with ASME A13.1.

F. Plastic Duct Markers: Manufacturer's standard color-coded, laminated plastic. Comply with the following color code:

1. Green: Cold air.

2. Yellow: Hot air.

3. Yellow/Green or Green: Supply air.

4. Blue: Exhaust, outside, return, and mixed air.

5. For hazardous exhausts, use colors and designs recommended by ASME A13.1.

6. Nomenclature: Include the following:

   a. Direction of airflow.

   b. Duct service.

   c. Duct origin.

   d. Duct destination.

   e. Design cubic feet per meter (liters per second).

G. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine sub-core, unless otherwise indicated.

1. Fabricate in sizes required for message.

2. Engraved with engraver's standard letter style, of sizes and with wording to match equipment identification.

3. Punch for mechanical fastening.

4. Thickness: 1/16 inch (1.6 mm), unless otherwise indicated.

5. Thickness: 1/8 inch (3.2 mm), unless otherwise indicated.

6. Thickness: 1/16 inch (1.6 mm), for units up to 20 sq. in. (130 sq. cm) or 8 inches (200 mm) long; 1/8 inch (3.2 mm) for larger units.

7. Fasteners: Self-tapping stainless-steel screws or contact-type permanent adhesive.

H. Plastic Equipment Markers: Color-coded, laminated plastic. Comply with the following color code:

1. Green: Cooling equipment and components.

2. Yellow: Heating equipment and components.

3. Yellow/Green: Combination cooling and heating equipment and components.

4. Brown: Energy reclamation equipment and components.

5. Blue: Equipment and components that do not meet any criteria above.

6. For hazardous equipment, use colors and designs recommended by ASME A13.1.

7. Nomenclature: Include the following, matching terminology on schedules as closely as possible:

   a. Name and plan number.

   b. Equipment service.

   c. Design capacity.

d. Other design parameters such as pressure drop, entering and leaving conditions, and rpm.

8. Size: Approximate 2-1/2 by 4 inches (65 by 100 mm) for control devices, dampers, and valves; and 4-1/2 by 6 inches (115 by 150 mm) for equipment.

I. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, lettering, and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.

1. Multiple Systems: If multiple systems of same generic name are indicated, provide identification that indicates individual system number and service such as "Boiler No. 3," "Air Supply No. 1H," or "Standpipe F12."

2.8 GROUT

A. Non-shrink, Nonmetallic Grout: ASTM C 1107, Grade B.

1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, non-staining, noncorrosive, nongaseous, and recommended for interior and exterior applications.

2. Design Mix: 5000-psig (34.5-MPa), 28-day compressive strength.

3. Packaging: Premixed and factory packaged.

PART 3 EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General: Install piping as described below, unless piping Sections specify otherwise. Individual Division 15 piping Sections specify unique piping installation requirements.

B. General Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping at indicated slope.

D. Install components with pressure rating equal to or greater than system operating pressure.

E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.

F. Install piping free of sags and bends.

G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, unless otherwise indicated.

H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

I. Install piping to allow application of insulation plus 1-inch (25-mm) clearance around insulation.

J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

K. Install fittings for changes in direction and branch connections.

L. Install couplings according to manufacturer's written instructions.

M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:

1. Chrome-Plated Piping: Cast brass, one piece, with set screw, and polished chrome-plated finish. Use split-casting escutcheons if required, for existing piping.

2. Uninsulated Piping Wall Escutcheons: Cast brass or stamped steel, with set screw.

3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.

4. Insulated Piping: Cast brass or stamped steel; with concealed hinge, spring clips, and chrome-plated finish.

5. Piping in Utility Areas: Cast brass or stamped steel, with set screw or spring clips.

N. Sleeves are not required for core drilled holes.

O. Permanent sleeves are not required for holes formed by PE removable sleeves.

P. Install sleeves for pipes passing through concrete and masonry walls, and concrete floor and roof slabs.

Q. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

1. Cut sleeves to length for mounting flush with both surfaces.

a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

2. Build sleeves into new walls and slabs as work progresses.

3. Install sleeves large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

a. PVC Pipe Sleeves: For pipes smaller than 6-inch NPS (DN150).

b. Steel Pipe Sleeves: For pipes smaller than 6-inch NPS (DN150).

c. Steel, Sheet-Metal Sleeves: For pipes 6-inch NPS (DN150) and larger, penetrating gypsum-board partitions.

d. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section

of cast-iron soil pipe to extend sleeve to 2 inches (50 mm) above finished floor level. Refer to Division 7 Section "Sheet Metal Flashing and Trim" for flashing.

1) Seal space outside of sleeve fittings with non-shrink, nonmetallic grout.

4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants. Refer to Division 7 Section "Joint Sealants" for materials.

5. Use Type S, Grade NS, Class 25, Use O, neutral-curing silicone sealant, unless otherwise indicated.

R. Aboveground, Exterior-Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.

2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) in diameter and larger.

3. Assemble and install mechanical sleeve seals according to manufacturer's written instructions. Tighten bolts that cause rubber sealing elements to expand and make water-tight seal.

S. Underground, Exterior-Wall, Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Assemble and install mechanical sleeve seals according to manufacturer's written instructions. Tighten bolts that cause rubber sealing elements to expand and make water-tight seal.

T. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire-stopping materials. Refer to Division 7 Section "Fire-stopping" for materials.

U. Verify final equipment locations for roughing-in.

V. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

W. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping specification Sections:

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3. Soldered Joints: Construct joints according to AWS's "Soldering Manual," Chapter "The Soldering of Pipe and Tube"; or CDA's "Copper Tube Handbook."

4. Soldered Joints: Construct joints according to AWS's "Soldering Manual," Chapter "The Soldering of Pipe and Tube."

5. Soldered Joints: Construct joints according to CDA's "Copper Tube Handbook."

6. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

7. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

    a. Note internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.

    b. Apply appropriate tape or thread compound to external pipe threads, unless dry seal threading is specified.

    c. Align threads at point of assembly.

    d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.

    e. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

8. Welded Joints: Construct joints according to AWS D10.12, "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe," using qualified processes and welding operators according to "Quality Assurance" Article.

9. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

10. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join pipe and fittings according to the following:

    a. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and sol-vent cements.

    b. ABS Piping: ASTM D 2235 and ASTM D 2661.

    c. CPVC Piping: ASTM D 2846 and ASTM F 493.

    d. PVC Pressure Piping: ASTM D 2672.

    e. PVC Non-pressure Piping: ASTM D 2855.

    f. PVC to ABS Non-pressure Transition Fittings: Procedure and solvent cement according to ASTM D 3138.

X. Piping Connections: Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping 2-inch NPS (DN50) and smaller, adjacent to each valve and at final connection to each piece of equipment with 2-inch NPS (DN50) or smaller threaded pipe connection.

2. Install flanges, in piping 2-1/2-inch NPS (DN65) and larger, adjacent to flanged valves and at final connection to each piece of equipment with flanged pipe connection.

3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.

4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.2 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to provide maximum possible headroom, if mounting heights are not indicated.

B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to Architect.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

D. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

E. Install equipment giving right of way to piping installed at required slope.

F. Install flexible connectors on equipment side of shutoff valves, horizontally and parallel to equipment shafts if possible.

3.3 LABELING AND IDENTIFYING

A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.

1. Stenciled Markers: According to ASME A13.1.

2. Plastic markers, with application systems. Install on insulation segment if required for hot, uninsulated piping.

3. Locate pipe markers as follows if piping is exposed in finished spaces, machine rooms, and accessible maintenance spaces, such as shafts, tunnels, plenums, and exterior non-concealed locations:

a. Near each valve and control device.

b. Near each branch, excluding short takeoffs for fixtures and terminal units. Mark each pipe at branch, if flow pattern is not obvious.

c. Near locations if pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.

d. At access doors, manholes, and similar access points that permit view of concealed piping.

e. Near major equipment items and other points of origination and termination.

f. Spaced at maximum of 50-foot (15-m) intervals along each run. Reduce intervals to 25 feet (7.5 m) in congested areas of piping and equipment.

g. On piping above removable acoustical ceilings, except omit intermediately spaced markers.

B. Equipment: Install engraved plastic-laminate sign or equipment marker on or near each major item of mechanical equipment.

1. Lettering Size: Minimum 1/4-inch- (6.4-mm-) high lettering for name of unit if viewing distance is less than 24 inches (610 mm), 1/2-inch- (12.7-mm-) high lettering for distances up to 72 inches (1800 mm), and proportionately larger lettering for greater distances. Pro-vide secondary lettering two-thirds to three-fourths of size of principal lettering.

2. Text of Signs: Provide name of identified unit. Include text to distinguish between multiple units, inform user of operational requirements, indicate safety and emergency pre-cautions, and warn of hazards and improper operations.

C. Duct Systems: Identify air supply, return, exhaust, intake, and relief ducts with duct markers; or provide stenciled signs and arrows, showing duct system service and direction of flow.

1. Location: In each space, if ducts are exposed or concealed by removable ceiling system, locate signs near points where ducts enter into space and at maximum intervals of 50 feet (15 m).

D. Adjusting: Relocate identifying devices as necessary for unobstructed view in finished construction.

3.4 PAINTING AND FINISHING

A. Refer to Division 9 Section "Painting" for paint materials, surface preparation, and application of paint.

B. Apply paint to exposed piping according to the following, unless otherwise indicated:

1. Interior, Ferrous Piping: Use semi-gloss, acrylic-enamel finish. Include finish coat over enamel undercoat and primer.

2. Interior, Galvanized-Steel Piping: Use semi-gloss, acrylic-enamel finish. Include two finish coats over galvanized metal primer.

3. Interior, Ferrous Supports: Use semi-gloss, acrylic-enamel finish. Include finish coat over enamel undercoat and primer.

4. Exterior, Ferrous Piping: Use semi-gloss, acrylic-enamel finish. Include two finish coats over rust-inhibitive metal primer.

5. Exterior, Galvanized-Steel Piping: Use semi-gloss, acrylic-enamel finish. Include two finish coats over galvanized metal primer.

6. Exterior, Ferrous Supports: Use semi-gloss, acrylic-enamel finish. Include two finish coats over rust-inhibitive metal primer.

C. Do not paint piping specialties with factory-applied finish.

D. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.5 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use 3000-psig (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS D1.1, "Structural Welding Code--Steel."

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners with-out splitting wood members.

C. Attach to substrates as required to support applied loads.

3.8 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair cut surfaces to match adjacent surfaces.

3.9 GROUTING

A. Install nonmetallic, non-shrink, grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's written instructions.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placing of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases to provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout according to manufacturer's written instructions.

END OF SECTION

SECTION 15060

HANGERS AND SUPPORTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes hangers and supports for mechanical system piping and equipment.

B. Related Sections include the following:

1. Division 5 Section "Metal Fabrications" for materials for attaching hangers and supports to building structure.

2. Division 15 Section "Mechanical Vibration Controls and Seismic Restraints" for vibration isolation and seismic restraint devices.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society for the Valve and Fittings Industry.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

A. Design channel support systems for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

B. Design heavy-duty steel trapezes for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

C. Design seismic restraint hangers and supports for piping and equipment.

D. Design and obtain approval from authorities having jurisdiction for seismic restraint hangers and sup-ports for piping and equipment.

1.5 SUBMITTALS

A. Product Data: For each type of pipe hanger, channel support system component, and thermal-hanger shield insert indicated.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. Pipe Hangers, Supports, and Components: MSS SP-58, factory-fabricated components. Refer to "Hanger and Support Applications" Article in Part 3 for where to use specific hanger and support types.

1. Galvanized, Metallic Coatings: For piping and equipment that will not have field-applied finish.

2. Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.

B. Channel Support Systems: MFMA-2, factory-fabricated components for field assembly.

1. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.

2. Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.

C. Thermal-Hanger Shield Inserts: 100-psi (690-kPa) minimum compressive-strength insulation, encased in sheet metal shield.

1. Material for Cold Piping: ASTM C 552, Type I cellular glass or water-repellent-treated, ASTM C 533, Type I calcium silicate with vapor barrier.

2. Material for Cold Piping: ASTM C 552, Type I cellular glass with vapor barrier.

3. Material for Cold Piping: Water-repellent-treated, ASTM C 533, Type I calcium silicate with vapor barrier.

4. Material for Hot Piping: ASTM C 552, Type I cellular glass or water-repellent-treated, ASTM C 533, Type I calcium silicate.

5. Material for Hot Piping: ASTM C 552, Type I cellular glass.

6. Material for Hot Piping: Water-repellent-treated, ASTM C 533, Type I calcium silicate.

7. For Trapeze or Clamped System: Insert and shield cover entire circumference of pipe.

8. For Clevis or Band Hanger: Insert and shield cover lower 180 degrees of pipe.

9. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.

2.2 MISCELLANEOUS MATERIALS

A. Powder-Actuated Drive-Pin Fasteners: Powder-actuated-type, drive-pin attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.

C. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars, black and galvanized.

D. Grout: ASTM C 1107, Grade B, factory-mixed and -packaged, non-shrink and nonmetallic, dry, hydraulic-cement grout.

1. Characteristics: Post hardening and volume adjusting; recommended for both interior and exterior applications.

2. Properties: Non-staining, noncorrosive, and nongaseous.

3. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger requirements are specified in Sections specifying equipment and systems.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Specification Sections.

C. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN15 to DN750).

2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg. F (49 to 232 deg. C) pipes, NPS 4 to NPS 16 (DN100 to DN400), requiring up to 4 inches (100 mm) of insulation.

3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24 (DN20 to DN600), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.

4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24 (DN15 to DN600), if little or no insulation is required.

5. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4 (DN15 to DN100), to al-low off-center closure for hanger installation before pipe erection.

6. Adjustable Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of non-insulated stationary pipes, NPS 3/4 to NPS 8 (DN20 to DN200).

7. Adjustable Steel Band Hangers (MSS Type 7): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8 (DN15 to DN200).

8. Adjustable Band Hangers (MSS Type 9): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8 (DN15 to DN200).

9. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 2 (DN15 to DN50).

10. Split Pipe-Ring with or without Turnbuckle-Adjustment Hangers (MSS Type 11): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 8 (DN10 to DN200).

11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 3 (DN10 to DN80).

12. U-Bolts (MSS Type 24): For support of heavy pipe, NPS 1/2 to NPS 30 (DN15 to DN750).

13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.

14. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 (DN100 to DN900), with steel pipe base stanchion support and cast-iron floor flange.

15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36 (DN100 to DN900), with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.

16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36 (DN65 to DN900), if vertical adjustment is required, with steel pipe base stanchion sup-port and cast-iron floor flange.

D. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN20 to DN500).

2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN20 to DN500), if longer ends are required for riser clamps.

E. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.

2. Steel Clevises (MSS Type 14): For 120 to 450 deg. F (49 to 232 deg. C) piping installations.

3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.

5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg. F (49 to 232 deg. C) piping installations.

F. Building Attachments: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.

G. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.

2. Protection Shields (MSS Type 40): Of length recommended by manufacturer to prevent crushing insulation.

3. Thermal-Hanger Shield Inserts: For supporting insulated pipe, 360-degree insert of high-density, 100-psi (690-kPa) minimum compressive-strength, water-repellent-treated calcium silicate or cellular-glass pipe insulation, same thickness

as adjoining insulation with vapor barrier and encased in 360-degree sheet metal shield.

H. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.

2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).

3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.

4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.

5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from hanger.

6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.

7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from trapeze support.

8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:

a. Horizontal (MSS Type 54): Mounted horizontally.

b. Vertical (MSS Type 55): Mounted vertically.

c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.

3.2 HANGER AND SUPPORT INSTALLATION

A. Pipe Hanger and Support Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, sup-ports, clamps, and attachments as required to properly support piping from building structure.

B. Channel Support System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled channel systems.

1. Field assemble and install according to manufacturer's written instructions.

C. Heavy-Duty Steel Trapeze Installation: Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated, heavy-duty trapezes.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install inter-mediate supports for smaller diameter pipes as specified above for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D-1.1.

D. Install building attachments within concrete slabs or attach to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, and expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

E. Install powder-actuated drive-pin fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

F. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

G. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

I. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

J. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping," is not exceeded.

K. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.

   a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.

   b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.

   c. Do not exceed pipe stress limits according to ASME B31.9.

2. Install MSS SP-58, Type 39 protection saddles, if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40 protective shields on cold piping with vapor barrier. Shields shall span arc of 180 degrees.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.

4. Shield Dimensions for Pipe: Not less than the following:

a. NPS 1/4 to NPS 3-1/2 (DN8 to DN90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.

b. NPS 4 (DN100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.

c. NPS 5 and NPS 6 (DN125 and DN150): 18 inches (457 mm) long and 0.06 inch (1.52 mm) thick.

d. NPS 8 to NPS 14 (DN200 to DN350): 24 inches (610 mm) long and 0.075 inch (1.91 mm) thick.

5. Pipes NPS 8 (DN200) and Larger: Include wood inserts.

6. Insert Material: Length at least as long as protective shield.

7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure above or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

3.4 METAL FABRICATION

A. Cut, drill, and fit miscellaneous metal fabrications for heavy-duty steel trapezes and equipment supports.

B. Fit exposed connections together to form hairline joints. Field-weld connections that cannot be shop-welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.6 PAINTING

A. Touching Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touching Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 9 Section "Painting."

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 15081

DUCT INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes semi-rigid and flexible duct, and plenum insulation; insulating cements; field-applied jackets; accessories and attachments; and sealing compounds.

B. Related Sections include the following:

1. Division 7 Section "Fire-stopping" for fire-stopping materials and requirements for penetrations through fire and smoke barriers.

2. Division 15 Section "Pipe Insulation" for insulation for piping systems.

1.3 SUBMITTALS

A. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for the following:

1. Removable insulation sections at access panels.

2. Application of field-applied jackets.

3. Applications at linkages for control devices.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing materials identical to those specified in this Section according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and sealer and cement material containers with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.

2. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate clearance requirements with duct Installer for insulation application.

PART 2 PRODUCTS

2.1 INSULATION MATERIALS

A. Mineral-Fiber Blanket Thermal Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II, without facing and with all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film.

B. Mineral-Fiber Board Thermal Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IB, without facing and with all-service jacket manufactured from kraft paper, rein-forcing scrim, aluminum foil, and vinyl film.

C. Calcium Silicate Insulation: Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

2.2 FIELD-APPLIED JACKETS

A. General: ASTM C 921, Type 1, unless otherwise indicated.

B. Foil and Paper Jacket: Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil.

C. Stainless-Steel Jacket: Deep corrugated sheets of stainless steel complying with ASTM A 666, Type 304 or 316; 0.10 inch (2.5 mm) thick; and roll stock ready for shop or field cutting and forming to indicated sizes.

1. Moisture Barrier: 1 mil (0.025 mm) thick, heat-bonded polyethylene and kraft paper.

2. Jacket Bands: Stainless steel, Type 304, 3/4 inch (19 mm) wide.

2.3 ACCESSORIES AND ATTACHMENTS

A. Bands: 3/4 inch (19 mm) wide, in one of the following materials compatible with jacket:

1. Stainless Steel: ASTM A 666, Type 304; 0.020 inch (0.5 mm) thick.

B. Wire: 0.080 inch (2.0 mm), nickel-copper alloy; 0.062 inch (1.6 mm), soft-annealed, stainless steel; or 0.062 inch (1.6 mm), soft-annealed, galvanized steel.

C. Weld-Attached Anchor Pins and Washers: Copper-coated steel pin for capacitor-discharge welding and galvanized speed washer. Pin length sufficient for insulation thickness indicated.

1. Welded Pin Holding Capacity: 100 lb. (45 kg) for direct pull perpendicular to the attached surface.

D. Adhesive-Attached Anchor Pins and Speed Washers: Galvanized steel plate, pin, and washer manufactured for attachment to duct and plenum with adhesive. Pin length sufficient for insulation thickness indicated.

1. Adhesive: Recommended by the anchor pin manufacturer as appropriate for surface temperatures of ducts, plenums, and breechings; and to achieve a holding capacity of 100 lb. (45 kg) for direct pull perpendicular to the adhered surface.

E. Self-Adhesive Anchor Pins and Speed Washers: Galvanized steel plate, pin, and washer manufactured for attachment to duct and plenum with adhesive. Pin length sufficient for insulation thickness indicated.

F. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8 oz./sq. yd. (270 g/sq. m).

1. Tape Width: 4 inches (100 mm).

2.4 VAPOR RETARDERS

A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL APPLICATION REQUIREMENTS

A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; and free of voids throughout the length of ducts and fittings.

B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each duct system.

C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Apply multiple layers of insulation with longitudinal and end seams staggered.

E. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.

F. Keep insulation materials dry during application and finishing.

G. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.

H. Apply insulation with the least number of joints practical.

I. Apply insulation over fittings and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated.

J. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic. Apply insulation continuously through hangers and around anchor attachments.

K. Insulation Terminations: For insulation application where vapor retarders are indicated, seal ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.

L. Apply insulation with integral jackets as follows:

1. Pull jacket tight and smooth.

2. Joints and Seams: Cover with tape and vapor retarder as recommended by insulation material manufacturer to maintain vapor seal.

3. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to duct flanges and fittings.

M. Cut insulation according to manufacturer's written instructions to prevent compressing insulation to less than 75 percent of its nominal thickness.

N. Install vapor-retarder mastic on ducts and plenums scheduled to receive vapor retarders.

1. Ducts with Vapor Retarders: Overlap insulation facing at seams and seal with vapor-retarder mastic and pressure-sensitive tape having same facing as insulation. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-retarder seal.

2. Ducts without Vapor Retarders: Overlap insulation facing at seams and secure with outward clinching staples and pressure-sensitive tape having same facing as insulation.

O. Roof Penetrations: Apply insulation for interior applications to a point even with top of roof flashing.

1. Seal penetrations with vapor-retarder mastic.

2. Apply insulation for exterior applications tightly joined to interior insulation ends.

3. Seal insulation to roof flashing with vapor-retarder mastic.

P. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and partitions, except fire-rated walls and partitions.

Q. Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire/smoke damper sleeves for fire-rated wall and partition penetrations.

R. Floor Penetrations: Terminate insulation at underside of floor assembly and at floor support at top of floor.

1. For insulation indicated to have vapor retarders, taper termination and seal insulation ends with vapor-retarder mastic.

3.4 MINERAL-FIBER INSULATION APPLICATION

A. Blanket Applications for Ducts and Plenums: Secure blanket insulation with adhesive and anchor pins and speed washers.

1. Apply adhesives according to manufacturer's recommended coverage rates per square foot, for 100 percent coverage of duct and plenum surfaces.

2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.

3. Install anchor pins and speed washers on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

   a. On duct sides with dimensions 18 inches (450 mm) and smaller, along longitudinal center-line of duct. Space 3 inches (75 mm) maximum from insulation end joints, and 16 inches (400 mm) o.c.

   b. On duct sides with dimensions larger than 18 inches (450 mm). Space 16 inches (400 mm) o.c. each way, and 3 inches (75 mm) maximum from insulation joints. Apply additional pins and clips to hold insulation tightly against surface at cross bracing.

   c. Anchor pins may be omitted from top surface of horizontal, rectangular ducts and plenums.

   d. Do not over-compress insulation during installation.

4. Impale insulation over anchors and attach speed washers.

5. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

6. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches (50 mm) from one edge and one end of insulation segment. Secure laps to adjacent insulation segment with 1/2-inch (13 mm) staples, 1 inch (25 mm) o.c. and cover with pressure-sensitive tape having same facing as insulation.

7. Overlap un-faced blankets a minimum of 2 inches (50 mm) on longitudinal seams and end joints. Secure with steel band at end joints and spaced a maximum of 18 inches (450 mm) o.c.

8. Apply insulation on rectangular duct elbows and transitions with a full insulation segment for each surface. Apply insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

9. Insulate duct stiffeners, hangers, and flanges that protrude beyond the insulation surface with 6 inch (150 mm) wide strips of the same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with anchor pins spaced 6 inches (150 mm) o.c.

10. Apply vapor-retarder mastic to open joints, breaks, and punctures for insulation indicated to receive vapor retarder.

B. Board Applications for Ducts and Plenums: Secure board insulation with adhesive and anchor pins and speed washers.

1. Apply adhesives according to manufacturer's recommended coverage rates per square foot, for 100 percent coverage of duct and plenum surfaces.

2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.

3. Space anchor pins as follows:

   a. On duct sides with dimensions 18 inches (450 mm) and smaller, along longitudinal centerline of duct. Space 3 inches (75 mm) maximum from insulation end joints, and 16 inches (400 mm) o.c.

   b. On duct sides with dimensions larger than 18 inches (450 mm). Space 16 inches (400 mm) o.c. each way, and 3 inches (75 mm) maximum from insulation joints. Apply additional pins and clips to hold insulation tightly against surface at cross bracing.

   c. Anchor pins may be omitted from top surface of horizontal, rectangular ducts and plenums.

   d. Do not over compress insulation during installation.

4. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation sur-face. Cover exposed pins and washers with tape matching insulation facing.

5. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches (50 mm) from one edge and one end of insulation segment. Secure laps to adjacent insulation segment with 1/2-inch (13-mm) staples, 1 inch (25 mm) o.c., and cover with pressure-sensitive tape having same facing as insulation.

6. Apply insulation on rectangular duct elbows and transitions with a full insulation segment for each surface. Groove and score insulation to fit as closely as possible to outside and inside radi-us of elbows. Apply insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

7. Insulate duct stiffeners, hangers, and flanges that protrude beyond the insulation surface with 6-inch- (150-mm-) wide strips of the same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with anchor pins spaced 6 inches (150 mm) o.c.

8. Apply vapor-retarder mastic to open joints, breaks, and punctures for insulation indicated to re-ceive vapor retarder.

3.5 CALCIUM SILICATE INSULATION APPLICATION

A. Apply insulation according to the manufacturer's written instructions and as follows:

1. Secure single layer of insulation to duct with stainless-steel bands. Tighten bands without de-forming the insulation material.

2. Apply two-layer insulation with joints tightly butted and staggered at least 3 inches (75 mm). Secure inner layer with 0.062 inch (1.6 mm), soft-annealed, stainless-steel wire. Secure outer layer with stainless-steel bands.

3. On exposed applications, without metal jacket, finish insulation with a skim coat of mineral-fiber, hydraulic-setting cement to surface of installed insulation. When dry,

apply flood coat of lagging adhesive and press on one layer of glass cloth or tape. Overlap edges at least 1 inch (25 mm). Apply finish coat of lagging adhesive over glass cloth or tape. Thin the finish coat to achieve smooth finish.

3.6 FIELD-APPLIED JACKET APPLICATION

A. Apply glass-cloth jacket, where indicated, directly over bare insulation or insulation with factory-applied jackets.

1. Apply jacket smooth and tight to surface with 2 inch (50 mm) overlap at seams and joints.

2. Embed glass cloth between two 0.062 inch (1.6 mm) thick coats of jacket manufacturer's recommended adhesive.

3. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.

3.7 DUCT SYSTEM APPLICATIONS

A. Insulation materials and thicknesses are specified in schedules at the end of this Section.

B. Materials and thicknesses for systems listed below are specified in schedules at the end of this Section.

C. Insulate the following plenums and duct systems:

1. Indoor concealed supply-, return-, and outside-air ductwork.

2. Indoor exposed supply-, return-, and outside-air ductwork.

3. Outdoor exposed supply and return ductwork.

D. Items Not Insulated: Unless otherwise indicated, do not apply insulation to the following systems, materials, and equipment:

1. Fibrous-glass ducts.

2. Metal ducts with duct liner.

3. Factory-insulated flexible ducts.

4. Factory-insulated plenums, casings, terminal boxes, and filter boxes and sections.

5. Flexible connectors.

6. Vibration-control devices.

7. Testing agency labels and stamps.

8. Nameplates and data plates.

9. Access panels and doors in air-distribution systems.

3.8 INDOOR DUCT AND PLENUM APPLICATION SCHEDULE

A. Service: Round, supply-air ducts.

1. Material: Mineral-fiber blanket.

2. Thickness: 2 inches (50 mm).

3. Number of Layers: One.

4. Field-Applied Jacket: Foil and paper.

5. Vapor Retarder Required: Yes.

B. Service: Round, return-air ducts.

1. Material: Mineral-fiber blanket.

2. Thickness: 2 inches (50 mm).

3. Number of Layers: One.

4. Field-Applied Jacket: Foil and paper.

5. Vapor Retarder Required: Yes.

C. Service: Round, outside-air ducts.

1. Material: Mineral-fiber blanket.

2. Thickness: 2 inches (50 mm).

3. Number of Layers: One.

4. Field-Applied Jacket: Foil and paper.

5. Vapor Retarder Required: Yes.

D. Service: Rectangular, supply-air ducts.

1. Material: Mineral-fiber blanket.

2. Thickness: 2 inches (50 mm).

3. Number of Layers: One.

4. Field-Applied Jacket: Foil and paper.

5. Vapor Retarder Required: Yes.

E. Service: Rectangular, return-air ducts.

1. Material: Mineral-fiber blanket.

2. Thickness: 2 inches (50 mm).

3. Number of Layers: One.

4. Field-Applied Jacket: Foil and paper.

5. Vapor Retarder Required: Yes.

F. Service: Rectangular, outside-air ducts.

1. Material: Mineral-fiber blanket.
2. Thickness: 2 inches (50 mm).
3. Number of Layers: One.
4. Field-Applied Jacket: Foil and paper.
5. Vapor Retarder Required: Yes.

3.9 OUTDOOR DUCT AND PLENUM APPLICATION SCHEDULE

A. Service: Rectangular, supply-air ducts.

1. Material: Mineral-fiber board.
2. Thickness: 2 inches (50 mm).
3. Number of Layers: One.
4. Field-Applied Jacket: Stainless steel.
5. Vapor Retarder Required: Yes.

D. Service: Rectangular, return-air ducts.

1. Material: Mineral-fiber board.
2. Thickness: 2 inches (50 mm).
3. Number of Layers: One.
4. Field-Applied Jacket: Stainless steel.
9. Vapor Retarder Required: Yes.

3.10 GENERATOR EXHAUST PIPE & MUFFLER APPLICATION SCHEDULE

A. Service: Round, exposed.

1. Material: Calcium silicate.
2. Thickness: 4 inches (100 mm).
3. Number of Layers: One.
4. Field-Applied Jacket: Stainless steel.
   a. Corrugation Dimension: 1-1/4 by 1/4 inch (32 by 6 mm).
5. Vapor Retarder Required: No.

END OF SECTION

SECTION 15083

PIPE INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes preformed, rigid and flexible pipe insulation; insulating cements; field-applied jackets; accessories and attachments; and sealing compounds.

B. Related Sections include the following:

1. Division 7 Section "Fire-stopping" for fire-stopping materials and requirements for penetrations through fire and smoke barriers.

2. Division 15 Section "Duct Insulation" for insulation for ducts and plenums.

3. Division 15 Section "Hangers and Supports" for pipe insulation shields and protection saddles.

1.3 SUBMITTALS

A. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing materials identical to those specified in this Section according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and sealer and cement material containers with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.

2. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 15 Section "Hangers and Supports."

B. Coordinate clearance requirements with piping Installer for insulation application.

1.7 SCHEDULING

A. Schedule insulation application after testing piping systems and, where required, after installing and testing heat-trace tape. Insulation application may begin on segments of piping that have satisfactory test results.

PART 2 PRODUCTS

2.1 INSULATION MATERIALS

A. Mineral-Fiber Insulation: Glass fibers bonded with a thermosetting resin complying with the following:

1. Preformed Pipe Insulation: Comply with ASTM C 547, Type 1, with factory-applied, all-purpose, vapor-retarder jacket.

2. Blanket Insulation: Comply with ASTM C 553, Type II, without facing.

3. Fire-Resistant Adhesive: Comply with MIL A-3316C in the following classes and grades:

a. Class 1, Grade A for bonding glass cloth and tape to un-faced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to un-faced glass-fiber insulation.

b. Class 2, Grade A for bonding glass-fiber insulation to metal surfaces.

4. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.

5. Mineral-Fiber Insulating Cements: Comply with ASTM C 195.

6. Expanded or Exfoliated Vermiculite Insulating Cements: Comply with ASTM C 196.

7. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.

B. Flexible Elastomeric Thermal Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

1. Adhesive: As recommended by insulation material manufacturer.

2. Ultraviolet-Protective Coating: As recommended by insulation manufacturer.

C. Calcium Silicate Insulation: Preformed pipe sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

D. Prefabricated Thermal Insulating Fitting Covers: Comply with ASTM C 450 for dimensions used in pre-forming insulation to cover valves, elbows, tees, and flanges.

2.2 FIELD-APPLIED JACKETS

A. General: ASTM C 921, Type 1, unless otherwise indicated.

B. Foil and Paper Jacket: Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil.

C. Stainless-Steel Jacket: ASTM A 666, Type 304 or 316; 0.10 inch (2.5 mm) thick; and factory cut and rolled to indicated sizes.

D. Stainless-Steel Jacket: ASTM A 666, Type 304 or 316; 0.10 inch (2.5 mm) thick; and roll stock ready for shop or field cutting and forming to indicated sizes.

1. Moisture Barrier: 1- mil - (0.025 -mm-) thick, heat-bonded polyethylene and kraft paper.

2. Moisture Barrier: 3- mil- (0.075 -mm-) thick, heat-bonded polyethylene and kraft paper.

3. Elbows: Gore type, for 45- and 90-degree elbows in same material, finish, and thickness as jack-et.

4. Jacket Bands: Stainless steel, Type 304, 3/4 inch (19 mm) wide.

2.3 ACCESSORIES AND ATTACHMENTS

A. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8 oz./sq. yd. (270 g/sq. m).

1. Tape Width: 4 inches (100 mm).

B. Bands: 3/4 inch (19 mm) wide, in one of the following materials compatible with jacket:

1. Stainless Steel: ASTM A 666, Type 304; 0.020 inch (0.5 mm) thick.

2. Galvanized Steel: 0.005 inch (0.13 mm) thick.

3. Aluminum: 0.007 inch (0.18 mm) thick.

4. Brass: 0.010 inch (0.25 mm) thick.

5. Nickel-Copper Alloy: 0.005 inch (0.13 mm) thick.

C. Wire: 0.080 -inch (2.0 -mm), nickel-copper alloy; 0.062 -inch (1.6 -mm), soft-annealed, stainless steel; or 0.062- inch (1.6 -mm), soft-annealed, galvanized steel.

2.4 VAPOR RETARDERS

A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry pipe and fitting surfaces. Remove materials that will adversely affect insulation application.

3.3 GENERAL APPLICATION REQUIREMENTS

A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.

B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each piping system.

C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Apply insulation with longitudinal seams at top and bottom of horizontal pipe runs.

E. Apply multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.

H. Keep insulation materials dry during application and finishing.

I. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.

J. Apply insulation with the least number of joints practical.

K. Apply insulation over fittings, valves, and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated. Refer to special instructions for applying insulation over fittings, valves, and specialties.

L. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic.

1. Apply insulation continuously through hangers and around anchor attachments.

2. For insulation application where vapor retarders are indicated, extend insulation on anchor legs at least 12 inches (300 mm) from point of attachment to pipe and taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.

3. Install insert materials and apply insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.

M. Insulation Terminations: For insulation application where vapor retarders are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.

N. Apply adhesives and mastics at the manufacturer's recommended coverage rate.

O. Apply insulation with integral jackets as follows:

1. Pull jacket tight and smooth.

2. Circumferential Joints: Cover with 3 -inch- (75 -mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches (100 mm) o.c.

3. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches (40 mm). Apply insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches (100 mm) o.c.

a. Exception: Do not staple longitudinal laps on insulation having a vapor retarder.

4. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.

5. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retarder mastic.

P. Roof Penetrations: Apply insulation for interior applications to a point even with top of roof flashing.

1. Seal penetrations with vapor-retarder mastic.

2. Apply insulation for exterior applications tightly joined to interior insulation ends.

3. Extend metal jacket of exterior insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.

4. Seal metal jacket to roof flashing with vapor-retarder mastic.

Q. Exterior Wall Penetrations: For penetrations of below-grade exterior walls, terminate insulation flush with mechanical sleeve seal. Seal terminations with vapor-retarder mastic.

R. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and floors.

S. Fire-Rated Wall and Partition Penetrations: Apply insulation continuously through penetrations of fire-rated walls and partitions.

1. Fire-stopping and fire-resistive joint sealers are specified in Division 7 Section "Fire-stopping."

T. Floor Penetrations: Apply insulation continuously through floor assembly.

1. For insulation with vapor retarders, seal insulation with vapor-retarder mastic where floor supports penetrate vapor retarder.

3.4 MINERAL-FIBER INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

1. Secure each layer of preformed pipe insulation to pipe with wire, tape, or bands without deforming insulation materials.

2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic. Apply vapor retarder to ends of insulation at intervals of 15 to 20 feet (4.5 to 6 m) to form a vapor retarder between pipe insulation segments.

3. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches (150 mm) o.c.

4. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.

B. Apply insulation to fittings and elbows as follows:

1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.

2. When pre-molded insulation elbows and fittings are not available, apply mitered sections of pipe insulation, or glass-fiber blanket insulation, to a thickness equal to adjoining pipe insulation. Se-cure insulation materials with wire, tape, or bands.

3. Cover fittings with standard PVC fitting covers.

4. Cover fittings with heavy PVC fitting covers. Overlap PVC covers on pipe insulation jackets at least 1 inch (25 mm) at each end. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.

C. Apply insulation to valves and specialties as follows:

1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.

2. When pre-molded insulation sections are not available, apply glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to strainer basket without disturbing insulation.

3. Apply insulation to flanges as specified for flange insulation application.

4. Use preformed standard PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mas-tic.

5. Use preformed heavy PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mas-tic.

6. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

3.5 FLEXIBLE ELASTOMERIC THERMAL INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

1. Follow manufacturer's written instructions for applying insulation.

2. Seal longitudinal seams and end joints with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

B. Apply insulation to flanges as follows:

1. Apply pipe insulation to outer diameter of pipe flange.

2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.

3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of the same thickness as pipe insulation.

4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

C. Apply insulation to fittings and elbows as follows:

1. Apply mitered sections of pipe insulation.

2. Secure insulation materials and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

D. Apply insulation to valves and specialties as follows:

1. Apply preformed valve covers manufactured of the same material as pipe insulation and attached according to the manufacturer's written instructions.

2. Apply cut segments of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, fabricate removable sections of insulation arranged to allow access to strainer basket.

3. Apply insulation to flanges as specified for flange insulation application.

4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

3.6 CALCIUM SILICATE INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

1. Secure each layer of insulation to pipe with stainless-steel bands at 12-inch (300 - mm) intervals and tighten without deforming insulation materials.

2. Apply two-layer insulation with joints tightly butted and staggered at least 3 inches (75 mm). Secure inner layer with 0.062-inch (1.6-mm), soft-annealed, stainless-steel wire spaced at 12-inch (300-mm) intervals. Secure outer layer with stainless-steel bands at 12 -inch (300-mm) intervals.

3. Apply a skim coat of mineral-fiber, hydraulic-setting cement to surface of installed insulation. When dry, apply flood coat of lagging adhesive and press on one layer of glass cloth or tape. Overlap edges at least 1 inch (25 mm). Apply finish coat of lagging adhesive over glass cloth or tape. Thin the finish coat to achieve smooth finish.

B. Apply insulation to flanges as follows:

1. Apply preformed pipe insulation to outer diameter of pipe flange.

2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.

3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of the same material and thickness as pipe insulation.

4. Finish flange insulation the same as pipe insulation.

C. Apply insulation to fittings and elbows as follows:

1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.

2. When pre-molded sections of insulation are not available, apply mitered sections of calcium silicate insulation. Secure insulation materials with stainless-steel wire.

3. Finish insulation of fittings the same as pipe insulation.

D. Apply insulation to valves and specialties as follows:

1. Apply mitered segments of calcium silicate insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to strainer basket without disturbing insulation.

2. Apply insulation to flanges as specified for flange insulation application.

3. Finish valve and specialty insulation the same as pipe insulation.

3.7 FIELD-APPLIED JACKET APPLICATION

A. Apply glass-cloth jacket, where indicated, directly over bare insulation or insulation with factory-applied jackets.

1. Apply jacket smooth and tight to surface with 2 -inch (50 -mm) overlap at seams and joints.

2. Embed glass cloth between two 0.062 -inch- (1.6-mm-) thick coats of jacket manufacturer's recommended adhesive.

3. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.

B. Foil and Paper Jackets: Apply foil and paper jackets where indicated.

1. Draw jacket material smooth and tight.

2. Apply lap or joint strips with the same material as jacket.

3. Secure jacket to insulation with manufacturer's recommended adhesive.

4. Apply jackets with 1-1/2-inch (40-mm) laps at longitudinal seams and 3-inch- (75-mm-) wide joint strips at end joints.

5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-retarder mastic.

C. Apply PVC jacket where indicated, with 1-inch (25-mm) overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

D. Apply metal jacket where indicated, with 2-inch (50-mm) overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches (300 mm) o.c. and at end joints.

3.8 FINISHES

A. Glass-Cloth Jacketed Insulation: Paint insulation finished with glass-cloth jacket as specified in Division 9 Section "Painting."

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of the insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

3.9 PIPING SYSTEM APPLICATIONS

A. Insulation materials and thicknesses are specified in schedules at the end of this Section.

B. Items Not Insulated: Unless otherwise indicated, do not apply insulation to the following systems, materials, and equipment:

1. Flexible connectors.

2. Vibration-control devices.

3. Fire-suppression piping.

4. Drainage piping located in crawl spaces, unless otherwise indicated.

5. Below-grade piping, unless otherwise indicated.

6. Chrome-plated pipes and fittings, unless potential for personnel injury.

7. Air chambers, unions, strainers, check valves, plug valves, and flow regulators.

3.10 FIELD QUALITY CONTROL

A. Inspection: Owner will engage a qualified inspection agency to perform the following field quality-control inspections, after installing insulation materials, jackets, and finishes, to determine compliance with requirements:

B. Inspection: Engage a qualified inspection agency to perform the following field quality-control inspections, after installing insulation materials, jackets, and finishes, to determine compliance with requirements:

C. Inspection: Perform the following field quality-control inspections, after installing insulation materials, jackets, and finishes, to determine compliance with requirements:

1. Inspect fittings and valves randomly selected by Architect.

2. Remove fitting covers from 20 elbows or 1 percent of elbows, whichever is less, for various pipe sizes.

3. Remove fitting covers from 20 valves or 1 percent of valves, whichever is less, for various pipe sizes.

D. Insulation applications will be considered defective if sample inspection reveals noncompliance with requirements. Remove defective Work and replace with new materials according to these Specifications.

E. Reinstall insulation and covers on fittings and valves uncovered for inspection according to these Specifications.

3.11 INSULATION APPLICATION SCHEDULE, GENERAL

A. Refer to insulation application schedules for required insulation materials, vapor retarders, and field-applied jackets.

B. Application schedules identify piping system and indicate pipe size ranges and material, thickness, and jacket requirements.

3.12 INTERIOR INSULATION APPLICATION SCHEDULE

A. Service: Domestic hot and recirculated hot water.

1. Operating Temperature: 60 to 140 deg. F (15 to 60 deg. C).

2. Insulation Material: Mineral fiber.

3. Insulation Thickness: Apply the following insulation thicknesses:

a. Copper Pipe, <1 inch:1 inch

b. Copper Pipe, 1-<1.5 inches: 1 inch

c. Copper Pipe, 15-<4 inches: 1 inch

4. Field-Applied Jacket: Foil and paper.

5. Vapor Retarder Required: Yes.

6. Finish: None.

B. Service: Condensate drain piping.

1. Operating Temperature: 35 to 75 deg. F (2 to 24 deg. C).

2. Insulation Material: Flexible elastomeric.

3. Insulation Thickness: 1 inch

4. Field-Applied Jacket: None.

5. Vapor Retarder Required: Yes.

6. Finish: None.

C. Service: Exposed sanitary drains and domestic water supplies and stops for fixtures for the disabled.

1. Operating Temperature: 35 to 120 deg. F (2 to 49 deg. C).

2. Insulation Material: Flexible elastomeric.

3. Insulation Thickness: 1 inch

4. Field-Applied Jacket: PVC P-trap and supply covers.

5. Vapor Retarder Required: No.

6. Finish: Painted.

D. Service: Refrigerant suction and hot-gas piping.

1. Operating Temperature: 35 to 50 deg. F (2 to 10 deg. C).

2. Insulation Material: Flexible elastomeric.

3. Insulation Thickness: Apply the following insulation thicknesses:

a. Copper Pipe, <1 inch:1 inch

b. Copper Pipe, 1-<1.5 inches: 1 inch

c. Copper Pipe, 15-<4 inches:1 inch

4. Field-Applied Jacket: Stainless steel.

5. Vapor Retarder Required: Yes.

6. Finish: None.

E. Service: Diesel-engine exhaust.

1. Operating Temperature: 850 deg. F (454 deg. C) and lower.

2. Insulation Material: Calcium silicate.

3. Insulation Thickness: Apply the following insulation thicknesses:

a. Steel Pipe, 0.25-1.25 inches:3 inches

b. Steel Pipe, 1.5-3 inches: 3.5 inches

c. Steel Pipe, 3.5-5 inches:4 inches

d. Steel Pipe, 6-10 inches: 4 inches

4. Field-Applied Jacket: Stainless steel.

5. Vapor Retarder Required: No.

6. Finish: None.

3.13 EXTERIOR INSULATION APPLICATION SCHEDULE

A. This application schedule is for aboveground insulation outside the building. Loose-fill insulation, for belowground piping, is specified in Division 2 piping distribution Sections.

B. Service: Refrigerant suction.

1. Operating Temperature: 35 to 50 deg. F (2 to 10 deg. C).

2. Insulation Material: Flexible elastomeric.

3. Insulation Thickness: Apply the following insulation thicknesses:

a. Copper Pipe, <1 inch:1 inch

b. Copper Pipe, 1-<1.5 inches:1 inch

c. Copper Pipe, 15-<4 inches:1 inch

4. Field-Applied Jacket: Stainless steel.

5. Vapor Retarder Required: Yes.

6. Finish: None.

END OF SECTION

SECTION 15100

VALVES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general duty valves common to several mechanical piping systems.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Special purpose valves are specified in Division 15 piping system Sections.

2. Valve tags and charts are specified in Division 15 Section "Mechanical Identification."

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each valve type. Include body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions. Include list indicating valve and its application.

C. Maintenance data for valves to include in the operation and maintenance manual specified in Division 1. Include detailed manufacturer's instructions on adjusting, servicing, disassembling, and repairing.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Comply with the requirements specified in Division 1 Section "Materials and Equipment," under "Source Limitations" Paragraph.

B. ASME Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.

C. MSS Compliance: Comply with the various MSS Standard Practice documents referenced.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.

2. Protect threads, flange faces, grooves, and weld ends.

3. Set globe and gate valves closed to prevent rattling.

4. Set ball and plug valves open to minimize exposure of functional surfaces.

5. Set butterfly valves closed or slightly open.

6. Block check valves in either closed or open position.

B. Use the following precautions during storage:

1. Maintain valve end protection.

2. Store indoors and maintain valve temperature higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use a sling to handle large valves. Rig to avoid damage to exposed parts. Do not use handwheels and stems as lifting or rigging points.

PART 2 PRODUCTS

2.1 BASIC, COMMON FEATURES

A. Design: Rising stem or rising outside screw and yoke stems, except as specified below.

1. Non-rising stem valves may be used only where headroom prevents full extension of rising stems.

B. Pressure and Temperature Ratings: As indicated in the "Application Schedule" of Part 3 of this Section and as required to suit system pressures and temperatures.

C. Sizes: Same size as upstream pipe, unless otherwise indicated.

D. Operators: Use specified operators and handwheels, except provide the following special operator features:

1. Handwheels: For valves other than quarter turn.

2. Lever Handles: For quarter-turn valves 6 inches (DN150) and smaller, except for plug valves, which shall have square heads. Furnish Owner with 1 wrench for every 10 plug valves.

3. Chain-Wheel Operators: For valves 4 inches (DN100) and larger, installed 96 inches (2400 mm) or higher above finished floor elevation.

4. Gear-Drive Operators: For quarter-turn valves 8 inches (DN200) and larger.

E. Extended Stems: Where insulation is indicated or specified, provide extended stems arranged to receive insulation.

F. Bypass and Drain Connections: Comply with MSS SP-45 bypass and drain connections.

G. Threads: ASME B1.20.1.

H. Flanges: ASME B16.1 for cast iron, ASME B16.5 for steel, and ASME B16.24 for bronze valves.

I. Solder Joint: ASME B16.18.

1. Caution: Where soldered end connections are used, use solder having a melting point below 840 deg. F (450 deg. C) for gate, globe, and check valves; below 421 deg. F (216 deg. C) for ball valves.

2.2 GATE VALVES

A. Gate Valves, 2-1/2 Inches (DN65) and Smaller: MSS SP-80; Class 125, 200-psi (1380-kPa) cold working pressure (CWP), or Class 150, 300-psi (2070-kPa) CWP; ASTM B 62 cast-bronze body and bonnet, solid-bronze wedge, copper-silicon alloy rising stem, teflon-impregnated packing with bronze packing nut, threaded or soldered end connections; and with aluminum or malleable-iron handwheel.

B. Gate Valves, 3 Inches (DN80) and Larger: MSS SP-70, Class 125, 200-psi (1380-kPa) CWP, ASTM A 126 cast-iron body and bonnet, solid cast-iron wedge, brass-alloy stem, outside screw and yoke, teflon-impregnated packing with 2-piece packing gland assembly, flanged end connections; and with cast-iron handwheel.

2.3 BALL VALVES

A. Ball Valves, 4 Inches (DN100) and Smaller: MSS SP-110, Class 150, 600-psi (4140-kPa) CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch (DN15) valves and smaller and conventional port for 3/4-inch (DN20) valves and larger; blowout proof; bronze or brass stem; teflon seats and seals; threaded or soldered end connections:

1. Operator: Vinyl-covered steel lever handle.

2. Specify stem extension for valves installed in insulated piping systems.

3. Stem Extension: For valves installed in insulated piping.

4. Memory Stop: For operator handles.

2.4 PLUG VALVES

A. Plug Valves: MSS SP-78, 175-psi (1200-kPa) CWP, ASTM A 126 cast-iron body and bonnet, cast-iron plug, Buna N, Viton, or teflon packing, flanged or grooved end connections:

1. Operator: Lever.

2. Operator: Worm and gear with handwheel, sizes 6 inches (DN150) and larger.

3. Operator: Worm and gear with chain wheel, sizes 6 inches (DN150) and larger, 96 inches (2400 mm) or higher above floor.

2.5 GLOBE VALVES

A. Globe Valves, 2-1/2 Inches (DN65) and Smaller: MSS SP-80; Class 125, 200-psi (1380-kPa) CWP, or Class 150, 300-psi (2070-kPa) CWP; ASTM B 62 cast-bronze body and screwed bonnet, rubber, bronze, or teflon disc, silicon bronze-alloy stem, teflon-impregnated packing with bronze nut, threaded or soldered end connections; and with aluminum or malleable-iron handwheel.

B. Globe Valves, 3 Inches (DN80) and Larger: MSS SP-85, Class 125, 200-psi (1380-kPa) CWP, ASTM A 126 cast-iron body and bolted bonnet with bronze fittings, renewable bronze seat and disc, brass-alloy stem, outside screw and yoke, teflon-impregnated packing with cast-iron follower, flanged end connections; and with cast-iron handwheel.

2.6 BUTTERFLY VALVES

A. Butterfly Valves: MSS SP-67, 200-psi (1380-kPa) CWP, 150-psi (1035- kPa) maximum pressure differential, ASTM A 126 cast-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals, wafer, lug, or grooved style:

1. Disc Type: Nickel-plated ductile iron.

2. Operator for Sizes 2 Inches (DN50) to 6 Inches (DN150): Standard lever handle with memory stop.

3. Operator for Sizes 8 Inches (DN200) to 24 Inches (DN600): Gear operator with position indicator.

4. Operator for Sizes 8 Inches (DN200) and Larger, 96 Inches (2400 mm) or Higher above Floor: Chain-wheel operator.

2.7 CHECK VALVES

A. Swing Check Valves, 2-1/2 Inches (DN65) and Smaller: MSS SP-80; Class 125, 200-psi (1380-kPa) CWP, or Class 150, 300-psi (2070-kPa) CWP; horizontal swing, Y-pattern, ASTM B 62 cast-bronze body and cap, rotating bronze disc with rubber seat or composition seat, threaded or soldered end connections:

B. Swing Check Valves, 3 Inches (DN80) and Larger: MSS SP-71, Class 125, 200-psi (1380-kPa) CWP, ASTM A 126 cast-iron body and bolted cap, horizontal-swing bronze disc, flanged or grooved end connections.

C. Wafer Check Valves: Class 125, 200-psi (1380-kPa) CWP, ASTM A 126 cast-iron body, bronze disc/plates, stainless-steel pins and springs, Buna N seals, installed between flanges.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance of valves. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

C. Operate valves from fully open to fully closed positions. Examine guides and seats made accessible by such operation.

D. Examine threads on valve and mating pipe for form and cleanliness.

E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.

F. Do not attempt to repair defective valves; replace with new valves.

3.2 INSTALLATION

A. Install valves as indicated, according to manufacturer's written instructions.

B. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties.

C. Install valves with unions or flanges at each piece of equipment arranged to allow servicing, maintenance, and equipment removal without system shutdown.

D. Locate valves for easy access and provide separate support where necessary.

E. Install valves in horizontal piping with stem at or above the center of the pipe.

F. Install valves in a position to allow full stem movement.

G. For chain-wheel operators, extend chains to 60 inches (1500 mm) above finished floor elevation.

H. Installation of Check Valves: Install for proper direction of flow as follows:

1. Swing Check Valves: Horizontal position with hinge pin level.

2. Wafer Check Valves: Horizontal or vertical position, between flanges.

3.3 SOLDERED CONNECTIONS

A. Cut tube square and to exact lengths.

B. Clean end of tube to depth of valve socket with steel wool, sand cloth, or a steel wire brush to a bright finish. Clean valve socket.

C. Apply proper soldering flux in an even coat to inside of valve socket and outside of tube.

D. Open gate and globe valves to fully open position.

E. Remove the cap and disc holder of swing check valves having composition discs.

F. Insert tube into valve socket, making sure the end rests against the shoulder inside valve. Rotate tube or valve slightly to ensure even distribution of the flux.

G. Apply heat evenly to outside of valve around joint until solder melts on contact. Feed solder until it completely fills the joint around tube. Avoid hot spots or overheating valve. Once the solder starts cooling, remove excess amounts around the joint with a cloth or brush.

3.4 THREADED CONNECTIONS

A. Note the internal length of threads in valve ends and proximity of valve internal seat or wall to determine how far pipe should be threaded into valve.

B. Align threads at point of assembly.

C. Apply appropriate tape or thread compound to the external pipe threads, except where dry seal threading is specified.

D. Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.5 FLANGED CONNECTIONS

A. Align flange surfaces parallel.

B. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly with a torque wrench.

C. For dead-end service, butterfly valves require flanges both upstream and downstream for proper shutoff and retention.

3.6 VALVE END SELECTION

A. Select valves with the following ends or types of pipe/tube connections:

1. Copper Tube Size, 2-1/2 Inches (DN65) and Smaller: Solder ends, except provide threaded ends for heating hot water and low-pressure steam service.

2. Steel Pipe Sizes, 2-1/2 Inches (DN65) and Smaller: Threaded or grooved end.

3. Steel Pipe Sizes, 3 Inches (DN80) and Larger: Grooved end or flanged.

3.7 APPLICATION SCHEDULE

A. General Application: Use gate, ball, and butterfly valves for shutoff duty; globe, ball, and butterfly for throttling duty. Refer to piping system Specification Sections for specific valve applications and arrangements.

B. Domestic Water Systems: Use the following valve types:

1. Gate Valves: Class 125, bronze or cast-iron body to suit piping system.

2. Ball Valves: Class 150, 600-psi (4140-kPa) CWP, with stem extension.

3.8 ADJUSTING

A. Adjust or replace packing after piping systems have been tested and put into service, but before final adjusting and balancing. Replace valves if leak persists.

END OF SECTION

SECTION 15241

MECHANICAL VIBRATION CONTROLS AND SEISMIC RESTRAINTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes vibration isolators, vibration isolation bases, vibration isolation roof curbs, and seismic restraints and snubbers.

B. Related Sections include the following:

1. Division 15 Section "Hangers and Supports" for pipe hanger restraints.

2. Division 15 Section "Metal Ductwork" for flexible duct connectors.

3. Division 15 piping Sections for flexible pipe connectors.

1.3 SUBMITTALS

A. Product Data: Indicate types, styles, materials, and finishes for each type of isolator specified. Include load deflection curves.

B. Shop Drawings: Show designs and calculations, certified by a professional engineer, for the following:

1. Design Calculations: Calculations for selection of vibration isolators, design of vibration isolation bases, and selection of seismic restraints.

2. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to the structure and to the supported equipment. Include auxiliary motor slides and rails, and base weights.

3. Seismic Restraint Details: Detail fabrication and attachment of restraints and snubbers.

1.4 QUALITY ASSURANCE

A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in Guam and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of vibration isolation bases and seismic restraints that are similar to those indicated for this Project in material, design, and extent.

1.5 PROJECT CONDITIONS

A. See IBC seismic requirements, latest edition.

1.6 COORDINATION

A. Coordinate layout and installation of vibration isolation and seismic-restraint devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

B. Coordinate size and location of concrete housekeeping and vibration isolation bases. Cast anchor-bolt inserts into base. Concrete, reinforcement, and formwork requirements are specified in Division 3 Sections.

C. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7 Sections.

PART 2 PRODUCTS

2.1 VIBRATION ISOLATORS

A. Isolator Pads: Oil and water resistant and factory cut to sizes that match requirements of the equipment supported.

1. Rubber Isolator Pads: Elastomer (neoprene or silicone) arranged in single or multiple layers and molded with a nonslip pattern and steel baseplates of sufficient stiffness to provide uniform loading over the pad area.

2. Fiberglass or Cork Isolator Pads: Molded cork or glass fiber not less than 1 inch (25 mm) thick and pre-compressed through 10 compression cycles at 3 times the rated load.

3. Load Range: From 10 to 50 psig (69 to 345 kPa) and a deflection not less than 0.08 inch per 1 inch (2 mm per 25 mm) of thickness. Do not exceed a loading of 50 psig (345 kPa).

B. Rubber Isolator Mounts: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements, with encapsulated top and baseplates. Factory-drilled and tapped top plate for bolted equipment mounting. Factory-drilled baseplate for bolted connection to structure. Color-code to indicate capacity range.

C. Spring Isolators: Freestanding, laterally stable, open-spring-type isolators.

1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

2. Minimum Additional Travel: 50 percent of the required deflection at rated load.

3. Lateral Stiffness: More than 1.2 times the rated vertical stiffness.

4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

5. Baseplates: Factory drilled for bolting to structure and bonded to a 1/4-inch- (6-mm-) thick, rubber isolator pad attached to the baseplate underside. Size baseplates to limit floor loading to 100 psig (690 kPa).

6. Top Plates: Provide threaded studs for fastening and leveling equipment.

7. Finishes: Manufacturer's standard corrosive-resistant finish.

D. Restrained Spring Isolators: Vertically restrained, freestanding, laterally stable, steel

open-spring-type isolators.

1. Housing: Welded steel with resilient vertical limit stops to prevent spring extension due to wind loads or when weight is removed. Factory-drilled baseplate for bolting to structure and bonded to a 1/4-inch- (6-mm-) thick, rubber isolator pad attached to the baseplate underside. Provide adjustable equipment mounting and leveling bolt.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.

4. Lateral Stiffness: More than 0.8 times the rated vertical stiffness.

5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

6. Finishes: Baked enamel for metal components on isolators for interior use. Hot-dip galvanized for metal components on isolators for exterior use.

E. Rubber Hangers: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements bonded to formed-steel housings with threaded connections for hanger rods. Color-code to indicate capacity range.

F. Spring Hangers: Combination spring and elastomeric hanger with coil spring and elastomeric insert in compression.

1. Frame: Formed steel, fabricated for connection to threaded rods and to allow for 30 degrees of angular hanger rod misalignment without binding or reducing isolation efficiency.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.

4. Elastomeric Element: Molded, oil-resistant rubber or neoprene.

5. Finishes: Baked enamel for metal components. Color-code to indicate capacity range.

2.2 SEISMIC CONTROLS

A. Thrust Restraints: Combination spring and elastomeric restraints with coil spring and elastomeric insert in compression. Factory set for thrust.

1. Frame: Formed steel, fabricated for connection to threaded rods and to allow for 30 degrees of angular hanger rod misalignment without binding or reducing isolation efficiency.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.

4. Elastomeric Element: Molded, oil-resistant rubber or neoprene.

5. Finishes: Baked enamel for metal components. Color-code to indicate capacity range.

B. Manufactured Seismic Snubbers: All-directional, double-acting snubbers.

1. Construction: Interlocking steel members restrained by a 3/4-inch- (19-mm-) thick, replaceable, shock-absorbing neoprene insert. Maintain 1/8-inch (3-mm) clearance in all directions between rigid and resilient surfaces.

C. Fabricated Seismic Snubbers: Welded structural-steel shapes designed and fabricated to restrain equipment or vibration isolation bases from excessive movement during a seismic event. Design to resist gravity forces identified by authorities having jurisdiction.

1. Construction: Welded steel shapes conforming to ASTM A 36 (ASTM A 36M).

2. Resilient Components: 3/4-inch- (19-mm-) thick, replaceable, shock-absorbing neoprene insert.

2.3 VIBRATION ISOLATION BASES

A. Fabricated Steel Bases: Structural-steel bases and rails designed and fabricated by the isolation equipment manufacturer. Include equipment static loadings, power transmission, component misalignment, and cantilever loadings.

1. Fabricate bases to shapes required, with welded structural-steel shapes, plates, and bars conforming to ASTM A 36 (ASTM A 36M). Include support brackets to anchor base to isolation units. Include pre-located equipment anchor bolts and auxiliary motor slide bases or rails.

2. Design and fabricate bases to result in the lowest possible mounting height with not less than 1-inch (25-mm) clearance above the floor.

3. Weld steel angles on frame for outrigger isolation mountings, and provide for anchor bolts and equipment support.

4. Pump Bases: Size to support pump and piping elbows.

5. Factory Finish: Manufacturer's standard corrosive-resistant finish.

2.4 VIBRATION ISOLATION ROOF CURBS

A. Description: Factory-assembled, fully enclosed, insulated, air- and watertight curb designed to resiliently support roof-mounted equipment and to withstand 175-mph (78-m/s) wind impinging laterally against the side of the equipment. Design restraints to meet seismic requirements of authorities having jurisdiction.

B. Components: Upper support frame; lower support assembly; freestanding, unhoused, laterally stable steel springs; vertical and horizontal restraints.

1. Lower Support Assembly: Provide a means of attachment to the building structure and include a wood nailer strip for attachment of roof material and 2 inches (50 mm) of rigid insulation on the inside of the assembly.

2. Spring Isolators: As indicated or scheduled. Include adjustment bolt to permit leveling of equipment after installation. Attach to lower assembly with a rubber

isolation pad. Locate spring isolators so they are accessible for adjustment at any time during the life of the installation without interfering with the integrity of the roof.

3. Water Seal: Elastomeric seal conforming to UL Class A roofing materials, attached to the upper support frame, extending down past the wood nailer of the lower support assembly, and counter-flashed over the roof materials.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install and anchor vibration-, sound, and seismic-control products according to manufacturer's written instructions and authorities having jurisdiction.

B. Anchor interior mounts, isolators, hangers, and snubbers to vibration isolation bases. Bolt isolator baseplates to structural floors as required by authorities having jurisdiction.

C. Anchor exterior mounts, isolators, hangers, and snubbers to vibration isolation bases. Bolt isolator baseplates to structural supports as required by authorities having jurisdiction.

D. Install pipe connectors at connections for equipment supported on vibration isolators.

3.2 SEISMIC CONTROL

A. Vibration Isolation Bases: Mount equipment on structural-steel bases or concrete inertia bases.

B. Snubbers: Install the required number of seismic snubbers on each spring-mounted piece of equipment. Locate snubbers as close as possible to the vibration isolators and bolt to supporting structure.

3.3 ADJUSTING AND CLEANING

A. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operations.

B. Adjust thrust restraints for a maximum of 1/4 inch (6 mm) of movement at start and stop.

END OF SECTION

SECTION 15310

FIRE PROTECTION PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe, fittings, valves, and connections for sprinkler system.

1.2 RELATED SECTIONS

A. Section 15325 Sprinkler Systems: Sprinkler systems design.

1.3 REFERENCES

A. ASME Boiler and Pressure Vessel Code Section IX Welding and Brazing Qualifications.

B. ASME B16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.

C. ASME B16.3 Malleable Iron Threaded Fittings, Class 150 and 300.

D. ASME B16.4 Cast Iron Threaded Fittings, Class 125 and 250.

E. ASME B16.5 Pipe Flanges and Flanged Fittings.

F. ASME B16.9 Factory made Wrought Steel Buttwelding Fittings.

G. ASME B16.11 Forged Steel Fittings, Socket welding and Threaded.

H. ASME B16.25 Buttwelding Ends.

I. ASME B36.10 Welded and Seamless Wrought Steel Pipe.

J. ASTM A135 Electric Resistance Welded Steel Pipe.

K. ASTM A47 Malleable Iron Castings.

L. ASTM A53 Pipe, Steel, Black and Hot Dipped, Zinc coated Welded and Seamless.

M. ASTM A234 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

N. ASTM A795 Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.

O. AWS D10.9 Specifications for Qualification of Welding Procedures and Welders for Piping and Tubing.

P. AWWA C110 Ductile Iron and Gray Iron Fittings.

Q. AWWA C151 Ductile Iron Pipe, Centrifugally Cast.

R. NFPA 13 Installation of Sprinkler Systems.

S. NFPA 24 Installation of Private Fire Service Mains and Their Appurtenances

T. UL Fire Resistance Directory.

U. UL 262 Gate Valves for Fire-Protection Service.

V. UL 312 Check Valves for Fire-Protection Service.

W. UL 405 Fire Department Connections.

1.4 SUBMITTALS FOR REVIEW

A. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.

B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections as required by NFPA 13.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Project Record Documents: Record actual locations of components and tag numbering.

B. Operation and Maintenance Data: Include installation instructions and spare parts lists.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

C. Design fire sprinkler system under direct supervision of a Professional Fire Protection Engineer experienced in design of this Work and licensed in the U.S. Territory of Guam.

1.7 REGULATORY REQUIREMENTS

A. Conform to UL and/or FM.

B. Sprinkler Systems: Conform work to NFPA 13.

C. Welding Materials and Procedures: Conform to ASME Code.

D. Valves: Bear UL and/or FM label or marking. Provide manufacturer's name and pressure rating marked on valve body.

E. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

1.8 DELIVERY, STORAGE, AND PROTECTION

A. Deliver and store valves in shipping containers, with labelling in place.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 PRODUCTS

2.1 BURIED PIPING

A. Steel Pipe: ASTM A53, Schedule 40 black, with ASME C105 polyethylene jacket, or double layer, half lapped 10 mil (0.25 mm) polyethylene tape.

1. Steel Fittings: ASME B16.9, wrought steel, buttwelded; ASME B16.25, buttweld ends; ASTM A234, wrought carbon steel and alloy steel; ASME B16.11, forged steel socket welded and threaded; with double layer, half lapped 10 mil (0.25 mm) polyethylene tape.

2. Joints: AWS D1.1, welded.

2.2 ABOVE GROUND PIPING

A. Steel Pipe: ASTM A53; Schedule 40 black.

1. Steel Fittings: ASME B16.9, wrought steel, buttwelded; ASME B16.25, buttweld ends; ASTM A234, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.

2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings; ASME B16.4, threaded fittings.

3. Malleable Iron Fittings: ASME B16.3, threaded fittings ASTM A47.

4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

5. Mechanical Formed Fittings: Carbon steel housing with integral pipe stop and O-ring pocked and O-ring, uniformly compressed into permanent mechanical engagement onto pipe.

2.3 PIPE HANGERS AND SUPPORTS

A. Conform to NFPA 13.

B. Hangers for Pipe Sizes 1/2 to 1 1/2 Inch (15 to 40 mm): Malleable iron, adjustable swivel, split ring.

C. Hangers for Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.

D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

E. Wall Support for Pipe Sizes to 3 Inches (80 mm): Cast iron hook.

F. Wall Support for Pipe Sizes 4 Inches (100 mm) and Over: Welded steel bracket and wrought steel clamp.

G Vertical Support: Steel riser clamp.

H. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

I. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.4 GATE VALVES

A. Up to and including 2 Inches (50 mm):

1. Bronze body, bronze trim, rising stem, hand wheel, solid wedge or disc, threaded ends.

B. Over 2 Inches (50 mm):

1. Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, hand wheel, OS&Y, solid rubber covered bronze or cast iron wedge, grooved ends.

C. Over 4 Inches (100 mm):

1. Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged ends, iron body indicator post assembly.

2.5 GLOBE VALVES

A. Up to and including 2 Inches (50 mm):

1. Bronze body, bronze trim, rising stem and hand wheel, inside screw, renewable rubber disc, threaded ends, with back-seating capacity.

B. Over 2 Inches (50 mm):

1. Iron body, bronze trim, rising stem, hand wheel, OS&Y, plug type disc, flanged ends, renewable seat and disc.

2.6 BALL VALVES

A. Up to and including 2 Inches (50 mm):

1. Bronze two-piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing stops, threaded ends.

B. Over 2 Inches (50 mm):

1. Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle or gear drive hand wheel for sizes 10 inches (250 mm) and over, flanged.

2.7 BUTTERFLY VALVES

A. Bronze Body:

1. Stainless steel disc, resilient replaceable seat, threaded or grooved ends, extended neck, hand wheel and gear drive and integral indicating device.

B. Cast or Ductile Iron Body

1. Cast or ductile iron, chrome or nickel plated ductile iron or aluminum bronze disc, resilient replaceable EPDM seat, wafer, lug, or grooved ends, extended neck, hand wheel and gear drive and integral indicating device.

2.8 CHECK VALVES

A. Up to and including 2 Inches (50 mm):

1. Bronze body and swing disc, rubber seat, threaded ends.

B. Over 2 Inches (50 mm):

1. Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends with automatic ball check.

C. 4 Inches (100 mm) and Over:

1. Iron body, bronze disc, stainless steel spring, resilient seal, threaded, wafer, or flanged ends.

2.9 DRAIN VALVES

A. Compression Stop:

1. Bronze with hose thread nipple and cap.

B. Ball Valve:

1. Brass with cap and chain, 3/4-inch (20 mm) hose thread.

PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and foreign material, from inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

A. Install piping in accordance with NFPA 13 for sprinkler systems and NFPA 24 for service mains.

B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

C. Install piping to conserve building space, to not interfere with use of space and other work.

D. Group piping whenever practical at common elevations.

E. Sleeve pipes passing through partitions, walls, and floors.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. Inserts:

1. Provide inserts for placement in concrete formwork.

2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches (100 mm).

4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

5. Where inserts are omitted, drill through concrete slab from below and provide through bolt with recessed square steel plate and nut above slab.

H. Pipe Hangers and Supports:

1. Install in accordance with NFPA 13 and NFPA 14.

2. Install hangers to provide minimum 1/2-inch (15 mm) space between finished covering and adjacent work.

3. Place hangers within 12 inches (300 mm) of each horizontal elbow.

4. Use hangers with 1 1/2 inch (40 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

5. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.

6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

7. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

I. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.

J. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding. Refer to Section 09900.

K. Do not penetrate building structural members unless indicated.

L. Provide sleeves when penetrating floors and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.

M. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

N. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other nontoxic joint compound applied to male threads only.

O. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.

P. Provide gate or butterfly valves for shut off or isolating service.

Q. Provide drain valves at main shut off valves, low points of piping and apparatus.

END OF SECTION

SECTION 15320

FIRE PUMPS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire pump package.

B. Fire pump motor.

C. Electric jockey pump.

D. Controllers.

1.2 RELATED SECTIONS

A. Section 15170 - Motors.

B. Section 15245 - Vibration Isolation.

C. Section 15260 - Piping Insulation.

D. Section 15280 - Equipment Insulation.

E. Section 15310 - Fire Protection Piping.

F. Section 15410 - Plumbing Piping.

G. Section 16180 - Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.3 REFERENCES

A. FM - Factory Mutual System - Approval Guide.

B. NEMA MG-1 - Motors and Generators.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volt

D. NFPA 13 - Installation of Sprinkler Systems.

D. NFPA 20 - Installation of Centrifugal Fire Pumps.

E. NFPA 24 - Private Fire Service Mains and their Appurtenances.

F. NFPA 37 - Installation and Use of Stationary Combustion Engines and Gas Turbines.

G. NFPA 70 - National Electrical Code.

H. UL - Fire Protection Equipment Directory.

I. UL 448 - Pumps for Fire Protection Service.

J. UL 778 - Motor Operated Water Pumps.

K. UL 1478 - Fire Pump Relief Valves.

1.4 DESIGN REQUIREMENTS

A. Conform to NFPA 20.

1.5 PERFORMANCE REQUIREMENTS

A. Conform to greater of NFPA 20 or NFPA 13.

1.6 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Product Data: Provide manufacturers literature including general assembly, pump curves showing performance characteristics with pump and system, operating point indicated, NPSH curve, controls, wiring diagrams, and service connections.

C. Shop Drawings: Indicate layout, general assembly, components, dimensions, weights, clearances, and methods of assembly.

1.7 SUBMITTALS FOR INFORMATION

A. Section 01300 - Submittals: Procedures for submittals.

B. Test Reports: Indicate results of hydrostatic test and field acceptance tests performed in accordance with NFPA 20.

C. Manufacturer's Instructions: Indicate support details, connection requirements, for fire pump system.

1.8 SUBMITTALS AT PROJECT CLOSEOUT

A. Section 01700 - Contract Closeout:01730 - Operation and Maintenance Data: 01740 - Warranties and Bonds: Procedures for submittals.

B. Project Record Documents: Record actual locations of components and accessories.

C. Certificates: Certify that fire pumps meet or exceed specified requirements at specified operating conditions and that the installation complies with regulatory requirements. Submit summary and results of shop tests performed in accordance with NFPA 20.

D. Operation Data: Include manufacturer’s instructions, start-up data, trouble-shooting check lists, for pumps, drivers, and controllers.

E. Maintenance Data: Include manufacturers literature, cleaning procedures, replacement parts lists, and repair data for pumps, drivers and controllers.

1.9 QUALITY ASSURANCE

A. Perform Work in accordance with NFPA 20 . Maintain one copy on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum 3 years experience.

C. Installer Qualifications: Company specializing in performing the work of this section [with minimum 3 years experience.

D. Design fire pump system under direct supervision of a Professional Engineer experienced in design of this Work and licensed at the place where the Project is located.

1.10 REGULATORY REQUIREMENTS

A. Conform to UL or FM.

B. Perform work in accordance with NFPA 20.

C. Conform to NFPA 20 for installation and testing of fire pumps, drivers, and controllers.

D. Provide certificate of compliance from authority have jurisdiction indicating approval of field acceptance tests.

E. Equipment and Components: Bear UL or FM label or marking.

F. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.11 PRE-INSTALLATION MEETING

A. Section 01039 - Coordination and Meetings: Pre-installation meeting.

B. Convene one week before starting work of this section.

1.12 DELIVERY, STORAGE, AND PROTECTION

A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.

B. Accept fire pumps and components on site in factory packing. Inspect for damage. Comply with manufacturers rigging and installation instructions.

C. Protect fire pumps and components from physical damage including effects of weather, water, and construction debris.

D. Provide temporary inlet and outlet caps, and maintain in place until installation.

1.13 MAINTENANCE SERVICE

A. Section 01700 - Contract Closeout.

B. Provide service and maintenance of fire pump, driver, and controller foroneyear from date of Substantial Completion.

1.14 EXTRA MATERIALS

A. Section 01700 - Contract Closeout. 01730 - Operation and Maintenance Data.

B. Provide one set of gaskets seals for each pump type and model supplied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. AC Fire Pump

B. Other Acceptable Manufacturers:

1. Aurora Pumps

2. Fairbanks

3. Pentair

C. Section 01600 - Material and Equipment: Product options and substitutions. Substitutions: Not permitted.

2.2 HORIZONTAL BASE MOUNTED PUMPS

A. Type: UL 448 and UL 778 , horizontal shaft, single stage, double suction, direct connected, horizontally split casing, for 250 psi (1 720 kPa) maximum working pressure.

B. Casing: Cast iron, with suction and discharge gage ports, renewable bronze casing wearing rings, seal flush connection, drain plug, flanged suction and discharge.

C. Impeller: Bronze double suction fully enclosed, balanced and keyed to shaft.

D. Bearings: Grease lubricated ball bearings, replaceable without opening casing.

E. Shaft: Alloy steel with replaceable bronze shaft sleeve.

F. Seal: Packing gland with minimum four rings graphite impregnated packing and bronze lantern rings, 230 degrees F (110 degrees C) maximum continuous operating temperature.

G. Drive: Flexible coupling with coupling guard.

H. Baseplate: Cast iron [or fabricated steel] with integral drain rim.

I. Performance:

1. Flow: gpm 500 at 208 feet head

2. Motor: 40 hp, 480 volt, three phase, 60 Hz

1. Flow: gpm 500 at 208 feet head

2. Motor: 40 hp, 480 volt, three phase, 60 Hz

2.3 FIRE PUMP ACCESSORIES

A. Eccentric suction reducer and OS&Y gate or butterfly valve on suction side of pump.

B. Concentric increaser and check valve in pump discharge and OS&Y gate or butterfly valve on system side of check valve.

C. Fire pump bypass fitted with OS&Y gate or butterfly valves and check valve.

D. Main relief valve, UL 1478, open type waste cone.

E. Suction pressure gage, 4 1/2 inch (110 mm) diameter dial with snubber, valve cock and lever handle.

F. Discharge pressure gage mounted on board attached to pump, with snubber, valve cock and l ever handle.

G. Casing 3/4 inch (20 mm) relief valve.

H. Float operated 3/4 inch automatic air release valve.

I. Hose valve manifold with 2 1/2 inch hose gate valves with caps and chains.

J. Flow metering system for closed loop testing.

2.4 ELECTRIC MOTOR DRIVE

A. Motor: Squirrel cage induction type; in open drip proof NEMA MG-1 enclosure, 3500rpm. Refer to Section 15170.

B. Controller: Limited service type with [auto-transformer] [primary resistor] [reduced voltage,] [part winding] [across-the-line] starter, in NEMA 250 enclosure, including the following:

3. Disconnect Switch: Externally operable, quick break type.

4. Circuit Breaker: Size to NFPA 20, minimum 65,000 amperes interrupting capacity.

5. Motor Starter: Energized automatically through pressure switch or manually by externally operable handle.

6. Pressure Switch: Set to cut in at churn pressure.

7. Running Period Timer: Keeps motor in operation when started automatically, for a minimum of seven minutes.

8. Pilot Lamp: Indicates circuit breaker closed and power available.

9. Test Accessories: Ammeter test link and voltmeter test studs.

10. Alarm Relay: Energizes alarm to indicate circuit breaker open or power failure.

11. Switch Relay: For remote start.

12. Manual Selector Station: On enclosure marked "Automatic" and "Non-Automatic."

C. Electrical Characteristics:

1. 40 hp.

2. 480 volts, three phase, 60 Hz.

2.5 PRESSURE BOOSTER (JOCKEY) PUMP

A. Manufacturer: Goulds SV

B. Other acceptable manufacturers offering equivalent products.

1. Pentair

2. Grundfos

3. Xylem

4. Section 01600 - Material and Equipment: Product options and substitutions. Substitutions: Permitted.

C. Electrically operated, turbine type with standard open drip-proof horizontal motor.

D. Control by automatic jockey pump controller with full voltage starter [and minimum run timer] to start pump on pressure drop in system [and stay in operation for minimum period of time]. Fire pump shall start automatically on further pressure drop or on jockey pump failure.

E. Electrical Characteristics:

1. 2 hp.

2. 480 volts, three phase, 60 Hz.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with NFPA 20.

B. Install diesel engine drive in accordance with NFPA 37.

C. Provide access space around pumps for service; no less than minimum as recommended by manufacturer.

D. Install piping in accordance with Section 15310. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. For base mounted pumps, provide supports under elbows on pump suction and discharge.

E. Provide drains for bases and seals, piped to and discharging into floor drains.

F. Mount unit on vibration isolators. Refer to Section 15245.

G. Provide piping for fuel supply and return connected to motor. Provide piping to and from exhaust silencer with thimble at wall or roof penetrations. Refer to Section 15410.

H. Insulate piping associated with pump, pump casing and exhaust silencer. Refer to Section 15260 and Section 15280.

I. Provide for connection to electrical service. Refer to Section 16180.

J. Lubricate pumps before start-up.

K. Check, align, and certify base mounted pumps by qualified millwright prior to start-up.

3.2 FIELD QUALITY CONTROL

A. Section 01400 - Quality Assurance and 01650 - Starting of Systems: Field testing.

B. Perform flow test on entire system in accordance with NFPA 20.

C. Require test to be witnessed by authority having jurisdiction and Architect/Engineer.

3.3 DEMONSTRATION AND INSTRUCTIONS

A. Section 01700 - Contract Closeout: Demonstrating installed work.

B. Demonstrate automatic operation of system including verification of pressure switch set points.

END OF SECTION

SECTION 15330

WET PIPE SPRINKLER SYSTEM

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

Section 15010 "Basic Mechanical Requirements," applies to this section, with the additions and modifications specified herein.

1.2 DESCRIPTION

A. The work includes designing and providing new automatic wet pipe fire extinguishing sprinkler system for uniform distribution of water by hydraulic design to afford complete fire protection coverage throughout the project. Sprinkler protection shall provide 100% coverage for the enclosed areas of the buildings in accordance with NFPA 13.

B. System shall be provided with earthquake protection. Design and install system to give full consideration to blind spaces, piping, electrical equipment, ductwork, and all other construction and equipment to afford complete coverage in accordance with detailed drawings to be submitted for approval. Devices and equipment for fire protection service shall be listed by the Underwriters' Laboratories, Inc. or approved by Factory Mutual System. In the NFPA publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears; reference to the "authority having jurisdiction" shall be interpreted to mean the Government of Guam Fire Department and Department of Public Works. The work shall begin at the point indicated.

1.3 APPLICABLE PUBLICATIONS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the designation only.

A. ASTM A 53-83 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

B. AWWA C 104-80 - Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fitting for Water

C. AWWA C 110-82 - Gray-Iron and Ductile-Iron Fittings, 3 in. Through 48 in. for Water and Other Liquids

D. AWWA C 151-81 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids

E. AWWA C 500-80 - Gate Valves, 3 Inch Through 48 Inch, for Water and Sewage Systems

F. AWWA C 601-81 - Disinfecting Water Mains

G. FM 1992 - Approval Guide

H. NFPA 10-90 - Portable Fire Extinguishers

I. NFPA 13-91 - Sprinkler Systems

J. NFPA 14-90 - Standpipe and Hose Systems

K. NFPA 24-90 - Outside Protection

L. NFPA 70-90 - National Electrical Code

M. UL 262-80 - Gate Valves for Fire Protection Service

N. UL 789-82 - Indicator Posts for Fire Protection Service

1.4 QUALIFICATIONS OF INSTALLER

Prior to installation, submit data for approval by the Engineer, showing that the Contractor has successfully installed automatic fire extinguishing sprinkler systems of the same type and design as specified herein, or that he has a firm contractual agreement with a subcontractor having such required experience. The data shall include the names and locations of at least two installations where the Contractor, or the subcontractor referred to above, has installed such systems. The Contractor shall indicate the type and design of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than two years.

1.5 SUBMITTALS

Partial submittals will not be acceptable. Annotate descriptive data to show the specific model, type, and size of each item the Contractor proposes to furnish. Prepare working drawings on sheets not smaller than 30 inches by 42 inches, in accordance with the requirements for "Working Drawings (Plans) as specified in NFPA 13 and NFPA 14, and include data essential to the proper installation of each system. Do not commence work until the design of each system and the various components have been approved. The Engineer, Guam Fire Department and Department of Public Works will review and approve all submittals. Before work is commenced, submit for approval complete sets of working drawings and calculations for each sprinkler system and working drawings for the standpipe. Working drawings and calculations must be stamped by a registered professional engineer.

A. Manufacturer's Data:

1. Pipe, fittings, and mechanical coupling

2. Valves including gate, check, relief and globe

3. Sprinkler heads

4. Pipe hangers, supports and earthquake sway bracing

5. Alarm pressure switches

6. Valve tamper switches and waterflow switches

7. Fire department connections

8. Fire Hose Cabinets

9. Sprinkler stoppers

B. Shop (Working) Drawings:

1. Sprinkler system layout

2. Hydraulic calculations

3. Standpipe system layout

C. Samples: One of each type of sprinkler head and escutcheon plates to be used.

D. Certificates of Compliance:

1. Contractor's material and test certificate

2. Pipe and fittings

E. Operation and Maintenance Manuals: For all sprinkler system components.

1.6 AS-BUILT (RECORD) WORKING DRAWINGS

After completion, but before final acceptance of the work, furnish a complete set of drawings of each sprinkler, fire pump and standpipe system for record purposes. The drawings shall be not smaller than 30 inches by 42 inches reproducible drawings on mylar film with title block (8 inches by 4 inches) similar to full size contract drawings. Furnish the as-built (record) working drawings in addition to the as-built contract drawings required by Division 1 Section, “Project Record Documents”.

1.7 ELECTRICAL WORK

Provide under this section as specified in Division 16 "Electrical".

PART 2 PRODUCTS

2.1 DESIGN OF SPRINKLER SYSTEMS

A. Design of wet pipe fire extinguishing sprinkler system shall be by hydraulic calculations for uniform distribution of water over the design area and shall conform to NFPA 13 and to the requirements as specified herein.

B. Distribution of Water: Distribution shall be essentially uniform throughout the area in which it is assumed the sprinkler heads will open. Variation in discharge from individual heads in the hydraulically most remote area shall be between 100 and 120 percent of the specified density.

C. Density of Application of Water: Size pipe to provide the specified density when the system is discharging the specified total maximum required flow. Application to horizontal surfaces below the sprinklers shall be as indicated.

D. Sprinkler Discharge Area: Shall be the hydraulically most remote 1,500 sf as defined by NFPA 13.

E. Outside Hose Allowances: Hydraulic calculations shall include allowances for outside hose.

F. Water Supply: Water supply information shall be as indicated on the drawing. Contractor shall perform flow test on water supply to ensure that there is available flow and pressure for each sprinkler system.

G. Friction Losses: Calculate losses in pipe in accordance with the Hazen-Williams formula with 'C' value of 120 for steel pipe and 140 for buried cement-lined ductile-iron pipe and asbestos cement pipe.

H. Velocity: Sprinkler system hydraulic design shall limit velocities of flow in pipes to a maximum of 20 feet per second.

I. Location of Sprinkler Heads: Heads in relation to the ceiling and walls and the spacing of sprinklers shall not exceed that permitted by NFPA 13.

2.2 EQUIPMENT

A. Sprinkler Heads: Release element of each head shall be of the ordinary temperature rating or higher as suitable for the individual location where it is installed. Provide recessed chromium-plated pendant sprinklers, and chromium-plated ceiling plates below suspended ceilings. Sidewall sprinklers shall be chromium plated. Sprinklers located in exposed areas shall be stainless steel or polyester coated.

B. Heads in isolation cells and other security areas shall be institutional type heads. Verify with the Architect those areas requiring institutional type heads.

C. Cabinet: Provide extra sprinkler heads and sprinkler head wrench and three of the proper types of sprinkler stoppers in a metal cabinet located as instructed. The number and types of extra sprinkler heads shall be as specified in NFPA 13.

D. Sprinkler Supervisory Devices: Provide as indicated. Connection of the sprinkler supervisory devices to the building fire alarm system shall be provided under Division 16, Electrical.

E. Alarm Pressure Switch: UL listed or FM approved.

F. Water Flow Switch: Provide listed or approved vane type water flow switches complete with an adjustable pneumatic retard with an adjustable range of 0 to approximately 60 seconds and two sets of Form C electrical contacts.

G. Valve Tamper Switch: Provide each control valve with a listed or approved tamper switch for the automatic transmittal of a trouble signal.

2.3 ABOVE GROUND PIPING SYSTEMS

A. Inspect, test and approve piping before covering, or concealing. Provide fittings for changes in direction of piping and for all connections. Make changes in piping sizes through reducing pipe fittings; the use of bushings will not be permitted. Welding shall be performed in the shop; field welding will not be permitted.

B. Pipe and Fittings: Provide in accordance with NFPA 13, except as modified hereinafter. All pipe shall be black steel, schedule 40. Plastic pipe and copper tubing shall not be permitted. Fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded shall be welded, threaded, or grooved-end type. Use of plain-end fittings with mechanical couplings (which utilize steel gripping devices to bite into pipe when pressure is applied) will not be permitted. Rubber gasketed grooved-end pipe and fittings with mechanical couplings shall be permitted in pipe sizes 1.25 inches and larger; fittings shall be UL listed or FM approved for use in sprinkler systems.

C. Provide earthquake sway brace within 24 inches of each flexible coupling which is installed in horizontal piping for purposes other than earthquake protection.

D. Pipe Hangers, Supports, and Earthquake Sway Bracing: Provide in accordance NFPA 13 and NFPA 14.

E. Valves: Provide valves as required by NFPA 13 and NFPA 14 and of types approved for fire service. Gate valves shall open by counter clockwise rotation. Check valves shall be flanged clear opening swing check type with flanged inspection and access cover plate for sizes 4

inches and larger. Provide OS&Y sectional valves as indicated. Where maximum pressures exceed 175 psi valves shall comply with paragraph 3-13.1.4 of NFPA 13.

F. Identification Signs: Attach proper lettered approved metal signs conforming to NFPA 13 to each valve and alarm device. Permanently affix hydraulic design data nameplates to the riser of each system.

G. Inspector's Test Connection: Provide test connections about 6 feet above the floor for each sprinkler system or portion of each sprinkler system equipped with an alarm device and locate at the hydraulically most part of each system.

H. Main and Auxiliary Drains: Provide drain piping to discharge at safe points outside each building or to sight cones attached to drains of adequate size to readily receive the full flow from each drain under maximum pressure. Provide auxiliary drains required by NFPA 13.

I. Pipe Sleeves: Provide where piping passes through walls, floors, roofs, and partitions. Secure sleeves in proper position and location. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs, and partitions. Provide not less than 0.25-inch space between exterior of piping or pipe insulation and interior of sleeve. Firmly pack space with insulation and caulk at both ends of the sleeve with plastic waterproof cement which will dry to a firm but pliable mass, or provide a segmented elastomeric seal.

J. Sleeves in Masonry and Concrete Walls and Floors: Provide ASTM A 53 or ASTM A 120, Schedule 40 or Standard Weight, zinc-coated steel pipe sleeves. Extend sleeves in floor slabs 3 inches above the finished floor.

K. Sleeves in Partitions and Other Than Masonry and Concrete Walls, Floors, and Roofs: Provide zinc-coated steel having weight of not less than 0.90 pounds per square foot.

L. Escutcheon Plates: Provide one piece or split hinge type metal plates for piping passing through floors, walls, and ceilings in exposed areas. Provide chromium-plated finish on plates; in finished areas.

M. Provide paint finish on plates in unfinished areas. Securely anchor plates in place with setscrews or other approved positive means.

N. Fire Department Connections: Provide connections approximately 3 feet above finish grade, of the approved two-way type with 2.5-inch National Standard female hose threads with plug and chain. The function of the connection shall be clearly indicated for the SPRINKLER SYSTEM by raised 1-inch letters cast on the cover plate or fitting. Fire department connections shall be located as indicated and approved by the Guam Fire Department.

2.4 BURIED WATER PIPING SYSTEMS:

Pipe and Fittings: Provide outside-coated, cement mortar lined, ductile-iron pipe and fittings conforming to NFPA 24 for piping under the building and less than 5 feet outside of the building walls. Anchor the joints in accordance with NFPA 24; provide concrete thrust block at the elbow where the pipe turns up toward the floor, and restrain the pipe riser with steel rods from the elbow to the flange above the floor. Minimum pipe size shall be 6 inches. Minimum depth of cover shall be 3 feet. Piping more than 5 feet outside of the building walls shall be provided under Division 2 "Site Work".

PART 3 EXECUTION

3.1 INSTALLATION

A. Equipment, material, installation, and workmanship shall be in accordance with NFPA 13 and NFPA 14, except as modified herein. Install piping straight and true to bear evenly on

hangers. Keep the interior and of new piping and existing piping affected by the Contractor's operations thoroughly cleaned of water and foreign matter. Keep piping systems clean during installation by means of plugs or other approved methods. When work is not in progress, securely close open ends of piping and fittings so that water and foreign matter will not enter the pipes or fittings. Inspect piping before placing into position. Inspect, test, and approve piping before burying, covering, or concealing. Provide fittings for changes in direction of piping and for all connections. Make changes in piping sizes through tapered reducing pipe fittings; do not use bushings.

B. Pipe Hangers (Supports): Provide additional hangers to support the concentrated loads in piping between hangers, such as for flanged valves.

3.2 DISINFECTION

Disinfect the new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C601. Fill the piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush the solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million.

3.3 FIELD PAINTING

A. Clean, pre-treat, prime, and paint new sprinkler systems including valves, piping, conduit, hangers, miscellaneous metalwork, and accessories. Apply coatings to clean dry surfaces using clean brushes. Clean the surfaces to remove dust, dirt, rust and loose mill scale. Immediately after cleaning, provide the metal surfaces with one coat of pretreatment primer applied to a minimum dry film thickness of 0.3 mil, and one coat of primer applied to a minimum dry film thickness of one mil. Exercise care to avoid painting of sprinkler heads or protective devices. Remove materials which are used to protect sprinkler heads, while painting is in process, upon the completion of painting. Remove sprinkler heads which are painted and provide new clean sprinkler heads of the proper type. Provide primed surfaces with the following:

B. Sprinkler Systems in Unfinished Areas: Unfinished areas are defined as attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, and spaces where walls or ceiling are not painted or not constructed of prefinished material. Provide primed surfaces with one coat of red enamel applied to a minimum dry film thickness of one mil.

C. Sprinkler Systems in All Other Areas: Provide primed surfaces with two coats of paint to match adjacent surfaces, except provide valves and operating accessories with one coat of red enamel or self adhering red plastic tape bands at maximum of 20-foot intervals throughout the piping systems, except in finished areas, such as offices, the red bands may be deleted.

3.4 FIELD TESTING AND FLUSHING:

A. Preliminary Tests: Hydrostatically test each system at 200 psig or at 50 psi in excess of maximum pressure when the maximum will be in excess of 150 psi, whichever is greater, for a period of two hours. Piping above suspended ceilings shall be tested, inspected and approved before installation of ceilings.

1. Flush sprinkler and standpipe piping in accordance with NFPA 13. Continue flushing operations until water is clear, but for not less than 10 minutes.
2. Test the alarms and other devices. Test the water flow alarms by flowing water through the inspector's test connection.
3. When tests have been made completed and corrections made, submit a signed and dated certificate, similar to that specified in NFPA 13, with a request for a formal

inspection and tests.

4. Formal Inspection and Tests: The Government of Guam Fire Department and Department of Public Works will witness formal tests and approve all systems before they are accepted. Submit the request for formal inspection at least 15 days prior to the date for formal inspection is to take place. An experienced technician regularly employed by the sprinkler installer shall be present during the inspection. At this inspection repeat any or all of the required tests as directed. Correct defects in the work provided by the Contractor, and make additional tests until it has been demonstrated that the system complies with all contract requirements. Furnish appliances, equipment, electrically, instruments, connecting devices, and personnel for the tests.

3.5 INSTRUCTING OPERATING PERSONNEL

Upon completion of the work and at a time designated by the Owner, provide for a period of not less than a 4-hour the services of experienced technicians regularly employed by the manufacturer of the sprinkler to instruct operating personnel in the proper operation and maintenance of the equipment.

END OF SECTION 15330

SECTION 15411

WATER DISTRIBUTION AND LPG PIPING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes water and fuel distribution piping from locations indicated to fixtures and equipment inside building.

B. Related Sections include the following:

1. Division 2 Section "Water Systems" for exterior water service piping.

2. Division 15 Section "Plumbing Specialties" for water distribution piping specialties.

1.3 DEFINITIONS

A. Water Service Piping: Water piping outside building that conveys water to building.

B. Service Entrance Piping: Water piping at entry into building between water service piping and water distribution piping.

C. Water Distribution Piping: Water piping inside building that conveys water to fixtures and equipment throughout the building.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:

1. Combined Fire-Protection and Domestic, Service Entrance Piping: 250 psig (1725 kPa).

2. Service Entrance Piping: 160 psig (1100 kPa).

3. Water Distribution Piping: 125 psig (860 kPa).

1.5 SUBMITTALS

A. Water Samples, Test Results, and Reports: Specified in "Field Quality Control" and "Cleaning" articles.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

1.6 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.

B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic potable-water piping components. Include marking "NSF-pw" on plastic potable-water piping.

D. Comply with NSF 61, "Drinking Water System Components--Health Effects," Sections 1 through 9 for potable-water piping and components.

E. ANSI Standard: Comply with ANSI Z223.1, "National Fuel Gas Code."

F. FM Standard: Provide components listed in FM's "Fire Protection Approval Guide" if specified to be FM approved.

G. UL Standard: Provide components listed in UL's "Gas and Oil Equipment Directory" if specified to be UL listed.

PART 2 PRODUCTS

2.1 PIPES AND TUBES

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.

B. Soft Copper Tube: ASTM B 88, Types K and L (ASTM B 88M, Types A and B), water tube, annealed temper.

C. Hard Copper Tube: ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.

2.2 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper.

C. Copper, Grooved-End Fittings: ASTM B 75 (ASTM B 75M) copper tube or ASTM B 584 bronze castings.

D. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.

E. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends. Include threads conforming to ASME B1.20.1 on threaded ends.

2.3 JOINING MATERIALS

A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

B. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for commonly used joining materials.

C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.

D. Brazing Filler Metal: AWS A5.8, BCuP, copper phosphorus or BAg, silver classification.

E. Copper, Keyed Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, gasket suitable for hot water, and bolts and nuts.

2.4 VALVES

A. Gate Valve

1. Up To and Including 2 Inches (50 mm):

a. MSS SP-80, Class 125, bronze body, bronze trim, rising stem, hand-wheel, inside screw, solid wedge disc, solder or threaded ends.

2. 2 Inches (50 mm) and Larger:

a. MSS SP-70, Class 125, iron body, bronze trim, outside screw and yoke, hand-wheel, solid wedge disc, flanged ends. Provide chain-wheel operators for valves 6 inches (150 mm) and larger mounted over 8 feet (2400 mm) above floor.

B. GLOBE VALVES

1. Up To and Including 2 Inches (50 mm):

a. MSS SP-80, Class 125, bronze body, bronze trim, hand-wheel, bronze disc, solder or threaded ends.

2. 2 Inches (50 mm) and Larger:

a. MSS SP-85, Class 125, iron body, bronze trim, hand-wheel, outside screw and yoke, renewable bronze plug-type disc, renewable seat, flanged ends. Provide chain-wheel operators for valves 6 inches (150 mm) and larger mounted over 8 feet (2400 mm) above floor.

C. BALL VALVES:

1. Construction, 4 Inches (100 mm) and Smaller: MSS SP-110, Class 150, 400 psi (2760 kPa) CWP, bronze, two-piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded ends with union.

D. BUTTERFLY VALVES.

1. Construction 1-1/2 Inches (40 mm) and Larger: MSS SP-67, 200 psi (1380 kPa) CWP, cast or ductile iron body, aluminum bronze disc, resilient replaceable Buna N seat, wafer, lug or grooved ends, extended neck, 10 position lever handle. Provide gear operators for valves 8 inches (150 mm) and larger, and chain-wheel operators for valves mounted over 8 feet (2400 mm) above floor.

E. SWING CHECK VALVES:

1. Up To and Including 2 Inches (50 mm):

   a. MSS SP-80, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder or threaded ends.

   b. 2 Inches (50 mm) and Larger: MSS SP-71, Class 125, iron body, bronze swing disc, renewable disc seal and seat, flanged or grooved ends.

F. SPRING LOADED CHECK VALVES:

1. Class 125, iron body, bronze trim, stainless steel springs, bronze disc, Buna N seals, wafer style ends.

G. RELIEF VALVES

1. Pressure Relief: AGA Z21.22 certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

2.5 LPG PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53 Schedule 40 black.

1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, forged steel welding type.

2. Joints: NFPA 58, threaded.

B. Copper Tubing: ASTM B88 (ASTM B88M), Type K annealed.

1. Fittings: ASME B16.26, cast bronze.

2. Joints: Flared.

C. Piping specialties:

1. Flexible Connectors: ANSI Z21.24, copper alloy.

2. Quick-Disconnect Devices: ANSI Z21.41, convenience outlets and matching plug connector.

D. Specialty valves:

1. Valves, NPS 2 (DN 50) and Smaller: Threaded ends according to ASME B1.20.1 for pipe threads.

2. Valves, NPS 2-1/2 (DN 65) and Larger: Flanged ends according to ASME B16.5 for steel flanges and according to ASME B16.24 for copper and copper-alloy flanges.

3. Appliance Connector Valves: ANSI Z21.15 and IAS listed.

4. Gas Stops: Bronze body with AGA stamp, plug type with bronze plug and flat or square head, ball type with chrome-plated brass ball and lever handle, or butterfly valve with stainless-steel disc and fluoro-carbon elastomer seal and lever handle; 2-psig (13.8-kPa) minimum pressure rating.

5. Automatic Gas Valves: ANSI Z21.21, with mechanical operator for actuation by appliance automatic shutoff device.

6. Electrically Operated Gas Valves: UL 429, bronze, aluminum, or cast-iron body solenoid valve; 120-V ac, 60 Hz, Class B, continuous-duty molded coil. Include NEMA ISC 6, Type 4, coil enclosure and electrically opened and closed dual coils. Valve position shall normally be closed.

E. Pressure regulators:

1. Description: Single stage and suitable for fuel gas service. Include steel jacket and corrosion-resistant components, elevation compensator, and atmospheric vent.

a. NPS 2 (DN 50) and Smaller: Threaded ends according to ASME B1.20.1 for pipe threads.

b. NPS 2-1/2 (DN 65) and Larger: Flanged ends according to ASME B16.5 for steel flanges and according to ASME B16.24 for copper and copper-alloy flanges.

c. Line Pressure Regulators: ANSI Z21.80 with **2-psig- (13.8-kPa-) minimum** inlet pressure rating.

PART 3 EXECUTION

3.1 EXCAVATION

A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Fitting Option: Mechanically formed tee-branch outlets and brazed joints may be used on aboveground copper tubing.

D. Underground, Service Entrance Piping: Do not use flanges or valves underground. Use the following:

1. 2-Inch NPS (DN50) and Smaller: Soft copper tube, Type K (Type A); copper, solder-joint pressure fittings; and soldered joints.

2. 2-1/2- to 3-1/2-Inch NPS (DN65 to DN90): Soft copper tube, Type K (Type A); copper, solder-joint pressure fittings; and soldered joints.

E. Aboveground, Water Distribution Piping: Use the following:

1. 1-1/2-Inch NPS (DN40) and Smaller: Hard copper tube, Type L (Type B); copper, solder-joint fit-tings; and soldered joints.

2. 2-Inch NPS (DN50): Hard copper tube, Type L (Type B); copper, solder-joint fittings; and soldered joints.

3. 2-Inch NPS (DN50): Hard copper tube, Type L (Type B) with grooved ends; copper, grooved-end fittings; and copper, keyed couplings.

4. Hard copper tube, Type L (Type B); copper, solder-joint fittings; and soldered joints.

5. 2-1/2- and 3-Inch NPS (DN65 and DN80): Hard copper tube, Type L (Type B) with grooved ends; copper, grooved-end fittings; and copper, keyed couplings.

F. Underground, Water Distribution Piping: Do not use flanges or valves underground. Use the following:

1. 2-Inch NPS (DN50) and Smaller: Soft copper tube, Type L (Type B); wrought-copper, solder-joint pressure fittings; and soldered joints.

2. 2-1/2- to 4-Inch NPS (DN65 to DN100): Hard copper tube, Type L (Type B); wrought-copper, solder-joint pressure fittings; and soldered joints.

3.3 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use gate, ball, or butterfly valves.

2. Throttling Duty: Use globe, ball, or butterfly valves.

3.4 PIPING INSTALLATION, GENERAL

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.

3.5 SERVICE ENTRANCE PIPING INSTALLATION

A. Extend service entrance piping to exterior water service piping in sizes and locations indicated for service entrances into building. Refer to Division 2 Section "Water Systems" for water service piping.

B. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each service entrance pipe.

C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service entrance pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for sleeves and mechanical sleeve seals.

3.6 WATER DISTRIBUTION PIPING INSTALLATION

A. Install piping level without pitch.

3.7 JOINT CONSTRUCTION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

B. Mechanically Formed Outlets: Form tee in copper tube according to equipment manufacturer's written instructions. Use tool designed for copper tube, drill pilot hole, form collar for outlet, dimple tube forming seating stop, and braze branch tube into collar.

C. Grooved Joints: Assemble joints with coupling, gasket, lubricant, and bolts according to coupling and fit-ting manufacturer's written instructions.

3.8 VALVE INSTALLATION

A. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use gate or ball valves for piping 2-inch NPS (DN50) and smaller. Use gate or butterfly valves for piping 2-1/2-inch NPS (DN65) and larger.

B. Shutoff Valves: Install shutoff valve on each water supply to equipment, on each supply to plumbing fixtures without supply stops, and where indicated. Use gate or ball valves for piping 2-inch NPS (DN50) and smaller. Use gate or butterfly valves for piping 2-1/2-inch NPS (DN65) and larger.

C. Drain Valves: Install drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.

1. Install hose-end drain valves at low points in water mains, risers, and branches.

2. Install stop-and-waste drain valves where indicated.

3.9 HANGER AND SUPPORT INSTALLATION

A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:

1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.

2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet (30 m) and less.

3. Adjustable roller hangers, MSS Type 43, for individual, straight, horizontal runs longer than 100 feet (30 m).

4. Spring cushion rolls, MSS Type 49, if indicated, for individual, straight, horizontal runs longer than 100 feet (30 m).

5. Pipe rolls, MSS Type 44, for multiple, straight, horizontal runs 100 feet (30 m) or longer. Support pipe rolls on trapeze.

6. Spring hangers, MSS Type 52, for supporting base of vertical runs.

B. Install supports according to Division 15 Section "Hangers and Supports."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

E. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:

1. 3/4-Inch NPS (DN20) and Smaller: Maximum horizontal spacing, 60 inches (1500 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

2. 1-Inch NPS (DN25): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

3. 1-1/4-Inch NPS (DN32): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

4. 1-1/2 and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 96 inches (2400 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

5. 2-1/2-Inch NPS (DN65): Maximum horizontal spacing, 108 inches (2700 mm) with 1/2-inch (13-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

6. 3-Inch NPS (DN80): Maximum horizontal spacing, 10 feet (3 m) with 1/2-inch (13-mm) mini-mum rod diameter; maximum vertical spacing, 10 feet (3 m).

F. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.10 CONNECTIONS

A. Connect service entrance piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.

B. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:

1. Booster Systems: Connect cold-water suction and discharge piping.

2. Water Heaters: Connect cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.

3. Plumbing Fixtures: Connect hot- and cold-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Fixtures."

4. Equipment: Connect hot- and cold-water supply piping as indicated. Provide shutoff valve and union for each connection. Use flanges instead of unions for connections 2-1/2-inch NPS (DN65) and larger.

3.11 FIELD QUALITY CONTROL

A. Inspect water distribution piping as follows:

B. Inspect service entrance piping and water distribution piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

C. Test water distribution piping as follows:

D. Test service entrance piping and water distribution piping as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, ex-tended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.

3. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.

4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.

5. Prepare reports for tests and required corrective action.

3.12 CLEANING

A. Clean and disinfect service entrance piping and water distribution piping as follows:

1. Purge new piping and parts of existing water piping that have been altered, extended, or repaired before using.

2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, procedure described in either AWWA C651 or AWWA C652 or as described be-low:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.

b. Fill and isolate system according to either of the following:

1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.

2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for 3 hours.

c. Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.

d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows contamination.

B. Prepare and submit reports for purging and disinfecting activities.

C. Clean interior of piping system. Remove dirt and debris as work progresses.

3.13 COMMISSIONING

A. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.

B. Perform the following steps before putting into operation:

1. Close drain valves, hydrants, and hose bibbs.

2. Open shutoff valves to fully open position.

3. Open throttling valves to proper setting.

4. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.

5. Remove and clean strainer screens. Close drain valves and replace drain plugs.

6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and that cartridges are clean and ready for use.

C. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

D. Check plumbing specialties and verify proper settings, adjustments, and operation.

E. Energize pumps and verify proper operation.

END OF SECTION

SECTION 15420

DRAINAGE AND VENT PIPING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sanitary drainage and vent piping, and storm drainage piping inside building and to locations indicated.

B. Related Sections include the following:

1. Division 2 Section "Sewerage and Drainage" for sanitary sewerage and storm drainage.

2. Division 2 Section "Foundation Drainage Systems" for foundation drains.

3. Division 15 Section "Plumbing Specialties" for drainage and vent piping system specialties.

1.3 DEFINITIONS

A. Sewerage Piping: Building sewer piping outside building that conveys sanitary sewage from building.

B. Drainage Piping: Building sewer piping outside building that conveys storm drainage from building.

C. Service Entrance Piping: Drainage piping at entry into building between outside building sewer piping and inside drainage piping.

D. Drainage and Vent Piping: Piping inside building that conveys waste water and vapors from fixtures and equipment throughout the building.

E. The following are industry abbreviations for plastic and other piping materials:

1. ABS: Acrylonitrile-butadiene-styrene.

2. EPDM: Ethylene-propylene-diene polymer, rubber.

3. NBR: Acrylonitrile-butadiene rubber.

4. PVC: Polyvinyl chloride.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:

1. Soil, Waste, and Vent Systems: 10-foot head of water (30 kPa).

2. Storm Drainage Systems: 10-foot head of water (30 kPa).

1.5 SUBMITTALS

A. Test Results and Reports: Specified in "Field Quality Control" Article.

1.6 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.

B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic piping components. Include marking with "NSF-DWV" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents. Deliver materials to Owner.

1. Couplings for Hubless, Cast-Iron Soil Piping, 4-Inch NPS (DN100) and Smaller: 8 of each type and size installed.

2. Couplings for Hubless, Cast-Iron Soil Piping, 5-Inch NPS (DN125) and Larger: 6 of each type and size installed.

3. Keyed Couplings, 4-Inch NPS (DN100) and Smaller: 4 of each type and size installed. Include one extra gasket with each coupling.

4. Keyed Couplings, 5-Inch NPS (DN125) and Larger: 2 of each type and size installed. Include one extra gasket with each coupling.

PART 2 PRODUCTS

2.1 PIPES AND TUBES

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.

B. Hubless, Cast-Iron Soil Pipe: ASTM A 888 or CISPI 301.

C. ABS Plastic Pipe: ASTM D 2661, Schedule 40.

D. PVC Plastic Pipe: ASTM D 2665, Schedule 40.

2.2 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Threaded-Fitting, End Connections: ASME B1.20.1.

C. Hubless, Cast-Iron, Soil-Pipe Fittings: CISPI 301.

D. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311 drain, waste, and vent pipe patterns.

E. ABS Tubular Fittings: ASTM F 409 drainage pattern, with ends as required for application.

F. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311 drain, waste, and vent pipe patterns.

G. PVC Plastic, Tubular Fittings: ASTM F 409 drainage pattern, with ends as required for application.

2.3 JOINING MATERIALS

A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

B. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for commonly used joining materials.

C. Hubless, Cast-Iron, Soil-Piping Couplings: ASTM C 1277 assembly of metal housing, corrosion-resistant fasteners, and ASTM C 564 rubber sleeve or gasket with integral, center pipe stop. Include the following:

1. Heavy-Duty, FM-Approved, Stainless-Steel Couplings: ASTM A 666, Type 304, stainless-steel housing; and stainless-steel clamps. Include gasket or bushing.

a. Clamp Width: 3 inches (75 mm) wide with 2 clamps, for piping 1-1/2- to 4-inch NPS (DN40 to DN100).

b. Clamp Width: 4 inches (100 mm) wide with 2 clamps, for piping 5- to 10-inch NPS (DN125 to DN250).

2.4 VALVES

A. Refer to Division 15 Section "Valves" for general-duty valves. Use valves specified for "Domestic Water Systems" applications.

PART 3 EXECUTION

3.1 EXCAVATION

A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

B. Aboveground, Soil, Waste, and Vent Piping: Use the following:

1. 1-1/2-Inch NPS (DN40): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fittings; and one of the following hubless, cast-iron, soil-piping couplings:

a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

2. 2- to 4-Inch NPS (DN50 to DN100): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fit-tings; and one of the following hubless, cast-iron, soil-piping couplings:

   a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

3. 5- and 6-Inch NPS (DN125 and DN150): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fittings; and one of the following hubless, cast-iron, soil-piping couplings:

   a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

4. 8-Inch NPS (DN200): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fittings; and one of the following hubless, cast-iron, soil-piping couplings:

   a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

C. Underground, Soil, Waste, and Vent Piping: Use the following:

1. 1-1/2-Inch NPS (DN40): ABS plastic pipe, ABS socket fittings, and solvent-cemented joints.

2. 2- to 4-Inch NPS (DN50 to DN100): ABS plastic pipe, ABS socket fittings, and solvent-cemented joints.

3. 5- and 6-Inch NPS (DN125 and DN150): ABS plastic pipe, ABS socket fittings, and solvent-cemented joints.

4. 8-Inch NPS (DN200): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.

D. Aboveground, Storm Drainage Piping: Use the following:

1. 2- to 4-Inch NPS (DN50 to DN100): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fit-tings; and one of the following hubless, cast-iron, soil-piping couplings:

   a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

2. 5- and 6-Inch NPS (DN125 and DN150): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fittings; and one of the following hubless, cast-iron, soil-piping couplings:

   a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

3. 8-Inch NPS (DN200): Hubless, cast-iron soil pipe; hubless, cast-iron, soil-pipe fittings; and one of the following hubless, cast-iron, soil-piping couplings:

   a. Couplings: Heavy-duty, FM-approved, Type 304, stainless steel.

E. Underground, Storm Drainage Piping: Use the following:

1. 3- and 4-Inch NPS (DN80 and DN100): ABS plastic pipe, ABS socket fittings, and solvent-cemented joints.

2. 5- and 6-Inch NPS (DN125 and DN150): ABS plastic pipe, ABS socket fittings, and solvent-cemented joints.

3. 8-Inch NPS (DN200): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.

3.3 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use gate, ball, or butterfly valves.

2. Throttling Duty: Use globe, ball, or butterfly valves.

3.4 PIPING INSTALLATION, GENERAL

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.

3.5 SERVICE ENTRANCE PIPING INSTALLATION

A. Refer to Division 2 Section "Sewerage and Drainage" for sanitary and storm sewer piping.

B. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.

C. Extend building storm drain piping and connect to storm sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building storm drains and building storm sewers.

D. Install wall penetration system at each service entrance pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for wall penetration systems.

3.6 DRAINAGE AND VENT PIPING INSTALLATION

A. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.

C. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

D. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:

1. Sanitary Building Drain: 2 percent downward in direction of flow for piping 3-inch NPS (DN80) and smaller; 2 percent downward in direction of flow for piping 4-inch NPS (DN100) and larger.

2. Horizontal, Sanitary Drainage Piping: 2 percent downward in direction of flow.

3. Storm Building Drain: 1 percent downward in direction of flow.

4. Horizontal, Storm Drainage Piping: 2 percent downward in direction of flow.

5. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

E. Sleeves are not required for cast-iron soil piping passing through concrete slab on grade if slab is without membrane waterproofing.

F. Install ABS plastic drainage piping according to ASTM D 2661.

G. Install PVC plastic drainage piping according to ASTM D 2665.

H. Install underground, ABS and PVC plastic drainage piping according to ASTM D 2321.

3.7 JOINT CONSTRUCTION

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Hand-book," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Hubless Joints: Make with rubber gasket and sleeve or clamp.

C. ABS Piping Joints: Join drainage piping according to ASTM D 2661.

D. PVC Piping Joints: Join drainage piping according to ASTM D 2665.

E. ABS to PVC Piping Transition Joints: Make non-pressure transition joints between ABS and PVC drainage components, using fittings and procedure according to ASTM D 3138.

F. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling during joining of plastic pipe and fittings.

3.8 HANGER AND SUPPORT INSTALLATION

A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:

1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.

2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet (30 m) and less.

3. Adjustable roller hangers, MSS Type 43, for individual, straight, horizontal runs longer than 100 feet (30 m).

4. Spring cushion rolls, MSS Type 49, if indicated, for individual, straight, horizontal runs longer than 100 feet (30 m).

5. Pipe rolls, MSS Type 44, for multiple, straight, horizontal runs 100 feet (30 m) or longer. Support pipe rolls on trapeze.

6. Spring hangers, MSS Type 52, for supporting base of vertical runs.

B. Install supports according to Division 15 Section "Hangers and Supports."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum spacing and minimum rod diameters:

1. 1-1/2- and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 60 inches (1500 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 15 feet (4.5 m).

2. 3-Inch NPS (DN80): Maximum horizontal spacing, 60 inches (1500 mm) with 1/2-inch (13-mm) minimum rod diameter; maximum vertical spacing, 15 feet (4.5 m).

3. 4- and 5-Inch NPS (DN100 and DN125): Maximum horizontal spacing, 60 inches (1500 mm) with 5/8-inch (16-mm) minimum rod diameter; maximum vertical spacing, 15 feet (4.5 m).

4. 6-Inch NPS (DN150): Maximum horizontal spacing, 60 inches (1500 mm) with 3/4-inch (19-mm) minimum rod diameter; maximum vertical spacing, 15 feet (4.5 m).

5. 8- through 12-Inch NPS (DN200 through DN300): Maximum horizontal spacing, 60 inches (1500 mm) with 7/8-inch (22-mm) minimum rod diameter; maximum vertical spacing, 15 feet (4.5 m).

F. Install hangers for ABS and PVC plastic piping with the following maximum spacing and minimum rod diameters:

1. 1-1/2- and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 48 inches (1200 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).

2. 4- and 5-Inch NPS (DN100 and DN125): Maximum horizontal spacing, 48 inches (1200 mm) with 5/8-inch (16-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).

3. 6-Inch NPS (DN150): Maximum horizontal spacing, 48 inches (1200 mm) with 3/4-inch (19-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).

4. 8- through 12-Inch NPS (DN200 through DN300): Maximum horizontal spacing, 48 inches (1200 mm) with 7/8-inch (22-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).

G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.9 CONNECTIONS

A. Connect service entrance piping to exterior sewerage and drainage piping. Use transition fitting to join dissimilar piping materials.

B. Connect drainage piping to service entrance piping, and extend to and connect to the following:

1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Fixtures."

2. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Specialties."

3. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections 2-1/2-inch NPS (DN65) and larger.

3.10 FIELD QUALITY CONTROL

A. Inspect drainage and vent piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedure, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, ex-tended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.

3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of over-flow, but not less than 10 feet of head (30 kPa). Water level must not drop from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air

pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.

6. Prepare reports for tests and required corrective action.

3.11 CLEANING AND PROTECTING

A. Clean interior of piping system. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

D. Exposed ABS and PVC Piping: Protect plumbing vents exposed to sunlight with 2 coats of water-based latex paint.

END OF SECTION

SECTION 15430

PLUMBING SPECIALTIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes plumbing specialties for the following:

1. Water distribution systems.

2. Soil, waste, and vent systems.

3. Storm drainage systems.

4. Rainwater harvesting systems.

B. Related Sections include the following:

1. Division 15 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.

2. Division 15 Section "Water Distribution Piping" for water-supply piping and connections.

3. Division 15 Section "Drainage and Vent Piping" for drainage and vent piping and connections.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:

1. Water Distribution Piping: 125 psig (860 kPa).

2. Soil, Waste, and Vent Piping: 10-foot head of water (30 kPa).

3. Storm Drainage Piping: 10-foot head of water (30 kPa).

4. Rainwater Harvesting Piping: 10-foot head of water (30 kPa).

1.4 SUBMITTALS

A. Product Data: For each plumbing specialty indicated. Include rated capacities of selected equipment and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:

1. Balancing valves.

2. Strainers.

3. Water hammer arresters.

4. Drain valves.

5. Hose bibbs.

6. Cleanouts.

7. Floor drains.

8. Vent caps, vent terminals, and roof flashing assemblies.

9. Roof drains.

10. Vortex Rainwater Fine Filter.

11. Rainwater harvesting smoothing inlet.

12. Sleeve penetration systems.

13. Solids interceptor.

14. Acid neutralizing tank.

B. Reports: Specified in "Field Quality Control" Article.

C. Closeout Submittals:

1. Operation and Maintenance Data:

a. Provide instructions on operation, calibration, troubleshooting, and servicing equipment.

b. Include layout drawings, parts lists, and component manufacturer’s product data.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, dimensional requirements, and characteristics of plumbing specialties and are based on the specific types and models indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

B. Provide listing/approval stamp, label, or other marking on plumbing specialties made to specified standards.

C. Listing and Labeling: Provide electrically operated plumbing specialties specified in this Section that are listed and labeled.

1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: "Nationally Recognized Testing Laboratory" as de-fined in OSHA Regulation 1910.7.

D. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

E. Comply with NFPA 70, "National Electrical Code," for electrical components.

F. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic potable-water piping components. Include marking "NSF-pw" on plastic potable-water piping and "NSF-dwv" on plastic drain, waste, and vent piping.

G. Rainwater Harvesting System.

1. Manufacturer Qualifications:

a. Minimum 3 years' experience in work of this Section.

b. Successful completion of minimum of 5 previous projects of similar scope and complexity.

2. Installer Qualifications:

a. Minimum 2 years' experience in work of this Section.

b. Successful completion of minimum of 3 previous projects of similar scope and complexity.

c. Maintain factory trained technicians on staff to provide field service and warranty work.

1.6 DELIVERY, STORAGE AND HANDLING

A. Do not deliver system components until time needed for installation, and after proper protection can be provided.

B. Protect components from damage and corrosion.

C. Leave protective coverings in place until just prior to installation.

PART 2 PRODUCTS

2.1 DISHWASHER AIR-GAP FITTINGS

A. Description: ASSE 1021, fitting suitable for use with domestic dishwashers and for deck mounting; with plastic body, chrome-plated brass cover; and capacity of at least 5 gpm (0.32 L/s); and inlet pres-sure of at least 5 psig (35 kPa) at temperature of at least 140 deg F (60 deg C). Include 5/8-inch- (16-mm-) ID inlet and 7/8-inch- (22-mm-) ID outlet hose connections.

2.2 BACKFLOW PREVENTERS

A. General: ASSE standard, backflow preventers, of size indicated for maximum flow rate and maximum pressure loss indicated.

1. 2-Inch NPS (DN50) and Smaller: Bronze body with threaded ends.

2. 2-1/2-Inch NPS (DN65) and Larger: Bronze, cast-iron, steel, or stainless-steel body with flanged ends.

a. Interior Lining: AWWA C550 or FDA-approved, epoxy coating for backflow preventers having cast-iron or steel body.

3. Interior Components: Corrosion-resistant materials.

4. Exterior Finish: Polished chrome-plate if used in chrome-plated piping system.

5. Strainer on inlet, if indicated.

B. Hose-Connection Vacuum Breakers: ASSE 1011, nickel plated, with nonremovable and manual drain features, and ASME B1.20.7 garden-hose threads on outlet. Units attached to rough-bronze-finish hose connections may be rough bronze.

C. Reduced-Pressure-Principle Backflow Preventers: ASSE 1013, suitable for continuous pressure appli-cation. Include outside screw and yoke gate valves on inlet and outlet, and strainer on inlet; test cocks; and pressure-differential relief valve with ASME A112.1.2 air-gap fitting located between 2 positive-seating check valves.

1. Pressure Loss: 12 psig (83 kPa) maximum, through middle one-third of flow range.

D. Laboratory Faucet Vacuum Breakers: ASSE 1035, suitable for continuous pressure application and chrome plated; consisting of primary and secondary checks; intermediate vacuum breaker; and threaded ends, 1/4- or 3/8-inch NPS (DN8 or DN10) as required.

2.3 WATER FILTERS

A. General: Cartridge-type assemblies suitable for potable water of size and at flow rate and pressure loss indicated. Include housing, fittings, filter cartridges, and cartridge end caps.

B. Wall-Mounting Type: Housing head section with threaded inlet and outlet, mounting bracket, and re-movable lower section for 10-inch- (250-mm-) long filter cartridge.

1. Housing Material: Stainless steel, 150-psig (1035-kPa) minimum operating pressure.

2. Housing Material: Plastic, 125-psig (860-kPa) minimum operating pressure.

3. Cartridge: Activated-charcoal filter media, 10 inches (250 mm), 10-micron-particulate removable rating.

4. Cartridge: Wound- or molded-fiber filter media, 10 inches (250 mm), 10-micron-particulate removable rating.

5. Cartridge: Pleated-polypropylene filter media, 10 inches (250 mm), 10-micron-particulate re-movable rating.

C. Floor-Mounting Type: Stainless-steel housing rated at 150-psig (1035-kPa) minimum operating pressure.

1. Base Section: Floor-mounting section with inlet and outlet connections and removable top section for one or more 10-micron-particulate removable-rating cartridges.

2. Connections, 2-Inch NPS (DN50) and Smaller: Threaded.

3. Connections, 2-1/2-Inch NPS (DN65) and Larger: Flanged.

4. Cartridge: Activated-charcoal filter media.

5. Cartridge: Wound- or molded-fiber filter media.

6. Cartridge: Pleated-polypropylene filter media.

2.4 WATER TEMPERING VALVES

A. General: Manually adjustable, thermostatically controlled water tempering valve; bronze body; and ad-justable temperature setting.

B. System Water Tempering Valves: Piston or discs controlling both hot- and cold-water flow, capable of limited antiscald protection. Include threaded inlets and outlet, capacity at pressure loss, and tempera-ture range or setting as indicated.

1. Finish: Rough bronze unless chrome-plated finish is indicated.

C. Limited-Volume, Water Tempering Valves: Solder-joint inlets and 3/4-inch NPS (DN20) maximum outlet, with minimum capacity and maximum pressure loss as indicated.

2.5 BALANCING VALVES

A. Calibrated Balancing Valves: Adjustable, with 2 readout ports and memory setting indicator. Include manufacturer's standard hoses, fittings, valves, differential pressure meter, and carrying case.

1. 2-Inch NPS (DN50) and Smaller: Bronze body with brass ball, adjustment knob, calibrated nameplate, and threaded or solder-joint ends.

2. 2-Inch NPS (DN50) and Smaller: Bronze, Y-pattern body with adjustment knob and threaded ends.

3. 2-1/2-Inch NPS (DN65) and Larger: Cast-iron, Y-pattern body with bronze disc and flanged or grooved ends.

2.6 STRAINERS

A. Strainers: Y-pattern, unless otherwise indicated, and full size of connecting piping. Include ASTM A 666, Type 304, stainless-steel screens with 3/64-inch (1.2-mm) round perforations, unless otherwise indicated.

1. Pressure Rating: 125-psig (860-kPa) minimum steam working pressure, unless otherwise indicated.

2. 2-Inch NPS (DN50) and Smaller: Bronze body, with female threaded ends.

3. 2-1/2-Inch NPS (DN65) and Larger: Cast-iron body, with interior AWWA C550 or FDA-approved epoxy coating and flanged ends.

4. Y-Pattern Strainers: Screwed screen retainer with centered blowdown.

a. Drain: Pipe plug.

b. Drain: Factory- or field-installed, hose-end drain valve.

5. T-Pattern Strainers: Malleable-iron or ductile-iron body with grooved ends; access end cap with drain plug and access coupling with rubber gasket.

2.7 DRAIN VALVES

A. Hose-End Drain Valves: MSS SP-110, 3/4-inch NPS (DN20) ball valve, rated for 400-psig (2760-kPa) minimum CWP. Include 2-piece, ASTM B 62 bronze body with standard port, chrome-plated brass ball, replaceable seats and seals, blowout-proof stem, and vinyl-covered steel handle.

1. Inlet: Threaded or solder joint.

2. Outlet: Short-threaded nipple with ASME B1.20.7 garden-hose thread and cap.

3. Hose-End Drain Valve Option: MSS SP-80, gate valve, Class 125, ASTM B 62 body, with 3/4-inch NPS (DN20) threaded or solder-joint inlet and ASME B1.20.7 garden-hose threads on outlet and cap. Hose bibbs are prohibited for this application.

4. Fire-Hose-End Drain Valve Option: UL 668, 1-1/2-inch NPS (DN40), bronze body, 90-degree angle or straightway-pattern hose valve, rated for 175-psig (1200-kPa) minimum working pressure.

a. Male Outlet Threads: NFPA 1963 and local fire department standards. Include attached chain and cap.

1) Option: 2-1/2-inch NPS (DN65) valves with 2-1/2-by-1-1/2-inch NPS (DN65 by DN40) adapter and attached chain and cap may be provided instead of 1-1/2-inch NPS (DN40) valves.

B. Stop-and-Waste Drain Valves: MSS SP-110, ball valve, rated for 200-psig (1380-kPa) minimum CWP or MSS SP-80, Class 125, gate valve; ASTM B 62 bronze body, with 1/8-inch NPS (DN6) side drain outlet and cap.

2.8 OUTLET BOXES

A. General: Recessed-mounting outlet boxes with fittings complying with ASME A112.18.1M. Include box with faceplate, services indicated for equipment connections, and wood-blocking reinforcement.

B. Clothes Washer Outlet Boxes: With hose connections, drain, and the following:

1. Box and Faceplate: Plastic.

2. Shutoff Fittings: 2 hose bibbs.

3. Supply Fittings: Two 1/2-inch NPS (DN15) gate, globe, or ball valves and 1/2-inch NPS (DN15) copper, water tubing.

4. Drain Fitting: 2-inch NPS (DN50) drainage piping P-trap with 2-inch NPS (DN50) standpipe ex-tending from floor to outlet box and 2-inch NPS (DN50) waste.

5. Inlet Hoses: Two 60-inch- (1500-mm-) long, ASTM D 3571, clothes washer inlet hoses with fe-male hose-thread couplings.

6. Drain Hose: One 48-inch- (1200-mm-) long, ASTM D 3572, clothes washer drain hose with hooked end.

C. Ice Maker Outlet Boxes: With hose connection and the following:

1. Box and Faceplate: Plastic.

2. Shutoff Fitting: Hose bibb.

3. Supply Fitting: 1/2-inch NPS (DN15) gate, globe, or ball valve and 1/2-inch NPS (DN15) cop-per, water tubing.

D. Reinforcement: 2-by-4-inch- or 2-by-6-inch- (38-by-89-mm- or 38-by-140-mm-), fire-retardant-treated-wood blocking between studs.

2.9 TRAP SEAL PRIMER VALVES

A. Trap Seal Primer Valves: ASSE 1018, water-supply-fed type, with the following characteristics:

1. 125-psig (860-kPa) minimum working pressure.

2. Bronze body with atmospheric-vented drain chamber.

3. Inlet and Outlet Connections: 1/2-inch NPS (DN15) threaded, union, or solder joint.

4. Gravity Drain Outlet Connection: 1/2-inch NPS (DN15) threaded or solder joint.

5. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome fin-ished.

B. Trap Seal Primer System: Factory-fabricated, automatic-operation assembly for wall mounting with the following:

1. Piping: 3/4-inch NPS, ASTM B 88, Type L (DN20, ASTM B 88M, Type B); copper, water tubing inlet and manifold with number of 1/2-inch NPS (DN15) outlets as indicated.

2. Cabinet: Steel box with stainless-steel cover.

3. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V, ac power.

4. Water Hammer Arrester: ASSE 1010.

5. Vacuum Breaker: ASSE 1001.

2.10 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASME A112.26.1M, ASSE 1010, or PDI-WH 201, bellows or piston type with pressurized cushioning chamber. Sizes are based on water-supply fixture units, ASME A112.26.1M sizes A through F and PDI-WH 201 sizes A through F.

B. Hose Bibbs: Bronze body, with renewable composition disc, 1/2- or 3/4-inch NPS (DN15 or DN20) threaded or solder-joint inlet. Provide ASME B1.20.7 garden-hose threads on outlet and integral or field-installed, non-removable, drainable, hose-connection vacuum breaker.

1. Finish: Chrome or nickel plated.

2. Operation: Wheel handle.

C. Roof Flashing Assemblies: Manufactured assembly made of 4-lb/sq. ft. (20-kg/sq. m), 0.0625-inch- (1.6-mm-) thick, lead flashing collar and skirt extending at least 8 inches (200 mm) from pipe with galvanized steel boot reinforcement, and counter-flashing fitting.

1. Vent Cap: Open top, without cap.

D. Floor-Drain Inlet Fittings: Cast iron, with threaded inlet and threaded or spigot outlet, and trap seal primer valve connection.

E. Air-Gap Fittings: ASME A112.1.2, cast iron or cast bronze, with fixed air gap, inlet for drain pipe or tube, and threaded or spigot outlet.

F. Stack Flashing Fittings: Counter-flashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.

G. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and set-screws to secure to vent pipe.

H. Vent Terminals: Commercially manufactured, shop-fabricated or field-fabricated, frost-proof assembly constructed of galvanized steel, copper, or lead-coated copper. Size to provide 1-inch (25-mm) enclosed air space between outside of pipe and inside of flashing collar extension, with counter-flashing, as indicated.

I. Expansion Joints: ASME A112.21.2M, assembly with cast-iron body with bronze sleeve, packing gland, and packing, of size and end types corresponding to connected piping.

J. Downspout Boots: ASTM A 74, Service class, hub-and-spigot, cast-iron soil pipe.

2.11 SLEEVE PENETRATION SYSTEMS

A. Description: UL 1479, through-penetration fire-stop assembly consisting of sleeve and stack fitting with fire-stopping plug.

1. Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.

2. Stack Fitting: ASTM A 48, cast-iron, hubless pattern, wye-branch stack fitting with neoprene O-ring at base and cast-iron plug in thermal-release harness in branch. Include PVC protective cap for plug.

a. Special Coating: Include corrosion-resistant interior coating on fittings for plastic chemical waste and vent stacks.

2.12 FLASHING MATERIALS

A. Copper Sheet: ASTM B 152 (ASTM B 152M), of the following minimum weights and thicknesses, unless otherwise indicated:

1. General Applications: 12 oz./sq. ft. (3.7 kg/sq. m or 0.41-mm thickness).

2. Vent Pipe Flashing: 8 oz./sq. ft. (2.5 kg/sq. m or 0.27-mm thickness).

B. Fasteners: Metal compatible with material and substrate being fastened.

C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

D. Solder: ASTM B 32, lead-free alloy.

E. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

2.13 RAINWATER HARVESTING SPECIALTIES

A. Rainwater Filter, Vortex Type:

1. Jay R. Smith Mfg. Co. Model: No. RH9521-12 or approved equal.

2. Description: 20-inch stainless steel lift handle, removable stainless steel 380-micron fine mesh filter, steel housing lid and baseplate, and polypropylene filter housing with closing ring.

3. Ventilation: To suit project conditions.

B. Storage Tank Accessories:

1. Smoothing inlets:

a. Jay R. Smith Mfg. Co. Model: No. RH9530SI or approved equal.

b. Description: Stainless steel smoothing inlet for an 8-inch inlet pipe.

2. Level indicator:

a. Jay R. Smith Mfg. Co. Model: No. RH9530LI or approved equal.

b. Description: Wireless storage tank level sensor.

3. Float switch:

a. Jay R. Smith Mfg. Co. Model: No. RH9542FSO or approved equal.

b. Description: Polyethylene switch level and float housing with flexible cable; dry run protection, normally open.

4. Second source storage tank float switch:

a. Jay R. Smith Mfg. Co. Model: No. RH9542FSC or approved equal.

b. Description: Polyethylene switch level and float housing with flexible cable; control normally closed solenoid valve.

PART 3 EXECUTION

3.1 PLUMBING SPECIALTY INSTALLATION

A. General: Install plumbing specialty components, connections, and devices according to manufacturer's written instructions.

B. Install strainers on supply side of each control valve, pressure regulator, and solenoid valve, and where indicated.

C. Install hose bibbs with integral or field-installed vacuum breaker.

D. Install expansion joints on vertical risers, stacks, and conductors as indicated.

E. Install cleanouts in aboveground piping and building drain piping as indicated, and where not indicated, according to the following:

1. Size same as drainage piping up to 4-inch NPS (DN100). Use 4-inch NPS (DN100) for larger drainage piping unless larger cleanout is indicated.

2. Locate at each change in direction of piping greater than 45 degrees.

3. Locate at minimum intervals of 50 feet (15 m) for piping 4-inch NPS (DN100) and smaller and 100 feet (30 m) for larger piping.

4. Locate at base of each vertical soil and waste stack.

F. Install cleanout deck plates, of types indicated, with top flush with finished floor, for floor cleanouts for piping below floors.

G. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.

H. Install flashing flange and clamping device with each stack and cleanout passing through floors with waterproof membrane.

I. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.

J. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor or as indicated. Size outlets as indicated.

K. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates de-pressed according to the following drainage area radii:

1. Radius, 30 Inches (750 mm) or Less: Equivalent to 1 percent slope, but not less than 1/4-inch (6.35-mm) total depression.

2. Radius, 30 to 60 Inches (750 to 1500 mm): Equivalent to one percent slope.

3. Radius, 60 Inches (1500 mm) or Larger: Equivalent to 1 percent slope, but not greater than 1-inch (25-mm) total depression.

L. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

M. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

N. Position floor drains for easy access and maintenance.

O. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions. Size outlets as indicated.

P. Install roof-drain flashing collar or flange so no leakage occurs between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.

Q. Position roof drains for easy access and maintenance.

R. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.

S. Fasten recessed, wall-mounting plumbing specialties to reinforcement built into walls.

T. Secure supplies to supports or substrate.

U. Install individual stop valve in each water supply to plumbing specialties. Use ball, gate, or globe valve if specific valve is not indicated.

V. Install water-supply stop valves in accessible locations.

W. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

X. Locate drainage piping as close as possible to bottom of floor slab supporting fixtures and drains.

Y. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

Z. Include wood-blocking reinforcement for recessed and wall-mounting plumbing specialties.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

1. Install piping connections between plumbing specialties and piping specified in other Division 15 Sections.

2. Install piping connections indicated between appliances and equipment specified in other Sections; connect directly to plumbing piping systems.

3. Install piping connections indicated as indirect wastes from appliances and equipment specified in other Sections, to spill over receptors connected to plumbing piping systems.

B. Install hoses between plumbing specialties and appliances as required for connections.

C. Arrange for electric-power connections to plumbing specialties and devices that require power. Electric power is specified in Division 16 Sections.

D. Supply Run-outs to Plumbing Specialties: Install hot- and cold-water-supply piping of sizes indicated, but not smaller than required by authorities having jurisdiction.

E. Drainage Run-outs to Plumbing Specialties: Install drainage and vent piping, with approved trap, of sizes indicated, but not smaller than required by authorities having jurisdiction.

F. Ground electric-powered plumbing specialties.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

G. Arrange for electric-power connections to plumbing specialties and devices that require power. Electric power, wiring, and disconnect switches are specified in Division 16 Sections.

3.3 FLASHING INSTALLATION

A. Fabricate flashing manufactured from single piece unless large pans, sumps, or other drainage shapes are required.

B. Solder joints of copper sheets where required.

C. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches (2500 mm), and skirt or flange extending at least 8 inches (200 mm) around pipe.

2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.

3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.

D. Set flashing on floors and roofs in solid coating of bituminous cement.

E. Secure flashing into sleeve and specialty clamping ring or device.

F. Install flashing for piping passing through roofs with counter-flashing or commercially made flashing fit-tings, according to Division 7 Section "Sheet Metal Flashing and Trim."

G. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

H. Fabricate and install flashing and pans, sumps, and other drainage shapes as indicated. Install drain connection if indicated.

3.4 COMMISSIONING

A. Before startup, perform the following checks:

1. System tests are complete.

2. Damaged and defective specialties and accessories have been replaced or repaired.

3. Clear space is provided for servicing specialties.

B. Before operating systems, perform the following steps:

1. Close drain valves, hydrants, and hose bibbs.

2. Open general-duty valves to fully open position.

3. Remove and clean strainers.

4. Verify that drainage and vent piping are clear of obstructions. Flush with water until clear.

C. Startup Procedures: Follow manufacturer's written instructions. If no procedures are prescribed by manufacturer, proceed as follows:

1. Energize circuits for electrically operated units. Start and run units through complete sequence of operations.

D. Adjust operation and correct deficiencies discovered during commissioning.

3.5 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to pre-vent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.6 CLEANOUT SCHEDULE

A. Cleanout FCO: Where plumbing specialties of this designation are indicated, provide products complying with the following:

1. Applicable Standard: ASME A112.36.2M.

2. Application: Floor cleanout.

3. Body or Ferrule Material: Cast iron.

4. Outlet Connection: Spigot.

5. Adjustable Housing Material: Cast iron with threads.

6. Frame and Cover Material and Finish: Nickel-brass, copper alloy.

7. Frame and Cover Shape: Round.

3.7 FLOOR-DRAIN SCHEDULE

A. Floor Drain FD: Where plumbing specialties of this designation are indicated, provide products complying with the following:

1. Applicable Standard: ASME A112.21.1M.

2. Body Material: Cast iron.

3. Seepage Flange: Required.

4. Clamping Device: Required.

5. Outlet: Bottom.

6. Sediment Bucket: Not required.

7. Top or Strainer Material: Stainless steel.

8. Top of Body and Strainer Finish: Stainless steel.

9. Top Shape: Round.

10. Top Loading Classification: Medium Duty.

11. Trap Material: Cast iron.

12. Trap Pattern: Standard P-trap.

3.8 TRENCH-DRAIN SCHEDULE

A. Trench Drain: Where plumbing specialties of this designation are indicated, provide products complying with the following:

1. Applicable Standard: ASME A112.21.1M.

2. Body Material: Cast iron.

3. Outlet: Bottom or Side.

4. Grate Material: Stainless steel.

5. Top Loading Classification: Heavy Duty.

3.9 GREASE-INTERCEPTOR SCHEDULE

A. Grease Interceptor: Where plumbing specialties of this designation are indicated, provide prod-ucts complying with the following:

1. Applicable Standard: PDI-G101.

2. Body Material: Plastic.

3. Cleanout: Integral or field installed on outlet.

4. Mounting: See plumbing plans.

7. Flow-Control Fitting: Required.

3.10 OIL-INTERCEPTOR SCHEDULE

A. Oil Interceptor: Where plumbing specialties of this designation are indicated, provide products complying with the following:

1. Body Material: Cast iron or steel.

2. Interior Coating: Corrosion-resistant enamel.

3. Exterior Coating: Corrosion-resistant enamel.

4. Cleanout: Integral or field installed on outlet.

5. Mounting: See plumbing plans.

6. Flow-Control Fitting: Required.

3.11 SOLIDS-INTERCEPTOR SCHEDULE

A. Solids Interceptor SI-[#]: Where plumbing specialties of this designation are indicated, provide products complying with the following:

1. Body Material: Cast iron or steel.

2. Interior Separation Device: Baffles or Screens.

3. Interior Coating: Corrosion-resistant enamel.

4. Exterior Coating: Corrosion-resistant enamel.

5. Mounting: See plumbing plans.

3.12 ACID NEUTRALIZATION TANK

A. Compact, under sink mounted acid neutralization tank with 2-inch inlet, outlet and vent connections; with seamless construction manufactured from high-density polyethylene. The top shall be with gasketed, bolt-down cover.

B. Limestone chips used in conjunction with neutralization tanks must be in the one to three-inch (1"- 3") diameter size range and must contain a high calcium carbonate content in excess of 90%.

3.13 ROOF-DRAIN SCHEDULE

A. Roof Drain RD: Where plumbing specialties of this designation are indicated, provide products complying with the following:

1. Applicable Standard: ASME A112.21.2M.

2. Body Material: Cast iron.

3. Combination Flashing Ring and Gravel Stop: Required.

4. Outlet: Bottom.

5. Dome Material: Cast iron.

6. Extension Collars: Required.

7. Underdeck Clamp: Required.

8. Sump Receiver: Required.

END OF SECTION

SECTION 15440

PLUMBING FIXTURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes plumbing fixtures and trim, faucets, other fittings, and related components.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Joint Sealants" for sealing between fixtures and walls, floors, and counters.

2. Division 15 Section "Plumbing Specialties" for backflow preventers and other specialties not specified in this Section.

1.3 DEFINITIONS

A. Accessible: Plumbing fixture, building, facility, or portion thereof that can be approached, entered, and used by physically handicapped, disabled, and elderly people.

B. Fitting: Device that controls flow of water into or out of plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, traps and waste pipes. Pipe fittings, tube fittings, and general-duty valves are included where indicated.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each plumbing fixture category and type specified. Include selected fixture, trim, fit-tings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.

C. Wiring diagrams from manufacturer for electrically operated units.

D. Maintenance data for plumbing fixtures and components to include in the operation and maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category from one source and by a single manufacturer.

1. Exception: Where fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for this category.

B. Regulatory Requirements: Comply with requirements of CABO A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; regarding plumbing fixtures for physically handicapped people.

C. Regulatory Requirements: Comply with requirements of Architectural and Transportation Barriers Compliance Board's (ATBCB) "Uniform Federal Accessibility Standards (UFAS), 1985-494-187" regarding plumbing fixtures for physically handicapped people.

D. Energy Policy Act Requirements: Comply with requirements of Public Law 102-486, "Energy Policy Act," regarding water flow rate and water consumption of plumbing fixtures.

E. Listing and Labeling: Provide electrically operated fixtures and components specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

G. Product Options: Drawings indicate size, profiles, dimensional requirements, and characteristics of plumbing fixtures and are based on specific types and models indicated. Other manufacturers' fixtures with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver plumbing fixtures in manufacturer's protective packing, crating, and covering.

B. Store plumbing fixtures on elevated platforms in dry location.

1.7 PROJECT CONDITIONS

A. Field Measurements: Coordinate roughing-in and final fixture locations and verify that plumbing fixtures can be installed to comply with original design and referenced standards.

PART 2 PRODUCTS

2.1 PLUMBING FIXTURE STANDARDS

A. Comply with applicable standards below and other requirements specified.

1. Emergency Equipment: ANSI Z358.1.

2. National Sanitation Foundation Construction: NSF 2.

3. Vitreous-China Fixtures: ASME A112.19.2M.

4. Water-Closet, Flush Valve: ASME A112.19.5.

5. Electric Water Coolers: ARI 1010 and UL 399.

6. Stainless-Steel Fixtures Other than Service Sinks: ASME A112.19.3M.

2.2 LAVATORY/SINK FAUCET STANDARDS

A. Comply with ASME A112.18.1M and other requirements specified for lavatory, sink, and similar-type-fixture faucet fittings. Include hot- and cold-water indicators; 0.5-gpm maximum flow rate; and polished, chrome-plated finish; except where otherwise indicated. Coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.

1. Pipe Threads: ASME B1.20.1.

2. Sensor-Actuated Faucets and Electrical Devices: UL 1951.

3. Sink Spray Hoses: ASTM D 3573.

2.3 SHOWER FAUCET STANDARDS

A. Comply with ASME A112.18.1M and other requirements specified for bathtub and shower faucet fittings. Include hot- and cold-water indicators; 2.5-gpm- (0.16-L/s-) maximum flow rate; and polished, chrome-plated finish; except where otherwise indicated. Coordinate faucet inlets with supplies and outlet with diverter valve; tub spout; and shower head, arm, and flange.

1. Combination, Pressure-Equalizing- and Thermostatic-Control, Antiscald Faucets: ASSE 1016.

2. Hand-Held Showers: ASSE 1014.

3. High-Temperature-Limit Controls for Thermal-Shock-Preventing Devices: ASTM F 445.

4. Hose-Coupling Threads: ASME B1.20.1 or ASME B1.20.7.

5. Manual-Control Antiscald Faucets: ASTM F 444.

6. Pipe Threads: ASME B1.20.1.

7. Pressure-Equalizing-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.

8. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.

2.4 MISCELLANEOUS FITTING STANDARDS

A. Comply with ASME A112.18.1M and other requirements specified for fittings, other than faucets. Include polished, chrome-plated finish, except where otherwise indicated. Coordinate fittings with other components and connectors.

1. Atmospheric Vacuum Breakers: ASSE 1001.

2. Automatic Flow Restrictors: ASSE 1028.

3. Brass and Copper, Supplies and Tubular Brass: ASME A112.18.1M.

4. Fixed Flow Restrictors: ASSE 1034.

5. Plastic Tubular Fittings: ASTM F 409.

6. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.

2.5 MISCELLANEOUS COMPONENT STANDARDS

A. Comply with applicable standards below and other requirements specified for components for plumbing fixtures, equipment, and appliances.

1. Disposers: ASSE 1008 and UL 430.

2. Floor Drains: ASME A112.21.1M.

3. Grab Bars: ASTM F 446.

4. Hose-Coupling Threads: ASME B1.20.7.

5. Pipe Threads: ASME B1.20.1.

6. Plastic Toilet Seats: ANSI Z124.5.

7. Supply and Drain Insulation Kits: CABO A117.1.

8. Supports: ASME A112.6.1M.

2.6 FITTINGS

A. Fittings for Plumbing Fixtures: Refer to plumbing fixture schedules at the end of this Section for materials for supplies, supply stops, supply risers, traps, and other fittings.

B. Fittings for Equipment Specified in Other Sections: Fittings include the following:

1. Supply Inlets: Brass pipe or copper tube, size required for final connection.

2. Supply Stops: Chrome-plated brass, angle or straight; compression, wheel-handle type; same size as supply inlet and with outlet matching supply riser.

3. Supply Risers: 3/8-inch NPS (DN10) flexible copper tube with knob end. Use chrome-plated tube for exposed applications.

4. Traps: Tubular brass with 0.045-inch (1.1 mm) wall thickness, slip-joint inlet, cleanout, wall flange, escutcheons, and size to match equipment. Use chrome-plated tube for exposed applications.

5. Continuous Waste: Tubular brass, 0.045-inch (1.1-mm) wall thickness, with slip-joint inlet, and size to match equipment.

6. Indirect Waste: Tubular brass, 0.045-inch (1.1-mm) wall thickness, and size to match equipment.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for potable, hot- and cold-water supply piping systems; soil, waste, and vent piping systems; and supports. Verify that locations and sizes of piping and

locations and types of supports match those indicated, before installing and connecting fixtures. Use manufacturer's roughing-in data when roughing-in data are not indicated.

B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Include supports for plumbing fixtures according to the following:

1. Carriers: For wall-hanging water closets and fixtures supported from wall construction.

2. Chair Carriers: For wall-hanging urinals, lavatories, sinks, drinking fountains, and electric water coolers.

3. Heavy-Duty Chair Carriers: For accessible urinals, lavatories, and other fixtures where indicated.

4. Reinforcement: For floor-mounted lavatories and sinks that require securing to wall and recessed, box-mounted, electric water coolers.

5. Fabricate reinforcement from 2-by-4-inch or 2-by-6-inch (38-by-89-mm or 38-by-140-mm) fire-retardant-treated-wood blocking between studs or 1/4-by-6-inch (6.35-by-152.4-mm) steel plates attached to studs, in wall construction, to secure fixtures to wall. Include length that will extend beyond ends of fixture mounting bracket and attach to at least 2 studs.

B. Include fitting insulation kits for accessible fixtures according to the following:

1. Lavatories: Cover hot- and cold-water supplies, stops and handles, drain, trap, and waste to wall.

2. Sinks: Cover hot- and cold-water supplies, stops and handles, drain, trap, and waste to wall.

3. Fixtures with Offset Drain: Cover hot- and cold-water supplies, offset drain, trap, and waste to wall.

4. Other Fixtures: Cover exposed fittings below fixture.

3.3 PLUMBING FIXTURE INSTALLATION

A. Assemble plumbing fixtures and trim, fittings, faucets, and other components according to manufacturers' written instructions.

B. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.

C. Install wall-hanging, back-outlet water closets with support manufacturer's tiling frame or setting gage.

D. Install toilet seats on water closets.

E. Install wall-hanging, back-outlet urinals with gasket seals.

F. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for handicapped people to reach.

G. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.

H. Fasten floor-mounted fixtures to substrate. Fasten fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.

I. Fasten recessed, wall-mounted fittings to reinforcement built into walls.

J. Fasten wall-mounted fittings to reinforcement built into walls.

K. Fasten counter-mounting plumbing fixtures to casework.

L. Secure supplies to supports or substrate within pipe space behind fixture.

M. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.

1. Exception: Omit stop valves on supplies to emergency equipment, except when permitted by authorities having jurisdiction. When permitted, install valve chained and locked in OPEN position.

N. Install water-supply stop valves in accessible locations.

O. Install faucet, laminar-flow fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

P. Install supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

Q. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

R. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes, except where otherwise indicated.

S. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.

T. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant according to sealing requirements specified in Division 7 Section "Joint Sealants." Match sealant color to fixture color.

3.4 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

1. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other Division 15 Sections.

B. Supply and Waste Connections to Plumbing Fixtures: Refer to plumbing fixture schedules at the end of this Section for fitting sizes and connection requirements for each plumbing fixture.

C. Supply and Waste Connections to Equipment Specified in Other Sections: Connect equipment with sup-ply inlets, supply stops, supply risers, and traps specified in this Section. Use fitting sizes required to match connected equipment. Connect fittings to plumbing piping.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

E. Arrange for electric-power connections to fixtures and devices that require power. Electric power is specified in Division 16 Sections.

3.5 FIELD QUALITY CONTROL

A. Verify that installed fixtures are categories and types specified for locations where installed.

B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized and demonstrate proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.6 ADJUSTING AND CLEANING

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Adjust water pressure at electric water coolers, faucets, and flushometer valves having controls, to pro-duce proper flow and stream.

C. Replace washers and seals of leaking and dripping faucets and stops.

D. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Include the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.

2. Remove sediment and debris from drains.

3.7 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of fixtures for temporary facilities, except when approved in writing by Owner.

3.8 WATER CLOSET SCHEDULE

A. Water Closet WC & WC-1: Flushometer valve. Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture Color: To be selected by Architect.

2. Bowl Type and Operation: Elongated, siphon jet.

3. Mounting and Outlet: Floor Mounted.

4. Fixture Bolt Caps: Color matching bowl.

5. Rim Height: 14 to 15.5 inches (356 to 394 mm) for Standard height (WC); and 17.5 to 18 inches (445 to 457 mm) for Accessible (WC-1).

6. Design Water Consumption: 1.3 gal. per flushing cycle.

7. Flushometer Valve Construction: Cast-brass body, brass or copper pipe or tubing inlet with wall flange and tailpiece with spud, screwdriver check stop, and vacuum breaker.

8. Flushometer Valve Operation: Diaphragm.

9. Flushometer Valve Finish: Polished, chrome-plated, exposed metal parts.

10. Flushometer Valve, Water Consumption: Factory set or field adjusted, 1.3 gal. maximum per flushing cycle.

11. Flushometer valve components include the following:

a. Battery-powered, sensor-actuation, automatic flushing system.

12. Toilet Seat: Solid-plastic, water-closet seat with bumpers and hardware, compatible with water closet and as follows:

a. Color: To be selected by Architect.

b. Class: Commercial, Heavy Duty.

c. Size: Elongated.

d. Pattern: Open front without cover.

e. Hinge Type: Self-sustaining check (SC).

13. Fixture Support: Vertically adjustable, cast-iron, water-closet carrier with combination support and waste fitting assemblies and tiling frame or setting gage. Include additional faceplate and coupling for water closet at wide pipe space. Compact-type carrier for back-to-back water-closet installation is prohibited.

3.9 URINAL SCHEDULE

A. Urinal UR & UR-1: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture Color: To be selected by Architect.

2. Type and Operation: Siphon jet.

3. Mounting and Outlet: Wall hanging, back outlet.

4. Fixture Bolt Caps: Color to match fixture.

5. Rim Height: 24 inches (610 mm) standard (UR); and 17 inches (432 mm) for Accessible (UR-1).

6. Design Water Consumption: 0.5 gal. per flushing cycle.

7. Flushometer Valve Construction: Cast-brass body, brass or copper pipe or tubing inlet with wall flange and tailpiece with spud, screwdriver check stop, and vacuum breaker.

8. Flushometer Valve Operation: Diaphragm.

9. Flushometer Valve Finish: Polished, chrome-plated, exposed metal parts.

10. Flushometer Valve, Water Consumption: Factory set or field adjusted 0.5 gal. maximum per flushing cycle.

11. Flushometer valve components include the following:

    a. Battery-powered, sensor-actuation, automatic flushing system.

12. Fixture Support: Type I, vertically adjustable, urinal, chair carrier with coupling; heavy-duty, rectangular-steel, upright members; bearing plate; and feet.

3.10 LAVATORY SCHEDULE

A. Lavatory LAV & LAV-1: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture Color: To be selected by Architect.

2. Fixture Dimensions: See architectural plans.

3. Fixture Faucet-Hole Spacing: 3 holes, centered and 4 inches (102 mm) each side of center.

4. Mounting: See architectural plans.

5. Faucet Construction: Center set with inlets on 4-inch (102-mm) centers, and with pop-up waste.

6. Faucet Valve Operation: Manual, adjustable, self-closing, metering lavatory faucet

7. Faucet Mounting Position: Centered on fixture deck.

8. Faucet Components: Include the following:

a. Fixture Operation: Manual.

b. Standard Handle (LAV): Dual, metering, self-closing, pushbuttons.

c. Accessible Handle (LAV-1): Dual, 4-inch (102-mm) wrist blade.

d. Spout: Swing gooseneck.

e. Spout Outlet: 1/2-gpm (0.032-L/s) laminar flow.

9. Supply Inlets: 1/2-inch NPS (DN15), brass pipe or copper tubing.

10. Supply Stops: Manufacturer's standard brass, angle or straight, compression, wheel-handle type, same size as supply inlet and with outlet matching supply riser.

11. Supply Risers: 3/8-inch NPS (DN10) flexible with knob end.

12. Supply, Flow-Control Restrictors: 3/8-inch NPS (DN10), 1/2 gpm (0.032 L/s).

13. Drain: Pop-up with 1-1/4-inch NPS (DN32) tailpiece, included with faucet.

14. Tubular Trap: 1-1/4-inch NPS (DN32), with slip-joint inlet and wall flange.

15. Supply Insulation Kit: Molded, soft-plastic covering for supplies from wall to fixture with removable covering for stops and handles. Include manufacturer's standard fasteners, straps, and adhesives.

16. Drain Insulation Kit: Molded, soft-plastic covering for drain piping from fixture to wall. Include manufacturer's standard fasteners, straps, and adhesives.

3.11 SHOWER SCHEDULE

A. Shower SHO & SHO-1: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Faucet Construction: Cast-brass, thermostatic-control, with high-temperature-limit control, single-handle mixing valve with check stops, and escutcheon.

2. Faucet Components: Include the following:

a. Handle: Single-lever, chrome-plated brass.

b. Standard Shower Head, Arm, and Flange (SHO): Manufacturer's standard with manual flow control in head.

c. Shower Arm, Flow-Control Fitting: 1.5 gpm.

d. Accessible Hand Shower, Hose, and Brackets or Slide (SHO-1): Manufacturer's standard.

e. Hose-Supply, Flow-Control Fitting: 1.5 gpm (.

B. Supplies: Copper tubing with ball, gate, or globe valve if check stops not included with faucet.

3.12 SINK SCHEDULE

A. Kitchen Sink KS: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture Dimensions: See architectural plans.

2. Fixture Stainless-Steel Thickness: 0.063 inch (1.6 mm).

3. Fixture Faucet-Hole Spacing: 3 holes, centered and 4 inches (102 mm) each side of center.

4. Fixture Mounting: Counter.

5. Faucet Construction: Center set with inlets on 4-inch (102-mm) centers, and cast-brass underbody and brass escutcheon.

6. Faucet Mounting: Centered on fixture deck.

7. Faucet Components: Include the following:

   a. Accessible-Fixture Operation: Manual.

   b. Handles: Dual, 4-inch (102-mm) wrist blades.

   c. Spout: Swing gooseneck.

   d. Spout-Outlet, Flow-Control Fitting: 1.5 gpm.

8. Supply Inlets: 1/2-inch NPS (DN15), brass pipe or copper tubing.

9. Supply Stops: Manufacturer's standard brass, angle or straight, compression, wheel-handle type, same size as supply inlet and with outlet matching supply riser.

10. Drain: 1-1/2-inch (38-mm) removable, stainless-steel strainer bucket with 3-1/2-inch (89-mm) removable, stainless-steel crumb cup with 1-1/2-inch NPS (DN40) tubular stainless-steel tailpiece.

B. 2-Compartment Sink: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture: See architectural plans or FFE submittal.

2. Faucet: ASME A112.18.1; NSF 61 – Section 9; NSF 372 (Low Lead Content); 8” Wall mount mixing faucet, Quarter turn cartridges with spring checks, Lever handles, Add-on faucet, 12” Swing nozzle, 44” Flexible stainless-steel hose, 1.5 GPM Spray valve and ½” NPT Female inlets.

3. Accessories: Chrome plated 17 gage (1.3 mm) brass P-trap with clean-out plug and arm with escutcheon, wheel handle stop, flexible supplies.

C. 3-Compartment Sink: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture: See architectural plans or FFE submittal.

2. Faucet: ASME A112.18.1; NSF 61 – Section 9; NSF 372 (Low Lead Content); 8” Wall mount mixing faucet, Quarter turn cartridges with spring checks,

Lever handles, Add-on faucet, 12” Swing nozzle, 44” Flexible stainless-steel hose, 1.5 GPM Spray valve and ½” NPT Female inlets.

3. Accessories: Chrome plated 17 gage (1.3 mm) brass P-trap with clean-out plug and arm with escutcheon, wheel handle stop, flexible supplies.

D. Multi station hand wash sink:

1. Fixture Dimensions: See architectural plans.

2. Fixture Stainless-Steel Thickness: 16-gauge type 304 stainless steel with 2" tubular stainless steel wall brackets. Prefab system with ADA accessibility provisions.

3. Fixture Faucet-Hole Spacing: 4" on center faucet holes are pre-drilled inthe hand sink's high backsplash.

4. Fixture Mounting: Pre-fabricated self standing with adjustable legs and clear space for ADA access.

5. Faucet Construction: Center set with inlets on 4-inch (102-mm) centers, and cast-brass underbody and brass escutcheon.

6. Faucet Mounting: match with number faucet holes.

7. Faucet Components: Include the following:

a. Accessible-Fixture Operation: Manual.

b. Handles: Dual, 4-inch (102-mm) wrist blades.

c. Spout: Swing gooseneck.

d. Spout-Outlet, Flow-Control Fitting: 1.5 gpm.

8. Supply Inlets: 1/2-inch NPS (DN15), brass pipe or copper tubing.

9. Supply Stops: Manufacturer's standard brass, angle or straight, compression, wheel-handle type, same size as supply inlet and with outlet matching supply riser.

10. Drain: 1-1/2-inch (38-mm) removable, stainless-steel strainer bucket with 3-1/2-inch (89-mm) removable, stainless-steel crumb cup with 1-1/2-inch NPS (DN40) tubular stainless-steel tailpiece.

3.13 MOP-SERVICE BASIN SCHEDULE

A. Mop-Service Basin MS: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Fixture Stainless-Steel Thickness: 0.078 inch (2.0 mm).

2. Fixture Dimensions: 24 by 36 inches (610 by 914 mm); 12 inches (305 mm).

3. Mounting: Floor.

4. Rim Guard: Chrome plated, brass.

5. Faucet: Widespread, cast brass with supplies on 8-inch (203-mm) centers.

6. Faucet Mounting: Wall, centered on fixture.

7. Faucet Components: Include the following:

   a. Finish: Polished chrome.

   b. Handles: Dual lever or 4 arm.

   c. Supply Stops: Integral, in shanks.

   d. Spout: With integral vacuum breaker, pail hook, and hose-thread outlet.

   e. Wall Brace: Assembly with wall bracket and support to faucet spout.

   f. Hose: 30-inch- (762-mm-) minimum, flexible hose with stainless-steel hose wall bracket.

8. Drain: 3-inch NPS (DN80) with grid strainer.

9. P-Trap: 3-inch NPS (DN80) drainage piping.

10. Mop Rack: Wall mounted.

11. Supplies: 1/2-inch NPS (DN15) copper tubing with ball, gate, or globe valve.

12. Reinforcement: Provide for wall-mounting faucet and wall brace.

3.14 ELECTRIC WATER COOLER SCHEDULE (DRINKING FOUNTAIN)

A. Dual Height Electric Water Cooler EWC: Where plumbing fixtures of this designation are indicated, pro-vide products complying with the following:

1. Fixture Type: Bi-level bubbler with water bottle filler and integral counter.

2. No. of Bubblers or Stations: 2.

3. Fixture Unit Capacity: 7.8 GPH of 50 degree-F drinking waters.

4. Fixture Cabinet Material: Stainless steel, vandal resistant.

5. Fixture Color or Finish: Stainless steel, vandal resistant.

6. Fixture Mounting: Recessed.

7. Wall Grille: Stainless steel, vandal resistant.

8. Supply: 3/8-inch NPS (DN10) copper tubing with gate, globe, or ball valve.

9. Water Filter: Manufacturer's standard.

10. Cast-Brass Trap{s}: 1-1/4-inch NPS (DN32), cast-brass trap, with slip-joint inlet, pipe nipple to wall, and wall flange.

11. Fixture Support: bilevel, vertically adjustable, hanger-plate, water-cooler, chair carrier with steel-pipe upright members, bearing plate{s}, and feet.

3.15 EMERGENCY EQUIPMENT SCHEDULE

A. Combination Emergency Shower & Eyewash: Where plumbing fixtures of this designation are indicated, provide products complying with the following:

1. Material: Galvanized steel with safety yellow coating.

2. Mounting: Floor, with wall brace.

3. Supply: 1-1/2-inch NPS (DN40) copper tubing.

4. Provide with water flow sensor with audible & visual alarm.

END OF SECTION

SECTION 15441

WATER DISTRIBUTION PUMPS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes pumps for the building potable-water systems.

B. Related Sections include the following:

1. Division 16 Sections for power-supply wiring, field-installed disconnects, electrical devices, and motor controllers.

1.3 SUBMITTALS

A. Product Data: Include certified performance curves and rated capacities of selected models; shipping, installed, and operating weights; furnished specialties; and accessories for each type and size of pump specified. Indicate pumps' operating point on curves.

B. Shop Drawings: Show layout and connections for pumps. Include setting drawings with templates, directions for installation of foundation and anchor bolts, and other anchorages.

1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.

C. Maintenance Data: For each pump specified to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain same type of pumps through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, connections, and dimensional requirements of pumps and are based on specific manufacturer types and models indicated. Other manufacturers' pumps with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Retain shipping flange protective covers and protective coatings during storage.

B. Protect bearings and couplings against damage.

PART 2 PRODUCTS

2.1 PUMPS, GENERAL

A. Description: Factory-assembled and -tested, centrifugal pump units; complying with UL 778; suitable for potable-water service; with all-bronze or stainless-steel construction and components in contact with water made of corrosion-resistant materials.

B. Motors: Comply with requirements in Division 15 Section "Motors" with built-in thermal-overload protection appropriate for motor size and duty.

C. End Connections for NPS 2-1/2 (DN65) and Larger: Flanged.

D. Finish: Manufacturer's standard paint applied to factory-assembled and -tested units before shipping.

E. Manufacturer's Preparation for Shipping: Clean flanges and exposed machined metal surfaces and treat with anticorrosion compound after assembly and testing. Protect flanges, pipe openings, and nozzles.

2.2 COMPACT CIRCULATORS

A. Description: Horizontal, in-line, replaceable-cartridge-design circulator; rated for 125-psig (860-kPa) minimum working pressure and minimum continuous water temperature of 225 deg F (107 deg C).

1. Pump and Motor Assembly: On common shaft in hermetically sealed unit without stuffing box or mechanical seal, and with manufacturer's standard cooling and lubrication system.

2. Impeller: Corrosion-resistant material.

3. Motor: Single speed, unless otherwise indicated.

2.3 IN-LINE CIRCULATORS

A. Description: Horizontal in-line circulator, rated for 125-psig (860-kPa) minimum working pressure and minimum continuous water temperature of 225 deg F (107 deg C).

1. Construction: Radially split, all-bronze casing.

2. Impeller: ASTM B 36/B 36M, rolled brass; or ASTM B 584, cast bronze; overhung, single suction, and keyed to shaft.

3. Seal: Mechanical.

4. Shaft and Sleeve: Steel shaft, with oil-lubricated copper sleeve.

5. Pump Bearings: Oil-lubricated, bronze-journal or thrust type.

6. Shaft Coupling: Flexible, capable of absorbing torsional vibration and shaft misalignment.

7. Motor: Single speed, with oil-lubricated bearings, unless otherwise indicated; and resiliently mounted to pump casing.

a. Motor Size: For motors larger than 1/2 hp, select motor size that will not overload through full range of pump performance curve.

2.4 HORIZONTAL IN-LINE PUMPS

A. Description: Horizontal, in-line, separately coupled pump; rated for 175-psig (1200-kPa) minimum working pressure and minimum continuous water temperature of 225 deg F (107 deg C); and complying with HI 1.1-1.5 for in-line centrifugal pumps.

1. Construction: Radially split, all-bronze casing.

2. Impeller: ASTM B 584, cast bronze; statically and dynamically balanced, closed, overhung, single suction, and keyed to shaft.

3. Shaft and Sleeve: Stainless-steel shaft, with oil-lubricated copper sleeve.

4. Mechanical Seal: Carbon-steel rotating ring, stainless-steel spring, ceramic seat, and rubber bellows and gasket. Include water slinger on shaft between motor and seal.

5. Pump Bearings: Oil-lubricated, bronze-journal or ball type.

6. Shaft Coupling: Flexible, capable of absorbing torsional vibration and shaft misalignment.

7. Motor: Energy-efficient design; single speed, with built-in thermal-overload protection; grease-lubricated ball bearings; and resiliently mounted to pump casing.

a. Motor Size: For motors larger than 1/2 hp, select motor size that will not overload through full range of pump performance curve.

2.5 VERTICAL IN-LINE PUMPS

A. Description: Vertical, in-line, separately coupled pump; rated for 175-psig (1200-kPa) minimum working pressure and minimum continuous water temperature of 225 deg F (107 deg C); and complying with HI 1.1-1.5 for in-line centrifugal pumps.

1. Construction: Radially split, all-bronze casing.

2. Impeller: ASTM B 584, cast bronze; statically and dynamically balanced, closed, overhung, single suction, and keyed to shaft.

3. Shaft and Sleeve: Stainless-steel shaft, with oil-lubricated copper sleeve.

5. Mechanical Seal: Carbon-steel rotating ring, stainless-steel spring, ceramic seat, and rubber bellows and gasket. Include water slinger on shaft between motor and seal.

6. Pump Bearings: Oil-lubricated, bronze-journal or ball type.

7. Shaft Coupling: Flexible, capable of absorbing torsional vibration and shaft misalignment.

8. Motor: Energy-efficient design; single speed, with built-in thermal-overload protection; grease-lubricated ball bearings; and directly mounted to pump casing.

a. Motor Size: For motors larger than 1/2 hp, select motor size that will not overload through full range of pump performance curve.

b. Lifting and Supporting Lug: Directly mounted in top of motor enclosure.

2.6 MULTIPLEX, VARIABLE-SPEED BOOSTER PUMPS

A. Description: Factory-assembled and tested, fluid-handling system for domestic water, with pumps, piping, valves, integral bladder type expansion tank, specialties, and controls, and mounted on base.

B. Pumps:

1. Type: Vertical, multistage as defined in HI 1.1-1.2 and HI 1.3 for in-line, multistage, separately coupled, overhung-impeller, centrifugal pump.

2. Casing: Cast-iron or steel base and stainless-steel chamber.

3. Impeller: Closed, stainless steel; statically and dynamically balanced and keyed to shaft.

4. Shaft: Stainless steel.

5. Seal: Mechanical.

6. Bearing: Water-lubricated sleeve type.

C. Motors: Pre-greased, permanently shielded, ball-type bearings. Select motors that will not overload through full range of pump performance curve.

D. Piping: Stainless-steel pipe and fittings.

E. Valves:

1. Shutoff Valves NPS 2 (DN 50) and Smaller: Gate valve or two-piece, full-port ball valve, in each pump's suction and discharge piping.

2. Shutoff Valves NPS 2-1/2 (DN 65) and Larger: Gate valve or lug-type butterfly valve, in each pump's suction and discharge piping.

3. Check Valves NPS 2 (DN 50) and Smaller: Silent or swing type in each pump's discharge piping.

4. Check Valves NPS 2-1/2 (DN 65) and Larger: Silent type in each pump's discharge piping.

5. Thermal-Relief Valve: Temperature-and-pressure relief type in pump's discharge header piping.

F. Dielectric Fittings: With insulating material isolating joined dissimilar metals.

G. Control Panel: Factory installed and connected as an integral part of booster pump; automatic for multiple-pump, variable-speed operation, with load control and protection functions.

1. Control Logic: Solid-state system with transducers, programmable microprocessor, VFC, and other devices in controller. Install VFC for pump motors larger than 25 hp in separate panel; same type as motor control panel enclosure.

2. Motor Controller: NEMA ICS 2, variable-frequency, solid-state type.

    a. Control Voltage: 24-V ac, with integral control-power transformer.

3. Enclosure: NEMA 250, Type 3R.

4. Motor Overload Protection: Overload relay in each phase.

5. Starting Devices: Hand-off-automatic selector switch for each pump in cover of control panel, plus pilot device for automatic control.

    a. Triplex, Sequence (Lead-Lag-Lag) Starter: Switches lead pump to one lag main pump and to three-pump operation.

6. Pump Operation and Sequencing: Pressure-sensing method.

    a. Time Delay: Controls pump on-off operation; adjustable from 1 to 300 seconds.

7. VFC: Voltage-source, pulse-width, modulating-frequency converter for each pump.

8. Manual Bypass: Magnetic contactor arranged to transfer to constant-speed operation upon VFC failure.

9. Instrumentation: Suction and discharge pressure gages.

10. Lights: Running light for each pump.

11. Alarm Signal Device: Sounds alarm when backup pumps are operating.

    a. Time Delay: Controls alarm operation; adjustable from 1 to 300 seconds, with automatic reset.

12. Thermal-bleed cutoff.

13. Low-suction-pressure cutout.

14. High-suction-pressure cutout.

15. Low-discharge-pressure cutout.

16. High-discharge-pressure cutout.

H. Base: Structural steel.

2.7 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors.

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in NFPA 70.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for booster pumps to verify actual locations of piping connections before booster-pump installation.

3.2 INSTALLATION

A. Equipment Mounting:

1. Install booster pumps on cast-in-place concrete equipment base.

B. Support connected domestic-water piping so weight of piping is not supported by booster pumps.

C. Install pumps according to manufacturer's written instructions and with access for periodic maintenance, including removing motors, impellers, couplings, and accessories.

D. Support pumps and piping so weight of piping is not supported by pumps.

E. Suspend horizontal in-line pumps independent of piping. Use continuous-thread hanger rods and vibration isolation hangers of sufficient size to support pump weight. Fabricate brackets or supports as re-quired. Refer to Division 15 Section "Hangers and Supports" for materials.

F. Suspend vertical in-line pumps independent of piping. Use continuous-thread hanger rods and vibration isolation hangers of sufficient size to support pump weight. Refer to Division 15 Section "Hangers and Supports" for materials.

3.3 CONNECTIONS

A. Comply with requirements for piping specified in Section 15411 "Water Distribution Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect domestic-water piping to booster pumps. Install suction and discharge pipe equal to or greater than size of system suction and discharge headers.

1. Install flanged, or grooved-joint connections on suction and discharge headers at connection to domestic-water piping.

2. Install valved bypass, same size as and between piping, at connections to booster-pump suction and discharge headers.

3. Install flexible connectors, same size as piping, on piping connections to booster-pump suction and discharge headers.

4. Install piping adjacent to booster pumps to allow service and maintenance.

C. Electrical wiring and connections are specified in Division 16 Sections.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Perform visual and mechanical inspection.

2. Leak Test: After installation, charge booster pump and test for leaks. Repair leaks and retest until no leaks exist.

3. Operational Test: After electrical circuitry has been energized, start booster pumps to confirm proper motor rotation and booster-pump operation.

4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Pumps and controls will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.6 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.7 ADJUSTING

A. Adjust booster pumps to function smoothly, and lubricate as recommended by manufacturer.

B. Adjust pressure set points.

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting booster pump to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain booster pumps.

END OF SECTION

SECTION 15446

ELEVATOR SUMP PUMPS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sump pumps for the building storm drainage systems.

B. Related Sections include the following:

1. Division 15 Section "Motors" for sump pump motors.

1.3 SUBMITTALS

A. Product Data: Include performance curves, furnished specialties, and accessories for each type and size of pump indicated.

B. Shop Drawings: Show layout and connections for pumps. Include setting drawings with templates, directions for installing foundation and anchor bolts, and other anchorages.

1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.

C. Maintenance Data: For each type and size of pump specified to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, connections, and dimensional requirements of pumps and are based on specific manufacturer types and models indicated. Other manufacturers' pumps with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Retain shipping flange protective covers and protective coatings during storage.

B. Protect bearings and couplings against damage.

C. Comply with pump manufacturer's rigging instructions for handling.

PART 2 PRODUCTS

2.1 SUMP PUMPS, GENERAL

A. Description: Factory-assembled and -tested, single-stage, centrifugal, end-suction sump pump units complying with UL 778. Include motor, operating controls, and construction for permanent installation.

B. Discharge Pipe End Connections NPS 2 (DN50) and Smaller: Threaded. Pumps available only with flanged-end discharge pipe may be furnished with threaded companion flanges.

C. Discharge Pipe End Connections NPS 2-1/2 (DN65) and Larger: Flanged.

D. Motors: Single speed, with grease-lubricated ball bearings, and non-overloading through full range of pump performance curves.

E. Finish: Manufacturer's standard paint applied to factory-assembled and -tested units before shipping.

F. Manufacturer's Preparation for Shipping: Clean flanges and exposed machined metal surfaces and treat with anticorrosion compound after assembling and testing. Protect flanges, pipe openings, and nozzles with wooden flange covers or with screwed-in plugs.

2.2 SUBMERSIBLE SUMP PUMPS

A. Description: Submersible, direct-connected sump pump complying with HI 1.1-1.5 for submersible sump pumps.

1. Pump Arrangement: Simplex.

2. Casing: Cast iron with cast-iron inlet strainer, legs that elevate pump to permit flow into impeller, and discharge companion flange suitable for plain-end pipe connection arranged for vertical dis-charge.

3. Impeller: ASTM A 48, Class No. 25 A or higher cast iron; statically and dynamically balanced, open or semi-open non-clog design, overhung, single suction, keyed to shaft, and secured by locking cap screw.

4. Construction: Stainless steel with stainless-steel or other corrosion-resistant impeller, stainless-steel inlet strainer, legs that elevate pump to permit flow into impeller, and discharge companion flange suitable for plain-end pipe connection arranged for vertical discharge.

5. Pump and Motor Shaft: Stainless steel, with factory-sealed, grease-lubricated ball bearings.

6. Seals: Double mechanical seals.

7. Motor: Hermetically sealed, capacitor-start type, with built-in overload protection; and three-conductor waterproof power cable of length required, with grounding plug and cable-sealing assembly for connection at pump.

8. Moisture-Sensing Probe: Internal moisture sensor, moisture alarm, and waterproof cable of length required, with cable-sealing assembly for connection at pump.

9. Pump Discharge Piping: Factory or field fabricated, ASTM A 53, Schedule 40, galvanized-steel pipe, bronze pipe, or copper tube.

10. Basin Cover: Cast iron or steel and suitable for supporting controls. Refer to "Sump Pump Ba-sins" Article for other requirements.

11. Controls: NEMA 250, Type 1 enclosure, pedestal mounted, unless wall mounting is indicated; with two mercury-float switches in NEMA 250, Type 6 enclosures; mounting rod; and electric cables; operating & alarm condition indicator lights and alarm horn. Provide oil sensor with indicating lights and alarm horn for elevator sump pit applications.

12. Float-Guide Pipe: Guide pipe or other restraint for floats and rods in basins of depth greater than 60 inches (1500 mm).

13. High-Water Alarm: Rod-mounted, NEMA 250, Type 6 enclosure with mercury-float-switch alarm matching control and electric bell; 120-V ac, with transformer and contacts for remote alarm bell, unless battery operation is indicated.

2.3 SUMP PUMP PITS

A. Description: Cast-in-place concrete with steel curb frames and covers. Refer to Division 3 Section "Cast-in Place Concrete."

B. Curb Frames: Galvanized steel or steel with bitumastic coating of dimension to fit cover.

1. Pattern: Angle-cross-section shape with flat top surface.

2. Pattern: Z-cross-section shape with raised outer rim of height matching cover for recessed mounting that will have installed cover flush with top of floor slab.

C. Pit Cover: Fabricate with openings with gaskets, seals, and bushings, for access, pumps, pump shafts, control rods, discharge piping, vent connections, and power cables.

1. Material: Steel, with drainage holes and bitumastic coating or cast iron, with drainage holes.

2. Reinforcement: Steel or cast-iron reinforcement capable of supporting foot-traffic areas.

2.4 GENERAL-DUTY VALVES

A. Refer to Division 15 Section "Valves" for general-duty gate, ball, butterfly, globe, and check valves. Use valves specified for domestic water, unless otherwise indicated. Include features and devices indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of plumbing piping systems to verify actual locations of piping connections before pump installation.

3.2 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.3 CONCRETE

A. Install concrete bases of dimensions indicated for sump pumps. Refer to Division 3 Section "Cast-in-Place Concrete" and Division 15 Section "Basic Mechanical Materials and Methods."

B. Concrete for pits and sumps is specified in Division 3 Section "Cast-in-Place Concrete."

3.4 INSTALLATION

A. Install pumps according to manufacturer's written instructions.

B. Install pumps and arrange to provide access for maintenance, including removal of motors, impellers, couplings, and accessories.

C. Support piping so weight of piping is not supported by pumps.

D. Submersible Sump Pumps: Set pumps on basin, pit, or sump floor. Make direct connections to storm drainage piping.

E. Sump Pump Pits: Construct concrete pits and connect to storm drainage piping. Refer to Division 3 Section "Cast-in-Place Concrete" for concrete work. Set basin cover and fasten to top edge of concrete pit. Install so top surface of cover is flush with finished floor.

3.5 CONNECTIONS

A. Storm drainage piping installation requirements are specified in Division 15 Section "Drainage and Vent Piping." Drawings indicate general arrangement of piping and specialties. The following are specific connection requirements:

1. Install discharge pipe sizes equal to or greater than diameter of pump nozzles, and connect to storm drainage piping.

2. Install swing check valve and gate or ball valve on each sump pump discharge. Include spring-loaded or weighted-lever check valves for piping NPS 2-1/2 (DN65) and larger.

3. Install swing check valve and gate or ball valve on each automatic, packaged pump discharge.

B. Install electrical connections for power, controls, and devices.

C. Electrical power and control components, wiring, and connections are specified in Division 16 Sections.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.6 ADJUSTING

A. Pump Controls: Set pump controls for automatic start, stop, and alarm operation as required for system application.

3.7 COMMISSIONING

A. Final Checks before Starting: Perform the following preventive maintenance operations:

1. Lubricate bearings.

2. Disconnect couplings and check motors for proper direction of rotation.

3. Verify that each pump is free to rotate by hand. Do not operate pump if it is bound or drags, until cause of trouble is determined and corrected.

4. Verify that pump controls are correct for required application.

B. Starting procedure for pumps with shutoff power not exceeding safe motor power is as follows:

1. Start motors.

2. Open discharge valves slowly.

3. Check general mechanical operation of pumps and motors.

END OF SECTION

SECTION 15450

POTABLE WATER STORAGE TANKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Panel Type Water Storage Tank

1.2 RELATED SECTIONS

A. Section 15140 - Supports and Anchors.

1.3 REFERENCES

A. ANSI/ASHRAE 90A - Energy Conservation in New Building Design.

B. ANSI/NFPA 70 - National Electrical Code.

1.4 DEFINITIONS

A. Reservoir: Flat-bottomed, surface water-storage tank.

B. FRP: Fiberglass Reinforced Plastic

C. GRP: Glass-fiber Reinforced Plastic

D. NR: Natural rubber.

E. PVC: Polyvinyl chloride plastic.

1.5 PERFORMANCE REQUIREMENTS

A. Structural Performance: Surface water-storage tank, including structural reinforcement, foundation & base supports, shall be capable of withstanding the effects of dead and live gravity loads and winds determined according to authorities having jurisdiction.

B. Seismic Performance: Surface water-storage tank, including structural reinforcement, foundation and base supports, shall be capable of withstanding the effects of earthquake motions determined according to authorities having jurisdiction.

C. Thermal Movements: Surface water-storage tank, including structural reinforcement, foundation and base supports, shall allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg. F (67 deg. C), ambient; 180 deg. F (100 deg. C), material surfaces.

1.6 SUBMITTALS

A. Shop Drawings:

1. Include dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.

B. Product Data:

1. Include dimension drawings of water heaters indicating components and connections to other equipment and piping.

2. Provide electrical characteristics and connection requirements.

C. Manufacturer's Installation Instructions.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01700.

B. Include operation, maintenance, and inspection data.

1.8 QUALITY ASSURANCE

A. Perform Work in accordance with Uniform Plumbing Code and in accordance with authorities having jurisdiction.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01600.

B. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.10 WARRANTY

A. Provide one year warranty under provisions of Section 01700.

PART 2 PRODUCTS

2.1 PANEL-TYPE WATER STORAGE TANK

A. GRP Panel type water tank shall be in compliance with ANSI/NSF 61, Section 9. and shall be designed to have sufficient strength to withstand expected 0.3G minimum horizontal ground acceleration. Tanks shall be constructed in metric moduled panels in configurations of 2m x 1m / 1m x 1m/ 1.5m x 1m / 2m x 0.5m / 1.5m x 0.5m / 1m x 0.5m / 0.5m x 0.5m as per manufacturer recommendation.

B. Materials

1. Materials for the construction of the panels shall be Isophthalic unsaturated polyester resin, and the glassfibre used shall be non-alkali type.

2. Manufacturing process of panel shall be the Hot Press Moulding System at 150°c temperature with Sheet Moulding Compound (S.M.C.).

3. The SMC forming panels shall be externally reinforced with a F/G roving mesh of density not less than 230 g/m2 before the hot pressing process.

4. Panels and covers shall be in Grey colour in accordance to Munsell's value N-7.0 to prevent light transmission so as to avoid algae growth in tank. (Value of light transmission shall not be exceeding 0.00%).

C. Dimensions

1. Tolerance of dimensions of each panel shall be within +/-0.03% of the nominal dimensions.

2. Tolerance with regard to panel and flange angle shall be within +/-0.30

D. Fabrication

1. G.R.P. Panels shall be externally flanged at 90º on four sides.

2. Thickness of flange for roof panels shall not be less than 6mm, other panels' flange shall not be less than 10mm and the landed width of all flanges shall not be less than 57mm.

3. Bottom panels shall be convex shape and drain panel shall be concave shape to allow complete drainage of water from the tank by gravity.

E. Bolts & Nuts

1. Bolts, nuts and washers for external fixing shall be of stainless steel grade A4-316.

2. Bolts, nuts and washers for internal fixing of roof panels and partition shall be of stainless steel grade A4-316.

3. Bolt sets for connecting the flanges of inlet, outlet, overflow and drainage to water tanks shall be food grade Rubber Capped.

4. Diameter of bolts shall be 12mm & at a rate of 8 bolt sets per linear meter.

F. Sealing Materials

1. Sealant materials used for joints shall be chemically stable, non-toxic, flexible, and resistant to ultraviolet rays and must be tested for non-toxicity in accordance to the SISR 245-1981

2. Material for the roof sealant shall be made of EPDM and the main solid sealant shall be made of S.E.B.S. (Stylene Ethylene Butyrene Styrene) i.e. Solid synthetic Rubber.

3. The main sealant shall be ribbed in not less than 4 locations. These ribs shall be continuous along the length of the sealant without any breaking. Such main sealant shall remain flexible and resistant to ultra-violet rays.

4. The main sealant shall be subject to testing in accordance to SS245 for the following :- Effect on taste, odor, color and turbidity - Toxic metals - Cytotoxicity - Microbiological growth Such tests shall be performed by a reputable laboratory.

G. Reinforcements and Supports of Water Tank

1. Water tanks shall be strengthened externally with the hot-dipped galvanized steel reinforcement.

2. Internal reinforcements for sectional tank, if required by manufacturer, shall be of Stainless Steel grade A4–316.

3. Support poles of ceiling panels shall be uPVC pipes properly secured.

4. Brackets securing the roof tank covers shall be out of food grade high density polyurethane material.

H. Roof Manhole Cover

1. The roof manhole panel shall have a 610mm diameter opening and access door fixed with Stainless Steel Hinges and lock device.

2. The access door shall be designed to be non-detachable and opened at 135º.

3. The access door shall be hermetically closed and light, dust and insect proof.

I. Air Vent

1. Air vents shall be made of uPVC 2” or 4” Dia with net of mesh No. 22 and shall be light, dust and insect proof.

J. Cat ladder

1. Tanks above 1.0 meter high shall have one external and one internal ladder fitted to every manhole access.

2. The external ladder shall be made of hot dipped galvanized steel conforming to J.I.S. G3101 SS400 and H8641.

3. The internal ladder shall be made of uPVC.

K. Steel Skid

1. Water tanks higher than 1 meter shall be mounted firmly onto a cross steel footing. For 1.5&2 m. high tanks primary beams shall be H Beam of size 100*100*8mm and for tanks higher than 2m. primary beams shall be I Beams of minimum size 200*100*7t*5mm.

2. Maximum deflection permissible shall not exceed 5mm. The Steel footing shall be painted with 2 coats of Red Oxide Primer.

L. Concrete pad and pedestal supports.

1. Provide concrete pad and pedestal supports, size and configuration per manufacturer's recommendations. Structural design shall be submitted for review and approval of Structural DOR.

PART 3 EXECUTION

3.1 PANEL-TYPE WATER TANK INSTALLATION

A. Install water tank in accordance with manufacturer's instructions. Installation shall be by trained manufacturers personnel.

B. Coordinate with plumbing piping and related electrical work to achieve operating system.

3.2 CONNECTIONS

A. Connect tanks to water-distribution and fire suppression piping.

B. Connect drains to storm-drainage piping.

3.3 WATER-STORAGE TANK APPURTENANCE INSTALLATION

A. Install and adjust water-level control valves, piping, and alarms.

B. Install obstruction lighting according to authorities having jurisdiction.

3.4 FIELD QUALITY CONTROL

A. Testing: Engage a qualified testing agency to perform the following field quality-control testing:

1. Leak Test: Comply with IPC. Fill tanks with potable water and test for leaks after installation. Repair leaks and retest until no leaks exist.

a. Water will be furnished by Owner.

2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace malfunctioning units and retest as specified above.

3.5 CLEANING

A. Clean interior and exterior of surface water-storage tanks.

B. Disinfect surface water-storage tanks according to AWWA C652 or requirements of authorities having jurisdiction.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the following. Retain subparagraphs below to suit Project.

1. Obstruction lighting.

2. Water-level controls.

END OF SECTION 15450

SECTION 15484

FUEL OIL PIPING SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe and pipe fittings.

B. Valves.

C. Fuel oil storage tanks.

D. Accessories.

1.2 RELATED SECTIONS

A. Section 09900 - Painting.

B. Section 10600 – Hangers and Supports.

C. Section 16180 - Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.3 REFERENCES

A. ANSI B31.9 - Building Service Piping.

B. API 650 - Welded Steel Tanks for Oil Storage.

C. API 2000 - Venting Atmospheric and Low-Pressure Storage Tanks.

D. ASME - Boiler and Pressure Vessel Code.

E. ASME SEC IX - Welding and Brazing Qualifications.

F. ASME B16.3 - Malleable Iron Threaded Fittings.

G. ASME B36.10 - Welded and Seamless Wrought Steel Pipe.

H. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.

I. ASTM A234/A234M - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

J. ASTM D2310 - Machine-Made Reinforced Thermosetting Resin Pipe.

K. ASTM D2996 - Filament-Wound Reinforced Thermosetting Resin Pipe.

L. NFPA 30 - Flammable and Combustible Liquids Code.

M. NFPA 31 - Installation of Oil Burning Equipment.

N. UL 142 - Steel Aboveground Tanks for Flammable and Combustible Liquids.

1.4 SUBMITTALS FOR REVIEW

A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

B. Shop Drawings: Indicate tanks, system layout, pipe sizes, location, and elevations. For fuel oil tanks, indicate dimensions and accessories including manholes and hold down straps.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Project Record Documents: Record actual locations of piping system, storage tanks, and system components.

B. Maintenance Data: Include installation instructions, spare parts lists.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

A. Welding Materials and Procedures: Conform to ASME Code.

B. Welders Certification: In accordance with ASME SEC IX.

C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section approved by manufacturer.

E. Valves: Manufacturer's name and pressure rating marked on valve body.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable EPA Regulations for installation of fuel oil system.

B. Conform to ANSI B31.1 for installation of fuel oil piping.

C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.8 DELIVERY, STORAGE, AND PROTECTION

A. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation.

1.9 WARRANTY

A. Provide five-year manufacturer warranty for fuel tanks.

1.10 EXTRA MATERIALS

A. Provide two repacking kits for each size valve.

PART 2 PRODUCTS

2.1 BURIED PIPING

A. Steel Pipe: ASTM A53, Schedule 40 black.

1. Fittings: ASTM A234/A234M, wrought carbon steel and alloy steel welding type.

2. Joints: ANSI B31.9 welded.

3. Jacket: AWWA C105 polyethylene or double layer, half-lapped 10 mil (0.25 mm) polyethylene tape.

2.2 ABOVE GROUND PIPING

A. Steel Pipe: ASTM A53 or ASME B36.10, Schedule 40 black.

1. Fittings: ASTM B16.3, malleable iron, or ASTM A234/A234M, wrought carbon steel and alloy steel welding type.

2. Joints: NFPA 30, threaded or welded to ANSI B31.9.

2.3 UNDERGROUND PIPING CONTAINMENT SYSTEM

A. FRP: ASTM D2310 and ASTM D2996, UL listed filament wound fiberglass reinforced epoxy pipe with integral epoxy liner and exterior coating.

1. Fittings: Two piece, compression molded, filament wound fiberglass reinforced epoxy, mechanically joined.

2.4 PIPE HANGERS AND SUPPORTS

A. Conform to ANSI B31.4.

B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch (15 to 40 mm): Carbon steel, adjustable swivel, split ring.

C. Hangers for Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.

D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

E. Wall Support for Pipe Sizes to 3 Inches (80 mm): Cast iron hook.

F. Vertical Support: Steel riser clamp.

G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.5 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches (50 mm) and Under:

1. Ferrous pipe: 150 psi (1034 kPa) malleable iron threaded unions.

B. Pipe Size Over 2 Inches (50 mm):

1. Ferrous pipe: 150 psi (1034 kPa) forged steel slip-on flanges; 1/16 inch (1.6 mm) thick preformed neoprene gaskets.

2.6 GATE VALVES

A. MSS SP-80, Class 125, bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge disc, threaded ends.

2.7 GLOBE VALVES

A. MSS SP-80, Class 125, bronze body, bronze trim, handwheel, bronze disc, threaded ends.

2.8 BALL VALVES

A. MSS SP-110, Class 150, 400 psi (2760 kPa) CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded ends with union.

2.9 SWING CHECK VALVES

A. MSS SP-80, Class 125, bronze body and cap, bronze swing disc, threaded ends.

2.10 RELIEF VALVES

A. Bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated at maximum 60 psi (400 kPa), UL listed for fuel oil, capacities ASME certified and labelled.

2.11 STRAINERS

A. Threaded brass body for 175 psi (1200 kPa) CWP, Y pattern with 1/32 inch (0.8 mm) stainless steel perforated screen.

2.12 FLEXIBLE CONNECTORS

A. Bronze inner hose and braided exterior sleeve, suitable for minimum 200 psi (1380 kPa) CWP and 250 degrees F (121 degrees C).

2.13 ABOVEGROUND FUEL STORAGE TANKS AND ACCESSORIES

A. Construct fuel oil tanks of steel to comply with NFPA 30, NFPA 31, and UL 2085. Provide openings for fill, vent, pump suction, oil return, and oil level gage. Size vent pipes according to NFPA 30, NFPA 31, and UL 2085 but not less than 1 ¼-inch nominal inside diameter. Vent pipe shall connect to tapping at high end of tank and shall not extend more than one inch into tank.

1. Description: UL 2085, double-wall, horizontal, steel tank; with primary and secondary containment walls and interstitial space.

2. Construction: Fabricated with welded, carbon steel; suitable for operation at atmospheric pressure and for storing fuel oil with specific gravity up to 1.1 and with maintained temperature up to 150 deg F.

3. Supports: Manufacturer's standard structural steel welded to tank.

C. Aboveground Fuel Storage/Daytank

1. Tank: UL 142, welded steel, oval with steel support saddles, tappings for accessories, threaded connections; integral secondary containment system.

2. Accessories: Tank fill, gage, vents (emergency & normal), and outlet connections.

3. Integral transfer pump control panel with automatic level controls, level gauge indicator, alarms, and safety devices.

D. Tank Protective Coatings

1. Interior surfaces: Coat 100 percent of metal tank's interior surfaces including all metal piping and metal appurtenances as specified in Section LOW VOC POLYSULFIDE INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS.

2. Exterior Surfaces, Aboveground Tanks: Protect the exterior surfaces of each aboveground tank as specified in Section HIGH PERFORMANCE COATING FOR STEEL STRUCTURES.

3. All Contractors and Subcontractors that perform surface preparation or coating application must be certified to SSPC QP 3 and SSPC QS 1 prior to contract award and must remain certified while accomplishing any surface preparation or coating application. Painting contractors and painting subcontractors must remain so certified for the duration of the project. If a contractor or subcontractor certification expires, the firm is not allowed to perform any work until the certification is reissued. Requests for extension of time due to delay as a result of an inactive certification will not be considered and liquidated damages will apply.

E. Connections to Fuel Oil Tanks:

Provide the following connections

1. Goose-neck vent caps or caps conforming to MIL-C-19902.

2. Fill lines with removable single strainer; filler cap; spill containment box with lockable cover.

3. Gage: Remote reading, electronic, for two wire, 24 volt power, with wall mounted direct reading gage.

4. A sounding connection, to permit entry of the gaging rod, with a locking cap. Provide graduated gaging rod and calibration chart.

5. Pump suction lines with internal vertical pipes and foot valve extending to within 4 inches of tank bottom.

6. Fuel oil supply, return, fill and vent piping utilizing swing joint elbows to allow for

ample tank movement and pipe expansion. Drain piping into tank when pump is shut-off.

7. Flexible hose connections for vibration isolation of oil burning equipment.

8. On steel tanks weld a 12 by 12 by 1/4 inch steel striker plate under gage and fill lines.

9. Nylon dielectric bushings on pipe connections to steel tanks.

10. Ball float valves on vent lines to restrict flow into tank when the tank reaches 90 percent full.

11. Automatic high level alarm with setting of approximately 95 percent and 98 percent of tank capacity. Audible alarm shall sound locally at tank.

12. Gage Fittings.

13. Connections: UL 567, dielectric bushings.

14. Manway: 22 inch (550 mm) diameter, with cover and gasket, and extension sleeve; located at top of tank.

15. Leak Detector System.

16. Ladders: Carbon-steel ladder outside tank, anchored to top and side wall.

2.14 FUEL OIL STORAGE TANK PIPING SPECIALTIES

A. Fitting Materials: Cast iron, malleable iron, brass, or corrosion-resistant metal; suitable for fuel-oil service.

1. Surface, Flush-Mounted Fittings: Waterproof and suitable for truck traffic.

2. Aboveground-Mounted Fittings: Weatherproof.

B. Spill-Containment Fill Boxes: Flush mounting, with drainage feature to drain oil into tank, threaded fill-pipe connection, and wrench operation.

C. Fill Boxes: Flush mounting, with threaded fill-pipe connection and wrench operation.

D. Locking Fill Boxes: Flush mounting, with locking-type inner fill cap for standard padlock and threaded fill-pipe connection.

E. Supply and Sounding Drop Tubes: Fuel-oil supply piping or fitting, inside tank, terminating 6 inches (150 mm) above bottom of tank, and with end cut at a 45-degree angle (1:1 slope).

F. Pipe Adapters and Extensions: Compatible with piping and fittings.

G. Suction Strainers and Check Valves: Bronze or corrosion-resistant metal components.

H. Foot Valves and Antisiphon Valves: Poppet-type, bronze or corrosion-resistant metal components.

I. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant

wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

J. Monitoring Well Caps: Locking pipe plug and manhole.

2.15 FUEL OIL TRANSFER PUMPS

A. Fuel Oil Transfer Pump Sets: Factory-fabricated and wired, packaged unit; for fuel oil service, listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction; with base, strainer, two fuel oil pumps, and controls.

1. Base: Steel with pumps, accessories, and controls factory mounted.

2. Pumps: Comply with HI 3.1-3.5, two-stage, internal-gear with crescent, positive-displacement, rotary type. Include foot-mounted, cast-iron housing; steel gears; bronze bearings; steel shaft; mechanical seals; and built-in pressure relief bypass.

3. Drives: V-belt with guard or direct close coupled.

4. Motors: Comply with Division 15 Section "Motors."

5. Piping: Steel with ferrous fittings and threaded or welded joints.

6. Strainer: Duplex, basket type with corrosion-resistant-metal-screen baskets.

7. Controls: Automatic operation with pump alternator and broken-line, oil shutoff feature. System: Float valves and relays to automatically energize transfer pumps to fill day tank from main storage tank.

a. Low level: Energize pumps when tank level drops below 50 percent of full volume.

b. Full level: De-energize pumps when full.

c. Alarm: Sound audible alarm when fuel overflows into return line.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and AP1 1615.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals. Install to NACE RP-01-69.

C. Route piping in orderly manner and maintain gradient.

D. Install piping to conserve building space and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. Provide clearance for installation of insulation and access to valves and fittings.

H. Provide access where valves and fittings are not exposed.

I. Establish elevations of buried piping outside the building to ensure not less than 2 ft of cover.

J. Where pipe support members are welded to structural building framing, scrape, brush clean, weld, and apply one coat of zinc rich primer.

K. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting. Refer to Section 09900.

L. Identify piping systems including underground piping. refer to Section 15190.

M. Install valves with stems upright or horizontal, not inverted.

N. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

3.4 FUEL TANK INSTALLATION

A. Install tanks in accordance with manufacturer's instructions and API 1615.

B. Clean and flush aboveground tanks prior to delivery to site. Seal until pipe connections are made.

C. Provide piping connections to tanks with unions and swing joints. Provide venting to API 2000.

D. Mount aboveground tanks on steel support saddles and stands as indicated.

E. Clean and flush day tank prior to delivery to site. Seal until pipe connections are made.

F. Fill tanks at project turn-over with appropriate fuel.

END OF SECTION

SECTION 15485

ELECTRIC DOMESTIC WATER HEATERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for domestic water systems:

1. Tankless, electric water heaters.

2. Commercial, electric water heaters.

3. Compression tanks.

4. Accessories.

1.3 SUBMITTALS

A. Product Data: For each type and size of water heater. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

B. Shop Drawings: Detail water heater assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.

C. Product Certificates: Signed by manufacturers of water heaters certifying that products furnished com-ply with requirements.

D. Maintenance Data: For water heaters to include in maintenance manuals specified in Division 1.

E. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain same type of water heaters through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of water heaters and are based on specific units indicated. Other manufacturers' products complying with requirements may be considered. Refer to Division 1 Section "Substitutions."

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. ASME Compliance: Fabricate and label water heater, hot-water storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.

E. ASHRAE Standards: Comply with performance efficiencies prescribed for the following:

1. ASHRAE 90.2, "Energy Efficient Design of New Low-Rise Residential Buildings," for household water heaters.

1.5 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run con-current with, other warranties made by Contractor under requirements of the Contract Documents.

PART 2 PRODUCTS

2.1 POINT-OF-USE, TANKLESS, ELECTRIC WATER HEATERS

A. Description: Comply with UL 499.

B. Construction: Without hot-water storage.

1. Working-Pressure Rating: 125 psig (860 kPa) minimum.

2. Tappings: ASME B1.20.1, pipe thread.

3. Interior Finish: Materials complying with NSF 61, barrier materials for potable-water tank linings.

4. Jacket: Aluminum or steel, with enameled finish, or plastic.

C. Heating System: Electric-resistance type.

1. Temperature Control: Adjustable thermostat.

2. Temperature Control: Adjustable, microprocessor temperature-control thermostat for remote, wall-mounting installation. Include control wiring.

3. Temperature Control: Factory-set, temperature-control thermostat for fixed, outlet-water temperature.

4. Temperature Control: Flow-control fitting in inlet piping.

5. Safety Control: Automatic, high-temperature-limit cutoff device or system.

D. Mounting: Bracket or device for wall mounting.

2.2 COMMERCIAL, STORAGE, ELECTRIC WATER HEATERS

A. Description: Comply with UL 1453.

B. Storage Tank Construction: ASME-code steel with 150-psig (1035-kPa) working-pressure rating.

1. Tappings: Factory fabricated of materials compatible with tank for piping connections, relief valve, pressure gage, thermometer, drain, anode rods, and controls as required. Attach tappings to tank shell before testing and labeling.

a. NPS 2 (DN50) and Smaller: Threaded ends according to ASME B1.20.1, pipe threads.

b. NPS 2-1/2 (DN65) and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges and according to ASME B16.24 for copper and copper-alloy flanges.

2. Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.

3. Insulation: Comply with ASHRAE 90.1. Surround entire storage tank except connections and controls.

4. Jacket: Steel, with enameled finish.

C. Heating Elements: Electric, screw-in or bolt-on, immersion type arranged in multiples of three.

1. Exception: Water heaters up to 9-kW input may have 2 or 3 elements.

2. Staging: Input not exceeding 18 kW per step.

3. Temperature Control: Adjustable, surface-mounted thermostat.

4. Safety Controls: Automatic, high-temperature-limit and low-water cutoff devices or systems.

D. Drain Valve: ASSE 1005, corrosion-resistant metal, factory installed.

E. Anode Rods: Factory installed, magnesium.

F. Dip Tube: Factory installed. Not required if cold-water inlet is near bottom of storage tank.

G. Special Requirement: NSF 5 construction.

2.3 COMPRESSION TANKS

A. Description: Steel, pressure-rated tank constructed with welded joints and factory-installed, butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.

B. Construction: 150-psig (1035-kPa) working-pressure rating.

C. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1, pipe thread.

D. Tank Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.

E. Tank Exterior Finish: Manufacturer's standard, unless finish is indicated.

F. Air-Charging Valve: Factory installed.

2.4 WATER HEATER ACCESSORIES

A. Combination Temperature and Pressure Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3. Include relieving capacity at least as great as heat input and include pressure setting less than water heater working-pressure rating. Select relief valve with sensing element that extends into tank.

1. Option: Separate temperature and pressure relief valves are acceptable instead of combination relief valve.

2. Exception: Omit combination temperature and pressure relief valve for tankless water heater, and furnish pressure relief valve for installation in piping.

B. Pressure Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3. Include pressure setting less than heat-exchanger working-pressure rating.

C. Water Heater Mounting Brackets: Water heater manufacturer's factory-fabricated, steel bracket for wall mounting and capable of supporting water heater and water.

D. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE 90.1 or ASHRAE 90.2.

PART 3 EXECUTION

3.1 WATER HEATER INSTALLATION

A. Install water heaters in accordance with manufacturer’s recommendations.

B. Anchor water heaters to substrate.

C. Install temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend relief valve outlet with water piping in continuous downward pitch and discharge onto closest floor drain.

D. Install pressure relief valves in water piping for water heaters without storage. Extend relief valve outlet with water piping in continuous downward pitch and discharge onto closest floor drain.

E. Install vacuum relief valves in cold-water-inlet piping.

F. Install water heater drain piping as indirect waste to spill into open drains or over floor drains. Install hose-end drain valves at low points in water piping for water heaters that do not have tank drains. Refer to Division 15 Section "Plumbing Specialties" for drain valves.

G. Install piping-type heat traps on inlet and outlet piping of water heater storage tanks without integral or fitting-type heat traps.

H. Fill water heaters with water.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow service and maintenance.

C. Connect hot- and cold-water piping with shutoff valves and unions. Connect hot-water-circulating piping with shutoff valve, check valve, and union.

D. Make connections with dielectric fittings where piping is made of dissimilar metal.

E. Electrical Connections: Power wiring and disconnect switches are specified in Division 16 Sections. Arrange wiring to allow unit service.

F. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Engage a factory-authorized service representative to perform startup service.

B. In addition to manufacturer's written installation and startup checks, perform the following:

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

2. Verify that piping system tests are complete.

3. Check for piping connection leaks.

4. Check for clear relief valve inlets, outlets, and drain piping.

5. Check operation of circulators.

6. Test operation of safety controls, relief valves, and devices.

7. Energize electric circuits.

8. Adjust operating controls.

9. Adjust hot-water-outlet temperature settings. Do not set above 140 deg. F (60 deg. C) unless piping system application requires higher temperature.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain water heaters.

1. Train Owner's maintenance personnel on procedures for starting and stopping, troubleshooting, servicing, and maintaining equipment.

2. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."

3. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."

4. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END OF SECTION 15485

SECTION 15535

REFRIGERATION PIPING AND SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Piping.

B. Refrigerant.

C. Moisture and liquid indicators.

D. Filter-driers.

1.2 RELATED REQUIREMENTS

Section 15050, "Basic Mechanical Materials and Methods", applies to this section with the additions and modifications specified herein.

1.3 RELATED SECTIONS

A. Section 15260 - Piping Insulation.

1.4 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. ANSI 15 - Safety Code for Mechanical Refrigeration (ANSI/ASHRAE 15).

B. ANSI 17 - Method of Testing for Capacity Rating of Thermostatic Refrigerant Expansion Valves (ANSI/ASHRAE 17).

C. ANSI/ARI 710 - Liquid-Line Driers.

D. ANSI/ASHRAE 34 - Number Designation of Refrigerants.

E. ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

F. ANSI/ASME B31.5 - Refrigeration Piping.

G. ANSI/ASME B31.9 - Building Services Piping.

H. ANSI/AWS A5.8 - Filler Metals for Brazing and Braze Welding.

I. ARI 750 - Thermostatic Refrigerant Expansion Valves.

J. ARI 760 - Solenoid Valves for Use with Volatile Refrigerants.

K. ASTM B 88 - Seamless Copper Water Tube.

L. ASTM B280 - Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.

M. ASTM C 534 - Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

N. FS OO-A-373 - (Rev C; Int A^m 1) Air Conditioners, Single Package Type.

O. FS OO-A-374 - (Rev B) Air Conditioners, with Remote Condensing Units or Remote Air-Cooled, Condenser Units, Unitary.

P. MIL-H-22547 - (Rev C) Heat Pumps, Heating and Cooling (Unitary) (8,400 to 300,000 BTU).

Q. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture.

R. MSS SP-69 - Pipe Hangers and Supports - Selection and Application.

S. UL 109 - Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service, and Marine Use.

1.5 SUBMITTALS

A. Manufacturers' Catalog Data: Submit product data under provisions of Section 01300.

1. Pipe, fittings and accessories.

2. Valves.

3. Gaskets.

4. Brazing materials

5. Hangers and supports

For valves, submit the valve manufacturer's published ratings and maximum operating pressure differential. For relief valves, also submit the manufacturers published discharge capacity ratings. For level control valves, also submit manufacturers published ratings based on factory test, for a particular refrigerant application.

B. Installation Drawings/Calculations: Field-assembled refrigerant piping including equipment connections, specific pipe routing, hangers and supports, critical dimensions, pipe sizes and refrigerant system controls. Provide refrigerant pipe sizing calculations based on actual locations and distances of the equipment and pipes. Verify with air conditioning equipment manufacturer that the refrigerant pipe sizes are within the operating limits of the air-conditioning equipment.

C. Welding Procedure: Before performing welding, the Contractor shall submit three copies of welding procedure specification for each metal included in the work, together with proof of qualifications in accordance with ASME B31.5.

D. Performance Qualification Record: Before performing welding, the Contractor shall submit three copies of the Welder's Performance Qualification Record in conformance with ASME B31.5 showing that the welder or operator was tested under the approved procedure specification submitted by the Contractor. Certification dates shall be less than one (1)

year old.

E. Submit test reports indicating results of leak test, vacuum and acid test.

F. Submit operation and maintenance data in accordance with Section, "Operation and Maintenance Data."

1.6 PROJECT RECORD DOCUMENTS

A. Accurately record exact locations of equipment and refrigeration accessories on record drawings.

1.7 REGULATORY REQUIREMENTS

A. Conform to ANSI/ASME B31.9.

B. Welding Materials and Procedures: Conform to ANSI/ASME SEC 9 and applicable Guam labor regulations.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in accordance with the applicable provisions of General Conditions and General Requirements.

B. Deliver and store piping and specialties in shipping containers with labeling in place.

C. Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.

PART 2 PRODUCTS

2.1 PIPING

A. Dimensions and material requirements for pipe, pipe fittings and components shall conform to ANSI 15 and ASME B31.5 and shall be compatible with fluids used and capable of withstanding the pressures and temperatures of the service. Pipe, tubing, and components used for refrigerant service shall be cleaned, sealed, capped, or plugged prior to shipment from the manufacturer's plant.

B. Provide accessories as specified in FS OO-A-374, MIL-H-22547 and this section. Provide suction line accumulators as recommended by equipment manufacturer's installation instructions. Provide a filter-drier in the liquid line.

C. Factory Charged Tubing: Provide extra soft, deoxidized, bright annealed copper tubing conforming to ASTM B 280, factory dehydrated and furnished with a balanced charge of refrigerant recommended by manufacturer of equipment being connected. Factory insulates suction line tubing with 1/2-inch minimum thickness of closed cell, foamed plastic conforming to ASTM C 534 with a permeance rating not to exceed 1.0. Provide quick-connectors with caps or plugs to protect couplings. Include couplings for suction and liquid line connections of the indoor and outdoor sections.

D. Field-Assembled Piping: Material and dimensional requirements for field-assembled refrigerant piping, valves, fittings, and accessories shall conform to ANSI 15 and ASME

B31.5, except as herein specified. Provide seamless copper tubing, hard drawn, Type K or L, conforming to ASTM B 88, except that tubing with outside diameters of 1/4 inch and 3/8 inch shall have nominal wall thickness of not less than 0.30 inch and 0.032-inch, respectively. Soft annealed copper tubing conforming to ASTM B 280 may be used where flare connections to equipment are required only in nominal sizes less than one inch outside diameter. Provide schedule 80 CPVC for drain lines.

E. Fittings for Field-Assembled Piping: Wrought copper, ANSI B16.22 for solder-joint fittings. UL 109 for flared tube fittings.

F. Brazing Filler Material: AWS A5.8 brazing filler metal type BAg-5 with AWS Type 3 flux, except type BCuP-5 or BCuP-6 may be used for brazing copper-to-copper joints.

G. Gaskets: ASTM D 2000, fluorinated elastomers compatible in form with grooves in the flange faces.

H. Pipe Hangers and Supports: Design and fabrication of pipe hangers, supports, and welding attachments shall conform to MSS SP-58. Hanger types and supports for bare and covered pipes shall conform to MSS SP-69 for the system temperature range. Unless otherwise indicated, horizontal and vertical piping attachments shall conform to MSS SP-58. Provide metal protection shields and inserts for insulated piping in accordance with Section 15260, Piping Insulation.

I. Pipe Sleeves: Provide sleeves where piping passes through walls, floors, roofs, and partitions. Secure sleeves in proper position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs, and partitions. Provide not less than 0.5-inch space between exterior of piping or pipe insulation and interior of sleeve. Firmly pack space with insulation and caulk at both ends of the sleeve with plastic waterproof cement, which will dry to a firm but pliable mass, or provide a segmented elastomeric seal.

1. Sleeves in Masonry and Concrete Walls, Floors, and Roofs: Provide Schedule 40 or Standard Weight zinc-coated steel pipe sleeves. Extend sleeves in floor slabs 3 inches above finished floor.

2. Sleeves in Partitions and Non-Masonry Structures: Provide zinc-coated steel sheet sleeves having a nominal weight of not less than 0.90 pound per square foot, in partitions and other than masonry and concrete walls, floors, and roofs.

2.2 VALVES

A. Provide valves designed, manufactured, and tested specifically for refrigerant service. Internal parts shall be removable for inspection or replacement without applying heat or breaking pipe connections. Valves shall open when turned counterclockwise. Threaded ends shall not be used, except as specified herein.

B. Globe and Angle Valves: Forged brass, bronze alloy, forged steel, steel alloy, or ductile iron body with packed stem and seal cap. Packless type with hand wheels and forged brass or bronze alloy bodies with brazing ends may be used in sizes up to and including 7/8-inch O.D. Valves 1 1/4 inches and larger shall be tongue-and-groove flanged and shall have bolted bonnets. Valves one-inch and smaller shall have brazed or soldered ends. Refrigerant valves shall be of the back seating type making it possible to repack the valves under pressure without removal from the line.

2.3 REFRIGERANT

ANSI/ASHRAE 34; R-410A

2.4 ACCESSORIES

A. Moisture and Liquid Indicators: Double port type, UL listed, with copper or brass body, flared or solder ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum working pressure of 500 psi, and maximum temperature of 200 degrees F. Indicating material shall register moisture by varying degrees of color change, based on 100 degrees F and a moisture content in the range of 45 to 180 particles per million in R410a refrigerant.

B. Filter-Driers: Sealed cartridge type, ANSI/ARI 710, UL listed, steel shell, molded desiccant filter core; for maximum working pressure of 350 psi.

C. Liquid Line Driers: ARI 710. Driers 50 cubic inches and larger shall be the cartridge refillable type, provided with a valved bypass of the same size as the liquid line. Drier body shall be of brass or steel, provided with means for holding the desiccant securely in place and distributing the liquid refrigerant evenly throughout the desiccant. Driers shall be capable of withstanding a service pressure of 350 psig. Driers may be of the combination drier-indicator type.

PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Maintain pipe seals until system is closed to prevent contamination by moisture and dirt.

C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

A. Install refrigeration specialties in accordance with manufacturer's instructions.

3.3 PIPING

A. Brazing, bending, forming and assembly of refrigerant piping shall conform to ASME B31.5.

B. Pipe Hangers and Supports: Design and fabrication of pipe hangers, supports, and welding attachments shall conform to MSS SP-58. Installation of hanger types and supports for are and covered pipes shall conform to MSS SP-69 for the system temperature range. Unless otherwise indicated, horizontal and vertical piping attachments shall conform to MSS SP-58.

C. Refrigerant Piping: Cut pipe to measurements established at the site and work into place without springing or forcing. Install piping with sufficient flexibility to provide for expansion and contraction due to temperature fluctuation. Where pipe passes through building structure pipe joints shall not be concealed, but shall be located where they may be readily inspected. Install piping to be insulated with sufficient clearance to permit application of insulation. Install piping as indicated and detailed, to avoid interference with other piping,

conduit, or equipment. Except where specifically indicated otherwise, run piping plumb and straight and parallel to walls and ceilings. Trapping of lines will not be permitted except where indicated. Provide sleeves of suitable size for lines passing through building structure. Braze refrigerant piping with silver solder complying with AWS A5.8. Inside of tubing and fittings shall be free of flux. Clean parts to be jointed with emery cloth and keep hot until solder has penetrated full depth of fitting and extra flux has been expelled. Cool joints in air and remove flame marks and traces of flux. During brazing operation, prevent oxide film from forming on inside of tubing by slowly flowing dry nitrogen through tubing to expel air. Make provisions to automatically return oil on halocarbon systems. Installation of piping shall comply with ASME B31.5.

D. Returning Oil from Refrigerant System: Install refrigerant lines so that gas velocity in the evaporator suction line is sufficient to move oil along with gas to the compressor. Where equipment location requires vertical risers, line shall be sized to maintain sufficient velocity to lift oil at minimum system loading and corresponding reduction of gas volume. Install a double riser when excess velocity and pressure drop would result from full system loading. Larger riser shall have a trap, of minimum volume, obtained by use of 90- and 45- degree ells. Arrange small riser with inlet close to bottom of horizontal line, and connect to top of upper horizontal line. Do not install valves in risers.

E. Refrigerant Driers, Sight Glass Indicators, and Strainers: Provide refrigerant driers, sight glass liquid indicators, and strainers in refrigerant piping in accordance with MIL-H-22547 when not furnished by the manufacturer as part of the equipment. Install driers in liquid line with service valves and valve bypass line the same size as liquid line in which dryer is installed. Size of driers shall be determined by piping and installation of the unit on location. Install dryers of 50 cubic inches and larger vertically with the cover for removing cartridge at the bottom. Install moisture indicators in the liquid line downstream of the drier. Indicator connections shall be the same size as the liquid line in which it is installed.

F. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.

G. Install piping to conserve building space and not interfere with use of space.

H. Group piping whenever practical at common elevations locations. Slope piping one percent in direction or oil return.

I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

J. Provide clearance for installation of insulation and access to valves and fittings.

K. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting.

L. Fully charge completed system with refrigerant after testing.

3.4 DRAIN CONNECTIONS AND DRAIN LINES

A. Provide separate drain lines for the unit drain. Traps and piping to drainage disposal points shall conform to International Plumbing Code.

3.5 ACCESS PANELS

A. Provide access panels for concealed valves, controls, dampers, and other fittings requiring inspection and maintenance.

3.6 APPLICATION

A. Provide line size liquid indicator in liquid line.

B. Provide line size filter-drier in liquid line.

3.7 FIELD QUALITY CONTROL

A. Test refrigeration system in accordance with ANSI/ASME B31.5.

B. Pressure test system with dry nitrogen to 200 psig. Perform final tests at 27 inches vacuum and 200 psig using halide torch or electronic leak detector. Test to no leakage.

3.8 QUALITY CONTROL

A. Prior to initial operation examine and inspect piping systems for conformance to plans and specifications and ASME B31.5. Equipment, material, or work rejected because of defects or nonconformance with plans, specifications, and ANSI Codes for pressure piping shall be corrected as directed by the Project Engineer.

3.9 FIELD-TESTS

After completion of piping installation and prior to initial operation, conduct tests on piping system. Furnish materials and equipment required for tests. Correct defects disclosed by the test. Perform test after installation and prior to acceptance in the presence of the Project Engineer and subject to his approval.

A. Refrigerant Piping System Test: Test system for tightness after installation and before insulation is applied. Temporarily remove controls and other apparatus that may be damaged by test pressure or make inoperative before tests are made and plug, or cap openings. Correct threaded, soldered, or brazed joints that leak by remaking joints. Repair welded joints that leak by cutting out faulty weld affected section and rewelding joint. Test charging, evacuation, and initial charging are not necessary for fully pre-charged refrigeration machinery. Provide leak testing of connections and add only enough additional refrigerant to obtain full charge.

B. Test Pressures: Refrigerant system test pressures for tightness shall not be less than test pressures specified in ANSI 15 or ASME B31.5.

C. Charging System for Test: Charge low and high pressure side of system with a dry, inert gas, such as nitrogen or anhydrous carbon dioxide using a small amount of refrigerant gas to act as a tracer. Use a pressure limiting or reducing valve with pressure gage on high pressure gas tank to limit the pressure in system to the specified test pressure for the respective refrigerant.

D. Leakage Test: With system charged to desired pressure, tightly shutoff gas supply and hold the system for 30 minutes, during which time there shall be no loss of pressure. If a pressure drop, not attributable to temperature changes, occurs during this period, check entire system with a halide torch or an electronic leak detector. When leaks are found, make repairs and provide another 30-minute period at test pressure. Testing and repair shall continue until there is no loss of pressure.

E. Evacuation: After completions of leak testing of refrigerant system, remove all air and moisture from system with a high vacuum pump. Pump shall be capable of reducing absolute pressure in system to a point where any water present in lines will vaporize at a temperature appreciably below ambient temperature and will be withdrawn from system. Before conducting evacuation test, inspect vacuum pump oil for purity and provide new oil charge if existing charge is contaminated. Evacuate system to a maximum absolute pressure of 0.020 inches of Mercury (500 microns) or lower. During evacuation, ambient temperature shall not drop below 35 degrees F. Use pressure gages for measurement of pressure. Upon achieving evacuation of system, valve off vacuum pump from system for a period of at least 12 hours. Consider system tight and dry and free of air, if absolute pressure has not increased by more than 0.002 inches of mercury (50 microns) at the expiration of this period. Repeat pressure test if pressure rise exceeds 0.02 inches of mercury, indicating a leak in system or presence of moisture. If no leaks are found, resume evacuation test and continue until dryness of system is achieved. When a satisfactory vacuum has been obtained, break vacuum by introducing vapor (no liquid) refrigerant and subsequently seal off system.

F. Charging: Provide initial charge of refrigerant. Charge by connecting drums of refrigerant to system charging connection, to feed liquid refrigerant into low side of system where it will be evaporated. Note gross and net weights of drum, and place drum on a scale to determine when empty. Loosely connect charging connection to system connection, so that initial flow of refrigerant will expel air from connection, and then tighten loose joint. When system vacuum has been broken by refrigerant, start and operate compressor while charging continues. Exercise the following procedures and precautions during charging operation:

1. Place refrigerant condensing system in operation.

2. Place fluid circulation system of water coolers or evaporator fans of a direct expansion system in operation.

3. Do not permit compressor discharge pressure from becoming excessive.

3.10 STARTUP AND OPERATIONAL TESTS

Start up and initially operate refrigeration system. During this time, periodically clean strainers until no further accumulation of foreign material occurs. Exercise care so that minimum loss of refrigerant occurs when strainers are cleaned. Adjust safety and automatic control instruments as necessary to place them in required operation and sequence.

END OF SECTION

SECTION 15630

SOLAR ENERGY DEVICES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Solar Collectors.

B. Controls.

C. Pipe and pipe fittings.

D. Valves.

1.2 RELATED WORK

A. Section 15010 - Basic Mechanical Requirements.

B. Section 15260 - Piping Insulation.

1.3 REFERENCES

A. ANSI/ASME Sec 8D Boiler and Pressure Vessel Code.

B. ASHRAE 93 Methods of Testing to Determine the Thermal Performance of Solar Collectors.

C. ASHRAE 96 Methods of Testing to Determine the Thermal Performance of Unglazed Flat Plate Liquid Type Solar Collectors.

D. ASTM B88 Seamless Copper Water Tube.

1.4 REGULATORY REQUIREMENTS

A. Conform to ANSI/ASME B31.9.

1.5 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Manufacturer: For each product specified, provide components by same manufacturer throughout.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, "Drinking Water System Components - Health Effects."

1.6 SUBMITTALS

A. Shop Drawings: Provide for manufactured assemblies. Indicate system and controls schematics. Indicate solar collector installation, layout, weights, mounting and support details, and piping connections.

B. Product Data: Provide data on specialties, including manufacturers catalogue information. Submit performance ratings for solar collectors, rough in details, weights, support requirements, and piping connections.

C. Operation and Maintenance Instructions: Include installation instruction, spare parts lists, procedures, and treatment programs.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store solar collectors in shipping containers and maintain in place until installation. Provide caps on piping connections.

B. Deliver and store valves in shipping containers with labelling in place.

PART 2 PRODUCTS

2.1 HEAT PIPE SOLAR COLLECTORS

A. Construction: Unit consisting of manufacturers standard assembly of frame, manifold casing, header, cover, back cover with insulation, absorber solar tubes heat pipe assembly, and accessories.

B. Frame: Type 304 2B stainless steel frame assembly, with stainless steel screws and self-sealing neoprene washers.

C. Manifold casing: Type 304 2B stainless steel.

D. Header pipe:C12200 copper pipe.

E. Insulation: Rigid fiberglass insulation, 2 inch thick.

F. Rubber seals and rings: UV stabilized high temperature silicone rubber.

G. Testing pressure:130 psi.

H. Collector tube assembly: Copper heat pipe & heat transfer fins inside high efficiency solar glass vacuum tube. Minimum output: 525 kwh per square meter. Quantity of collector tubes shall be per manufacturers recommendations, submit shop drawings & calculations for review & approval by engineer.

2.2 DIFFERENTIAL CONTROLLERS

A. Description: Solid state differential temperature thermostat with two low resistance thermistors and SPDT relay contactor, and field adjustable differential.

B. Functions:

1. Standard: When collector outlet temperature exceeds storage temperature, close contacts.

2. Ambient Override: When collector temperature is less than 80 degrees F, open contacts.

3. High Limit Off: When storage temperature rises above 160 degrees F (71 degrees C), open contacts.

2.3 THERMOSTATS

A. Electric Thermostat: Low voltage type with setback/setup temperature control for heating only.

B. Line Voltage Thermostats: Integral manual On/Off/Auto selector switch, maximum dead band of 2 degrees F concealed temperature adjustment, and locking cover, rated for motor load, single or two pole as required.

2.4 PIPING

A. Copper Tubing: ASTM B88, Type L hard drawn.

1. Fittings: Cast brass or wrought copper.

2. Joints: Grade 95TA solder joints.

2.5 GATE VALVES

A. Up to 2 Inches: Bronze body, bronze trim, non-rising stem, handwheel, inside screw, single wedge or disc, [solder or] threaded ends.

2.6 GLOBE VALVES

A. Up to 2 Inches: Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable composition disc, [solder or] screwed ends, with backseating capacity.

2.7 BALL VALVES

A. Up to 2 Inches: Bronze or stainless steel one piece body, stainless steel ball, teflon seats and stuffing box ring, lever handle, solder or threaded ends.

2.8 SWING CHECK VALVES

A. Up to 2 Inches: Bronze swing disc, solder or screwed ends.

2.9 RELIEF VALVES

A. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

2.10 DIAPHRAGM TYPE COMPRESSION TANKS

A. Construction: Welded steel, tested and stamped in accordance with Section 8D of ANSI/ASME Code; rated for working pressure of 125 psig, with flexible diaphragm sealed into tank, and steel legs or saddles.

B. Automatic Cold Water Fill Assembly: Pressure reducing valve, reduced pressure double check back flow preventer, test cocks, strainer, vacuum breaker, and valved by pass.

C. Pressure Relief Valve: 80 psi.

D. Accessories: Pressure gage and air charging fitting.

2.11 AIR VENTS

A. Manual Type: Short vertical sections of 2-inch (50 mm) diameter pipe to form air chamber, with 1/8 inch (3 mm) brass needle valve at top of chamber.

B. Float Type: Brass or semi steel body, copper float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.

2.12 STRAINERS

A. Size 2 inch and Under: Screwed brass or iron body for 175 psig working pressure, Y pattern with 1/32-inch stainless steel perforated screen.

2.13 CONTROL VALVES

A. Angle or straight pattern, rising stem, globe valve for 125 psig working pressure, with bronze body and integral union for screwed connections, renewable composition disc, general purpose solenoid enclosure with continuous duty coil.

2.14 TANKS

A. Tank: 0.188-inch-thick steel internally lined with epoxy lining 0.01-inch-thick, and painting on exterior with primer. Continuous weld and grind joints smooth. Brace externally around perimeter. Slope floor towards drain nozzle. Support floor with flat bars spaced as required. Flange external connections larger than 2 inches.

PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. After completion, fill, clean, and treat systems.

3.2 INSTALLATION

A. Install equipment in accordance with manufacturer’s instructions.

B. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.

C. Install piping to conserve building space, and not interfere with use of space and other work. Group piping whenever practical at common elevations.

D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 15121.

E. Provide clearance for installation of insulation, and access to valves and fittings.

F. Provide access where valves and fittings are not exposed.

G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.

H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

I. Prepare pipe, fittings, supports, and accessories for finish painting.

J. Install valves with stems upright or horizontal.

K. Support tanks inside building from building structure.

L. Provide valved drain and hose connection on strainer blow down connection.

M. Select system relief valve capacity so that it is greater than make up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment. Pipe relief valve outlet to nearest floor drain.

N. Change line size with reducing fittings. Support piping adjacent to pump such that no weight is carried on pump casings.

O. Provide line sized shut off valve and strainer on pump suction, and line sized check valve and balancing valve on pump discharge. Provide air cock and drain connection on horizontal pump casings.

P. Install unions downstream of valves and at equipment or apparatus connections.

Q. Install thread brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.

R. Install ball valves for shut off and to isolate equipment, part of systems, or vertical risers.

S. Install globe valves for throttling, bypass, or manual flow control services.

T. Provide 3/4-inch ball drain valves at main shut off valves, low points of piping, bases of vertical risers, and at equipment. Pipe to nearest drain.

U. Provide automatic air vents at system high points. Provide vent tubing to nearest drain.

V. Provide relief valves on system at expansion tanks.

3.3 CLEANING SEQUENCE

A. After completion, fill, start, and vent prior to cleaning. Use water meter to record capacity in each system. Place terminal control valves in open position during cleaning.

B. Circulate for 48 hours, then drain systems as quickly as possible. Refill with clean water, circulate for 24 hours, then drain. Refill with clean water and repeat until system cleaner is removed.

C. Use neutralizer agents on recommendation of system cleaner supplier and approval of Architect/Engineer.

D. Flush open systems with clean water for one hour minimum. Drain completely and refill.

E. Remove, clean, and replace strainer screens. Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

END OF SECTION

SECTION 15738

SPLIT-SYSTEM AIR-CONDITIONING UNITS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes split-system air-conditioning units consisting of separate evaporator-fan and compressor-condenser components. Units are designed for exposed or concealed mounting, and may be connected to ducts.

B. Related Sections include the following:

1. Division 15 Section "Mechanical Vibration Isolation and Seismic Restraints" for isolation pads, spring isolators, and seismic restraints.

1.3 DEFINITIONS

A. Evaporator-Fan Unit: The part of the split-system air-conditioning unit that contains a coil for cooling (heat rejection for heating operation in heat pump units) and a fan to circulate air to conditioned space.

B. Compressor-Condenser Unit: The part of the split-system air-conditioning unit that contains a refrigerant compressor and a coil for condensing refrigerant (evaporator for heating operation in heat pump units).

1.4 SUBMITTALS

A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each type of product indicated. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

B. Shop Drawings: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

C. Samples for Initial Selection: Manufacturer's color charts consisting of units of sections of units showing the full range of colors available for units with factory-applied color finishes.

D. Maintenance Data: For split-system air-conditioning units to include in maintenance manuals specified in Division 1.

E. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of split-system units and are based on the specific system indicated. Other manufacturers'

systems with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 COORDINATION

A. Coordinate size and location of concrete bases for units. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork are specified in Division 3 Section "Cast-in-Place Concrete."

B. Coordinate size, location, and connection details with roof curbs, equipment supports, and roof penetrations specified in Division 7 Section "Roof Accessories."

1.7 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run con-current with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

C. Warranty Period: One year from date of substantial completion.

PART 2 PRODUCTS

2.1 VARIABLE REFRIGERANT VOLUME MULTI-SPLIT SYSTEM TYPE

A. The Variable Refrigerant Volume (VRV) & capacity, heat pump air conditioning system shall consist of multiple indoor ducted type fan coil units and one outdoor unit. The VRV system shall be direct expansion (DX), air-cooled heat pump air-conditioning system, variable speed driven compressor multi zone split system, using R410A refrigerant. All indoor units shall be capable of operating separately with individual temperature control. The indoor units shall be connected to the outdoor utilizing manufacturer's specified piping joints and headers.

B. Provide maintenance tools, software and converters to enable maintenance personnel to diagnose, operate, monitor, control and maintain the system.

C. The outdoor condensing unit shall be of galvanized steel casing with factory applied finish coating. Corrosion control coating for outdoor unit casing and condenser coils & fins shall pass salt-spray tests per ASTM B117 for duration of 10,000 hours.

2.2 SINGLE-SPLIT SYSTEM TYPE

A. The single-split air conditioning system shall consist of matched indoor ducted type air-handling unit and outdoor unit. The direct expansion (DX) air-conditioning system shall include multi-stage compressors using R410A refrigerant.

B. Provide maintenance tools, software and converters to enable maintenance personnel to diagnose, operate, monitor, control and maintain the system.

C. The outdoor condensing unit shall be of galvanized steel casing with factory applied finish coating. Corrosion control coating for outdoor unit casing and condenser coils & fins shall pass salt-spray tests per ASTM B117 for duration of 10,000 hours.

2.3 DEDICATED OUTSIDE AIR SUPPLY SPLIT-SYSTEM TYPE

A. Dedicated Outdoor Air Supply (DOAS) ducted DX-split system shall be designed for the treatment of outdoor air only. Unit shall pre-cool outdoor air and adjust the outdoor air temperature via fixed discharge temperature control using electric or hot gas reheat; temperature control set point shall be field adjustable.

B. Provide passive Wrap-around type Heat Pipe to enhance dehumidification capacity.

C. Provide maintenance tools, software and converters to enable maintenance personnel to diagnose, operate, monitor, control and maintain the system.

D. The outdoor condensing unit shall be of galvanized steel casing with factory applied finish coating. Corrosion control coating for outdoor unit casing, condenser coils & fins and indoor unit evaporator coils & fins shall pass salt-spray tests per ASTM B117 for duration of 10,000 hours.

2.4 DUCTED TYPE EVAPORATOR-FAN COMPONENTS

A. Cabinet: Enameled steel with flanged duct connections, removable panels for servicing, and insulation on back of panel.

1. Insulation: Faced, glass-fiber duct liner.

2. Drain Pans: Galvanized steel, with connection for drain; insulated.

B. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with thermal-expansion valve. For DOAS units, provide factory applied corrosion control coating.

C. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.

D. Fan Motor: Multispeed, PSC type. Provide Variable Frequency Drive (VFD), where required. See mechanical equipment schedules.

E. Disposable Filters: MERV-14, extended surface mini-pleat filters in fiberboard frames.

F. Wiring Terminations: Connect motor to chassis wiring with plug connection.

G. Provide UVC Ultraviolet Germicidal Irradiation Lights for HVAC systems. The UVC system shall be ETL or UL 1598 Listed for luminaries and the lamps shall be rated for wet locations and air handling unit use. Provide mechanical interlock switches to access doors and panels to insure UVC system will be de-energized when access panels are opened. Provide UVC sight glass and 1-set of spare lamps for each AHU or FCU.

2.5 WALL- OR CEILING-MOUNTED, EVAPORATOR-FAN COMPONENTS

A. Cabinet: Enameled steel with removable panels on front and ends, and discharge drain pans with drain connection.

B. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with thermal-expansion valve.

C. Fan and Motor: Centrifugal fan, directly driven by multispeed, electric motor with integral overload protection; resiliently mounted.

D. Filters: Permanent, cleanable.

E. Provide ionization type disinfection device consisting of emitters, status LED light indicators, Building System Automation (BAS) alarm contacts and positive & negative ion output. Disinfection device shall be UL Listed and approved for use with ductless mini-split units.

2.6 AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS

A. Casing: Steel, finished with baked enamel, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing. Provide factory or shop applied corrosion control coating.

B. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation. Compressor motor shall have thermal and current-sensitive overload devices, start capacitor, relay, and contactor.

1. Compressor Type: Reciprocating.

2. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.

C. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with liquid sub-cooler. Provide factory applied corrosion control coating.

D. Fan: Aluminum-propeller type, directly connected to motor.

E. Motor: Permanently lubricated, with integral thermal-overload protection.

F. Mounting Base: Polyethylene.

2.7 ACCESSORIES

A. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:

1. Compressor time delay.

2. 24-hour time control of system stop and start.

3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.

4. Fan-speed selection, including auto setting.

B. Automatic-reset timer to prevent rapid cycling of compressor.

C. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install units' level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install ground-mounted, compressor-condenser components on 4-inch- (100-mm-) thick, reinforced concrete base; 4 inches (100 mm) larger on each side than unit. Concrete, reinforcement, and formwork are specified in Division 3, "Cast-in-Place Concrete." Coordinate anchor installation with concrete base.

D. Install roof-mounted compressor-condenser components on equipment supports specified in Division 7 Section "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.

E. Connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to unit to allow service and maintenance.

C. Unless otherwise indicated, connect piping with unions and shutoff valves to allow units to be disconnected without draining piping. Refer to piping system Sections for specific valve and specialty arrangements.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Installation Inspection: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections, and to prepare a written report of inspection.

B. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

C. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new components, and retest.

D. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 COMMISSIONING

A. Engage a factory-authorized service representative to perform startup service.

B. Verify that units are installed and connected according to the Contract Documents.

C. Lubricate bearings, adjust belt tension, and change filters.

D. Perform startup checks according to manufacturer's written instructions and do the following:

1. Fill out manufacturer's checklists.

2. Check for unobstructed airflow over coils.

3. Check operation of condenser capacity-control device.

4. Verify that vibration isolation devices and flexible connectors dampen vibration transmission to structure.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining units.

2. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."

3. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."

4. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END OF SECTION

SECTION 15781

PACKAGED AIR-CONDITIONING UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Packaged roof top unit.

B. Unit controls.

C. Roof Curb

1.2 REFERENCES

A. ARI 210 - Unitary Air-Conditioning Equipment.

B. ARI 240 - Air Source Unitary Heat Pump Equipment.

C. ARI 270 - Sound Rating of Outdoor Unitary Equipment.

D. NFPA 70 - National Electrical Code.

E. NFPA 90A - Installation of Air Conditioning and Ventilation Systems.

1.3 SUBMITTALS FOR REVIEW

A. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

C. Submit manufacturer's installation instructions. Indicate assembly, support details, connection requirements, and include start-up instructions.

D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years' experience.

1.5 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Protect units from physical damage by storing off site until equipment curbs are in place, ready for immediate installation of units.

1.7 WARRANTY

A. Provide a one-year warranty to include coverage for refrigeration compressors.

1.8 MAINTENANCE SERVICE

A. Furnish service and maintenance of packaged units for one year from Date of Substantial Completion.

B. Provide maintenance service with a two-month interval as maximum time period between calls. Provide 24-hour emergency service on breakdowns and malfunctions.

C. Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.

D. Submit copies of service calls work order or report, and includes description of work performed.

1.9 EXTRA MATERIALS

A. Provide one set of filters.

PART 2 PRODUCTS

2.1 AIR CONDITIONING UNITS

A. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

B. Provide manufacturer’s standard hot gas reheat system for humidity control.

C. Disconnect Switch: Factory mount disconnects switch on equipment.

2.2 DEDICATED OUTSIDE AIR SUPPLY UNITS

A. Provide single packaged type Dedicated Outdoor Air Supply (DOAS) unit complete with reheat, outside air intake, ducted supply outlet, control dampers, humidity & temperature sensors & controllers, vibration isolators and appurtenances.

B. The unit’s evaporator and condenser coil assembly shall be treated with phenolic coating or other manufacturer’s protective coating to protect against sea spray and other corrosive elements. Coil coating shall meet 10,000-hours Salt Spray test rating per ASTM B117 Standard.

C. The unit's casing shall be provided with corrosion protection with finish coating that pass salt-spray tests per ASTM B117 for duration of 10,000 hours.

2.2 FABRICATION

A. Cabinet: Galvanized steel with baked enamel finishes, access doors or removable access panels with stainless-steel quick fasteners screwdriver operated flush cam type. Structural members shall be minimum 18 gage (1.20 mm), with access doors or removable panels of minimum 20 gage (0.90 mm). Provide phenolic or equivalent coating for the entire unit; coating shall meet 10,000-hours Salt Spray test rating per ASTM B117 Standard.

B. Insulation: 2-inch (50-mm) thick neoprene coated glass fiber with edges protected from erosion.

C. Supply Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch motor pulley, and rubber isolated hinge mounted high efficiency motor. Isolate complete fan assembly.

D. Air Filters: MERV-14, One-inch (25-mm) thick glass fiber disposable media in metal frames.

2.3 EVAPORATOR COIL

A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.

B. Provide capillary tubes or thermostatic expansion valves for units of 6 tons (21 kW) capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons (26 kW) cooling capacity and larger.

2.4 COMPRESSOR

A. Provide hermetic or semi-hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high- and low-pressure safety controls, motor overload protection, suction and discharge service valves and gage ports, and filter drier.

B. Five-minute timed off circuit to delay compressor start.

C. Provide step capacity control by cylinder unloading.

2.5 CONDENSER COIL

A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard. Treat coil assembly with phenolic coating or other manufacturer’s protective coating to protect against sea spray and other corrosive elements. Coil coating shall meet 10,000-hours Salt Spray test rating per ASTM B117 Standard.

B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

2.6 MIXED AIR CASING

A. Dampers: Provide manual outside air dampers for fixed outside air quantity.

B. Gaskets: Provide tight fitting dampers with edge gaskets maximum leakage 5 percent at 2 inches (500 Pa) pressure differential.

2.7 UVC ULTRAVIOLET GERMICIDAL IRRADIATION LIGHTS

A. UVC system shall be ETL or UL 1598 Listed for luminaries and the lamps shall be rated for wet locations and air handling unit use. Provide mechanical interlock switches to access doors and panels to insure UVC system will be de-energized when access panels are opened. Provide UVC sight glass and 1-set of spare lamps for each PCU.

2.8 VARIABLE-AIR-VOLUME CONTROL (WHERE REQUIRED)

A. Electric discharge-air-temperature step controller; supply-air static-pressure controller with damper operator operating variable-inlet-fan vanes.

2.9 SMOKE DETECTORS

A. Photoelectric detector located in return-air plenum, to de-energize unit.

2.10 OPERATING CONTROLS

A. Provide low voltage, adjustable thermostat to control compressor and condenser fan and supply fan to maintain temperature setting.

1. Include system selector switch (off-auto-cool) and fan control switch (auto-on).

2. Provide single acting thermostat with minimum 3 stage cooling.

3. Locate thermostat in return air.

B. Provide voltage monitor protection.

C. Provide remote mounted fan control switch (on-auto).

D. Provide low limit thermostat in supply air to stop supply fan.

E. Provide night control energized by central time clock to maintain lower thermostat setting for night and unoccupied operation.

F. Provide remote readout panels containing signal lights indicating system status, cooling system failure; check switches proving signal light operations; system on-off switch and cooling system on-off switch.

G. Provide in panel a manual 12-hour timer to override night control, 7 day time clock for energizing night control, low limit manual reset, and remote thermostat temperature set point.

2.11 OPERATING CONTROLS - SINGLE ZONE UNITS

A. Electric solid-state microcomputer-based room thermostat located as indicated in service area with remote sensor located as indicated.

B. Room thermostat shall incorporate:

1. Preferential rate control to minimize overshoot and deviation from set point.
2. Set-up for four separate temperatures per day.

3. Instant override of set point for continuous or timed period from one hour to 31 days.

4. Short cycle protection.

5. Programming based on weekdays, Saturday and Sunday.

6. Switch selection features including imperial or metric display, 12 or 24-hour clock, keyboard disable, remote sensor, and fan on-auto.

C. Room thermostat display shall include:

1. Time of day.

2. Actual room temperature.

3. Programmed temperature.

4. Programmed time.

5. Duration of timed override.

6. Day of week.

7. System model indication: cooling, auto, off, fan auto, fan on.

8. Stage (cooling) operation.

2.12 Roof Mounting Curb: 24 inches (610 mm) high stainless-steel, channel frame with gaskets, nailer strips.

PART 3 EXECUTION

3.1 EXAMINATION

A. Coordination and Meetings: Verification of existing conditions prior to beginning work.

B. Verify that proper power supply is available.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 90A.

3.3 MANUFACTURER'S FIELD SERVICES

A. Provide initial start-up and shut-down during first year of operation, including routine servicing and check-out.

END OF SECTION

SECTION 15815

DUCTWORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes rectangular, round, and flat-oval metal ducts and plenums for heating, ventilating, and air-conditioning systems in pressure classes from minus 2- to plus 10-inch w.g. (minus 500 to plus 2490 Pa).

B. Related Sections include the following:

1. Division 7 Section "Joint Sealants" for fire-resistant sealants for use around duct penetrations and fire-damper installations in fire-rated floors, partitions, and walls.

2. Division 10 Section "Louvers and Vents" for intake and relief louvers and vents connected to ducts and installed in exterior walls.

3. Division 15 Section "Mechanical Insulation" for duct insulation.

4. Division 15 Section "Duct Accessories" for dampers, sound-control devices, duct-mounted access doors and panels, turning vanes, and flexible ducts.

5. Division 15 Section "Diffusers, Registers, and Grilles."

6. Division 15 Section "Testing, Adjusting, and Balancing" for air balancing and final adjusting of manual-volume dampers.

1.3 DEFINITIONS

A. Thermal Conductivity and Apparent Thermal Conductivity (k-Value): As defined in ASTM C 168. In this Section, these values are the result of the formula Btu x in./h x sq. ft. x deg. F or W/m x K at the temperature differences specified. Values are expressed as Btu or W.

1. Example: Apparent Thermal Conductivity (k-Value): 0.26 or 0.037.

1.4 SYSTEM DESCRIPTION

A. Duct system design, as indicated, has been used to select and size air-moving and -distribution equipment and other components of air system. Changes to layout or configuration of duct system must be specifically approved in writing by Architect. Accompany requests for layout modifications with calculations showing that proposed layout will provide original design results without increasing system total pressure.

1.5 SUBMITTALS

A. Product Data: For sealing materials.

B. Shop Drawings: Show details of the following:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.

2. Duct layout indicating pressure classifications and sizes on plans.

3. Fittings.

4. Reinforcement and spacing.

5. Seam and joint construction.

6. Penetrations through fire-rated and other partitions.

7. Hangers and supports, including methods for building attachment, vibration isolation, seismic restraints, and duct attachment.

C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Ceiling suspension assembly members.

2. Other systems installed in same space as ducts.

3. Ceiling- and wall-mounted access doors and panels required to provide access to dampers and other operating devices.

4. Coordination with ceiling-mounted items, including lighting fixtures, diffusers, grilles, speakers, sprinkler heads, access panels, and special moldings.

D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

E. Record Drawings: Indicate actual routing, fitting details, reinforcement, support, and installed accessories and devices.

1.6 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," unless otherwise indicated.

B. Comply with NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations," Chapter 3, "Duct System," for range hood ducts, unless otherwise indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver sealant and fire-stopping materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle sealant and fire-stopping materials according to manufacturer's written recommendations.

C. Deliver and store stainless-steel sheets with mill-applied adhesive protective paper maintained through fabrication and installation.

PART 2 PRODUCTS

2.1 SHEET METAL MATERIALS

A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 (Z275) coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.

B. Stainless Steel: ASTM A 480/A 480M, Type 316, sheet form with No. 4 finish for surfaces of ducts ex-posed to view; and Type 304, sheet form with No. 1 finish for concealed ducts.

C. Aluminum Sheets: ASTM B 209 (ASTM B 209M), Alloy 3003, Temper H14, sheet form with standard, one-side bright finish for ducts exposed to view and with mill finish for concealed ducts.

D. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

E. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for 36-inch (900-mm) length or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

2.2 SEALANT MATERIALS, METAL DUCTWORK

A. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature but includes tapes and combinations of open-weave fabric strips and mastics.

1. Joint and Seam Tape: 2 inches (50 mm) wide; glass-fiber fabric reinforced.

2. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and a modified acrylic/silicone activator to react exothermically with tape to form a hard, durable, air-tight seal.

3. Joint and Seam Sealant: One-part, non-sag, solvent-release-curing, polymerized butyl sealant, formulated with a minimum of 75 percent solids.

4. Flanged Joint Mastics: One-part, acid-curing, silicone, elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

2.3 THERMOPLASTIC DUCTWORK

A. Construct ductwork, fittings and accessories in accordance with SMACNA 1378 and NFPA 91. Fabricate supplementary steel in accordance with the AISC 360.

B. Provide duct system from a manufacturer recognized in the field of fabrication of PVC material. Fabricating personnel must be certified by the manufacturer as qualified to perform the work in accordance with the specified requirements.

C. Fabricate ducts, accessories and components in sheet form from materials conforming to ASTM D1927, Type I, Grade 2. Utilize extrusions of the same compounds as specified for duct. Solvent cement must conform to ASTM D2564. Construct metal components, when permitted to be located interior to the duct, of 316 or 316L corrosion resistant steel.

D. Where penetration of duct surfaces is approved or specified, provide Type 316 corrosion resistant steel fastener assemblies encapsulated with polyester on duct interior, unless total disassembly is intended. Provide flange fastener bolts and nuts of hex type only, cadmium plated, unless exposed to corrosive fumes; in which case provide Type 316 stainless steel. Equip bolted assemblies with two oversized washers, except where assembled with metallic reinforcement contact. Plastic bolting is prohibited.

E. Joint gaskets. Provide 1/8-inch-thick acid resistant chloroprene.

F. Fabrication: Construct water washable, watertight, self-draining, and airtight ductwork as specified or indicated. Provide required reinforcements, bracing, supports, framing, gasketing, sealing, resilient mounting, drainage provisions, and fastening to guarantee rigid construction and freedom from vibration, airflow induced motion and noise, and excessive deflection at specified maximum system pressure and velocity.

G. Flanges: Provide flanges at all branches on maximum 20 foot centers in ducting sized 16 inches and under, on maximum 8 foot centers in duct sized over 16 inches, where required for ease of access to equipment, at hoods, enclosure connections and where indicated. Furnish one piece, heat, adhesive, or solvent vulcanized or bonded full face gaskets at flange joints.

H. Access plates: Provide access plates upstream and downstream of equipment in ducts at locations to facilitate duct cleaning, and where indicated. Locate access openings a minimum of 2 inches above bottom of duct and externally frame with welded and ground miter joint steel which is isolated from duct interior. Construct access plate with PVC on interior side, backed with steel on exterior side. Provide stainless steel access plate fasteners. For ductwork cleaning access, provide 8 inch diameter gasketed access plates on maximum 10 foot on centers, except where access is available through an air terminal device or other required access.

2.4 HANGERS AND SUPPORTS

A. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for building materials.

1. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches (100 mm) thick.

2. Exception: Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches (100 mm) thick.

B. Hanger Materials: Galvanized, sheet steel or round, threaded steel rod.

1. Hangers Installed in Corrosive Atmospheres: Electrogalvanized, all-thread rod or galvanized rods with threads painted after installation.

2. Straps and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for sheet steel width and thickness and for steel rod diameters.

C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

D. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.

1. Supports for Galvanized-Steel Ducts: Galvanized steel shapes and plates.

2. Supports for Stainless-Steel Ducts: Stainless-steel support materials.

3. Supports for Aluminum Ducts: Aluminum support materials, unless materials are electrolytically separated from ductwork.

2.5 RECTANGULAR DUCT FABRICATION

A. General: Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction with galvanized, sheet steel, according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible." Comply with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.

1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.

2. Materials: Free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.

B. Static-Pressure Classifications: Unless otherwise indicated, construct ducts to the following:

1. Supply Ducts: 3-inch wg (750 Pa).

2. Return Ducts: 2-inch wg (500 Pa), negative pressure.

3. Exhaust Ducts: 2-inch wg (500 Pa), negative pressure.

C. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches (480 mm) and larger and 0.0359 inch (0.9 mm) thick or less, with more than 10 sq. ft. (0.93 sq. m) of unbraced panel area, un-less ducts are lined.

2.6 ROUND AND FLAT-OVAL DUCT FABRICATION

A. General: Diameter as applied to flat-oval ducts in this Article is the diameter of the size of round duct that has a circumference equal to perimeter of a given size of flat-oval duct.

B. Round Ducts: Fabricate supply ducts of galvanized steel according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

C. Flat-Oval Ducts: Fabricate supply ducts with standard spiral lock seams or with butt-welded longitudinal seams according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

2.7 ROUND AND FLAT-OVAL SUPPLY AND EXHAUST FITTING FABRICATION

A. 90-Degree Tees and Laterals and Conical Tees: Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," with metal thicknesses specified for longitudinal seam straight duct.

B. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from body onto branch tap entrance.

C. Elbows: Fabricate in die-formed, gored, pleated, or mitered construction. Fabricate bend radius of die-formed, gored, and pleated elbows one and one-half times elbow diameter. Unless elbow construction type is indicated, fabricate elbows as follows:

1. Mitered-Elbow Radius and Number of Pieces: Welded construction complying with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," unless otherwise indicated.

2. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from minus 2- to plus 2-inch wg (minus 500 to plus 500 Pa):

    a. Ducts 3 to 26 Inches (75 to 660 mm) in Diameter: 0.028 inch (0.7 mm).

    b. Ducts 27 to 36 Inches (685 to 915 mm) in Diameter: 0.034 inch (0.85 mm).

    c. Ducts 37 to 50 Inches (940 to 1270 mm) in Diameter: 0.040 inch (1.0 mm).

    d. Ducts 52 to 60 Inches (1320 to 1525 mm) in Diameter: 0.052 inch (1.3 mm).

    e. Ducts 62 to 84 Inches (1575 to 2130 mm) in Diameter: 0.064 inch (1.6 mm).

3. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from 2- to 10-inch wg (500 to 2490 Pa):

    a. Ducts 3 to 14 Inches (75 to 355 mm) in Diameter: 0.028 inch (0.7 mm).

    b. Ducts 15 to 26 Inches (380 to 660 mm) in Diameter: 0.034 inch (0.85 mm).

    c. Ducts 27 to 50 Inches (685 to 1270 mm) in Diameter: 0.040 inch (1.0 mm).

    d. Ducts 52 to 60 Inches (1320 to 1525 mm) in Diameter: 0.052 inch (1.3 mm).

    e. Ducts 62 to 84 Inches (1575 to 2130 mm) in Diameter: 0.064 inch (1.6 mm).

4. Flat-Oval Mitered Elbows: Welded construction with same metal thickness as longitudinal seam flat-oval duct.

5. 90-Degree, Two-Piece, Mitered Elbows: Use only for supply systems, or exhaust systems for material-handling classes A and B; and only where space restrictions do not permit using 1.5 bend radius elbows. Fabricate with single-thickness turning vanes.

6. Round Elbows, 8 Inches (200 mm) and Smaller: Fabricate die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Fabricate nonstandard bend-angle configuration or nonstandard diameter elbows with gored construction.

7. Round Elbows, 9 through 14 Inches (225 through 355 mm): Fabricate gored or pleated elbows for 30, 45, 60, and 90 degrees, unless space restrictions require a mitered elbow. Fabricate non-standard bend-angle configuration or nonstandard diameter elbows with gored construction.

8. Round Elbows, Larger than 14 Inches (355 mm), and All Flat-Oval Elbows: Fabricate gored el-bows, unless space restrictions require a mitered elbow.

9. Die-Formed Elbows for Sizes through 8 Inches (200 mm) and All Pressures: 0.040 inch (1.0 mm) thick with two-piece welded construction.

10. Round Gored-Elbow Metal Thickness: Same as non-elbow fittings specified above.

11. Flat-Oval Elbow Metal Thickness: Same as longitudinal seam flat-oval duct specified above.

12. Pleated Elbows for Sizes through 14 Inches (355 mm) and Pressures through 10-inch wg (2490 Pa): 0.022 inch (0.55 mm).

PART 3 EXECUTION

3.1 DUCT INSTALLATION, GENERAL

A. Duct installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of ducts, fittings, and accessories.

B. Construct and install each duct system for the specific duct pressure classification indicated.

C. Install round and flat-oval ducts in lengths not less than 12 feet (3.7 m), unless interrupted by fittings.

D. Install ducts with fewest possible joints.

E. Install fabricated fittings for changes in directions, changes in size and shape, and connections.

F. Install couplings tight to duct wall surface with a minimum of projections into duct.

G. Install ducts, unless otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs.

H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

I. Install ducts with a clearance of 1 inch (25 mm), plus allowance for insulation thickness.

J. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions, unless specifically indicated.

K. Coordinate layout with suspended ceiling, fire and smoke control dampers, lighting layouts, and similar finished work.

L. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

M. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same metal thickness as duct. Overlap opening on four sides by at least 1-1/2 inches (38 mm).

N. Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, install appropriately rated fire damper, sleeve, and fire-stopping sealant. Fire and smoke dampers are specified in Division 15 Section "Duct Accessories." Fire-stopping materials and installation methods are specified in Division 7 Section "Fire-stopping."

3.2 SEAM AND JOINT SEALING

A. General: Seal duct seams and joints according to the duct pressure class indicated and as described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Pressure Classification Less than 2-Inch wg (500 Pa): Transverse joints.

C. Seal externally insulated ducts before insulation installation.

3.3 HANGING AND SUPPORTING

A. Install rigid round, rectangular, and flat-oval metal duct with support systems indicated in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

B. Support horizontal ducts within 24 inches (600 mm) of each elbow and within 48 inches (1200 mm) of each branch intersection.

C. Support vertical ducts at a maximum interval of 16 feet (5 m) and at each floor.

D. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

E. Install concrete inserts before placing concrete.

F. Install powder-actuated concrete fasteners after concrete is placed and completely cured.

3.4 CONNECTIONS

A. Connect equipment with flexible connectors according to Division 15 Section "Duct Accessories."

B. For branch, outlet and inlet, and terminal unit connections, comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

3.5 ADJUSTING

A. Adjust volume-control dampers in ducts, outlets, and inlets to achieve design airflow.

B. Refer to Division 15 Section "Testing, Adjusting, and Balancing" for detailed procedures.

3.6 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect the system. Vacuum ducts before final acceptance to remove dust and debris.

END OF SECTION

SECTION 15820

DUCT ACCESSORIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Backdraft dampers.

2. Manual-volume dampers.

3. Fire and smoke dampers.

4. Turning vanes.

5. Duct-mounted access doors and panels.

6. Flexible ducts.

7. Flexible connectors.

8. Duct accessory hardware.

B. Related Sections include the following:

1. Division 8 Section "Access Doors" for wall- and ceiling-mounted access doors and panels.

2. Division 10 Section "Louvers and Vents" for intake and relief louvers and vents connected to ducts and installed in exterior walls.

3. Division 15 Section "Diffusers, Registers, and Grilles."

1.3 SUBMITTALS

A. Product data for the following:

1. Backdraft dampers.

2. Manual-volume dampers.

3. Fire and smoke dampers.

4. Duct-mounted access doors and panels.

5. Flexible ducts.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loadings, required clearances, method of field assembly, components, location, and size of each field connection. Detail the following:

1. Special fittings and manual- and automatic-volume-damper installations.

2. Fire and smoke-damper installations, including sleeves and duct-mounted access doors and panels.

C. Product Certificates: Submit certified test data on dynamic insertion loss; self-noise power levels; and airflow performance data, static-pressure loss, dimensions, and weights.

1.4 QUALITY ASSURANCE

A. NFPA Compliance: Comply with the following NFPA standards:

1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."

1.5 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Fusible Links: Furnish quantity equal to 10 percent of amount installed.

PART 2 PRODUCTS

2.1 SHEET METAL MATERIALS

A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 (Z275) coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.

B. Aluminum Sheets: ASTM B 209 (ASTM B 209M), Alloy 3003, Temper H14, sheet form; with standard, one-side bright finish for ducts exposed to view and mill finish for concealed ducts.

C. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063, Temper T6.

D. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

E. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for 36-inch (900-mm) length or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

2.2 BACKDRAFT DAMPERS

A. Description: Suitable for horizontal or vertical installations.

B. Frame: 0.052-inch (1.3-mm) thick, galvanized, sheet steel, with welded corners and mounting flange.

C. Blades: 0.025-inch- (0.6-mm-) thick, roll-formed aluminum.

D. Blade Seals: Felt.

E. Blade Axles: Galvanized steel.

F. Tie Bars and Brackets: Galvanized steel.

G. Return Spring: Adjustable tension.

2.3 MANUAL-VOLUME DAMPERS

A. General: Factory fabricated with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.

1. Pressure Classifications of 3-Inch wg (750 Pa) or Higher: End bearings or other seals for ducts with axles full length of damper blades and bearings at both ends of operating shaft.

B. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, and suitable for horizontal or vertical applications.

1. Steel Frames: Hat-shaped, galvanized, sheet steel channels, minimum of 0.064 inch (1.62 mm) thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.

2. Roll-Formed Steel Blades: 0.064-inch (1.62-mm) thick, galvanized, sheet steel.

3. Roll-Formed Aluminum Blades: 0.10-inch (2.5-mm) thick aluminum sheet.

4. Extruded-Aluminum Blades: 0.050-inch (1.2-mm) thick extruded aluminum.

5. Blade Axles: Galvanized steel.

6. Tie Bars and Brackets: Galvanized steel.

C. Low-Leakage Volume Dampers: Multiple or single-blade, parallel or opposed-blade design as indicated, low-leakage rating, and suitable for horizontal or vertical applications.

1. Steel Frames: Hat-shaped, galvanized, sheet steel channels, minimum of 0.064 inch (1.62 mm) thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.

2. Roll-Formed Steel Blades: 0.064-inch- (1.62-mm) thick, galvanized, sheet steel.

3. Blade Seals: Felt.

4. Blade Seals: Vinyl.

5. Blade Seals: Neoprene.

6. Blade Axles: Galvanized steel.

7. Tie Bars and Brackets: Galvanized steel.

D. Jackshaft: 1-inch- (25-mm) diameter, galvanized steel pipe rotating within a pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.

1. Length and Number of Mountings: Appropriate to connect linkage of each damper of a multiple-damper assembly.

E. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch- (2.4-mm) thick zinc-plated steel, and a 3/4-inch (19-mm) hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

2.4 FIRE DAMPERS

A. General: Labeled to UL 555.

B. Fire Rating: One and one-half and three hours.

C. Frame: SMACNA Type B with blades out of airstream; fabricated with roll-formed, 0.034-inch- (0.85-mm) thick galvanized steel; with mitered and interlocking corners.

D. Mounting Sleeve: Factory- or field-installed galvanized, sheet steel.

1. Minimum Thickness: 0.052 inch (1.3 mm) or 0.138 inch (3.5 mm) thick as indicated, and length to suit application.

2. Exceptions: Omit sleeve where damper frame width permits direct attachment of perimeter mounting angles on each side of wall or floor, and thickness of damper frame complies with sleeve requirements.

E. Mounting Orientation: Vertical or horizontal as indicated.

F. Blades: Roll-formed, interlocking, 0.034-inch (0.85-mm) thick, galvanized, sheet steel. In place of interlocking blades, use full-length, 0.034-inch (0.85-mm) thick, galvanized steel blade connectors.

G. Horizontal Dampers: Include a blade lock and stainless-steel negator closure spring.

H. Fusible Link: Replaceable, 165 or 212 deg. F (74 or 100 deg. C) rated as indicated.

2.5 TURNING VANES

A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Manufactured Turning Vanes: Fabricate of 1-1/2-inch- (38-mm-) wide, curved blades set 3/4 inch (19 mm) o.c.; support with bars perpendicular to blades set 2 inches (50 mm) o.c.; and set into side strips suitable for mounting in ducts.

C. Acoustic Turning Vanes: Fabricate of airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

2.6 DUCT-MOUNTED ACCESS DOORS AND PANELS

A. General: Fabricate doors and panels airtight and suitable for duct pressure class.

B. Frame: Galvanized, sheet steel, with bend-over tabs and foam gaskets.

C. Door: Double-wall, galvanized, sheet metal construction with insulation fill and thickness, and number of hinges and locks as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch (25-by-25-mm) butt or piano hinge and cam latches.

D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.

E. Insulation: 1-inch- (25-mm-) thick, fibrous-glass or polystyrene-foam board.

2.7 FLEXIBLE CONNECTORS

A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.

B. Standard Metal-Edged Connectors: Factory fabricated with a strip of fabric 3-1/2 inches (89 mm) wide attached to two strips of 2-3/4-inch (70-mm) wide, 0.028-inch (0.7-mm) thick, galvanized, sheet steel or 0.032-inch (0.8-mm) aluminum sheets. Select metal compatible with connected ducts.

C. Conventional, Indoor System Flexible Connector Fabric: Glass fabric double coated with polychloroprene.

1. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m).

2. Tensile Strength: 480 lbf/inch (84 N/mm) in the warp, and 360 lbf/inch (63 N/mm) in the filling.

D. Conventional, Outdoor System Flexible Connector Fabric: Glass fabric double coated with a synthetic-rubber, weatherproof coating resistant to the sun's ultraviolet rays and ozone environment.

1. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m).

2. Tensile Strength: 530 lbf/inch (93 N/mm) in the warp, and 440 lbf/inch (77 N/mm) in the filling.

2.8 FLEXIBLE DUCTS

A. General: Comply with UL 181, Class 1.

B. Flexible Ducts, Insulated: Factory-fabricated, insulated, round duct, with an outer jacket enclosing 1-1/2-inch (38-mm) thick, glass-fiber insulation around a continuous inner liner.

1. Reinforcement: Steel-wire helix encapsulated in inner liner.

2. Outer Jacket: Glass-reinforced, silver Mylar with a continuous hanging tab, integral fibrous-glass tape, and nylon hanging cord.

3. Outer Jacket: Polyethylene film.

4. Inner Liner: Polyethylene film.

C. Pressure Rating: 6-inch wg (1500 Pa) positive, 1/2-inch wg (125 Pa) negative.

2.9 ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments, and length to suit duct insulation thick-ness.

B. Splitter Damper Accessories: Zinc-plated damper blade bracket; 1/4-inch (6-mm), zinc-plated operating rod; and a duct-mounted, ball-joint bracket with flat rubber gasket and square-head set screw.

C. Flexible Duct Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action, in sizes 3 to 18 inches (75 to 450 mm) to suit duct size.

D. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details shown in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts and NAIMA's "Fibrous Glass Duct Construction Standards" for fibrous-glass ducts.

B. Provide test holes at fan inlet and outlet and elsewhere as indicated.

C. Install fire and smoke dampers according to manufacturer's UL-approved written instructions.

1. Install fusible links in fire dampers.

D. Install duct access panels for access to both sides of duct coils. Install duct access panels downstream from volume dampers, fire dampers, turning vanes, and equipment.

1. Install duct access panels to allow access to interior of ducts for cleaning, inspecting, adjusting, and maintaining accessories and terminal units.

2. Install access panels on side of duct where adequate clearance is available.

E. Label access doors according to Division 15 Section "Mechanical Identification."

3.2 ADJUSTING

A. Adjust duct accessories for proper settings.

B. Adjust fire and smoke dampers for proper action.

C. Final positioning of manual-volume dampers is specified in Division 15 Section "Testing, Adjusting, and Balancing."

END OF SECTION

SECTION 15845

AIR TERMINALS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Single-duct air terminals.

B. Related Sections include the following:

1. Division 15 Section "Duct Insulation" for external insulation of air terminals.

2. Division 15 Section "Control Systems Equipment" for control devices installed on air terminals.

1.3 SUBMITTALS

A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each model indicated. Include a schedule showing drawing designation, room location, number furnished, model number, size, and accessories furnished.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.

C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating air outlets with other items installed in ceilings.

D. Maintenance Data: List of parts for each type of air terminal and troubleshooting maintenance guide to include in the maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Product Options: Drawings and schedules indicate requirements of air terminals and are based on specific systems indicated. Other manufacturers' systems with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

B. Listing and Labeling: Provide electrically operated air terminals specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

C. NFPA Compliance: Install air terminals according to NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."

D. Comply with NFPA 70 for electrical components and installation.

PART 2 PRODUCTS

2.1 SINGLE-DUCT AIR TERMINALS

A. Configuration: Volume-damper assembly inside unit casing. Locate control components inside protective metal shroud.

B. Casings: Steel or aluminum sheet metal of the following minimum thicknesses:

1. Upstream Pressure Side: 0.032-inch (0.8-mm) aluminum.

2. Downstream Pressure Side: 0.025-inch (0.63-mm) aluminum.

C. Casing Lining: Minimum of 1/2-inch (13-mm) thick, neoprene- or vinyl-coated, fibrous-glass insulation; 1.5-lb/cu. ft. (24-kg/cu. m) density, complying with NFPA 90A requirements and UL 181 erosion requirements. Secure lining to prevent delamination, sagging, or settling.

1. Coat liner surfaces and edges with erosion-resistant coating or cover with perforated metal.

D. Plenum Air Inlets: Round stub connections or S-slip and drive connections for duct attachment.

E. Plenum Air Outlets: S-slip and drive connections.

F. Access: Removable panels to permit access to dampers and other parts requiring service, adjustment, or maintenance; with airtight gasket and quarter-turn latches.

G. Volume Damper: Construct of galvanized steel with peripheral gasket and self-lubricating bearings.

1. Maximum Damper Leakage: 2 percent of nominal airflow at 1-inch wg (250-Pa) inlet static pressure.

2. Maximum Damper Leakage: 2 percent of nominal airflow at 3-inch wg (750-Pa) inlet static pressure.

3. Damper Position: Normally open.

H. Round Outlet: Discharge collar matching inlet size.

I. Controls: Damper operator, thermostat, and other devices compatible with temperature controls specified in other Division 15 Sections.

J. Electric Controls: 24-V damper actuator with wall-mounted electric thermostat and appropriate mounting hardware.

K. Electronic Controls: Bidirectional damper operator and microprocessor-based controller with integral airflow transducer and room sensor provide control with the following features:

1. Proportional plus integral control of room temperature.

2. Occupied/unoccupied operating mode.

3. Remote reset of airflow or temperature set points.

4. Adjusting and monitoring with portable terminal.

5. Communication with temperature-control system specified in other Division 15 Sections.

2.2 SOURCE QUALITY CONTROL

A. Testing Requirements: Test and rate air terminals according to ARI 880, "Industry Standard for Air Terminals."

B. Identification: Label each air terminal with plan number, nominal airflow, maximum and minimum factory-set airflows, coil type, and ARI certification seal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install air terminals level and plumb, according to manufacturer's written instructions, rough-in drawings, original design, and referenced standards; and maintain sufficient clearance for normal service and maintenance.

B. Connect ductwork to air terminals according to Division 15 ductwork Sections.

3.2 CONNECTIONS

A. Electrical: Comply with applicable requirements in Division 16 Sections.

B. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes.

3.5 COMMISSIONING

A. Verify that installation of each air terminal is according to the Contract Documents.

B. Check that inlet duct connections are as recommended by air terminal manufacturer to achieve proper performance.

C. Check that controls and control enclosure are accessible.

D. Verify that control connections are complete.

E. Check that nameplate and identification tag are visible.

F. Verify that controls respond to inputs as specified.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel as specified below:

1. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.

2. Review data in the maintenance manuals. Refer to Division 1 Section "Contract Closeout."

3. Review data in the maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."

4. Schedule training with Owner, through Architect, with at least 7 days' advance notice.

END OF SECTION

SECTION 15853

POWER VENTILATORS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Propeller wall exhaust fans.

2. In-line centrifugal fans.

3. Centrifugal roof ventilators.

4. Make-up air supply fans.

5. Air curtain fans.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 15 Section "Vibration Control" for vibration hangers and supports.

2. Division 15 Section "Control Systems Equipment" for control devices.

3. Division 16 Section "Disconnects and Circuit Breakers" for disconnect switches.

4. Division 16 Section "Motor Controllers" for motor starters.

C. Products furnished, but not installed, under this Section include roof curbs for roof-mounted exhaust fans.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base air ratings on sea-level conditions.

B. Operating Limits: Classify according to AMCA 99.

C. Fan Unit Schedule: The following information is described in an equipment schedule on the Drawings.

1. Fan performance data including capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

2. Fan arrangement including wheel configuration, inlet and discharge configurations, and required accessories.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data including rated capacities of each unit, weights (shipping, installed, and operating), furnished specialties, accessories, and the following:

1. Certified fan performance curves with system operating conditions indicated.

2. Certified fan sound power ratings.

3. Motor ratings and electrical characteristics plus motor and electrical accessories.

4. Material gages and finishes, including color charts.

5. Dampers, including housings, linkages, and operators.

C. Shop Drawings from manufacturer detailing equipment assemblies and indicating dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.

D. Coordination Drawings, according to Division 15 Section "Basic Mechanical Requirements," for roof penetration requirements and for reflected ceiling plans drawn accurately to scale and coordinating penetrations and units mounted above ceiling. Show the following:

1. Ceiling suspension assembly members.

2. Size and location of initial access modules for acoustical tile.

3. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

E. Wiring diagrams detailing wiring for power and control systems and differentiating clearly between manufacturer-installed and field-installed wiring.

F. Maintenance data for power ventilators to include in the operation and maintenance manual specified in Division 1 and in Division 15 Section "Basic Mechanical Requirements."

1.5 QUALITY ASSURANCE

A. Electrical Component Standard: Provide components that comply with NFPA 70 and that are listed and labeled by UL where available.

B. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

C. AMCA Compliance: Provide products that meet performance requirements and are licensed to use the AMCA Seal.

D. NEMA Compliance: Provide components required as part of fans that comply with applicable NEMA standards.

E. UL Standard: Provide power ventilators that comply with UL 705.

F. Kitchen Hood Roof Ventilators: Comply with requirements of NFPA 96 and UL 762.

G. Comply with AMCA 220, "Test Methods for Air Curtain Units," for airflow, outlet velocity, and power consumption.

H. Comply with NSF 37, "Air Curtains for Entranceways in Food and Food Service Establishments."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements. Verify clearances.

B. Do not operate fans until ductwork is clean, filters are in place, bearings are lubricated, and fans have been commissioned.

1.7 COORDINATION AND SCHEDULING

A. Coordinate the size and location of structural steel support members.

B. Coordinate the installation of roof curbs, equipment supports, and roof penetrations. Roof specialties are specified in Division 7 Sections.

1.8 EXTRA MATERIALS

A. Furnish one set of belts for each belt-driven fan that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

PART 2 PRODUCTS

2.1 PROPELLER WALL EXHAUST FANS

A. Description: Belt-driven or direct-drive propeller fans, as indicated, consisting of housing, wheel, gravity-type discharge damper, fan shaft, bearings, motor and disconnect switch, drive assembly, wall housing, exhaust hood, and accessories.

B. Fan Housing: Reinforced and braced galvanized steel, containing galvanized steel gravity dampers and motor and drive assembly, and fan wheel.

C. Exhaust Hood: Stainless steel weather hood with stainless steel bird screen; 90-degree facing-down configuration.

D. Fan Wheel: Replaceable, cast-aluminum blades fastened to cast-aluminum hub; factory set pitch angle.

E. Belt-Driven Drive Assembly: Resiliently mounted to the housing; weatherproof housing of same material as fan housing with the following features:

1. Fan Shaft: Turned, ground, and polished steel drive shaft keyed to wheel hub.

2. Shaft Bearings: Pre-lubricated and sealed, self-aligning, pillow-block-type ball bearings.

3. Pulleys: Cast-iron, adjustable-pitch motor pulley.

4. Motor Mount: On outside of fan cabinet, adjustable base for belt tensioning.

2.2 IN-LINE CENTRIFUGAL FANS

A. Description: In-line, belt-driven centrifugal fans consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, drive assembly, motor and disconnect switch, mounting brackets, and accessories.

B. Housing: Split, spun-aluminum housing, with aluminum straightening vanes; inlet and outlet flanges; and support bracket adaptable to floor, side wall, or ceiling mounting.

C. Direct-Drive Units: Motor encased in housing out of air stream, factory wired to disconnect located on outside of fan housing.

D. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

E. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.

F. Accessories: The following accessories are required as indicated:

1. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.

2. Companion Flanges: For inlet and outlet duct connections.

3. Fan Guards: Expanded metal in removable frame. Provide belt guards for units not connected to ductwork.

2.3 CENTRIFUGAL ROOF VENTILATORS

A. Product Requirements:

1. Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal.

2. Sound Ratings: AMCA 301, tested to AMCA 300 and bear AMCA Certified Sound Rating Seal.

3. Fabrication: Conform to AMCA 99.

4. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705; and UL 762 for ventilators handling grease laden vapors.

B. Description: Belt-driven or direct-drive centrifugal fans, as indicated, consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

C. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.

1. Upblast Units: Provide spun-aluminum discharge baffle to direct discharge air upward, with rain drains.

D. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

E. Belt-Driven Drive Assembly: Resiliently mounted to the housing, with the following features:

1. Fan Shaft: Turned, ground, and polished steel drive shaft keyed to wheel hub.

2. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.

3. Pulleys: Cast-iron, adjustable-pitch motor pulley.

4. Fan and motor isolated from exhaust air stream.

F. Accessories: The following items are required as indicated:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to less than 50 percent.

2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.

3. Bird Screens: Removable 1/2-inch (13-mm) mesh, aluminum or brass wire.

4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.

5. Roof Curbs: Galvanized steel; mitered and welded corners; 2-inch- (50-mm-) thick, rigid, fiber-glass insulation adhered to inside walls; and 2-inch (50-mm) wood nailer. Size as required to suit roof opening and fan base.

a. Configuration: Self-flashing without a cant strip, with mounting flange.

b. Overall Height: 12 inches (300 mm).

G. Tie-Down Points: Four aluminum brackets which secures fan in heavy wind applications.

2.4 ROOF SUPPLY FANS

A. General Description: Base fan performance at standard conditions (density 0.075 Lb/ft3). Maximum continuous operating temperature is 130 Fahrenheit (54.4 Celsius). Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual serial number.

B. Wheel: Forward curved centrifugal wheel. Constructed of heavy gauge steel. Shall be a double width and double inlet scroll. Statically and dynamically balanced in accordance to AMCA Standard 204-05. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency.

C. Motor enclosures: Totally enclosed fan cooled. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase. Mounted on vibration isolators, out of the airstream.

D. Shafts and Bearings: Fan shaft shall be ground and polished solid steel with an anti-corrosive coating. Permanently sealed bearings. Bearing shall be selected for a minimum L50 life, in excess of 200,000 hours at maximum cataloged operating speed. Bearings are 100 percent factory tested. Fan Shaft first critical speed is at least 25 percent over maximum operating speed.

E. Hood: Constructed of heavy gauge steel. Removable hood cover. Leak resistant.

F. Housing Supports and Drive Frame: Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators. Lifting lugs shall be located on the drive frame to provide easy lifting.

G. Vibration Isolation: Double studded or pedestal mount true isolators. No metal to metal contact. Sized to match the weight of each fan.

H. Drive Assembly: Belts, pulleys, and keys oversized for a minimum of 150 percent of driven horsepower. Belts: Static free and oil resistant. Pulleys: Cast type, keyed, and securely attached to wheel and motor shafts. Motor pulleys are adjustable for final system balancing. Readily accessible for maintenance.

I. Filters: Washable aluminum one-inch filter factory standard, two inch also available.

J. Curb Caps: Includes prepunched mounting holes to ensure correct attachment to roof.

K. Tie-Down Points: Four aluminum brackets which secures fan in heavy wind applications.

2.5 AIR CURTAINS

A. Housing Materials: Heavy-gage, aluminum construction. Anodized Finish: Match finish and color of adjacent architectural metals. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Intake Louvers: Integral part of the housing, mechanically field adjustable and capable of reducing air-outlet velocity by 60 percent with louver in totally closed position.

C. Discharge Nozzle: Integral part of the housing, wedge shaped, containing adjustable air-directional vanes with 40-degree sweep front to back.

D. Fans: **Aluminum, Centrifugal, forward curved, double width, double inlet;** statically and dynamically balanced.

E. Fan Drives: **Direct**.

F. Motor Type: **Two speed**, resiliently mounted, continuous duty, **totally enclosed, fan cooled**, with integral thermal-overload protection.

G. Automatic Door Switch: Remotely installed in door area to activate air curtain when door opens and to deactivate air curtain when door closes.

H. Motor-Control Panel: Complete with motor starter, 115-V ac transformer with primary and secondary fuses, terminal strip, and NEMA 250, Type **1** enclosure.

2.6 MOTORS

A. Refer to Division 15 Section "Motors" for general requirements for factory-installed motors.

B. Motor Construction: NEMA MG 1, general purpose, continuous duty, Design B.

C. Enclosure Type: The following features are required as indicated:

1. Open drip-proof motors where satisfactorily housed or remotely located during operation.

2. Guarded drip-proof motors where exposed to contact by employees or building occupants.

2.7 FACTORY FINISHES

A. Sheet Metal Parts: Prime coat before final assembly.

B. Exterior Surfaces: Baked-enamel finish coat after assembly.

C. Aluminum Parts: No finish required.

2.8 SPECIAL CONSTRUCTION FOR HAZARDOUS AREAS

A. Spark resistant: Construct specified or indicated units in accordance with AMCA 99-0401; Type C. Provide Type B or Type C construction and electrical grounding of fan parts and grounding to building structure where fume or vapor handling systems conforming to NFPA 91 are specified. Do not place bearings in the air stream.

B. Explosion proof: Construct fans to AMCA 99-0401, Type C spark-resistant requirements where explosion-proof electrical components are specified or indicated to conform to NFPA 70 requirements.

C. Protective coating of fans: Prepare and coat fans as follows: Replace bolts required to provide access or adjustment and normally threaded into the coated surface with studs or bolts having heads continuously welded inside. Omit sharp edges, self-tapping screws, and permanent threads protruding into the coated surface. Eliminate hairline cracks and sharp inside corners by continuous welding, brazing, or filling with high melting point solder. Seal impeller hub to the shaft. Construct housing split to use external through bolts. Flange inlet and outlet and consider as fan interior. Peen or grind welds smooth, and grind outside corners to approximately 1/16-inch radius. Sandblast metal surfaces to white metal in accordance with SSPC SP 5/NACE No. 1. Coat interior surfaces of housing in contact with airstream, including inlet, impeller and shaft, flange faces, shaft seal, exterior surfaces of housing and bearing and motor pedestal. Do not coat bearings, coupling, motor, drive, or other auxiliaries. Finish fan in accordance with the manufacturer's standard practice. Statically and dynamically balance the fan in two planes after coating and finishing, and where material has been removed, refinish and rebalance the fan as specified herein.

D. PVC blowers: Housings shall be vacuum formed from unplasticized Type I polyvinyl chloride for complete corrosion protection. Impellers shall be made of injection molded PVDF to resist highly corrosive atmospheres. Dry powder epoxy-coated base and weather cover provide long life in extreme weather. Inlet and discharge diameters sized to receive rigid PVC ducting material directly for easy installation. Sheaves shall be adjustable to save energy and to allow for air volume adjustment. Self-adjusting gravity belt tightener ensures consistent performance because belt is held taut by weight of motor. Motor mount keeps the motor in place should the belt ever fail.

2.9 SOURCE QUALITY CONTROL

A. Testing Requirements: The following factory tests are required as indicated:

1. Sound Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA Seal.

2. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements of installation tolerances and other conditions affecting performance of the power ventilators. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install power ventilators according to manufacturer's written instructions.

B. Support units using the vibration-control devices indicated. Vibration-control devices are specified in Division 15 Section "Vibration Control."

1. Suspend units from structural steel support frame using threaded steel rods and vibration isolation springs.

2. Ceiling Units: Suspend units from structure using steel wire or metal straps.

C. Install units with clearances for service and maintenance.

D. Label units according to requirements specified in Division 15 Section "Mechanical Identification."

3.3 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 15 Sections. Drawings indicate the general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors.

B. Electrical: Conform to applicable requirements in Division 16 Sections.

C. Grounding: Ground equipment. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide services of a factory-authorized service representative to supervise the field assembly of components and installation of fans, including duct and electrical connections, and to report results in writing.

3.5 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Lubricate bearings.

3.6 CLEANING

A. After completing installation, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes including chips, scratches, and abrasions.

B. Clean fan interiors to remove foreign material and construction debris. Vacuum clean fan wheel and cabinet.

3.7 COMMISSIONING

A. Final Checks before Startup: Perform the following operations and checks before startup:

1. Verify that shipping, blocking, and bracing are removed.

2. Verify that unit is secure on mountings and supporting devices and that connections for piping, ducts, and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnects.

3. Perform cleaning and adjusting specified in this Section.

4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.

5. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.

6. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in the fully open position.

7. Disable automatic temperature-control operators.

B. Starting procedures for fans are as follows:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated RPM.

2. Measure and record motor voltage and amperage.

C. Shut unit down and reconnect automatic temperature-control operators.

D. Refer to Division 15 Section "Testing, Adjusting, and Balancing" for procedures for air-handling-system testing, adjusting, and balancing.

E. Replace fan and motor pulleys as required to achieve design conditions.

3.8 DEMONSTRATION

A. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.

B. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Contract Closeout."

C. Schedule training with Owner, through Architect, with at least 7 days' advance notice.

D. Demonstrate operation of power ventilators. Conduct walking tour of the Project. Briefly identify location and describe function, operation, and maintenance of each power ventilator.

END OF SECTION

SECTION 15855

DIFFUSERS, REGISTERS, AND GRILLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes ceiling and wall-mounted diffusers, registers, and grilles.

B. Related Sections include the following:

1. Division 10 Section "Louvers and Vents" for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.

2. Division 15 Section "Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

3. Division 15 Section "Testing, Adjusting, and Balancing" for balancing diffusers, registers, and grilles.

1.3 DEFINITIONS

A. Diffuser: Linear slot, circular, square, or rectangular air distribution outlet, generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.

B. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall, ceiling, or floor.

C. Register: A combination grille and damper assembly over an air opening.

1.4 SUBMITTALS

A. Product Data: For each model indicated, include the following:

1. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.

2. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.

B. Coordination Drawings: Reflected ceiling plans and wall elevations drawn to scale to show locations and coordination of diffusers, registers, and grilles with other items installed in ceilings and walls.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings and schedules indicate specific requirements of diffusers, registers, and grilles and are based on the specific requirements of the systems indicated.

Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

B. NFPA Compliance: Install diffusers, registers, and grilles according to NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems."

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. Diffusers, registers, and grilles are scheduled at the end of this Section.

B. Diffusers, registers, and grilles sizes are indicated on Drawings.

2.2 SOURCE QUALITY CONTROL

A. Testing: Test performance according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb, according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of the panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

3.4 CLEANING

A. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to re-move burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

3.5 DIFFUSER SCHEDULE

A. Ceiling Diffusers:

1. Material: Aluminum.

2. Finish: Baked enamel, color to be selected by Architect.

3. Duct Connection: Round.

4. Duct Connection Size: See mech. drawings.

5. Face Size: See mech. drawings.

6. Maximum Noise-Criterion Rating: ASHRAE Standard.

7. Face Style: Square.

8. Mounting: Flush.

9. Pattern: 4-way.

10. Dampers: Opposed blade.

11. Accessories: Include the following:

a. Equalizer deflectors.

b. Smudge ring.

c. Plaster ring.

d. Extractor.

e. Blank-off panel.

f. Operating keys.

3.6 CEILING SLOT DIFFUSERS

A. Type: Continuous one inch wide slot, one slot wide, with adjustable vanes for left, right, or vertical discharge; and volume control.

B. Fabrication: Aluminum extrusions with factory baked enamel finish, color to be selected by architect.

C. Frame: One inch margin with concealed mounting and gasket, end cap.

D. Plenum: Integral, galvanized steel, insulated.

3.7 REGISTER SCHEDULE

A. Supply Registers:

1. Material: Aluminum.

2. Finish: Baked enamel, color to be selected by Architect.

3. Face Blade Arrangement: Adjustable horizontal.

4. Rear Blade Arrangement: Adjustable vertical.

5. Frame: 1-1/4 inches (32 mm) wide.

6. Mounting: Concealed.

7. Damper Type: Adjustable opposed-blade assembly.

8. Accessories: Include plaster frame.

3.8 GRILLE SCHEDULE

A. Return and Exhaust Grilles:

1. Material: Aluminum.

2. Finish: Baked enamel, color to be selected by Architect.

3. Face Blade Arrangement: Fixed horizontal.

4. Rear Blade Arrangement: Fixed vertical.

5. Frame: 1-1/4 inches (32 mm) wide.

6. Mounting: Concealed.

7. Accessories: Include plaster frame.

END OF SECTION

SECTION 15900

HVAC INSTRUMENTATION AND CONTROLS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes control equipment for HVAC systems and components, including control components for terminal cooling units not supplied with factory-wired controls.

B. Related Sections include the following:

1. Division 13 Section "Fire Alarm" for fire and smoke detectors mounted in HVAC systems and equipment.

2. Division 13 Section "Lighting Controls" for building lighting control system.

3. Division 16 Section "Electrical Power Monitoring and Control."

1.3 DEFINITIONS

A. DDC: Direct-digital controls.

B. LAN: Local area network.

C. MS/TP: Master-slave/token-passing.

D. PICS: Protocol Implementation Conformance Statement.

1.4 SYSTEM DESCRIPTION

A. Control system consists of sensors, indicators, actuators, final control elements, interface equipment, other apparatus

B. Control system includes the following:

1. Fire alarm system specified in Division 13 Section "Fire Alarm."

2. Building lighting control system specified in Division 13 Section "Lighting Controls."

1.5 SUBMITTALS

A. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, and installation and startup instructions for each type of product indicated.

1. Each control device labeled with setting or adjustable range of control.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Schematic flow diagrams showing fans, pumps, coils, dampers, valves, and control devices.

2. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.

3. Details of control panel faces, including controls, instruments, and labeling.

4. Written description of sequence of operation.

5. Trunk cable schematic showing programmable control unit locations and trunk data conductors.

6. Listing of connected data points, including connected control unit and input device.

7. System graphics indicating monitored systems, data (connected and calculated) point addresses, and operator notations.

8. System configuration showing peripheral devices, batteries, power supplies, diagrams, modems, and interconnections.

C. ASHRAE BACnet Statement: PICS for each DDC system component (panel, zone controller, field devices, and operator workstation) proposed.

D. Samples: For each color required, of each type of thermostat cover.

E. Software and Firmware Operational Documentation: Include the following:

1. Software operating and upgrade manuals.

2. Program Software Backup: On a magnetic media or compact disc, complete with data files.

3. Device address list.

4. Printout of software application and graphic screens.

5. Software license required by and installed for DDC workstations and control systems.

F. Software Upgrade Kit: For Owner to use in modifying software to suit future power system revisions or monitoring and control revisions.

G. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

H. Maintenance Data: For systems to include in maintenance manuals specified in Division 1. Include the following:

1. Maintenance instructions and lists of spare parts for each type of control device and compressed-air station.

2. Interconnection wiring diagrams with identified and numbered system components and devices.

3. Keyboard illustrations and step-by-step procedures indexed for each operator function.

4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.

5. Calibration records and list of set points.

I. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

J. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors. Revise Shop Drawings to reflect actual installation and operating sequences.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is an authorized representative of the automatic control system manufacturer for both installation and maintenance of units required for this Project.

B. Manufacturer Qualifications: A firm experienced in manufacturing automatic temperature-control systems similar to those indicated for this Project and with a record of successful in service performance.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilation Systems."

E. Comply with ASHRAE 135 for DDC system control components.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to unit manufacturer.

1.8 COORDINATION

A. Coordinate location of thermostats and other exposed control sensors with plans and room details before installation.

B. Coordinate equipment with Division 13 Section "Fire Alarm" to achieve compatibility with equipment that interfaces with that system.

C. Coordinate supply of conditioned electrical circuits for control units and operator workstation.

D. Coordinate equipment with Division 16 Section "Panel boards" to achieve compatibility with starter coils and annunciation devices.

E. Coordinate equipment with Division 16 Section "Motor-Control Centers" to achieve compatibility with motor starters and annunciation devices.

F. Coordinate equipment with Division 13 Section "Lighting Controls" to achieve compatibility with equipment that interfaces with that system.

G. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

B. Replacement Materials: One replacement diaphragm or relay mechanism for each unique valve motor, controller, thermostat & positioning relay.

C. Maintenance Materials: One thermostat adjusting key.

PART 2 PRODUCTS

2.1 DDC EQUIPMENT

A. Operator Station: PC-based Microcomputer station with printer.

B. Workstation: IBM-compatible microcomputer with minimum configuration as follows:

1. Motherboard: With 8 integrated USB 2.0 ports, integrated Intel Pro 10/100 (Ethernet), integrated audio, bios, and hardware monitoring

2. Processor: Intel Pentium Dual Core, 3.2 GHz or higher.

3. Random-Access Memory: 512 MB or higher.

4. Graphics: Video adapter, minimum 1600 x 1200 pixels, 64-MB video memory, with TV out.

5. Monitor: 17 inches LCD flat panel color monitor, high resolution 1024 x 768 minimum.

6. Keyboard: QWERTY, 105 keys in ergonomic shape.

7. USB Ports.

8. Hard-Disk Drive: 80 GB minimum.

9. CD-RW Drive.

10. Mouse: Three button.

11. Modem: Autodial, internal, minimum 56 kBaud.

12. Tape Backup: Internal, 56 kBps or higher.

13. Operating System: Microsoft Windows 10 or later.

14. BACnet Conformance: Workstation shall support BACnet device and have minimum capabilities defined in PICS for the following areas:

    a. Network.

    b. Functional groups.

    c. Standard application services supported.

    d. Standard objects supported.

C. Printer: Color, ink-jet type as follows:

1. Print Head: 1440 x 1440 dpi photo quality color resolution.

2. Internal Memory Buffer: 32 kB.

3. Paper Handling: Minimum of 100 sheets.

4. Print Speed: Minimum of 8 ppm in black and 4 ppm in color.

D. Application Software: Include the following:

1. Input/output capability from operator station.

2. Operator system access levels via software password.

3. Database creation and support.

4. Dynamic color graphic displays.

5. Alarm processing.

6. Event processing.

7. Automatic restart of field equipment on restoration of power.

8. Data collection.

9. Graphic development on workstation.

10. Maintenance management.

E. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.

1. Units monitor or control each input/output point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator station.

2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

    a. Global communications.

    b. Discrete/digital, analog, and pulse input/output.

c. Monitoring, controlling, or addressing data points.

d. Testing and developing control algorithms without disrupting field hardware and controlled environment.

e. Local operator interface provides for download from or upload to mobile operator station.

f. BACnet Conformance: Reside on BACnet LAN in Ethernet IEEE 802.3, Class 3, minimum, with routers between LAN and other panels, with at least one communication port, and have minimum capabilities defined in PICS for the following areas:

1) Network.

2) Functional groups.

3) Standard application services supported.

4) Standard objects supported.

F. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.

1. Units monitor or control each input/output point; process information; and download from or upload to operator station.

2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

a. Global communications.

b. Discrete/digital, analog, and pulse input/output.

c. Monitoring, controlling, or addressing data points.

d. Local operator interface provides for download from or upload to mobile operator station.

e. BACnet Conformance: Reside on BACnet LAN using MS/TP, Class 2, minimum, with at least one communication port, and have minimum capabilities defined in PICS for the following areas:

1) Network.

2) Functional groups.

3) Standard application services supported.

4) Standard objects supported.

G. LANs: Capacity for a minimum of 10 workstations connected to multiuser, multitasking environment with concurrent capability to access DDC network or control units.

1. Media: Ethernet, peer-to-peer CMA/CD, operating at 10 MBps.

2. Media: ARCNET (attached resources computer network), peer to peer, operating at 2.5 MBps.

3. Media: MS/TP, EIA 485, operating at 76.8 kBps.

H. Software: Update to latest version of software at Project completion. Include and implement the following capabilities from the control units:

1. Units of Measure: Inch-pound and SI (metric).

2. Load Control Programs: Demand limiting, duty cycling, automatic time scheduling, start/stop time optimization, night setback/setup, DDC with fine tuning, and trend logging.

3. HVAC Control Programs: Optimal run time, supply-air reset, and enthalpy switchover.

4. Programming Application Features: Include trend point, alarm messages, weekly scheduling, and interlocking.

2.2 CONTROL PANELS

A. Central (Master) Control Panels: Fully enclosed, steel-rack-type cabinet with locking doors or locking removable backs. Match finish of panels and provide multicolor graphic displays, schematically showing system being controlled.

B. Local Control Panels: Unitized cabinet with suitable brackets for wall or floor mounting, located adjacent to each system under automatic control. Provide common keying for all panels.

1. Fabricate panels of 0.06-inch- (1.5-mm-) thick, furniture-quality steel, or extruded-aluminum alloy, totally enclosed, with hinged doors and keyed lock and with manufacturer's standard shop-painted finish.

2. Panel-Mounted Equipment: Temperature and humidity controllers, relays, and automatic switches; except safety devices. Mount devices with adjustments accessible through front of panel.

3. Door-Mounted Equipment: Flush-mount (on hinged door) manual switches, including damper-positioning switches, changeover switches, thermometers, and gages.

4. Graphics: Color-coded graphic, laminated-plastic displays on doors, schematically showing system being controlled, with protective, clear plastic sheet bonded to entire door.

C. Alarm Panels: Indicating light for each alarm point, single horn, acknowledge switch, and test switch, mounted in hinged-cover enclosure.

1. Alarm Condition: Indicating light flashes and horn sounds.

2. Acknowledge Switch: Horn is silent and indicating light is steady.

3. Second Alarm: Horn sounds and indicating light is steady.

4. Alarm Condition Cleared: System is reset and indicating light is extinguished.

5. Contacts in alarm panel allow remote monitoring by independent alarm company.

2.3 ANALOG CONTROLLERS

A. Step Controllers: Six- or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.

B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 70 deg. F (minus 23 to plus 21 deg. C), and single- or double-pole contacts.

C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.

1. Single controllers can be integral with control motor if provided with accessible control readjustment potentiometer.

D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference.

E. Receiver Controllers: Single or multiple-input models with control-point adjustment, direct or reverse acting with mechanical set-point adjustment with locking device, proportional band adjustment, authority adjustment, and proportional control mode.

1. Remote-control-point adjustment shall be plus or minus 20 percent of sensor span, input signal of 3 to 13 psig (21 to 90 kPa).

2. Proportional band shall extend from 2 to 20 percent for 5 psig (34 kPa).

3. Authority shall be 20 to 200 percent.

4. Air-supply pressure of 18 psig (124 kPa), input signal of 3 to 15 psig (21 to 103 kPa), and output signal 0 to supply pressure.

5. Gages: 3-1/2 inches (89 mm) in diameter, 2.5 percent wide-scale accuracy, and range to match transmitter input or output pressure.

2.4 TIME CLOCKS

A. Solid-state, programmable time control with 4 separate programs; 24-hour battery carryover; individual on-off-auto switches for each program; 365-day calendar with 20 programmable holidays; choice of fail-safe operation for each program; and system fault alarm.

2.5 SENSORS

A. Electronic Sensors: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.

1. Thermistor temperature sensors as follows:

a. Accuracy: Plus, or minus 0.5 deg. F (0.3 deg. C) at calibration point.

b. Wire: Twisted, shielded-pair cable.

c. Insertion Elements in Ducts: Single point, 8 inches (20 cm) long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft. (1 sq. m).

d. Averaging Elements in Ducts: 36 inches (91 cm) long, flexible; use where prone to temperature stratification or where ducts are larger than 9 sq. ft. (1 sq. m); length as required.

e. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches (64 mm).

f. Room Sensors: Match room thermostats, locking cover.

g. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.

h. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

2. Resistance Temperature Detectors: Platinum.

a. Accuracy: Plus, or minus 0.2 percent at calibration point.

b. Wire: Twisted, shielded-pair cable.

c. Insertion Elements in Ducts: Single point, 8 inches (20 cm) long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft. (1 sq. m).

d. Averaging Elements in Ducts: 36 inches (91 cm) long, flexible; use where prone to temperature stratification or where ducts are larger than 9 sq. ft. (1 sq. m); length as required.

e. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches (64 mm).

f. Room Sensors: Match room thermostats, locking cover.

g. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.

h. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

3. Humidity Sensors: Bulk polymer sensor element.

a. Accuracy: 5 percent full range with linear output.

b. Room Sensors: With locking cover matching room thermostats, span of 25 to 90 percent relative humidity.

c. Duct and Outside-Air Sensors: With element guard and mounting plate, range of 0 to 100 percent relative humidity.

4. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.

a. Accuracy: 2 percent of full scale with repeatability of 0.5 percent.

b. Output: 4 to 20 mA.

c. Building Static-Pressure Range: 0 to 0.25 inch wg (0 to 62 Pa).

d. Duct Static-Pressure Range: 0 to 5 inches wg (0 to 1243 Pa).

5. Pressure Transmitters: Direct acting for gas or liquid service; range suitable for system; proportional output 4 to 20 mA.

B. Equipment operation sensors as follows:

1. Status Inputs for Fans: Differential-pressure switch with adjustable range of 0 to 5 inches wg (0 to 1243 Pa).

2. Status Inputs for Pumps: Differential-pressure switch piped across pump with adjustable pressure-differential range of 8 to 60 psig (55 to 414 kPa).

3. Status Inputs for Electric Motors: Current-sensing relay with current transformers, adjustable and set to 175 percent of rated motor current.

C. Electronic Valve/Damper Position Indication: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.

D. Carbon-Monoxide Detectors: Single or multichannel, dual-level detectors, using solid-state sensors with 3-year minimum life, maximum 15-minute sensor replacement, suitable over a temperature range of 23 to 130 deg F (minus 5 to plus 55 deg C), calibrated for 50 and 100 ppm, with maximum 120-second response time to 100-ppm carbon monoxide.

E. Carbon-Dioxide Sensor and Transmitter: Single detectors, using solid-state infrared sensors, suitable over a temperature range of 23 to 130 deg F (minus 5 to plus 55 deg C), calibrated for 0 to 2 percent, with continuous or averaged reading, 4 to 20 mA output, and wall mounted.

F. Occupancy Sensor: Passive infrared, with time delay, daylight sensor lockout, sensitivity control, and 180-degree field of view with vertical sensing adjustment, for flush mounting.

2.6 THERMOSTATS

A. Combination Thermostat and Fan Switches: Line-voltage thermostat with two-, three-, or four-position, push-button or lever-operated fan switch.

1. Label switches "FAN ON-OFF," "FAN HIGH-LOW-OFF," "FAN HIGH-MED-LOW-OFF." Provide unit for mounting on two-gang switch box.

B. Electric solid-state, microcomputer-based room thermostat with remote sensor.

1. Preferential rate control to minimize overshoot and deviation from set point.

2. Set up for four separate temperatures per day.

3. Instant override of set point for continuous or timed period from 1 hour to 31 days.

4. Short-cycle protection.

5. Programming based on weekdays, Saturdays and Sundays.

6. Selection features include deg. F or deg. C display, 12- or 24-hour clock, keyboard disable, remote sensor, fan on-auto.

7. Battery replacement without program loss.

8. Thermostat display features include the following:

    a. Time of day.

    b. Actual room temperature.

    c. Programmed temperature.

    d. Programmed time.

    e. Duration of timed override.

    f. Day of week.

    g. System mode indications include "heating," "off," "fan auto," and "fan on."

C. Low-Voltage, On-Off Thermostats: NEMA DC 3, 24-V, bimetal-operated, mercury-switch type, with adjustable or fixed anticipation heater.

D. Line-Voltage, On-Off Thermostats: Bimetal-actuated, open contact or bellows-actuated, enclosed, snap-switch type, or equivalent solid-state type, with heat anticipator, integral manual on-off-auto selector switch.

1. Equip thermostats, which control electric heating loads directly, with off position on dial wired to break ungrounded conductors.

2. Dead Band: Maximum 2 deg. F (1 deg. C).

E. Remote-Bulb Thermostats: On-off or modulating type, liquid filled to compensate for changes in ambient temperature, with copper capillary and bulb, unless otherwise indicated.

1. Bulbs in water lines with separate wells of same material as bulb.

2. Bulbs in air ducts with flanges and shields.

3. Averaging Elements: Copper tubing with either single- or multiple-unit elements, extended to cover full width of duct or unit, adequately supported.

4. Scale settings and differential settings are clearly visible and adjustable from front of instrument.

5. On-Off Thermostat: With precision snap switches, with electrical ratings required by application.

6. Modulating Thermostats: Construct so complete potentiometer coil and wiper assembly is removable for inspection or replacement without disturbing calibration of instrument.

F. Room Thermostat Cover Construction: Manufacturer's standard locking covers.

1. Set-Point Adjustment: Concealed.

2. Set-Point Indication: Exposed.

3. Thermometer: Concealed.

4. Color: Manufacturer's standard.

5. Orientation: Horizontal.

G. Room thermostat accessories include the following:

1. Insulating Bases: For thermostats located on exterior walls.

2. Thermostat Guards: Locking; heavy-duty, transparent plastic; mounted on separate base.

3. Adjusting Key: As required for calibration and cover screws.

4. Aspirating Boxes: For flush-mounted aspirating thermostats.

5. Set-Point Adjustment: 1/2-inch- (13-mm-) diameter, adjustment knob.

H. Immersion Thermostat: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range and adjustable set point.

1. Airstream Thermostats: Two-pipe, fully proportional, single-temperature type, with adjustable set point in middle of range and adjustable throttling range, plug-in test fitting or permanent pressure gage, remote bulb, bimetal rod and tube, or averaging element.

I. Electric Low-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- or automatic-reset switch that trips if temperature sensed across any 12 inches (300 mm) of bulb length is equal to or below set point.

1. Bulb Length: Minimum 20 feet (6 m).

2. Quantity: One thermostat for every 20-sq. ft. (2 sq. m) of coil surface.

J. Electric High-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- or automatic-reset switch that trips if temperature sensed across any 12 inches (300 mm) of bulb length is equal to or above set point.

1. Bulb Length: Minimum 20 feet (6 m).

2. Quantity: One thermostat for every 20-sq. ft. (2 sq. m) of coil surface.

2.7 HUMIDISTATS

A. Room Humidistats: Wall-mounted, proportioning type with adjustable throttling range, 55 to 95 percent operating range, cover matching room thermostat cover.

B. Duct-Mounted Humidistats: Electric insertion, 2-position type with adjustable 2 percent throttling range, 20 to 80 percent operating range, single- or double-pole contacts.

2.8 ACTUATORS

A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.

1. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.

2. Non-Spring-Return Motors for Valves Larger Than NPS 2-1/2 (DN 65): Size for running torque of 150 in. x lbf (16.9 N x m) and breakaway torque of 300 in. x lbf (33.9 N x m).

3. Spring-Return Motors for Valves Larger Than NPS 2-1/2 (DN 65): Size for running and breakaway torque of 150 in. x lbf (16.9 N x m).

4. Non-Spring-Return Motors for Dampers Larger Than 25 Sq. Ft. (2.3 sq. m): Size for running torque of 150 in. x lbf (16.9 N x m) and breakaway torque of 300 in. x lbf (33.9 N x m).

5. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft. (2.3 sq. m): Size for running and breakaway torque of 150 in. x lbf (16.9 N x m).

2.9 CONTROL VALVES

A. Control Valves: Factory fabricated, of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.

B. Globe Valves NPS 2 (DN 50) and Smaller: Bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with back seating capacity re-packable under pressure.

C. Globe Valves NPS 2-1/2 (DN 65) and Larger: Iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.

D. Butterfly valves below can also be rated up to 250 deg. F (121 deg. C).

E. Butterfly Valves: 200-psig (1380-kPa), 150-psig (1035-kPa) maximum pressure differential, ASTM A 126 cast-iron or ASTM A 536 ductile-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals.

1. Body Style: Lug or Grooved.

2. Disc Type: Nickel-plated ductile iron.

3. Sizing: 1-psig (7-kPa) maximum pressure drop at design flow rate.

2.10 DAMPERS

A. Dampers: AMCA-rated, opposed-blade design; 0.1084-inch (2.8-mm) minimum, galvanized-steel frames with holes for duct mounting; damper blades shall not be less than 0.0635-inch (1.6-mm) galvanized steel with maximum blade width of 8 inches (203 mm).

1. Blades shall be secured to 1/2-inch- (13-mm-) diameter, zinc-plated axles using zinc-plated hardware, with nylon blade bearings, blade-linkage hardware of zinc-plated steel and brass, ends sealed against spring-stainless-steel blade bearings, and thrust bearings at each end of every blade.

2. Operating Temperature Range: From minus 40 to plus 200 deg F (minus 40 to plus 93 deg C).

3. For standard applications, include optional closed-cell neoprene edging.

4. For low-leakage applications, use opposed-blade design with inflatable seal blade edging, or replaceable rubber seals, rated for leakage at less than 10 cfm per sq. ft. (51 L/s per sq. m) of damper area, at differential pressure of 4 inches wg (995 Pa) when damper is being held by torque of 50 in. x lbf (5.6 N x m); when tested according to AMCA 500D.

2.11 CONTROL CABLE

A. Electronic and Fiber-Optic Cable for Control Wiring: As specified in Division 16 Section "Control/Signal Transmission Media."

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that conditioned power supply is available to control units and operator workstation.

B. Verify that duct, pipe, and equipment-mounted devices and wiring are installed before proceeding with installation.

3.2 INSTALLATION

A. Install equipment level and plumb.

B. Install software in control units and operator workstation. Implement all features of programs to specified requirements and as appropriate to sequence of operation.

C. Connect and configure equipment and software to achieve sequence of operation specified.

D. Verify location of thermostats, humidistats, and other exposed control sensors with plans and room details before installation. Locate all 60 inches (1524 mm) above the floor.

1. Install averaging elements in ducts and plenums in crossing or zigzag pattern.

E. Install guards on thermostats in the following locations:

1. Entrances.
2. Public areas.
3. Where indicated.

F. Install labels and nameplates to identify control components according to Division 15 Section "Basic Mechanical Materials and Methods."

G. Install electronic and fiber-optic cables according to Division 16 Section "Control/Signal Transmission Media."

3.3 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Division 16 Section "Raceways and Boxes."

B. Install building wire and cable according to Division 16 Section "Conductors and Cables."

C. Install signal and communication cable according to Division 16 Section "Control/Signal Transmission Media."

1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.

2. Install exposed cable in raceway.

3. Install concealed cable in raceway.

4. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.

5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.

6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.

D. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

E. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.4 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

1. Install piping adjacent to machine to allow service and maintenance.

B. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

2. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove malfunctioning units, replace with new units, and retest.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment, and retest.

4. Calibration test electronic controllers by disconnecting input sensors and stimulating operation with compatible signal generator.

B. Engage a factory-authorized service representative to perform startup service.

C. Replace damaged or malfunctioning controls and equipment.

1. Start, test, and adjust control systems.

2. Demonstrate compliance with requirements, including calibration and testing, and control sequences.

3. Adjust, calibrate, and fine tune circuits and equipment to achieve sequence of operation specified.

D. Verify DDC as follows:

1. Verify software including automatic restart, control sequences, scheduling, reset controls, and occupied/unoccupied cycles.

2. Verify operation of operator workstation.

3. Verify local control units including self-diagnostics.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain control systems and components.

1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.

2. Provide operator training on data display, alarm and status descriptors, requesting data, executing commands, calibrating and adjusting devices, resetting default values, and requesting logs. Include a minimum of 40 hours' dedicated instructor time on-site.

3. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."

4. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."

5. Schedule training with Owner, through Architect, with at least seven days' advance notice.

3.7 ON-SITE ASSISTANCE

A. Occupancy Adjustments: Within one year of date of Substantial Completion, provide up to three Project site visits, when requested by Owner, to adjust and calibrate components and to assist Owner's personnel in making program changes and in adjusting sensors and controls to suit actual conditions.

END OF SECTION

SECTION 15990

TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes testing, adjusting, and balancing HVAC systems to produce design objectives, including the following:

1. Balancing airflow within distribution systems, including submains, branches, and terminals, to indicated quantities according to specified tolerances.

2. Adjusting total HVAC systems to provide indicated quantities.

3. Measuring electrical performance of HVAC equipment.

4. Setting quantitative performance of HVAC equipment.

5. Verifying that automatic control devices are functioning properly.

6. Measuring sound and vibration.

7. Reporting results of the activities and procedures specified in this Section.

B. Related Sections include the following:

1. Testing and adjusting requirements unique to particular systems and equipment are included in the Sections that specify those systems and equipment.

2. Field quality-control testing to verify that workmanship quality for system and equipment installation is specified in system and equipment Sections.

1.3 DEFINITIONS

A. Adjust: To regulate flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

B. Balance: To proportion flows within the distribution system, including sub mains, branches, and terminals, according to design quantities.

C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.

D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

E. Report Forms: Test data sheets for recording test data in logical order.

F. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

G. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.

H. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

I. Test: A procedure to determine quantitative performance of a system or equipment.

J. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.

K. AABC: Associated Air Balance Council.

L. AMCA: Air Movement and Control Association.

M. NEBB: National Environmental Balancing Bureau.

N. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.4 SUBMITTALS

A. Quality Assurance Submittals: Within 30 days from the Contractor's Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.

B. Contract Documents Examination Report: Within 45 days from the Contractor's Notice to Proceed, submit 2 copies of the Contract Documents review report as specified in Part 3 of this Section.

C. Strategies and Procedures Plan: Within 60 days from the Contractor's Notice to Proceed, submit 2 copies of the testing, adjusting, and balancing strategies and step-by-step procedures as specified in Part 3 "Preparation" Article below. Include a complete set of report forms intended for use on this Project.

D. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.

E. Sample Report Forms: Submit 2 sets of sample testing, adjusting, and balancing report forms.

F. Warranty: Submit 2 copies of special warranty specified in the "Warranty" Article below.

1.5 QUALITY ASSURANCE

A. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by either AABC or NEBB.

B. Testing, Adjusting, and Balancing Conference: Meet with the Owner's and the Architect's representatives on approval of the testing, adjusting, and balancing strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of testing, adjusting, and balancing team members, equipment manufacturers' authorized

service representatives, HVAC controls Installer, and other support personnel. Provide 7 days' advance notice of scheduled meeting time and location.

1. Agenda Items: Include at least the following:

    a. Submittal distribution requirements.

    b. Contract Documents examination report.

    c. Testing, adjusting, and balancing plan.

    d. Work schedule and Project site access requirements.

    e. Coordination and cooperation of trades and subcontractors.

    f. Coordination of documentation and communication flow.

C. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:

1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.

2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.

D. Testing, Adjusting, and Balancing Reports: Use standard forms either from AABC's "National Standards for Testing, Adjusting, and Balancing" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."

E. Instrumentation Type, Quantity, and Accuracy: As described either in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification" or AABC national standards.

F. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

1.6 PROJECT CONDITIONS

A. Partial Owner Occupancy: The Owner may occupy completed areas of the building before Substantial Completion. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations.

1.7 COORDINATION

A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.

B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.

C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.8 WARRANTY

A. General Warranty: The national project performance guarantee specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. National Project Performance Guarantee: Provide a guarantee on AABC'S "National Standards" forms stating that AABC will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

C. Special Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

1. The certified Agent has tested and balanced systems according to the Contract Documents.

2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.

1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.

2. Verify that balancing devices, such as test ports, gage cocks and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of HVAC systems and equipment.

C. Examine project record documents described in Division 1 Section "Project Record Documents."

D. Examine Architect's and Engineer's design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data, including fan curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts

found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.

G. Examine system and equipment test reports.

H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

J. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

K. Examine terminal units, such as variable-air-volume boxes and mixing boxes, to verify that they are accessible and their controls are connected and functioning.

L. Examine plenum ceilings, utilized for supply air, to verify that they are airtight. Verify that pipe penetrations and other holes are sealed.

M. Examine equipment for installation and for properly operating safety interlocks and controls.

N. Examine automatic temperature system components to verify the following:

1. Dampers, valves, and other controlled devices operate by the intended controller.

2. Dampers and valves are in the position indicated by the controller.

3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multi-zone units, mixing boxes, and variable-air-volume terminals.

4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.

5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.

6. Sensors are located to sense only the intended conditions.

7. Sequence of operation for control modes is according to the Contract Documents.

8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.

9. Interlocked systems are operating.

O. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.2 PREPARATION

A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.

B. Complete system readiness checks and prepare system readiness reports. Verify the following:

1. Permanent electrical power wiring is complete.

2. Automatic temperature-control systems are operational.

3. Equipment and duct access doors are securely closed.

4. Balance, smoke, and fire dampers are open.

5. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.

6. Windows and doors can be closed so design conditions for system operations can be met.

3.3 GENERAL TESTING AND BALANCING PROCEDURES

A. Perform testing and balancing procedures on each system according to the procedures contained either in AABC national standards, or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.

C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.4 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct airflow measurements.

E. Check the airflow patterns from the outside-air louvers and dampers and the return and exhaust-air dampers, through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling unit components.

3.5 CONSTANT-VOLUME AIR SYSTEMS' BALANCING PROCEDURES

A. The procedures in this Article apply to constant-volume supply, return, and exhaust air systems. Additional procedures are required for variable-air-volume supply-air systems and process exhaust-air systems. These additional procedures are specified in other articles in this Section.

B. Adjust fans to deliver total design airflows within the maximum allowable rpm listed by the fan manufacturer.

1. Measure fan static pressures to determine actual static pressure as follows:

a. Measure outlet static pressure as far downstream from the fan as practicable and up-stream from restrictions in ducts such as elbows and transitions.
b. Measure static pressure directly at the fan outlet or through the flexible connection.
c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

2. Measure static pressure across each air-handling unit component.

a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.

3. Measure static pressures entering and leaving other devices such as sound traps, heat recovery equipment, and air washers under final balanced conditions.

4. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.

5. Adjust fan speed higher or lower than design with the approval of the Architect. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.

6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure no overload will occur. Measure amperage in full cooling, full heating, and economizer modes to determine the maximum required brake horsepower.

C. Adjust volume dampers for main duct, submain ducts, and major branch ducts to design airflows within specified tolerances.

1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.

a. Where sufficient space in submains and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust sub-mains and branch ducts to design airflows within specified tolerances.

D. Measure terminal outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or the outlet manufacturer's written instructions and calculating factors.

E. Adjust terminal outlets and inlets for each space to design airflows within specified tolerances of design values. Make adjustments using volume dampers rather than extractors and the dampers at the air terminals.

1. Adjust each outlet in the same room or space to within specified tolerances of design quantities without generating noise levels above the limitations prescribed by the Contract Documents.

2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 VARIABLE-AIR-VOLUME SYSTEMS' ADDITIONAL PROCEDURES

A. Compensating for Diversity: When the total airflow of all terminal units is more than the fan design airflow volume, place a selected number of terminal units at a maximum set-point airflow condition until the total airflow of the terminal units equals the design airflow of the fan. Select the reduced airflow terminal units so they are distributed evenly among the branch ducts.

B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set outside-air dampers at minimum, and return and exhaust-air dampers at a position that simulates full-cooling load.

2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of the terminal unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge duct losses.

3. Measure total system airflow. Adjust to within 10 percent of design airflow.

4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use the terminal unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.

5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow as described for constant-volume air systems.

    a. If air outlets are out of balance at minimum airflow, report the condition but leave the outlets balanced for maximum airflow.

6. Re-measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.

7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure adequate static pressure is maintained at the most critical unit.

8. Record the final fan performance data.

3.7 MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer, model, and serial numbers.

2. Motor horsepower rating.

3. Motor rpm.

4. Efficiency rating if high-efficiency motor.

5. Nameplate and measured voltage, each phase.

6. Nameplate and measured amperage, each phase.

7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass for the controller to prove proper operation. Record observations, including controller manufacturer, model and serial numbers, and nameplate data.

3.8 TEMPERATURE TESTING

A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.

B. Measure indoor wet and dry-bulb temperatures every other hour for a period of 2 successive 8-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.

C. Measure outside-air, wet and dry-bulb temperatures.

3.9 CONDENSING UNITS

A. Verify proper rotation of fans and measure entering- and leaving-air temperatures. Record compressor data.

3.10 TEMPERATURE TESTING

A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.

B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of 2 successive 8-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.

C. Measure outside-air, wet- and dry-bulb temperatures.

3.11 FUME HOODS

A. Determine total airflow into the room where the fume hood is located and balance systems to ensure ad-equate air supply to all hoods.

1. Set fume-hood door opening at position of normal use.

2. Energize the exhaust fan and adjust airflow to provide the indicated average fume-hood face velocity at hood opening.

3. Measure exhaust airflow volume by measuring airflow by Pitot-tube duct traverse.

4. Measure air velocity using Pitot-tube traverse method.

5. Record each face velocity measurement taken at 4- to 6-inch (100- to 150-mm) increments over the entire hood door opening.

6. Calculate the average face velocity by averaging all velocity measurements.

7. Calculate the airflow volume of exhaust-hood face velocity by multiplying the calculated aver-age face velocity by the opening area. Compare this quantity with exhaust volume at exhaust fan and report duct leakage.

8. Measure airflow volume supplied by makeup fan. Verify that the makeup system supplies the proper amount of air to keep the space at the indicated pressure with the exhaust systems in all operating conditions.

9. Retest for average face velocity. Adjust hood baffles, fan drives, and other parts of the system to provide the indicated average face velocity and the indicated auxiliary air-supply percentages.

10. Retest and adjust the systems until fume-hood performance complies with Contract Documents.

3.12 TEMPERATURE-CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between set points and actual measurements.

D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).

E. Verify free travel and proper operation of control devices such as damper and valve operators.

F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water-flow measurements. Note the speed of response to input changes.

G. Confirm interaction of electrically operated switch transducers.

H. Confirm interaction of interlock and lockout systems.

I. Verify main control supply-air pressure and observe compressor and dryer operations.

J. Record voltages of power supply and controller output. Determine if the system operates on a grounded or non-grounded power supply.

K. Note operation of electric actuators using spring return for proper fail-safe operations.

3.13 TOLERANCES

A. Set HVAC system airflow and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans: Plus 5 to plus 10 percent.

2. Air Outlets and Inlets: 0 to minus 10 percent.

3.14 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.15 FINAL REPORT

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.

B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.

1. Include a list of the instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to the certified field report data, include the following:

1. Fan curves.

2. Manufacturers' test data.

3. Field test reports prepared by system and equipment installers.

4. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.

D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:

1. Title page.

2. Name and address of testing, adjusting, and balancing Agent.

3. Project name.

4. Project location.

5. Architect's name and address.

6. Engineer's name and address.

7. Contractor's name and address.

8. Report date.

9. Signature of testing, adjusting, and balancing Agent who certifies the report.

10. Summary of contents, including the following:

    a. Design versus final performance.

    b. Notable characteristics of systems.

    c. Description of system operation sequence if it varies from the Contract Documents.

11. Nomenclature sheets for each item of equipment.

12. Data for terminal units, including manufacturer, type size, and fittings.

13. Notes to explain why certain final data in the body of reports vary from design values.

14. Test conditions for fans and pump performance forms, including the following:

    a. Settings for outside, return, and exhaust-air dampers.

    b. Conditions of filters.

    c. Cooling coil, wet and dry-bulb conditions.

    d. Face and bypass damper settings at coils.

    e. Fan drive settings, including settings and percentage of maximum pitch diameter.

    f. Inlet vane settings for variable-air-volume systems.

    g. Settings for supply-air, static-pressure controller.

h. Other system operating conditions that affect performance.

E. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present with single-line diagrams and include the following:

1. Quantities of outside, supply, return, and exhaust airflows.

2. Duct, outlet, and inlet sizes.

3. Terminal units.

4. Balancing stations.

F. Air-Handling Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data: Include the following:

a. Unit identification.

b. Location.

c. Make and type.

d. Model number and unit size.

e. Manufacturer's serial number.

f. Unit arrangement and class.

g. Discharge arrangement.

h. Sheave make, size in inches (mm), and bore.

i. Sheave dimensions, center-to-center and amount of adjustments in inches (mm).

j. Number of belts, make, and size.

k. Number of filters, type, and size.

2. Motor Data: Include the following:

a. Make and frame type and size.

b. Horsepower and rpm.

c. Volts, phase, and hertz.

d. Full-load amperage and service factor.

e. Sheave make, size in inches (mm), and bore.

f. Sheave dimensions, center-to-center and amount of adjustments in inches (mm).

3. Test Data: Include design and actual values for the following:

a. Total airflow rate in cfm (L/s).

b. Total system static pressure in inches wg (Pa).

c. Fan rpm.

d. Discharge static pressure in inches wg (Pa).

e. Filter static-pressure differential in inches wg (Pa).

f. Cooling coil static-pressure differential in inches wg (Pa).

g. Outside airflow in cfm (L/s).

h. Return airflow in cfm (L/s).

i. Outside-air damper position.

j. Return-air damper position.

G. Apparatus-Coil Test Reports: For apparatus coils, include the following:

1. Coil Data: Include the following:

a. System identification.

b. Location.

c. Coil type.

d. Number of rows.

e. Fin spacing in fins per inch (mm o.c.).

f. Make and model number.

g. Face area in sq. ft. (sq. m).

h. Tube size in NPS (DN).

i. Tube and fin materials.

j. Circuiting arrangement.

2. Test Data: Include design and actual values for the following:

a. Airflow rate in cfm (L/s).

b. Average face velocity in fpm (m/s).

c. Air pressure drop in inches wg (Pa).

d. Outside-air, wet- and dry-bulb temperatures in deg. F (deg. C).

e. Return-air, wet- and dry-bulb temperatures in deg. F (deg. C).

f. Entering-air, wet- and dry-bulb temperatures in deg. F (deg. C).

g. Leaving-air, wet- and dry-bulb temperatures in deg. F (deg. C).

h. Refrigerant expansion valve and refrigerant types.

i. Refrigerant suction pressure in psig (kPa).

j. Refrigerant suction temperature in deg. F (deg. C).

H. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data: Include the following:

a. System identification.

b. Location.

c. Make and type.

d. Model number and size.

e. Manufacturer's serial number.

f. Arrangement and class.

g. Sheave make, size in inches (mm), and bore.

h. Sheave dimensions, center-to-center and amount of adjustments in inches (mm).

2. Motor Data: Include the following:

a. Make and frame type and size.

b. Horsepower and rpm.

c. Volts, phase, and hertz.

d. Full-load amperage and service factor.

e. Sheave make, size in inches (mm), and bore.

f. Sheave dimensions, center-to-center and amount of adjustments in inches (mm).

g. Number of belts, make, and size.

3. Test Data: Include design and actual values for the following:

a. Total airflow rate in cfm (L/s).

b. Total system static pressure in inches wg (Pa).

c. Fan rpm.

d. Discharge static pressure in inches wg (Pa).

e. Suction static pressure in inches wg (Pa).

I. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data: Include the following:

a. System and air-handling unit number.

b. Location and zone.

c. Traverse air temperature in deg. F (deg. C).

d. Duct static pressure in inches wg (Pa).

e. Duct size in inches (mm).

f. Duct area in sq. ft. (sq. m).

g. Design airflow rate in cfm (L/s).

h. Design velocity in fpm (m/s).

i. Actual airflow rate in cfm (L/s).

j. Actual average velocity in fpm (m/s).

k. Barometric pressure in psig (Pa).

J. Air-Terminal-Device Reports: For terminal units, include the following:

1. Unit Data: Include the following:

a. System and air-handling unit identification.

b. Location and zone.

c. Test apparatus used.

d. Area served.

e. Air-terminal-device make.

f. Air-terminal-device number from system diagram.

g. Air-terminal-device type and model number.

h. Air-terminal-device size.

i. Air-terminal-device effective area in sq. ft. (sq. m).

2. Test Data: Include design and actual values for the following:

a. Airflow rate in cfm (L/s).

b. Air velocity in fpm (m/s).

c. Preliminary airflow rate as needed in cfm (L/s).

d. Preliminary velocity as needed in fpm (m/s).

e. Final airflow rate in cfm (L/s).

f. Final velocity in fpm (m/s).

g. Space temperature in deg. F (deg. C).

K. Compressor and Condenser Reports: For refrigerant side of unitary systems, stand-alone refrigerant compressors or air-cooled condensing units include the following:

1. Unit Data: Include the following:

a. Unit identification.

b. Location.

c. Unit make and model number.

d. Manufacturer's compressor serial numbers.

e. Compressor make.

f. Compressor model and serial numbers.

g. Refrigerant weight in lb (kg).

h. Low ambient temperature cutoff in deg F (deg C).

2. Test Data: Include design and actual values for the following:

a. Inlet-duct static pressure in inches wg (Pa).

b. Outlet-duct static pressure in inches wg (Pa).

c. Entering-air, dry-bulb temperature in deg F (deg C).

d. Leaving-air, dry-bulb temperature in deg F (deg C).

e. Control settings.

f. Unloader set points.

g. Low-pressure-cutout set point in psig (kPa).

h. High-pressure-cutout set point in psig (kPa).

i. Suction pressure in psig (kPa).

j. Suction temperature in deg F (deg C).

k. Condenser refrigerant pressure in psig (kPa).

l. Condenser refrigerant temperature in deg F (deg C).

m. Oil pressure in psig (kPa).

n. Oil temperature in deg F (deg C).

o. Voltage at each connection.

p. Amperage for each phase.

q. The kW input.

r. Crankcase heater kW.

s. Number of fans.

t. Condenser fan rpm.

u. Condenser fan airflow rate in cfm (L/s).

v. Condenser fan motor make, frame size, rpm, and horsepower.

w. Condenser fan motor voltage at each connection.

x. Condenser fan motor amperage for each phase.

L. Instrument Calibration Reports: For instrument calibration, include the following:

1. Report Data: Include the following:

a. Instrument type and make.

b. Serial number.

c. Application.

d. Dates of use.

e. Dates of calibration.

3.16 ADDITIONAL TESTS

A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

END OF SECTION

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 RELATED DOCUMENTS: This Section supplements all sections of Division 16, and shall apply to all phases of work specified, shown on the drawings, and required to provide all electrical systems complete and operable for the project. The work required under the Division is not limited to the work shown on the electrical drawings. Refer to site, architectural, structural and mechanical drawings, coordinate all such work to attain fully operational systems throughout the project. The intent of this specification is to provide a complete and operating electrical system in accordance with all Contract Documents.

1.2 WORK INCLUDED: Provide all labor, materials, services and skilled supervision necessary for the construction, erection, installation, connection, testing, and adjustment of all circuits and electrical equipment required by the Contract Documents, complete in all respects and ready for use.

1.3 SUPERVISION OF WORK

A. Electrical work shall be under the full supervision of a professional electrical engineer or a master electrician registered to practice in the Territory of Guam. Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit a certification from the Professional Engineer or master electrician stating that the work will be done under his full supervision. At the conclusion of the work, prior to final inspection, submit certification that the work was done in accordance with electrical construction documents and the installation complies with the latest edition of the National Electrical Code.

B. Installation of Diesel Generating Unit shall be under the direct supervision of Generator Manufacturer’s Representative.

1.4 COORDINATION OF WORK

A. Plan all work so that it proceeds with a minimum of interference with other trades. Coordinate all openings required for equipment and conduit required for work of other trades. Provide all special frames, sleeves and anchor bolts as required. Coordinate electrical work with the mechanical installation.

B. Work lines and established heights shall be in accordance with architectural drawings. Verify all dimensions shown and establish all elevations and detailed dimensions not shown.

C. Lay out and coordinate all work well in advance to avoid conflicts or interference with other work in progress so that in the event of interference, the electrical layout may be altered to suit the conditions, prior to the installation of any work, and without additional cost to the Owner. Conflicts arising from lack of coordination shall be the contractor's responsibility.

D. Maintain all code required clearance around electrical equipment. Unless specifically noted otherwise, establish the exact location of electrical equipment based on the actual dimensions of equipment furnished.

1.5 COOPERATION WITH OTHER TRADES

A. Cooperate and coordinate all work of Division 16 with that of other trades; afford reasonable opportunity for the execution of their work. Properly connect and coordinate

this work with the work of other trades at such time and in such a manner as not to delay or interfere with their work.

B. Examine the drawings and specifications for the general and mechanical work and the work of other trades. Coordinate this work accordingly.

C. Promptly report to the Contracting Officer any delay or difficulties encountered in the installation of this work which might prevent prompt and proper installation or make it unsuitable to connect with or receive the work of others. Failure to report shall constitute an acceptance of the work of other trades as being fit and proper for the execution of this work.

1.6 CODES, PERMITS AND FEES

A. Perform work in accordance with the National Electrical Code, applicable building ordinances, and other applicable codes, hereinafter referred to as the "Code". Where the Contract Documents exceed minimum requirements, the most stringent shall apply unless variance is approved.

B. Comply with all requirements for permits, licenses, fees, and codes. Obtain all required permits, licenses, inspections, and pay all fees required to perform the work described in the Contract Documents.

C. Comply with all requirements of the applicable utility authorities serving the project. Make all arrangements with the utility authorities for proper coordination of the work.

1.7 MATERIALS AND EQUIPMENT FURNISHED BY OTHERS: The electrical work includes the installation or connection of certain materials and equipment furnished by others. Verify installation details. Foundations for apparatus and equipment will be furnished by others unless otherwise noted or detailed.

1.8 CONTRACT DRAWINGS: The Contract Drawings are shown in part diagrammatic, and intend to convey the scope of work, indicating the intended general arrangement of equipment, conduit and outlets. Follow the drawings in laying out the work and verify spaces for the installation of materials and equipment based on actual dimensions of equipment furnished. Wherever a question exists regarding the intended location of outlets or equipment, circuiting, etc., obtain instructions from the Contracting Officer before proceeding with the work.

1.9 EQUIPMENT OR FIXTURES: Equipment or fixtures shall be connected to provide circuit continuity in accordance with applicable codes whether or not each piece of conductor, conduit, or protective device is shown between such items of equipment or fixtures, and the point of circuit origin.

1.10 NEW EQUIPMENT AND MATERIAL:

A. Unless otherwise specified, equipment and materials of the same type of classification, and used for the same purpose shall be products of the same manufacturer. Use only new and unweathered material.

B. Furnish products listed and classified by Underwriter's Laboratories, Inc.

1.11 APPLICABLE DOCUMENTS: Design, manufacture, testing and method of installation of all apparatus and materials furnished under Division 16 of the specifications shall conform to the latest publications or standard rules of the following:

Institute of Electrical and Electronic Engineers
(Formerly American Institute of Electrical Engineers) – IEEE

National Electrical Manufacturers' Association - NEMA
Underwriters' Laboratories, Inc. - UL
National Fire Protection Association - NFPA
American Society for Testing and Materials - ASTM
American National Standards Institute – ANSI
National Electrical Code - NEC
National Electrical Safety Code - NESC
Uniform Fire Code – UFC
International Building Code - IBC
Insulated Power Cable Engineers Association – IPCEA
Americans with Disabilities Act Guidelines - ADAG
American Institute of Steel Construction - AISC
Department of Public Works Standards, Government of Guam - DPW
Guam Fire Department Standards, Government of Guam - GFD
Guam Power Authority Standards, Government of Guam - GPA
GTA Standards – GTA
Guam Environmental Protection Agency - GEPA

1.12 EXECUTION OF THE WORK

A. Install equipment and materials in neat and workmanlike manner and align, level and adjust for proper operation. Install equipment so that all parts are easily accessible for inspection, operation, maintenance, and repair.

B. Where damage, marring or disfigurement has occurred, replace or refinish the damaged surfaces as directed, and to the satisfaction of the Contracting Officer.

C. Provide the design, fabrication, and erection of all supplementary structural framing required for attachment of hangers or other devices supporting electrical equipment. Submit design/shop drawing to the Contracting Officer for approval.

D. Outlet Location:

1. Position of outlets: Center all outlets with regard to panelling, furring and trim. Symmetrically arrange outlets in the room. Satisfactorily correct outlets improperly located or installed. Repair or replace damaged finishes. Set outlets plumb and extend to the finished surface of the wall, ceiling or floor without projecting beyond same.

2. Install all receptacles, switches, and outlets shown on the wood trim, cases or symmetrically, and where necessary, set the long dimension of the plate horizontal, or ganged in tandem.

1.13 SPECIAL CONSIDERATION

A. Cutting, Patching and Piercing: Obtain written permission from the Contracting Officer before cutting or piercing structural members.

1. Use craftsmen skilled in their respective trades for cutting, fitting, repairing, patching of plaster and finishing of materials including carpentry work, metal work or concrete work required for by Division 16. Do not weaken walls, partitions or floor by cutting. Holes required to be cut in floors must be drilled or cored without breaking or spalling around the holes. Do all necessary patching and/or refinishing as instructed by the Contracting Officer.

2. Sleeves through floors and walls to be galvanized rigid steel flush with walls, ceiling or finished floors; size to accommodate the raceway.

3. Use care in piercing waterproofing. After the part piercing waterproofing has been set in place, seal opening and make absolutely watertight.

4. Provide baked white enamel painted spring-clipped escutcheon plates where exposed pipe passes through walls, floors, or ceilings. Cover sleeves and entire opening made for the pipe with escutcheon plates. Field applied paint finish shall match color of surrounding finish. Seal all conduit openings through floor slabs, masonry walls, and continuous partitions to make air and watertight. Tightly caulk space between conduit and abutting materials with fiberglass insulation and nonflammable sealant.

B. Seal equipment or components exposed to the weather and make watertight and insect-proof. Protect equipment outlets and conduit openings with temporary plugs or caps at all times that work is not in progress.

C. Equipment Access: Locate starters, switches, receptacles, and pull boxes to allow easy Equipment Identification: Identify each piece of equipment including disconnect switches and motor starters, with plastic laminate nameplates, black face with white core letters, having proper and complete identification. Clearly identify on the equipment served, and spell out the full name of the equipment, such as "Air Handling Unit AHU-1" and "Hot Water Cir. Pump P-1". Do not use abbreviated plan references such as "AHU-1" or "P-1".

D. Equipment Access: Locate starters, switches, receptacles, and pull boxes to allow easy access for operation, repair and maintenance, and if concealed, provide access doors.

E. Equipment Bases: Provide equipment bases on all floor-mounted equipment furnished under this Contract.

F. Protection of apparatus, materials and equipment: Take all necessary precautions to properly protect all apparatus, fixtures, appliances, material, equipment and installations from damage of any kind. The Contracting Officer may reject any particular piece or pieces of material, apparatus, or equipment which has scratches, dents or otherwise damaged.

G. Operation and Maintenance Manuals: During the time of the Contract and before final acceptance of the electrical installation, submit to the Contracting Officer three copies of all descriptive literature, maintenance recommendations from the equipment manufacturer, data of initial operation, wiring diagrams and parts list of each item of electrical equipment installed under the Contract; submit all manufacturer's guarantees and warranties. Submittal shall include: switchboards, motor control centers, generators, and fire alarm system.

1. Refer to Division 1 for additional requirements.

H. Painting Preparation: Prepare all exposed fittings, boxes, supports and panelboards for painting; remove traces of oil, grease and dirt. Employ all necessary precautionary methods to prevent scratching or defacing of all electrical apparatus and devices.

I. Painting: Exposed conduit, boxes installed after room has been painted, shall be painted to match room finish by this contractor.

1. Corrosion Control: All corrosive metal surfaces, conduits/fittings, pipelines and structures shall be provided with corrosion inhibiting primer before installation. Appropriate surface preparation shall be made before application of primer.

J. Rust Prevention: Provide hot dip galvanized finish for all ferrous materials. In addition, outdoor installations shall be field painted with two coats of enamel paint.

K. Tests: Provide all tests as outlined hereinafter, and other tests necessary to establish the adequacy, quality, safety, completed status, and suitable operation of each system. Tests shall be conducted in the presence of the Contracting Officer.

1. Ground Rod Test: Immediately after installation, test driven grounds with direct-reading single-test megger, utilizing the AC fall-of-potential method and two reference electrodes. Orient the ground to be tested and two reference electrodes in a straight line spaced 50 feet apart. Drive the reference electrodes 5 feet deep. Disconnect the ground rod to be tested from other ground system at the time of testing. Ground resistance for the electrical service shall be 25 ohms or less. Ground resistance for communication system shall meet manufacturer's minimum requirements. Submit the results, date of test, and soil conditions, to the Contracting Officer in writing, immediately after testing.

2. System voltage at each panelboard measure voltage between phases; phase to neutral; phase to ground; and neutral to ground. Measurements shall be conducted during unloaded condition and repeated during loaded condition. Adjust system value to within ±3% of nominal voltage.

3. Insulation resistance of conductors.

L. Seismic Consideration: Installation shall meet Seismic Zone 4 requirements.

M. Windload Consideration: Installation exposed to outdoors shall be designed to withstand 170 MPH wind speed IBC 2009 Exposure C and ASCE7-05.

1.14 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Division.

B. Without additional cost to the Owner, provide such other labor and materials as are required to complete the work of this Division in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

1.15 ELECTRICAL SERVICE

A. Electrical service to the building is as indicated on the drawings.

B. Make all necessary arrangements with the serving utilities, and pay all costs and fees, assessed to the project by the serving utilities. All work shall be in accordance with serving utilities standards and subject to their approval. Coordinate the installation of service entrance equipment with GPA prior to start of construction.

C. Application for power service must be submitted to GPA eight months before service connection to allow for timely delivery of transformers.

1.16 PRODUCT HANDLING: Comply with pertinent provisions of Division 1.

1.17 WARRANTY: Provide one year warranty on all labor and materials.

1.18 AS-BUILT DRAWINGS

A. The Contractor shall maintain at the site one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders, and other modifications, in good order and marked to record all changes made during construction. These shall be made available to the Contracting Officer.

B. At the conclusion of the work, the Contractor will be furnished by the Contracting Officer, at the Contractor's expense, a set of reproducibles made from original contract plans. The Contractor shall then incorporate all changes made, as recorded, into the set of reproducibles in a clear, legible and reproducible manner. All feeders, main alarm and communication lines, service entrance, and stub-outs shall be dimensionally located within the building structure. As a condition for acceptance of work, "as-built" reproducibles shall be signed by Contractor attesting that all changes have been incorporated, dated and delivered to the Contracting Officer.

1.19 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra Products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

END OF SECTION

SECTION 16208

DIESEL ENGINE-GENERATOR SET

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED IN OTHER SECTIONS: Section 16050 "Basic Electrical Materials and Methods," applies to this section except as specified otherwise.

1.2 DESCRIPTION: Provide diesel electric generating unit with accessories, auxiliary equipment, and associated work as specified.

1.3 QUALITY ASSURANCE: Provisions of Division 1 apply.

A. Operating Experience Requirements: Engines installed shall meet all of the operating experience requirements listed below:

1. Only electric generation service is considered as equivalent experience. Engines driving pumps or compressors, or those in marine propulsion or railroad service, are not acceptable.

2. Only experience on the same engine model is acceptable. Engine model is considered to be a given series or class of identical bore and stroke and of the same type of engine, such as in-line or Vee. In-line and Vee engines with identical bore and stroke are considered as two separate models of engines.

3. Only experience at the identical rotative speed as that which is offered is acceptable.

4. Only experience at the identical or higher brake mean effective pressure as that which is offered is acceptable.

5. Only experience with fuel oil is acceptable.

1.4 SUBMITTALS

A. Furnish certificate(s) within 30 days after award certifying that not less than two engines of identical number of cylinders and cylinder size, identical rotative speed, and identical or higher BMEP, and of the same basic configuration (in-line or Vee) as the engine to be furnished, shall have driven generators which have satisfactory operated not less than 3-years. Certificate(s) shall include:

1. A list of at least two engine installations meeting the experience requirements set forth in paragraph entitled "Operating Experience Requirements".

2. Owner and location of each such installation.

3. Date of initial operation of each such installation.

4. Number of KW hours produced at each installation.

5. Horsepower rating, KW rating, and rotative speed of each unit.

6. Design characteristics of each unit, such as bore and stroke, number of cylinders, and configuration (in-line or Vee).

B. Manufacturer's Data:

1. Diesel engine driven electric generator set.

2. Valves.

3. Fuel oil day tank (specified under Division 15).

4. Fuel line strainers.

5. Engine muffler.

C. Shop Drawings and Calculations: Submit for diesel generating unit and auxiliary equipment, including the following:

1. Certified outline, general arrangement (setting plan), and anchor bolt details. Drawings shall show the total weight and center of gravity of the assembled equipment on the mounting skid.

2. General arrangement drawings showing location of all auxiliary equipment in relation to the diesel generating unit.

3. Piping schematics for fuel oil, lubricating oil, jacket water, and cooling water integral with diesel engine.

4. Battery sizes and cranking time calculations.

5. Critical speed calculations.

6. Drawings for the transfer switch, including certified outline, electrical ratings, general arrangement, and detail drawings.

7. Electrical elements, schematics and wiring diagrams, including details of the safety shutdown systems and main generator circuit breaker trip system.

D. Certified Test Reports:

1. Diesel engine shop tests.

2. Generator shop test.

3. Diesel engine driven electric generator set shop tests.

4. Automatic transfer switch.

5. Radio-interference suppression.

E. Manuals: Provide two sets of operation and maintenance manuals for equipment. Identification symbols for all replaceable parts and assemblies shall be included. Information in manuals shall be comprehensive and specific.

F. Safety Requirements: Comply with ANSI B15.1.

G. Approved Manufacturers: Manufacturer shall have local on-island distributor with spare parts and repair services available.

1. Generator Set:

a. Caterpillar
b. Onan
c. Kohler

2. Automatic Transfer Switch:

a. ASCO
b. Russelectric
c. Zenith

PART 2 PRODUCTS

2.1 MATERIALS

A. Standard Commercial Product: Generator set shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product with any added features needed to comply with the requirements. Additional or better features which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product shall be included in the generator set being furnished. Standard commercial product is a product which has been or will be sold on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model(s).

B. Materials and Equipments: Furnish new materials of high quality which will give long life and reliable operation. Equipment shall not have been in prior service except as required by factory test. Workmanship shall be of highest quality in every detail.

2.2 DIESEL-ELECTRIC GENERATOR SET AND AUXILIARY EQUIPMENT: Each generator set shall consist of a diesel engine connected to an alternating current generator with brushless excitation system mounted on a steel subbase and provided with all necessary accessories, auxiliaries, and control equipment resulting in a complete self-contained unit capable of operation. Set shall be arranged for automatic unattended starting. Generator set must be capable of providing full rated power within 10 seconds after failure of normal power. Generator set shall be "tropicallized".

A. Equipment Rating and Capability: Diesel-electric generating set shall have a standby rating indicated at 0.8 power factor. Gross KW rating of each diesel generating set shall be not more than the figure obtained by multiplying the delivered shaft horsepower rating of the engine by 0.746 and by the overall efficiency of the generator at the corresponding load. Overall efficiency of the generator shall allow for power required to operate the exciter. Rated net capacity of each generating set is defined as gross electrical power output of generator minus total electrical power requirements of electric motor driven engine accessories normally constituting part of "engine assembly," as defined in DEMA publication "Standard Practices for Stationary Diesel and Gas Engines." All auxiliary equipment furnished shall be designed for continuous duty at 110 percent of rated net capacity of generating set.

B. Critical Speeds: Each complete diesel-electric generating set shall be free of critical speeds of either a major or minor order that will endanger satisfactory operation of the set.

Satisfactory operation will be considered endangered if torsional vibration stresses exceed 5,000 psi within 10 percent above or below rated engine speed.

2.3 DESIGN AND CONSTRUCTION: Rotating or reciprocating parts, or other parts that may present a hazard to operating personnel shall be isolated or shielded to minimize danger. Design characteristics shall limit operating temperatures at critical points of maximum wear at full-load operating conditions.

2.4 DIESEL ENGINE AND ACCESSORIES

A. Engine shall be 4-cycle, naturally aspirated, turbocharged, turbocharged-intercooled, vertical in-line or vertical "V" type. Design and construct engine so as to eliminate undue heating, vibration, and wear. Engine shall be capable of burning diesel fuel oil conforming to Fed. Spec. W-F-800 (Grade DF-2). Limiting characteristics of engine shall be as follows:

1. Maximum engine speed, 1,800 rpm:

2. Maximum piston speed, 1,950 fpm:

B. Base rating of each engine on plant site elevation of 1,000 feet above mean sea level and an atmospheric temperature of 104 degrees F. Offer engine only at speeds and ratings not higher than those for which they have been designed, which fulfill requirements specified in paragraph entitled "Operating Experience Requirements."

C. General Construction: Engine shall be constructed adequately to withstand sudden changes from no load to rated load, and to preserve alignment of integral components under all conditions of operation. Engine shall be neat in appearance and shall permit easy access to various parts for maintenance purposes. The crankshaft shall incorporate drilled passages for pressure lubrication of bearings, and the journals shall be hardened, or chromium plated to provide a hard shock-resistant surface with ductile core. Crankshaft and connecting rod bearings shall be the replaceable precision sleeve type. Cylinders shall be provided with replaceable liners. The piston rings shall be constructed of a heat-resisting alloy steel or chromium plated cast iron. Camshafts shall be gear or chain driven and shall have higher wear resistance at cams and journals. Timing marks shall be clearly indicated on the crankshaft and gears. Valves shall operate in removable stem guides and seat inserts. The fly-wheel shall be balanced and shall be capable of being rotated 50 percent above the maximum rated engine rotative speed without danger of breaking or exploding. Flywheel housings shall be provided with a drain hole at the lowest point. Means for turning the crankshaft manually shall be provided.

D. Assembly: Completely factory assembles each engine. Mount turbocharger, intercooler if provided and all piping integral with the engine on the engine.

E. Engine Speed Governing System: Governing system shall be electronic type suitable for controlling the speed of the generator set within the requirements specified herein without intermediate adjustment and shall maintain the specified stability without hunting or cycling.

1. Speed (Frequency) Governing System: Set shall have an engine speed (frequency) governing system conforming to IEEE 126, Section II. Engine speed governing system shall be adjusted to meet the performance requirements of IEEE 126, Section II, when tested in accordance with ASME PTC26.

F. Overspeed Shutdown Device: The overspeed shutdown device shall be entirely independent of the engine speed governing system and shall consist of solid-state

overspeed device positive engaged so that engine speed shall not exceed 110 percent of synchronous speed and shall react to shut-off the engine's air or fuel supply and trip the set output circuit breaker. The overspeed device shall require manual resetting after emergency tripping.

G. Engine Fuel System: The engine shall be provided with all necessary equipment, including piping, fittings, valves, fuel coolers, filters, strainers, day tank, and appurtenances. A mechanical fuel injection system shall be employed. Injection pump shall be driven in a positive manner from cam or drive shaft. Injection pump and injection valves shall be of type not requiring adjustment in service and shall be capable of quick replacement in a few minutes by ordinary mechanics without special diesel experience. Internal parts forming the high-pressure portion of the fuel system shall have wear-resistant surfaces where relative movement between surfaces exists. The fuel system shall include the following fuel related equipment supplied and factory installed by the engine-generator set manufacturer. A sub-base fuel storage tank with capacity of minimum 24 hours continuous operation at 80% capacity. It shall have the structural integrity to support the engine generator set along with the associated vibrations and shall be designed to meet Seismic Zone 4 requirements. Minimum features shall include double walled all welded construction, fuel gauge, low fuel alarm, line check valve, fuel leak indicator and fittings for fuel supply fill and vent.

H. Engine Lubricating Oil System: Provide with a full pressure lubricating system arranged to distribute oil to all moving parts of the engine and to cool the pistons. System shall include an engine-driven positive displacement pump, pressure regulating valves, oil filter, oil pressure indicator, crankcase ventilator for four-cycle engines, and the necessary piping and fittings. The pump shall have ample capacity to circulate the lubricating oil required for engine lubrication, and to cool the pistons. All necessary stop, check, pressure relief, and pressure control valves shall be provided.

1. Lubricating Oil Filters: Shall be the full-flow type (throw-away-type) and shall be capable of filtering the full rate of oil flow of the oil pump at maximum engine speed. Means shall be provided to insure delivery of lubricating oil to vital wearing surfaces regardless of the condition of the filter. Additionally, the filter must provide a means of automatically bypassing filter if it should become flow-restricting.

2. Lubricating Oil Coolers: Provide to maintain the lubricating oil within the temperature limits recommended by the manufacturer. Oil cooler shall utilize the engine jacket cooling water from the radiator as the cooling medium. Temperature rise of the jacket water across the lubricating oil cooler shall be limited so that the temperature of the water leaving the lubricating oil cooler will be not higher than the optimum temperature as recommended by the engine manufacturer for jacket water to the engine. Cooler shall be either the shell and tube single or multipass design or shall be built in as an integral part of the engine cooling radiator. The core shall be constructed of copper base alloys. The cooler shall be designed for jacket water to pass through the tubes. The temperature of the oil to the engine shall be maintained at a reasonably constant value. Thermostats used in the oil cooler shall be of the nonadjustable type and factory set at the temperature as recommended by the manufacturer. Where temperature of the oil in the cooler is regulated by controlling the jacket water temperature, the system design shall assure proper oil temperature under operating conditions.

I. Engine Cooling System: The radiator fan shall direct the air flow from the engine outward through the radiator, with horizontal air discharge. The fan shall be driven directly from the engine crankshaft or through V-belt drive. The radiator shall have sufficient capacity to dissipate not less than the total British Thermal Units per hour rejected by the engine to the cooling system at 110 percent rated load in 104 degrees F ambient, and against a static

restriction of 0.5 inches of water as may be imposed by louvers, ductwork, etc. Cooling section shall have a tube and fin type core which shall consist of copper or copper base alloy tubes with nonferrous fins. The radiator shall be protected by a strong grille or metal bar guard on the exterior, and the fan shielded with a metal canopy. Filler caps shall be designed for pressure relief prior to removal. A thermostatic control valve shall be installed in the jacket water system of the engine to maintain the water system temperature of the engine. The thermostatic valve shall be the standard modulating type utilizing self-contained thermostats. The valve shall be capable of passing the water flow as determined by the manufacturer without excessive pressure drop across the valve. The valve shall be provided with one or more interchangeable thermostatic elements. The elements shall be nonadjustable type and the operating temperature shall be set at the temperature recommended by the engine manufacturer. The valve shall be designed so that in event of the thermostatic element failure, water will be able to flow through the engine. Radiator core shall be treated with anti corrosion coating.

J. Engine Exhaust System: Provide a complete exhaust system, including exhaust flexible connection and residential type silencer.

K. Engine Air Induction System: The air induction system shall be equipped with heavy-duty dry type air cleaners of adequate capacity to effectively remove the dirt and abrasives from the combustion air to the engine. When the engine air intake noise level is above the audible mechanical noise level of the engine, a combination filter-silencer or a separate silencer shall be provided. For two-stroke engines, an air intake shutoff shall be provided which shall be operated by the engine overspeed shutdown device.

1. Scavenging air blowers for two-stroke cycle engines shall be built integrally with and driven directly from the engine.

2. Turbocharger shall be a combination centrifugal blower driven by an exhaust gas turbine, with the air blower directly connected to the intake air manifold. Systems that require cooling of the intake air below ambient air temperature ahead of the turbocharger or scavenger air blower will not be acceptable. They may be lubricated from the engine pressure lubrication system or as recommended by the manufacturer. All necessary supports and connections shall be provided.

3. Intercooler: Tubular heat exchangers will be accepted only if available jacket water can be used as the cooling medium. Supplementary water cooling equipment is not acceptable. When intercooling is included, provide and install on the engine all necessary intercooling equipment, including valves, controls, and integral piping.

L. Cranking System: NEMA ICS 1 and NEMA ICS 2. An electric cranking system shall be furnished, capable of rotating the engine at a speed sufficient for rapid starting in an ambient temperature of 60 degrees F. The system shall be arranged to permit starting of the engine automatically upon signal from the automatic transfer switch.

1. Cranking: The electric cranking system shall utilize direct current (DC) electrical circuit, with the negative polarity grounded, energized by storage batteries. The cranking motor shall be of the heavy-duty type with adequate capacity to crank the engine continuously to start the engine in an ambient temperature of 60 degrees F. The drive mechanism for engaging the starting motor with the engine flywheel shall be designed to inherently engage and release without binding. When the engine starts, a "stop cranking" switch, which is engine speed actuated, shall cause disengagement of the starting gearing and the shutdown of the starting motor. Starting shall be automatic. Automatic cranking panel shall crank the engine for 15 seconds cranking and 15 seconds off for three consecutive cycle before locking out

the starting circuitry, sounding an alarm and illuminating an "overcrank" indicating light which shall remain lighted until it is manually reset.

2. Storage Battery: The engine cranking battery shall be S.A.E. Type "D", diesel engine starting type and of sufficient size and capacity in a fully charged condition to start the engine-generator six consecutive times. Batteries shall comply with Fed. Spec. W-B-133.

3. Battery Charger: The battery charger shall be enclosed, wall-mounted, automatic, dual rate, solid-state, constant voltage type having AC voltage compensation, DC voltage regulation, and current limiting. The charger shall employ transistor-controlled magnetic amplifier circuits to provide continuous taper charging. Charger shall have two ranges, float and equalize, with 0-24 hour equalizer time, DC cranking relay, silicon diode full-wave rectifiers, automatic surge suppressors, DC ammeter, DC voltmeter, and fused inputs and outputs. Charger shall have a continuous rated output of not less than 10 amps. Battery charger shall conform to UL 1236.

M. Safety Shutdown Controls and Alarms: Control shall be provided that will function to immediately shut off delivery of fuel to the engine cylinders, when actuated by a condition of low lubricating oil pressure, high water temperature, overspeed, or low water level. The values at which the controls for low lubricating oil pressure and high water temperature are actuated shall be as recommended by the manufacturer, and the overspeed governor shall be set to actuate at the value specified herein. The low lubricating oil pressure shutdown control shall be provided with a means to make it inoperative during the period of low oil pressure when the engine is started. Each shutdown shall initiate its individual light and sound an alarm within the cranking panel and shall require manual reset to release each indicating light. Normal startup and shutdown shall not actuate the manual reset indicator system.

2.5 GENERATORS AND EXCITATION SYSTEMS

A. Generators: The generators for each unit shall be rated as indicated, 60 Hz, 0.80 power factor alternating-current type with revolving field. The speed of the generator shall be that of the engine. The generator shall be capable of carrying continuously an 0.80 power factor load equal to the gross kilowatt rating of the diesel generating unit at normal voltage and with a temperature rise of not more than 130 degrees C as measured by resistance based on 40 degrees C ambient temperature. Enclosures shall be the general-purpose open type with ventilating openings covered with removable screens having a mesh not larger than 1/2 inch. The generator shall conform to ANSI C50.10, and to NEMA MG-1. The generator shall have Class H insulation. The stator winding shall be arranged for "wye" connection with both line and neutral leads of each of the three-phase windings brought out of the bottom of the generator frame, and the neutral grounded. The generator and flywheel shall have sufficient flywheel effect to meet the requirements of regulation and operation as specified. The rotor shall have continuous or interconnected amortisseur windings. The generator rotor shall be mounted on an extended shaft which shall be coupled rigidly to the engine crankshaft. Impellers shall be mounted on the rotor for cooling the generator. The rotor shall be capable of safe operation at a speed 25 percent in excess of its rated synchronous speed. The generator armature, field, and ground leads shall have clamp-or crimp-type lugs or connectors for electrical connections. Terminal markings shall conform to NEMA MG-1.

1. Generator Space Heater: Provide 120 ac volt heaters. Heater capacity shall be as recommended by the generator manufacturer to aid in keeping the generator insulation dry.

B. Excitation and Voltage Regulation System: The excitation system shall be the integral brushless-type consisting of a rotating AC exciter and rectifier diode assembly together with a static-type voltage regulating system and including surge protection and the required accessories. The system shall serve as an individual excitation and regulation system for the generator specified herein, and there is no requirement for parallel operation with other exciters. The excitation system shall have a continuous current rating of not less than the generator excitation current required when the generator operates at 105 percent rated voltage under the condition of continuous rating requiring maximum field current. The voltage rating of the system shall be as required to match the generator field requirements. The excitation system response ratio shall be not less than 0.5 and the ceiling voltage shall be not less than 120 percent of rated voltage.

1. Exciter: The exciter shall be a rotating AC generator having a rotating armature on the rotor spider and a stationary field on the stator frame. The exciter insulation shall be Class B and the temperature rise shall not exceed 70 degrees C when measured by resistance based on a 40 degree C ambient temperature.

2. Rectifiers: Shall be full-wave silicon diode type, with each diode protected by individual fuses. The rectifiers shall be mounted on the rotating part of the exciter to convert AC exciter output to DC for the main generator excitation. Connections shall be provided between the exciter, rectifiers, and generator field without use of brushes or slip rings.

3. Voltage Regulator: The voltage regulator shall be completely solid-state type for control of generator voltage by control of the exciter field. The regulator shall be suitable for mounting in the generator switchgear. The regulator shall control the generator exciter field as required to maintain a constant and stable generator output voltage within plus or minus 1/4 of one percent of nominal for all steady-state loads from no load to full load, including a 5 percent variation in frequency and the effects of field heating. The regulator shall be designed for single-phase voltage sensing. Electromagnetic interference suppression shall be an integral part of the regulator. Thermal protection for power semiconductors, inherent overvoltage protection, and fuse protection shall be provided internally in the regulator. No electrolytic capacitors, vacuum tubes, or electromechanical relays shall be used in the voltage regulator. The regulator shall have provisions for switching to manual control to allow the generator voltage to be controlled either manually or automatically. The following regulator components shall be mounted on the front of the generator switchgear:

   a. Voltage adjusting rheostat.

   b. Manual voltage control with adjusting rheostat and manual automatic-off transfer switch.

4. Engine-Generator Instruments and Controls: NEMA ICS 1, 2, 3, 4, and 6.

5. Engine Instruments: Include the following as minimum components:

   a. Lubricating Oil Pressure Gauge: Shall be electronic, utilizing a Bourdon tube for confining the pressure medium. The Bourdon tube shall be seamless and made of phosphor bronze. Gauge shall be accurate to within 2 percent of full scale reading. Gauge subject to rapid pressure surges shall be properly suppressed.

b. Coolant Temperature Indicators: Shall be analog or electronic. Capillary tubing shall be covered with a protective casing throughout its entire length and reinforced with an additional casing at the connection to the bulb or socket. The temperature indicator shall be accurate to within 2 percent of full scale reading.

c. Running Time Meter: Totalize engine running time to 9999.9 hours total.

d. Oil Temperature Gauge: Shall be indicating dial type. Indicator shall be accurate to within 2% of full scale reading.

e. Fuel Pressure Gauge: Shall be indicating dial type, utilizing a Bourdon tube. Gauge shall be accurate to within 2% of full scale reading.

6. Generator Controls and Instruments: NEMA ICS 1, 2, 3, and 4 and shall include the components listed below: Instruments shall comply with ANSI C39.1.

a. Voltmeter and Ammeter: Semiflush mounted electronic type.

b. Frequency Meter: Electronic type.

c. Control Switches: Voltage and ampere ratings suitable for the intended use. Contacts shall be rated in accordance with NEMA Standards ICS 2-125.

d. Generator Output Circuit Breaker: Shall comply with Fed. Spec. W-C-375. Molded case type, trip-free, and shall be mounted to allow operation from outside the control panel. Frame size shall be adequate for generator amperage when operating at standby rating, and an adjustable trip shall be provided. Lugs shall be provided for electrical connections.

e. Voltage adjustment rheostat.

f. Panel lights and control switch.

g. Alarm indicating panel.

h. Remote Annunciator Panels: ANSI/NFPA 99; include engine run and low fuel indicator lights, failure alarm, normal and emergency power status lights, automatic transfer switch position status lights, and remote start/stop switch; surface mounted panel with brushed stainless steel finish.

2.6 GENERATOR CIRCUIT BREAKER: UL 489, molded case, adjustable thermal magnetic trip type circuit breaker. The circuit breaker continuous current rating shall be adequate for the power rating of the engine-generator set and the circuit breaker shall be rated to withstand the short circuit current provided by the generator set. Provide circuit breaker in a NEMA ICS 6, Type 1 enclosure mounted on the engine-generator set.

2.7 BASE ASSEMBLY AND ENCLOSURE: NEMA ICS 6.

A. Engine-Generator: Shall be mounted on a fabricated steel skid base suitable for supporting, transporting, and skidding engine and generator without damage to equipment or alignment.

B. Vibration Isolators: Shall be provided to isolate the engine-generator set from the building floor. At least four isolators, as recommended by the isolator manufacturer, are required.

The isolators shall be manufactured by a firm specializing in this product, and the unit shall be specifically listed for this application and have a maximum deflection of one inch.

2.8 TREATMENT AND PAINTING: All parts, including engine subject to high temperature, shall be treated and painted in accordance with manufacturer's standards. The generator and all associated electrical equipment shall be thoroughly cleaned and treated prior to painting. Color shall be manufacturer's standard.

2.9 AUTOMATIC TRANSFER SWITCH: UL 1008.

A. Automatic Transfer Switch: Provide automatic transfer switch with the number of poles, amperage voltage, and withstand ratings as shown. Transfer switch shall be listed per UL 1008 as a recognized component for emergency systems and rated for all classes of loads when installed in an unventilated enclosure. Electrical operation shall be accomplished by a nonfused momentarily energized solenoid direct operating mechanism or stored energy operator. Mechanical locking in each direction shall be provided. Operation shall be inherently double throw where normal and emergency contacts operate with no intentional delay in mid position. Main pole structures shall be designed so that fault currents result in increased main contact pressure. An overload or short circuit shall not cause the switch to go to a neutral position. Main contacts shall be designed for automatic transfer switch service. Inspection and replacement of all main and separate arcing contacts, moving and stationary, shall be possible from the front of the switch without any disassembly of operating linkages or power conductors. Two circuit breaker system is not acceptable.

B. Accessories: A separately mounted unitized control module shall include:

1. Nonadjustable (one-second, nominal) time delay to override momentary dips in normal power source.

2. Phase voltage relay supervision of three phases of the normal source 65 to 70 percent dropout (D.O.) and 92 to 95 percent pickup (P.U.) to detect "brown-out" conditions.

3. Voltage/frequency lockout relay (90 percent P.U., nominal) to prevent premature transfer.

4. System test switch (momentary type).

5. Engine starting control contacts (one-N.C. and one-N.O.).

6. Auxiliary pilot contacts rated 10 amperes at 480 Vac (one closed on "N" (normal) and one closed on "E" (emergency)).

7. Adjustable 2-25 minutes time delay on retransfer to normal power source.

8. The switch shall have full-rated neutral transfer contacts driven by the main contact shaft.

9. Provide adjustable time delay, 5 to 15 minutes, on shutdown of engine-generator after retransfer of the load to "normal".

10. Pilot lights to indicate source to which the load is connected.

11. Automatic Exerciser - Provide exerciser to function equivalent to a test switch to automatically start and run generator for 15 minutes every 168 hours. Provide selector switch to choose between test with load and test without load conditions.

12. Provide inphase monitor controls for transfer and retransfer of load.

PART 3 EXECUTION

3.1 INSTALLATION: Installation shall conform to the requirements of NFPA 70. Muffler and fuel connections shall be made under the Mechanical sections of this contract.

3.2 DIESEL ENGINE-GENERATOR: Install diesel generating unit as indicated. Provide vibration isolators to isolate vibrations from the diesel generating unit to the foundation.

3.3 TESTING: Perform the following tests on the generator set system provided. The Contracting Officer shall be given 5 working days notice prior to each test. The Contractor shall provide all test equipment, load bank, fuel, lubricants, and personnel and submit written copies of all test results.

A. Factory Tests: The engine-generator shall be subject to the manufacturer's standard run-in and conditioning tests. Following the run-in tests, test the engine-generator set at rated speed and voltage for 4 hours of continuous operation with 2 hours each at 50 and 100 percent of rated load, consecutively, 0.8 power factor. Determine generator frequency, phase current, and voltage and record at 15-minute intervals. Run tests on the voltage regulator to determine the variation in terminal voltage under conditions of constant load, and under conditions of abrupt load changes to determine the maximum voltage change during the surging period and the time required as specified in paragraph entitled "Voltage Regulator".

1. Speed Governing Test: Engine speed governing system shall be tested in accordance with ASME PTC26.

B. Field Tests and Inspections: The Contractor shall perform all field tests and trial operations and conduct all field inspections (except final field inspection). The Contractor shall provide all labor, equipment, load bank, and incidentals required for the tests. The Government Representative(s) will witness all field tests and trial operations and conduct final field inspections. The Contractor shall give the Contracting Officer ample notice of the dates and times scheduled for tests, trial operations, and inspections which require the presence of the Owner Representative. All deficiencies found shall be rectified and work affected by such deficiencies shall be completely retested at the Contractor's expense. A qualified factory representative shall assist the Contractor with the field checkout, startup, and test. Field tests shall include the following:

1. Demonstrate proper operation of all systems.

2. Simulate power failure and demonstrate complete automatic start, load, unload, by-pass, and stop sequence.

3. Conduct 6-hour load run utilizing Contractor-furnished portable load banks as follows:

a. 1/2 load--2 hours

b. Full load--4 hours

C. Failure to Meet Requirements: In the event any of the equipment fails to meet specified performance or fails to operate satisfactorily, the Owner shall have the right to operate the equipment until the defects have been corrected. Any equipment proved to be faulty or inadequate for the service specified will be rejected, but the Owner shall have the right to operate the rejected equipment until such time as new equipment is provided by the Contractor to replace the equipment rejected.

D. Instruction of Operators: After equipment is ready to be placed in service, the Contractor shall provide the services of the manufacturer's technical representative to fully instruct the Owner's designated plant operators in operation and maintenance of the equipment.

E. Cleaning: Clean work under provisions of Division 1. Clean engine and generator surfaces. Replace oil and fuel filters.

F. Operating Permit: Obtain EPA operating permit.

END OF SECTION

SECTION 16301

EXTERIOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1. RELATED DOCUMENTS

A. General conditions and special provisions preceding these specifications shall govern this section.

B. Specifications and drawings complement each other and what is specified, scheduled or mentioned by one shall be binding as if called for by both. Specifications and drawings are intended to specify nature, quantity, and quality of work. Report any error, conflicts, or omissions to the Owner's Representative (hereafter referred to as Contracting Officer) at least one week before submission of bids for interpretation or clarification. If errors or omissions are not reported, provide necessary work at no costs to Owner to complete intent of specifications and drawings.

1.2. SCOPE OF WORK

A. In general, provide complete conduit riser and underground raceways for electric.

B. Provide all material, labor, tools, and equipment to construct all items as indicated on the drawings and as specified herein; including but not limited to the following:

1. Complete underground raceway system including conduits, service risers, handholes and concrete pads that will be used by the Guam Power Authority, (hereafter referred to as GPA).

2. Coordinate work and arrange for periodic and specified inspections of work by GPA, and Contracting Officer. Request for inspection shall be submitted 2 days in advance.

3. Pass test mandrel through all ducts and conduits and make corrections as directed by inspectors or Contracting Officer.

4. Provide 70 lb. test nylon pull cord in all ducts and conduits, except provide 200 pound test line in all 4" ducts.

5. Immediately report and pay for damages to existing equipment.

C. Obtain and pay for electrical permits, arrange for periodic inspection by local authorities and deliver certificate of final inspection to Contracting Officer.

1.3. SPECIAL CONDITIONS

A. Contractor shall make detailed arrangements for work by utility agencies pertaining to this Contract. Payment to utility agencies for their work shall be by the Contractor. Request shall be submitted at least 7 days in advance for proper coordination.

B. Riser conduit work on utility pole shall be in accordance with utility agency standards.

C. Application for power service must be submitted eight months before service connection to allow for delivery of transformers.

1.4. WORK BY OTHERS

A. Electric utility and equipment by respective utility agencies.

B. Contractor shall schedule their work to allow the utility agencies sufficient time to complete their respective utility work within the time frame allowed under this contract.

1.5. WORKMANSHIP AND REGULATIONS

A. Work shall comply with ordinances of the Government of Guam, Department of Public Works, National Electrical Code, National Electrical Safety Code and applicable specifications and requirements of GPA.

B. Inspection, skill, and competency of workmanship shall be subject to the approval of the inspectors of GPA, and Contracting Officer. All concrete pouring, handhole fabrications, riser conduit erection, and duct laying shall be performed in the presence of the respective utility agencies and company's inspector. Notification shall be given 72 hours in advance.

1.6. DRAWINGS

A. Before installing, verify all dimensions, conditions, and sizes of equipment at job site.

B. During bidding and construction, Contractor shall coordinate his work with utilities and other trades to avoid omissions and overlapping responsibilities.

PART 2 PRODUCTS

2.1. GENERAL: Materials shall be new and those items listed by the Underwriters' Laboratories shall bear "UL" labels of approval.

2.2. CONDUIT

A. Underground conduits shall be PVC, Schedule 40.

B. Rigid Metal Conduits: Rigid aluminum, round bore electrical conduits, and used with threaded fitting. Manufacture and install in accordance with NEC Article 346. Use only where exposed.

C. Conduit and Duct Accessories: Couplings, spacers, plugs and accessories shall be as recommended by the manufacturer of conduits and ducts.

End Bells: End bells matching conduit or duct shall be provided at each entry into handhole or transformer.

2.3. GROUND RODS: Ground rods shall be 3/4" x 10' copperweld.

2.4. HARDWARE: Steel hardware for handholes shall be hot-dipped galvanized after fabrication.

2.5. STRUCTURAL REINFORCING BARS: Intermediate grade steel, deformed, and meeting ASTM Specifications A-15.

2.6. WIRE MESH: Welded steel wire fabric for reinforcing concrete, galvanized conforming to ASTM Specification A-185.

2.7. CONCRETE: Ready mixed type with compressive strengths as shown on drawing. Concrete material and aggregates shall be No. 3 fine.

2.8. BACKFILL MATERIAL

A. Selected Backfill: Sand, earth or earth and gravel mixture. If earth and gravel mixture, rock size shall be 1-inch or smaller and shall not contain more than 50% rock particles by volume. This fill shall be used over concrete encased ducts and over buried ducts after sand cushion has been placed, in accordance with drawings.

B. Sand Cushion: Manufactured sand or beach sand. This fill shall be used all around direct buried conduits as shown on the drawings.

2.9. WIRES AND CABLES

A. Ground Wire: as indicated.

B. Wires: 600 volts, No. 12 AWG minimum, copper conductor. Size No. 12 to 10 solid; No. 8 and larger stranded. National Electrical Code insulation: THW, RHW, THWN. Manufacture and install according to NEC Articles 300 and 310.

PART 3 PART 3 EXECUTION

3.1. TRENCH EXCAVATIONS

A. Dimensions and locations of trenches for handholes, pads, conduits and ductlines shall be as shown on the drawings. Trench width and depth shall be sufficient to accommodate proper installation of conduit banks.

B. Where a trench is excavated on slope, sides are to be vertical, and depth measured at lowest side. All measurements are to be based on final grade.

C. All trench bottoms are to be flat and smooth.

D. Trenches shall be widened at concrete transformer pad sites to permit proper entry of conduits.

E. Trenches shall be approved by utility inspector before any ducts are placed.

F. All excavations for handholes and pullboxes in excess of the depths required shall be filled with concrete or crushed rock.

G. Sheathing and bracing as required shall be provided to support sides of excavations from cave-ins.

H. Provide drainage and pumps to keep trenches dry.

I. Saw cut all edges of existing sidewalks and pavement before trenching.

3.2. BACKFILL

A. Concrete encasement or sand cushion backfilling shall be done after duct, pullbox and conduit installations have been approved by GPA and the Contracting Officer.

B. Sand cushion around direct buried conduit shall be 4" thick.

C. Selected backfill shall be used over concrete encased ducts only and sand cushioned ducts.

D. Backfilling shall be to finished grades shown on accompanying drawings and matching existing conditions.

E. Backfill material shall be completely free of wood or other debris.

F. Sand cushion around conduits shall be installed under supervision of utility agencies' inspectors.

G. Backfill material shall be placed in maximum of 12" layers in loose thickness before compacting. Backfill shall be thoroughly compacted with hand or mechanical tampers, and in no case, tamping shall be accomplished by using the wheels or tracts of a vehicle.

3.3. GPA TRANSFORMER PAD AND LOT

A. Slope of lots for concrete pads shall not exceed one-inch rise in one foot run.

B. Grade sufficiently around lots to prevent future filling of lots.

C. Concrete pad shall be level. The pad elevation shall be 2" above the highest sidewalk grade.

3.4. INSTALLATION OF CONDUIT AND DUCT BANKS

A. Trench bottom shall be clean, smooth, well graded and approved by utility agency inspectors.

B. Saw, cut, ream and taper ducts and conduits with manufacturer approved tool.

C. Coupling shall be tight to prevent entry of dirt or concrete into ducts and conduits.

D. Provide plastic spacers to maintain proper separation between ducts.

E. Conduits and duct run change of direction shall not exceed 4 degrees per length of conduit or duct. Radii and turns shall be made with appropriate duct short lengths.

F. Ducts shall be clean and free from debris and rubbish.

G. Concrete encasement shall be 3" all around duct bank.

H. When pouring concrete prevent heavy masses of concrete from falling directly on ducts. If unavoidable, protect ducts with plank.

I. Direct flow of concrete down sides of duct bank to bottom, to center, and then to rise up in middle thus filling all open spaces uniformly.

J. To insure against voids, work a long, flat splicing bar or spatula liberally and carefully up and down the vertical rows of ducts.

K. Cure for a minimum 72 hours before permitting traffic and backfilling.

L. During construction provide temporary conduit plugs at the end of conduit banks to prevent entry of dirt, rubbish, debris or concrete at end of each day's work.

M. Pass smooth bullet-shaped wooden test mandrel through the entire length of each duct or conduit to test for freedom of burrs and obstructions.

N. Install 70 lbs. nylon pull cord in each conduit after testing, except install 200 pound line in 4" ducts.

O. Apply thin coat of sealing compound on ducts and conduits at couplings and bells.

P. Couplings and bells shall be tight to prevent entry of dirt or concrete into ducts and conduits.

3.5. CONCRETE WORK

A. Concrete, ready mixed according to ASTM C-94-47.

B. Convey concrete from mixer to forms rapidly to prevent segregation. Free drop shall be limited to 5', unless authorized by inspector.

C. Placing:

1. Clean and remove all debris from inside forms and trenches before placing concrete.

2. Place concrete only on clean damp surfaces, but free from water.

3. Place concrete in forms in horizontal layers not exceeding 18" thickness.

4. Place concrete to avoid segregation of materials and displacement of ducts, inserts and reinforcing.

D. Forming:

1. Forms shall be of good sound lumber with sufficient strength and conforming to shapes and dimensions indicated on drawings.

2. Forms shall be treated with non-staining form oil immediately before each use.

E. Patching: Patch all voids, pour joints and holes before concrete is thoroughly dry. Use mortar of same proportions as original concrete.

F. Curing: Curing of concrete shall be accomplished by impervious membrane method with liquid membrane compound. Apply two or more coats of total one (1) gallon for one hundred and fifty (150) square feet of concrete surface.

G. Reinforcing Steel:

1. Clean reinforcing of mill or rust scale and form to dimensions indicated.

2. Install reinforcing in proper locations and secure in place to prevent movement during concrete placing or vibrating.

H. Hollow Concrete Block Work:

1. Hollow block shall be laid in full bed of mortar both horizontally and vertically and joints shall be tooled.

2. Mortar shall be one (1) part cement and three (3) parts sand thoroughly mixed and used when fresh. Retamping will not be allowed.

3. Setting bed shall be of depth required to bring top of blocks flush with finish line.

I. Finishing:

1. Handhole floors shall have integral cement topping with smooth metal trowelled finish.

2. Removable concrete covers for handholes shall be finished to match the adjacent sidewalk.

3.6. STRUCTURAL STEEL AND MISCELLANEOUS METAL WORK: Structural steel work including bolts, nuts, anchors, pulling-in irons, etc. shall be galvanized by hot-dipped process after fabrication into largest practical sections.

3.7. UNDERGROUND UTILITIES: Underground utilities indicated on plans, are approximate in location. It is not the intention of plans to imply that all existing utilities are drawn and located. It shall be the responsibility of Contractor to coordinate locations of existing utilities prior to doing any excavation work.

3.8. CLEANING AND REPAIRING

A. During the progress of work, all rubbish, waste, lumber, displaced materials, etc. shall be removed as soon as possible and upon completion of the work, Contractor shall remove from Owner's property and from all public and private property, at his own expense, all temporary structures, rubbish and waste material resulting from his operations.

B. The Contractor shall restore all removed or damaged pavement, gutters, curbs, sidewalks, sign posts, trees and landscape to as near their original conditions or better.

3.9. SOIL TREATMENT

A. All electrical backfill shall be treated with toxicant. Toxicant shall be registered with the Environmental Protection Agency (EPA) for use as specified herein. The toxicant shall be chlorpyrifos phosphorothiate, 1.0% concentration by weight. Diluent shall not include other pesticide residues or rinsates.

B. Application:

1. Licenses and Certification Requirements: The Contractor shall be licensed by the applicable agency responsible for enforcing the Federal Insecticide, Fungicide, and Rodenticide Act as amended (FIFRA), in the category required for performance of this contract. Pesticide applications shall be made by a certified applicator.

2. Application: Toxicant shall be applied by spraying after conduits have been covered by one foot of soil but prior to compaction. Application shall be at rate of 1.5 gallons per 10 square feet.

END OF SECTION

SECTION 16402

INTERIOR WIRING SYSTEMS

PART 1 GENERAL

1.1 RELATED REQUIREMENTS: Section 16050, "Basic Electrical Materials and Methods," applies to this section with additions and modifications specified herein.

1.2 SUBMITTALS

A. Shop Drawings - Submit for the following:

Panelboards
Transformers

B. Manufacturer's Data:

Receptacles
Circuit breakers
Switches
Conduit and fittings (each type)
Ground rods
Device plates
Insulated conductors
Outlet and junction boxes
Transformers

C. Test Reports: Submit test results for approval in report form.

1. Transformer tests: Submittal shall include routine NEMA ST20 transformer test results on each transformer and also contain the results of NEMA "design" and "prototype" tests that were made on transformers electrically and mechanically equal to those specified.

2. 600-volt wiring test.

3. Grounding system test.

1.3 QUALITY ASSURANCE: In each standard referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears. Interpret references in these standards to "authority having jurisdiction.

A. SD-01, DATA

1. Short-Circuit and Protective Devices Coordination Studies: Studies which demonstrate that the equipment selected, and system constructed meet the contract requirements for equipment ratings and coordination and protection. The studies shall include a complete single-line diagram of the power system covered by this specification; a short circuit study including the maximum and minimum values of short circuit currents at major buses extended down to system buses where currents are equal to 10,000 amperes symmetrical; utility company data including system voltage, transformer ratios, and relay device numbers and settings; and existing

power system data including time-current characteristic curves including recommended ratings and settings of all protective devices in tabulated form; and associated calculations to demonstrate that the power system or equipment submitted. Situations where system coordination is not achievable due to device limitations along with inadequate interrupting ratings shall be noted. These studies shall be performed by the registered Professional Engineer.

2. Equipment Performance: Data consisting of manufacturer's time-current characteristic curves for individual protective devices, recommended settings of adjustable protective devices, and recommended ratings of non-adjustable protective devices.

3. Qualifications: Verification of experience and license number of a registered Professional Engineer with at least four years of current experience in the design or coordinated power system protection. Experience data shall include at least five references for work of magnitude comparable to this contract, including points of contact, addresses and telephone numbers. This engineer must perform items required by this section to be performed by a registered Professional Engineer.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Materials, equipment and devices shall, as a minimum, meet the requirements of UL, where UL standards are established for those items, and the requirements of NFPA 70.

2.2 CONDUIT AND FITTINGS

A. Rigid Steel Conduit (Zinc-Coated): ANSI C80.1, UL 6.

B. Rigid Aluminum Conduit: ANSI C80.5, UL 6.

C. Rigid Nonmetallic Conduit: PVC Type EPC-40, in accordance with NEMA TC2.

D. Electrical Metallic Tubing (EMT): UL 797, ANSI C80.3.

E. Flexible Metal Conduit: UL 1.

1. Liquid-Tight Flexible Metal Conduit (Steel): UL 360.

F. Fittings for Metal Conduit, EMT and Flexible Metal Conduit: UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.

1. Fittings for Rigid Metal Conduit and IMC: Threaded type. Split couplings unacceptable.

2. Fittings for EMT: Compression-type.

3. Fittings for use in Hazardous Locations: UL 886.

G. Fittings for Rigid Nonmetallic Conduit: NEMA TC3.

2.3 OUTLET BOXES AND COVERS: UL 514A, cadmium- or zinc-coated, if of ferrous metal. UL 514C, if nonmetallic.

A. Outlet Boxes in Hazardous Locations: UL 886.

B. Floor Outlet Boxes: Boxes shall be adjustable and concrete-tight. Each outlet shall consist of a nonmetallic or cast-metal body with threaded openings or sheet-steel body with knockouts for conduits, adjustable ring, brass flange ring, and cover plate with 3/4-inch 1-inch or threaded plug. Receptacle outlets shall consist of flush brass housing with a duplex-type receptacle, as specified herein. Gaskets shall be used where necessary to ensure watertight installation.

2.4 CABINETS, JUNCTION BOXES AND PULL BOXES (WITH VOLUME GREATER THAN 100 CUBIC INCHES): UL 50, hot-dip zinc-coated, if of sheet steel.

2.5 WIRES AND CABLES: Wires and cables shall meet the applicable requirements of NFPA 70 and UL for the type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to the site shall not be used.

A. Conductors: No. 10 AWG and smaller shall be solid; No. 8 AWG and larger shall be stranded. Conductors shall be copper, unless indicated otherwise.

1. Minimum Conductor Sizes: Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote-control and signal circuits, No. 14 AWG; and for Class 2 Low-energy, remote-control and signal circuits, No. 16 AWG.

B. Color Coding: Provide for all service, feeder, branch, control, and signaling circuit conductors. Color shall be green for grounding conductors, and white for neutrals, except where neutrals of more than one system are installed in same raceway or box, the other neutral shall be white with a colored (not green) stripe. The color of the ungrounded conductors in different voltage systems shall be as follows:

1.	120/208 volt, 3-phase:	Phase A - black Phase B - red Phase C - blue
2.	277/480 volt, 3-phase:	Phase A - brown Phase B -orange Phase C -yellow
3.	120/240 volt, single phase:	red and black.

C. Insulation: Unless specified or indicated otherwise or required by NFPA 70, all power and lighting wires shall be 600-volt, Type THW, THWN, XHHW, or RHW, except that grounding wire may be Type TW; remote-control and signal circuits shall be Type TW, THW or TF. Conductors shall conform to UL 83. Where lighting fixtures require 90 degree C conductors, provide only conductors with 90 degree C insulation or better.

D. Bonding Conductors: ASTM B 1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B 8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

E. Service-Entrance (SE) and Underground Service-Entrance (USE) Cables: UL 854.

2.6 SPLICES AND TERMINATION COMPONENTS: UL 486A for wire connectors, and UL 510 for insulating tapes. Connectors for wires No. 10 AWG and smaller diameter wires shall be insulated,

pressure-type in accordance with UL 486A or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.7 DEVICE PLATES: Provide UL listed, one-piece device plates for outlets and fittings to suit the devices installed. Plates on finished walls shall be urea or phenolic, minimum 0.10-inch wall thickness. Plates shall be the same color as the receptacle or toggle switch with which they are mounted. Screws shall be machine type with countersunk heads in a color to match the finish of the plate. The use of sectional type device plates will not be permitted. Plates installed in wet locations shall be gasketed and UL listed for "wet locations".

2.8 SWITCHES

A. Toggle Switches: Fed. Spec. W-S-896, totally enclosed with bodies of thermosetting plastic and a mounting strap. Handles shall be ivory. Wiring terminals shall be of the screw type, side wired. Switches shall be rated quiet-type AC only, 120/277 volts, with the current rating and number of poles indicated.

B. Disconnect Switches: NEMA KS1. Switches serving as motor-disconnect means shall be horsepower rated. Provide heavy duty type switches where indicated, where switches are rated higher than 240 volts, and for double throw switches. Fused switches shall utilize Class R fuseholders and fuses, unless indicated otherwise. Provide switches in NEMA enclosure as indicated, per NEMA ICS 6.

C. Breakers Used as Switches: For 120-Volt LED, mark breakers "SWD" in accordance with UL 489.

2.9 RECEPTACLES: UL 498 and NEMA WDI, heavy-duty, specification grade grounding type. Ratings and configurations shall be as indicated. Wiring terminals shall be of the screw type, side wired. Connect grounding pole to the mounting strap. Bodies shall be ivory thermosetting plastic supported on a metal mounting strap.

A. Weatherproof Receptacles: Provide in a cast metal box with a gasketed, weatherproof, cast-metal cover plate and a gasketed cap over each receptacle opening. Receptacle shall be UL approved for use in "wet locations". All outdoor-location receptacles shall be GFCI and weather-resistant rated. Device cover shall be weatherproof rated, “in-use” type.

B. Ground Fault Circuit Interrupter (GFCI) Receptacles: UL 943, duplex type for mounting in a standard outlet box. The device shall be capable of detecting a current leak of 6 milliamperes or greater and tripping per requirements of UL 943 for Class A GFCI devices.

2.10 PANELBOARDS: UL 67 and UL 50. Panelboards for use as service disconnecting means shall additionally conform to UL 869. Panelboards shall be circuit breaker equipped bolt on type. Design shall be such that any individual breakers can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as a means of obtaining clearances as required by UL. Where "space only" (PFB) is indicated, make provisions for the future installation of a breaker sized as indicated. All panelboard locks shall be keyed same. Directories shall be typed to indicate load served by each circuit and mounted in a holder behind transparent protective covering.

A. Panelboard Buses: Provide panelboard with copper bus. Support bus bars on bases independent of the circuit breakers. Main buses and back pans shall be designed so that breakers may be changed without machining, drilling, or tapping. Provide an isolated neutral bus in each panel for connection of circuit neutral conductors. Provide a separate ground bus identified as equipment grounding bus per UL 67 for connecting grounding connectors; bond to steel cabinet.

B. Circuit Breakers: Fed. Spec. W-C-375 thermal magnetic type with interrupting capacity as indicated. Series rated circuit breakers are unacceptable. Breaker terminals shall be UL listed as suitable for the type of conductor provided. Plug-in circuit breakers unacceptable.

1. Multipole Breakers: Provide common-trip type with a single operating handle. Breaker design shall be such that an overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B and C, respectively.

2. Circuit Breaker with GFCI: UL 943 and NFPA 70. Provide with "push-to-test" button, visible indication of tripped condition, and ability to detect and trip on current imbalance of 6 milliamperes or greater per requirements of UL 943 for Class A GFCI devices.

2.11 ENCLOSED CIRCUIT BREAKERS: UL 489. Individual molded case circuit breakers with voltage and continuous current ratings, number of poles, overload trip setting, and short circuit interrupting rating as indicated. Enclosure type as indicated. Provide solid neutral.

2.12 TRANSFORMERS: NEMA ST20, general-purpose, dry-type, self-cooled, sealed. Provide transformers in a NEMA 1 enclosure. Transformer shall have 220 degrees C insulation system for transformer 15kVA and greater and shall have 180 degrees C insulation for transformers rated 10kVA and less, with temperature rise not exceeding 80 degrees C under full-rated load in maximum ambient of 40 degrees C. Transformer of 80 degrees C temperature rise shall be capable of carrying continuously 130 percent of nameplate kVA without exceeding insulation rating. Transformers shall be quiet type with maximum sound level of minimum 3 decibels less than NEMA standard level for transformer ratings indicated.

2.13 GROUNDING AND BONDING EQUIPMENT: UL 467. Ground rods shall be copper-encased steel, with minimum diameter of 3/4 inch and minimum length of 10 feet.

2.14 HAZARDOUS LOCATIONS: Electrical materials, equipment and devices for installation in hazardous locations, as defined by NFPA 70, shall be specifically approved by Underwriters' Laboratories, Inc., or Factory Mutual for the particular "Class", "Division", and "Group" of hazardous locations involved. The boundaries and classifications of hazardous locations shall be as indicated.

2.15 CONTACTOR: NEMA ICS 2, electrically operated, mechanically held contactor rated as indicated. Provide in NEMA 1 enclosure conforming to NEMA ICS 6. Contactor shall have silver alloy double-break contacts and coil clearing contactor with hand-off automatic selector switch.

2.16 NAMEPLATES: Fed. Spec. L-P-387. Provide as specified in Section 16050, "Basic Electrical Materials and Methods."

2.17 SOURCE QUALITY CONTROL: Test opening around electrical penetrations through fire resistive-rated walls, partitions, floor or ceiling for fire resistive integrity in accordance with ASTM E 814.

PART 3 EXECUTION

3.1 INSTALLATION: Electrical installations shall conform to requirements of NFPA 70 and to requirements specified herein.

A. Underground Service: Underground service conductors and associated conduit shall be continuous from service entrance equipment to outdoor power system connection.

B. Hazardous Locations: Work in hazardous locations, as defined by NFPA 70, shall be performed in strict accordance with NFPA 70 for the particular "Class", "Division", and "Group" of hazardous locations involved. Provide conduit and cable seals where required by NFPA 70. All conduit shall have tapered threads.

C. Service Entrance Identification: Service entrance disconnect devices, switches, or enclosures shall be labeled or identified as such.

1. Labels: Wherever work results in service entrance disconnect devices in more than one enclosure, as permitted by NFPA 70, each enclosure, new and existing, shall be labeled as one of several enclosures containing service entrance disconnect devices. Label, at minimum, shall indicated number of service disconnect devices housed by enclosure and shall indicate total number of enclosures that contain service disconnect devices. Provide laminated plastic labels. Use lettering of at least 0.25 inch in height and engrave on black-on-white matte finish. Service entrance disconnect devices in more than one enclosure shall be provided only as permitted by NFPA 70.

D. Wiring Methods: Provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise, or required by NFPA 70 to be installed otherwise. Provide insulated, green equipment grounding conductor in all feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated, green conductor for grounding conductors installed in conduit or raceways. Minimum conduit size shall be 3 /4 inch in diameter for low voltage lighting and power circuits. Vertical distribution in multiple story buildings shall be made with metal conduit in fire-rated shafts. Metal conduit shall extend through shafts for minimum distance of 6 inches. Conduit which penetrates fire walls, fire partitions, or floors shall be metallic on both sides of fire walls, fire partitions, or floors for minimum distance of 6 inches.

1. Aluminum Conduit: Use in exposed installation and in unairconditioned spaces.

a. Do not install underground or encase in concrete.

b. Do not use brass or bronze fittings.

2. Electrical Metallic Tubing: Use in dry partitions and above drop ceiling.

a. Do not use in feeder circuits.

b. Do not install underground.

c. Do not encase in concrete.

d. Do not use in areas where subject to severe physical damage (including, but not limited to, mechanical equipment rooms and electrical equipment rooms).

e. Do not use in hazardous areas.

f. Do not use in outdoor work.

3. Nonmetallic Conduit:

a. Underground Conduit: PVC, Type EPC-40; or fiberglass.

b. Conduit Embedded in Concrete: PVC, Type EPC-40.

c. Restrictions applicable to PVC Schedule 40 and PVC Schedule 80:

(1) Do not use in areas subject to severe physical damage (including, but not limited to, mechanical equipment rooms, electrical equipment rooms, etc.).

(2) Do not use in hazardous areas.

(3) Do not use in penetrating fire-rated walls or partitions, fire rated floors, etc.

E. Conduit Installation: Unless indicated otherwise, conceal conduit within finished walls, ceilings, and floors. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot-water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members were located above accessible ceilings and where conduit will be visible after completion of project.

1. Where conduits rise through floor slabs, the curved portion of bends shall not be visible above the finish slab.

2. Conduit Support: Support conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. The load applied to fasteners shall not exceed one-fourth of the proof test load. Fasteners attached to concrete ceiling shall be vibration resistant and shock resistant. Holes cut to a depth of more than 1-1/2 inches in reinforced concrete beams or to a depth of more than 3/4-inch in concrete joints shall not cut the main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet-metal screws. In suspended-ceiling construction, run conduit above the ceiling. Spring steel fasteners may be used for lighting branch circuit conduit supports in suspended ceiling in dry locations. Support exposed risers in wire shafts of multi-story buildings by U-clamp hangers at each floor level and at 10 feet maximum intervals. Where conduit crosses building expansion joints provide a suitable watertight expansion/deflection fitting that maintains the conduit electrical continuity by bonding jumpers or other means.

3. Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with a hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of all obstructions.

4. Install pull wires in empty conduit in which wire is to be installed by others. The pull wire shall be plastic having minimum 200-pound tensile strength. Leave a minimum 12 inches of slack at each end of the pull wire.

5. Conduit Installed in Concrete Floor Slabs: Locate so as not to adversely affect the structural strength of the slabs. Install conduit within the middle one-third of the

concrete slab. Do not stack conduits. Space conduit horizontally minimum three diameters except at cabinet locations. Curved portions of bends shall not be visible above the finish slab. Increase slab thickness as necessary to provide a minimum one-inch cover over conduit. Where embedded conduits cross expansion joints, provide suitable watertight expansion/deflection fittings and bonding jumpers. Conduit larger than one-inch trade size shall be parallel with or at right angles to the main reinforcement; when at right angles to the reinforcement, the conduit shall be close to one of the supports of the slab. Where nonmetallic conduit is used, raceway must be converted to plastic coated rigid steel before rising above floor, unless specifically indicated otherwise.

6. Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use minimum single locknut and bushing. Locknuts shall have sharp edges for digging into the wall of metal enclosures. Install bushings on the ends of conduits and provide insulating type where required by NFPA 70.

7. Stub-Ups: Provide conduits stubbed up through concrete floor for connection to free-standing equipment with an adjustable top or coupling threaded inside for plugs, set flush with the finished floor. Extend conductors to equipment in rigid steel conduit, except that flexible metal conduit may be used 6 inches above the floor. Where no equipment connections are made, install screwdriver-operated threaded flush plugs in conduit end.

8. Flexible Connections: Provide flexible connections of short length, 6 feet maximum, for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Provide liquid-tight flexible conduit in wet locations. Provide separate ground conductor across flexible connections.

F. Boxes, Outlets and Supports: Provide boxes in the wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be of the cast-metal hub type when located in wet locations, when surface mounted on outside of exterior surfaces, when installed exposed up to 7 feet above interior floors and walkways, or when installed in hazardous areas. Boxes in other locations shall be sheet steel, except that aluminum boxes may be used with aluminum conduit; nonmetallic boxes may be used with nonmetallic conduit system. Each box shall have the volume required by NFPA 70 for the number of conductors enclosed in the box. Boxes for mounting lighting fixtures shall be minimum 4 inches square or octagonal, except that smaller boxes may be installed as required by fixture configurations, as approved. Boxes for use in masonry-block or tile walls shall be square-cornered tile-type, or standard boxes having square-cornered tile-type covers. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces. Provide separate boxes for flush or recessed fixtures when required by the fixture terminal operating temperature; fixtures shall be readily removable for access to the boxes unless ceiling access panels are provided. Support boxes and pendants for surface-mounted fixtures on suspended ceilings independently of the ceiling supports or make adequate provisions for distributing the load over the ceiling support members. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units and with machine screws or welded studs on steel. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support; support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on

opposite sides of the box and support the raceway with an approved type fastener maximum 24 inches from the box. When penetrating reinforced-concrete members, avoid cutting any reinforcing steel.

1. Boxes for use with raceway systems shall be minimum 1-1/2 inches deep, except where shallower boxes required by structural conditions are approved. Boxes for other than lighting-fixture outlets shall be minimum 4 inches square, except that 4 inch by 2 inch boxes may be used where only one raceway enters the outlet.

2. Pull Boxes: Construct of at least the minimum size required by NFPA 70 of code-gage aluminum or galvanized sheet steel, except where cast-metal boxes are required in locations specified herein. Furnish boxes with screw-fastened covers. Where several feeders pass through a common pull box, tag the feeders to indicate clearly the electrical characteristics, circuit number, and panel designation.

G. Mounting Heights: Mount panelboards, circuit breakers, and disconnecting switches so the height of the operating handle at its highest position maximum 72 inches above the floor. Mount lighting switches receptacles and other devices as indicated. Measure mounting heights of wiring devices and outlets to the center of device or outlet.

H. Conductor Identification: Provide conductor identification within each enclosure where a tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, color coding shall be by factory-applied color-impregnated insulation. For conductors No. 4 AWG and larger diameter, color coding shall be by plastic-coated self-sticking markers, colored nylon cable ties and plates, or heat-shrink type sleeves. Identify control circuit terminations.

I. Splices: Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with an insulated pressure type connector. Make splices in conductors No. 8 AWG and larger diameter with a solderless connector and cover with an insulation material equivalent to the conductor insulation.

J. Covers and Device Plates: Install with edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings are not permitted. Plates shall be installed with an alignment tolerance of 1/16 inch. The use of sectional type device plates are not permitted. Plates installed in wet locations shall be gasketed.

K. Electrical Penetrations: Openings around electrical penetrations through fire resistance rated walls, partitions, floors, or ceilings shall be sealed to maintain fire resistive integrity as tested per ASTM E 814.

L. Grounding and Bonding: In accordance with NFPA 70. Ground all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, and neutral conductor of wiring systems. Make ground connection to driven ground rods on the exterior of the building. Where ground fault protection is employed, ensure that the connection of ground and neutral does not interfere with the correct operation of the fault protection. Bond building foundation rebars to ground.

1. Grounding Conductor: Provide an insulated, green equipment grounding conductor in all feeder and branch circuits including lighting circuits. Grounding conductor shall be separated from the electrical system neutral conductor. Provide insulated, green conductor for grounding conductors installed in conduit or raceways.

2. Resistance: The maximum resistance to ground of the grounding system shall not exceed 25 ohms under normally dry conditions. Where the resistance obtained exceed 25 ohms provide additional ground rods to achieve the resistance level. Spacing of ground rods shall not exceed 10 feet apart.

M. Elevator: Provide circuit to line terminals of elevator controller, and disconnect switch on line side of controller, outlet for control power, outlet receptacle and work light at midheight of elevator shaft, and work light and outlet receptacle in elevator pit.

N. Owner-Furnished Equipment: The Contractor shall make connections to Owner-furnished equipment to make equipment operate as intended, including providing miscellaneous items such as plugs, receptacles, wire, cable, conduit, flexible conduit, and outlet boxes or fittings.

O. Motor Load: When motor size provided differs from the size indicated or specified, make adjustments to the wiring, disconnect devices, and branch circuit protection to accommodate the equipment actually provided.

3.2 FIELD QUALITY CONTROL: Furnish test equipment and personnel and submit written copies of test results to the Contracting Officer. Give five working days notice prior to each test.

A. Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least five times, demonstrating satisfactory operation each time.

B. Transformer Tests: Perform tests classified as routine in accordance with NEMA ST 20 on each transformer.

C. Test on 600-Volt Wiring: Test all 600-volt wiring to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on all wiring No. 6 AWG and larger diameter using an instrument which applies a voltage of approximately 500 volts to provide a direct reading of resistance; minimum resistance shall be 250,000 ohms.

D. Grounding System Test: Test the grounding system to ensure continuity and resistance to ground is not excessive. Test each ground rod for resistance to ground before making any connections to the rod; tie grounding system together and test for resistance to ground. Make resistance measurements in dry weather, not earlier than 48 hours after rainfall. Submit written results of each test to the Contracting Officer and indicate the location of the rods as well as the resistance and soil conditions at the time the measurements were made.

END OF SECTION

SECTION 16475

INTERIOR SWITCHGEAR AND SWITCHBOARDS, LOW-VOLTAGE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS: Section 16050, "Basic Electrical Materials and Methods," applies to this section, with the additions and modifications specified herein. Equipment, materials, installation, and workmanship shall be in accordance with the required and advisory provisions of NFPA 70. Materials not normally furnished by the manufacturer of the equipment shall be provided in Section 16301, "Underground Electrical Work" and Section 16402, "Interior Wiring Systems".

1.2 SUBMITTALS

A. Manufacturer's Data

1. Switchboards;
2. Meters;
3. Relays; and
4. Circuit Breakers.

B. Shop Drawings: Furnish drawings for switchboards including, but not limited to, the following:

1. Overall dimensions and front view;
2. Ampere ratings of bus bars;
3. Maximum short circuit bracing;
4. Circuit breaker type, interrupting rating, trip setting;
5. Provision for future extension;
6. Elementary diagrams and wiring diagrams with terminals identified, and indicating prewired interconnections between items of equipment and the interconnection between the items; and
7. One-line diagrams.

C. Certified Laboratory Test Reports:

1. Switchgear Production Tests: Furnish reports which include results of production tests performed according to ANSI C37.20.

2. Switchgear Paint Qualification Test: Furnish reports showing that the paint qualification test of UL 1558 has been performed to ensure the adequacy of finishes to inhibit the buildup of rust on ferrous metal materials used for enclosures.

3. Switchboard Production Tests: Furnish reports which include results of production tests performed according to NEMA PB 2.

D. Operation and Maintenance Manuals:

1. Switchboards

E. Field Tests Reports: Certified copies of dielectric tests reports.

F. Ground Resistance Tests Reports: Upon completion and before final acceptance of the work, submit the measured ground resistance of each ground rod and grounding system, indicating the location of the rod and grounding system and soil condition at the time the measurements were taken.

PART 2 PRODUCTS

2.1 SWITCHBOARDS: NEMA PB 2, deadfront, metal-enclosed, self-supported type. Main bus shall be rated as indicated. Switchboard shall be UL listed as service entrance equipment. Devices shall be front accessible and shall be completely isolated between sections by vertical steel barriers. Provide switchboard in NEMA ICS 6 Type 1 enclosure. Switchboard shall be factory engineered and assembled, including protective devices and equipment indicated with necessary interconnections, instrumentations, and control wiring. Switchboard shall consist of main, auxiliary and distribution sections.

A. Bus Bars: Copper with silver-plated contact surfaces. Plating shall be a minimum of 0.0002 inches thick. Make bus connections and joints with hardened steel bolts. A full-capacity bus shall connect sections together, with provisions for future expansion. Buses shall be insulated from the devices so that the only exposed energized parts will be at the point of connection to devices. Locate each bus horizontally in the rear of each section behind the components and vertically centered. Support and brace the buses for the short circuit current specified. Provide and secure ground bus to each vertical switchboard section and extend ground bus to the entire length of the structure. Size neutral bus 100 percent of full load amperes.

B. Main Protective Device: Individually mounted molded-case circuit breaker removable from the front of the switchboard.

1. Molded Case Circuit Breaker: UL 489. Manually operated, rated as indicated, equipped with solid-state trips, with current sensors and solid-state logic circuits integral to the circuit breaker frame. The solid-state current control shall provide adjustable ampere setting, adjustable long-time delay, short-time delay, and adjustable instantaneous trip. Settings shall be located behind cover to deter tampering. Provide ground fault protection having solid-state circuitry as an integral part of the circuit breaker frame.

C. Auxiliary Section: Provide a watthour meter with 15 - minute maximum demand register, ammeter with integral peak current demand indicator, voltmeter, selector switches, potential transformers, current transformers in each phase, and related control wiring, fuses, and accessories.

1. Watthour Meter: ANSI C12.10 with 3-wire, single pole double throw, quick-make, quick-break pulse initiator. Coordinate pulse output ratio with main circuit breaker rating.

2. Mechanical Demand Register: ANSI C12.4.

3. Voltmeter and Ammeter: ANSI C39.1.

4. Potential and Current Transformers: ANSI C57.13.

5. Instrument Control Switches: Provide rotary cam operated type with positive means of indicating contact positions. Switches shall have silver-to-silver contacts enclosed in a protective cover which can be removed to inspect the contacts.

D. Distribution Section: Provide group mounted devices arranged to allow removal and interchanging from the front of the switchboard without disturbing adjacent devices. Where indicated, "space for future" or "space" shall mean to include bus, device supports, and connections. Group mounted devices shall be mounted in a panelboard arrangement.

1. Feeder Breakers: Molded-case current-limiting type unless indicated otherwise, of sizes and capacity indicated.

E. Finish: ANSI Z55.1, ANSI 61 or ANSI 49 light gray, for exterior surfaces of switchboard assembly.

2.2 CORROSION PROTECTION: Bases, frames, and channels of switchgear and switchboards which come in contact with concrete shall be corrosion resistant and shall be fabricated of hot-dip galvanized steel.

A. Galvanized Steel: ASTM A123, ASTM A525 G90 coating, and ASTM A153, as applicable. Galvanize after fabrication where practicable. Galvanizing repair paint shall conform to Mil. Spec. DOD-P-21035.

2.3 WIRE MARKING: Mark control and metering conductors at each end. Provide factory-installed white plastic tubing heat stamped with black block type letters on factory-installed wiring. On field-installed wiring, provide white preprinted polyvinyl chloride (PVC) sleeves, heat stamped with black block type letters. Each sleeve shall contain a single letter or number, shall be elliptically shaped to securely grip the wire, and shall be keyed in such a manner to ensure alignment with adjacent sleeves. Provide specific wire markings using the appropriate combination of individual sleeves. Each wire marker shall indicate the device or equipment, including specific terminal number to which the remote end of the wire is attached.

PART 3 EXECUTION

3.1 INSTALLATION: Electrical installations shall conform to ANSI C2, NFPA 70, and to the requirements specified herein. Provide new equipment and materials, unless indicated or specified otherwise.

3.2 GROUNDING: NFPA 70 and ANSI C2, except that grounds and grounding systems shall have a resistance to solid earth ground not exceeding 25 ohms.

A. Grounding Electrodes: Where practicable, use electrically continuous metallic buried water piping for grounding electrodes, supplemented by driven ground rods and building foundation rebar as specified in Section 16402, "Interior Wiring Systems". Provide bolted (clamped) connection at equipment end of ground conductors.

B. Switchboard Grounding: Provide bare copper cable not smaller than No. 4/0 AWG not less than 24 inches below grade connecting to the indicated ground rods.

C. Connections: Weld joints in grounding conductors and mats. The welding process shall not cause joined parts to be damaged or weakened and shall join strands. The welding process shall be an exothermic type, and the completed connection or joint shall be equal or larger in size than the conductors joined.

D. Ground Cable Crossing Expansion Joints in Structures and Pavements: Protect from damage by means of approved devices or methods of installation to allow the necessary slack in the cable across the joint to permit movement. Use stranded or other approved flexible copper cable run or jumper across such separations.

E. Grounding and Bonding Equipment: UL 467, except as indicated or specified otherwise.

3.3 INSTALLATION OF EQUIPMENT AND ASSEMBLIES: Install and connect switchboards as indicated on project drawings, the approved shop drawings, and as specified herein.

A. Switchboard: NEMA PB 2.1.

B. Meters and Instrument Transformers: ANSI C12.1.

C. Galvanizing Repair: ASTM A780, using galvanizing repair paint for galvanizing damaged by handling, transporting, cutting, welding, or bolting. Do not heat surfaces that repair paint has been applied to.

3.4 FOUNDATION FOR EQUIPMENT AND ASSEMBLIES: Mount switchboard on concrete slab. The top of the concrete slab shall be approximately 4 inches above the finished floor. Edges above floor shall have 1/2-inch chamfer. The slab shall be of adequate size to project at least 8 inches beyond the equipment. Provide concrete work under Section 03300 or 03302, "Cast-in Place Concrete."

3.5 FIELD TESTS AND INSPECTIONS

A. Performance of Acceptance Checks, Settings, and Tests: Perform in accordance with the manufacturer's recommendations, NFPA 70B, and referenced ANSI standards. Perform tests to obtain information about the performance of the breakers, meters, wiring, and instrument transformers together as a unit, as well as separately. Tests shall include but not be limited to the following:

1. Compare actual connections with wiring diagrams. If differences are found, determine if error is in diagram or in actual wiring; correct as necessary.

2. Inspect devices and equipment for damage or maladjustment caused by shipment or installation.

3. Use calibrated torque wrench to assure that tightness of bolted bus joints are in accordance with manufacturer's recommendations.

4. Perform mechanical operator and contact alignment tests on breakers and operating mechanisms in accordance with manufacturer's recommendations. Adjust as necessary.

5. Measure breaker contact resistance and perform minimum pickup voltage tests on trip and closing coils. Adjust as necessary to stay within manufacturer's acceptable range.

6. Check electrical continuity of current, potential, and control circuits in accordance with wiring diagrams.

7. Perform insulation resistance test at 500 volts dc on field-installed control wiring. Disconnect field-installed control wiring from equipment and from factory-installed wiring before testing. Minimum insulation resistance shall be 1,000,000 ohms.

8. Verify type, range, and connections of instrument transformers. Confirm correct polarity of current transformers electrically.

9. Remove short-circuiting links from current transformers after checking that secondary circuits are complete.

10. Verify meter connections and ensure calibration.

11. Remove wedges, ties, and blocks installed by the manufacturer to prevent damage during shipment.

12. Check low-voltage circuit breakers in accordance with manufacturer's instructions. Check time-current characteristics with a test kit approved by the breaker manufacturer.

13. Perform testing and calibration of power relays by a certified relay technician.

14. Verify maximum resistance to ground of grounding systems.

CAUTION: Changes of connection, insertion, and removal of instruments and meters must be performed in such a manner that the secondary circuits of energized current transformers are not opened, even momentarily.

B. Field Dielectric Tests: Perform on low-voltage switchgear according to ANSI C37.20.

C. Follow-up Verification: Upon completion of acceptance checks, settings, and tests, the Contractor shall show by demonstration in service that circuits and devices are in good operating condition and performing the intended function. Circuit breakers shall be tripped by operation of each protective device. Test shall require each item to perform its function not less than three times. As an exception to requirements stated elsewhere in the contract, the Contracting Officer shall be given 5 working days advance notice of the dates and times for checks, settings, and tests.

END OF SECTION

SECTION 16501

COORDINATED POWER SYSTEM PROTECTION

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

The power system covered by this specification consists of 3-phase, ungrounded 13.8 kV system supplying 480/277 V loads and 480-208/120 V loads.

1.2 SUBMITTALS

Approval is required for submittals indicated. Submit the following in accordance with the SUBMITTAL PROCEDURES:

A. Product Data

Fault Current Analysis

Protective Device Coordination Study

System Coordinator

1.3 QUALITY ASSURANCE

A. System Coordinator

System coordination recommended ratings and settings of protective devices, and design analysis must be accomplished by a registered professional electrical power engineer with a minimum of 3 years of current experience in the coordination of electrical power systems. Submit verification of experience and license number, of a registered Professional Engineer as specified above. Provide experience data consisting of at least five references for work of a magnitude comparable to this contract, including points of contact, addresses and telephone numbers.

PART 2 PRODUCTS

2.1 COORDINATED POWER SYSTEM PROTECTION

Contractor to prepare analyses to demonstrate that the equipment selected, and system constructed meet the contract requirements for ratings, coordination, and protection. Include a load flow analysis, a fault current analysis, and a protective device coordination study. Submit the study along with protective device equipment submittals. No time extensions or similar contact modifications will be granted for work arising out of the requirements for this study. Approval of protective devices proposed will be based on recommendations of this study. The Government is not responsible for any changes to equipment, device ratings, settings, or additional labor for installation of equipment or devices ordered and/or procured prior to approval of the study. The studies must be performed by a registered professional engineer with demonstrated experience in power system coordination in the last 3 years. Provide a list of references complete with points of contact, addresses and telephone numbers. The selection of the engineer is subject to the approval of the Contracting Officer.

A. Scope of Analyses

The fault current analysis and protective device coordination study must begin at the source bus of medium voltage primary transformer and extend down to system buses where fault availability is 10,000 amperes (symmetrical) for building/facility 600 volt level distribution buses.

B. Determination of Facts

Determine and document the time-current characteristics, features, and nameplate data for each existing protective device. Coordinate with the commercial power company for fault current availability at the site.

C. Single Line Diagram

Prepare a single line diagram to show the electrical system buses, devices, transformation points, and all sources of fault current (including generator and motor contributions). A fault-impedance diagram or a computer analysis diagram may be provided. Each bus, device or transformation point must have a unique identifier. If a fault-impedance diagram is provided, show impedance data. Show location of switches, breakers, and circuit interrupting devices on the diagram together with available fault data, and the device interrupting rating.

D. Fault Current Analysis

1. Method

Perform the fault current analysis in accordance with methods described in IEEE 242, and IEEE 399.

2. Data

Utilize actual data in fault calculations. Bus characteristics and transformer impedance must be those proposed. Document data in the report.

3. Fault Current Availability

Provide balanced three-phase fault, bolted line-to-line fault, and line-to-ground fault current values at each voltage transformation point and at each power distribution bus. Show the maximum and minimum values of fault available at each location in tabular form on the diagram or in the report.

E. Coordination Study

Demonstrate that the maximum possible degree of selectivity has been obtained between devices specified, consistent with protection of equipment and conductors from damage from overloads and fault conditions. Include a description of the coordination of the protective devices in this project. Provide a written narrative describing which devices may operate in the event of a fault at each bus; the logic used to arrive at device ratings and settings; situations where system coordination is not achievable due to device limitations (an analysis of any device curves which overlap); coordination between upstream and downstream devices; and relay settings. Provide recommendations to improve or enhance system reliability, and detail where such changes would involve additions or modifications to the contract and cost damages (addition or reduction). Provide composite coordination plots on log-log graph paper.

F. Study report

1. Include a narrative describing: the analyses performed; the bases and methods used; and the desired method of coordinated protection of the power system.

2. Include descriptive and technical data for existing devices and new protective devices proposed. Include manufacturers published data, nameplate data, and definition of the fixed or adjustable features of the existing or new protective devices.

3. Document utility company data including system voltages, fault MVA, system X/R ratio, time-current characteristic curves, current transformer ratios, and relay device numbers and settings; and existing power system data including time-current characteristic curves and protective device ratings and settings.

4. The report must contain fully coordinated composite time-current characteristics curves for each bus in the system, as required to ensure coordinated power system protection between protective devices or equipment. Include recommended ratings and settings of all protective devices in tabulated form.

5. Provide the calculation performed for the analyses, including computer analysis programs utilized. Provide the name of the software package, developer, and version number.

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 16510

INTERIOR LIGHTING

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

Materials not considered to be luminaires, luminaire accessories, or lighting equipment are specified in Section 16402 INTERIOR WIRING SYSTEM. Luminaires and accessories that are mounted in exterior environments and not attached to the exterior of the building are specified in Section 16520 EXTERIOR LIGHTING.

1.2 DEFINITIONS

A. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications and on the drawings, must be as defined in IEEE 100 and ANSI/IES LS-1.

B. For LED luminaire light sources, "Useful Life" is the operating hours before reaching 70 percent of the initial rated lumen output (L70) with no catastrophic failures under normal operating conditions. This is also known as 70 percent "Rated Lumen Maintenance Life" as defined in ANSI/IES LM-80.

C. For LED luminaires, "Luminaire Efficacy" (LE) is the appropriate measure of energy efficiency, measured in lumens/watt. This is gathered from LM-79 data for the luminaire, in which absolute photometry is used to measure the lumen output of the luminaire as one entity, not the source separately and then the source and housing together.

D. Total harmonic distortion (THD) is the root mean square (RMS) of all the harmonic components divided by the total fundamental current.

1.3 SUBMITTALS

A. Shop Drawings

Luminaire Drawings
Occupancy/Vacancy Sensor Coverage Layout
Lighting Control System One-Line Diagram
Sequence of Operation for Lighting Control System

B. Product Data

Luminaires
Light Sources
LED Drivers
Luminaire Warranty
Lighting Controls Warranty
Local Area Controller
Lighting Relay Panel
Lighting Control Panel
Gateway
Lighting Contactor
Switches
Digital Switch Timers

Wall Box Dimmers
Scene Wallstations
Occupancy/Vacancy Sensors
Photosensors
Time Clocks
Power Packs
Power Hook Luminaire Hangers
Exit Signs
Emergency Drivers
Linear LED Lamps

C. Design Data

Luminaire Design Data
Photometric Plan

D. Reports

ANSI/IES LM-79 Test Report
ANSI/IES LM-80 Test Report
ANSI/IES TM-21 Test Report
ANSI/IES TM-30 Test Report
Occupancy/Vacancy Sensor Verification Test
Photosensor Verification Test

E. Certificates

LED Driver and Dimming Switch Compatibility Certificate

F. Operation and Maintenance Data

Lighting System
Lighting Control System
Maintenance Staff Training Plan
End-User Training Plan

1.4 QUALITY ASSURANCE

Data, drawings, and reports must employ the terminology, classifications and methods prescribed by the IES Lighting Library as applicable, for the lighting system specified.

A. Luminaire Drawings

Include dimensions, accessories installation details, and construction details. Photometric data, including CRI, CCT, LED driver type, zonal lumen data, and candlepower distribution data must accompany shop drawings.

B. Luminaire Design Data

1. Provide safety certification and file number for the luminaire family that must be listed, labeled, or identified in accordance with the NFPA 70. Applicable testing bodies are determined by the US Occupational Safety Health Administration (OSHA) as Nationally Recognized Testing Laboratories (NRTL) and include: CSA (Canadian Standards Association), ETL (Edison Testing Laboratory), and UL (Underwriters Laboratories).

2. Provide long term lumen maintenance projections for each LED luminaire in accordance with ANSI/IES TM-21. Data used for projections must be obtained from testing in accordance with ANSI/IES LM-80.

C. ANSI/IES LM-79 Test Report

Submit test report on manufacturer's standard production model of specified luminaire. Testing must be performed at the same operating drive current as specified luminaire. Include all applicable and required data in IES format as outlined under "14.0 Test Report" in ANSI/IES LM-79.

D. ANSI/IES LM-80 Test Report

Submit report on manufacturer's standard production LED light source (package, array, or module) of specified luminaire. Testing must be performed at the same operating drive current as specified luminaire. Include all applicable and required data as outlined under "8.0 Test Report" in ANSI/IES LM-80.

E. ANSI/IES TM-21 Test Report

Submit test report on manufacturer's standard production LED light source (package, array, or module) of specified luminaire. Testing must be performed at the same operating drive current as specified luminaire. Include all applicable and required data, as well as required interpolation information as outlined under "7.0 Report" in ANSI/IES TM-21.

F. ANSI/IES TM-30 Test Report

Submit color vector graphic in accordance with ANSI/IES TM-30 on manufacturer's standard production LED light source (package, array, or module) of specified luminaire. Include spectral distribution of test LED light source.

G. LED Driver and Dimming Switch Compatibility Certificate

Submit certification from the luminaire, driver, or dimmer switch manufacturer that ensures compatibility and operability between devices without flickering and to specified dimming levels.

H. Occupancy/Vacancy Sensor Coverage Layout

Provide floor plans showing coverage layouts of all devices using manufacturer's product information.

I. Test Laboratories

Test laboratories for the ANSI/IES LM-79 and ANSI/IES LM-80 test reports must be one of the following:

1. National Voluntary Laboratory Accreditation Program (NVLAP) accredited for solid-state lighting testing as part of the Energy-Efficient Lighting Products laboratory accreditation program for both LM-79 and LM-80 testing.

2. One of the qualified labs listed on the Department of Energy - LED Lighting Facts Approved Testing Laboratories List for LM-79 testing.

3. One of the EPA-Recognized Laboratories listed for LM-80 testing.

J. Regulatory Requirements

Equipment, materials, installation, and workmanship must be in accordance with the mandatory and advisory provisions of NFPA 70, unless more stringent requirements are specified or indicated. Provide luminaires and assembled components that are approved by and bear the label of UL for the applicable location and conditions unless otherwise specified.

K. Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design, and workmanship. Products must have been in satisfactory commercial or industrial use for six months prior to bid opening. The six-month period must include applications of equipment and materials under similar circumstances and of similar size. The product must have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the six-month period. Where two or more items of the same class of equipment are required, these items must be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1. Alternative Qualifications

Products having less than a six-month field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

2. Material and Equipment Manufacturing Date

Do not use products manufactured more than six months prior to date of delivery to site, unless specified otherwise.

1.5 WARRANTY

Support all equipment items by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

A. Luminaire Warranty

Provide and transfer to the owner the original LED luminaire manufacturers standard commercial warranty for each different luminaire manufacturer used in the project.

1. Provide a written five year minimum replacement warranty for material, luminaire finish, and workmanship. Provide written warranty document that contains all warranty processing information needed, including customer service point of contact, whether or not a return authorization number is required, return shipping information, and closest return location to the luminaire location.

(a) Finish warranty must include failure and substantial deterioration such as blistering, cracking, peeling, chalking, or fading.

(b) Material warranty must include:

(1) All LED drivers and integral control equipment.

(2) Replacement when more than 10 percent of LED sources in any lightbar or subassembly(s) are defective, non-starting, or operating below 70 percent of specified lumen output.

2. Warranty period must begin in accordance with the manufacturer's standard warranty starting date.

3. Provide replacements that are promptly shipped, without charge, to the using Government facility point of contact and that are identical to or an improvement upon the original equipment. All replacements must include testing of new components and assembly.

B. Lighting Controls Warranty

Provide and transfer to the owner the original lighting controls manufacturers standard commercial warranty for each different lighting controls manufacturer used in the project. Warranty coverage must begin from date of final system commissioning or three months from date of delivery, whichever is the earliest. Warranty service must be performed by a factory-trained engineer or technician.

1. Unless otherwise noted, provide a written five year minimum warranty on the complete system for all systems with factory commissioning. Provide warranty that covers 100 percent of the cost of any replacement parts and services required over the five years which are directly attributable to the product failure. Failures include, but are not limited to, the following:

(a) Software: Failure of input/output to execute switching or dimming commands.

(b) Damage of electronic components due to transient voltage surges.

(c) Failure of control devices, including but not limited to occupancy sensors, photosensors, and manual wall station control devices.

2. Provide a written five year minimum warranty on all input devices against defect in workmanship or materials provided by device manufacturer.

3. Provide a written five year minimum warranty on all control components attached to luminaires against defect in workmanship or materials.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Lighting System

Provide operation and maintenance manuals for the lighting system that provide basic data relating to the design, operation, and maintenance of the lighting system for the building. Include the following:

1. Manufacturers' operating and maintenance manuals.

2. Luminaire shop drawings for modified and custom luminaires.

3. Luminaire Manufacturers' standard commercial warranty information as specified in paragraph LUMINAIRE WARRANTY.

B. Lighting Control System

Provide operation and maintenance manuals for the lighting control system that provide basic data relating to the design, operation, and maintenance of the lighting control system for the building. Include the following:

1. Lighting control system layout and wiring plan.

2. Lighting control system one-line diagram.

3. Product data for all devices, including installation and programming instructions.

4. Occupancy/vacancy sensor coverage layout.

5. Training materials, such as videos or in-depth manuals, that cover basic operation of the lighting control system and instructions on modifying the lighting control system. Training materials must include calibration, adjustment, troubleshooting, maintenance, repair, and replacement.

6. Sequence of operation descriptions for each typical room type, including final programming, schedules, and calibration settings.

PART 2 PRODUCTS

2.1 PRODUCT COORDINATION

2.2 LUMINAIRES

UL 1598, NEMA C82.77-10. Provide luminaires as indicated in the luminaire schedule and NL plates or details on project plans, complete with light source, wattage, and lumen output indicated. All luminaires of the same type must be provided by the same manufacturer. Luminaires must be specifically designed for use with the driver and light source provided.

A. Luminaires

UL 8750, ANSI/IES LM-79, ANSI/IES LM-80. For all luminaires, provide:

1. Complete system with LED drivers and light sources.

2. Housings constructed of non-corrosive materials. All new aluminum housings must be anodized or powder-coated. All new steel housings must be treated to be corrosion resistant.

3. ANSI/IES TM-21, ANSI/IES LM-80. Minimum L70 lumen maintenance value of 50,000 hours unless otherwise indicated in the luminaire schedule. Luminaire drive current value must be identical to that provided by test data for luminaire in question.

4. Minimum efficacy as specified in the luminaire schedule. Theoretical models of initial lamp lumens per watt are not acceptable. If efficacy values are not listed in the luminaire schedule, provide luminaires that meet the following minimum values:

Luminaire Style	Minimum Luminaire Efficacy
Recessed 1 by 4, 2 by 4, and 2 by 2	100 LPW
Recessed Downlight (fixed, adjustable, wallwash)	80 LPW
Linear, Accent (undercabinet, cove)	45 LPW
Linear, Ambient (indirect wall mount, linear pendent)	100 LPW
High Bay, Low Bay, and Industrial Locations	100 LPW
Food Service and Hazardous Locations	60 LPW
Other (track, residential diffusers)	50 LPW
Exterior Wall Sconce	50 LPW

5. UL listed for dry or damp location typical of interior installations. Any luminaire mounted on the exterior of the building must be UL listed for wet location typical of exterior installations.

6. LED driver and light source package, array, or module are accessible for service or replacement without removal or destruction of luminaire.

7. Lenses constructed of heat tempered borosilicate glass, UV-resistant acrylic, or silicone. Sandblasting, etching and polishing must be performed as indicated in the luminaire description.

B. Luminaires for Hazardous Locations

In addition to requirements stated herein, provide LED luminaires for hazardous locations which conform to UL 844 or which have Factory Mutual certification for the class and division indicated.

2.3 LIGHT SOURCES

NEMA ANSLG C78.377, NEMA SSL 3. Provide type, delivered lumen output, and wattage as indicated in the luminaire schedule on project plans.

A. LED Light Sources

Provide LED light sources that meet the following requirements:

1. NEMA ANSLG C78.377. Emit white light and have a nominal CCT of 3500 Kelvin.

2. Minimum Color Rendering Index (CRI) of 80 with an R9 value of 95.

3. Directive 2011/65/EU. Restriction of Hazardous Substances (RoHS) compliant.

4. Light source color consistency by utilizing a binning tolerance within a 3-step McAdam ellipse.

a) Linear LED Lamps

Provide linear LED Lamps and meet the following additional requirements:

1) UL 1993 UL Type A linear LED lamp.

2) Power Factor greater than or equal to 0.90 at full input power and across specified dimming range.

3) Maximum Total Harmonic Distortion (THD) less than or equal to 20 percent at full input power and across specified dimming range.

4) Lumen per watt efficacy no less than 120.

5) Minimum beam angle of 180 degrees.

6) Lamp datasheet complies with ANSI C78.54. Manufacturer must provide list of all ballasts that are compatible for use with lamp.

2.4 LED DRIVERS

NEMA SSL 1, UL 8750. Provide LED drivers that are electronic, UL Class 1 or Class 2, constant-current type and that comply with the following requirements:

A. The combined driver and LED light source system does not exceed the minimum luminaire efficacy values as listed in the luminaire schedule provided.

B. Operates at a voltage of 120-277 volts at 50/60 hertz, with input voltage fluctuations of plus/minus 10 percent.

C. Power Factor (PF) greater than or equal to 0.90 at full input power and across specified dimming range.

D. Maximum Total Harmonic Distortion (THD) less than 20 percent at full input power and across specified dimming range.

E. Operates for at least 50,000 hours at maximum case temperature and 90 percent non-condensing relative humidity.

F. Withstands Category A surges of 4 kV without impairment of performance. Provide surge protection that is integral to the driver.

G. Integral thermal protection that reduces the output power to protect the driver and light source from damage if the case temperature approaches or exceeds the driver's maximum operating temperature.

H. 47 CFR 15. Complies with the requirements of the Federal Communications Commission (FCC) rules and regulations, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

I. Class A sound rating.

J. Directive 2011/65/EU. Restriction of Hazardous Substances (RoHS) compliant.

K. Provide dimming capability as indicated in the luminaire schedule on project plans. Dimmable drivers must dim down to 10 percent. Dimmable drivers must be controlled by

a Class 2 low voltage 0-10VDC controller dimming signal protocol unless otherwise specified. LED drivers of the same family/series must track evenly across multiple luminaires at all light levels.

2.5 LIGHTING CONTROLS

A. Devices

1. Switches

Provide line-voltage toggle switches as specified in Section 16402 INTERIOR WIRING SYSTEM. When used for non-digital loads, devices must be rated at 20 Amps inductive load, and be compatible with the lighting control systems.

2. Wall Box Dimmers

UL 1472, UL 20, IEEE C62.41, NEMA 77, NEMA SSL 7A. Dimmers must provide flicker-free, continuously variable light output throughout the dimming range of 10 percent to 100 percent. Devices must be capable of operating at their full rated capacity regardless of being single or ganged-mounted, and be compatible with three-way and four-way switching scenarios.

Provide wall-box dimmers that meet the following requirements:

a. Device operates as an independent control device.

b. Device operates with the use of a vertical slider, paddle, rotary, button, or toggle with adjacent vertical slider.

c. Finish of device matches switches and outlets in the same area.

d. Back box in wall has sufficient depth to accommodate body of switch and wiring.

e. Dimmer is capable of controlling 0-10 volt LED drivers. Dimmers and the drivers they control must be provided from the same manufacturer or tested and certified as compatible for use together.

f. Radio frequency interference suppression is integral to device.

3. Scene Wallstations

Provide scene wallstations that are compatible with the other components of the lighting control system and capable of Class 1 or 2 wiring methods in accordance with the NEC and local codes. Provide devices that contain on/off group, preset scene functions, or dim up/dim down interface through front panel. Programming of new scenes or zone assignments must be accomplished by authorized personnel from the space being controlled. Provide labeling for each button, including laminated sheet with scene descriptions to be posted near each scene controller.

4. Occupancy/Vacancy Sensors

IEEE C62.41, NEMA WD 1, UL 94, UL 916, UL 508, ASTM D4674 REV A, NEMA WD 7. Provide occupancy/vacancy sensors with coverage patterns as indicated on manufacturer shop drawings. Provide no less quantity of sensors as shown on plans, but add additional sensors when required to fulfill coverage requirement for the specific model of sensor

provided. Provide sensor types as described in the sequence of operations. Sensor locations and quantities are shown in shop drawings provided by the lighting control system manufacturer. Provide occupancy sensor operation that requires movement to activate luminaires controlled and turns luminaires off after a set time of inactivity. Provide vacancy sensor operation that requires manual control to activate luminaires and turns luminaires off after a set time of inactivity. Provide ceiling or wall-mounted occupancy/vacancy sensors that meet the following requirements:

a. Operating voltage of 120-277 volts.

b. Time delay of 30 seconds to 30 minutes with at least four intermediate time delay settings.

c. Sensors are ceiling mounted wall-box mounted wall mounted.

d. No minimum load requirement and be capable of switching from zero to 800 W at 120 VAC, 50/60 Hz and from zero to 1200 W at 277 VAC, 50/60 Hz.

e. Shielded or controlled by internal logic to adjust sensitivity to avoid false triggering due to ambient temperature, air temperature variations or HVAC air movement.

f. Sensor is equipped to automatically energize the connected load upon loss of normal power when located in a means of egress.

g. Occupancy and vacancy operation is field-adjustable and programmable with push-button or dip switch on the sensor device.

h. No leakage current to load when in the off mode.

i. Utilize zero-crossing circuitry to prevent damage from high inrush current and to promote long life operation.

j. Allow the adding or deleting of specific luminaires or zones to the assigned sensor without the use of ladders.

1) Passive Infrared Sensors

Provide Passive Infrared Sensors (PIR) sensors that detect occupancy by sensing heat and movement in the area of coverage. Provide sensors are constructed of a housing of high-impact, injection-molded thermoplastic. Provide PIR sensors that are temperature compensated, with a dual element sensor and a multi-element fresnel lens of POLY IR4 material.

2) Ultrasonic Sensors

Provide ultrasonic sensors that detect occupancy by sensing a change in pattern of reflected ultrasonic waves in the area of coverage. Provide sensors that are constructed of a housing of high-impact, injection-molded thermoplastic. Provide ultrasonic sensors that operate at 40 kHz.

3) Dual Technology Sensors

Provide dual technology sensors that meet the requirements for PIR sensors and ultrasonic sensors indicated above. If either the PIR or ultrasonic sensing registers occupancy, the luminaires must remain on.

4) High Bay Sensors

Provide occupancy/vacancy sensors specifically designed for high-bay mounting applications for all ceiling-mounted sensors mounted above 35 feet using PIR technology. Provide high-bay sensors with interchangeable lenses for 360 degree open area coverage or narrow rectangular warehouse aisle coverage.

5) Power Packs

UL 2043. Provide power packs to provide power to lighting control sensors as required in accordance with the manufacturer's specifications. Provide power packs that meet the following requirements:

a) Operate at an input voltage of 120-277 VAC, with an output voltage 12-24 VDC at 225 mA.

b) Constructed of plenum-rated, high-impact thermoplastic enclosure.

c) Utilizes zero-crossing circuitry to prevent damage from inrush current.

d) Directive 2011/65/EU. Restriction of Hazardous Substances (RoHS) compliant.

6. Photosensors

Provide photosensors that meet the following requirements:

a. Detect changes in ambient lighting level and enable dimming as required.

b. Contain a detection cone, where the base of the cone may be circular or an elongated shape, and where the smallest angle between the edge and the axis of the cone is between 20 and 50 degrees. The cone axis may be tilted to the vertical when installed to give the sensor preferred directionality.

c. Sensors are ceiling-mounted wall-box-mounted wall-mounted with sensitivity, filtering, range and viewing angle to meet requirements of sequence of operation, scope of work and construction documents.

d. Time delay that is adjustable from 1 to 30 seconds ON delay, and 1 to 30 minutes OFF delay to prevent cycling, with deadband adjustment of 25 percent to 100 percent above lower setpoint.

e. Output dimming signal is linear to light level with less than 1 percent variation. Cadmium sulfide photo-resistors are not acceptable.

f. Sensor is not combined in the same housing or location with occupancy or vacancy sensors if the proper location for one function compromises

the successful operation of the other function, or in any way reduces the system's ability to meet the design intent.

7. Time Clocks

UL 917, NEMA ICS 6. House time clock in a surface-mounted, lockable, NEMA 1 or 4 as required enclosure constructed of painted steel or plastic polymer. Provide electronic type time clock that meets the following criteria:

a. Astronomic programming function.

b. 12 hour AM/PM type digital clock display format.

c. Power outage back-up for time clock utilizing lithium battery which provides coverage for a minimum of seven days.

d. Contacts are rated for 30 amps at 120-277 VAC resistive load in a normally open (NO) normally closed (NC) configuration.

e. Contains function that allows automatic control to be skipped on certain selected days of the week manual bypass or remote override control.

2.6 EXIT AND EMERGENCY LIGHTING EQUIPMENT

A. Exit Signs

UL 924, NFPA 101. Provide wattage as indicated in the luminaire schedule on project plans. Provide LED Exit Signs that meet the following criteria:

a. Housing constructed of Edge-lit type with clear acrylic, edge-lit face and aluminum trim having clear aluminum finish.

b. UL listed for damp location.

c. Configured for universal mounting.

d. 6 inch high, 3/4 inch stroke red lettering on face of sign with chevrons on either side of lettering to indicate direction.

e. Single or double face as indicated in project plans and luminaire schedule.

1) Exit Signs with Battery Backup

Equip with automatic power failure device, test switch, and pilot light, and fully automatic high/low trickle charger in a self-contained power pack. Battery must be sealed, maintenance free nickel-cadmium type, and must operate unattended for a period of not less than five years. Emergency run time must be a minimum of 1-1/2 hours. LEDs must have a minimum rated life of 10 years. Provide self-diagnostic circuitry integral to emergency LED driver.

B. Emergency Lighting Unit (ELU)

UL 924, NFPA 101. Provide emergency lighting units (ELUs) completely assembled with wiring and mounting devices, ready for installation at the locations indicated. Provide in UV-stable, thermo-plastic housing with UL damp label as indicated. Emergency lighting units must be rated for 12 volts, except units having no remote-mounted light sources and

having no more than two unit-mounted light sources may be rated six volts. Equip units with brown-out sensitive circuit to activate battery when input voltage falls to 75 percent of normal. Equip with two LED light sources, automatic power failure device, test switch, and pilot light, and fully automatic high/low trickle charger in a self-contained power pack. Battery must be sealed, maintenance free nickel-cadmium type, and must operate unattended for a period of not less than five years. Emergency run time must be a minimum of 90 minutes. LEDs must have a minimum rated life of 10 years. Provide self-diagnostic circuitry integral to emergency LED driver.

C. LED Emergency Drivers

UL 924, NFPA 101. Provide LED emergency driver with automatic power failure detection, test switch and LED indicator (or combination switch/indicator) located on luminaire exterior, and fully-automatic solid-state charger, battery and inverter integral to a self-contained housing. Provide self-diagnostic function integral to emergency driver. Integral nickel-cadmium battery is required to supply a minimum of 90 minutes of emergency power at 10 watts, 10-50 VDC, constant output. Driver must be RoHS compliant, rated for installation in plenum-rated spaces and damp locations, and be warranted for a minimum of five years.

D. Self-Diagnostic Circuitry for LED Drivers

UL 924, NFPA 101. Provide emergency lighting unit with fully-automatic, integral self-testing/diagnostic electronic circuitry. Circuitry must provide for a one minute diagnostic test every 28 days, and a 30 minute diagnostic test every six months, minimum. Any malfunction of the unit must be indicated by LED(s) visible from the exterior of the luminaire. A manual test switch must also be provided to perform a diagnostic test at any given time.

2.7 LUMINAIRE MOUNTING ACCESSORIES

A. Suspended Luminaires

1. Provide hangers capable of supporting twice the combined weight of luminaires supported by hangers.

2. Hangers must allow luminaires to swing within an angle of 45 degrees. Brace pendents 4 feet or longer to limit swinging. Provide with swivel hangers to ensure a plumb installation for rigid stem pendents. Provide cadmium-plated steel with a swivel-ball tapped for the conduit size indicated.

3. Single-unit suspended luminaires must have twin-stem hangers. Multiple-unit or continuous row luminaires with a separate power supply cord must have a tubing or stem for wiring at one point and a tubing or rod suspension provided for each unit length of chassis, including one at each end.

4. Provide all linear pendent and surface mounted luminaires with two supports per four-foot section or three per eight-foot section unless otherwise recommended by manufacturer.

5. Provide rods in minimum 0.18 inch diameter.

B. Recess and Surface Mounted Luminaires

Provide access to light source and LED driver from bottom of luminaire. Provide trim and lenses for the exposed surface of flush-mounted luminaires as indicated on project drawings and specifications. Luminaires recessed in ceilings which have a fire resistive

rating of one hour or more must be enclosed in a box which has a fire resistive rating equal to that of the ceiling. For surface mounted luminaires with brackets, provide flanged metal stem attached to outlet box, with threaded end suitable for supporting the luminaire rigidly in design position. Flanged part of luminaire stud must be of broad base type, secured to outlet box at not fewer than three points.

C. Luminaire Support Hardware

1. Wire

ASTM A641/A641M. Galvanized, soft tempered steel, minimum 0.11 inches in diameter, or galvanized, braided steel, minimum 0.08 inches in diameter.

2. Wire for Humid Spaces

ASTM A580/A580M. Composition 302 or 304, annealed stainless steel, minimum 0.11 inches in diameter.

ASTM B164. UNS NO4400, annealed nickel-copper alloy, minimum 0.11 inches in diameter.

3. Threaded Rods

Threaded steel rods, 3/16 inch diameter, zinc or cadmium coated.

4. Straps

Galvanized steel, one by 3/16 inch, conforming to ASTM A653/A653M, with a light commercial zinc coating or ASTM A1008/A1008M with an electrodeposited zinc coating conforming to ASTM B633, Type RS.

2.8 EQUIPMENT IDENTIFICATION

A. Manufacturer's Nameplate

Each item of equipment must have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

B. Labels

UL 1598. All luminaires must be clearly marked for operation of specific light sources and LED drivers. The labels must be easy to read when standing next to the equipment, and durable to match the life of the equipment to which they are attached. Note the following light source characteristics in the format "Use Only _____":

1. Correlated Color Temperature (CCT) and Color Rendering Index (CRI) for all luminaires.

2. Driver and dimming protocol.

All markings related to light source type must be clear and located to be readily visible to service personnel, but unseen from normal viewing angles when light sources are in place. LED drivers must have clear markings indicating dimming type and indicate proper terminals for the various outputs.

2.9 FACTORY APPLIED FINISH

NEMA 250. Provide all luminaires and lighting equipment with factory-applied painting system that as a minimum, meets requirements of corrosion-resistance testing.

PART 3 EXECUTION

3.1 INSTALLATION

IEEE C2, NFPA 70.

A. Light Sources

When light sources are not provided as an integral part of the luminaire, deliver light sources of the type, wattage, lumen output, color temperature (CCT), color rendering index (CRI), and voltage rating indicated to the project site and install just prior to project completion, if not already installed in the luminaires from the factory.

B. Luminaires

Set luminaires plumb, square, and level with ceiling and walls, in alignment with adjacent luminaires and secure in accordance with manufacturers' directions and approved drawings. Provide accessories as required for ceiling construction type indicated on Finish Schedule. Luminaire catalog numbers do not necessarily denote specific mounting accessories for type of ceiling in which a luminaire may be installed. Provide wires, straps, or rods for luminaire support in this section. Install luminaires with vent holes free of air blocking obstacles.

1. Suspended Luminaires

Measure mounting heights from the bottom of the luminaire for ceiling-mounted luminaires and to center of luminaire for wall-mounted luminaires. Obtain architect approval of the exact mounting height on the job before commencing installation and, where applicable, after coordinating with the type, style, and pattern of the ceiling being installed. Support suspended luminaires from structural framework of ceiling or from inserts cast into slab.

a. Provide suspended luminaires with 45 degree swivel hangers so that they hang plumb and level.

b. Locate so that there are no obstructions within the 45 degree range in all directions.

c. The stem, canopy and luminaire must be capable of 45 degree swing.

d. Rigid pendent stem, aircraft cable, rods, or chains 4 feet or longer excluding luminaire must be braced to prevent swaying using three cables at 120 degree separation.

e. Suspended luminaires in continuous rows must have internal wireway systems for end to end wiring and must be properly aligned to provide a straight and continuous row without bends, gaps, light leaks or filler pieces.

f. Utilize aligning splines on extruded aluminum luminaires to assure minimal hairline joints.

g. Support steel luminaires to prevent "oil-canning" effects.

h. Match supporting pendents with supported luminaire. Aircraft cable must be stainless steel.

i. Match finish of canopies to match the ceiling and provide low profile canopies unless otherwise shown.

j. Maximum distance between suspension points must be 10 feet or as recommended by the manufacturer, whichever is less.

2. Recessed and Semi-Recessed Luminaires

a. Support recessed and semi-recessed luminaires independently from the building structure by a minimum of two wires, straps or rods per luminaire and located near opposite corners of the luminaire. Secure horizontal movement with clips provided by manufacturer. Ceiling grid clips are not allowed as an alternative to independently supported luminaires.

b. Support round luminaires or luminaires smaller in size than the ceiling grid independently from the building structure by a minimum of four wires, straps or rods per luminaire, spaced approximately equidistant around.

c. Do not support luminaires by acoustical tile ceiling panels.

d. Where luminaires of sizes less than the ceiling grid are indicated to be centered in the acoustical panel, support each independently and provide at least two 3/4 inch metal channels spanning, and secured to, the ceiling tees for centering and aligning the luminaire.

e. Luminaires installed in suspended ceilings must also comply with the requirements of Section 09 51 00 ACOUSTICAL CEILINGS.

f. Adjust aperture rings on all applicable ceiling recessed luminaires to accommodate various ceiling material thickness. Coordinate cut-out size in ceiling to ensure aperture covers cut-out entirely. Install aperture rings such that the bottom of the ring is flush with finished ceiling or not more than 1/16 inch above. Do not install luminaires such that the aperture ring extends below the finished ceiling surface.

3. Field Applied Painting

Paint lighting equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Provide painting as specified in Section 09 90 00 PAINTS AND COATINGS.

C. LED Drivers

Provide LED drivers integral to luminaire as constructed by the manufacturer.

D. Exit Signs

NFPA 101. Wire exit signs and emergency lighting units ahead of the local switch, to the normal lighting circuit located in the same room or area.

Connect exit signs on separate circuits and serve from an emergency panel. Provide only one source of control, which would be the circuit breaker in the emergency panel. Paint source of control red and provide lockout capability.

E. Lighting Controls

1. Occupancy/Vacancy Sensors

a. Provide quantity of sensor units indicated as a minimum. Provide additional units to give full coverage over controlled area. Full coverage must provide hand and arm motion detection for office and administration type areas and walking motion for industrial areas, warehouses, storage rooms and hallways.

b. Locate ceiling-mounted sensors no closer than 6 feet from the nearest HVAC supply or return diffuser.

c. Locate the sensor(s) as indicated and in accordance with the manufacturer's recommendations.

2. Photosensors

Locate and aim sensor as indicated and in accordance with the manufacturer's recommendations. Adjust sensor set-point in accordance with the manufacturer's recommendations and for the indicated light level of the area of coverage, measured at the work plane.

3.2 FIELD QUALITY CONTROL

A. Tests

1. Lighting Control Verification Tests

Verify lighting control system and devices operate according to approved sequence of operations. Verification tests are to be completed after commissioning.

a. Verify occupancy/vacancy sensors operate as described in sequence of operations. Provide testing of sensor coverage, sensitivity, and time-out settings in all spaces where sensors are placed. This is to be completed only after all furnishings have been installed. Submit occupancy/vacancy sensor verification test.

b. Verify photosensors operate as described in sequence of operations. Provide testing of sensor coverage, aiming, and calibration in all spaces where sensors are placed. This is to be completed only after all furnishings have been installed. Submit photosensor verification test.

c. Verify wall box dimmers and scene wallstations operate as described in sequence of operations.

2. Emergency Lighting Test

Interrupt power supply to demonstrate proper operation of emergency lighting. If adjustments are made to the lighting system, re-test system to show compliance with standards.

3.3 CLOSEOUT ACTIVITIES

A. Commissioning

NFPA 101. Commission all components of the lighting system and lighting control system. Factory Trained Field Service Technician is responsible for calibration and programming sequences for input devices and systems in accordance with the requirements described in the sequence of operation.

B. Training

1. Maintenance Staff Training

Submit a Maintenance Staff Training Plan at least 30 calendar days prior to training session that describes training procedures for Owner's personnel in the operation and maintenance of lighting and lighting control system. Provide on-site training which demonstrates full system functionality, assigning schedules, calibration adjustments for light levels and sensor sensitivity, integration procedures for connecting to third-party devices, and manual override including information on appropriate use. Provide protocols for troubleshooting, maintenance, repair, and replacement, and literature on available system updates and process for implementing updates.

2. End-User Training

Submit an End-User Training Plan at least 30 calendar days prior to training session that describes training procedures for end-users on the lighting control system. Provide users with a list of control devices located within user-occupied spaces, such as photosensors and occupancy and vacancy sensors, including information on the proper operation and schedule for each device. Provide demonstration for each type of interface. Provide users with the building schedule as currently commissioned, including conditional programming based on astronomic time clock functionality. Provide users with the correct contact information for maintenance personnel who will be available to address any lighting control issues.

Provide laminated instructions to the user at each scene wallstation. Provide only instructions relevant to the functionality of the specific scene wallstation. Provide a description of each labeled scene control button. If the room utilizes occupancy/vacancy sensors or photosensors, include a description of this functionality on the instruction sheet.

END OF SECTION

SECTION 16520

EXTERIOR LIGHTING

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

A. Materials not considered to be luminaires, luminaire accessories, or lighting equipment are specified in Section(s)16301 Exterior Electrical System. Luminaires and accessories installed in interior of buildings or attached to the exterior of a building are specified in Section 16402 Interior Wiring System.

1.2 DEFINITIONS

A. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications and on the drawings must be as defined in IEEE 100 and ANSI/IES LS-1.

B. For LED luminaire light sources, "Useful Life" is the operating hours before reaching 70 percent of the initial rated lumen output (L70) with no catastrophic failures under normal operating conditions. This is also known as 70 percent "Rated Lumen Maintenance Life" as defined in ANSI/IES LM-80.

C. For LED luminaires, "Luminaire Efficacy" (LE) is the appropriate measure of energy efficiency, measured in lumens/watt. This is gathered from LM-79 data for the luminaire, in which absolute photometry is used to measure the lumen output of the luminaire as one entity, not the source separately and then the source and housing together.

D. Total Harmonic Distortion (THD) is the Root Mean Square (RMS) of all the harmonic components divided by the total fundamental current.

1.3 SUBMITTALS

A. Shop Drawings

Luminaire Drawings
Pole Drawings
Control System One-Line Diagram
Sequence of Operation for Exterior Lighting Control System

B. Product Data

Luminaires
Light Sources
LED Drivers
Luminaire Warranty
Lighting Controls Warranty

C. Pole Warranty

Photosensors
Time Clock

Lighting Contactor

Poles
Brackets

D. Design Data

Luminaire Design Data
Photometric Plan

E. Test Reports

ANSI/IES LM-79 Test Report
ANSI/IES LM-80 Test Report
ANSI/IES TM-21 Test Report

F. Manufacturer's Instructions

Poles

G. Operation and Maintenance Data

Lighting System
Exterior Lighting Control System
Maintenance Staff Training Plan
End-User Training Plan

1.4 QUALITY ASSURANCE: Data, drawings, and reports must employ the terminology, classifications and methods prescribed by the IES Lighting Library as applicable, for the lighting system specified.

A. Drawing Requirements

1. Luminaire Drawings

Include dimensions, effective projected area (EPA), weight, accessories, and installation and construction details. Photometric data, including CRI, CCT, TM-15-11 BUG rating, LED driver type, aiming diagram, zonal lumen data, and candlepower distribution data per LM-79 must accompany shop drawings.

2. Pole Drawings

Include dimensions, wind load determined in accordance with ASCE 7-16, pole deflection, pole class, and other applicable information. For concrete poles, include: section and details to indicate quantities and position of prestressing steel, spiral steel, inserts, and through holes; initial prestressing steel tension; and concrete strengths at release and at 28 days.

B. Luminaire Design Data

1. Provide distribution data according to IES classification type as defined in IES Lighting Library and ANSI/IES RP-8.

2. B.U.G. rating for the installed position as defined by ANSI/IES TM-15 and shielding as defined by ANSI/IES RP-8.

3. Provide safety certification and file number for the luminaire family. Include listing, labeling and identification in accordance with NFPA 70 (NEC). Applicable testing bodies are determined by the US Occupational Safety Health Administration

(OSHA) as Nationally Recognized Testing Laboratories (NRTL) and include: CSA (Canadian Standards Association), ETL (Edison Testing Laboratory), and UL (Underwriters Laboratories).

4. Provide long term lumen maintenance projections for each LED luminaire in accordance with ANSI/IES TM-21. Data used for projections must be obtained from testing in accordance with ANSI/IES LM-80.

5. Provide wind loading calculations for luminaires mounted on poles. Weight and effective projected area (EPA) of luminaires and mounting brackets must not exceed maximum rating of pole as installed in particular wind zone area.

C. ANSI/IES LM-79 Test Report

Submit test report on manufacturer's standard production model of specified luminaire. Testing must be performed at the same operating drive current as specified luminaire. Include all applicable and required data as outlined under "14.0 Test Report" in ANSI/IES LM-79.

D. ANSI/IES LM-80 Test Report

Submit report on manufacturer's standard production LED light source (package, array, or module) of specified luminaire. Testing must be performed at the same operating drive current as specified luminaire. Include all applicable and required data as outlined under "8.0 Test Report" in ANSI/IES LM-80.

E. ANSI/IES TM-21 Test Report

Submit test report on manufacturer's standard production LED light source (package, array or module) of specified luminaire. Testing must be performed at the same operating drive current as specified luminaire. Include all applicable and required data, as well as required interpolation information as outlined under "7.0 Report" in ANSI/IES TM-21.

F. Photometric Plan

For parking lots and sport fields includes computer-generated photometric analysis of the "designed to" values in accordance with ANSI/IES LP-11 for the "end of useful life" of the luminaire installation using a light loss factor of 0.81. Provide photometric plans that meet criteria in the Basis of Design in the project plans. Include the following in the submittal:

1. Horizontal illuminance measurements at finished grade, taken at a maximum grid size of 10 feet by 10 feet.

2. Vertical illuminance measurements at 5 feet above finished grade at all sidewalks and crosswalks, taken at a maximum of 10 feet.

3. Minimum and maximum footcandle levels.

4. Average maintained footcandle level.

5. Maximum to minimum ratio for horizontal illuminance only.

G. Test Laboratories

Test laboratories for the ANSI/IES LM-79 and ANSI/IES LM-80 test reports must be one of the following:

1. National Voluntary Laboratory Accreditation Program (NVLAP) accredited for solid-state lighting testing as part of the Energy-Efficient Lighting Products laboratory accreditation program.

2. One of the qualified labs listed on the Department of Energy - Energy Efficiency & Renewable Energy, Solid-State Lighting web site.

3. One of the EPA-Recognized Laboratories listed at for LM-80 testing.

H. Regulatory Requirements

Equipment, materials, installation, and workmanship must be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated. Provide luminaires and assembled components that are approved by and bear the label of UL for the applicable location and conditions unless otherwise specified.

I. Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products must have been in satisfactory commercial or industrial use for six months prior to bid opening. The six-month period must include applications of equipment and materials under similar circumstances and of similar size. The product must have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the six-month period. Where two or more items of the same class of equipment are required, these items must be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1. Alternative Qualifications

Products having less than a six-month field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

2. Material and Equipment Manufacturing Date

Do not use products manufactured more than six months prior to date of delivery to site, unless specified otherwise.

1.5 DELIVERY, STORAGE, AND HANDLING OF POLES

A. Aluminum Poles

Do not store poles on ground. Support poles so they are at least one foot above ground level and growing vegetation. Do not remove factory-applied pole wrappings until just before installing pole.

B. Steel Poles

Do not store poles on ground. Support poles so they are at least one foot above ground level and growing vegetation. Do not remove factory-applied pole wrappings until just before installing pole.

C. Concrete Poles

Do not store poles on ground. Support poles so they are at least one foot above ground level and growing vegetation.

1.6 WARRANTY

Support all equipment items by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

A. Luminaire Warranty

Provide and transfer to the government the original LED luminaire manufacturers standard commercial warranty for each different luminaire manufacturer used in the project.

1. Provide a written five year minimum replacement warranty for material, luminaire finish, and workmanship. Provide written warranty document that contains all warranty processing information needed, including customer service point of contact, whether or not a return authorization number is required, return shipping information, and closest return location to the luminaire location.

a) Finish warranty must include failure and substantial deterioration such as blistering, cracking, peeling, chalking, or fading.

b) Material warranty must include:

(1) All LED drivers and integral control equipment.

(2) Replacement when more than 10 percent of LED sources in any lightbar or subassembly(s) are defective, non-starting, or operating below 70 percent of specified lumen output.

2. Warranty period must begin in accordance with the manufacturer's standard warranty starting date.

3. Provide replacements that are promptly shipped, without charge, to the using Government facility point of contact and that are identical to or an improvement upon the original equipment. All replacements must include testing of new components and installation.

B. Lighting Controls Warranty

Provide and transfer to the government the original lighting controls manufacturers standard commercial warranty for each different lighting controls manufacturer used in the project. Warranty coverage must begin from date of final system commissioning or three months from date of delivery, whichever is the earliest. Warranty service must be performed by a factory-trained engineer or technician.

1. Unless otherwise noted, provide a written five year minimum warranty on the complete system for all systems with factory commissioning. Provide warranty that covers 100 percent of the cost of any replacement parts and services required over the five years which are directly attributable to the product failure. Failures include, but are not limited to, the following:

a) Software: Failure of input/output to execute switching or dimming commands.

b) Damage of electronic components due to transient voltage surges.

c) Failure of control devices, including but not limited to photosensors and motion sensors.

2. Provide a written five-year minimum warranty on all input devices against defect in workmanship or materials provided by device manufacturer.

3. Provide a written five-year minimum warranty on all control components attached to luminaires against defect in workmanship or materials.

C. Pole Warranty

Provide and transfer to the owner the original pole manufacturers standard commercial warranty for each different pole manufacturer used in the project. Warranty coverage must begin from date of final system commissioning or three months from date of delivery, whichever is the earliest. Provide a written three year minimum replacement warranty for material, luminaire finish, and workmanship. Warranty service must be performed by a factory-trained engineer or technician.

1.7 OPERATION AND MAINTENANCE MANUALS

A. Lighting System

Provide operation and maintenance manuals for the lighting system that provide basic data relating to the design, operation, and maintenance of the lighting system. Include the following:

1. Manufacturers' operating and maintenance manuals.

2. Luminaire shop drawings for modified and custom luminaires.

3. Luminaire Manufacturers' standard commercial warranty information as specified in paragraph LUMINAIRE WARRANTY.

B. Exterior Lighting Control System

Provide operation and maintenance manuals for the exterior lighting control system that provide basic data relating to the design, operation, and maintenance of the exterior lighting control system. Include the following:

1. Control System One-Line Diagram

2. Product data for all devices, including installation and programming instructions.

3. Training materials, such as videos or in-depth manuals, that cover basic operation of the lighting control system and instructions on modifying the control system. Training materials must include calibration, adjustment, troubleshooting, maintenance, repair, and replacement.

PART 2 PRODUCTS

2.1 PRODUCT COORDINATION

2.2 LUMINAIRES

UL 1598, NEMA C82.77-10. Provide luminaires as indicated in the luminaire schedule and XL plates or details on project plans, complete with light source, wattage, and lumen output indicated. All luminaires of the same type must be provided by the same manufacturer. Luminaires must be specifically designed for use with the LED driver and light source provided.

A. Luminaires

UL 8750, ANSI/IES LM-79, ANSI/IES LM-80. For all luminaires, provide:

1. Complete system with LED drivers and light sources.

2. Housing constructed of non-corrosive materials. All new aluminum housings must be anodized or powder-coated. All new steel housings must be treated to be corrosion resistant.

3. ANSI/IES TM-21, ANSI/IES LM-80. Minimum L70 lumen maintenance value of 50,000hours unless otherwise indicated in the luminaire schedule. Luminaire drive current value must be identical to that provided by test data for luminaire in question.

4. Minimum efficacy as specified in the luminaire schedule. Theoretical models of initial lamp lumens per watt are not acceptable. If efficacy values are not listed in the luminaire schedule, provide luminaires that meet the following minimum values:

Luminaire Style	Minimum Luminaire Efficacy
Area and Roadway (pole mounted, arm mounted)	95 LPW
Pedestrian Post-Top (pole mounted, arm mounted)	90 LPW
Bollard	35 LPW
Accent (adjustable landscape, sign lighting)	35 LPW
Linear Accent (facade, wallwash)	80 LPW
Exterior Wall Sconce	50 LPW

5. Product rated for operation within an ambient temperature range of minus 22 degrees F to 122 degrees F.

6. UL listed for wet locations.

7. IES Lighting Library. Light distribution and NEMA field angle classifications as indicated in luminaire schedule on project plans.

8. Housing finish that is baked-on enamel, anodized, or baked-on powder coat paint. Finish must be capable of surviving ASTM B117 salt fog environment testing for 2500 hours minimum without blistering or peeling.

9. LED driver and light source package, array, or module are accessible for service or replacement without removal or destruction of luminaire.

10. ANSI/IES TM-15. Does not exceed the BUG ratings as listed in the luminaire schedule. If BUG ratings are not listed in the luminaire schedule, provide luminaires that meet the following minimum values for each application and mounting conditions:

Lighting Application	Mounting Conditions	BUG Rating
Area and Roadway	All	B3-U0-G3
Pedestrian Post-Top	All	B2-U1-G1
Exterior Wall Sconce	Above 4 feet AFF	B1-U0-G2
Exterior Wall Sconce	Below or at 4 feet AFF	B4-U0-G4

11. Fully assembled and electrically tested prior to shipment from factory.

12. Finish color is as indicated in the luminaire schedule or detail on the project plans.

13. Lenses constructed of frosted tempered glass or UV-resistant acrylic. Provide polycarbonate vandal-resistant lenses.

14. All factory electrical connections are made using crimp, locking, or latching style connectors. Twist-style wire nuts are not acceptable.

15. NEMA C136.31. Comply with 3G vibration testing.

16. Luminaire arm bolts constructed from 304 stainless steel or zinc-plated steel.

17. Wiring compartment on pole-mounted, street and area luminaires is accessible without the use of hand tools to manipulate small screws, bolts, or hardware.

18. Incorporate modular electrical connections, and construct luminaires to allow replacement of all or any part of the optics, heat sinks, LED drivers, surge suppressors and other electrical components using only a simple tool, such as a manual or cordless electric screwdriver.

19. ANSI C136.3. For all roadway and area luminaires, provide products with an integral tilt adjustment of plus or minus 5 degrees to allow the unit to be leveled.

2.3 LIGHT SOURCES

NEMA ANSLG C78.377, NEMA SSL 3. Provide type, lumen rating, and wattage as indicated in luminaire schedule on project plans.

A. LED Light Sources

Provide LED light sources that meet the following requirements:

1. NEMA ANSLG C78.377. Emit white light and have a nominal Correlated Color Temperature (CCT) of 3500 Kelvin.

2. Minimum Color Rendering Index (CRI) of 80.

3. Directive 2011/65/EU. Restriction of Hazardous Substances (RoHS) compliant.

4. Light source color consistency by utilizing a binning tolerance within a 4-step McAdam ellipse.

2.4 LED DRIVERS

NEMA SSL 1, UL 1310. Provide LED Drivers that are electronic, UL Class 1 or Class 2, constant-current type and meet the following requirements:

1. The combined LED driver and LED light source system is greater than or equal to the minimum luminaire efficacy values as listed in the luminaire schedule provided.

2. Operate at a voltage of 120-277 volts at 50/60 hertz, with input voltage fluctuations of plus or minus 10 percent.

3. Power Factor (PF) greater than or equal to 0.90 at full input power and across specified dimming range.

4. Maximum Total Harmonic Distortion (THD) less than or equal to 20 percent at full input power and across specified dimming range.

5. Operates for at least 50,000 hours at maximum case temperature and 90 percent non-condensing relative humidity.

6. Meets the "Elevated" (10kV/10kA) requirements per IEEE C62.41.2 -2002. Manufacturer must indicate whether failure of the electrical immunity system can possibly result in disconnect of power to luminaire. Provide surge protection that is integral to the LED driver.

7. Contains integral thermal protection that reduces the output power to protect the driver and light source from damage if the case temperature approaches or exceeds the driver's maximum operating temperature.

8. Complies with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 15, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

9. Class A sound rating for all drivers mounted under a covered structure, such as a canopy, or where otherwise appropriate.

10. Directive 2011/65/EU. Restriction of Hazardous Substances (RoHS) compliant.

11. UL listed for wet locations typical of exterior installations.

12. Rated to operate between ambient temperatures of minus 22 degrees F and 122 degrees F.

2.5 LIGHTING CONTROLS

A. System

Provide exterior lighting control system that operates the exterior lighting system as described in the exterior lighting control strategies in the project plans. Submit Sequence of Operation for Exterior Lighting Control System describing the operation of the proposed exterior lighting control system and devices. Sequence of Operation must provide the strategies identified in the exterior lighting control strategies.

1. Relay Panel

Enclose panel hardware in a surface-mounted, NEMA 1 or 4 as required, painted, steel enclosure with lockable access door and ventilation openings. Internal low-voltage compartment must be separated from line-voltage compartment of enclosure with only low-voltage compartment accessible upon opening of door. Provide additional remote cabinets that communicate back to main control panel as required. Provide relay panel that meets the following criteria:

a) Input voltage of 120-277 at 50/60 Hz, with internal low voltage power supply as required.

b) UL 924. Quantity as required single-pole latching relays rated at 30 amps, 120-277 volts. Provide provision for relays to close upon power failure. Provide relays designed for 10 years of use at full rated load.

B. Devices

1. Time Clock

NEMA ICS 6. House time clock in a surface-mounted, lockable NEMA 1 enclosure constructed of painted steel or plastic polymer. Provide electronic type time clock that meets the following criteria:

a) 24-hour 7-day astronomic programming function, providing a total of 56 on/off set points.

b) 12-hour AM/PM type digital clock display format.

c) Power outage back-up for switch utilizing lithium battery which provides coverage for a minimum of seven days.

d) Capable of controlling a minimum of 4 channels or loads.

e) Contacts are rated for 30 amps at 120-277 VAC resistive load in a SPST normally open (NO) normally closed (NC) configuration.

f) Contains function that allows automatic control to be skipped on certain selected days of the week manual bypass or remote override control ability for photosensor input.

2. Photosensors

UL 773, UL 773A. Provide Photosensors that meet the following requirements:

a) Hermetically sealed, cadmium sulfide light sensor type, rated as indicated on plan, 50/60 Hz with single-pole, single-throw contacts.

b) Turns ON at 1 to 3 footcandles and turns OFF at 3 to 15 footcandles.

c) Designed to fail to the ON position.

d) Housing is constructed of die cast aluminum UV stabilized polypropylene, rated to operate within a temperature range of minus 40 to 158 degrees F.

e) Time delay that prevents accidental switching from transient light sources.

f) Directional lens in front of the cell to prevent fixed light sources from creating a turnoff condition.

g) Designed for 20-year service to match life expectancy of long-life LED fixtures and exceed 15,000 operations at full load. Provide photosensors with zero-cross technology to withstand severe in-rush current and extend relay life.

h) Swivel base type housing with 1/2 in threaded base for mounting to a junction box or conduit.

i) NEMA C136.10. Twist-lock receptacle type. Provide with solid brass prongs and voltage markings and color coding on exterior of housing.

j) Provide photosensors with metal oxide varistor (MOV) type surge protection.

3. Lighting Contactor

NEMA ICS 2. Provide a mechanically -held lighting contactor. Contactor must have poles as indicated on plan, configured as normally open (NO) normally closed (NC). Contacts must be rated 600 volts, 30 amperes for a resistive load. Coil operating voltage must be volts as indicated on plan. Contactor must have silver cadmium oxide double-break contacts and coil clearing contacts for mechanically held contactors and must require no arcing contacts. Provide contactor with hand-off-automatic selector switch.

2.6 POLES

LTS ASCE 7-16. Provide round straight poles designed for wind loading of 170 miles per hour while supporting luminaires and all other appurtenances indicated. The effective projected areas (EPA) of luminaires and appurtenances used in calculations must be specific for the actual products provided on each pole. Provide poles that are embedded anchor-base type designed for use with underground. Poles must have oval-shaped hand hole having a minimum clear opening of 3 by 5 inches. Secure hand hole covers by stainless steel captive screws. Provide metal poles with an internal grounding connection accessible from the hand hole near the bottom of each pole. Install a means of wire disconnection accessible from the hand hole. Do not install square poles. Provide poles from a Manufacturer with a standard provision for protecting the finish during shipment and installation. Do not install scratched, stained, chipped, or dented poles.

A. Steel Poles

Provide steel poles with hot-dipped galvanized in accordance with ASTM A123/A123M factory finish. Provide poles that meet the following requirements:

1. Minimum 11-gage steel with minimum yield/strength of 48,000 psi

2. Pole is mounted by anchor bolts.

3. Consists of tapered tubular members, either round in cross section or polygonal.

4. Pole shaft is one piece and is of welded construction with no bolts, rivets, or other means of fastening except as specifically approved.

5. Base covers are of structural quality hot-rolled carbon steel plate, with a minimum yield of 36,000 psi.

6. Markings are approximately 3 to 4 feet above grade and includes manufacturer, year of manufacture, top and bottom diameters, and length.

7. Grounding connection is designed to prevent electrolysis when used with copper ground wire.

B. Concrete Poles

ASTM C1089. Cross-sectional shape must be round.

1. Steel Reinforcing

Provide prestressed concrete pole shafts that are reinforced with steel prestressing members. Provide internal longitudinal loading by either pre-tensioning or post-tensioning longitudinal reinforcing members.

2. Tensioned Reinforcing

Primary reinforcement steel used for a prestressed concrete pole shaft must be tensioned between 60 to 70 percent of its ultimate strength. The amount of reinforcement must be such that when reinforcement is tensioned to 70 percent of its ultimate strength, the total resultant tensile force does not exceed the minimum section compressive strength of the concrete.

3. Coating and Sleeves for Reinforcing Members

Where minimum internal coverage cannot be maintained next to required core opening, such as hand holes and wiring inlet, protect reinforcing with a vapor proof noncorrosive sleeve over the length without the 1/2 inch concrete coverage. Apply a nonmigrating slipper coating to each steel reinforcing member which is to be post-tensioned prior to the application of concrete to ensure uniformity of stress throughout the length of each member.

4. Strength Requirement

As an exception to the requirements of ASTM C1089, provide poles that are naturally cured to achieve a 28-day compressive strength of 7000 psi. Poles must not be subjected to severe temperature changes during the curing period.

5. Shaft Preparation

Provide completed prestressed concrete pole shaft with a hard, smooth, nonporous surface that is resistant to soil acids, road salts, and attacks of water and frost, and must be clean, smooth, and free of surface voids and internal honeycombing. Do not install poles within 15 days of manufacture.

C. Brackets and Supports

ANSI C136.3, ANSI C136.13, and ANSI C136.21. Provide pole brackets that are not less than 1 1/4 inch galvanized steel pipe secured to pole. Slip-fitter or pipe-threaded brackets may be used, but brackets must be coordinated to luminaires provided, and brackets for use with one type of luminaire must be identical. Brackets for pole-mounted street lights must correctly position luminaire no lower than mounting height indicated. Mount brackets not less than 24 feet above street. Provide special mountings or brackets as indicated and of metal which will not promote galvanic reaction with luminaire head.

D. Pole Foundations

Provide anchor bolts consisting of a steel rod with a minimum yield strength of 50,000 psi; the top 12 inches of the rod must be galvanized in accordance with ASTM A153/A153M. Concrete must be as specified in Section 03 30 00 CAST-IN-PLACE CONCRETE.

2.7 EQUIPMENT IDENTIFICATION

A. Manufacturer's Nameplate

Each item of equipment must have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

B. Labels

UL 1598. Luminaires must be clearly marked for operation of specific light sources and drivers according to proper light source type. Note the following luminaire characteristics in the format "Use Only _____":

1. Correlated color temperature (CCT) and color rendering index (CRI) for all luminaires.

2. Driver and dimming protocol.

Markings related to light source type must be clear and located to be readily visible to service personnel, but unseen from normal viewing angles when light sources are in place. LED drivers must have clear markings indicating dimming type and indicate proper terminals for the various outputs.

2.8 FACTORY APPLIED FINISH

NEMA 250. Provide all luminaires and lighting equipment with factory-applied painting system that as a minimum meets requirement of corrosion-resistance testing.

PART 3 EXECUTION

3.1 INSTALLATION

IEEE C2, NFPA 70.

A. Luminaires

Install all luminaires in accordance with the luminaire manufacturer's written instructions. Install all luminaires at locations and heights as indicated on the project plans. Level all luminaires in accordance to manufacturer's written instructions.

B. LED Drivers

Provide LED drivers integral to luminaire as constructed by the manufacturer.

C. Concrete Poles

Install according to pole manufacturer's instructions.

D. Aluminum and Steel Poles

Provide pole foundations with galvanized steel anchor bolts, threaded at the top end and bent 90 degrees at the bottom end. Provide ornamental covers to match pole and galvanized nuts and washers for anchor bolts. Concrete for anchor bases, polyvinyl chloride (PVC) conduit bells, and ground rods must be as specified in Section 16301 Exterior Electrical System. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath and the end of conduit ell. Adjust poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location. Install according to pole manufacturer's instructions. Alterations to poles after fabrication will void manufacturer's warranty and is not allowed.

E. Pole Setting

Set pole to depth as indicated. Poles in straight runs must be in a straight line. Dig holes large enough to permit the proper use of tampers to the full depth of the hole. Place backfill in the hole in 6 inch maximum layers and thoroughly tamp. Place surplus earth around the pole in a conical shape and pack tightly to drain water away.

F. Lighting Controls

1. Photosensors

Aim photosensor according to manufacturer's recommendations.

G. Grounding

Ground noncurrent-carrying parts of equipment including metal poles, luminaires, mounting arms, brackets, and metallic enclosures as specified in Section 16301 Exterior Electrical System. Where copper grounding conductor is connected to a metal other than copper, provide specially treated or lined connectors suitable for this purpose.

3.2 FIELD QUALITY CONTROL

A. Tests

Upon completion of installation, verify that equipment is properly installed, connected, and adjusted. Perform initial operational test, consisting of the entire system energized for 72 consecutive hours without any failures of any kind occurring in the system. All circuits must test clear of faults, grounds, and open circuits.

1. Lighting Control Verification Test

Verify lighting control system and devices operate according to approved sequence of operations. Verification tests are to be completed after commissioning.

3.3 CLOSEOUT ACTIVITIES

A. Training

Provide on-site training to the Owner's personnel in the operation and maintenance of lighting and lighting control system. Provide training that includes calibration, adjustment, troubleshooting, maintenance, repair, and replacement.

1. Maintenance Staff Training

Submit a Maintenance Staff Training Plan at least 30 calendar days prior to training session that describes training procedures for Owner's personnel in the operation and maintenance of lighting and lighting control system. Provide on-site training which demonstrate full system functionality, assigning schedules, calibration adjustments for light levels and sensor sensitivity, integration procedures for connecting to third-party devices, and manual override including information on appropriate use. Provide protocols for troubleshooting, maintenance, repair, and replacement, and literature on available system updates and process for implementing updates.

2. End-User Training

Submit a End-User Training Plan at least 30 calendar days prior to training session that describes training procedures for end-users on the lighting control system. Provide demonstration for each type of user interface. Provide users with the curfew schedule as currently commissioned, including conditional programming based on astronomic time clock functionality. Provide users with the correct contact information for maintenance personnel who will be available to address any lighting control issues.

END OF SECTION

SECTION 16721

DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Electrical Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.

2. Manual fire-alarm boxes.

3. System smoke detectors.

4. Heat detectors.

5. Flame detectors

6. Notification appliances.

7. Device guards.

8. Magnetic door holders.

9. Remote annunciator.

10. Addressable interface device.

11. Network communications.

1.3 DEFINITIONS

A. EMT: Electrical Metallic Tubing.

B. FACP: Fire Alarm Control Panel.

C. HLI: High Level Interface.

D. NICET: National Institute for Certification in Engineering Technologies.

E. PC: Personal computer.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.

2. Include rated capacities, operating characteristics, and electrical characteristics.

B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.

2. Include plans, elevations, sections, details, and attachments to other work.

3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.

4. Detail assembly and support requirements.

5. Include voltage drop calculations for notification-appliance circuits.

6. Include battery-size calculations.

7. Include input/output matrix.

8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.

9. Include performance parameters and installation details for each detector.

10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.

11. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.

12. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.

    a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.

    b. Show field wiring required for HVAC unit shutdown on alarm.

    c. Show field wiring and equipment required for HVAC unit shutdown on alarm.

    d. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' smoke-evacuation system.

    e. Locate detectors according to manufacturer's written recommendations.

13. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.

2. Shop Drawings shall be prepared by persons with the following qualifications:

   a. Trained and certified by manufacturer in fire-alarm system design.

   b. NICET-certified, fire-alarm technician; **Level III** minimum.

   c. Licensed or certified by authorities having jurisdiction.

D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.

2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.

3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Seismic Qualification Certificates: For fire-alarm control unit, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field quality-control reports.

1.6 Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

   a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.

c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.

d. Riser diagram.

e. Device addresses.

f. Record copy of site-specific software.

g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:

1) Equipment tested.

2) Frequency of testing of installed components.

3) Frequency of inspection of installed components.

4) Requirements and recommendations related to results of maintenance.

5) Manufacturer's user training manuals.

h. Manufacturer's required maintenance related to system warranty requirements.

i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.

2. Program Software Backup: On magnetic media or compact disk, complete with data files.

3. Device address list.

4. Printout of software application and graphic screens.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps for Remote Indicating Lamp Units: Quantity equal to **10** percent of amount installed, but no fewer than one unit.

2. Lamps for Strobe Units: Quantity equal to **10** percent of amount installed, but no fewer than one unit.

3. Smoke Detectors, Flame Detectors and Heat Detector: Quantity equal to **10**<> percent of amount of each type installed, but no fewer than one unit of each type.

4. Detector Bases: Quantity equal to **two** percent of amount of each type installed, but no fewer than one unit of each type.

5. Keys and Tools: One extra set for access to locked or tamper proofed components.

6. Audible and Visual Notification Appliances: **One** of each type installed.

7. Fuses: **Two** of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm **Level III** technician.

C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

D. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

E. NFPA Certification: Obtain certification according to NFPA 72 in the form of a placard by an FM Global-approved alarm company.

1.10 PROJECT CONDITIONS

A. Perform a full test of the existing system prior to starting work. Document any equipment or components not functioning as designed.

B. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:

1. Notify **Owner** no fewer than **seven** days in advance of proposed interruption of fire-alarm service.

2. Do not proceed with interruption of fire-alarm service without **Owner's** written permission.

C. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.11 SEQUENCING AND SCHEDULING

A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.

B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

1.12 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.

1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
2. Warranty Period: **2**years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.

B. Non-coded, **UL-certified** or **FM Global-placarded** addressable system, with multiplexed signal transmission and **speaker**/strobe evacuation.

C. Automatic sensitivity control of certain smoke detectors.

D. All components provided shall be listed for use with the selected system.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices **and systems**:

1. Manual stations.

2. Heat detectors..

3. Smoke detectors.

4. Duct smoke detectors.

5. Automatic sprinkler system water flow.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.

2. Identify alarm and specific initiating device at fire-alarm control unit**, connected network control panels, and remote annunciators**.

3. Release fire and smoke doors held open by magnetic door holders.

4. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.

5. Activate smoke-control system (smoke management). Close smoke dampers in air ducts of designated air-conditioning duct systems. Coordinate first subparagraph below with "Elevator Recall" Paragraph in "Fire-Alarm Control Unit" Article.

6. Recall elevators to primary or alternate recall floors.

7. Activate elevator power shunt trip.

8. Record events in the system memory.

9. Indicate device in alarm on the graphic annunciator.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.

2. Alert and Action signals of air-sampling detector system.

3. Elevator shunt-trip supervision.

4. Independent fire-detection and -suppression systems.

5. User disabling of zones or individual devices.

6. Loss of communication with any panel on the network.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.

2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.

3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, or Ethernet module.

4. Loss of primary power at fire-alarm control unit.

5. Ground or a single break in internal circuits of fire-alarm control unit.

6. Abnormal ac voltage at fire-alarm control unit.

7. Break in standby battery circuitry.

8. Failure of battery charging.

9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Hose cabinet door open.

E. System Supervisory Signal Actions:

1. Initiate notification appliances.

2. Identify specific device initiating the event at fire-alarm control unit**, connected network control panels, and remote annunciators**.

3. After a time delay of **200 seconds** transmit a trouble or supervisory signal to the remote alarm receiving station.

4. Transmit system status to building management system.

5. Display system status on graphic annunciator.

2.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to **ASCE/SEI 7**

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified **and the unit will be fully operational after the seismic event**."

2.4 FIRE-ALARM CONTROL UNIT

A. Fire Alarm Control unit: EST3 Base Platform or approved equivalent.

B. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.

a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.

b. Include a real-time clock for time annotation of events on the event recorder.

c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.

d. The FACP shall be listed for connection to a central-station signaling system service.

e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 1740 -event history log.

2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.

3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.

C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, **168** characters, minimum.

2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

D. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, **three** line(s) of **80** characters, minimum.

2. Keypad: Arranged to permit entry and execution of programming, display, and control commands **and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters**

E. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

1. Pathway Class Designations: NFPA 72, **Class A Class B**.

2. Pathway Survivability: **Level 1**.

3. Install no more than **256**addressable devices on each signaling-line circuit.

4. Serial Interfaces:

a. One dedicated RS 485 port for **central-station** operation using point ID DACT.

b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module.

c. One **USB** port for PC configuration.

d. One RS 232 port for voice evacuation interface.

F. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.

2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.

3. Sound general alarm if the alarm is verified.

4. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

G. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.

2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.

3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

H. Elevator Recall:

1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:

   a. Elevator lobby detectors except the lobby detector on the designated floor.

   b. Smoke detector in elevator machine room.

   c. Smoke detectors in elevator hoist way.

2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.

   a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

I. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall **be** connected to fire-alarm system.

J. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

K. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

L. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

1. Batteries: **Sealed lead calcium**

M. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.5 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm **pull-lever** type; with addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.

2. Station Reset: Key- or wrench-operated switch.

3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.

4. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.6 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.

2. Detectors shall be **two**-wire type.

3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.

5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.

6. Integral Visual-Indicating Light: LED type, indicating detector has operated **and power on status**.

7. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition **and individually adjustable for sensitivity by fire-alarm control unit**.

   a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 or 20 deg. F (8 or 11 deg. C) per minute.

   b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg. F (57 or 68 deg. C).

   c. Multiple levels of detection sensitivity for each sensor.

   d. Sensitivity levels based on time of day.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.

    b. Device type.

    c. Present average value.

    d. Present sensitivity selected.

    e. Sensor range (normal, dirty, etc.).

C. Ionization Smoke Detector:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.

    b. Device type.

    c. Present average value.

    d. Present sensitivity selected.

    e. Sensor range (normal, dirty, etc.).

D. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.

    b. Device type.

    c. Present average value.

    d. Present sensitivity selected.

    e. Sensor range (normal, dirty, etc.).

3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.

4. Each sensor shall have multiple levels of detection sensitivity.

5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.

6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.7 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.

1. Temperature sensors shall test for and communicate the sensitivity range of the device.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of **135 deg. F (57 deg. C)** or a rate of rise that exceeds **15 deg. F (8 deg. C)** per minute unless otherwise indicated.

1. Mounting: **Adapter plate for outlet box mounting**.

2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of **190 deg. F (88 deg. C)**.

1. Mounting: **Adapter plate for outlet box mounting**

2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.8 NOTIFICATION APPLIANCES

A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.

B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

C. Chimes, Low-Level Output: Vibrating type, 75-dBA minimum rated output.

D. Chimes, High-Level Output: Vibrating type, 81-dBA minimum rated output.

E. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.

1. Rated Light Output:

a. 15/30/75/110 cd, selectable in the field.

2. Mounting: Wall mounted unless otherwise indicated.

3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.

4. Flashing shall be in a temporal pattern, synchronized with other units.

5. Strobe Leads: Factory connected to screw terminals.

6. Mounting Faceplate: Factory finished, **white**.

F. Voice/Tone Notification Appliances:

1. Comply with UL 1480.

2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.

3. High-Range Units: Rated 2 to 15 W.

4. Low-Range Units: Rated 1 to 2 W.

5. Mounting: **surface mounted and bidirectional**.

6. Matching Transformers: Tap range matched to acoustical environment of speaker location.

G. Exit Marking Audible Notification Appliance:

1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.

2. Provide exit marking audible notification appliances at the entrance to all building exits.

3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

2.9 MAGNETIC DOOR HOLDERS

A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.

1. Electromagnets: Require no more than 3 W to develop 25-lbf (111-N) holding force.

2. Wall-Mounted Units: Flush mounted unless otherwise indicated.

3. Rating: 24-V ac or dc.

4. Rating: 120-V ac.

B. Material and Finish: Match door hardware.

2.10 ADDRESSABLE INTERFACE DEVICE

A. General:

1. Include address-setting means on the module.

2. Store an internal identifying code for control panel use to identify the module type.

3. Listed for controlling HVAC fan motor controllers.

B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

C. Integral Relay: Capable of providing a direct signal **to elevator controller to initiate elevator recall**.

1. Allow the control panel to switch the relay contacts on command.

2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

D. Control Module:

1. Operate notification devices.

2. Operate solenoids for use in sprinkler service.

2.11 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.

1. Factory fabricated and furnished by device manufacturer.

2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.

1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.

B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

1. Devices placed in service before all other trades have completed cleanup shall be replaced.

2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.

B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.

C. Equipment Mounting: Install fire-alarm control unit on concrete base. Comply with requirements for concrete base specified in **Section 033000 "Cast-in-Place Concrete."**

1. Install seismic bracing.

2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (460-mm) centers around the full perimeter of concrete base.

3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.

4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

5. Install anchor bolts to elevations required for proper attachment to supported equipment.

D. Equipment Mounting: Install fire-alarm control unit on finished floor.

E. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor.

F. Manual Fire-Alarm Boxes:

1. Install manual fire-alarm box in the normal path of egress within 60 inches (1520 mm) of the exit doorway.

2. Mount manual fire-alarm box on a background of a contrasting color.

3. The operable part of manual fire-alarm box shall be between 42 inches (1060 mm) and 48 inches (1220 mm) above floor level. All devices shall be mounted at the same height unless otherwise indicated.

G. Smoke- or Heat-Detector Spacing:

1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.

2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.

3. Smooth ceiling spacing shall not exceed **30 feet (9 m)**

4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A in NFPA 72.

5. HVAC: Locate detectors not closer than **36 inches (910 mm)** from air-supply diffuser or return-air opening.

6. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.

H. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.

I. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches (9100 mm) long shall be supported at both ends.

1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

J. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.

K. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

L. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.

M. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches (150 mm) below the ceiling. Install all devices at the same height unless otherwise indicated.

N. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

A. Pathways above recessed ceilings and in non-accessible locations may be routed exposed.

1. Exposed pathways located less than 96 inches (2440 mm) above the floor shall be installed in EMT.

B. Pathways shall be installed in EMT.

C. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches (910 mm) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.

2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.

3. Smoke dampers in air ducts of designated HVAC duct systems.

4. Magnetically held-open doors.

5. Alarm-initiating connection to elevator recall system and components.

6. Supervisory connections at valve supervisory switches.

7. Supervisory connections at elevator shunt-trip breaker.

3.5 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

3.6 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

A. Field tests shall be witnessed Owner’s engineer.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

D. Perform the following tests and inspections **with the assistance of a factory-authorized service representative**:

1. Visual Inspection: Conduct visual inspection prior to testing.

    a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.

    b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.

4. Test audible appliances for the private operating mode according to manufacturer's written instructions.

5. Test visible appliances for the public operating mode according to manufacturer's written instructions.

6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

F. Fire-alarm system will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include **12**months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.9 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for **two** years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within **two** years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least **30**days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.10 DEMONSTRATION

A. **Engage a factory-authorized service representative to train** Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION

SECTION 16800

PHOTOVOLTAIC SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following: Photovoltaic collectors, mounting hardware, inverters, and grid tie equipment. The Photovoltaic system shall provide of power with a grid tie connection to the electrical power system. The PV system shall be designed by the Contractor to provide a complete and functioning system.

1.2 DEFINITION

A. PV: Photovoltaic.

1.3 SUBMITTALS

Approval is required for submittals indicated. The following shall be submitted in accordance with SUBMITTAL PROCEDURES

A. Shop Drawings

PV Modules

Include photovoltaic collector interconnection method and photovoltaic collector mounting details.

B. Product Data

Photovoltaic Collectors
Inverters
Mounting Hardware
Grid Tie Equipment

C. Certificates

PV System

Submit certification of compliance with NFPA 70 (NEC 690) and UL listing.

1.4 QUALITY ASSURANCE

A. NFPA 70 - National Electrical Code (NEC)

B. Occupational Safety and Health Administration (OSHA) Directives

C. IEEE 519 Guide for Harmonic Control and Reactive Compensation of Static Power Controllers

D. IEEE 1262, Recommend Criteria for Qualifications of Photovoltaic Modules

E. IEEE 928, Recommend Criteria for Terrestrial Photovoltaic Power Systems (PV system performance criteria)

F. IEEE 929, Recommend Practice for Utility Interface of Photovoltaic (PV) Systems

G. Comply with IEEE C2

H. UL 1741 (UL Standard for Inverters and Charge Controllers)

I. UL 1703 (UL Standard for Listing Photovoltaic Modules

J. Certification of PV Equipment: All PV modules, inverters and electrical components shall be required to be listed or recognized by an appropriate and recognized United States Safety Laboratory (for example: UL, ETL, etc.)

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site sealed and protected from weather. Store with supports to prevent bending, warping, and deforming.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated: Notify those affected and the Owner no fewer than two days in advance of proposed interruption of electrical service.

1.7 COORDINATION

A. Coordinate layout and installation with surface features as determined in the field.

1.8 EQUIPMENT WARRANTIES

A. The solar modules shall have a one-year manufacturer's warranty.

B. The inverter shall have a one -year manufacturer's warranty.

C. The entire system shall have a one-year warranty from the installing subcontractor including parts and labor. The Contractor shall be responsible to correct any deficiencies in the system if it fails to meet the performance criteria during commissioning.

PART 2 PRODUCTS

2.1 PV SYSTEM

A. The PV components and the system shall be designed to safely operate at continuous output, under a wide range of temperature and irradiance conditions characteristic of the specific site. Readily available solar panels of the latest technologies are to be considered for this project.

B. The power converter/inverter shall be multi-mode and shall convert DC power generated by PV solar arrays into utility grade AC power. Equipment shall be mounted in a

rainproof NEMA 4X stainless enclosure. The converter shall be listed by UL 1741 or CEC. The inverter output must be connected to the building's AC electrical distribution system in a manner that does not create parallel grounding paths (parallel current paths are created with neutral currents flowing in the equipment grounding conductors). A 3-phase 480/277 V Isolation Transformer shall be an integral unit of the inverter. The Inverter shall automatically disconnect from the grid if no incoming power is detected.

C. Performance Requirements:

(1) Nominal AC Voltage: 480/277 VAC Three-phase, +10/-12 percent

(2) Nominal AV Frequency: 60 Hz +0.5 Hz / -0.7 Hz

(3) AC Current Distortion: <5 percent THD at rated power

(4) Max. Open Circuit Voltage: 600 VDC

(5) Max. Ripple Current: <5 percent of rated current

(6) Peak Inverter Efficiency: >95 percent

(7) Standby Tare Losses: <100 watts

(8) Protective Circuits: AC over/under voltage, AC over/under frequency, ground overcurrent, over temperature, AC and DC over current, DC over voltage.

(9) Meters: LCD display of following parameters:
AC Output: Voltage, kW
DC Input: Voltage, current, kW
Operating state of the inverter Faults

(10) Ambient Temp Range: Operating: 20 degrees C to 50 degrees C. Non-Operating: -40 degrees C to 50 degrees C.

(11) Ambient Humidity +/-95 percent to 25 degrees C.

(12) Enclosure Environmental Rating: NEMA 4X stainless steel.

2.2 PV MODULES

A. UL Class "C" fire rated solar modules are permitted providing that PV crystal panels are mounted above the roof surface allowing for a minimum of a 50 mm air gap, otherwise, UL Class "B" or better fire rated PV panels are required. UL fire classification of all PV panels shall be tested by UL 790. Strain relief shall be provided for connecting wires. If the module has a closed weatherproof junction box, strain relief and moisture-tight clamps shall be used in any knockouts provided for field wiring.

B. Provide structure support system that will withstand 170 mph typhoon winds and shall be seismically designed for zone 4 locations.

C. Modules shall be marked with the following information that must appear on each module's factory-installed label.

(a) Polarity of output terminals or leads

(b) Maximum over-current device rating for module protection
(c) Rated open-circuit voltage
(d) Rated operating voltage
(e) Rated short-circuit current
(f) Rated operating current
(g) Rated maximum power

D. Only Copper conductors shall be used for all PV system wiring (NEC 110-5). All wire sizes must refer to copper conductors. Conductor insulation must have a wet-rated 90 degrees C and be sunlight resistant. Single-conductor, Type UF (Underground Feeder - Identified (marked) as Sunlight Resistant), Type SE (Service Entrance), or Type USE (Underground Service Entrance) cables are permitted for module inter-connect wiring (NEC 690-31 (B)). Stranded wire is suggested to ease servicing of the modules after installation and for durability (NEC 690-34). The temperature de-rated ampacity of conductors, at any point, must be at least 156 percent of the module, or array of parallel modules, rated short-circuit (Isc) at that point (NEC 690-8(A), (B)). If flexible, two conductor cable is needed, electrical tray cable (Type TC) is available but must be supported in a specific manner as outlines in the (NEC 318 and NEC 340).

E. The instructions furnished with each module will state the acceptable size and type of wires for use with the terminals. Some modules may require the use of crimp-on terminals when stranded conductors are used. In general, un-insulated terminals are preferred (with insulation applied later if required), but care must be exercised to obtain the heavier, more reliable UL-Listed terminals and not unlisted electronic or automotive grades, use only UL-Listed terminals. If the junction box provides box-style pressure terminals, it is not necessary to use crimped terminals.

PART 3 EXECUTION

3.1 TRANSITION WIRING

A. The PV system w i ring must be made using one of the methods included in the (NEC 690-31, Chapter 3). single-conductor, exposed wiring is not permitted except for module wiring or with special permission (Chapter 3). The most common methods used for PV systems are individual conductors in electrical [conduit][metallic tubing (EMT), nonmetallic conduit, or non-metallic sheathed cable]. Where individual conductors are used in conduit, they should be conductors with at least 90 degrees C insulation such as RHW-2, THW-2, THWN-2 or XHHW-2. Conduits installed exposed or outdoors, are considered as installed in "wet locations". [The conduit can be thick-wall rigid galvanized-steel (RGS), intermediate metal conduit (IMC) or thin-wall electrical metallic tubing (EMT), and if rigid non-metallic conduit is used, electrical (gray) PVC (Schedule 40 or Schedule 80) must be used.] Splices from the conductors, from the modules to this wire, when located outside, must be protected in rainproof junction boxes such as NEMA type 3R. Cable clamps must also be used. Cable clamps used with this box must be listed for outdoor use.

3.2 MODULE CONNECTORS

A. Module connectors that are concealed at the time of installation must be able to resist the environment, be polarized. and be able to handle the short circuit current. They shall also be part of a latching design with the terminals guarded. The equipment grounding member, if used, shall make first and break last (NEC 690-32, 33). The UL standard also

requires that the connectors for positive and negative conductors should not be interchangeable.

B. Module Connection Access: All junction boxes and other locations where modules and stranded wiring may allow accessibility (NEC 690-34). The modules should not be permanently fixed (welded) to mounting frames, and solid wire that could break when modules are moved to service the junction boxes should not be used. Open spaces behind the modules would allow access to the junction boxes.

3.3 FUSING

A. Fuses shall be DC rated, listed, and able to handle the short circuit currents they may be subjected to. The use of AC-only rated supplementary fuses is not acceptable for the DC circuits of PV systems.

3.4 DISCONNECTING MEANS

The disconnect system must provide safe, reliable, and understandable operation.

A. Photovoltaic Array Disconnects: All current-carrying conductors from the PV power source must have disconnect provisions. This includes the ground conductor, if any. Ground conductors which normally remain connected at all times may have a bolted disconnect (terminal or lug) that can be used for service operations and for meeting the NEC requirements. Ungrounded conductors must have a switch or circuit breaker disconnect. In ungrounded 24-volt PV system, both positive and negative conductors must be switched.

B. Equipment Disconnects: Each piece of equipment in the PV system shall have disconnects switches as means of disconnecting the PV system from all sources of power. Disconnects shall be circuit breakers or switches and shall comply with all of the provisions of NEC 690-17. When properly located and used within their approved ratings, circuit breakers can serve as both disconnect and over current device. Disconnect switches must be rated to carry this load and have appropriate interrupt rating.

END OF SECTION

ATTACHMENT B-9

PERFORMANCE AUDIO-VIDEO LEGEND

WALL MOUNTED

AL — ASSISTED LISTENING ANTENNA BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX. FLUSH MOUNT IN WALL 6" BELOW FINISHED CEILING UNLESS OTHERWISE NOTED. AV CONTRACTOR SHALL PROVIDE ANTENNA AND MOUNT TO BOX WITH MANUFACTURER'S BRACKET.

AP — PRACTICE/ENSEMBLE/MUSIC OFFICE BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX. FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE ADJACENT TO BOX. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE.

BI — BLEACHER INTERFACE BOX. 3-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX, FLUSH MOUNT IN FACE OF BLEACHER. AV CONTRACTOR SHALL COORDINATE WITH BLEACHER PROVIDER. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO PLATE. TELECOM CONTRACTOR SHALL PROVIDE TWO (2) BUILDING DATA OUTLETS ADJACENT TO PLATE. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE.

CI — CLASSROOM INPUT. 4-GANG EXTRA DEEP, LARGE CAPACITY JUNCTION BOX, FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA OUTLET ADJACENT TO BOX.

FP — FLAT PANEL DISPLAY BOX. CHIEF PACS26 OR EQUAL. FLUSH MOUNT IN WALL AT HEIGHT SHOWN ON DRAWINGS. ELECTRICAL CONTRACTOR SHALL PROVIDE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE IN BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE IN BOX.

G — GYMNASIUM INPUT BOX. 3-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX. FLUSH MOUNT IN WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE ADJACENT TO BOX. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE.

IC$_X$ — INTERCOM BOX. 1-GANG LARGE CAPACITY JUNCTION BOX, FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT UNLESS OTHERWISE NOTED. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE. "X" DENOTES PLATE TYPE.

IS — INTERCOM SPEAKER STATION, 4-GANG EXTRA DEEP, LARGE CAPACITY JUNCTION BOX MOUNTED AT STANDARD SWITCH HEIGHT UNLESS OTHERWISE NOTED. AV CONTRACTOR SHALL MOUNT INTERCOM DEVICE IN BOX.

JB — BLEACHER JUNCTION BOX. 2-GANG EXTRA DEEP, LARGE CAPACITY JUNCTION BOX, FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA OUTLET ADJACENT TO BOX.

MX — MIX POSITION BOX. 6"x6"x4" JUNCTION BOX. FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT UNDER MIX POSITION COUNTER. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO PLUGMOLD STRIP ABOVE COUNTER. PROVIDE A MINIMUM OF ONE (1) OUTLET EVERY 18". GC TO PROVIDE FOUR (4) 2" GROMMET HOLES SPACED ACROSS THE BACK OF THE COUNTERTOP TO ACCESS CABLE TRAY. AV CONTRACTOR TO PROVIDE CUSTOM PLATE.

PS — PROJECTION SCREEN. ELECTRICAL CONTRACTOR SHALL TERMINATE LOW VOLTAGE CONDUIT INTO PROJECTION SCREEN CASE PER MANUFACTURER'S INSTRUCTIONS. ELECTRICAL CONTRACTOR SHALL PROVIDE AND TERMINATE 120VAC POWER TO PROJECTION SCREEN PER MANUFACTURER'S INSTRUCTIONS. AV CONTRACTOR SHALL PROVIDE AND INSTALL PROJECTION SCREEN AND COORDINATE POWER AND LOW VOLTAGE CONDUIT REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

RI$_X$ — RECORDING INTERFACE BOX. 8"x8"x4" JUNCTION BOX, FLUSH MOUNTED IN-WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO QUAD NEMA 5-20R RECEPTACLE ADJACENT TO BOX. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE. SUBSCRIPT DENOTES PLATE LOCATION AND TYPE.

S — LOUDSPEAKER BOX. 2-GANG LARGE CAPACITY JUNCTION BOX FLUSH MOUNT IN-WALL AT HEIGHT INDICATED ON DRAWING.

SA — STAGE I/O BOX. 8"x8"x4" JUNCTION BOX FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO QUAD NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE CUSTOM PLATE.

SC — PROJECTION SCREEN LOW VOLTAGE CONTROL CONNECTION BOX. 1-GANG LARGE CAPACITY JUNCTION BOX. FLUSH MOUNT IN WALL AT STANDARD SWITCH HEIGHT.

TS — TOUCH SCREEN. CUSTOM BACK BOX PROVIDED BY AV CONTRACTOR TO BE INSTALLED BY ELECTRICAL CONTRACTOR AT STANDARD SWITCH HEIGHT.

VC — VOLUME CONTROL. 1-GANG LARGE CAPACITY JUNCTION BOX. MOUNT FLUSH IN WALL AT STANDARD SWITCH HEIGHT

VI — VIDEO INPUT. 1-GANG LARGE CAPACITY JUNCTION BOX, FLUSH MOUNT IN-WALL AT STANDARD OUTLET HEIGHT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA OUTLET ADJACENT TO BOX. AV CONTRACTOR TO PROVIDE CUSTOM PLATE.

WM — WIRELESS MICROPHONE ANTENNA BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX FLUSH MOUNT IN-WALL AT 20' AFF, UNLESS OTHERWISE NOTED. AV CONTRACTOR SHALL PROVIDE PLATE WITH 1" GROMMET. AV CONTRACTOR SHALL PROVIDE AND MOUNT ANTENNA.

CEILING MOUNTED

AL — ASSISTED LISTENING ANTENNA BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX. FLUSH MOUNT IN FINISHED CEILING OPENING DOWNWARD. AV CONTRACTOR SHALL PROVIDE ANTENNA AND MOUNT TO BOX WITH MANUFACTURER'S BRACKET.

BT — BLUETOOTH RECEIVER BOX. 8"x8"x4" JUNCTION BOX SURFACE MOUNT TO CEILING STRUCTURE. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. AV CONTRACTOR TO INSTALL ANTENNA TO EXTERIOR OF BOX.

CA — CEILING CAMERA. 3-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX. FLUSH MOUNT IN FINISHED CEILING OPENING DOWNWARD ADJACENT TO CAMERA MOUNTING LOCATION. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE ADJACENT TO BOX. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE.

CM — CEILING MICROPHONE BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX FLUSH MOUNT IN CEILING OPENING DOWNWARD. AV CONTRACTOR TO PROVIDE CUSTOM PLATE.

CEILING MOUNTED (CONT.)

CS — CEILING LOUDSPEAKER. FLUSH MOUNT IN CEILING. IN ROOMS WITH ACCESSIBLE CEILINGS, PROVIDE PLENUM CABLE TO LOUDSPEAKER WITH J-HOOKS. IN ROOMS WITH NO CEILINGS, PROVIDE PENDANT LOUDSPEAKERS. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX ATTACHED TO STRUCTURE ABOVE LOUDSPEAKER LOCATION OPENING DOWNWARD. ELECTRICAL CONTRACTOR SHALL PROVIDE FLEXIBLE CONDUIT FROM JUNCTION BOX TO LOUDSPEAKER BACKCAN.

PJ — PROJECTOR BOX. CHIF CMS492C, OR EQUAL, FLUSH MOUNT IN ACT CEILING. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE IN BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE IN BOX.

PS — PROJECTION SCREEN. ELECTRICAL CONTRACTOR SHALL TERMINATE LOW VOLTAGE CONDUIT INTO PROJECTION SCREEN CASE PER MANUFACTURER'S INSTRUCTIONS. ELECTRICAL CONTRACTOR SHALL PROVIDE AND TERMINATE 120VAC POWER TO PROJECTION SCREEN PER MANUFACTURER'S INSTRUCTIONS. AV CONTRACTOR SHALL PROVIDE AND INSTALL PROJECTION SCREEN AND COORDINATE POWER AND LOW VOLTAGE CONDUIT REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

SP — SCENIC PROJECTION BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX. MOUNT TO UNDERSIDE OF CEILING STRUCTURE. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20 120V POWER CIRCUIT TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE ADJACENT TO BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA OUTLETS ADJACENT TO BOX. AV CONTRACTOR SHALL PROVIDE BLANK COVER PLATE.

TP — THEATRE VIDEO PROJECTOR BOX. 2-GANG EXTRA-DEEP, LARGE CAPACITY JUNCTION BOX. SURFACE MOUNT IN PROJECTOR LIFT. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V DEDICATED TECHNICAL POWER CIRCUIT TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE AND ONE (1) 20A 208V DEDICATED TECHNICAL POWER CIRCUIT ADJACENT TO PROJECTOR MOUNTING POINT. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE ADJACENT IN PROJECTOR LIFT. AV CONTRACTOR SHALL PROVIDE CUSOM PLATE.

S — LOUDSPEAKER BOX, CEILING MOUNTED. 4" X 4" X 4" JUNCTION BOX SURFACE MOUNT TO CEILING STRUCTURE ADJACENT TO LOUDSPEAKER RIGGING POINT OPENING DOWNWARD. AV CONTRACTOR TO PROVIDE CUSTOM PLATE WITH GROMMET.

WM — WIRELESS MICROPHONE ANTENNA BOX. 2-GANG LARGE CAPACITY, EXTRA DEEP JUNCTION BOX FLUSH MOUNT IN-WALL AT 20' AFF. UNLESS OTHERWISE NOTED. AV CONTRACTOR SHALL PROVIDE PLATE WITH 1" GROMMET. AV CONTRACTOR SHALL PROVIDE AND MOUNT ANTENNA.

FLOOR MOUNTED

FB$_X$ — FLOOR BOX, FSR FL-600P-6" OR EQUAL. RECESS BOX TO ALLOW COVER TO BE FLUSH WITH FINISHED FLOOR. SUBMIT COVER TO ARCHITECT FOR REVIEW. AV CONTRACTOR SHALL PROVIDE BOX TO ELECTRICAL CONTRACTOR FOR INSTALLATION. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 20A 120V TECHNICAL POWER CIRCUIT WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLE IN FLOOR BOX. TELECOM CONTRACTOR SHALL PROVIDE ONE (1) BUILDING DATA RECEPTACLE IN FLOOR BOX. AV CONTRACTOR SHALL PROVIDE CUSTOM PLATE. SUBSCRIPT DENOTES PLATE NUMBER.

EQUIPMENT RACKS

AV RK-1 — AV STAGE MANAGER'S RACK. ELECTRICAL CONTRACTOR SHALL PROVIDE TWO (2) 20A 120V TECHNICAL POWER CIRCUITS WITH ISOLATED GROUND TERMINATED TO QUAD NEMA 5-20R RECEPTACLES BEHIND RACK. TELECOM CONTRACTOR SHALL PROVIDE TWO (2) BUILDING DATA RECEPTACLES BEHIND RACK. AV CONTRACTOR SHALL COORDINATE OUTLET LOCATION SO THAT RACK SITS FLUSH WITH WALL.

AV RK-2 — AV AMPLIFIER RACK. ELECTRICAL CONTRACTOR SHALL PROVIDE FIVE (5) 20A 120V TECHNICAL POWER CIRCUITS WITH ISOLATED GROUND TERMINATED TO QUAD NEMA 5-20R RECEPTACLES BEHIND RACK. TELECOM CONTRACTOR SHALL PROVIDE TWO (2) BUILDING DATA RECEPTACLES BEHIND RACK. AV CONTRACTOR SHALL COORDINATE OUTLET LOCATION SO THAT RACK SITS FLUSH WITH WALL.

AV RK-3 — AV MIX POSITION UPPER RACK.

AV RK-4 — AV MIX POSITION LOWER RACK. ELECTRICAL CONTRACTOR SHALL PROVIDE THREE (3) 20A 120V TECHNICAL POWER CIRCUITS WITH ISOLATED GROUND TERMINATED TO QUAD NEMA 5-20R RECEPTACLES BEHIND RACK. TELECOM CONTRACTOR SHALL PROVIDE TWO (2) BUILDING DATA RECEPTACLES BEHIND RACK. AV CONTRACTOR SHALL COORDINATE OUTLET LOCATION SO THAT RACK SITS FLUSH WITH WALL.

AV RK-5 — AV CLASSROOM EQUIPMENT RACK. ELECTRICAL CONTRACTOR SHALL PROVIDE TWO (2) 20A 120V TECHNICAL POWER CIRCUITS WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLES BEHIND RACK. TELECOM CONTRACTOR SHALL PROVIDE TWO (2) BUILDING DATA RECEPTACLES BEHIND RACK. AV CONTRACTOR SHALL COORDINATE OUTLET LOCATION SO THAT RACK SITS FLUSH WITH WALL. MOUNT ON WALL WITH 46" CLEARANCE UNDER RACK.

AV RK-6 — AV PORTABLE RECORDING RACK. PARTIAL-HEIGHT, PORTABLE RACK. MOUNT MIXER ON TOP OF RACK. PROVIDE CABLE MANAGEMENT AS NEEDED.

AV RK-7 — AV GYMNASIUM EQUIPMENT RACK. ELECTRICAL CONTRACTOR SHALL PROVIDE TWO (2) 20A 120V TECHNICAL POWER CIRCUITS WITH ISOLATED GROUND TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLES BEHIND RACK. TELECOM CONTRACTOR SHALL PROVIDE TWO (2) BUILDING DATA RECEPTACLES BEHIND RACK. AV CONTRACTOR SHALL COORDINATE OUTLET LOCATION SO THAT RACK SITS FLUSH WITH WALL.

WIREWAY. ELECTRICAL CONTRACTOR TO PROVIDE WIREWAY CENTERED 18" ABOVE RACK. SIZE WIREWAY AS NEEDED TO ACCOMMODATE NUMBER AND SIZE OF CONDUITS SHOWN ON DRAWING.

FLAGS

1 — ROUTE TO WIREWAY ABOVE STAGE MANAGER'S RACK (AV RK-1)

2 — ROUTE TO WIREWAY ABOVE AMPLIFIER RACK (AV RK-2)

3 — NOT USED

4 — NOT USED

5 — ROUTE TO WIREWAY ABOVE CLASSROOM RACK (AV RK-5)

6 — ROUTE TO ASSOCIATED RECORDING INTERFACE BOX IN ROOM

7 — ROUTE TO WIREWAY ABOVE AV GYMNASIUM EQUIPMENT RACK (AV RK-7)

8 — ROUTE TO LOCAL VOLUME CONTROL (VC) IN ROOM

PERFORMANCE AUDIO-VIDEO GENERAL NOTES

1. THE INFRASTRUCTURE DRAWINGS ARE INTENDED AS DESIGN INPUT TO THE ARCHITECT AND ELECTRICAL THE INFRASTRUCTURE DRAWINGS ARE INTENDED AS DESIGN INPUT TO THE ARCHITECT AND ELECTRICAL CONTRACTOR.
2. ALL ELECTRICAL CONDUITS, BOXES AND WIRE WAYS DEFINED IN THE AV SERIES DRAWINGS SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED.
3. WHERE EXACT DIMENSIONS ARE NOT CALLED FOR, THE SCALE OF THESE DRAWING IS SUFFICIENTLY ACCURATE FOR DETERMINING LOCATION OF EQUIPMENT, JUNCTION BOXES, OUTLET BOX WIRE WAYS, PANELS, ETC. WHERE EXACT DIMENSIONS ARE CALLED FOR, THE REFERENCE SURFACE SHALL BE THE FINAL FINISHED SURFACE INCLUDING ANY ACOUSTICAL TREATMENT. DIMENSIONS REFER TO THE CENTER OF THE DEVICE UNLESS OTHERWISE ROOM DIMENSIONS ON THESE DRAWINGS HAVE BEEN TAKEN FROM PRELIMINARY ARCHITECTURAL DRAWINGS. ALL DIMENSIONS MUST BE VERIFIED AND ANY DEVIATIONS CAUSING CHANGES EXCEEDING 3.00 INCHES IN THE LOCATION OF EQUIPMENT MUST BE COORDINATED WITH THE ARCHITECT AND CONSULTANT.
4. CONDUIT RUNS ON THIS DRAWING SHOW ONLY INTERCONNECTION BETWEEN THE TERMINATION POINTS. THE EXACT PATH OF CONDUIT IS TO BE DETERMINED BY THE ELECTRICAL CONTRACTOR AND FIELD CONDITIONS.
5. ALL EMPTY CONDUIT SHALL BE DEBURRED, CLEANED, CAPPED, TAGGED AND FURNISHED WITH PULL STRINGS.
6. ELECTRICAL CONTRACTOR TO COORDINATE ALL CONDUIT RUNS WITH AV CONTRACTOR SUCH THAT CONDUIT IS THE MOST DIRECT AS POSSIBLE AND NO SIGNAL PATH IS BEYOND THE OPERATING LIMITS FOR ANY SIGNAL TYPE. ALL COORDINATION TO BE DOCUMENTED, DATED, AND SIGNED OFF BY BOTH AV AND ELECTRICAL CONTRACTORS.
7. THERE SHALL BE A MINIMUM OF ONE PULL BOX FOR EVERY 100 FEET OF CONDUIT. THERE SHALL NOT BE MORE THAN THE EQUIVALENT OF TWO QUARTER BENDS (180 DEGREES TOTAL) BETWEEN PULL POINTS.
8. POWER AND DATA RECEPTACLES CALLED FOR ON AV DRAWINGS ARE TO BE DEDICATED TO SPECIFIC AV EQUIPMENT.
9. OVERCURRENT PROTECTION DEVICES SHALL BE SIZED AND SPECIFIED BY THE ELECTRICAL ENGINEER. REFER TO ELECTRICAL DRAWINGS. ALL DEDICATED AV CIRCUITS SHALL BE PROTECTED BY 120 VAC, 20.0 A CIRCUIT BREAKERS UNLESS OTHERWISE NOTED.
10. ELECTRICAL FEEDS SHALL NOT BE RUN PARALLEL WITH VIDEO AND/ OR AUDIO LINES OR RACEWAYS. IF ELECTRICAL FEEDS MUST RUN PARALLEL TO AUDIO/VIDEO LINES, A MINIMUM OF 4 FEET OF SEPARATION MUST BE MAINTAINED.
11. STRUCTURAL BACKING FOR MOUNTING AV EQUIPMENT, INCLUDING DISPLAYS AND CAMERAS, SHALL BE COORDINATED BY AV CONTRACTOR AND PROVIDED BY GENERAL CONTRACTOR.
12. THE METHOD OF INSTALLATION OF BOXES IN WALLS AND THE METHOD OF PASSAGE OF CONDUITS AND WIRE WAYS THROUGH ACOUSTICALLY SENSITIVE WALLS SHALL BE COORDINATED WITH THE ACOUSTICAL CONSULTANT.
13. AV CONDUIT ABOVE ACCESSIBLE CEILING MAY BE INTERRUPTED ALLOWING AV CABLING TO BE RUN IN LADDER RACKS OR CEILING HOOKS. WHERE CONDUIT IS INTERRUPTED, PLENUM CABLE SHALL BE USED FOR THE ENTIRE RUN.

SCOPE OF WORK BETWEEN TRADES

GENERAL CONTRACTOR

1. FURNISH AND INSTALL ALL IN WALL AND IN CEILING BLOCKING SUPPORT FOR AV MOUNTS
2. PROVIDE WALL AND CEILING SPEAKER CUTOUTS
3. PROVIDE TABLE CUTOUTS FOR AV EQUIPMENT (UNLESS PROVIDED BY TABLE PROVIDER)

ELECTRICAL CONTRACTOR

1. FURNISH AND INSTALL ALL POWER OUTLETS AND JUNCTION BOXES
2. FURNISH AND INSTALL ALL CONDUIT
3. FURNISH AND INSTALL ALL PULL STRINGS IN CONDUIT
4. FURNISH AND INSTALL ALL CABLE TRAY AND LADDER RACKS
5. FURNISH AND INSTALL ALL ELECTRICAL BOXES
6. FURNISH AND INSTALL ALL AV BACK BOXES UNLESS OTHERWISE NOTED
7. FURNISH AND INSTALL ALL FLOOR BOXES UNLESS OTHERWISE NOTED

AUDIO VISUAL CONTRACTOR

1. FURNISH AND INSTALL ALL AV CABLING
2. FURNISH AND INSTALL ALL AV CONNECTORS
3. FURNISH AND INSTALL AV PLATES AND INTERFACES
4. FURNISH AND INSTALL CEILING AV MOUNTS
5. FURNISH AND INSTALL WALL MOUNTS
6. FURNISH AND INSTALL ALL AV DEVICES AND EQUIPMENT
7. FURNISH AND INSTALL ALL DEDICATED AV NETWORK EQUIPMENT AND CABLING
8. PROVIDE ALL AV SYSTEM PROGRAMMING REQUIRED TO PROVIDE DESCRIBED FUNCTIONALITY

DATA CONTRACTOR

1. FURNISH AND INSTALL ALL NETWORK CABLING, FIBER AND TWISTED PAIR, EXCLUDING DEDICATED AV NETWORK CABLING
2. FURNISH AND INSTALL ALL NETWORK CONNECTORS AND PLATES, EXCLUDING NETWORK CONNECTORS AND PLATES DEDICATED TO AV EQUIPMENT

AUDIO-VIDEO ABBREVIATIONS

AC	ABOVE COUNTER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFP	ABOVE FINISHED PLATFORM FLOOR
AS	ABOVE SLAB
AV	AUDIO-VIDEO
AVC	AUDIO-VIDEO CONTRACTOR
AWG	AMERICAN WIRE GAUGE
BFC	BELOW FINISHED CEILING
C	CONDUIT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CL	CENTER LINE
CLG	CEILING
COND	CONDUCTOR
CP	CONSOLIDATION POINT
CU	COPPER
DVR	DIGITAL VIDEO RECORDER
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
E.C.	EMPTY CONDUIT
EX	EXISTING
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
GC	GENERAL CONTRACTOR
GND	GROUND
HZ	HERTZ
IDF	INTERMEDIATE DISTRIBUTION FRAME
IG	ISOLATED GROUND
IP	INPUT
JB	JUNCTION BOX
KHZ	KILOHERTZ
LV	LOW VOLTAGE
MAX	MAXIMUM
MCS	MULTIMEDIA COMMUNICATION SYSTEM
MDF	MAIN DISTRIBUTIONS FRAME
MIN	MINIMUM
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFE	OWNER FURNISHED EQUIPMENT
OP	OUTPUT
PA	PUBLIC ADDRESS
PB	PULL BOX
PBO	PROVIDED BY OTHERS
PR	PAIR
PTZ	PAN/TILT/ZOOM
RM	ROOM
RX	RECEIVE
STD	STANDARD
STP	SHIELDED TWISTED PAIR
TEL	TELECOMMUNICATIONS
TEMP	TEMPORARY
TV	TELEVISION
TX	TRANSMIT
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTED POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
V	VOLTS
VA	VOLT-AMPERES
VM	VOLTMETER
W	WATTS
WP	WATERPROOF
WS	WORKSTATION
WW	WIREWAY
XFRM	TRANSFORMER

AV SYSTEMS DRAWING INDEX

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AV2.12	AV SYSTEMS GYMNASIUM PLAN - LEVEL 1
AV2.14	AV SYSTEMS AUDITORIUM PLAN - LEVEL 1
AV2.24	AV SYSTEMS LIBRARY PLAN
AV2.25	AV SYSTEMS CHOIR & BAND PLAN - LEVEL 2
AV2.26	AV SYSTEMS AUDITORIUM PLAN - LEVEL 2
AV3.12	AV SYSTEMS GYMNASIUM RCP - LEVEL 1
AV3.14	AV SYSTEMS AUDITORIUM RCP - LEVEL 1
AV3.24	AV SYSTEMS CHOIR & BAND RCP - LEVEL 2
AV3.25	AV SYSTEMS AUDITORIUM RCP - LEVEL 2
AV5.90	AV SYSTEMS AUDITORIUM SECTIONS & ELEVATIONS
AV5.91	AV SYSTEMS AUDITORIUM LOBBY & BACKSTAGE ELEVATIONS
AV5.92	AV SYSTEMS GYMSASIUM SECTIONS & ELEVATIONS
AV5.93	AV SYSTEMS MUSIC CLASSROOMS SECTIONS & ELEVATIONS
AV5.94	AV SYSTEMS DANCE AND MEDIA ROOMS SECTIONS & ELEVATIONS
AV7.00	AV SYSTEMS ONE-LINE DIAGRAM
AV7.10	AV SYSTEMS ONE-LINE DIAGRAM
AV7.11	AV SYSTEMS ONE-LINE DIAGRAM
AV7.20	AV SYSTEMS ONE-LINE DIAGRAM
AV7.21	AV SYSTEMS ONE-LINE DIAGRAM
AV7.30	AV SYSTEMS ONE-LINE DIAGRAM
AV7.80	AV SYSTEMS - PLATE DETAILS
AV7.81	AV SYSTEMS PLATE DETAILS
AV7.90	AV SYSTEMS RACK ELEVATIONS
AV8.00	AV SYSTEMS AUDITORIUM LOUDSPEAKER AIMING DIAGRAM

REVISION

No.	Description	Date

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Interior Design

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970 N. Kalaheo Avenue, Suite A-311, Kailua, Oahu, Hawaii 96734
www.dlaa.com 808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS LEGEND
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	
Date:	10/26/2022
Project No.	20-019
File	

Drawing No.
AV0.00
Sheet No. _____ of _____

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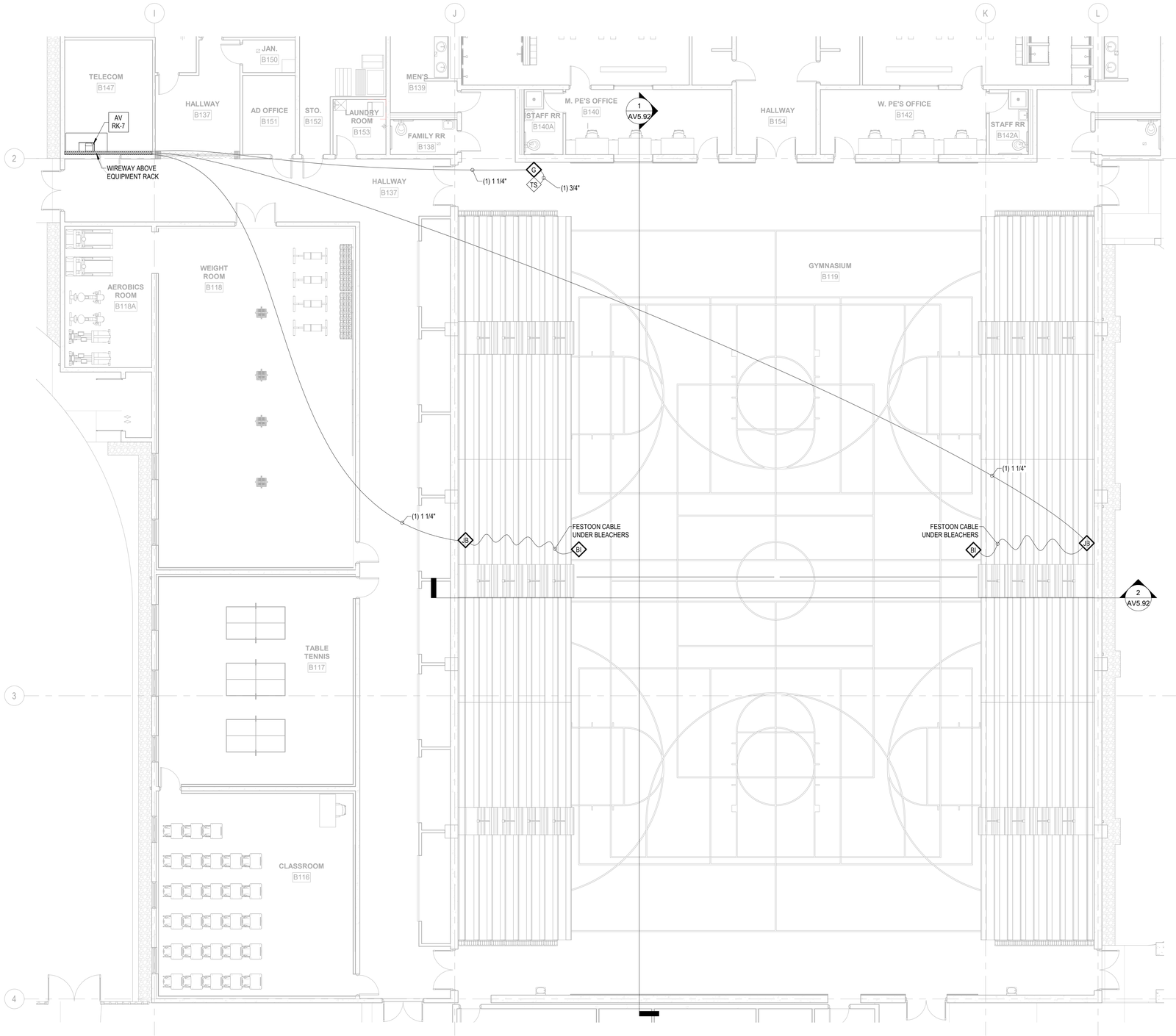

1 GYMNASIUM - LEVEL 1 FLOOR PLAN
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36"
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REVISION		
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Kailua, Oahu
Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS
GYMNASIUM PLAN - LEVEL 1
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
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Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

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AV2.12
Sheet No. _____ of _____

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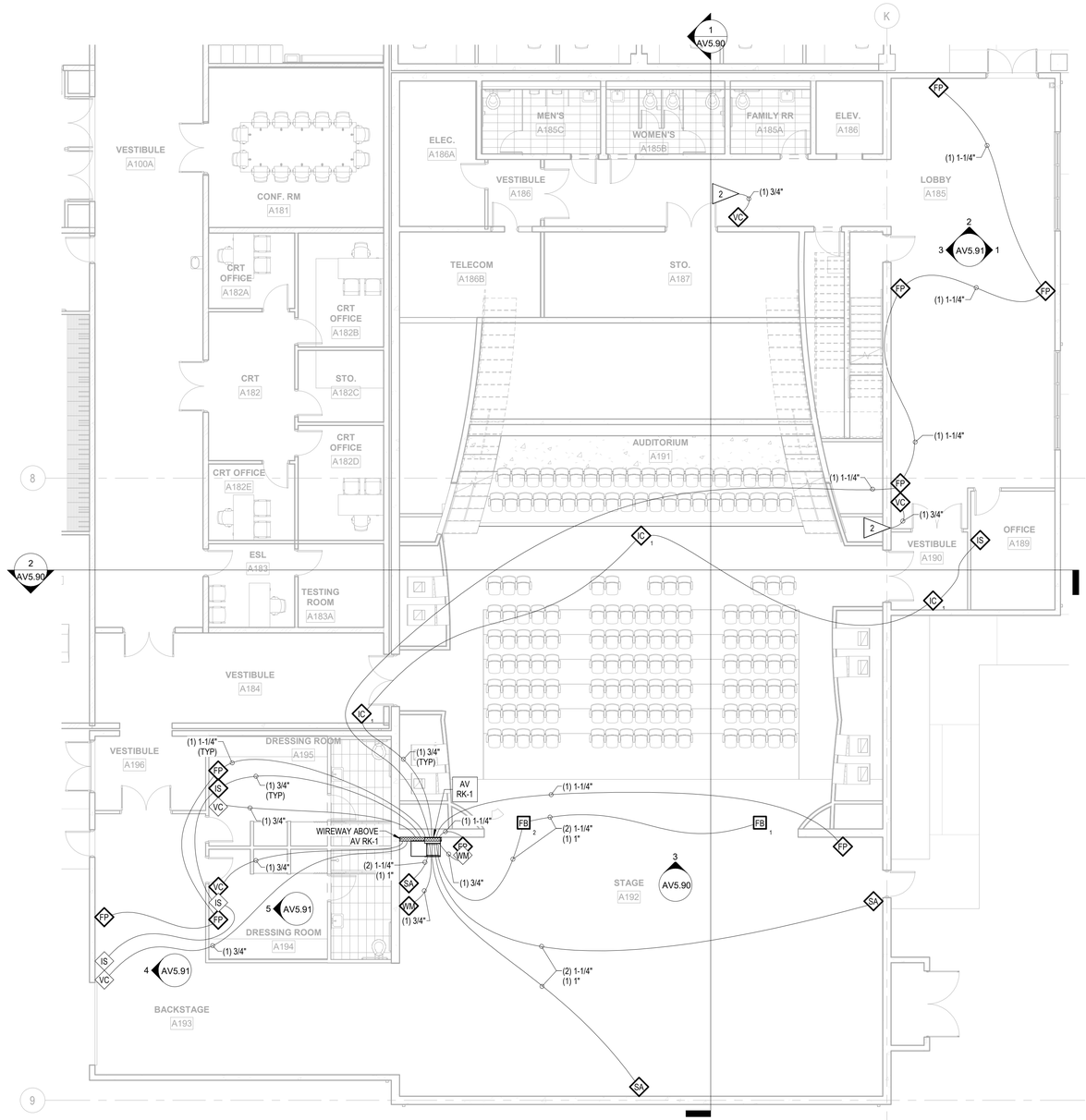

1 AUDITORIUM - LEVEL 1 FLOOR PLAN (LOWER EAST)
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36"
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Project:
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SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS AUDITORIUM PLAN - LEVEL 1
100% CONSTRUCTION DOCUMENTS

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Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No.: 20-019	File

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AV2.14
Sheet No. _____ of _____

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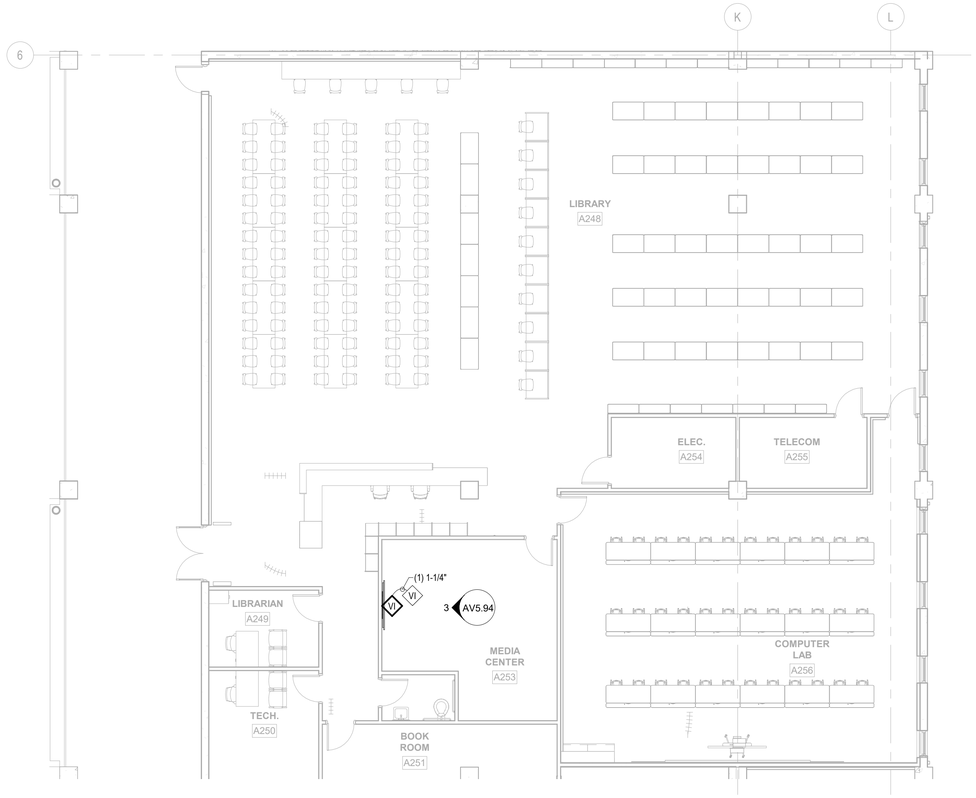

1 LIBRARY - LEVEL 2 FLOOR PLAN
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS LIBRARY PLAN

100% CONSTRUCTION DOCUMENTS

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Drawn:	RSP
Checked:	ZLW
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Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

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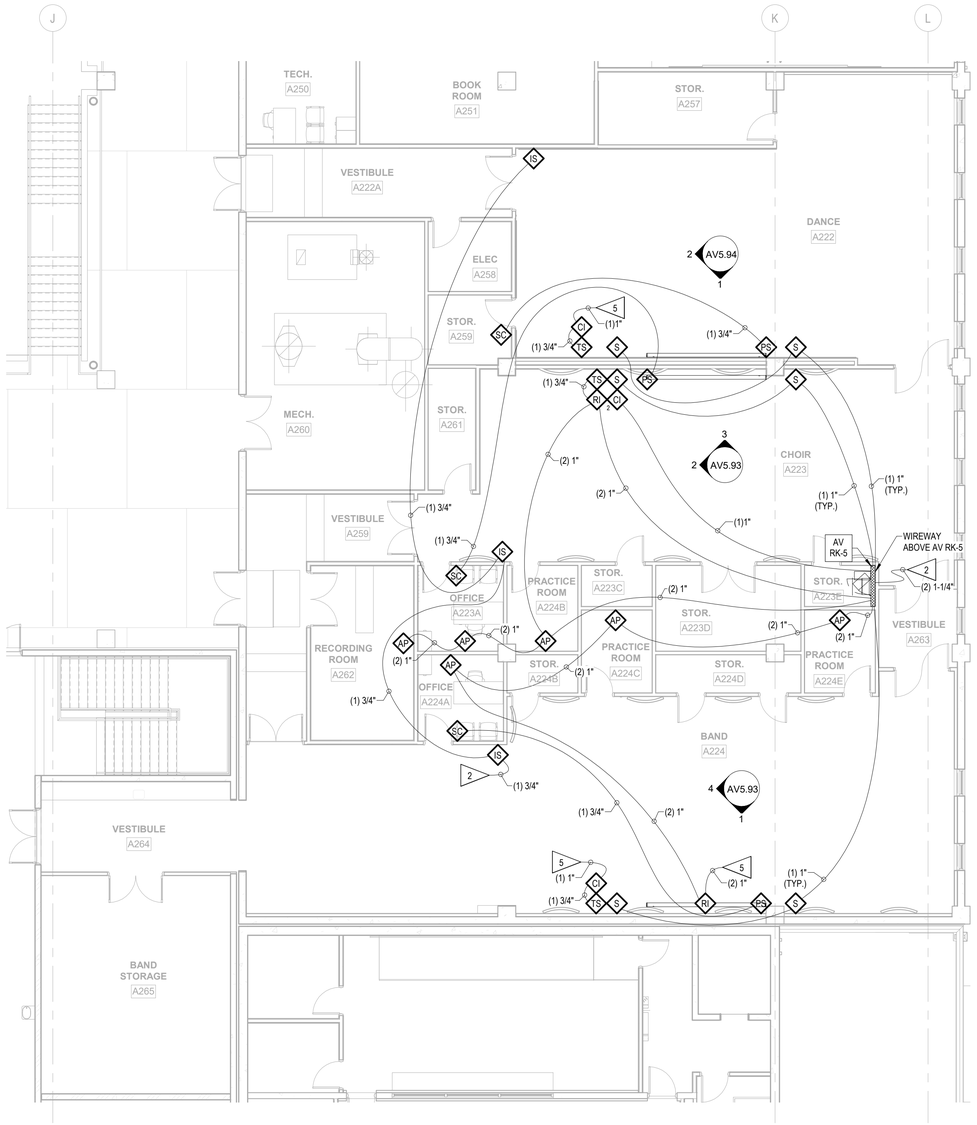

1 CHOIR & BAND - LEVEL 2 FLOOR PLAN
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS CHOIR & BAND PLAN - LEVEL 2

100% CONSTRUCTION DOCUMENTS

Designed:	CAB
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Supv:	
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Date:	10/26/2022
Project No.: 20-019	File

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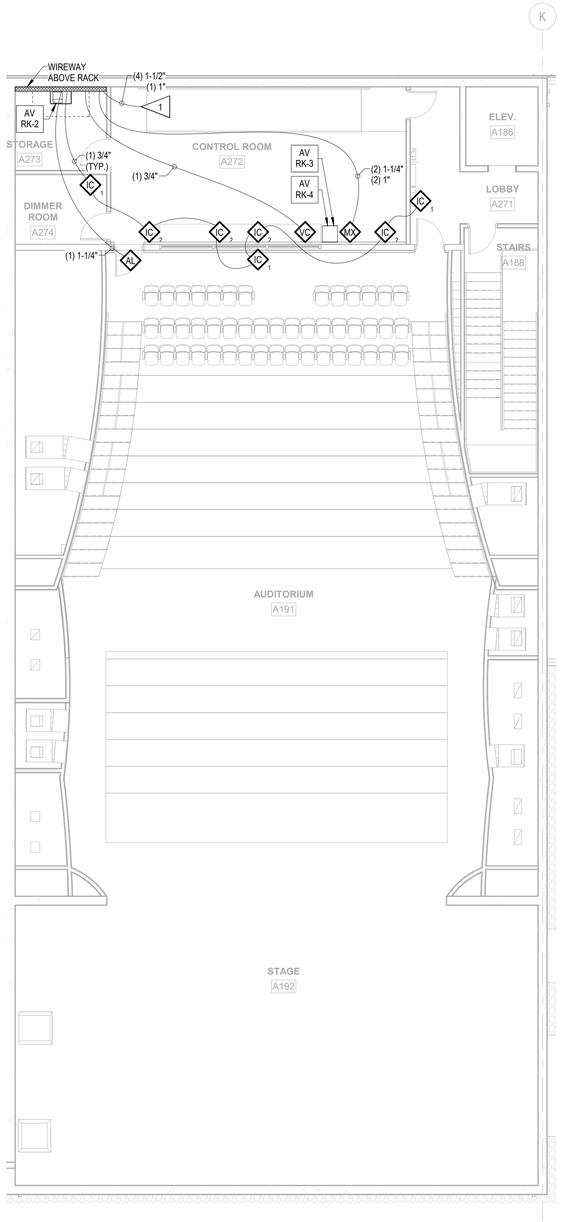

1 AUDITORIUM - LEVEL 2 FLOOR PLAN
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS AUDITORIUM PLAN - LEVEL 2
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
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Supv:	
Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

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AV2.26
Sheet No. _____ of _____

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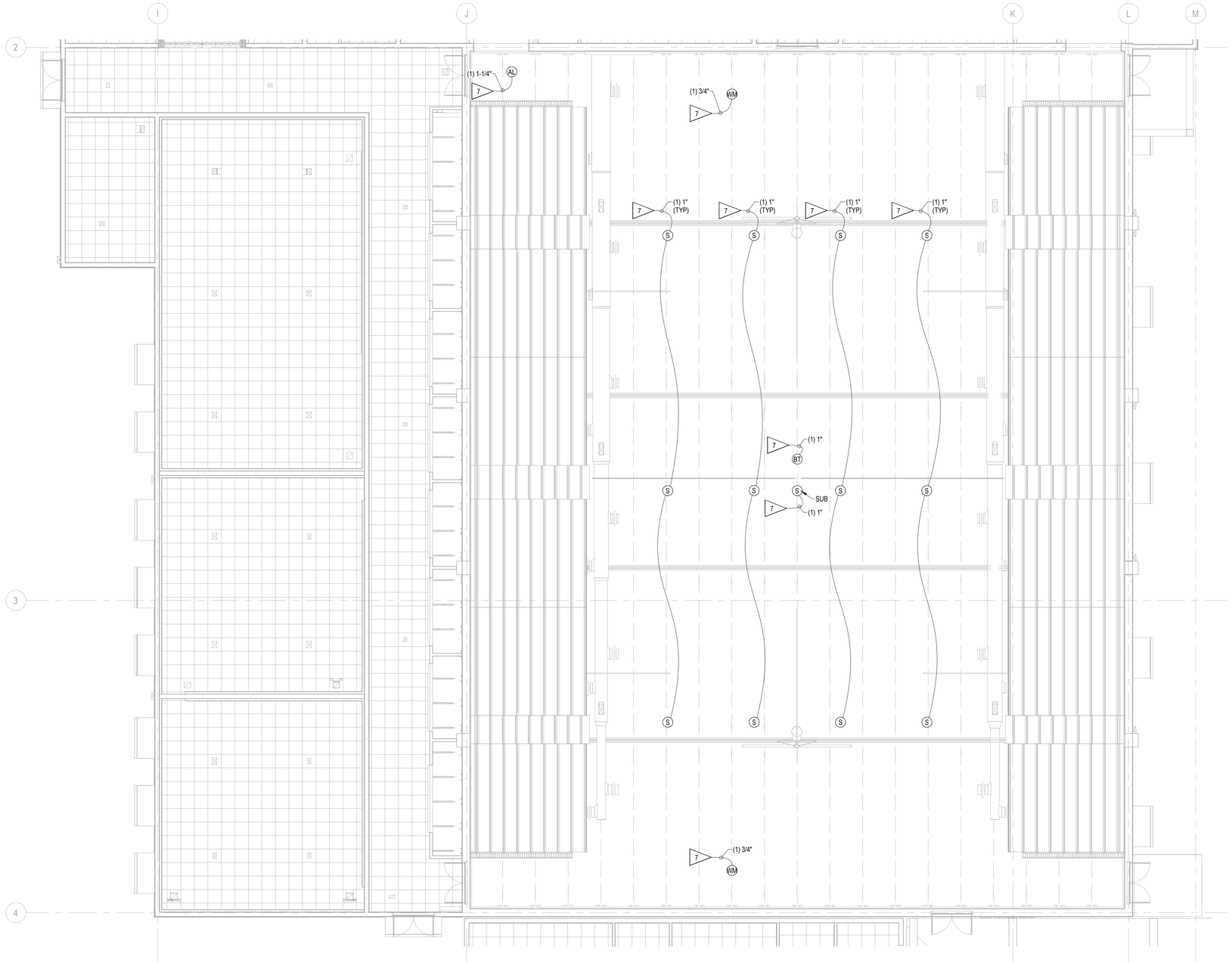

1 GYMNASIUM - LEVEL 1 RCP
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

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TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

Architecture
Planning
Interior Design

D. L. ADAMS ASSOCIATES
acoustics | performing arts | technology
970 N. Kalaheo Avenue
Suite A-311
www.dlaa.com
Kailua, Oahu
Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS
GYMNASIUM RCP - LEVEL 1
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV3.12
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 AUDITORIUM - LEVEL 1 RCP (LOWER EAST)
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS AUDITORIUM RCP - LEVEL 1
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV3.14
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 MUSIC CLASSROOMS - LEVEL 2 RCP
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36"
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www.dlaa.com, 808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

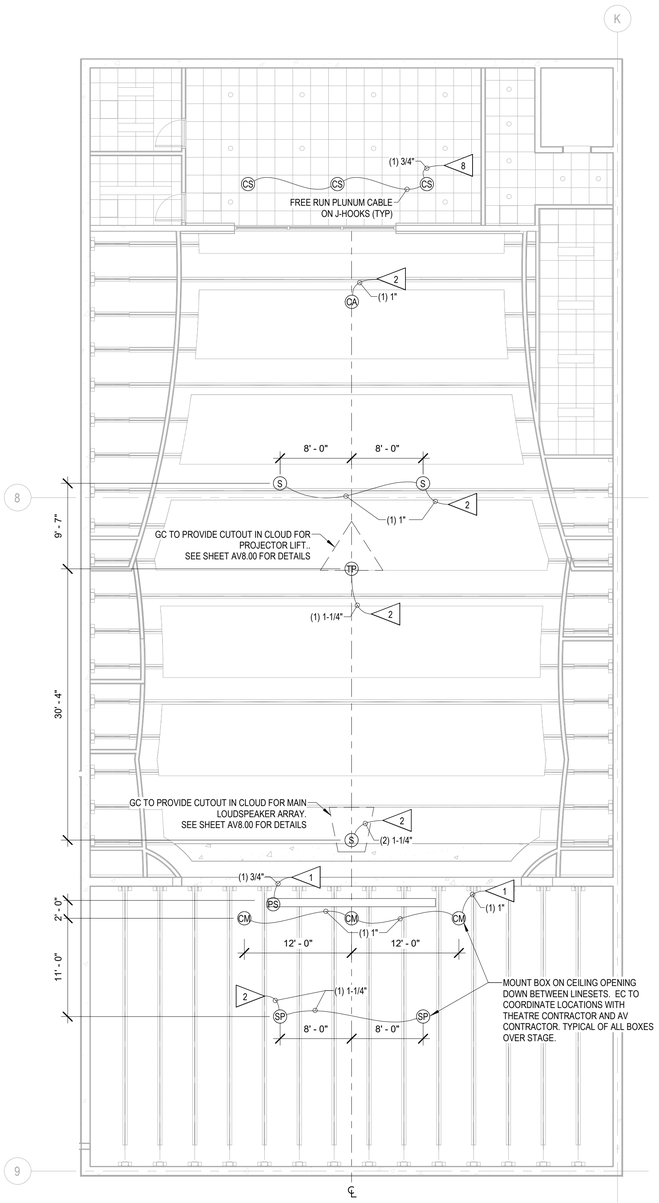
Title:
AV SYSTEMS CHOIR & BAND RCP - LEVEL 2

100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
AV3.24
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 AUDITORIUM - LEVEL 2 RCP (LOWER EAST)
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS AUDITORIUM RCP - LEVEL 2
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/8" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV3.25
Sheet No. _____ of _____

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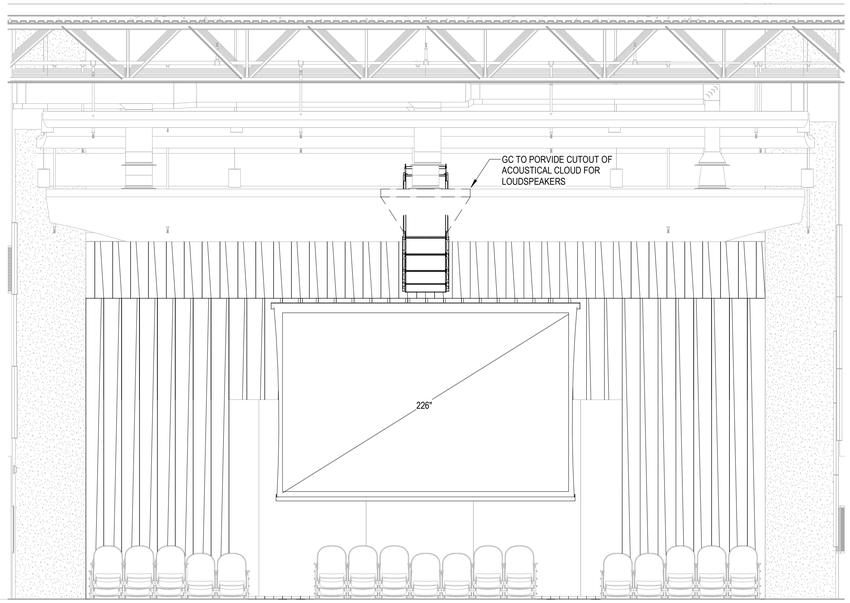
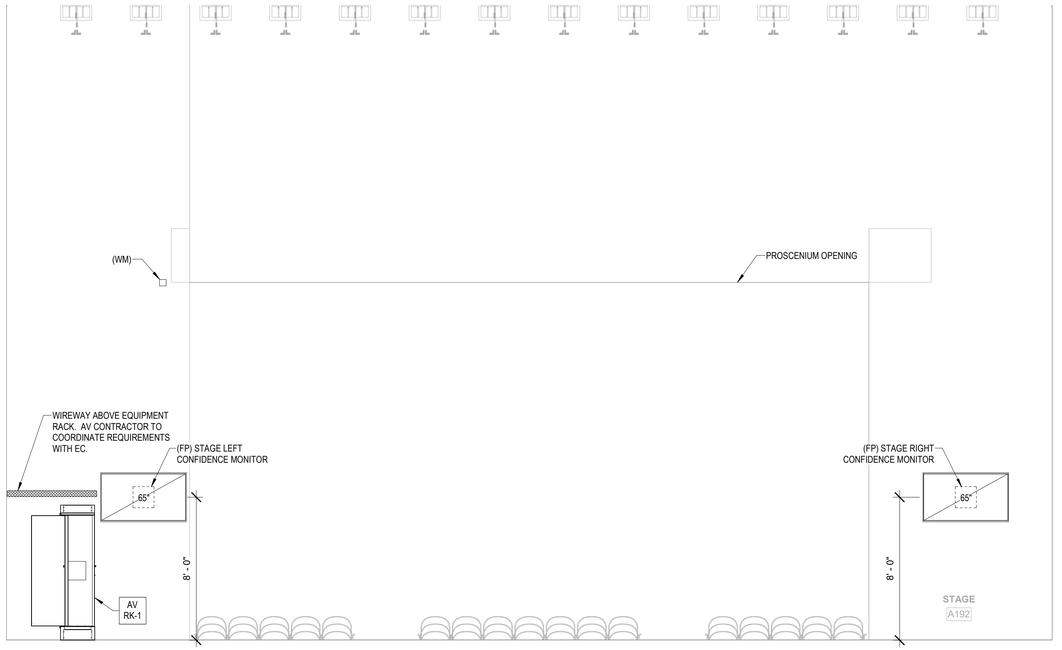
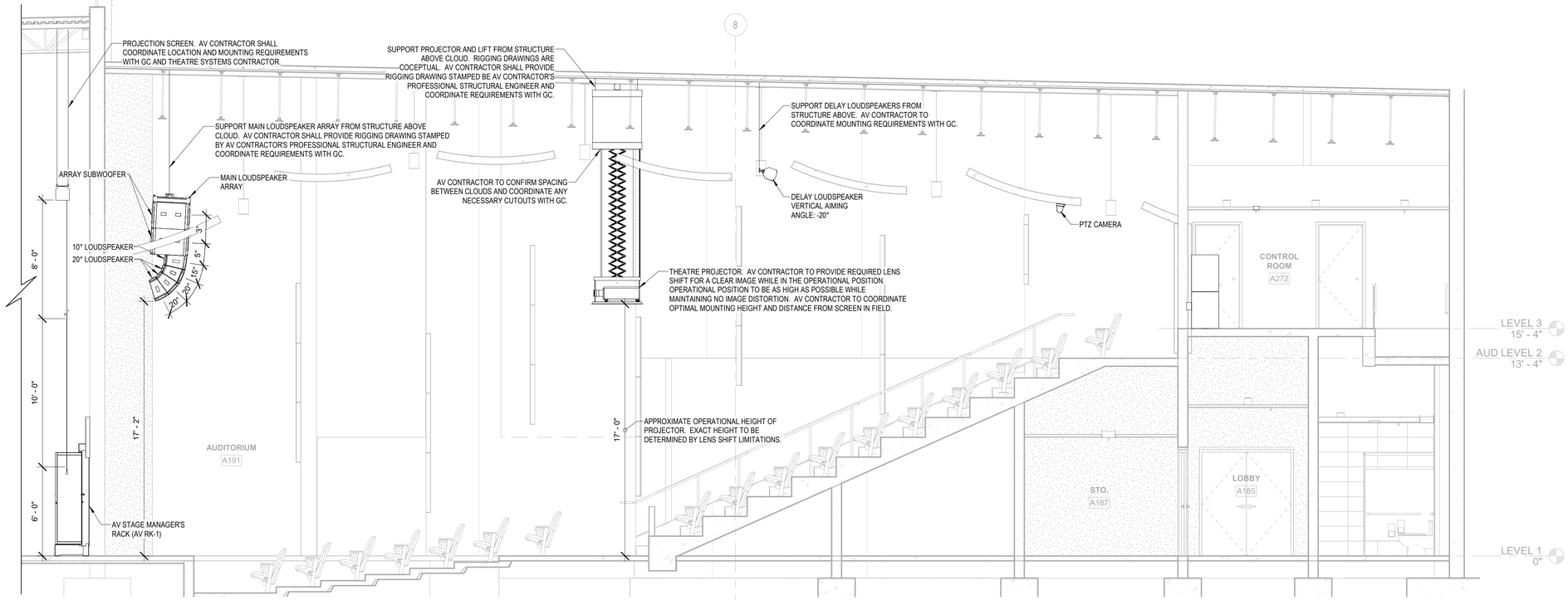


2 AUDITORIUM CROSS SECTION
1/4" = 1'-0"



3 STAGE ELEVATION - PROSCENIUM WALL
1/4" = 1'-0"



1 AUDITORIUM LONGITUDINAL SECTION
1/4" = 1'-0"

0' 5' 10'

IF SHEET IS LESS THAN 24" X 36" REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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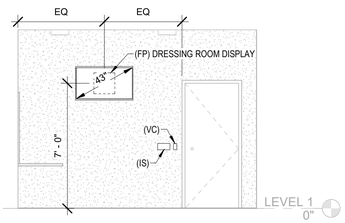
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS AUDITORIUM SECTIONS & ELEVATIONS
100% CONSTRUCTION DOCUMENTS

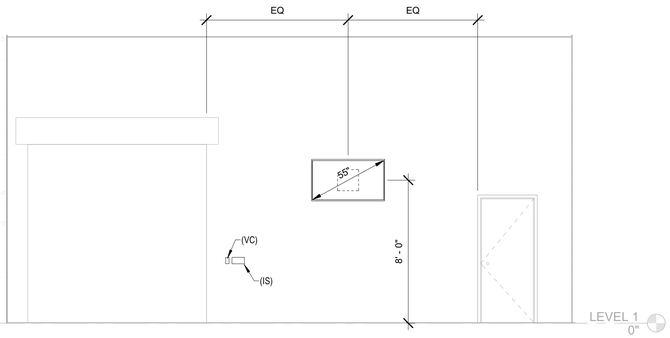
Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No.	20-019
File	

Drawing No.
AV5.90
Sheet No. _____ of _____

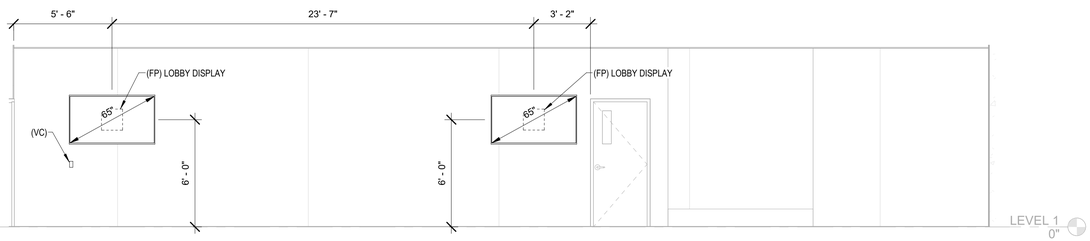
NOT FOR CONSTRUCTION



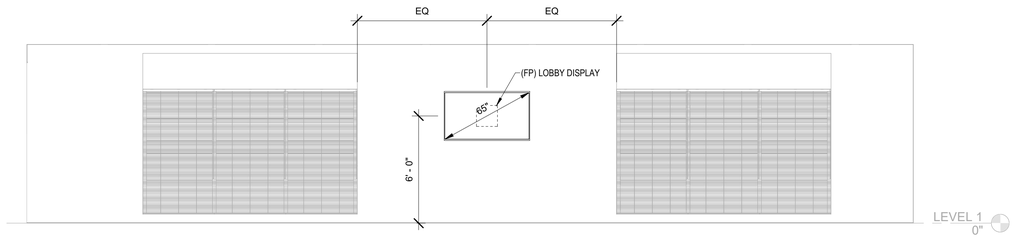
5 TYPICAL DRESSING ROOM
1/4" = 1'-0"



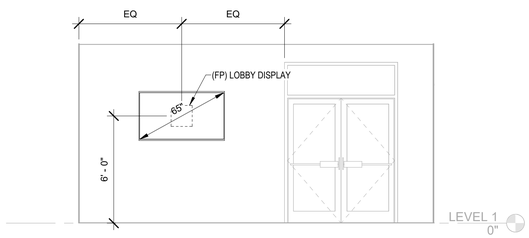
4 BACKSTAGE WEST WALL
1/4" = 1'-0"



3 AUDITORIUM LOBBY WEST WALL
1/4" = 1'-0"



1 AUDITORIUM LOBBY EAST WALL
1/4" = 1'-0"



2 AUDITORIUM LOBBY NORTH WALL
1/4" = 1'-0"

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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Kailua, Oahu
Hawaii 96734
808.254.3318

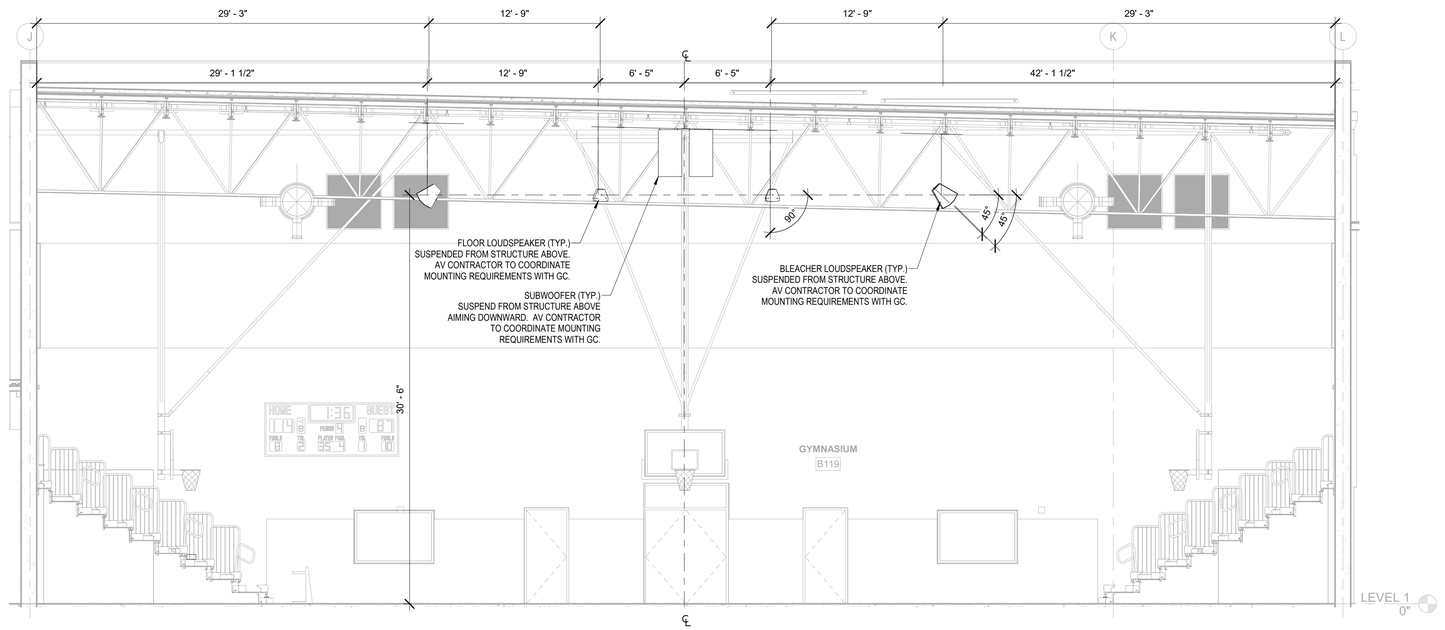
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS
AUDITORIUM LOBBY & BACKSTAGE ELEVATIONS
100% CONSTRUCTION DOCUMENTS

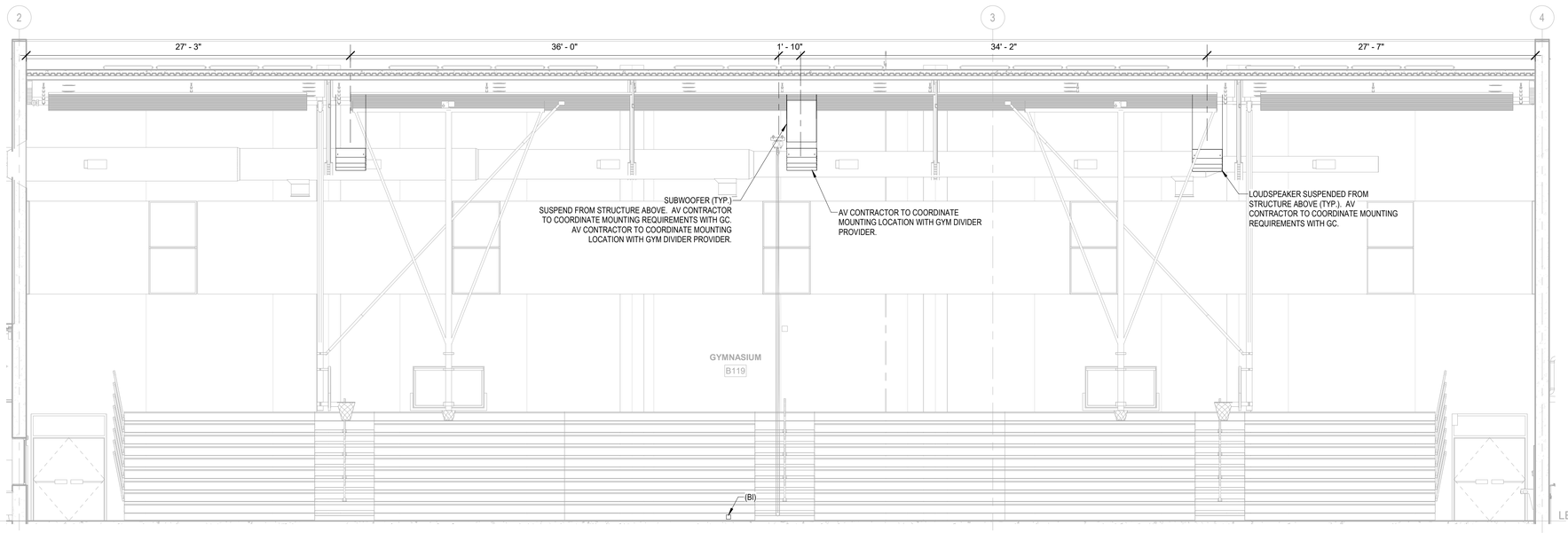
Designed:	Designer
Drawn:	Author
Checked:	Checker
Supv:	Approver
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
AV5.91
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



2 GYMNASIUM CROSS SECTION
3/16" = 1'-0"



1 GYMNASIUM LONGITUDINAL SECTION
3/16" = 1'-0"

0' 5' 10' 15'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
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Hawaii 96734
808.254.3318

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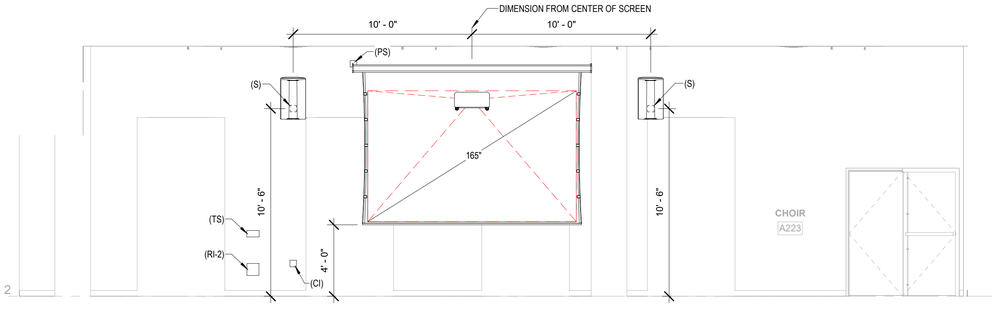
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

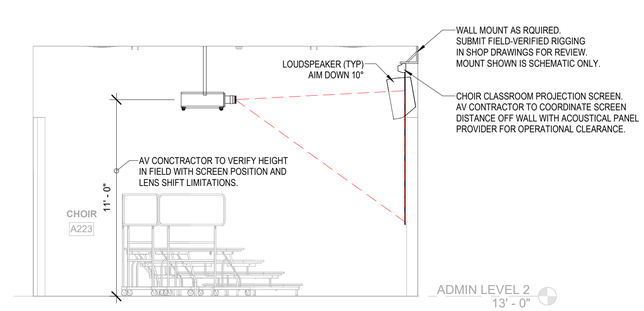
Title:
AV SYSTEMS
GYMSASIUM
SECTIONS &
ELEVATIONS
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	3/16" = 1'-0"
Date:	10/26/2022
Project No.	File
20-019	

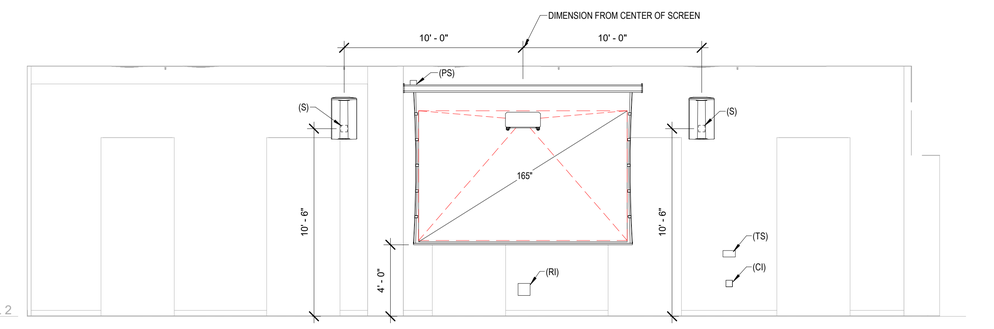
Drawing No.
AV5.92
Sheet No. _____ of _____



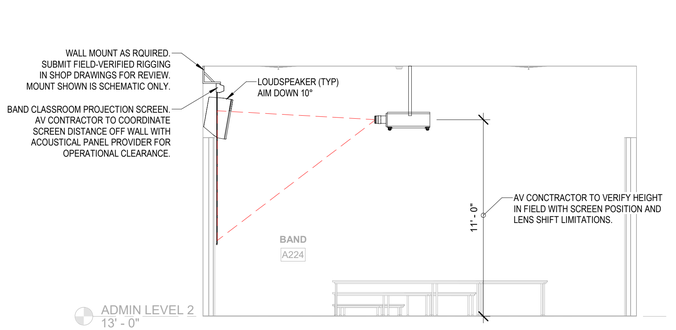
3 CHOIR ROOM A223 - NORTH WALL
1/4" = 1'-0"



2 CHOIR ROOM A223 - SECTION
1/4" = 1'-0"



1 BAND ROOM A224 - SOUTH WALL
1/4" = 1'-0"



4 BAND ROOM A224 - SECTION
1/4" = 1'-0"

0' 5' 10'

IF SHEET IS LESS THAN 24" X 36"
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REVISION

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Hawaii 96734
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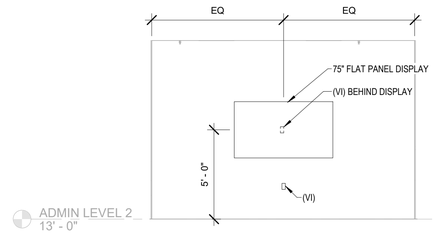
NOT FOR CONSTRUCTION

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

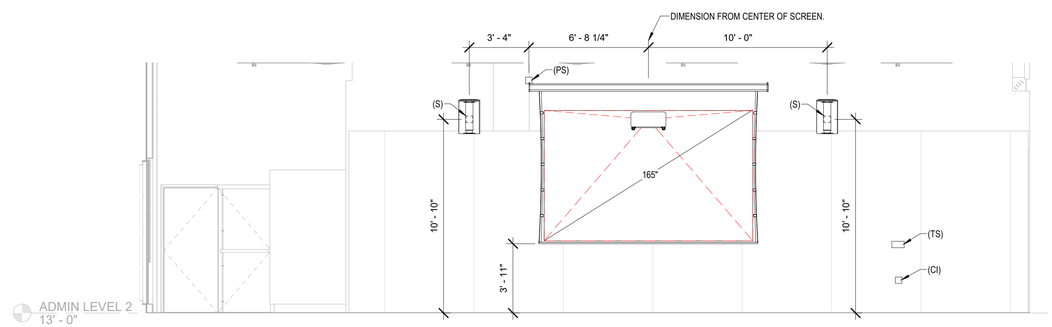
Title:
AV SYSTEMS MUSIC CLASSROOMS SECTIONS & ELEVATIONS
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

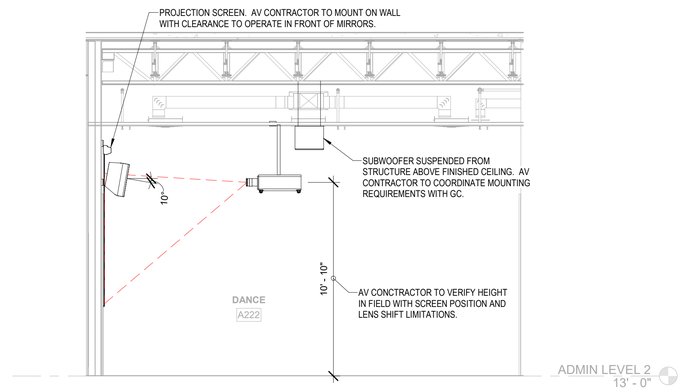
Drawing No.
AV5.93
Sheet No. _____ of _____



3 MEDIA CENTER A253 - WEST WALL
1/4" = 1'-0"



1 DANCE ROOM A222 - SOUTH WALL
1/4" = 1'-0"



2 DANCE ROOM A222 SECTION
1/4" = 1'-0"

0' 5' 10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION

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Kailua, Oahu
Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS DANCE AND MEDIA ROOMS SECTIONS & ELEVATIONS
100% CONSTRUCTION DOCUMENTS

Designed:	Designer
Drawn:	Author
Checked:	Checker
Supv:	Approver
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV5.94
Sheet No. _____ of _____

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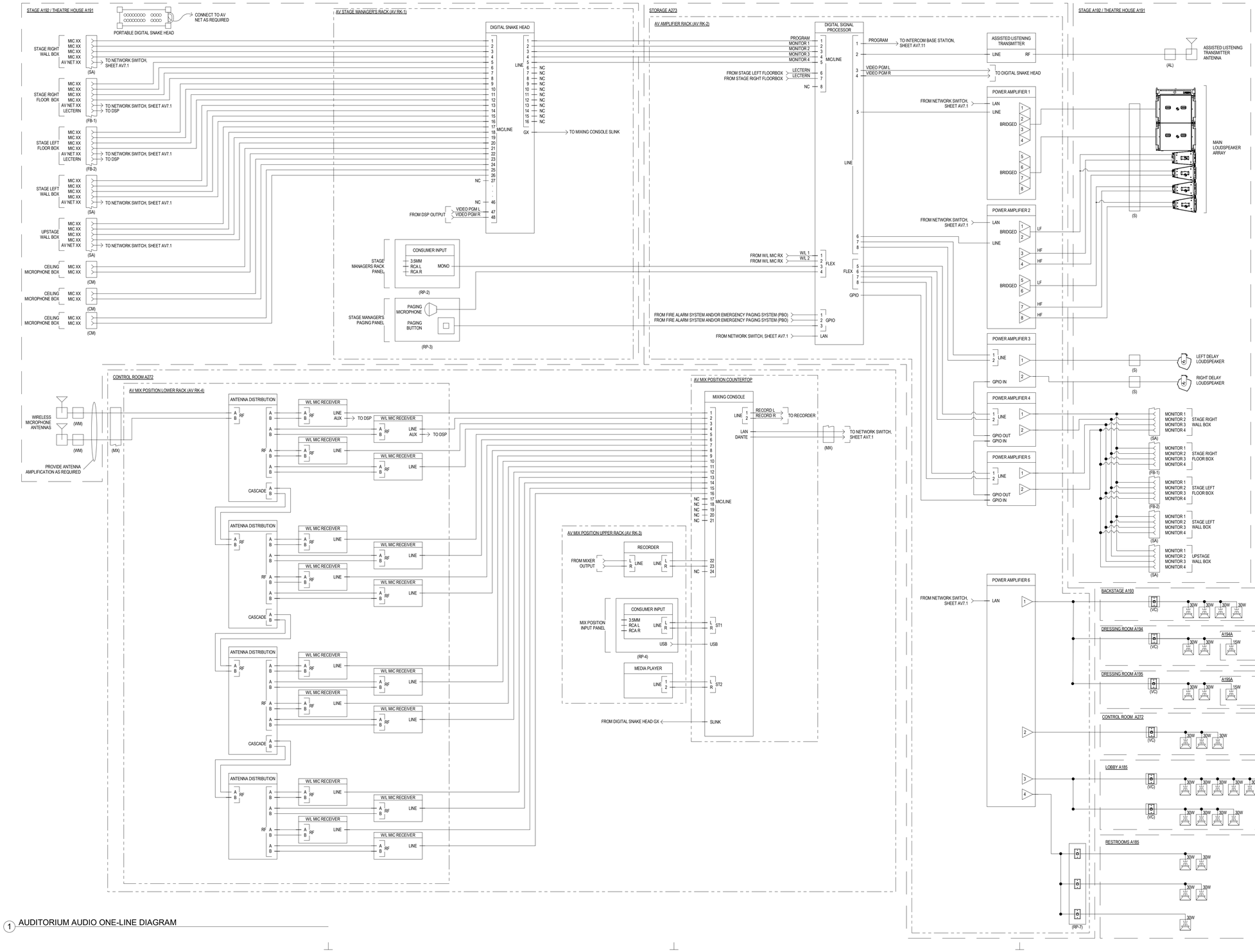

1 AUDITORIUM AUDIO ONE-LINE DIAGRAM

REVISION		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS ONE-LINE DIAGRAM

100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
AV7.00
Sheet No. _____ of _____

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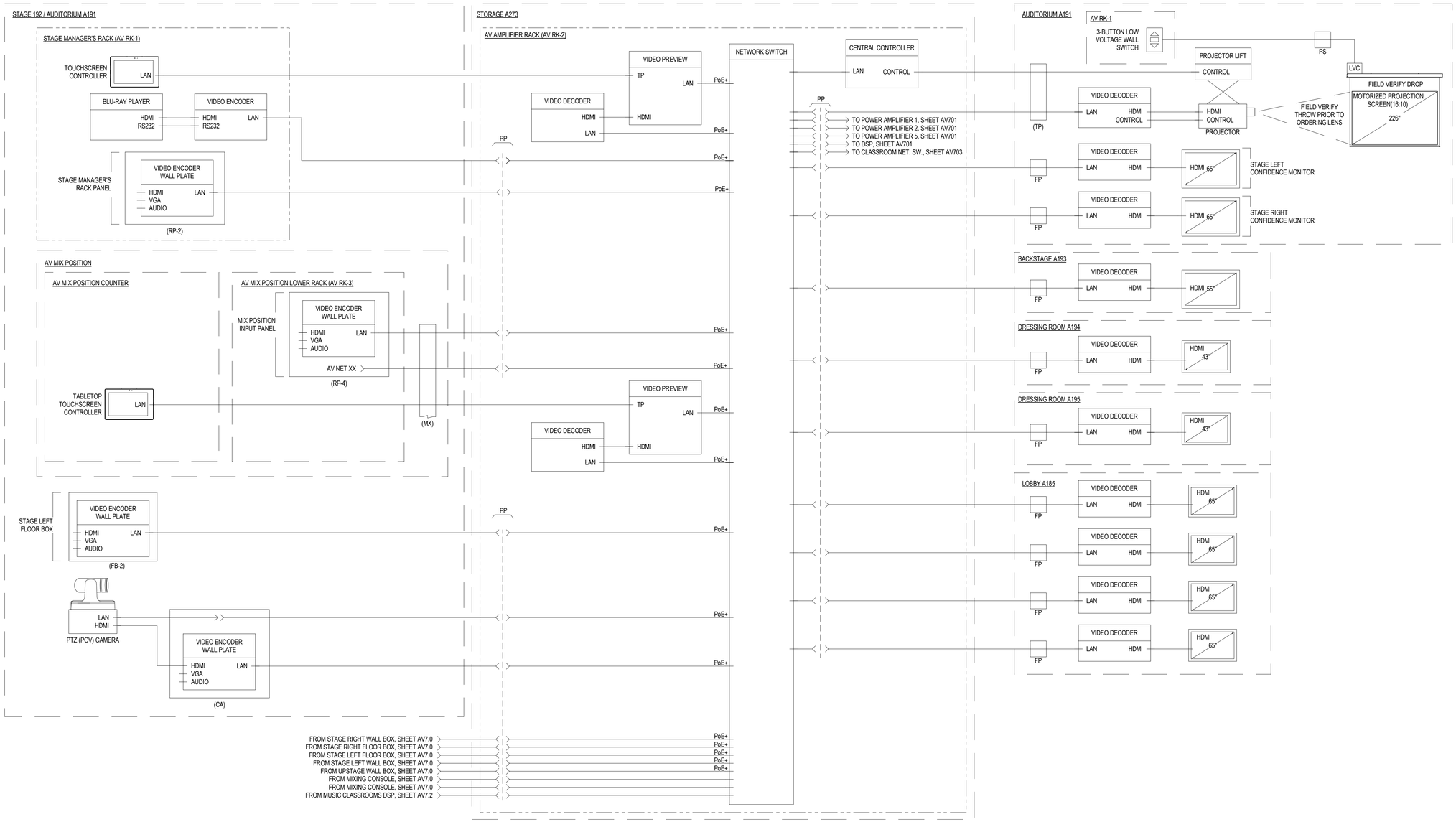

1 AUDITORIUM VIDEO AND CONTROL ONE-LINE DIAGRAM

REVISION		
No.	Description	Date

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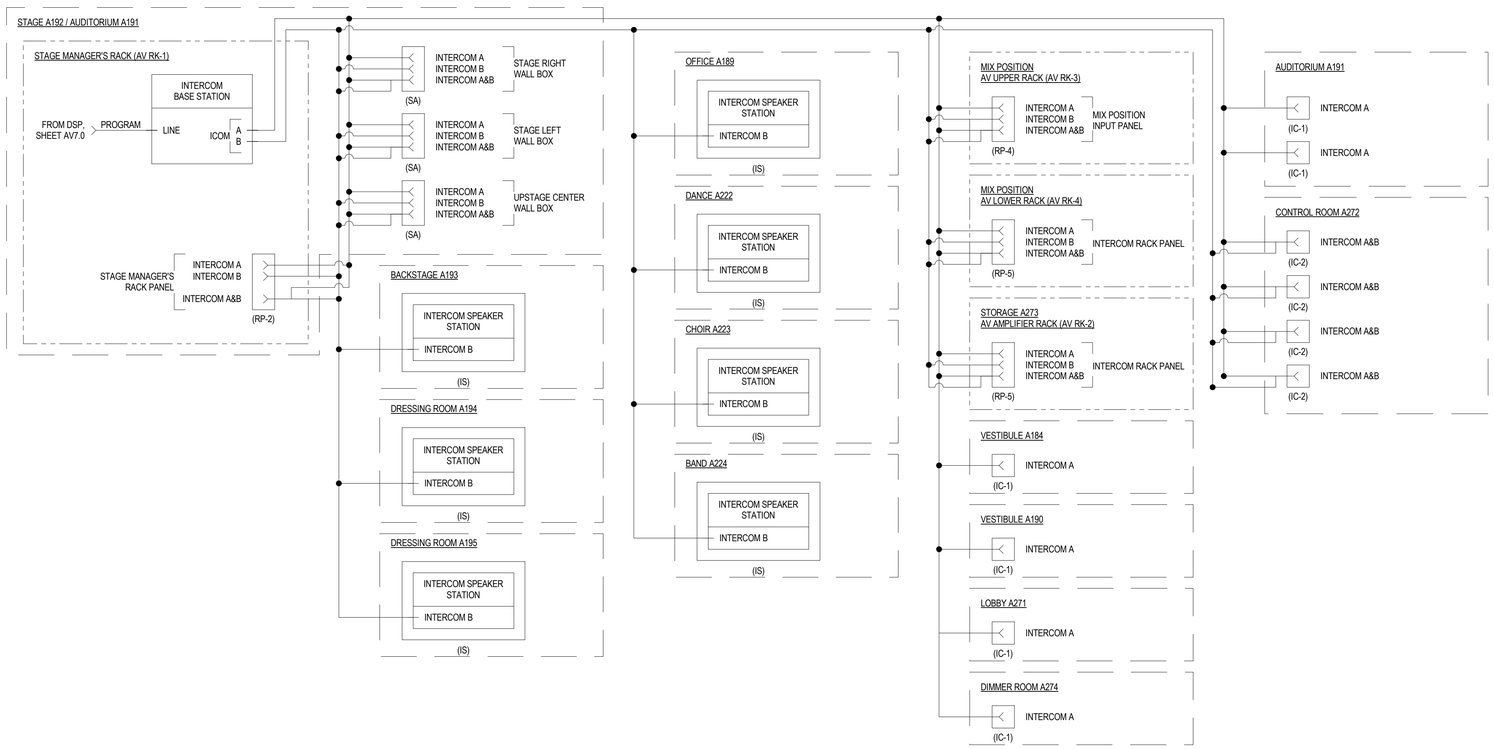
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
AV7.10
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 AV AUDITORIUM COMMUNICATIONS ONE LINE DIAGRAM

REVISION		
No.	Description	Date

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Hawaii 96734
808.254.3318

NOT FOR CONSTRUCTION

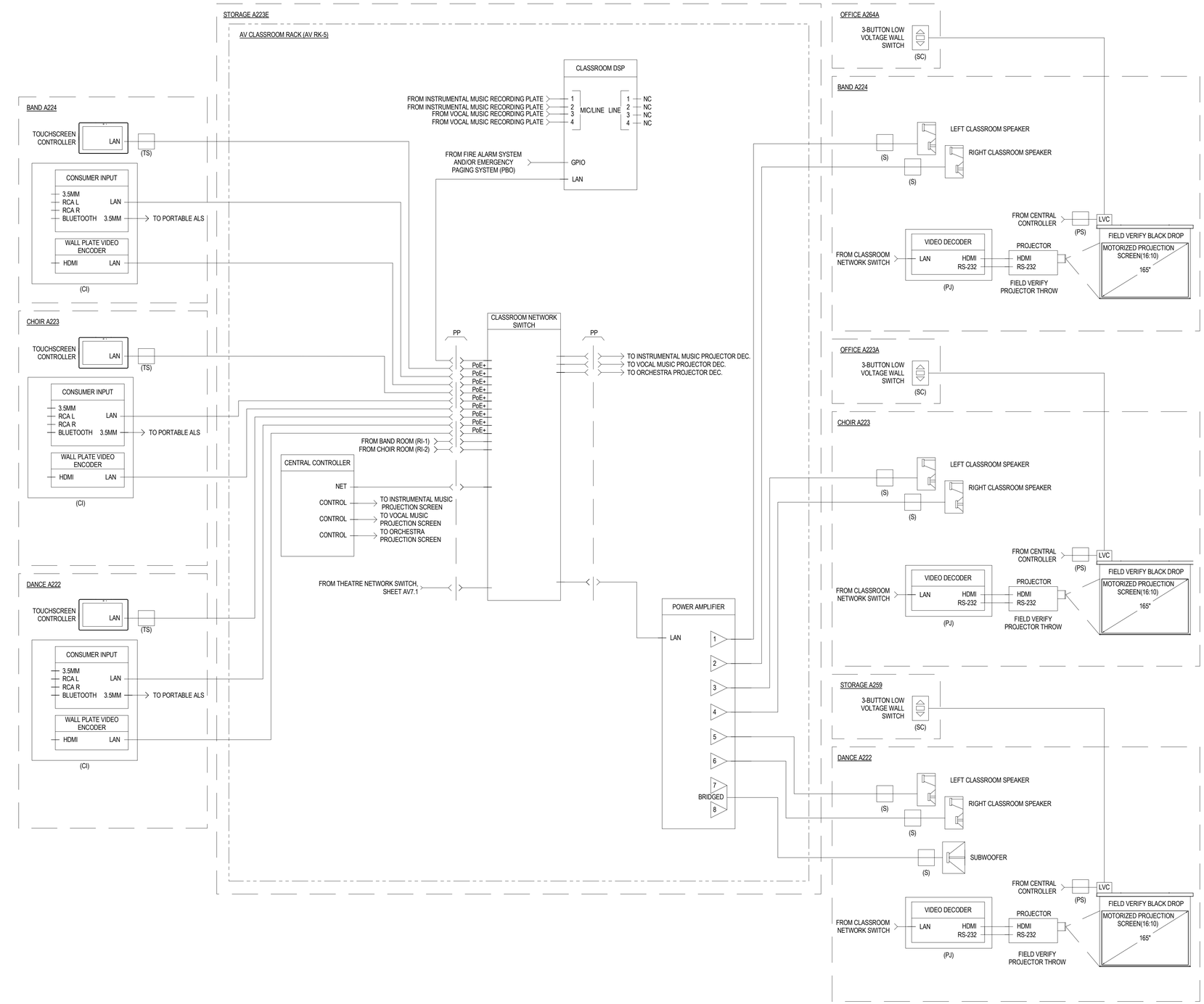
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS ONE-LINE DIAGRAM

100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	Approver
Scale:	
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV7.11
Sheet No. _____ of _____



1 AV MUSIC CLASSROOMS VIDEO AND CONTROL ONE-LINE DIAGRAM

REVISION		
No.	Description	Date

TRMA
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Hawaii 96734
808.254.3318

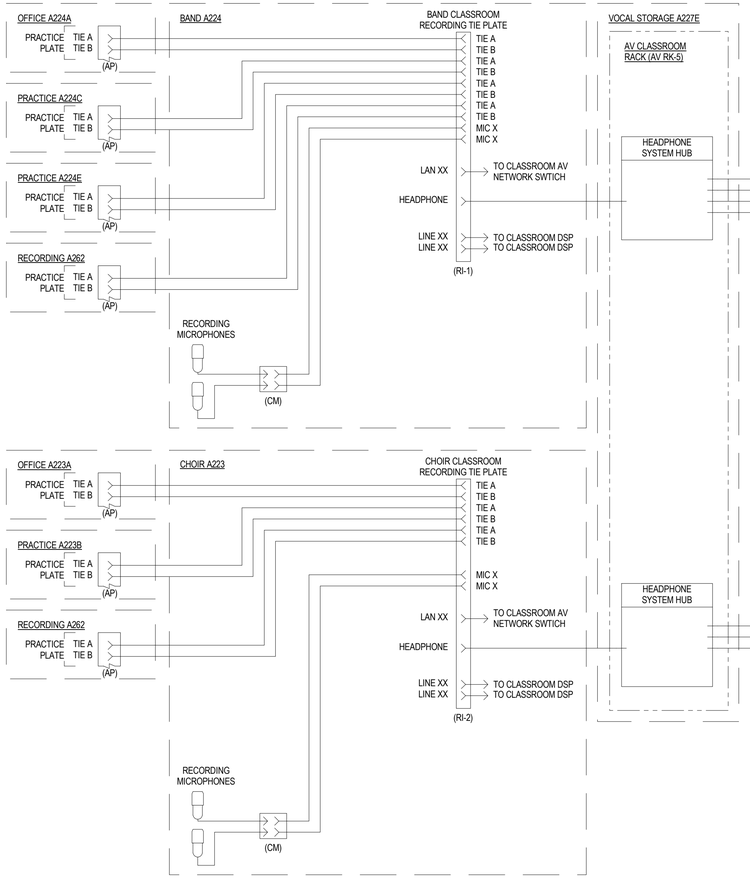
NOT FOR CONSTRUCTION

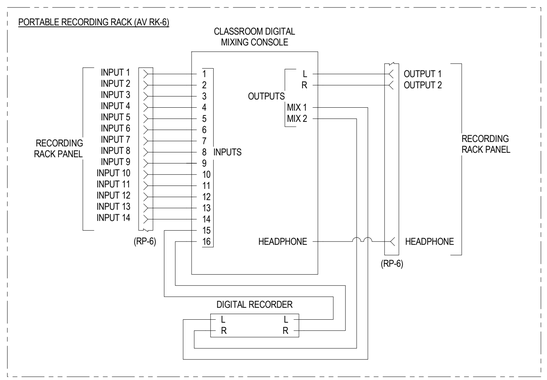
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

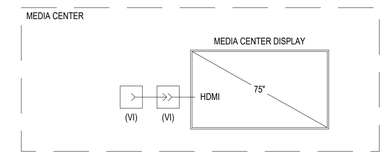
Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	Approver
Scale:	
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
AV7.20
Sheet No. _____ of _____





1 AV MUSIC/DANCE CLASSROOMS AUDIO ONE-LINE DIAGRAM



2 AV LIBRARY MEDIA ROOM VIDEO ONE-LINE DIAGRAM

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Planning
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Kailua, Oahu
Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS
ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	Approver
Scale:	
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV7.21
Sheet No. _____ of _____

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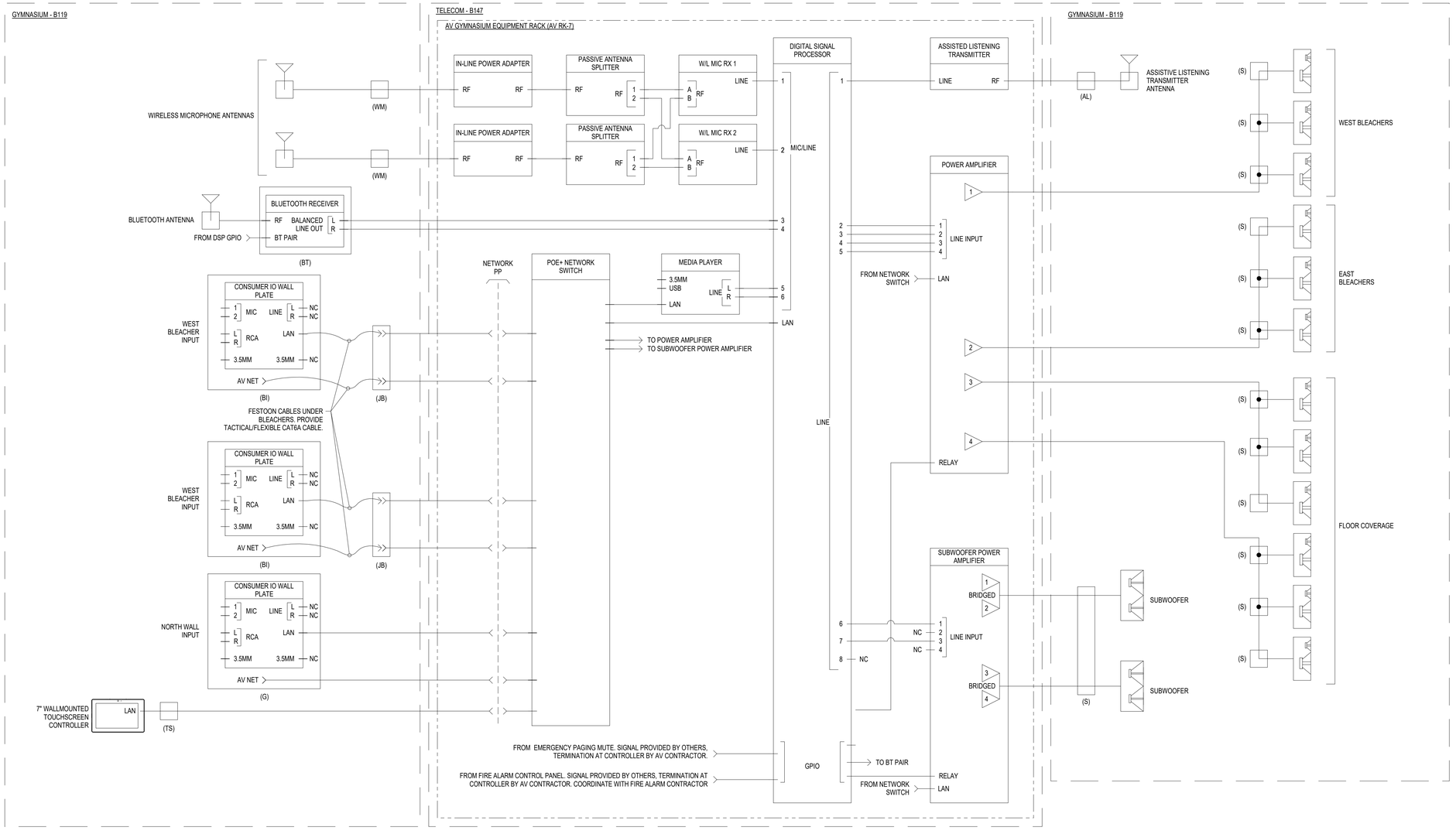

1 GYMNASIUM ONE-LINE DIAGRAM

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
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Title:
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100% CONSTRUCTION DOCUMENTS

Designed:	CAB
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Supv:	
Scale:	
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
AV7.30
Sheet No. _____ of _____

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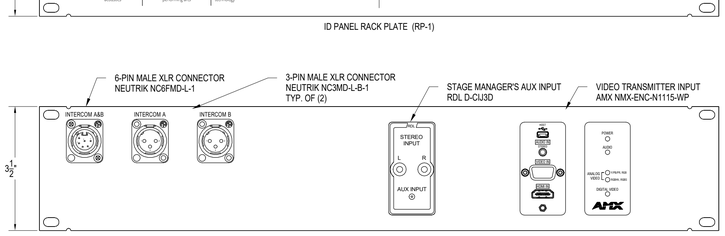
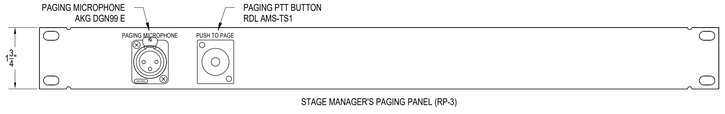
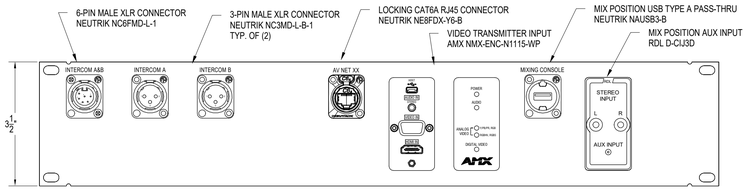
ID PANEL RACK PLATE (RP-1)



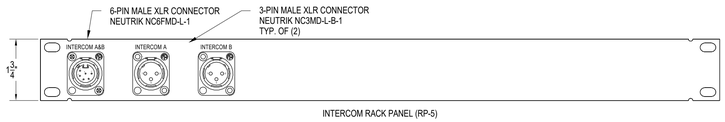
STAGE MANAGER'S RACK PANEL (RP-2)



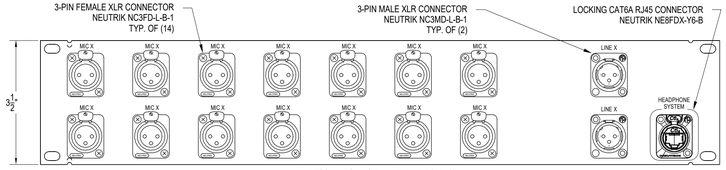
STAGE MANAGER'S PAGING PANEL (RP-3)



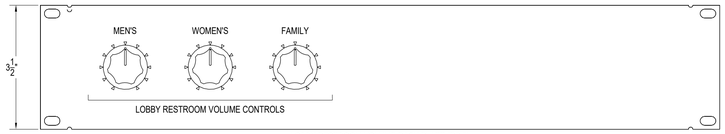
MIX POSITION INPUT PANEL (RP-4)



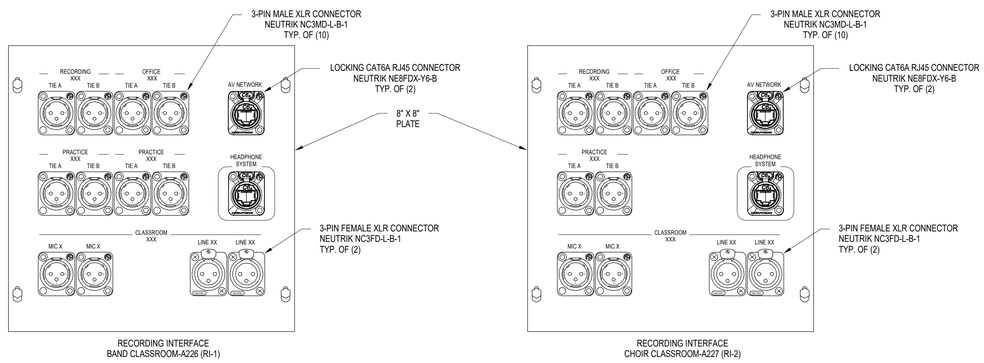
INTERCOM RACK PANEL (RP-5)



RECORDING RACK INPUT PLATE (RP-6)

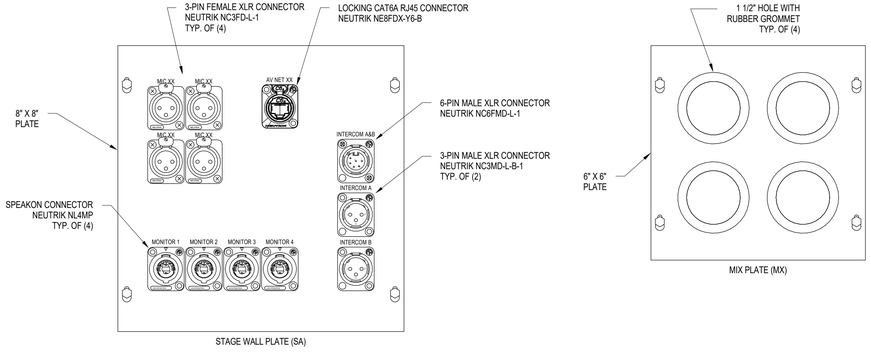


LOBBY RESTROOM VOLUME RACK PLATE (RP-7)



RECORDING INTERFACE
BAND CLASSROOM-A226 (RI-1)

RECORDING INTERFACE
CHOIR CLASSROOM-A227 (RI-2)



STAGE WALL PLATE (SA)

MIX PLATE (MX)

1 AV SYSTEMS PLATE DETAILS

REVISION		
No.	Description	Date

TRMA
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS - PLATE DETAILS
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
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Checked:	ZLW
Supv:	Approver
Scale:	
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV7.80
Sheet No. _____ of _____

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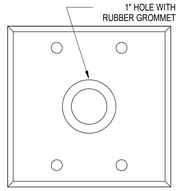
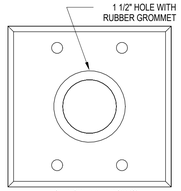
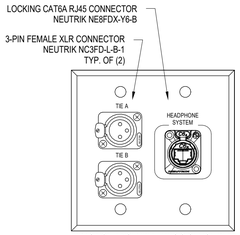


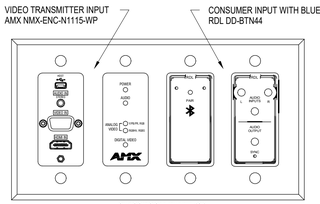
ASSISTED LISTENING ANTENNA BOX (AL)
WIRELESS MICROPHONE ANTENNA BOX (WM)



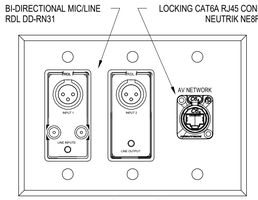
LOUD SPEAKER BOX (S)



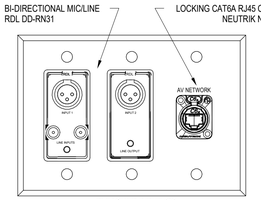
PRACTICE, ENSEMBLE, MUSIC OFFICE PLATE
(AP)



CLASSROOM PLATE (CI)



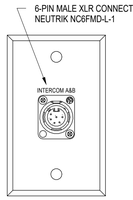
GYM INPUT (G)



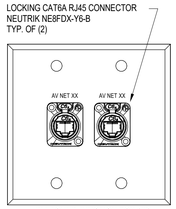
BLEACHER INPUT (BI)



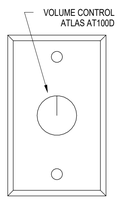
INTERCOM BOX (IC-1)



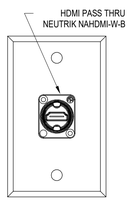
INTERCOM BOX (IC-2)



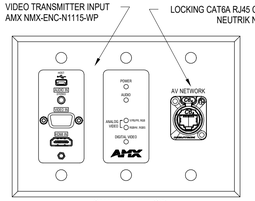
BLEACHER JUNCTION BOX (JB)



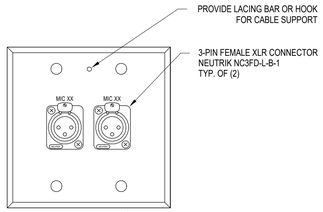
VOLUME CONTROL (VC)



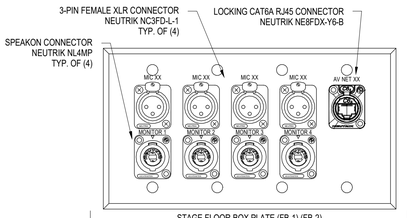
VIDEO INPUT (VI)



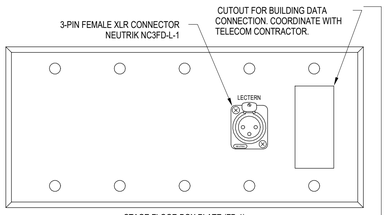
CAMERA INPUT (CA)



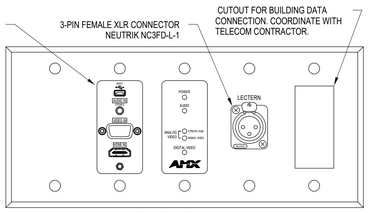
CEILING MIC PLATE (CM)



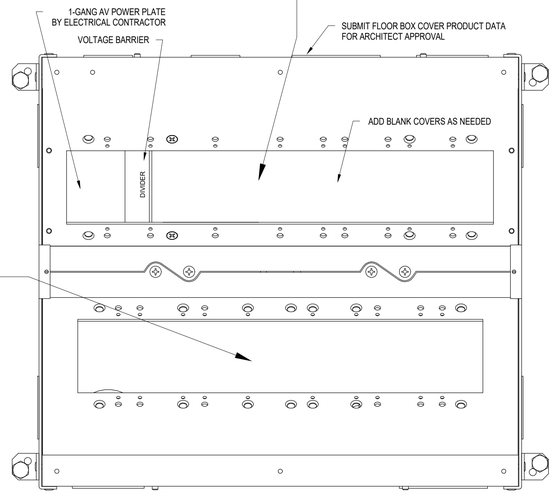
STAGE FLOOR BOX PLATE (FB-1) (FB-2)



STAGE FLOOR BOX PLATE (FB-1)



STAGE FLOOR BOX PLATE (FB-2)



1 AV SYSTEMS PLATE DETAILS

REVISION		
No.	Description	Date

TRMA
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Planning
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Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS PLATE DETAILS
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	Approver
Scale:	
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV7.81
Sheet No. _____ of _____

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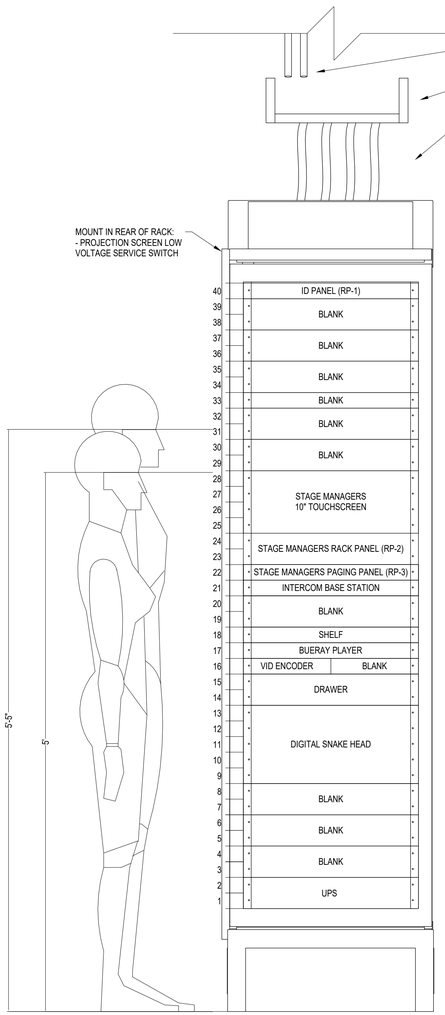
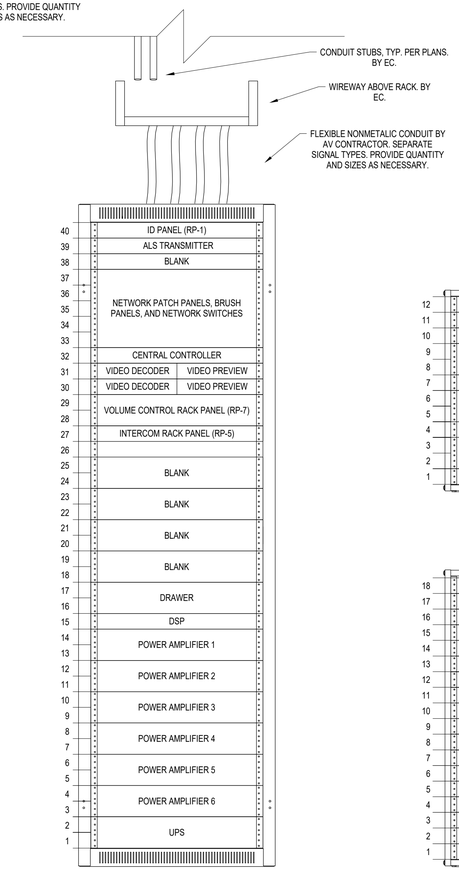
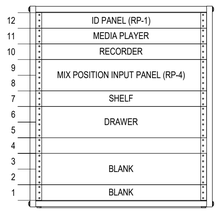


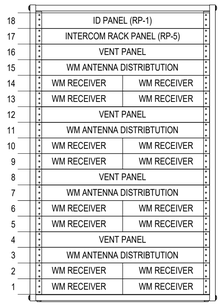
AV STAGE MANAGER'S RACK
AV RK-1



AV AMPLIFIER RACK
AV RK-2

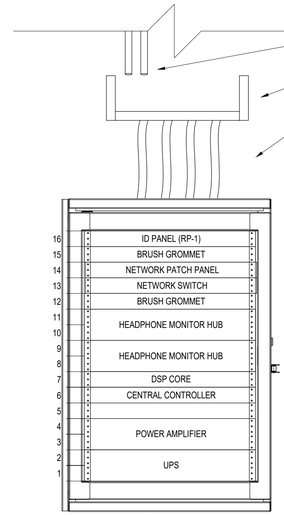


AV MIX POSITION UPPER RACK
AV RK-3



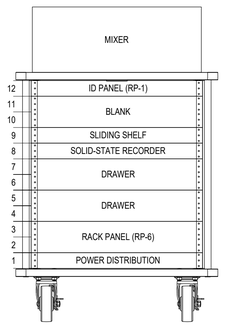
AV MIX POSITION LOWER RACK
AV RK-4

NOTE FOR ALL RACKS:
COORDINATE RACK EQUIPMENT THERE
WITH EQUIPMENT MANUFACTURERS A
MANUFACTURER TO ENSURE RACK DO
MAXIMUM OPERATING TEMPERATURE
EQUIPMENT ITEMS UNDER FULL LOAD
PROVIDE FAN KITS WITH THERMOSTAT
NECESSARY.



AV CLASSROOM EQUIPMENT RACK
AV RK-5

AV GYMNASIUM EQUIPMENT RACK
AV RK-7



AV PORTABLE RECORDING RACK
AV RK-6

1 AV SYSTEMS RACK ELEVATIONS

REVISION

No.	Description	Date

TRMA
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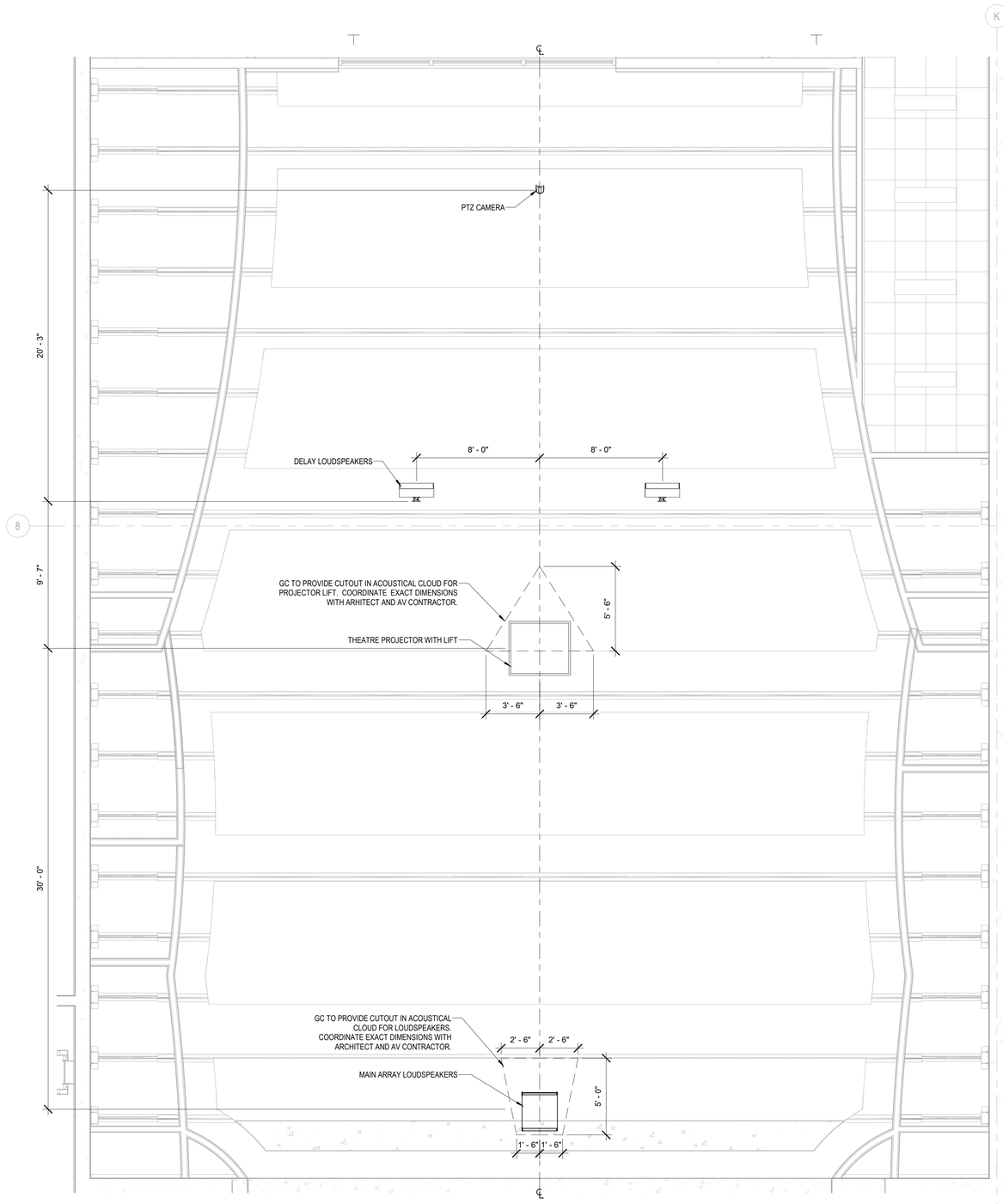
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS RACK ELEVATIONS
100% CONSTRUCTION DOCUMENTS

Designed: CAB
Drawn: RSP
Checked: ZLW
Supv:
Scale:
Date: 10/26/2022
Project No. 20-019
File

Drawing No.
AV7.90
Sheet No. _____ of _____



1 AUDITORIUM - LEVEL 2 RCP (LOWER EAST) SPEAKER AIMING
1/4" = 1'-0"

0' 5' 10'

NORTH

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
No.	Description	Date

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Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
AV SYSTEMS
AUDITORIUM
LOUDSPEAKER
AIMING DIAGRAM
100% CONSTRUCTION DOCUMENTS

Designed:	CAB
Drawn:	RSP
Checked:	ZLW
Supv:	
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
AV8.00
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

THEATRE SYSTEMS LEGEND

WALL MOUNTED

- (C2)X — LIGHTING CONTROL RECEPTACLE STATION. 4-GANG J-BOX RACO #695 OR EQUAL. SURFACE MOUNT 18" AFF, BENEATH COUNTER. (NETx2/DMX1IN/DMX2IN) ELECTRICAL TO PROVIDE 15A, 120VAC POWER, TERMINATED IN DUPLEX OUTLET, ADJACENT TO RECEPTACLE STATION. SUBSCRIPT DENOTES LOCATION.
- (E2)X — 2-BUTTON LIGHTING PRESET STATION. 1-GANG J-BOX RACO #692 OR EQUAL. FLUSH MOUNT AT SWITCH HEIGHT NEAR DOOR. SUBSCRIPT DENOTES CONTROL.
- (E4)X — 4-BUTTON LIGHTING PRESET STATION. 1-GANG J-BOX FSR #SMWB-1G OR EQUAL. FLUSH MOUNT AT SWITCH HEIGHT NEAR DOOR. SUBSCRIPT DENOTES CONTROL.
- (ES) — MOTORIZED HOIST CONTROL EMERGENCY STOP BUTTON. 2-GANG J-BOX, RACO #696 OR EQUAL. FLUSH MOUNT AT SWITCH HEIGHT.
- (HC)1 — MOTORIZED HOIST CONTROL AND INTERFACE BOX, THEATRE CONTRACTOR TO PROVIDE INTERFACE BOX. ELECTRICAL CONTRACTOR TO PROVIDE ONE (1) 20A, 480VAC, 3 PHASE CIRCUIT. COORDINATE EXACT LOCATION AND FEED WITH THEATRE SYSTEMS CONTRACTOR.
- (HC)2 — MOTORIZED HOIST CONTROL AND INTERFACE BOX, THEATRE CONTRACTOR TO PROVIDE INTERFACE BOX. ELECTRICAL CONTRACTOR TO PROVIDE ONE (1) 20A, 480VAC, 3 PHASE CIRCUIT. COORDINATE EXACT LOCATION AND FEED WITH THEATRE SYSTEMS CONTRACTOR.
- (HC)3 — MOTORIZED HOIST CONTROL AND INTERFACE RACEWAY, THEATRE CONTRACTOR TO PROVIDE INTERFACE BOX. ELECTRICAL CONTRACTOR TO PROVIDE (3) 20A, 480VAC, 3 PHASE CIRCUITS TO RACEWAY. NO MORE THAN (3) MOTORS WILL BE ALLOWED TO OPERATE SIMULTANEOUSLY. COORDINATE EXACT LOCATION AND FEED WITH THEATRE SYSTEMS CONTRACTOR.
- (MC) — MOTORIZED HOIST CONTROL STATION WITH LOCKABLE COVER. FLUSH WALL MOUNT +48" A.F.F.
- (T)X — PERFORMANCE LIGHTING TORM DISTRIBUTION OUTLET BOX. 4-GANG J-BOX RACO #695 OR EQUAL. SUBSCRIPT DENOTES LOCATION.
- (TS) — LIGHTING TOUCHSCREEN CONTROL STATION. CUSTOM BACKBOX PROVIDED BY THEATRE CONTRACTOR. FLUSH MOUNT AT STANDARD SWITCH HEIGHT. COORDINATE EXACT LOCATION WITH AV CONTRACTOR FOR STAGE MANAGER EQUIPMENT LOCATION.

CEILING MOUNTED

- (FH)X — PERFORMANCE LIGHTING DISTRIBUTION STRIP, PIPE MOUNTED ON BATTEN. THEATRE CONTRACTOR SHALL PROVIDE AND INSTALL TERMINAL BOX, ELECTRICAL CONTRACTOR TO TERMINATE LINE VOLTAGE WIRING. SUBSCRIPT DENOTES DEVICE LOCATION
- (OS)X — STAGE ORCHESTRA SHELL ELECTRICAL DISTRIBUTION STRIP. PROVIDED BY THEATRE CONTRACTOR INTEGRATED INTO ORCHESTRA SHELL FRAMING SYSTEM. SUBSCRIPT DENOTES LOCATION.
- (SE)X — PERFORMANCE LIGHTING DISTRIBUTION STRIP, PIPE MOUNTED ON BATTEN. THEATRE CONTRACTOR SHALL PROVIDE AND INSTALL TERMINAL BOX, ELECTRICAL CONTRACTOR TO TERMINATE LINE VOLTAGE WIRING. SUBSCRIPT DENOTES DEVICE LOCATION

FLOOR MOUNTED

- C1 — FLOOR OUTLET BOX, FLUSH MOUNT WITH AUDITORIUM FLOOR FINISH. FSR FL-400 OR EQUAL CONTROL OUTLETS (NETx2/DMX1IN/DMX2IN). CUSTOM BACK BOX AND COVER PROVIDED BY THEATRE CONTRACTOR. ELECTRICAL CONTRACTOR TO PROVIDE 15A, 120VAC POWER, TERMINATED IN DUPLEX OUTLET, IN FLOOR BOX.
- FB X — FLOOR OUTLET BOX, FLUSH MOUNT WITH STAGE FLOOR FINISH. FSR FL-400 OR EQUAL CUSTOM BACK BOX AND COVER PROVIDED BY THEATRE CONTRACTOR. SUBSCRIPT DENOTES LOCATION

EQUIPMENT RACKS

- RP RK-1 — RELAY PANEL. ELECTRICAL CONTRACTOR TO PROVIDE MINIMUM 200A, 3-PHASE, 4-WIRE WITH GROUND, 120/208VAC FEED TO RACK.
- PL RK-1 — WALL-MOUNTED LIGHTING CONTROL EQUIPMENT RACK. ELECTRICAL CONTRACTOR TO PROVIDE (2) 20A, 120VAC DEDICATED CIRCUITS TERMINATED TO DUPLEX NEMA 5-20R RECEPTACLES IN REAR OF RACK, AND PROVIDE NEW WIREWAY ABOVE, AS NEEDED FOR CONTROL WIRING.

FLAGS

- 1 — TO LIGHTING CONTROL EQUIPMENT RACK
- 2 — TO RELAY PANEL
- 3 — TO MOTORIZED HOIST CONTROL

THEATRE SYSTEMS GENERAL NOTES

1. ALL ELECTRICAL CONDUITS, BOXES AND WIREWAYS DEFINED IN THE THEATRE SYSTEMS DRAWINGS SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED.
2. WHERE EXACT DIMENSIONS ARE NOT CALLED FOR, THE SCALE OF THESE DRAWINGS IS SUFFICIENTLY ACCURATE FOR DETERMINING LOCATION OF EQUIPMENT, JUNCTION BOXES, OUTLET BOX WIRE WAYS, PANELS, ETC. WHERE EXACT DIMENSIONS ARE CALLED FOR, THE REFERENCE SURFACE SHALL BE THE FINAL FINISHED SURFACE INCLUDING ANY ACOUSTICAL TREATMENT. DIMENSIONS REFER TO THE CENTER OF THE DEVICE UNLESS OTHERWISE NOTED. ROOM DIMENSIONS ON THESE DRAWINGS HAVE BEEN TAKEN FROM ARCHITECTURAL DRAWINGS. ALL DIMENSIONS MUST BE VERIFIED AND ANY DEVIATIONS CAUSING CHANGES EXCEEDING 0'-3" IN THE LOCATION OF EQUIPMENT MUST BE COORDINATED WITH THE ARCHITECT AND CONSULTANT.
3. DIMENSIONS SHOWN ARE SUGGESTED PLACEMENTS AND ARE PROVIDED FOR INFORMATION ONLY. COORDINATE ALL ELECTRICAL DEVICES AND DIMENSIONED LOCATIONS WITH ARCHITECTURE DRAWINGS. COORDINATE WITH ADJACENT PLATES FOR A UNIFORM APPEARANCE.
4. DRAWINGS ARE NOT TO BE USED FOR ARCHITECTURAL OR ENGINEERING PURPOSES. DRAWINGS SHOULD ONLY BE USED FOR THEATRE SYSTEMS INSTALLATION AND COORDINATION WITH OTHER CONTRACTORS AND SYSTEMS. COORDINATE PATHWAYS FOR ALL THEATRE SYSTEMS RELATED DEVICES WITH ARCHITECTURAL AND ELECTRICAL PLANS.
5. ALL THEATRE SYSTEMS EQUIPMENT DEVICES SHALL BE SECURELY MOUNTED PLUMB AND STRAIGHT TO WALLS, FLOORS, RACKS, OR PIPES (AS APPLICABLE), PER THE MANUFACTURER'S RECOMMENDED MOUNTING PRACTICE.
6. ALL EQUIPMENT SHOWN IN GRAY IS SPECIFIED ELSEWHERE.
7. INSTALL FIRESTOP TO ALL SLAB AND WALL PENETRATIONS PROVIDED FOR THE INSTALLATION OF CABLE AS REQUIRED TO MAINTAIN FIRE RATING OF SLAB OR WALL. INSTALL NON-HARDENING ACOUSTICAL CAULK TO ALL SLAB AND WALL PENETRATIONS. REVIEW ARCHITECTURE DRAWINGS FOR PARTITION TYPES.
8. THE METHOD OF INSTALLATION OF BOXES IN WALLS, AND THE METHOD OF PASSAGE OF CONDUIT AND WIREWAYS THROUGH ACOUSTICALLY SENSITIVE WALLS, SHALL BE COORDINATED WITH THE ACOUSTICAL CONSULTANT AND ARCHITECT.
9. ALL ELECTRICAL FOR THEATRE SYSTEMS EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL ELECTRICAL CODE AND SEISMIC REQUIREMENTS.
10. REFER TO ELECTRICAL SPECIFICATION FOR INSTALLATION INSTRUCTIONS FOR FLOOR BOXES, JUNCTION BOXES, PLYWOOD PANELS, GROUNDING CONDUCTORS, BUSBARS, CONDUITS, CABLE TRAYS IN CORRIDORS, METALLIC ENCLOSURES, ELECTRICAL PANELBOARDS AND CIRCUITING. FIRE PROOFING SYSTEMS USED FOR ALL PENETRATIONS MUST BE APPROVED BY APPLICABLE AUTHORITIES PRIOR TO INSTALLATION.
11. ELECTRICAL FEEDS ARE NOT TO BE RUN PARALLEL WITH VIDEO AND/OR AUDIO LINES OR RACEWAYS. IF ELECTRICAL FEEDS MUST BE RUN PARALLEL TO AUDIO/VIDEO LINES, A MINIMUM OF 4'-0" OF SEPARATION MUST BE MAINTAINED.
12. POWER BREAKER PANELS ARE SIZED AND SPECIFIED BY THE ELECTRICAL ENGINEER, REFER TO ELECTRICAL DRAWINGS. ALL CIRCUITS SHALL BE PROTECTED.
13. POWER RECEPTACLES SHOWN ON THE THEATRE SYSTEMS DRAWINGS ARE DEDICATED TO SPECIFIC PERFORMANCE LIGHTING SYSTEMS EQUIPMENT AND ARE SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL UTILITY POWER RECEPTACLES.
14. GROUND ALL CONDUITS, CABLE TRAYS, AND JUNCTION BOXES PER THE MANUFACTURER'S RECOMMENDATIONS AND PER ALL APPLICABLE CODES.
15. MAINTAIN MINIMUM BEND RADIUS OF 10x O.D. FOR ALL CONDUITS.
16. PROVIDE CONNECTION HARDWARE, GROUNDING LUGS AND STRAPS, THERMAL EXPANSION PLATES, SUPPORT BRACKETS, SPLICE HARDWARE, RUNWAY DROPOFFS, AND 0'-7" CABLE RETAINING POSTS FOR ALL CABLE TRAY LOCATIONS PER MANUFACTURERS RECOMMENDATIONS AND PER APPLICABLE CODES.
17. ALL POWER CONDUIT, POWER WIREWAYS, AND POWER JUNCTION BOXES ARE SHOWN ON ELECTRICAL DRAWINGS.
18. CONDUIT RUNS ON THE THEATRE SYSTEMS DRAWINGS SHOW ONLY INTERCONNECTION BETWEEN THE TERMINATION POINTS. THE EXACT PATH OF CONDUIT ARE TO BE DETERMINED BY THE ELECTRICAL ENGINEER AND FIELD CONDITIONS.
19. IF DISCREPANCIES EXIST BETWEEN THE EXISTING CONDITIONS AND THE THEATRE SYSTEMS DRAWINGS, REQUEST CLARIFICATION BEFORE PROCEEDING WITH WORK.
20. THEATRE CONTRACTOR SHALL RESTORE CEILINGS AND WALLS AND ANY OTHER SURFACES AFFECTED BY ITS WORK UPON COMPLETION OF WORK, WITH LIKE MATERIALS TO MATCH EXISTING CONSTRUCTION.
21. THE FINISHES FOR ALL JUNCTION BOX FACEPLATES, GRILLES, FLOOR BOXES, AND WALL BOXES SHALL BE BLACK UNLESS OTHERWISE NOTED. COORDINATED WITH THE ARCHITECT FOR OTHER FINISH COLORS. ALL ELECTRICAL BOXES SHALL HAVE THE APPROPRIATE COVERS AND SCREWS INSTALLED BY THE ELECTRICAL CONTRACTOR TO MATCH THE FIT AND FINISH SPECIFIED.
22. IT SHALL BE THE RESPONSIBILITY OF THE THEATRE CONTRACTOR TO VERIFY SIGNAL/CONDUIT PATHWAYS WITH THE ELECTRICAL ENGINEERS DRAWINGS.
23. THEATRICAL CONTRACTOR TO VERIFY ALL DIMENSIONS AND CONDITIONS IN FIELD.
24. ALL FASTENERS TO HAVE LOCKWASHERS OR OTHER APPROVED SELF-LOCKING HARDWARE.
25. ALL CONDUIT SHALL BE METALLIC TYPE ONLY, NO PVC SHALL BE USED. CONDUIT IN SLAB MUST BE PVC COATED METALLIC TYPE OR APPROVED EQUIVALENT.
26. POWER, DATA, CATV, AND PHONE CONDUIT ARE SHOWN ON THE ELECTRICAL DRAWINGS.
27. ALL CONTROL WIRING RUNS SHALL BE SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AND TERMINATED BY THEATRE CONTRACTOR UNLESS OTHERWISE NOTED.
28. SIZE ALL LOAD WIRING AND CONTROL WIRING CONDUIT PER NEC CODE AND BASED ON MANUFACTURER'S WIRING. REQUIREMENTS AS SHOWN ON PERFORMANCE LIGHTING ONE-LINE DIAGRAMS. IF ALTERNATE LIGHTING MANUFACTURER IS USED, CONTRACTOR SHALL COORDINATE WIRING AND CONDUIT REQUIREMENTS TO PROVIDE EQUIVALENT, FULLY OPERATIONAL SYSTEM.
29. SURFACE-MOUNT ELECTRICAL BOXES MUST BE SELECTED TO ENSURE PROPER FIT OF COVER PLATES TO AVOID HAVING SHARP EDGES EXTEND BEYOND THE BOX.

SCOPE OF WORK BETWEEN TRADES

GENERAL CONTRACTOR

1. FURNISH AND INSTALL IN-WALL BLOCKING OR SUPPORT FOR THEATRE SYSTEM MOUNTS.
2. FURNISH AND INSTALL FURNITURE CUTOUTS FOR THEATRE SYSTEMS EQUIPMENT.
3. FURNISH AND INSTALL ALL STEEL STRUCTURAL SUPPORT NOT SPECIFICALLY IDENTIFIED AS THE RESPONSIBILITY OF THE THEATRE CONTRACTOR ON THE THEATRE SYSTEMS DRAWINGS.

THEATRE CONTRACTOR

1. FURNISH DEDICATED DISTRIBUTION PANELS AND RELAY PANELS.
2. FURNISH AND INSTALL ALL STEEL CHANNEL SPECIFICALLY IDENTIFIED AS THE RESPONSIBILITY OF THE THEATRE CONTRACTOR ON THE THEATRE SYSTEMS DRAWINGS OR AS REQUIRED FOR PERFORMANCE LIGHTING SYSTEMS DEVICES.
3. FURNISH, INSTALL, AND TERMINATE CUSTOM ENGRAVED PERFORMANCE LIGHTING SYSTEMS WALL PLATES (ELECTRICAL CONTRACTOR TO TERMINATE LINE VOLTAGE CONNECTIONS).
4. FURNISH AND INSTALL PERFORMANCE LIGHTING SYSTEMS DEVICE WALL MOUNTS.
5. FURNISH, INSTALL, AND TERMINATE PERFORMANCE LIGHTING SYSTEMS DEVICES AS DESCRIBED IN THE THEATRE SYSTEM DOCUMENTS.
6. FURNISH AND INSTALL ALL MOTORIZED RIGGING HOISTS.
7. TERMINATE PERFORMANCE LIGHTING SYSTEMS CONTROL WIRING AT THEATRE CONTRACTOR-PROVIDED DEVICES.

ELECTRICAL CONTRACTOR

1. INSTALL AND TERMINATE DEDICATED DISTRIBUTION PANELS AND RELAY PANELS.
2. FURNISH, INSTALL, AND TERMINATE PERFORMANCE LIGHTING SYSTEMS LINE VOLTAGE LOAD WIRING.
3. PROVIDE AND INSTALL ALL JUNCTION BOXES AND CONDUIT, UNLESS NOTED OTHERWISE.
4. FURNISH, INSTALL, AND TERMINATE MOTORIZED RIGGING CONTROL AND LOAD WIRING.
5. FURNISH AND INSTALL PERFORMANCE LIGHTING SYSTEMS LOW VOLTAGE CABLING.
6. FURNISH AND INSTALL ALL HOUSE LIGHTING SYSTEMS LOW VOLTAGE CABLING.
7. FURNISH AND INSTALL ALL HOUSE LIGHTING DRIVERS, POWER SUPPLIES, AND ACCESSORIES.
8. FURNISH AND INSTALL ALL PERFORMANCE LIGHTING SYSTEMS CONTROL WIRING.

TELECOM CONTRACTOR

1. INSTALL VOICE/DATA NETWORK CABLING (FIBER AND TWISTED PAIR), EXCEPT FOR PERFORMANCE LIGHTING SYSTEMS-SPECIFIC CABLE CALLED FOR ON THEATRE SYSTEMS DRAWINGS.

ATTACHMENT B-10

THEATRE SYSTEMS DRAWING INDEX

Sheet Number	Sheet Name
TS0.00	THEATRE SYSTEMS LEGEND, NOTES, AND INDEX
TS2.14	THEATRE SYSTEMS AUDITORIUM PLAN - LEVEL 1
TS2.26	THEATRE SYSTEMS AUDITORIUM PLAN - LEVEL 2
TS3.14	THEATRE SYSTEMS AUDITORIUM RCP - LEVEL 1
TS3.25	THEATRE SYSTEMS AUDITORIUM RCP - LEVEL 2
TS4.00	THEATRE SYSTEMS LINE SET SCHEDULE
TS4.14	THEATRE SYSTEMS STAGE RIGGING PLANS
TS4.25	THEATRE SYSTEMS STAGE RIGGING RCP
TS5.90	THEATRE SYSTEMS AUDITORIUM SECTIONS
TS5.91	THEATRE SYSTEMS FRONT OF HOUSE ELECTRIC ELEVATION
TS5.92	THEATRE SYSTEMS TYPICAL STAGE ELECTRICAL LINESET ELEVATION
TS5.93	THEATRE SYSTEMS PROJECTION SCREEN ELEVATION
TS5.94	THEATRE SYSTEMS ELEVATIONS
TS6.10	THEATRE SYSTEMS PANEL SCHEDULES
TS6.11	THEATRE SYSTEMS PERFORMANCE LIGHTING ONE-LINE DIAGRAM
TS6.12	THEATRE SYSTEMS PERFORMANCE LIGHTING ONE-LINE DIAGRAM
TS6.13	THEATRE SYSTEMS PERFORMANCE LIGHTING ONE-LINE DIAGRAM
TS6.20	THEATRE SYSTEMS MOTORIZED HOIST ONE-LINE DIAGRAM
TS6.31	THEATRE SYSTEMS DETAILS
TS6.32	THEATRE SYSTEMS DETAILS
TS6.41	THEATRE SYSTEMS DETAILS
TS7.10	THEATRE SYSTEMS ORCHESTRA SHELL PLAN
TS7.20	THEATRE SYSTEMS ORCHESTRA SHELL ELEVATION
TS7.30	THEATRE SYSTEMS ORCHESTRA SHELL SECTION DETAIL

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Kailua, Oahu, Hawaii 96734
808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS LEGEND, NOTES, AND INDEX
100% CONSTRUCTION DOCUMENTS

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Scale:	
Date:	10/26/2022
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Drawing No.
TS0.00
Sheet No. _____ of _____

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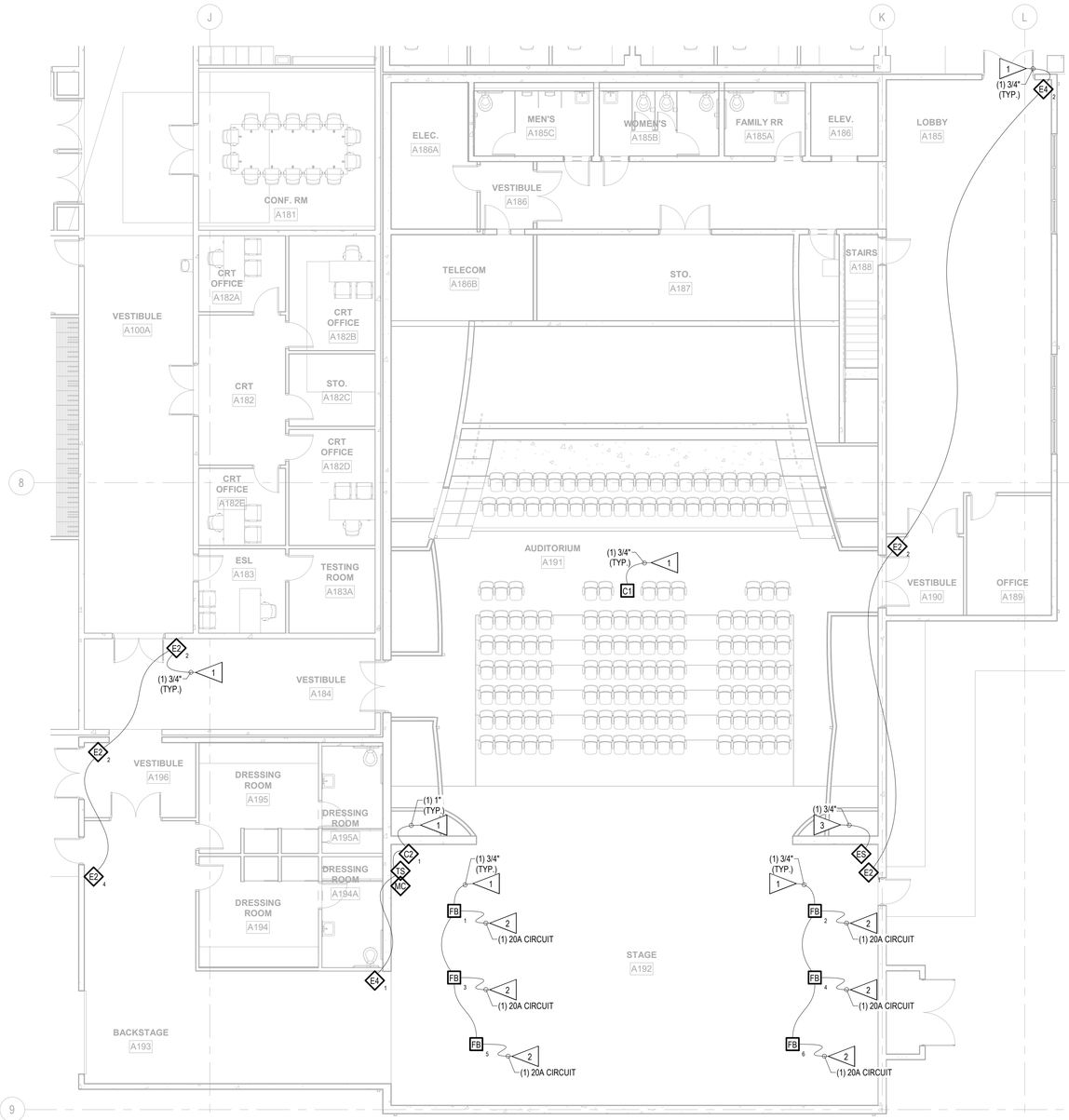

1 AUDITORIUM FLOOR PLAN - LEVEL 1
1/8" = 1'-0"

0' 5' 10' 15' 20'

NORTH

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Title:
THEATRE SYSTEMS AUDITORIUM PLAN - LEVEL 1
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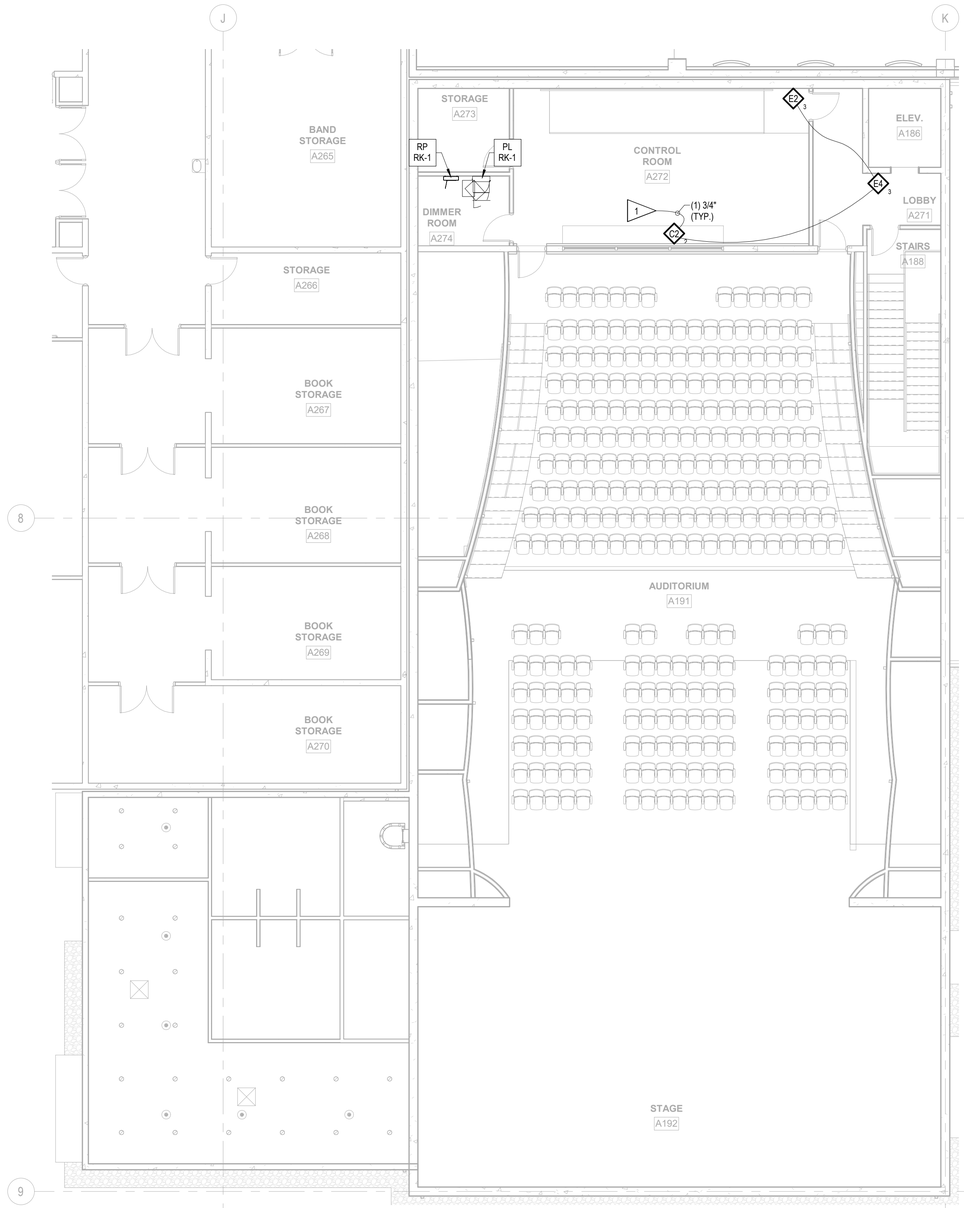

1 AUDITORIUM FLOOR PLAN - LEVEL 2
1/8" = 1'-0"

0' 5' 10' 15' 20'

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THEATRE SYSTEMS AUDITORIUM PLAN - LEVEL 2
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1 AUDITORIUM RCP - LEVEL 1
1/8" = 1'-0"

0' 5' 10' 15' 20'

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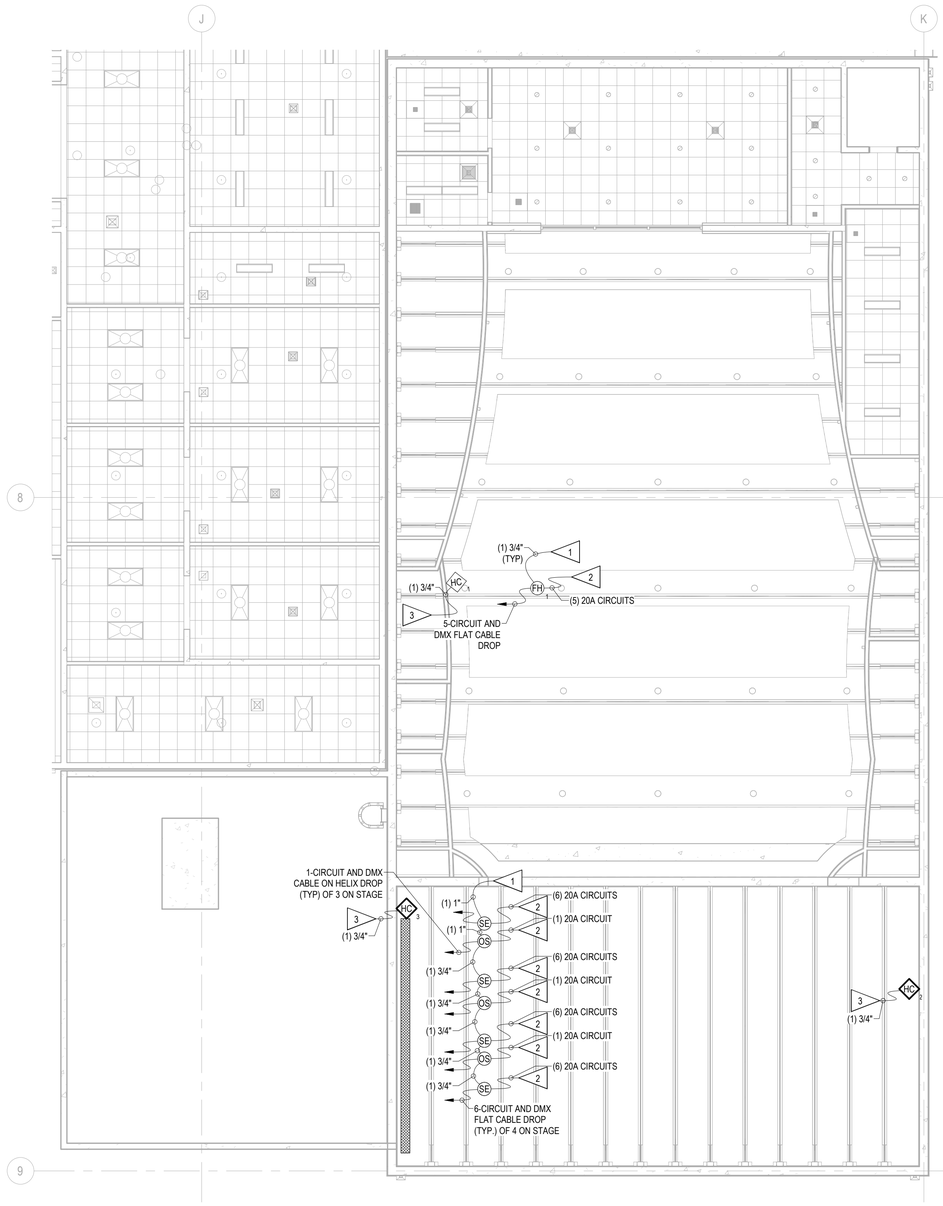

1 AUDITORIUM RCP - LEVEL 2
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0' 5' 10' 15' 20'

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SET NO.	DISTANCE FROM DATUM LINE TO THE C/L OF BATTEN	BATTEN DESCRIPTION	MIN. NO. OF SUPPORT POINTS	BATTEN LENGTH (SINGLE PIPE = S DOUBLE PIPE = D)	BRIADALED PICKUP ON BOTH BATTEN ENDS (YES = Y / NO = N)	SUSPENSION METHOD (DEAD-HUNG = DH / MOTORIZED = M)	CURTAIN SPECIFICATIONS			TRACK LENGTH	NOTES
							SIZE (H X W)	FULLNESS	COLOR		
FOH	33'-4"	FRONT OF HOUSE ELECTRIC	5	37'-0" S	N	M	---	---	---	---	MOTORIZED PIPE BATTEN WITH INTEGRATED CIRCUIT AND DMX DISTRIBUTION
---	0'-0"	DATUM REFERENCE									PLASTER LINE
1	0'-4"	GRAND VALANCE	8	47'-0" S	N	DH	8'-0" X 47'-0"	100%	BY ARCHITECT	---	LINED
2	1'-0"	GRAND DRAPE	8	47'-0" S	N	DH	2 @ 22'-0" X 24'-0"	100%	BY ARCHITECT	2 @ 25'-0"	LINED
3	1'-10"	PROJECTION SCREEN	8	47'-0" S	N	DH	---	---	---	---	SEE AV DRAWINGS FOR MORE INFORMATION
4	2'-6"	BORDER #1	8	47'-0" S	N	DH	8'-0" X 47'-0"	50%	BLACK	---	UNLINED
5	3'-0"	LEG SET #1	8	47'-0" S	N	DH	2 @ 23'-0" X 12'-0"	50%	BLACK	2 @ 25'-0"	UNLINED
6	4'-2"	STAGE ELECTRIC #1	6	42'-0" S	N	M	---	---	---	---	MOTORIZED PIPE BATTEN WITH INTEGRATED CIRCUIT AND DMX DISTRIBUTION
7	5'-6"	LEG SET #2	8	47'-0" S	N	DH	2 @ 23'-0" X 8'-0"	50%	BLACK	47'-0"	UNLINED
8	6'-2"	ORCHESTRA SHELL #1	6	47'-0" D	N	M	---	---	---	---	MOTORIZED ORCHESTRA SHELL WITH INTEGRATED PERFORMANCE LIGHTING
9	8'-0"	LEG SET #3	8	47'-0" S	N	DH	2 @ 23'-0" X 8'-0"	50%	BLACK	47'-0"	UNLINED
10	9'-4"	BORDER #2	8	47'-0" S	N	DH	8'-0" X 47'-0"	50%	BLACK	---	UNLINED
11	10'-8"	STAGE ELECTRIC #2	6	42'-0" S	N	M	---	---	---	---	MOTORIZED PIPE BATTEN WITH INTEGRATED CIRCUIT AND DMX DISTRIBUTION
12	11'-4"	LEG SET #4	8	47'-0" S	N	DH	2 @ 23'-0" X 8'-0"	50%	BLACK	47'-0"	UNLINED
13	11'-10"	OPEN/SPARE #1	6	47'-0" S	N	M	---	---	---	---	VARIABLE SPEED BATTEN
14	13'-2"	ORCHESTRA SHELL #2	6	47'-0" D	N	M	---	---	---	---	MOTORIZED ORCHESTRA SHELL WITH INTEGRATED PERFORMANCE LIGHTING
15	14'-8"	MIDSTAGE TRAVELER	8	47'-0" S	N	DH	2 @ 22'-0" X 24'-0"	50%	BLACK	2 @ 25'-0"	LINED
16	15'-4"	SCRIM	8	47'-0" S	N	DH	22'-0" X 35'-0"	0%	BLACK	47'-0"	---
17	16'-0"	BORDER #3	8	47'-0" S	N	DH	8'-0" X 47'-0"	50%	BLACK	---	UNLINED
18	17'-4"	STAGE ELECTRIC #3	6	42'-0" S	N	M	---	---	---	---	MOTORIZED PIPE BATTEN WITH INTEGRATED CIRCUIT AND DMX DISTRIBUTION
19	18'-8"	LEG SET #5	8	47'-0" S	N	DH	2 @ 23'-0" X 8'-0"	50%	BLACK	47'-0"	UNLINED
20	19'-4"	ORCHESTRA SHELL #3	6	47'-0" D	N	M	---	---	---	---	MOTORIZED ORCHESTRA SHELL WITH INTEGRATED PERFORMANCE LIGHTING
21	20'-8"	BORDER #4	6	41'-0" S	Y	DH	8'-0" X 41'-0"	50%	BLACK	---	UNLINED
22	21'-4"	LEG SET #6	6	41'-0" S	Y	DH	2 @ 23'-0" X 8'-0"	50%	BLACK	41'-0"	UNLINED
23	22'-8"	STAGE ELECTRIC #4	6	40'-0" S	N	M	---	---	---	---	MOTORIZED PIPE BATTEN WITH INTEGRATED CIRCUIT AND DMX DISTRIBUTION
24	25'-4"	UPSTAGE TRAVELER	6	41'-0" S	Y	DH	2 @ 20'-0" X 21'-0"	50%	BLACK	2 @ 22'-0"	UNLINED
25	26'-0"	OPEN/SPARE #2	6	41'-0" S	N	M	---	---	---	---	VARIABLE SPEED BATTEN
26	26'-8"	CYC	6	41'-0" S	Y	DH	20'-0" X 30'-0"	0%	WHITE	41'-0"	---

1 LINE SET SCHEDULE

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS
LINE SET SCHEDULE

100% CONSTRUCTION DOCUMENTS

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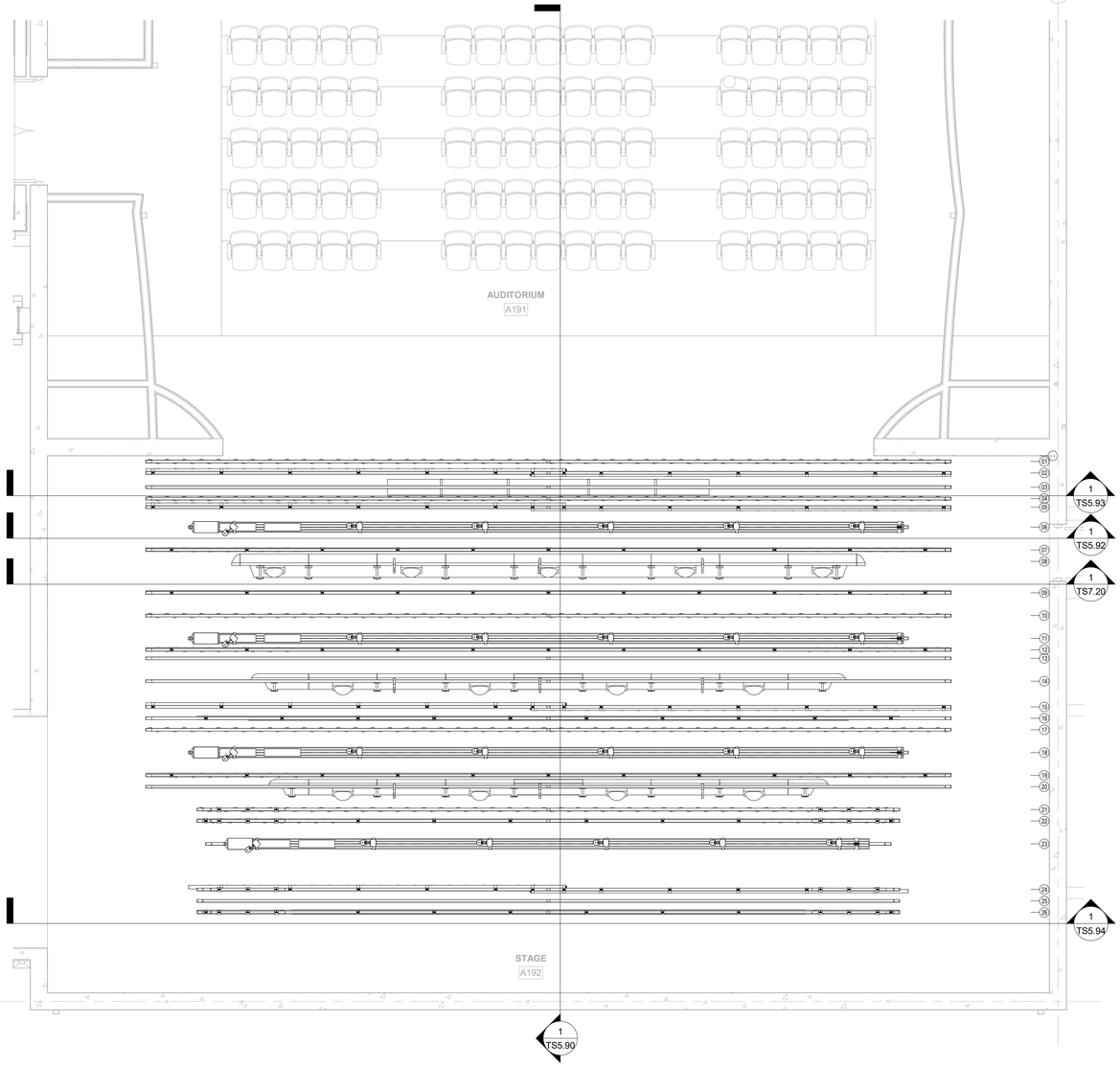

1 STAGE RIGGING PLANS
1/4" = 1'-0"

0' 5' 10'

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Kailua, Oahu
Hawaii 96734
808.254.3318

Project:

GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:

THEATRE SYSTEMS STAGE RIGGING PLANS

100% CONSTRUCTION DOCUMENTS

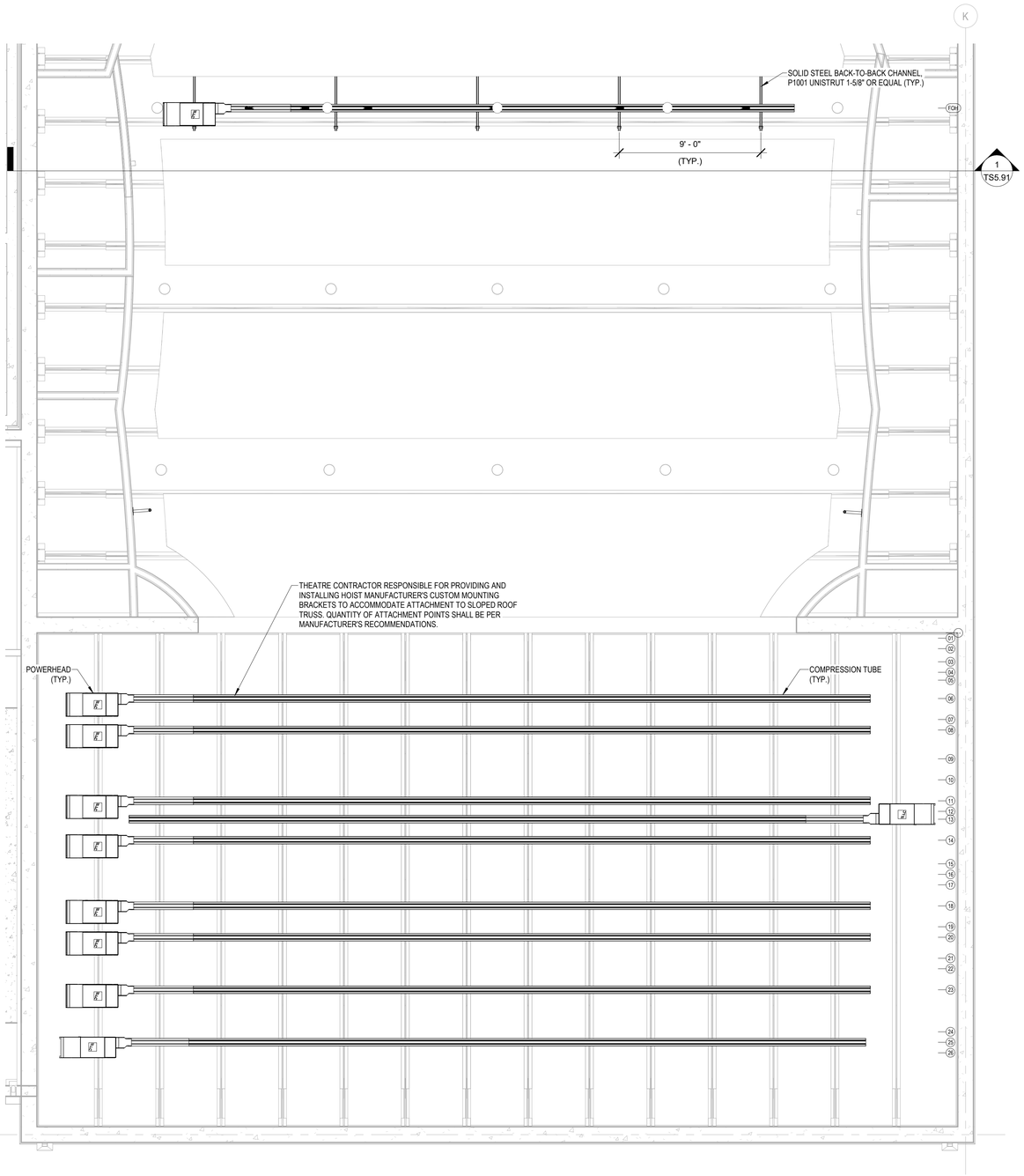
Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.

TS4.14

Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 STAGE RIGGING RCP
1/4" = 1'-0"

0' 5' 10'

NORTH

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
No.	Description	Date

TRMA
Taniguchi Ruth Makio Architects
100 Cliff Business Center, P.O. Box EA, Agana, GU 96910
Tel.: (671) 475-8772 • Fax.: (671) 472-3381

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS STAGE RIGGING RCP

100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
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Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
TS4.25
Sheet No. _____ of _____

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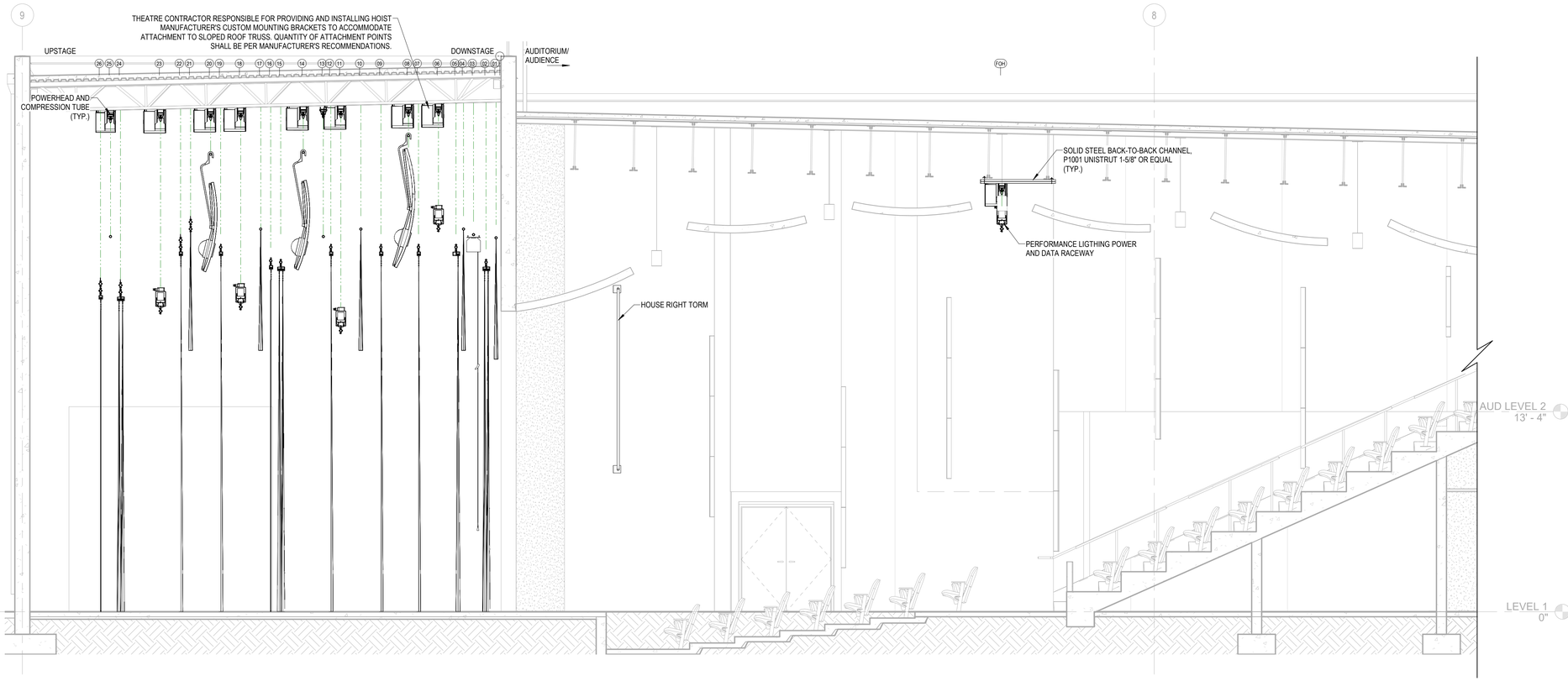
NOTE:
MAXIMIZE OUT-TRIM FOR ALL MOTORIZED LINESETS



1 AUDITORIUM SECTION
1/4" = 1'-0"

0' 5' 10'

IF SHEET IS LESS THAN 24" X 36"
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS AUDITORIUM SECTIONS
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Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS5.90
Sheet No. _____ of _____

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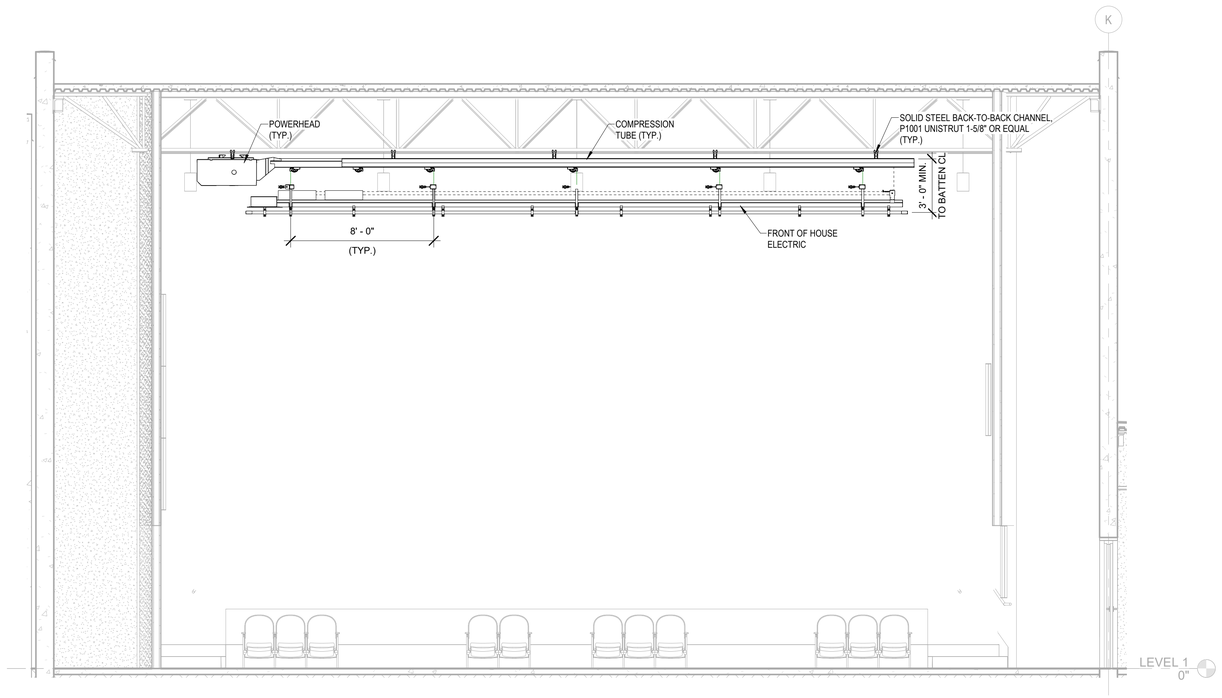

1 THEATRE SYSTEMS FRONT OF HOUSE ELECTRIC
1/4" = 1'-0"

REVISION		
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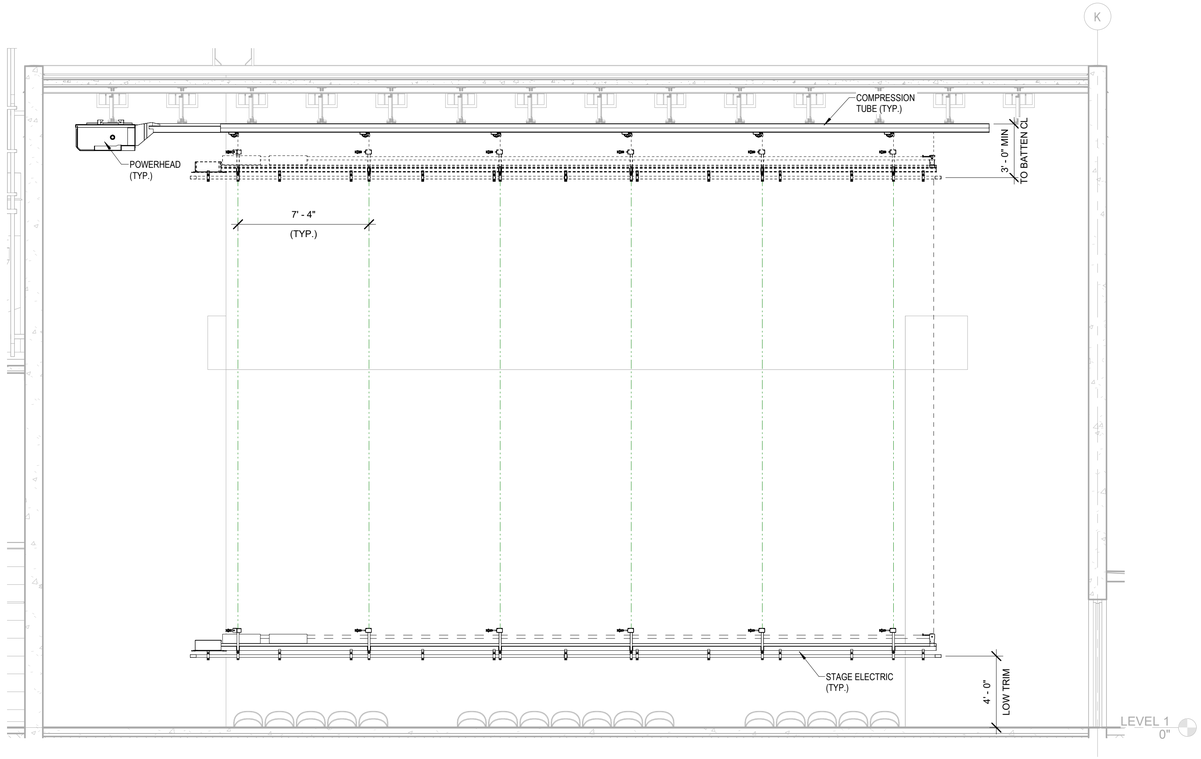
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS FRONT OF HOUSE ELECTRIC ELEVATION
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
TS5.91
Sheet No. _____ of _____

0' 5' 10'
IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES



1 TYPICAL STAGE ELECTRICAL LINESET ELEVATION
1/4" = 1'-0"

REVISION		
No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS
TYPICAL STAGE ELECTRICAL LINESET ELEVATION
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS5.92
Sheet No. _____ of _____

0' 5' 10'
IF SHEET IS LESS THAN 24" X 36"
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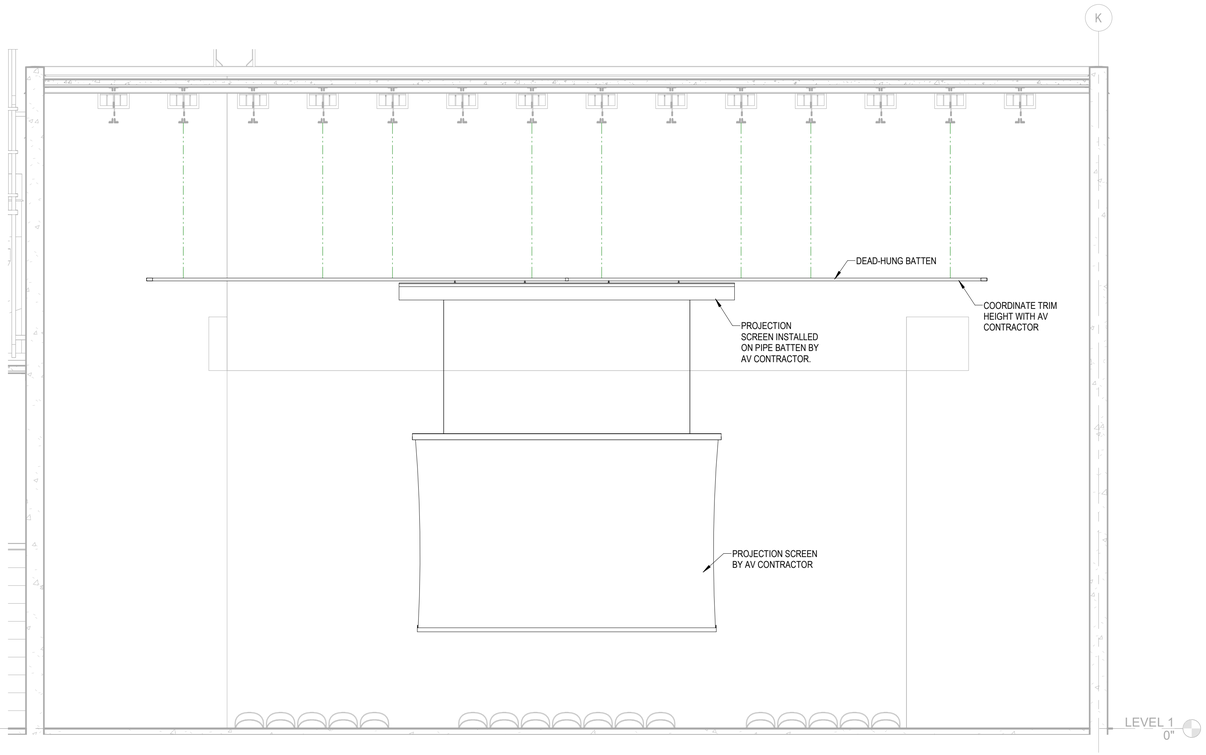

1 PROJECTION SCREEN ELEVATION (ALL DEAD-HUNG LINE SETS WITH 47' LONG BATTEN, SIMILAR. ADJUST TRIM HEIGHT ACCORDING TO LINE SET DESIGNATION)
1/4" = 1'-0"

REVISION		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS PROJECTION SCREEN ELEVATION
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS5.93
Sheet No. _____ of _____

0' 5' 10'
IF SHEET IS LESS THAN 24" X 36"
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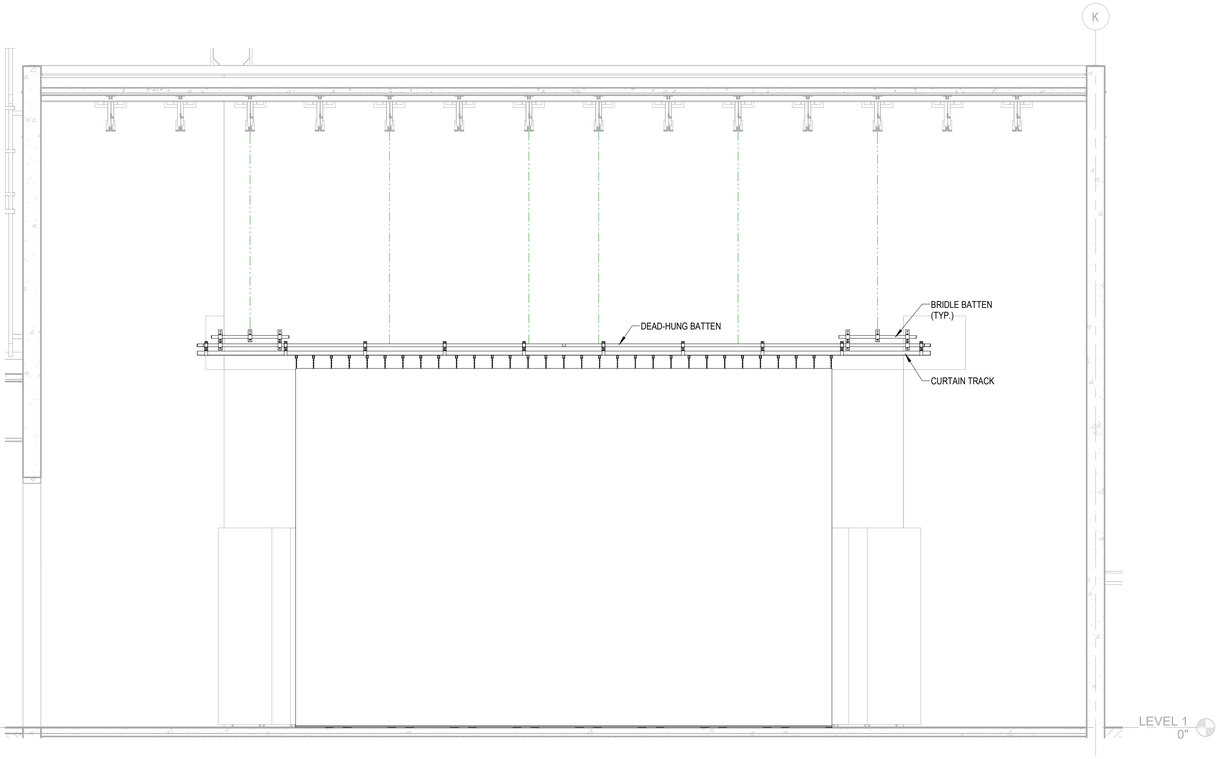

1 THEATRE SYSTEMS CYC LINESET ELEVATION (ALL DEAD-HUNG LINE SETS WITH 41' LONG BATTEN, SIMILAR. ADJUST TRIM HEIGHT ACCORDING TO LINE SET DESIGNATION)
1/4" = 1'-0"

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS ELEVATIONS

100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS5.94
Sheet No. _____ of _____

0' 5' 10'
IF SHEET IS LESS THAN 24" X 36"
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120V PANEL: ZC1

JOB NUMBER: 20-019 | JOB NAME: Simon Sanchez High School | DATE: 6/13/2022

INPUT CIRCUIT	OUTPUT	ADDRESS UNI	ADDRESS ADD	DESCRIPTION	FIXTURE CALL	FIXTURE TYPE	LOAD Subtotal	LOAD Circuit Total
HL-44	A1-1	1	49	DOWN LIGHTS	AU8	0-10V	48	
HL-44	A1-2	1	50	DOWN LIGHTS	AU8	0-10V	144	
HL-44	A1-3	1	51	DOWN LIGHTS	AU8	0-10V	48	
HL-44	A1-4	1	52	DOWN LIGHTS	AU8	0-10V	216	
HL-44	A1-5	1	53	DOWN LIGHTS	AU8	0-10V	72	
HL-44	A1-6	1	54	WHITE DOWN LIGHTS	AU8	0-10V	144	
HL-44	A7-7	1	55	WHITE PERIMETER WORK LIGHTS	AU3	0-10V	522	1194
		1	56					

3 PANEL SCHEDULE - 8 CHANNEL FOUNDRY

120V PANEL: ZC2

JOB NUMBER: 20-019 | JOB NAME: Simon Sanchez High School | DATE: 6/13/2022

INPUT CIRCUIT	OUTPUT	ADDRESS UNI	ADDRESS ADD	DESCRIPTION	FIXTURE CALL	FIXTURE TYPE	LOAD Subtotal	LOAD Circuit Total
HL-45	B1-1	1	57	WHITE LOBBY DOWNLIGHTS	AU8	0-10V	300	
HL-45	B1-2	1	58	WHITE LOBBY DOWNLIGHTS	AU8	0-10V	84	384

2 PANEL SCHEDULE - 2 CHANNEL FOUNDRY

RELAY PANEL: RP RK-1

JOB NUMBER: 20-019 | JOB NAME: Simon Sanchez HS | DATE: 8/26/2022 | REVISION: | PROJECT NOTE: 100%CD

SLOT	RELAY / DIMMER	AMP	ADDRESS UNI	ADDRESS ADD	DESCRIPTION	FIXTURE CALL	FIXTURE TYPE	FIXTURE QTY	FIXTURE LOAD	LOAD PHASING A	LOAD PHASING B	LOAD PHASING C	FIXTURE LOAD	FIXTURE QTY	FIXTURE TYPE	FIXTURE CALL	DESCRIPTION	ADDRESS ADD	ADDRESS UNI	AMP	RELAY / DIMMER	SLOT
1	1P RELAY/BREAKER	20	1	1	FH1 - FRONT OF HOUSE		DMX	6	150	900	900		150	6	DMX		FH1 - FRONT OF HOUSE	2	1	20	1P RELAY/BREAKER	2
3	1P RELAY/BREAKER	20	1	3	FH1 - FRONT OF HOUSE		DMX	6	150		900	900	150	6	DMX		FH1 - FRONT OF HOUSE	4	1	20	1P RELAY/BREAKER	4
5	1P RELAY/BREAKER	20	1	5	FH1 - FRONT OF HOUSE		DMX	6	150			900	900	150	6	DMX		SE1 - ELECTRIC 1	6	1	20	1P RELAY/BREAKER	6
7	1P RELAY/BREAKER	20	1	7	SE1 - ELECTRIC 1		DMX	6	150	900	900		150	6	DMX		SE1 - ELECTRIC 1	8	1	20	1P RELAY/BREAKER	8
9	1P RELAY/BREAKER	20	1	9	SE1 - ELECTRIC 1		DMX	6	150		900	900	150	6	DMX		SE1 - ELECTRIC 1	10	1	20	1P RELAY/BREAKER	10
11	1P RELAY/BREAKER	20	1	11	SE1 - ELECTRIC 2		DMX	6	150			900	900	150	6	DMX		SE1 - ELECTRIC 2	12	1	20	1P RELAY/BREAKER	12
13	1P RELAY/BREAKER	20	1	13	SE1 - ELECTRIC 2		DMX	6	150	900	900		150	6	DMX		SE1 - ELECTRIC 2	14	1	20	1P RELAY/BREAKER	14
15	1P RELAY/BREAKER	20	1	15	SE1 - ELECTRIC 2		DMX	6	150		900	900	150	6	DMX		SE1 - ELECTRIC 3	16	1	20	1P RELAY/BREAKER	16
17	1P RELAY/BREAKER	20	1	17	SE1 - ELECTRIC 3		DMX	6	150			900	900	150	6	DMX		SE1 - ELECTRIC 3	18	1	20	1P RELAY/BREAKER	18
19	1P RELAY/BREAKER	20	1	19	SE1 - ELECTRIC 3		DMX	6	150	900	900		150	6	DMX		SE1 - ELECTRIC 3	20	1	20	1P RELAY/BREAKER	20
21	1P RELAY/BREAKER	20	1	21	SE1 - ELECTRIC 4		DMX	6	150		900	900	150	6	DMX		SE1 - ELECTRIC 4	22	1	20	1P RELAY/BREAKER	22
23	1P RELAY/BREAKER	20	1	23	SE1 - ELECTRIC 4		DMX	6	150			900	900	150	6	DMX		SE1 - ELECTRIC 4	24	1	20	1P RELAY/BREAKER	24
25	1P RELAY/BREAKER	20	1	25	SE1 - ELECTRIC 4		DMX	6	150	900	750		150	5	DMX		T1 - TORM HR	26	1	20	1P RELAY/BREAKER	26
27	1P RELAY/BREAKER	20	1	27	T1 - TORM HR		DMX	5	150		750	750	150	5	DMX		T2 - TORM HL	28	1	20	1P RELAY/BREAKER	28
29	1P RELAY/BREAKER	20	1	29	T2 - TORM HL		DMX	5	150			750	450	150	3	DMX		FB1 - FLOOR BOX DSL	30	1	20	1P RELAY/BREAKER	30
31	1P RELAY/BREAKER	20	1	31	FB3 - FLOOR BOX DRS		DMX	3	150	450	450		150	3	DMX		FB5 - FLOOR BOX MSL	32	1	20	1P RELAY/BREAKER	32
33	1P RELAY/BREAKER	20	1	33	FB2 - FLOOR BOX MSR		DMX	3	150		450	450	150	3	DMX		FB4 - FLOOR BOX ULS	34	1	20	1P RELAY/BREAKER	34
35	1P RELAY/BREAKER	20	1	35	FB6 - FLOOR BOX USR		DMX	3	150			450	515	103	5	DMX		OS3 - ORCHESTRA SHELL 1	36	1	20	1P RELAY/BREAKER	36
37	1P RELAY/BREAKER	20	1	37	OS3 - ORCHESTRA SHELL 2		DMX	5	103	515	515		103	5	DMX		OS3 - ORCHESTRA SHELL 3	38	1	20	1P RELAY/BREAKER	38
39	1P RELAY/BREAKER	20	1	39	DONWSTAGE WORK LIGHTS		DMX	10	150		1500	900	10	90	DMX		UPSTAGE WORK LIGHTS	40	1	20	1P RELAY/BREAKER	40
41	1P BREAKER	20	1	41	HOUSE LIGHTING HL41		DMX	15	90			1350	1350	15	90	DMX		HOUSE LIGHTING HL42	42	1	20	1P BREAKER	42
43	1P BREAKER	20	1	43	HOUSE LIGHTING HL43		DMX	1	1393	1393	1194		1	1194	DMX		HOUSE LIGHTING HL44	44	1	20	1P BREAKER	44
45	1P BREAKER	20	1	45	HOUSE LIGHTING HL45		DMX	1	384		384	72	1	72	DMX		HOUSE LIGHTING HL46	46	1	20	1P BREAKER	46
47	1P BREAKER	20	1	47	SPARE							0	0				SPARE	48	1	20	1P BREAKER	48
						TOTAL WATTS				13367	12456	12065										
						TOTAL AMPS				111.39	103.80	100.54										

1 PANEL SCHEDULE

REVISION

No.	Description	Date

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS PANEL SCHEDULES
100% CONSTRUCTION DOCUMENTS

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Date:	10/26/2022

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Drawing No.
TS6.10
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

SYMBOL LEGEND

X (1)

(BACK BOX TYPE - PLATE NUMBER, IF APPLICABLE)

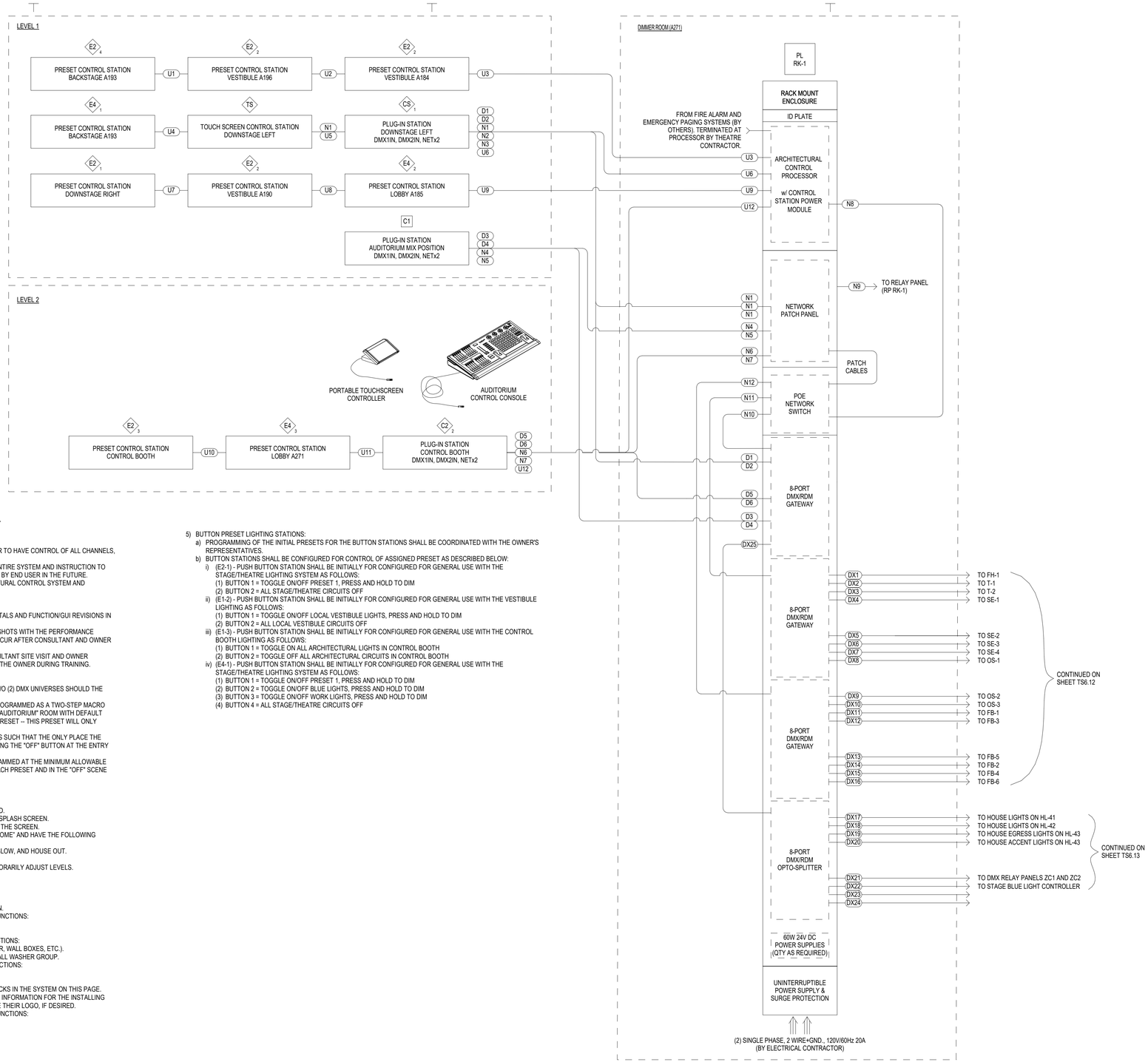
PLATE OR DEVICE TYPE
LOCATION
I/O ON PLATE OR DEVICE — WIRE TYPE

WIRE LEGEND

U*	-HOUSE LIGHT CONTROL	BELDEN #8471 + (1) #14AWG + (2) #16AWG
N*	-LIGHTING NETWORK	BELDEN #1583A
D*	-DMXIN	BELDEN #1583A
DX*	-DMXOUT	BELDEN #1583A

NOTES

1. ALL CONTROL WIRING AND RUNS SHALL BE SUPPLIED BY ELECTRICAL CONTRACTOR, AND TERMINATED BY THE THEATRE CONTRACTOR, UNLESS OTHERWISE NOTED.
2. TOTAL LENGTH OF HOUSE LIGHT CONTROL WIRING RUNS SHALL NOT EXCEED 1,640 FEET (500 METERS).
3. THEATRE CONTRACTOR TO VERIFY LOAD TYPE OF ALL HOUSE LIGHT LOADS PRIOR TO SYSTEM ENERGIZATION.
4. ELECTRICAL CONTRACTOR TO USE #10 AWG THHN WIRING FOR CONNECTION OF THEATRICAL LIGHTING LOADS.
5. CONNECT HOUSE LIGHTING TO PERFORMANCE LIGHTING SYSTEM EQUIPMENT AS SPECIFIED BY ELECTRICAL CONSULTANT.
6. A SEPARATE NEUTRAL IS REQUIRED FOR EACH CIRCUIT.



ARCHITECTURAL CONTROL SYSTEM PROGRAMMING NOTES

1) LIGHTING CONTROL CONSOLE
   a) SHALL CONTROL ALL THE LIGHTING ASSOCIATED WITH STAGE AND THEATRE.
   b) SHALL BE INITIALLY PROGRAMMED AND SET UP BY THEATRICAL CONTRACTOR TO HAVE CONTROL OF ALL CHANNELS, FIXTURES, AND DEVICES.
   c) THEATRE CONTRACTOR SHALL PROVIDE INITIAL MAGIC SHEET SET UP FOR ENTIRE SYSTEM AND INSTRUCTION TO END USER ON MAGIC SHEET FUNCTIONALITY FOR ADJUSTMENT TO CHANGES BY END USER IN THE FUTURE.
   d) THE CONSOLE SHALL AUTOMATICALLY TAKE CONTROL FROM THE ARCHITECTURAL CONTROL SYSTEM AND RELINQUISH IT WHEN CONSOLE IS POWERED OFF.

2) TOUCHSCREEN GUI DEVELOPMENT PROCESS
   a) THE THEATRE CONTRACTOR SHALL INCLUDE TWO (2) TOUCHSCREEN SUBMITTALS AND FUNCTION/GUI REVISIONS IN THE SCOPE OF WORK.
      i) THE THEATRE CONTRACTOR SHALL SUBMIT TOUCHSCREEN GUI SCREEN-SHOTS WITH THE PERFORMANCE LIGHTING SYSTEM SHOP DRAWING PACKAGE. ONE (1) REVISION SHALL OCCUR AFTER CONSULTANT AND OWNER REVIEW.
      ii) ONE (1) REVISION SHALL OCCUR AFTER THE POST-CONSTRUCTION CONSULTANT SITE VISIT AND OWNER TRAINING. ALL TOUCHSCREEN FUNCTIONS SHOULD BE CONFIRMED WITH THE OWNER DURING TRAINING.

3) GENERAL ARCHITECTURAL CONTROL SYSTEM PROGRAMMING
   a) LIGHTING ENTRY STATIONS MUST BE PROGRAMMABLE FOR A MINIMUM OF TWO (2) DMX UNIVERSES SHOULD THE OWNER WISH TO PROGRAM ADDITIONAL LIGHTING INTO THE PRESETS.
      i) ALL ENTRY STATION AND STAGE MANAGER'S TOUCHSCREEN SHALL BE PROGRAMMED AS A TWO-STEP MACRO WHICH RECALLS THE ASSOCIATED PRESET IN "AISLE LIGHTS" ROOM AND "AUDITORIUM" ROOM WITH DEFAULT FADE RATE WITH EXCEPTION OF THE STAGE MANAGER'S STATION "OFF" PRESET -- THIS PRESET WILL ONLY RECALL "OFF" IN THE "AUDITORIUM" ROOM
      ii) THE INTENT OF THE ARCHITECTURAL CONTROL SYSTEM PROGRAMMING IS SUCH THAT THE ONLY PLACE THE OWNER WILL BE ABLE TO TURN THE AISLE/STEP LIGHTS "OFF" IS BY PUSHING THE "OFF" BUTTON AT THE ENTRY STATIONS.
      iii) IN THIS FASHION, THE OWNER WILL HAVE THE AISLE/STEP LIGHTS PROGRAMMED AT THE MINIMUM ALLOWABLE DIMMING LEVEL, AS DIRECTED BY THE ELECTRICAL CONSULTANT, INTO EACH PRESET AND IN THE "OFF" SCENE AT THE TOUCHSCREENS.

4) PAGE-BY-PAGE TOUCHSCREEN FUNCTION DESCRIPTIONS
   a) THE SYSTEM SHALL DEFAULT TO A SPLASH SCREEN.
      i) THE OWNER SHALL SELECT SPLASH SCREEN GRAPHICS IMAGE, IF DESIRED.
      ii) IF DESIRED BY THE OWNER, PROVIDE A PIN OR PASSWORD LOCK ON THE SPLASH SCREEN.
   b) THE TOUCHSCREEN GUI SHALL BE LAID OUT WITH TABS ACROSS THE TOP OF THE SCREEN.
   c) WHEN THE TOUCHSCREEN IS ACTIVATED, THE FIRST TAB SHALL BE NAMED "HOME" AND HAVE THE FOLLOWING FUNCTIONS:
      i) FOUR (4) HOUSE LIGHTING PRESETS: HOUSE FULL, HOUSE HALF, HOUSE GLOW, AND HOUSE OUT.
         (1) THESE SHALL BE SAVED ON PRESETS 21-24.
         (2) PROVIDE A FADER FOR HOUSE LIGHTING THAT CAN BE USED TO TEMPORARILY ADJUST LEVELS.
      ii) TWO (2) TOGGLE BUTTONS WITH WORK LIGHTING PRESETS:
         (1) STAGE WORK LIGHTS ON/OFF.
         (2) STAGE BLUE LIGHTS ON/OFF.
      iii) BUTTON STATION LOCKOUT.
         (1) WITH ACTIVATION OF STATION LOCKOUT, BLUE LIGHTS SHALL TURN ON.
   d) THE SECOND TAB SHALL BE NAMED "PRESETS" AND HAVE THE FOLLOWING FUNCTIONS:
      i) TEN (10) PRESETS.
      ii) RECORD PRESET BUTTON WITH PIN LOCK (IF DESIRED BY OWNER).
   e) THE THIRD TAB SHALL BE NAMED "GROUPS" AND HAVE THE FOLLOWING FUNCTIONS:
      i) GROUPS OF RELAYS BY POSITION (WORK LIGHT POSITIONS, WALL WASHER, WALL BOXES, ETC.).
      ii) PROVIDE GROUP WITH INTENSITY FADER AND COLOR PICKER FOR THE WALL WASHER GROUP.
   f) THE FOURTH TAB SHALL BE NAMED "UTILITY" AND HAVE THE FOLLOWING FUNCTIONS:
      i) DUPLICATE THE STATION LOCKOUT BUTTON.
      ii) END OF DAY ENABLE/DISABLE.
      iii) PROVIDE A METHOD FOR THE OWNER TO CHANGE ALL PIN/PASSWORD LOCKS IN THE SYSTEM ON THIS PAGE.
   g) THE FIFTH TAB SHALL BE NAMED "HELP" AND SHOULD INCLUDE THE CONTACT INFORMATION FOR THE INSTALLING CONTRACTOR AS WELL AS THE MANUFACTURER. CONTRACTOR MAY INCLUDE THEIR LOGO, IF DESIRED.
   h) THE FINAL TABS SHALL BE NAMED "CHANNELS" AND HAVE THE FOLLOWING FUNCTIONS:
      i) INDIVIDUAL CONTROL OVER ALL RELAYS WITH ON/OFF BUTTONS.
      ii) ADD ADDITIONAL PAGES AS REQUIRED TO ACCESS ALL CHANNELS.

5) BUTTON PRESET LIGHTING STATIONS:
   a) PROGRAMMING OF THE INITIAL PRESETS FOR THE BUTTON STATIONS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVES.
   b) BUTTON STATIONS SHALL BE CONFIGURED FOR CONTROL OF ASSIGNED PRESET AS DESCRIBED BELOW:
      i) (E2-1) - PUSH BUTTON STATION SHALL BE INITIALLY FOR CONFIGURED FOR GENERAL USE WITH THE STAGE/THEATRE LIGHTING SYSTEM AS FOLLOWS:
         (1) BUTTON 1 = TOGGLE ON/OFF PRESET 1, PRESS AND HOLD TO DIM
         (2) BUTTON 2 = ALL STAGE/THEATRE CIRCUITS OFF
      ii) (E1-2) - PUSH BUTTON STATION SHALL BE INITIALLY FOR CONFIGURED FOR GENERAL USE WITH THE VESTIBULE LIGHTING AS FOLLOWS:
         (1) BUTTON 1 = TOGGLE ON/OFF LOCAL VESTIBULE LIGHTS, PRESS AND HOLD TO DIM
         (2) BUTTON 2 = ALL LOCAL VESTIBULE CIRCUITS OFF
      iii) (E1-3) - PUSH BUTTON STATION SHALL BE INITIALLY FOR CONFIGURED FOR GENERAL USE WITH THE CONTROL BOOTH LIGHTING AS FOLLOWS:
         (1) BUTTON 1 = TOGGLE ON ALL ARCHITECTURAL LIGHTS IN CONTROL BOOTH
         (2) BUTTON 2 = TOGGLE OFF ALL ARCHITECTURAL CIRCUITS IN CONTROL BOOTH
      iv) (E4-1) - PUSH BUTTON STATION SHALL BE INITIALLY FOR CONFIGURED FOR GENERAL USE WITH THE STAGE/THEATRE LIGHTING SYSTEM AS FOLLOWS:
         (1) BUTTON 1 = TOGGLE ON/OFF PRESET 1, PRESS AND HOLD TO DIM
         (2) BUTTON 2 = TOGGLE ON/OFF BLUE LIGHTS, PRESS AND HOLD TO DIM
         (3) BUTTON 3 = TOGGLE ON/OFF WORK LIGHTS, PRESS AND HOLD TO DIM
         (4) BUTTON 4 = ALL STAGE/THEATRE CIRCUITS OFF

1 LIGHTING CONTROL

REVISION		
No.	Description	Date

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970 N. Kalaheo Avenue, Suite A-311, Kailua, Oahu, Hawaii 96734
www.dlaa.com, 808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS PERFORMANCE LIGHTING ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	
Date:	10/26/2022
Project No.: 20-019	File

Drawing No.
TS6.11
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

SYMBOL LEGEND

X (1)

(BACK BOX TYPE - PLATE NUMBER, IF APPLICABLE)

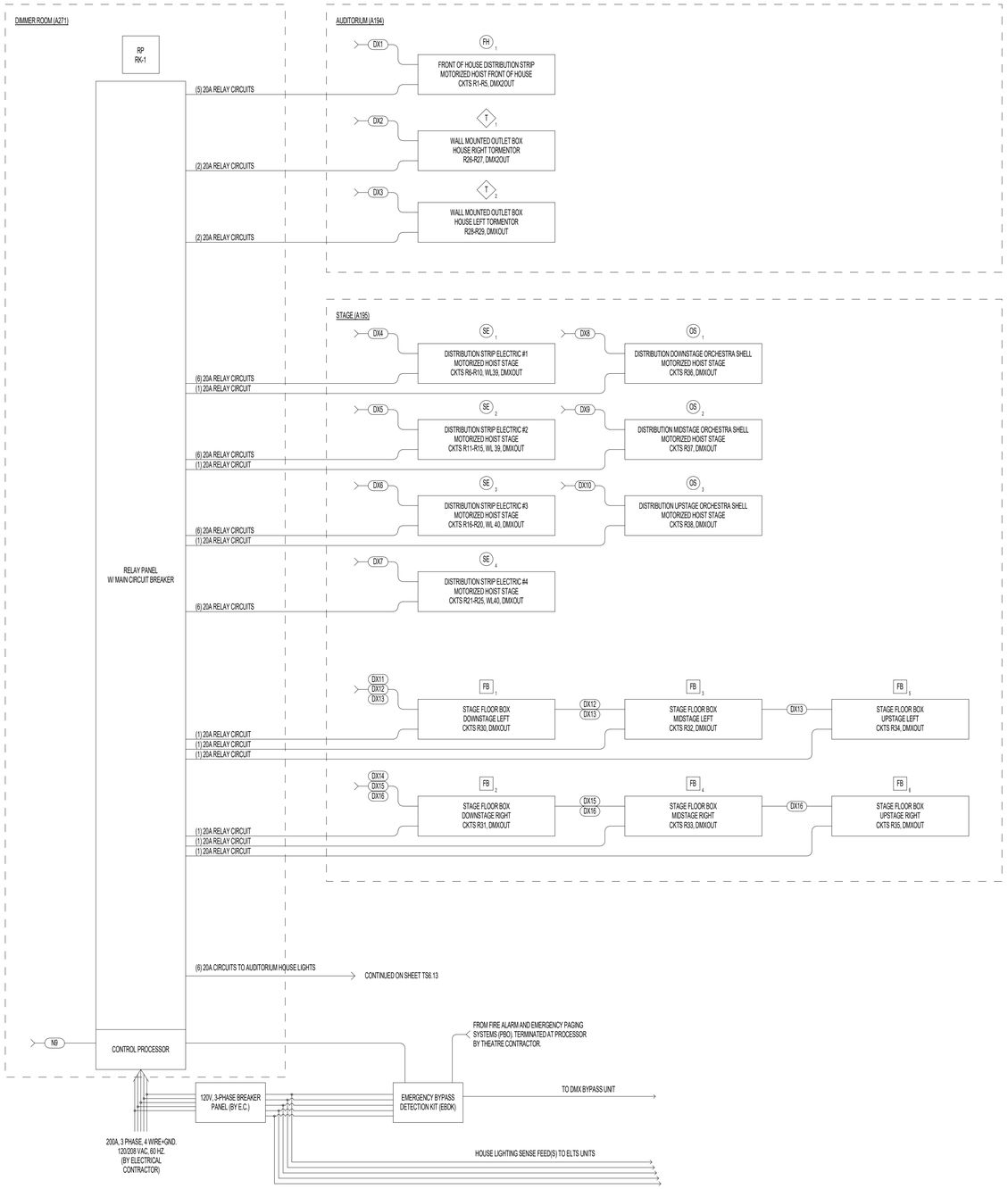
PLATE OR DEVICE TYPE LOCATION I/O ON PLATE OR DEVICE — WIRE TYPE

WIRE LEGEND

U*	-HOUSE LIGHT CONTROL	BELDEN #8471 + (1) #14AWG + (2) #16AWG
N*	-LIGHTING NETWORK	BELDEN #1583A
D*	-DMXIN	BELDEN #1583A
DX*	-DMXOUT	BELDEN #1583A

NOTES

1. ALL CONTROL WIRING AND RUNS SHALL BE SUPPLIED BY ELECTRICAL CONTRACTOR, AND TERMINATED BY THE THEATRE CONTRACTOR, UNLESS OTHERWISE NOTED.
2. TOTAL LENGTH OF HOUSE LIGHT CONTROL WIRING RUNS SHALL NOT EXCEED 1,640 FEET (500 METERS).
3. THEATRE CONTRACTOR TO VERIFY LOAD TYPE OF ALL HOUSE LIGHT LOADS PRIOR TO SYSTEM ENERGIZATION.
4. ELECTRICAL CONTRACTOR TO USE #10 AWG THHN WIRING FOR CONNECTION OF THEATRICAL LIGHTING LOADS.
5. CONNECT HOUSE LIGHTING TO PERFORMANCE LIGHTING SYSTEM EQUIPMENT AS SPECIFIED BY ELECTRICAL CONSULTANT.
6. A SEPARATE NEUTRAL IS REQUIRED FOR EACH CIRCUIT.



1 PERFORMANCE DISTRIBUTION

REVISION

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www.dlaa.com 808.254.3318

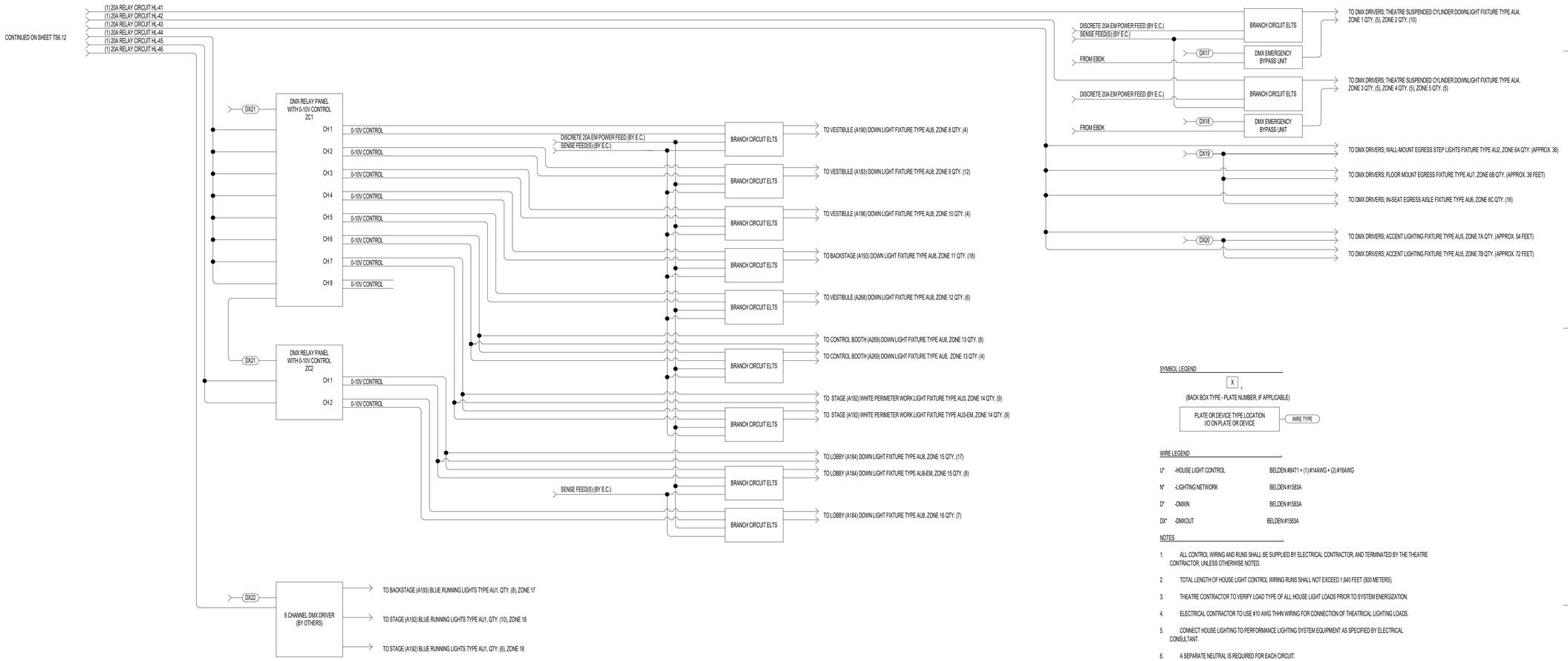
Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS PERFORMANCE LIGHTING ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

Designed:	Designer
Drawn:	RSP
Checked:	CB/ZW
Supv:	Approver
Scale:	
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS6.12
Sheet No. _____ of _____

NOT FOR CONSTRUCTION



1 HOUSE LIGHTING ONE-LINE

SYMBOL LEGEND

X
(BACK BOX TYPE - PLATE NUMBER, IF APPLICABLE)

PLATE OR DEVICE TYPE LOCATION
I/O ON PLATE OR DEVICE — WIRE TYPE

WIRE LEGEND

U*	-HOUSE LIGHT CONTROL	BELDEN #8471 + (1) #14AWG + (2) #16AWG
N*	-LIGHTING NETWORK	BELDEN #1583A
D*	-DMXIN	BELDEN #1583A
DX*	-DMXOUT	BELDEN #1583A

NOTES

1. ALL CONTROL WIRING AND RUNS SHALL BE SUPPLIED BY ELECTRICAL CONTRACTOR, AND TERMINATED BY THE THEATRE CONTRACTOR, UNLESS OTHERWISE NOTED.
2. TOTAL LENGTH OF HOUSE LIGHT CONTROL WIRING RUNS SHALL NOT EXCEED 1,640 FEET (500 METERS).
3. THEATRE CONTRACTOR TO VERIFY LOAD TYPE OF ALL HOUSE LIGHT LOADS PRIOR TO SYSTEM ENERGIZATION.
4. ELECTRICAL CONTRACTOR TO USE #10 AWG THHN WIRING FOR CONNECTION OF THEATRICAL LIGHTING LOADS.
5. CONNECT HOUSE LIGHTING TO PERFORMANCE LIGHTING SYSTEM EQUIPMENT AS SPECIFIED BY ELECTRICAL CONSULTANT.
6. A SEPARATE NEUTRAL IS REQUIRED FOR EACH CIRCUIT.

NOTE:
ALL HOUSE LIGHTING LOW-VOLTAGE DRIVERS PROVIDED BY OTHERS, WITH HOUSE LIGHTING FIXTURE PACKAGE

REVISION

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Title:
THEATRE SYSTEMS PERFORMANCE LIGHTING ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

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Drawn:	RSP
Checked:	
Supv:	
Scale:	
Date:	10/26/2022
Project No.	File
20-019	

Drawing No.
TS6.13
Sheet No. _____ of _____

NOT FOR CONSTRUCTION

SYMBOL LEGEND

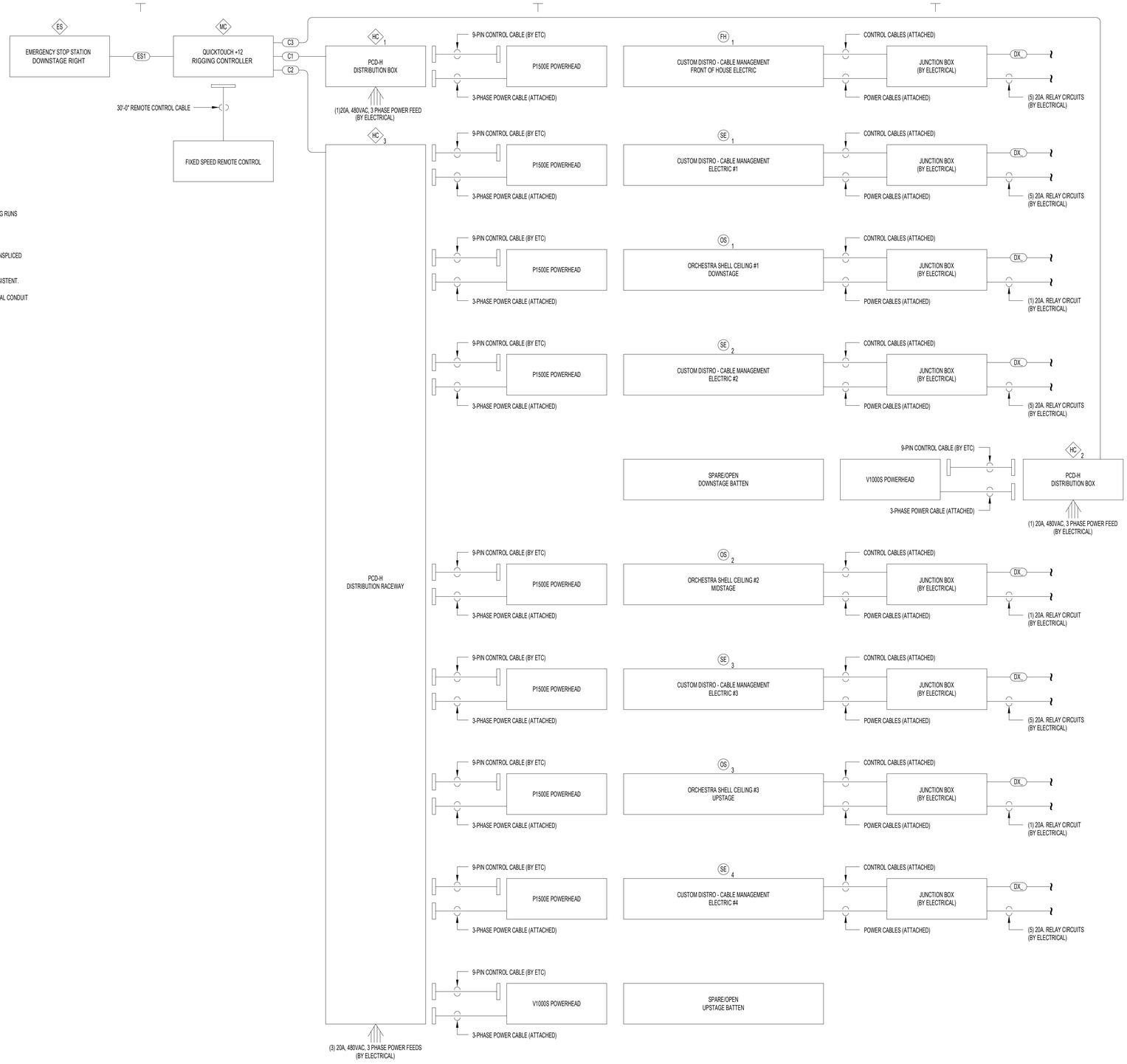
PLATE OR DEVICE TYPE
LOCATION
I/O ON PLATE OR DEVICE — WIRE TYPE

WIRE LEGEND

ES* - E-STOP	BELDEN #1583A
C* - HOIST CONTROL	BELDEN #1583A
DX* - DMXOUT	BELDEN #9729

NOTES

1. ALL CONTROL WIRING IS PROVIDED BY OTHERS UNLESS NOTED OTHERWISE.
2. TOTAL COMBINED LENGTH OF HOIST CONTROL AND EMERGENCY STOP WIRING RUNS CANNOT EXCEED 500 FEET (150 METERS)
3. A MAXIMUM OF 3 EMERGENCY STOP STATIONS PER SYSTEM..
4. ALL HOIST CONTROL AND EMERGENCY STOP RUNS SHALL BE CONTINUOUS UNSPLICED RUNS.
5. PHASE SEQUENCING FOR 3-PHASE POWER MUST BE OBSERVED AND BE CONSISTENT.
6. HOIST CONTROL AND EMERGENCY STOP WIRING MUST BE IN GROUNDED METAL CONDUIT UNLESS SHIELDED CABLE (CAT5E STP) IS USED.



1 RIGGING CONTROL

REVISION

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808.254.3318

Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS
MOTORIZED HOIST
ONE-LINE DIAGRAM
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	
Date:	10/26/2022
Project No.	File
20-019	

Drawing No.
TS6.20
Sheet No. _____ of _____

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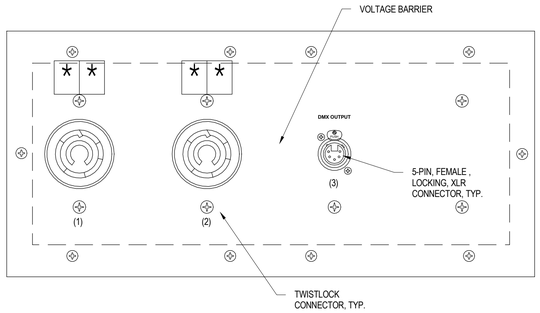
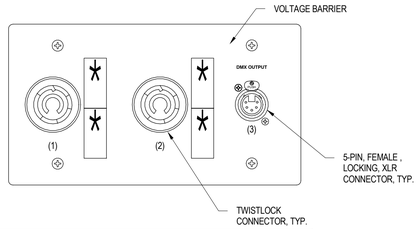
4 EQUIPMENT RACK LABEL
6" = 1'-0"



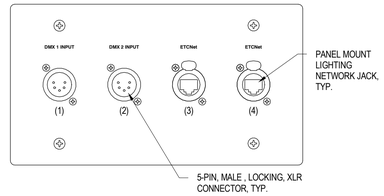
CIRCUIT DESIGNATION				
PLATE #	LOCATION	OUTLET #		
		(1)	(2)	(3)
FB 1	DOWNSTAGE LEFT	R30	R30	DMXOUT
FB 2	DOWNSTAGE RIGHT	R31	R31	DMXOUT
FB 3	MIDSTAGE LEFT	R32	R32	DMXOUT
FB 4	MIDSTAGE RIGHT	R33	R33	DMXOUT
FB 5	UPSTAGE LEFT	R34	R34	DMXOUT
FB 6	UPSTAGE RIGHT	R35	R35	DMXOUT

1 FLOORBOX FACEPLATE DETAIL
6" = 1'-0"



CIRCUIT DESIGNATION				
PLATE #	LOCATION	OUTLET #		
		(1)	(2)	(3)
T 1	HOUSE RIGHT TORM	R26	R27	DMXOUT
T 2	HOUSE LEFT TORM	R28	R29	DMXOUT

2 TORMENTOR FACEPLATE DETAIL
6" = 1'-0"



CIRCUIT DESIGNATION					
PLATE #	LOCATION	OUTLET #			
		(1)	(2)	(3)	(4)
C1	AUDITORIUM	DMX1IN	DMX2IN	NET	NET
C2 1	DOWNSTAGE LEFT	DMX1IN	DMX2IN	NET	NET
C2 2	CONTROL ROOM	DMX1IN	DMX2IN	NET	NET

3 CONTROL FACEPLATE DETAIL
6" = 1'-0"

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GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS DETAILS
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	6" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS6.31
Sheet No. _____ of _____

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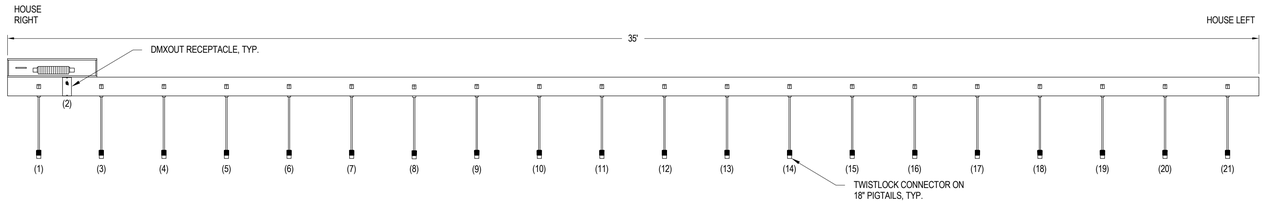
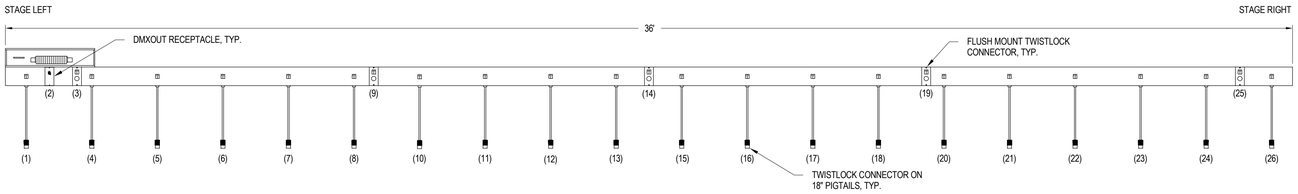


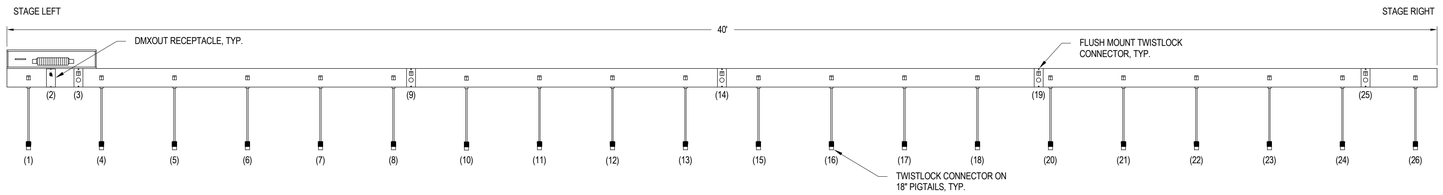
STRIP #	LOCATION	CIRCUIT DESIGNATION																				
		OUTLET #																				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
FH 1	FRONT OF HOUSE ELECTRIC	R1	DMXOUT	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5

3 FRONT OF HOUSE FACEPLATE DETAIL
1/2" = 1'-0"



STRIP #	LOCATION	CIRCUIT DESIGNATION																									
		OUTLET #																									
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
SE 4	STAGE ELECTRIC 4	R21	DMXOUT	WL 40	R22	R23	R24	R25	R21	WL 40	R22	R23	R24	R25	WL 40	R21	R22	R23	R24	WL 40	R25	R21	R22	R23	R24	WL 40	R25

2 STAGE ELECTRIC 4 FACEPLATE DETAIL
1/2" = 1'-0"



STRIP #	LOCATION	CIRCUIT DESIGNATION																									
		OUTLET #																									
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
SE 1	STAGE ELECTRIC 1	R6	DMXOUT	WL 37	R7	R8	R9	R10	R6	WL 37	R7	R8	R9	R10	WL 37	R6	R7	R8	R9	WL 37	R10	R6	R7	R8	R9	WL 37	R10
SE 2	STAGE ELECTRIC 2	R11	DMXOUT	WL 37	R12	R13	R14	R15	R11	WL 37	R12	R13	R14	R15	WL 37	R11	R12	R13	R14	WL 37	R15	R11	R12	R13	R14	WL 37	R15
SE 3	STAGE ELECTRIC 3	R16	DMXOUT	WL 40	R17	R18	R19	R20	R16	WL 40	R17	R18	R19	R20	WL 40	R16	R17	R18	R19	WL 40	R20	R16	R17	R18	R19	WL 40	R20

1 STAGE ELECTRIC 1-3 FACEPLATE DETAIL
1/2" = 1'-0"

REVISION

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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS DETAILS
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
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Scale:	1/2" = 1'-0"
Date:	10/26/2022
Project No.	20-019
File	

Drawing No.
TS6.32
Sheet No. _____ of _____

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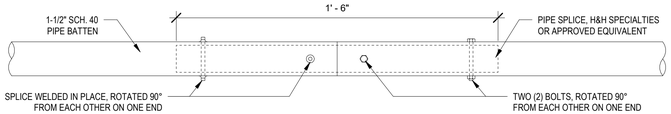
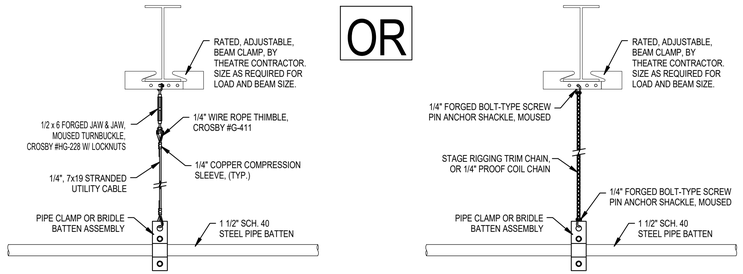
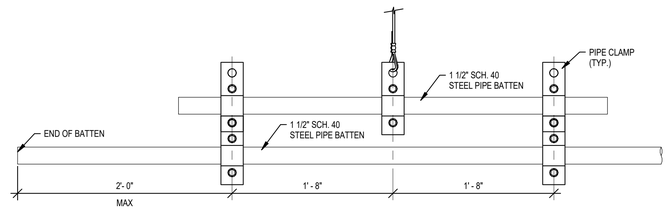


3 PIPE SPLICE
3" = 1'-0"



1 PIPE TRIM AND SUPPORT DETAILS
N.T.S.



2 BRIDLE BATTEN
1 1/2" = 1'-0"

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Project:
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THEATRE SYSTEMS DETAILS
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Designed:	SAA/JCC
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Checked:	JCC
Supv:	SAA
Scale:	As indicated
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS6.41
Sheet No. _____ of _____

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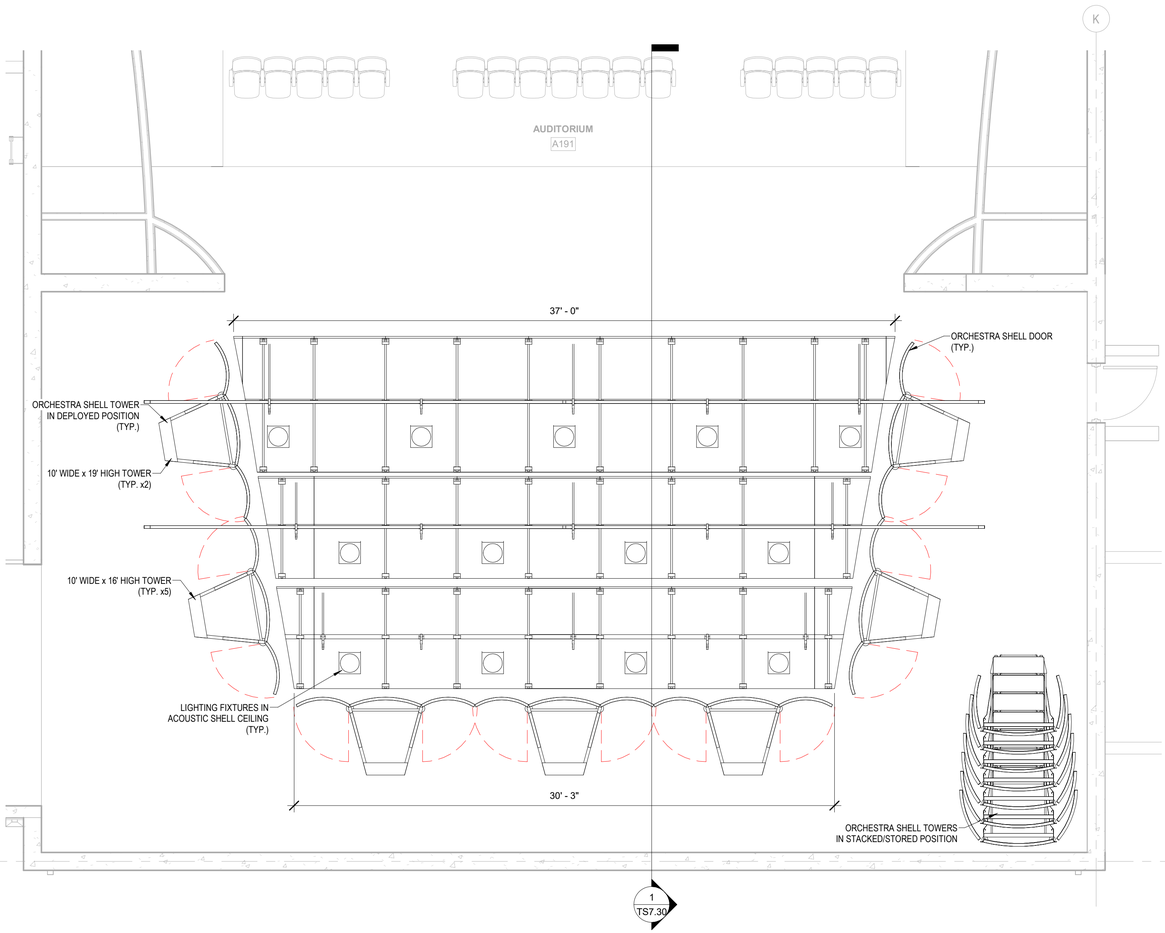

1 ORCHESTRTA SHELL FLOOR PLAN
1/4" = 1'-0"

REVISION		
No.	Description	Date

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Hawaii 96734
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

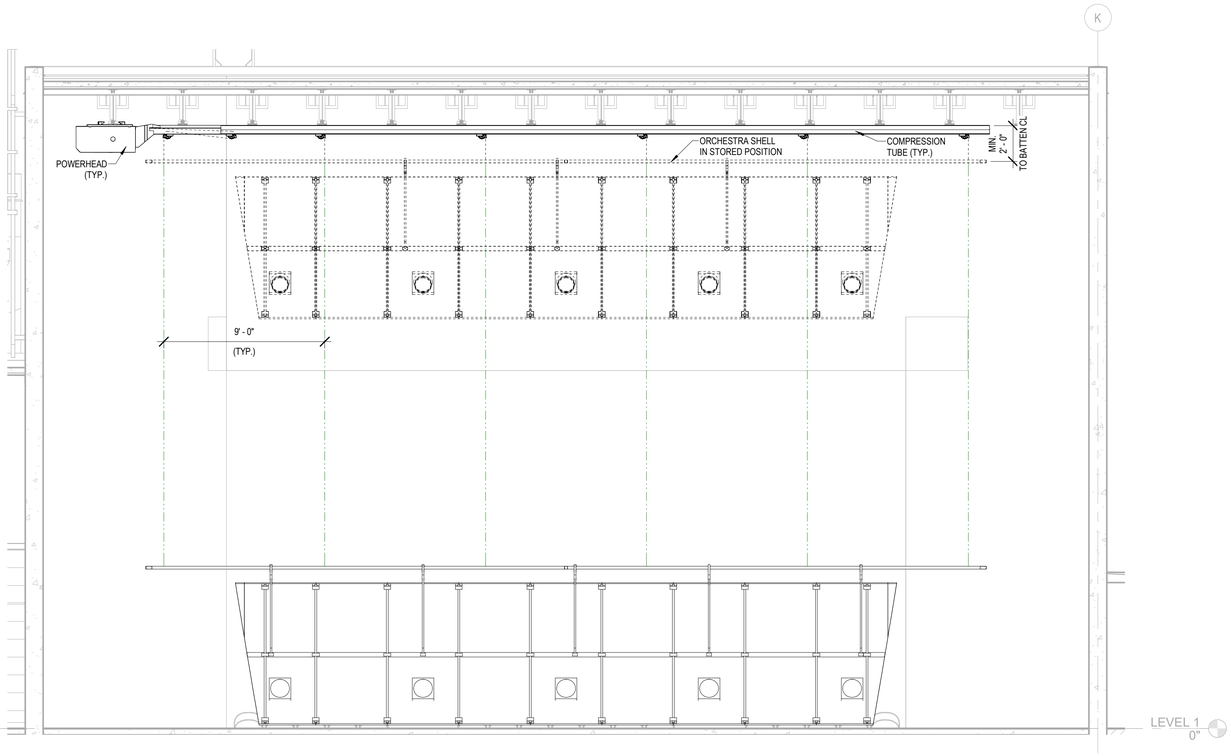
Title:
THEATRE SYSTEMS ORCHESTRA SHELL PLAN
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS7.10
Sheet No. _____ of _____

0' 5' 10'
NORTH
IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

NOT FOR CONSTRUCTION



1 TYPICAL ORCHESTRA SHELL ELEVATION
1/4" = 1'-0"

0' 5' 10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

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Hawaii 96734
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS
ORCHESTRA SHELL
ELEVATION
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS7.20
Sheet No. _____ of _____

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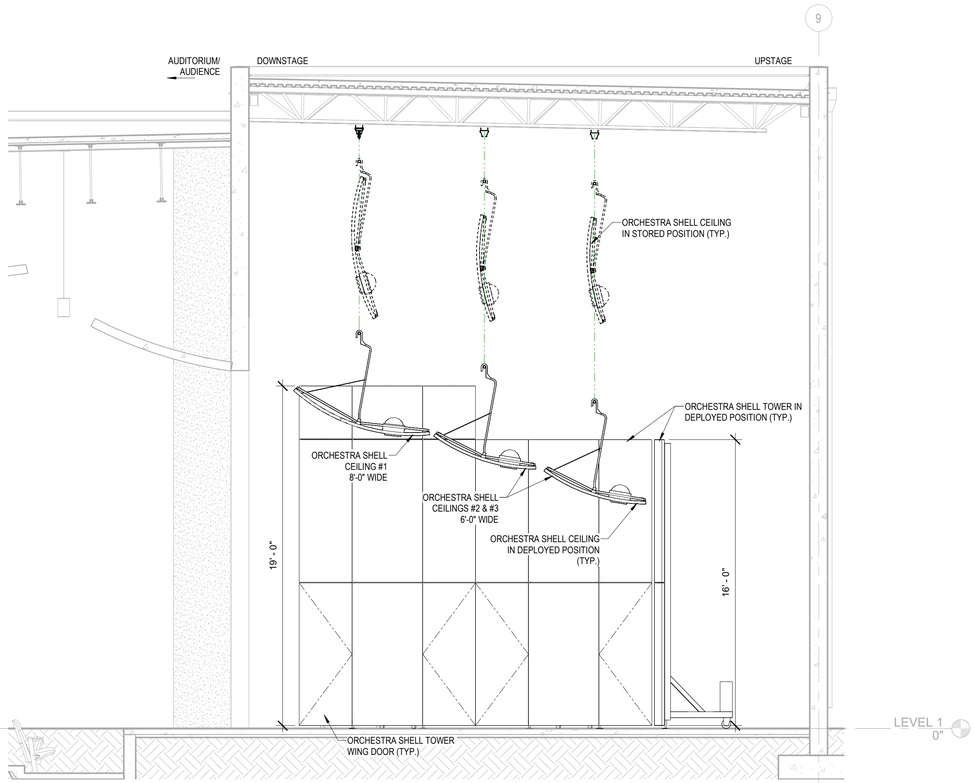

1 TYPICAL ORCHESTRA SHELL SECTION DETAIL
1/4" = 1'-0"

0' 5' 10'

IF SHEET IS LESS THAN 24" X 36"
REDUCED PRINT - USE GRAPHIC SCALES

REVISION		
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Project:
GDOE
SIMON SANCHEZ HIGH SCHOOL

Title:
THEATRE SYSTEMS
ORCHESTRA SHELL
SECTION DETAIL
100% CONSTRUCTION DOCUMENTS

Designed:	SAA/JCC
Drawn:	RSP
Checked:	JCC
Supv:	SAA
Scale:	1/4" = 1'-0"
Date:	10/26/2022
Project No. 20-019	File

Drawing No.
TS7.30
Sheet No. _____ of _____

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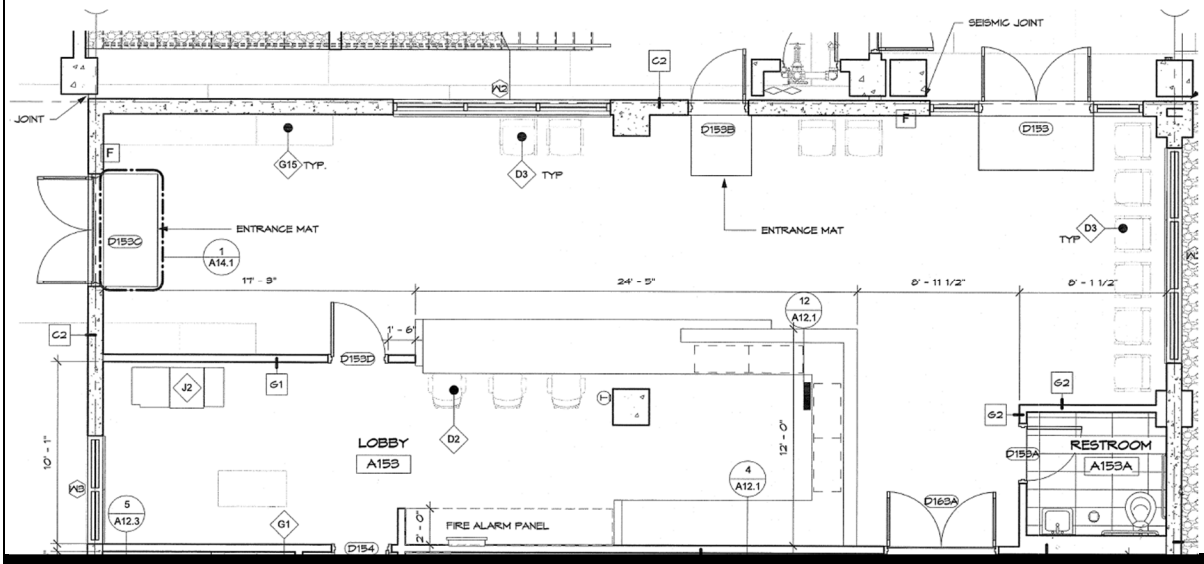
5.0 ROOM REQUIREMENTS

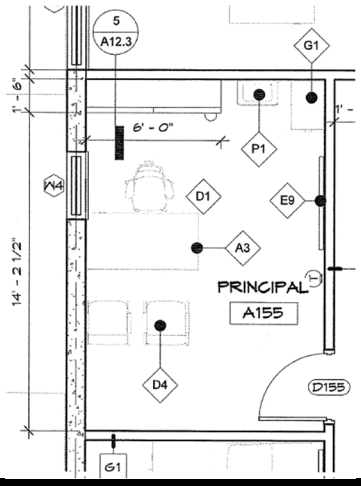
Lobby



Description	Requirements
Location	A-Wing, Administrative Building, Main Entrance
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide Greeter's Desk for 3 persons.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Locate Fire Alarm Center behind the front desk.
Other Requirements	Electronic access control at the public main entrance doors to the unsecured side of the main entrance. Provide public restroom with typical single occupant restroom requirements; add baby changing station.

5.0 ROOM REQUIREMENTS

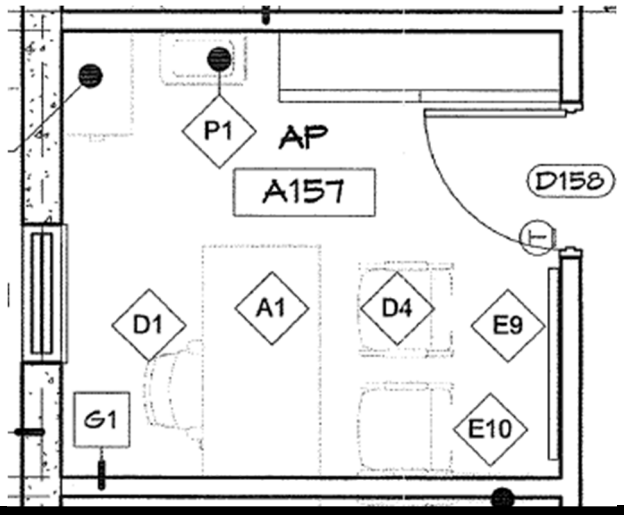
Principal's Office



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design.
Floor Finishes	Vinyl Composition Tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Provide room signage.
Fixed Furnishing	Provide base cabinets, countertop, and 3-tier shelving along back wall.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to courtyard space with window for direct view/supervision; adjacent to conference room and other assistant principal offices.

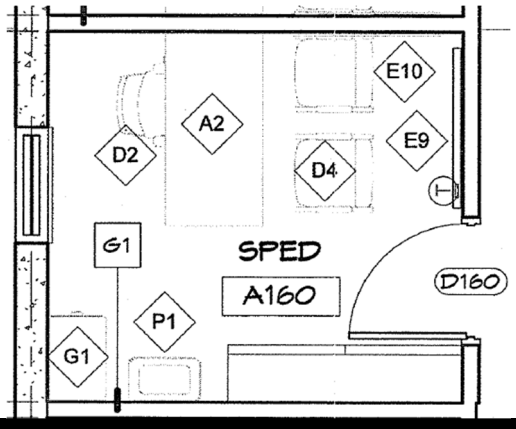
5.0 ROOM REQUIREMENTS

Assistant Principal's Office (A156, A157, A158, A159)



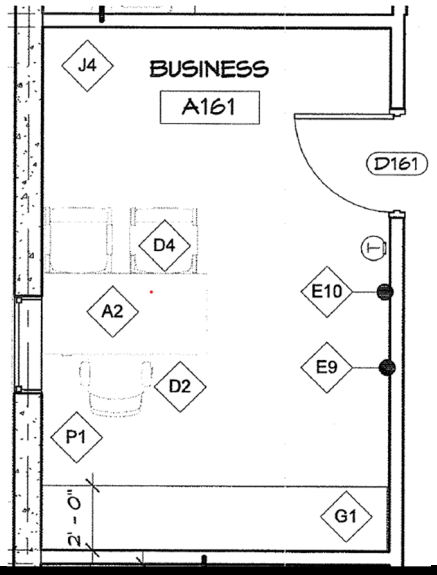
Description	Requirements
Location	A-Wing, Administrative Building.
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide base cabinets, countertop, and 3-tier shelving, min. length 6FT.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to courtyard space with window for direct view/supervision; adjacent to principal and assistant principal offices.

5.0 ROOM REQUIREMENTS

SPED Related Services Office	
	
Description	**Requirements**
Location	A-Wing, Administrative Building.
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage.
Fixed Furnishing	Provide base cabinets, countertop, and 3-tier shelving, min. length 6FT.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to courtyard space with window for direct view/supervision; adjacent to principal and assistant principal offices.

5.0 ROOM REQUIREMENTS

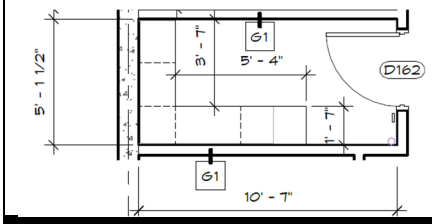
Business Office



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage; exterior signage for transaction window.
Fixed Furnishing	Provide base cabinets, countertop, and 3-tier shelving along full length of back wall, accommodate office safe.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to courtyard space with transaction window .

5.0 ROOM REQUIREMENTS

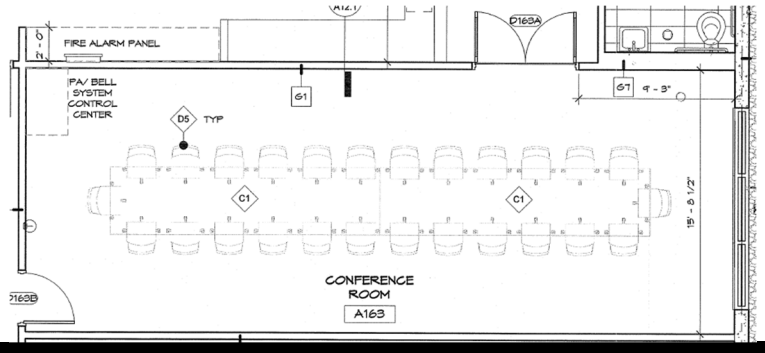
Business Office Storage



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	???????
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to business office.

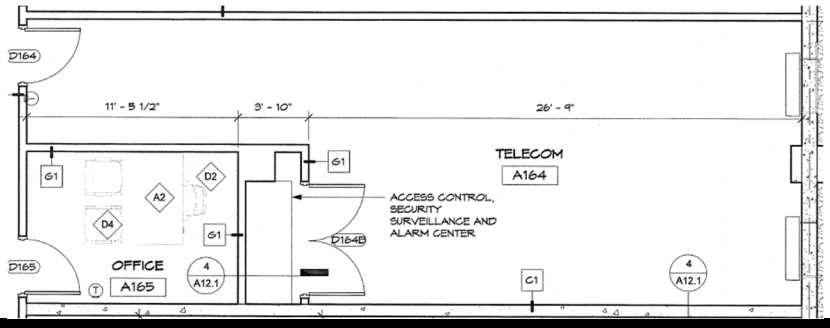
5.0 ROOM REQUIREMENTS

Conference Room

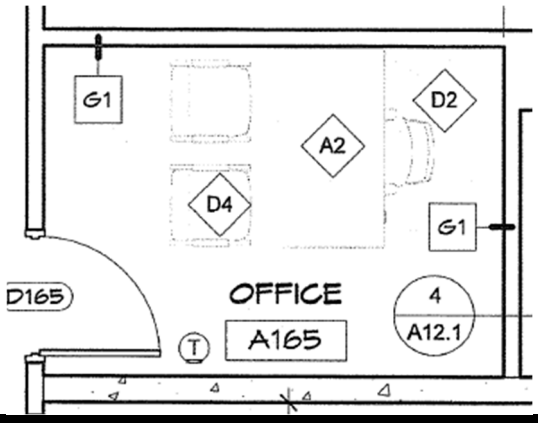


Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide base cabinets, countertop
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Locate Fire Alarm Center behind the front desk.
Other Requirements	Locate adjacent to lobby, principal, and assistant principal offices. Provide double-door access from lobby space, single door access from principal's office corridor.

5.0 ROOM REQUIREMENTS

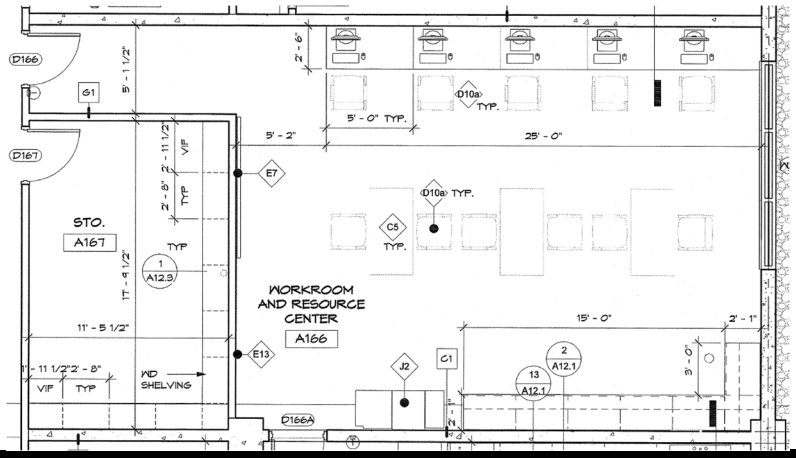
Telecommunication (Telecom) Room	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide 3FT x 8FT 3” clear closet with countertop at full length of closet for location of building system admin consoles.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Non-water fire suppression.
Other Requirements	Locate access control, security, surveillance and alarm, PA System Admin Console in closet. Locate adjacent to Office A165, principal, and assistant principal offices. Entrance point for campus telecom service.

5.0 ROOM REQUIREMENTS

Computer Operator Office	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide 5-tier, 1FT depth bookshelf at full length of rear wall.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to telecom room, principal and assistant principal offices.

5.0 ROOM REQUIREMENTS

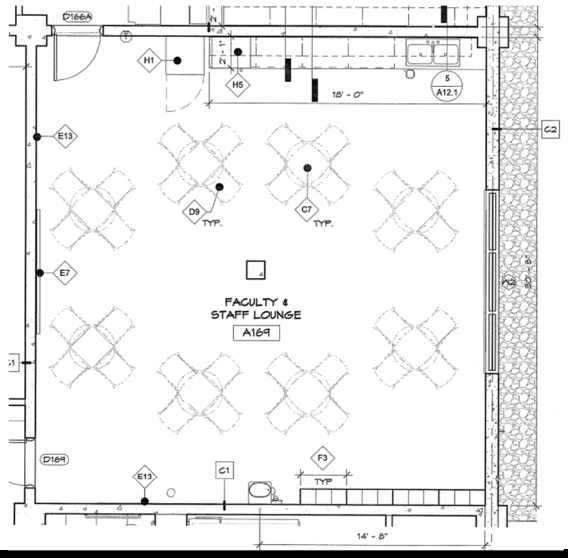
Workroom and Resource Center



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide min. 25FT counter space for 5 computer workstations. Provide base cabinets and countertop for open workspace, minimum 18FT.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide direct access to faculty and staff lounge; Locate adjacent to principal and assistant principal offices with hallway access to the front desk and a secondary exit to the courtyard covered walkway.

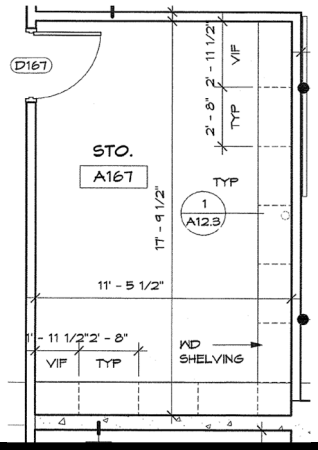
5.0 ROOM REQUIREMENTS

Faculty & Staff Lounge



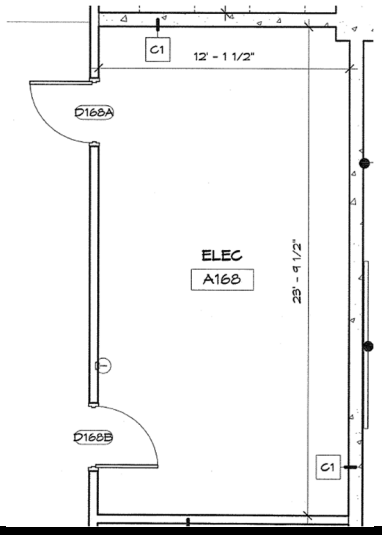
Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide base cabinets with countertop and wall mounted cabinet, minimum 18FT.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide 2-compartment sink, floor drain, tankless electric water heater, drinking fountain/ bottle filling station.
Other Requirements	Provide direct access Workroom and Resource Center. Locate adjacent to principal and assistant principal offices with hallway access to the front desk and a secondary exit to the courtyard covered walkway.

5.0 ROOM REQUIREMENTS

Storage	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide 6-teir shelving along half of perimeter walls.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to principal and assistant principal offices with hallway access to the front desk and a secondary exit to the courtyard covered walkway.

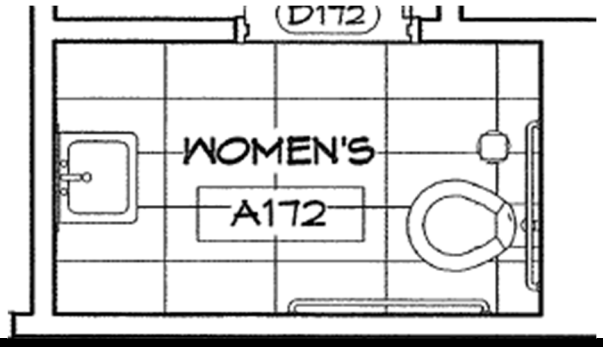
5.0 ROOM REQUIREMENTS

Electrical (Elec) Room

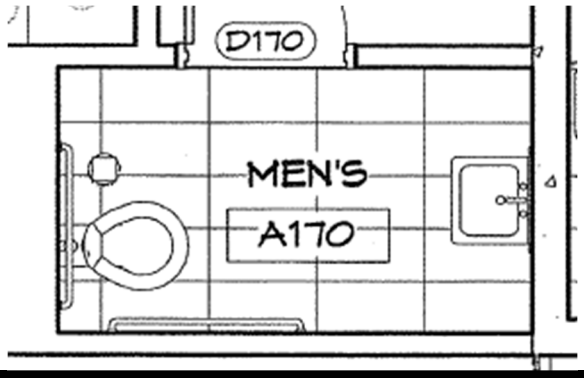


Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide two means of egress. Locate adjacent to principal and assistant principal offices with hallway access to the front desk and a secondary exit to the courtyard covered walkway.

5.0 ROOM REQUIREMENTS

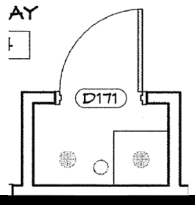
Women's Restroom	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closet, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle.

5.0 ROOM REQUIREMENTS

Men's Restroom	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closet, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle.

5.0 ROOM REQUIREMENTS

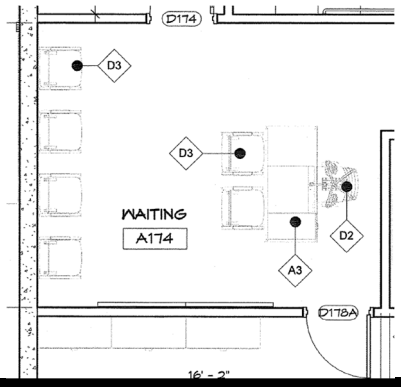
Janitorial (Jan) Closet



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide mop sink, floor drain.
Other Requirements	Provide adjustable storage wall mount organizer with 3 grip hooks; 2-tier, built-in shelves with paint finish.

5.0 ROOM REQUIREMENTS

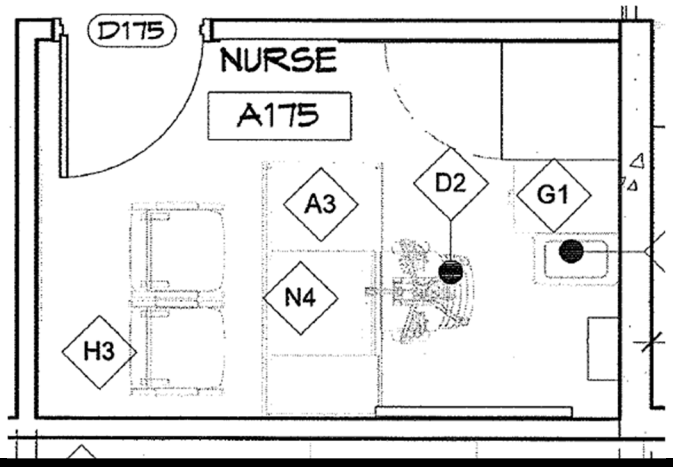
Nurse Office Lobby



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide direct access to Cumulative Folder Storage. Locate adjacent to principal and assistant principal offices with hallway access to the front desk and a secondary exit to the courtyard covered walkway.

5.0 ROOM REQUIREMENTS

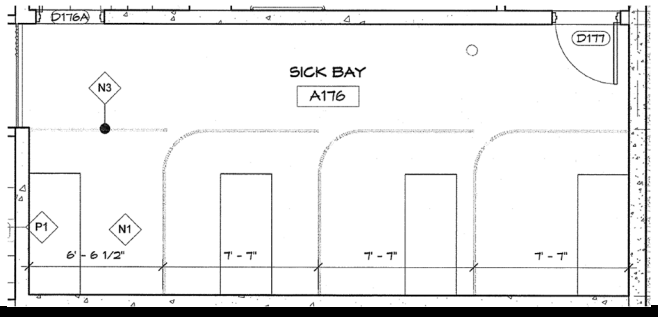
Nurse Office



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide 24” base cabinets with countertop/one compartment sink, and wall mounted cabinet.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide window for direct view/supervision into Nurse’s Lobby/Waiting Area. Locate adjacent to sick bay.

5.0 ROOM REQUIREMENTS

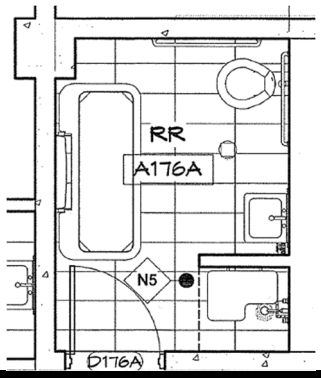
Nurse Office-Sick Bay



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to Nurse's office, Ante and Isolation rooms; provide curtain privacy screen to obstruct view from waiting area; provide direct access to restroom space; provide direct access to the Ante room.

5.0 ROOM REQUIREMENTS

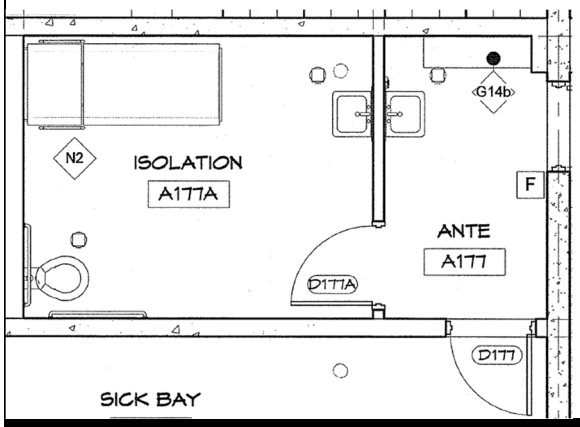
Nurse's Office Restroom



Description	Requirements
Location	A-Wing, Administrative Building, Nurse's Office
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closet, floor drain, shower column, shower drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle.

5.0 ROOM REQUIREMENTS

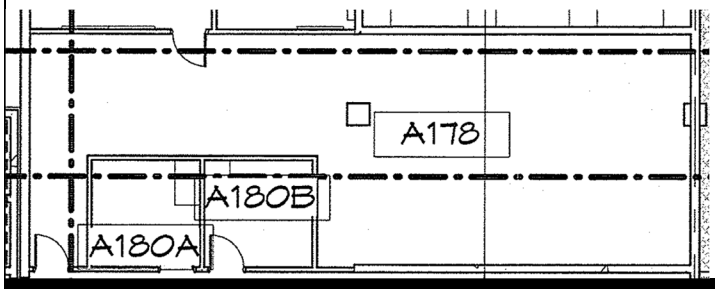
Isolation Room



Description	Requirements
Location	A-Wing, Administrative Building, Nurse's Office.
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closet, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle.

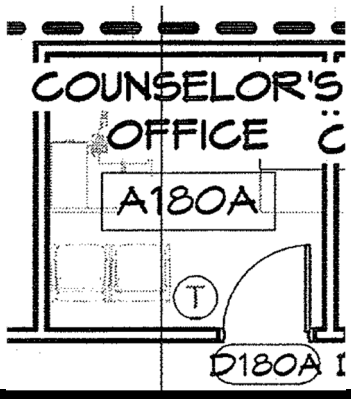
5.0 ROOM REQUIREMENTS

Cumulative Storage



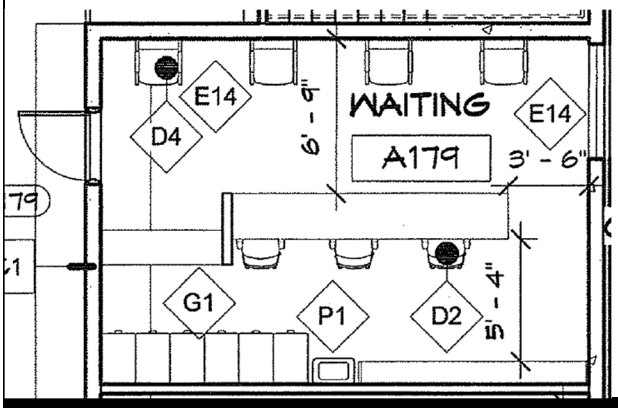
Description	Requirements
Location	A-Wing, Administrative Building.
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Per Programming Document design
Fixed Furnishing	None.
Furnishing	Per FF&E Document. File System?????
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide direct access to Counseling office and Nurse’s Office.

5.0 ROOM REQUIREMENTS

Counselor's Office (A180A,A180B, A180C,A180D, A180E, A180F, A180G, A180H)	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide base cabinets, countertop, and 3-tier shelving, min. length 4FT.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Cluster counselor offices together and locate them adjacent to the counselor's lobby and cumulative storage.

5.0 ROOM REQUIREMENTS

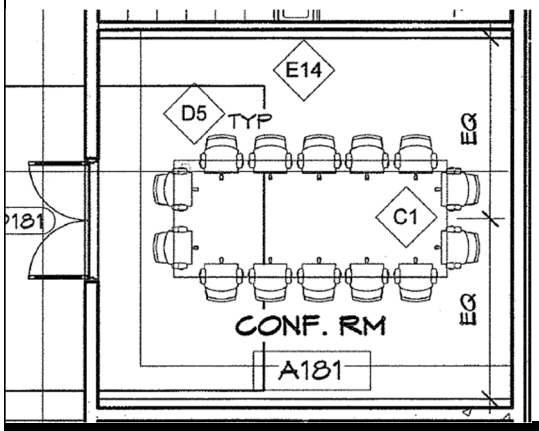
Counseling Department Lobby/Waiting Area



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage; Directional signage at courtyard and A-wing corridor.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide direct access to Cumulative Folder Storage; Locate adjacent to counselor offices; primary entrance access may be through a classroom building corridor or directly from a courtyard covered walkway.

5.0 ROOM REQUIREMENTS

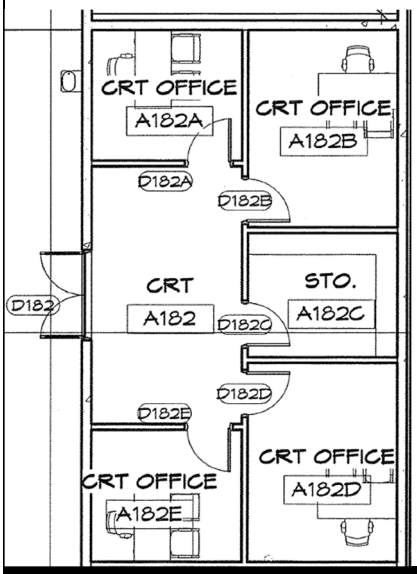
Conference Room



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Per FF&E Document.
Furnishing	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
System Requirements	Locate PA/Bell System Control Center within this space.
Other Requirements	Provide access from interior hallway and lobby; Locate adjacent to principal offices.

5.0 ROOM REQUIREMENTS

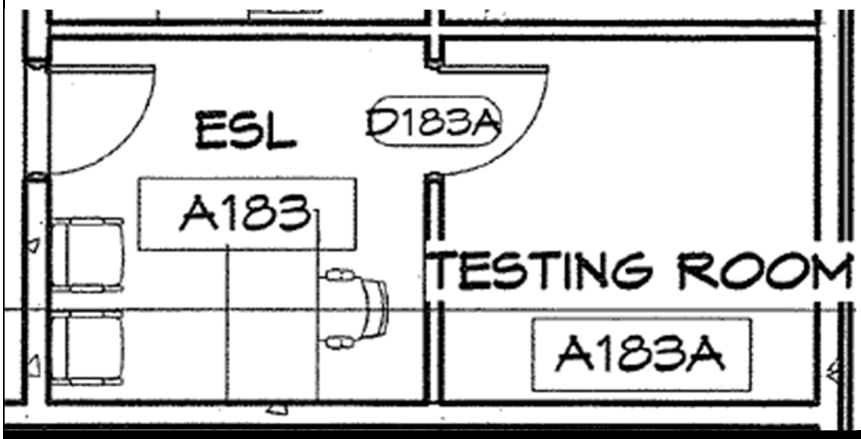
Consulting Research Teacher (CRT) Office



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage.
Fixed Furnishing	Provide 6 tier shelving at storage rooms,
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to ESL office, testing room, and conference room; Access may be through a classroom building or office corridor or directly from a courtyard covered walkway.

5.0 ROOM REQUIREMENTS

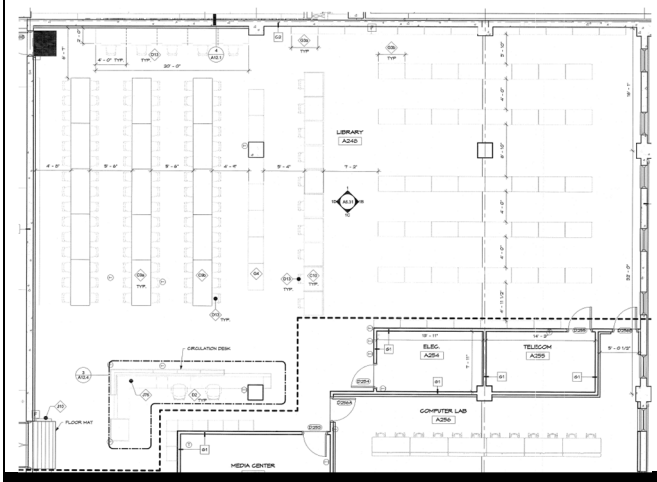
English as a Second Language (ESL) Coordinator Office



Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Overall Ideal Plan Dimensions: 10FT 1.5IN x 21FT 2.5IN clear ESL Office: 10FT 5 IN x 10FT 1.5IN Testing Room: 10FT 4.5IN x 10FT 1.5IN Minimum Ceiling Height: 10 FT
Floor Finishes	Provide vinyl composition tile with 4” rubber cove base
Wall Finishes	Provide painted paperless gypsum wallboard or concrete.
Ceiling Finishes	Provide acoustic ceiling tile on aluminum grid system and/or painted gypsum board.
Signage	Provide interior signage with room number and changeable name insert at entrance to each office; interior signage with room number and name at entrance to Testing Room.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to CRT office; primary entrance access may be through a classroom building or office corridor or directly from a courtyard covered walkway.

5.0 ROOM REQUIREMENTS

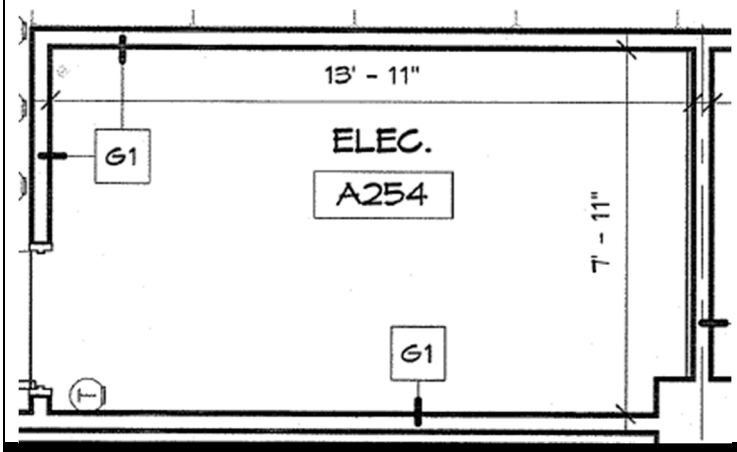
Library- Reading and Stack Area



Description	Requirements
Location	A-Wing, Administrative Building, 2nd floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; acoustical wall panels at reading area.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage; Directional signage at courtyard.
Fixed Furnishing	20FT wall mounted counters at reading area for open computer workstations; min. 24FT 6IN circulation desk with min. 3FT wide book return bin with mobile cart; 5 tier, 40-cube, cubby shelving behind circulation desk.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide clearstory window natural lighting for the reading area.
Other Requirements	Provide direct access from the courtyard covered balcony.

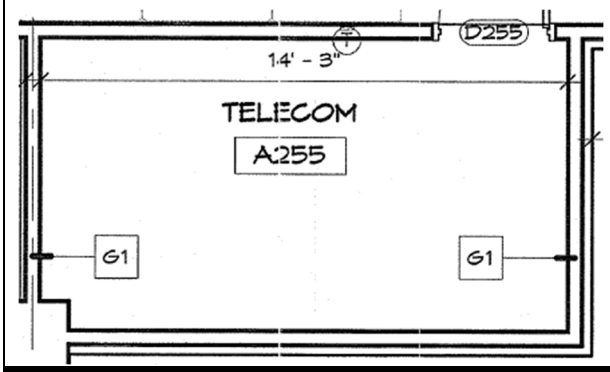
5.0 ROOM REQUIREMENTS

Electrical (Elec) Room



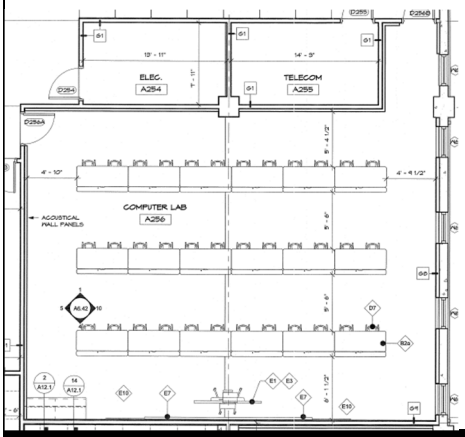
Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	

5.0 ROOM REQUIREMENTS

Telecommunication (Telecom) Room	
	
Description	**Requirements**
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	

5.0 ROOM REQUIREMENTS

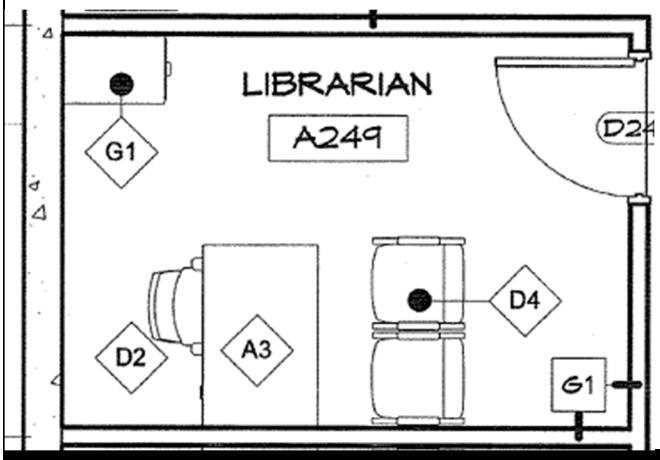
Computer Lab



Description	Requirements
Location	A-Wing, Administrative Building, Library
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; acoustical wall panels.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage.
Fixed Furnishing	Provide min.6FT base cabinet with counter and overhead cabinets.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to Library Reading area. Comply with Acoustical Design Criteria.

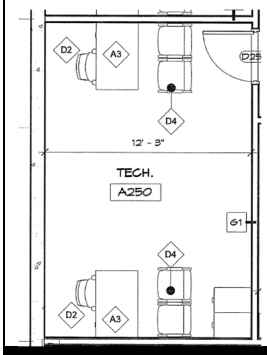
5.0 ROOM REQUIREMENTS

Librarian's Office



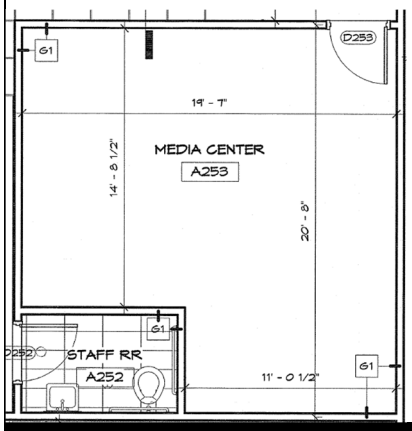
Description	Requirements
Location	A-Wing, Administrative Building, Library
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to Technician and Book rooms and staff restroom, accessed from a staff hallway.

5.0 ROOM REQUIREMENTS

Librarian's Office	
	
Description	**Requirements**
Location	A-Wing, Administrative Building, Library
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to Librarian office, staff restroom, and book room; accessed from a staff hallway.

5.0 ROOM REQUIREMENTS

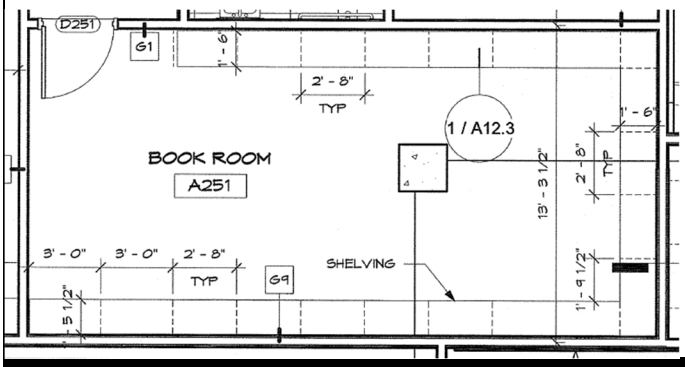
Media Center



Description	Requirements
Location	A-Wing, Administrative Building, Library
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide min.6FT base cabinet with counter and overhead cabinets.
Furnishing	Per FF&E Document. Provide min. 5 person half round/elliptical conference table with wall mounted screen.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	None.

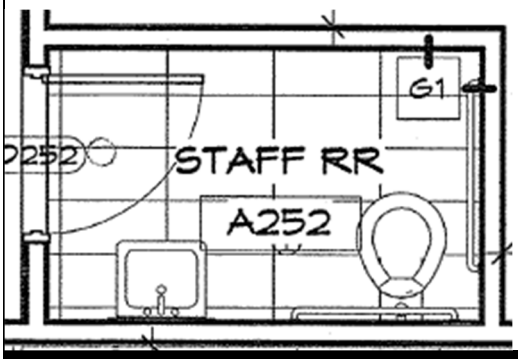
5.0 ROOM REQUIREMENTS

Storage



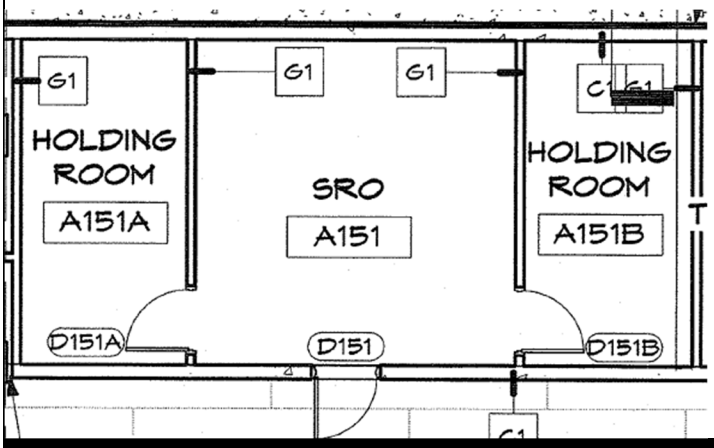
Description	Requirements
Location	A-Wing, Administrative Building, Library
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide min. 56FT 6-tier book shelving along perimeter walls.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	

5.0 ROOM REQUIREMENTS

Library Staff's Restroom	
	
Description	**Requirements**
Location	A-Wing, Administrative Building, Library
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain ceramic tile
Wall Finishes	Porcelain ceramic tile
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closet, floor drain.
Other Requirements	Locate adjacent to librarian office and technician and book rooms; accessed by staff hallway. Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle.

5.0 ROOM REQUIREMENTS

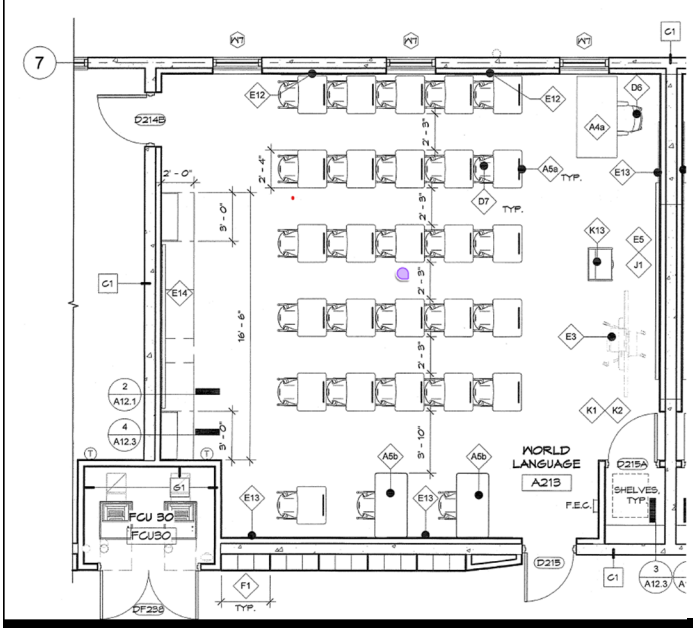
School Resource Officer (SRO) Office



Description	Requirements
Location	Gymnasium, Main Entrance
Area/Dimensions	Overall Ideal Plan Dimensions: 15FT 4 IN x 15FT 8.5IN clear Holding Room: 7FT 4IN x 15FT 8.5IN clear Minimum Ceiling Height: 10 FT
Floor Finishes	Provide vinyl composition tile with 4” rubber cove base
Wall Finishes	Provide painted paperless gypsum wallboard or concrete.
Ceiling Finishes	Provide acoustic ceiling tile on aluminum grid system and/or painted gypsum board.
Signage	Provide interior signage with room number and changeable name insert at entrance to office from hallway; interior signage with room number and name at entrance to each Holding Room.
Fixed Furnishing	None.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide keyed locksets from both sides function and vision panels for holding room doors. Locate at the secure side of the Main Entrance to the courtyard space.

5.0 ROOM REQUIREMENTS

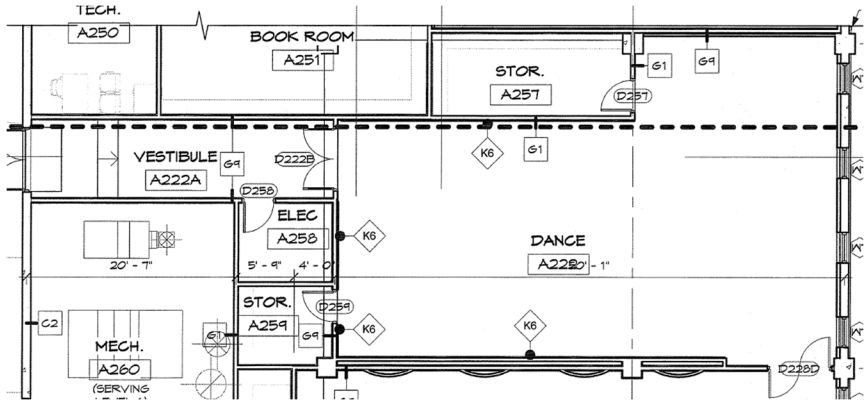
General Education Classrooms (Math, English, Social Studies, Business, Chamoru, World Language, ESL, SPED)



Description	Requirements
Location	A-Wing, B-Wing, and C-Wing Classroom Buildings, Credit Recovery Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Provide min. 16FT base cabinets with countertop; two min. 3FT wide 3 tier open book shelving along the back wall of the classroom. Provide 2-tier shelving along the back of the class storage room.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System.
Other Requirements	Provide two means of egress

5.0 ROOM REQUIREMENTS

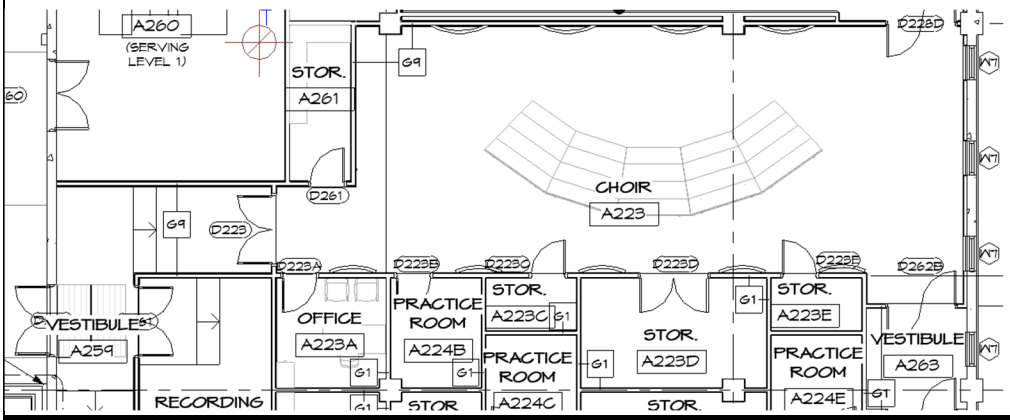
Dance Classroom



Description	Requirements
Location	A-Wing, 2nd floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile & sprung floor system.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide 6-teir shelving along half of each storage room perimeter walls.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide A/V system.
Other Requirements	Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

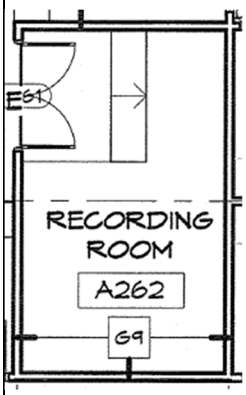
Choir Classroom



Description	Requirements
Location	A-Wing, 2nd floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; sprung floor system.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; acoustical diffusers.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits. Minimum Ceiling Height: 14 FT, 9FT in office, storage, and practice rooms; acoustical diffusers.
Signage	Room signage.
Fixed Furnishing	Provide min. 12FT 6IN 6-teir shelving along storage room (A261).
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide AV system.
Other Requirements	Provide two means of egress; vestibule shared with Band Classroom; Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

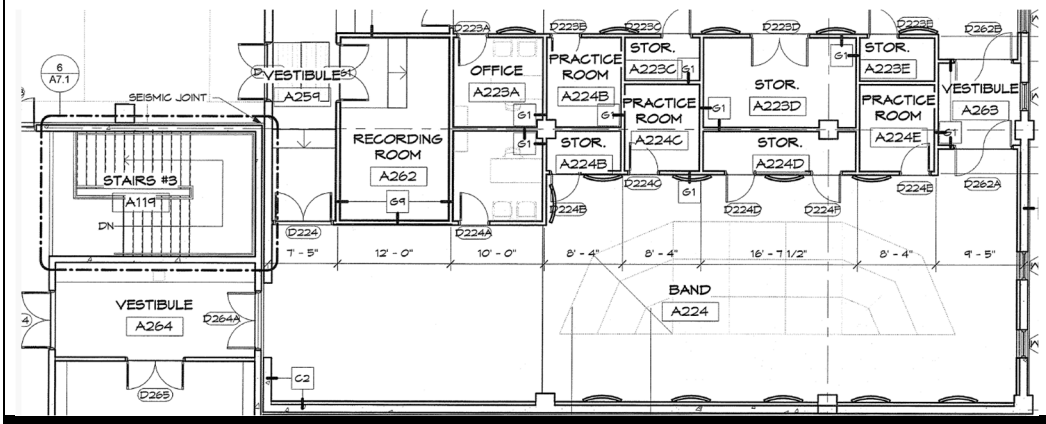
Recording Room



Description	Requirements
Location	A-Wing, 2nd floor Choir and Band Vestibule
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; sprung floor system.
Wall Finishes	Paint gyp. bd. walls; rubber wall base; acoustical wall panels.
Ceiling Finishes	Acoustical ceiling tile. Minimum Ceiling Height: 9FT
Signage	Room signage.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide A/V system.
Other Requirements	Locate adjacent to the Band and Choir rooms; Comply with Acoustical Design Criteria;

5.0 ROOM REQUIREMENTS

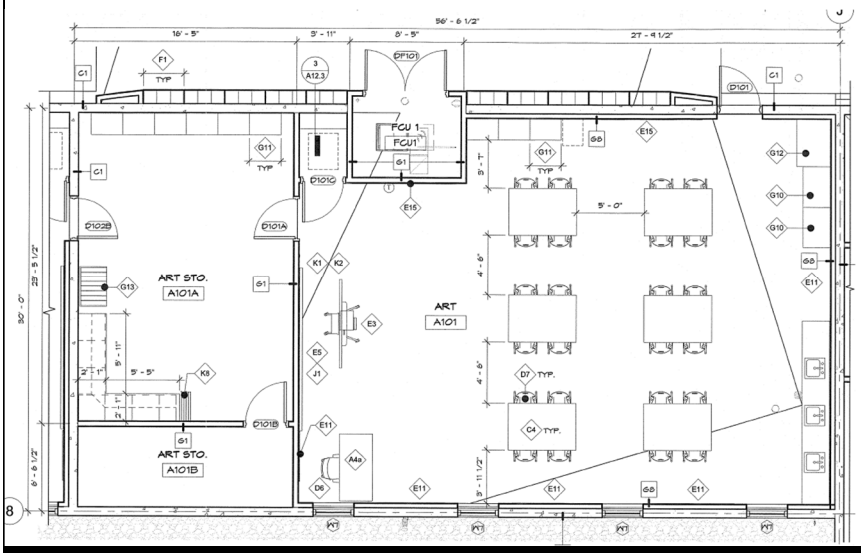
Band Classroom



Description	Requirements
Location	A-Wing, Administration Building 2nd floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; sprung floor system.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; acoustical diffusers.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits and acoustical diffusers. Minimum Ceiling Height: 14 FT over classroom practice area, 9FT ACT in office, storage, and practice rooms
Signage	Room signage.
Fixed Furnishing	Provide 30-cube bag cubby shelving; adjustable shelving throughout perimeter walls of band storage room; 21FT 2.5 counter along vestibule with 1 compartment sink at vestibule.
Furnishing	Per FF&E Document. Provide (G15) trophy case.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide AV system.
Other Requirements	Provide two means of egress; vestibule shared with Choir Classroom; Comply with Acoustical Design Criteria. Provide access to the Band Storage room and classroom corridor.

5.0 ROOM REQUIREMENTS

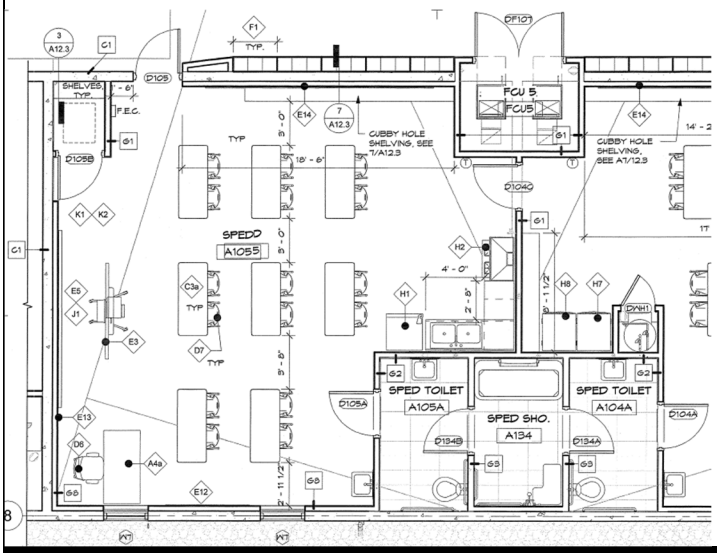
Fine Arts (Art) Classroom



Description	Requirements
Location	A-Wing, Classroom Building 1st floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Provide base cabinets with countertop and overhead cabinets in storage room, min. 11FT 4IN.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide one piece stainless steel three-station hand wash trough; floor drain.
Other Requirements	Provide two means of egress.

5.0 ROOM REQUIREMENTS

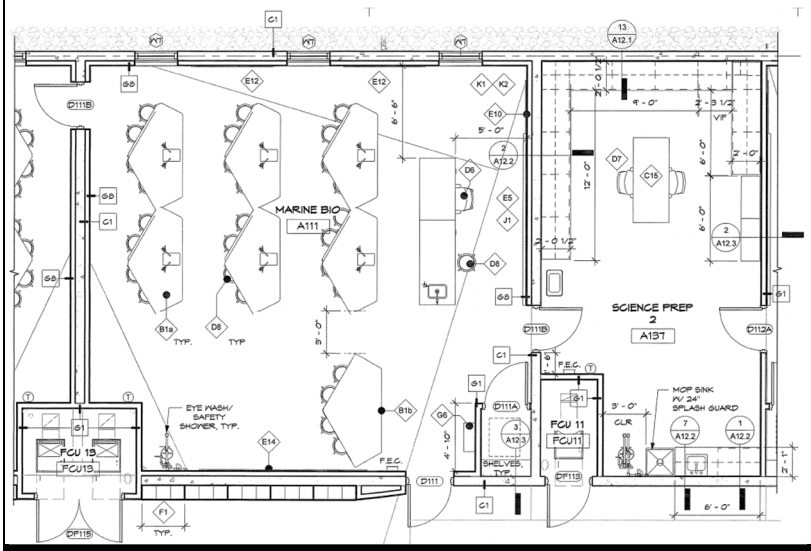
SPED BLS Classroom



Description	Requirements
Location	A-Wing, Classroom Building 1st floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	(A105) Provide base cabinets with countertop/2 compartment sink and overhead cabinets, min. 8FT 9. (A104) Provide 14IN deep wall mounted counter, min. length 8FT.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System. Provide 2 lavatories, one water closet, 1 shower column (at shared shower room), floor/shower drains
Other Requirements	Provide two means of egress. Locate with non-SPED classrooms.

5.0 ROOM REQUIREMENTS

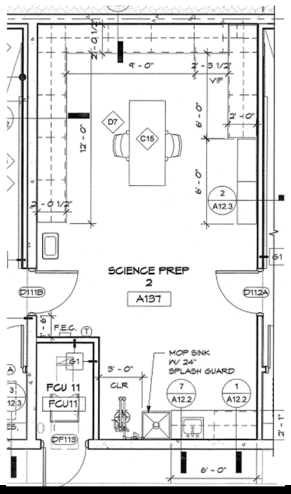
Science Classrooms (Laboratory)



Description	Requirements
Location	A-Wing, Classroom Building 1st floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Provide combination min. 6FT x 2FT 6IN 4 drawer single pedestal demonstration table with 1 compartment sink, gas fixtures, GFCI receptacle, and chemical resistant countertop, and 3 drawer single pedestal instructor desk, min. 4FT 6IN x 2FT 6IN.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System. Provide 2 Fume Hoods in Chemistry Classroom (A107). Provide water, power, and gas provisions for student lab tables as required.
Other Requirements	Provide direct access to Science Prep Room shared by 2 science classroom laboratories.

5.0 ROOM REQUIREMENTS

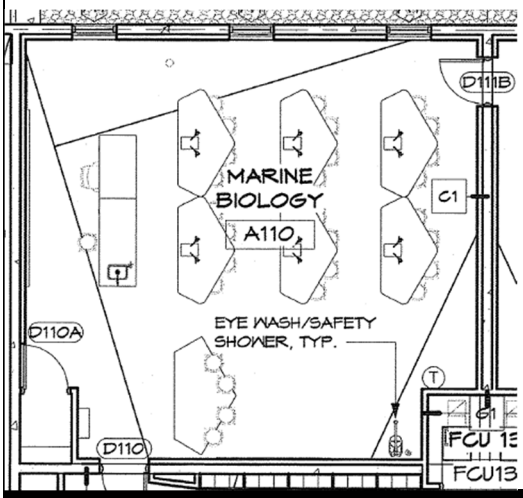
Science Classrooms (Laboratory)- A137, A138, A135



Description	Requirements
Location	A-Wing, Classroom Building 1st floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Provide min. 6FT base cabinet with countertop and 1 compartment sink, and overhead cabinets in all science prep rooms. (A138) Provide min. 6FT base cabinet with epoxy resin countertop and backsplash and overhead cabinet; min. 6FT W x 1FT 4IN D x 6FT H open storage cabinets; wall mounted cabinets and with epoxy resin countertop with back splash over mounted storage cabinets for corrosives/acids and flammables. (A137) Provide min. 31FT 6FT base cabinet with countertop with backsplash and overhead cabinet; min. 6FT W x 1FT 4IN D x 6FT H open storage cabinets. (A135)) Provide min. 17FT base cabinet with epoxy resin countertop and backsplash and overhead cabinet; min. 9FT W x 1FT 4IN D x 6FT H open storage cabinets
Furnishing	Refer to FF&E Document. Provide blocking for wall mounted FF&E. Coordinate with Electrical/Telecom to provide infrastructure.
System Requirements	Provide one mop sink w/ splash guard.
Other Requirements	Provide direct access from 2 adjacent science laboratory classrooms.

5.0 ROOM REQUIREMENTS

Science Classrooms (Lecture)



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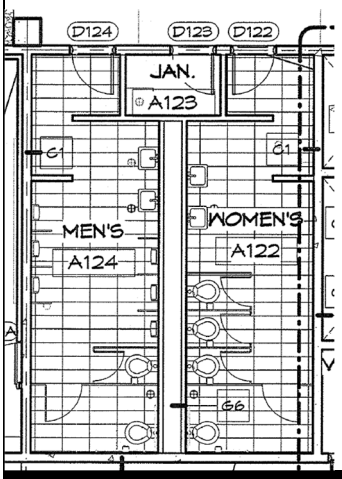
Description	Requirements
Location	A-Wing, Classroom Building 1st floor
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System.
Other Requirements	Provide two means of egress.

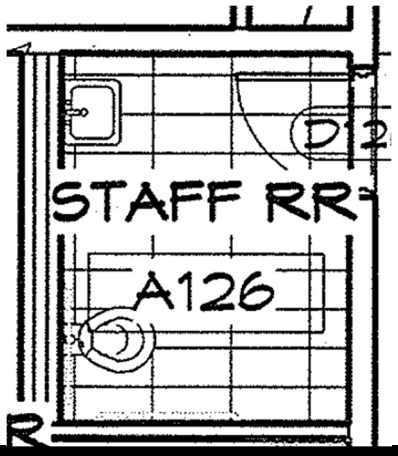
5.0 ROOM REQUIREMENTS

Shared Restrooms



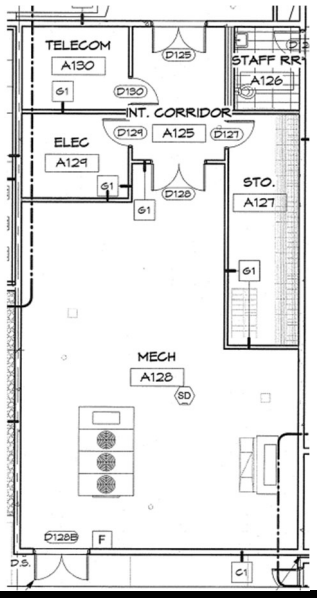
Description	Requirements
Location	A-Wing, B-wing, C-wing
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gypsum board.
Signage	Room signage; Directional signage at classroom corridor and courtyard covered walkway.
Furnishing	Phenolic Toilet partitions for water closets and urinal dividers.
System Requirements	Provide lavatory, water closet, urinals, floor drain as required.
Other Requirements	Provide screen walls at entry. Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder. Provide sanitary napkin receptacles at Women’s restrooms.

5.0 ROOM REQUIREMENTS

Staff Restroom	
	
Description	**Requirements**
Location	A-Wing, B-wing, C-wing
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain ceramic tile.
Wall Finishes	Porcelain ceramic tile.
Ceiling Finishes	Provide painted gypsum board.
Signage	Room signage; Directional signage at classroom corridor.
Furnishing	None.
System Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, baby-changing station.
Other Requirements	

5.0 ROOM REQUIREMENTS

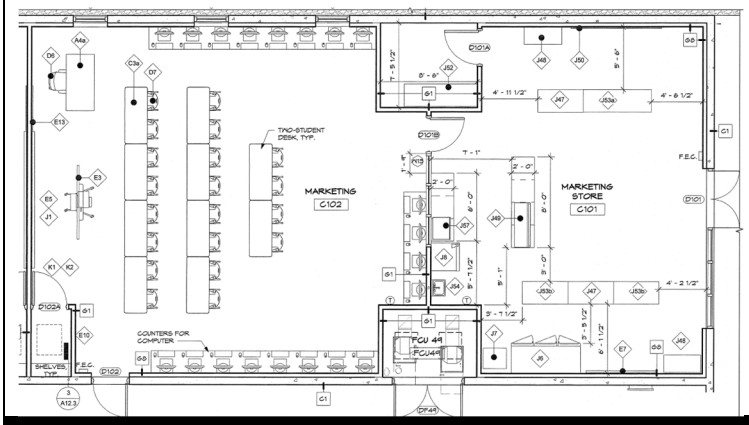
Utility Rooms



Description	Requirements
Location	A-Wing, B-Wing
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Non-water fire suppression.
Other Requirements	Locate mechanical rooms at the ends of the Classroom Buildings. Provide entrance vestibule for mechanical room with access to Telecom Room, Elec. Room, and Storage. Provide direct double door access to unsecured side of the building.

5.0 ROOM REQUIREMENTS

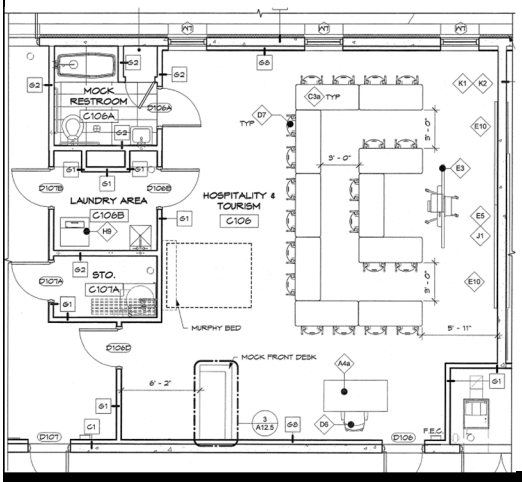
GCC Marketing Classroom and Store Lab



Description	Requirements
Location	C-Wing Classroom Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage; Exterior signage for the store.
Fixed Furnishing	Classroom: Provide min. 50FT length counters along the walls of the classroom for 20 computers. Laboratory: Provide min 6FT base cabinets and counter at rear wall of marketing store laboratory; min. 8FT island cabinets with countertop.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System at classroom.
Other Requirements	Provide two means of egress. Provide direct access to Student Store Lab from the courtyard covered walkway.Provide partition between the classroom and store lab with direct access and windows for direct supervision, min. 10FT wide and 2FT 10IN in height.

5.0 ROOM REQUIREMENTS

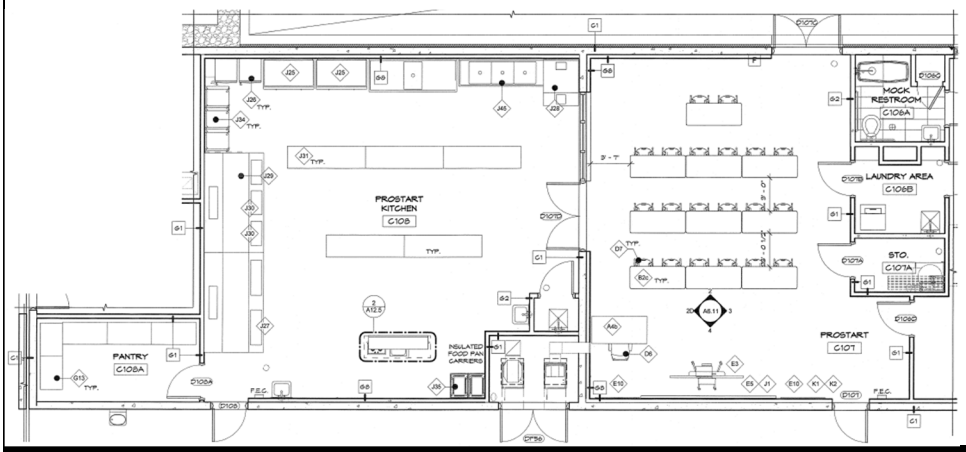
GCC Hospitality & Tourism Classroom



Description	Requirements
Location	C-Wing Classroom Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Provide double pedestal Mock Front Desk with transaction counter Podium, min. 2FT 6IN x 5FT 10IN
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System.
Other Requirements	Provide two means of egress. Provide direct access to Prostart Classroom from classroom and laundry room.

5.0 ROOM REQUIREMENTS

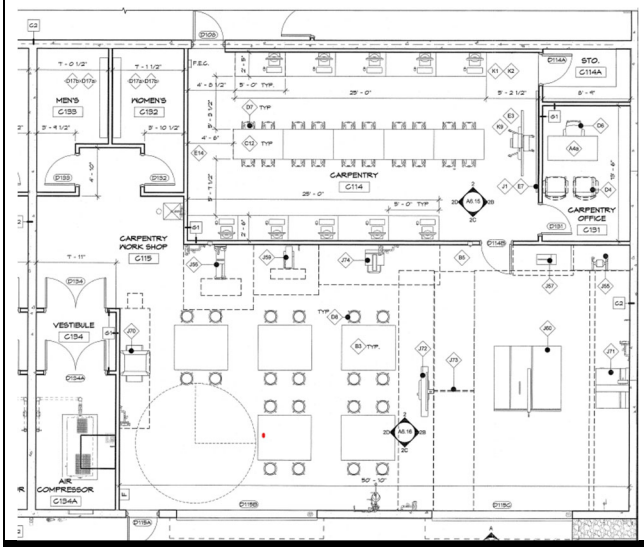
ProStart Classroom and Kitchen Laboratory



Description	Requirements
Location	C-Wing Classroom Buildings
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile at classroom; Quarry Tile at kitchen lab.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	(Kitchen Lab) Provide min. 2FT x 6FT cooking demonstration counter with table or ceiling mounted tilting demo mirror, two burner stove top range, and one (1) compartment low-flow handwashing sink.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide handwashing sink and soap dispenser at each entrance from Kitchen Lab. Provide sewer, waste, and vent piping from all fixtures. Provide PA/Bell/Intercom System at classroom.
Other Requirements	Provide two means of egress. Provide direct access to Hospitality & Tourism Classroom and Laundry room; double door access to Cafeteria

5.0 ROOM REQUIREMENTS

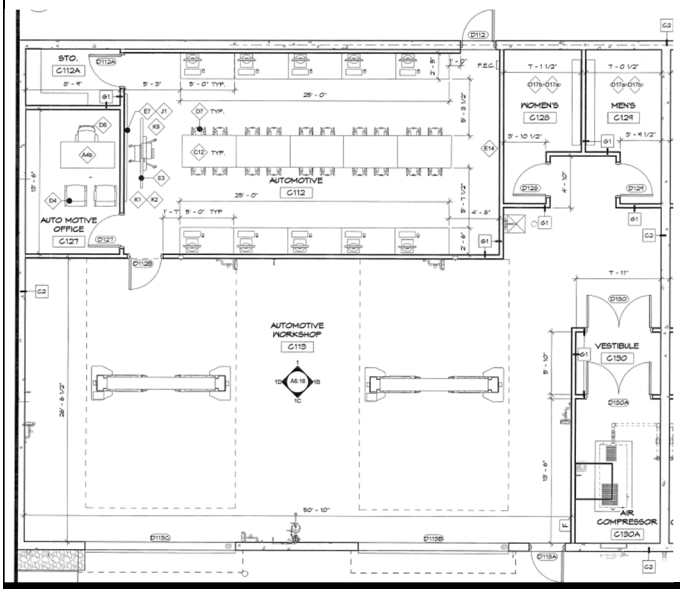
Carpentry Classroom and Workshop



Description	Requirements
Location	C-Wing Classroom Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile. Sealed concrete at workshop, compressor room and vestibule.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base at VCT floors only.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits at classrooms. Ensure projection screen visibility if soffits are used. Painted gyp. bd. and exposed structure at shop spaces.
Signage	Room signage.
Fixed Furnishing	Provide min. 50FT counter space along classroom walls for 10 computer workstations; 6 tier shelving along ½ perimeter walls of classroom storage.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide utility sink at workshop. Provide PA/Bell/Intercom System at classroom.
Other Requirements	Provide two means of egress.

5.0 ROOM REQUIREMENTS

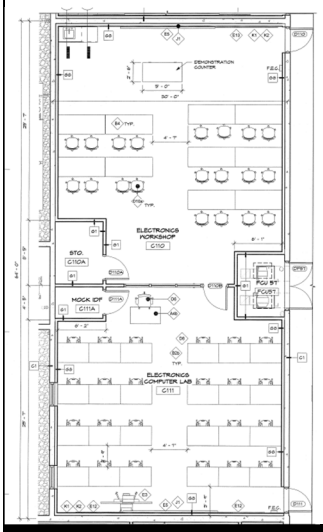
Automotive Classroom and Workshop



Description	Requirements
Location	C-Wing Classroom Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile. Sealed concrete at workshop, compressor room and vestibule.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base at VCT floors only.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits at classrooms. Ensure projection screen visibility if soffits are used. Painted gyp. bd. and exposed structure at shop spaces.
Signage	Room signage.
Fixed Furnishing	Provide min. 50FT counter space along classroom walls for 10 computer workstations; 6 tier shelving along ½ perimeter walls of classroom storage.
Furnishing	Refer to FF&E Document. Provide blocking for wall mounted FF&E. Coordinate with Electrical/Mechanical/Telecom to provide infrastructure.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide utility sink at workshop. Provide PA/Bell/Intercom System at classroom.
Other Requirements	Provide two means of egress.

5.0 ROOM REQUIREMENTS

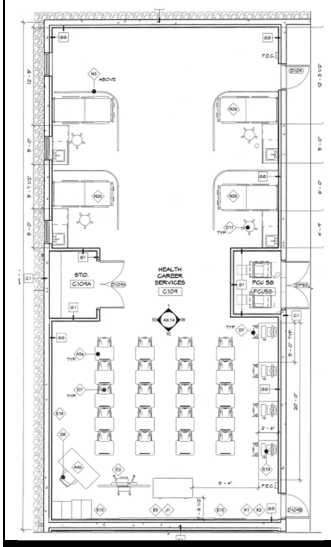
Electronics Technology Computer Lab and Workshop



Description	Requirements
Location	C-Wing Classroom Buildings
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Workshop: Provide min. 6FT x 2FT 6IN 3 drawer double pedestal demonstration table with modesty panel, one duplex general-purpose receptacle on each end, and solid epoxy resin countertop
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System at classroom.
Other Requirements	Provide partition between the classroom and store lab with direct access and windows for direct supervision, min. 10FT wide and 2FT 10IN in height. Provide two means of egress.

5.0 ROOM REQUIREMENTS

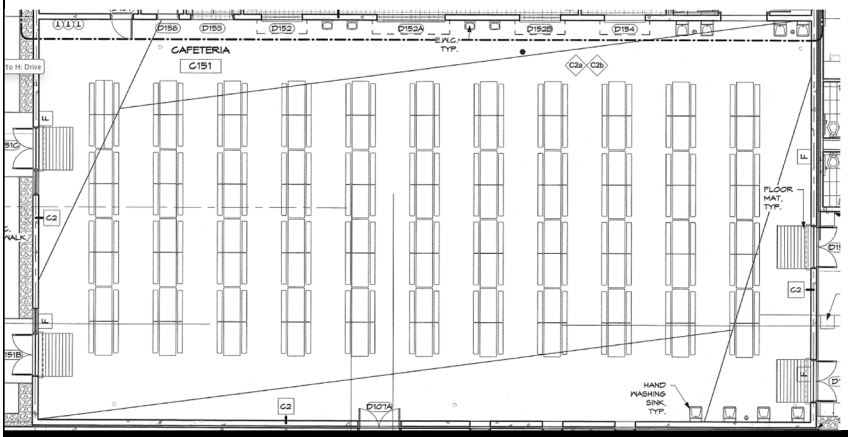
Health Career Sciences (HCS) Classroom and Lab



Description	Requirements
Location	C-Wing Classroom Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile.
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls and furring; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits; Minimum Ceiling Height: 10 FT, allows 8FT soffits. Ensure projection screen visibility if soffits are used
Signage	Room signage.
Fixed Furnishing	Classroom: Provide min. 6FT x 2FT 6IN 3 drawer double pedestal demonstration table with modesty panel, one duplex general-purpose receptacle on each end, and solid epoxy resin countertop; min. 20FT counters along classroom wall for 4 computer workstations. Lab area: Provide min. 5FT cabinet/plumbing shield with epoxy resin countertop and 1-compartment sink with soap and tissue dispenser at each mock triage/sick bed, min. 4 stations.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System.
Other Requirements	Provide two means of egress

5.0 ROOM REQUIREMENTS

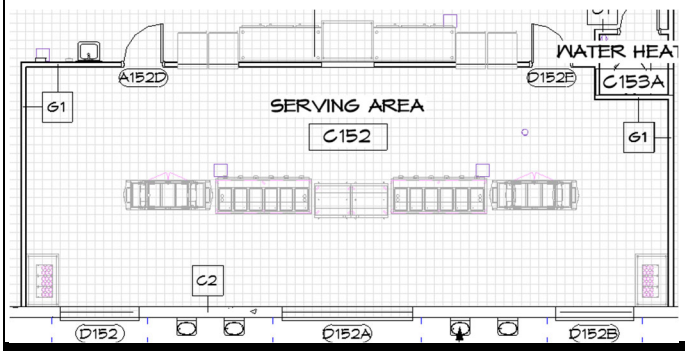
Cafeteria-Dining Hall



Description	Requirements
Location	C-Wing, Cafeteria Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Smooth ceiling tile and painted gyp. bd. soffits.
Signage	Room signage; Exterior Signage; Directional signage at courtyard.
Fixed Furnishing	None.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide 8 handwashing sinks, floor drains, 2 drinking fountain/ bottle filling station, air curtains at each entrance.
Other Requirements	Provide direct access from GCC Prostart Classroom and Cafeteria Kitchen and secondary exits outside of secured campus, with electronic access and permanent entryway system at each exterior entrance, min.width of door way x 5FT

5.0 ROOM REQUIREMENTS

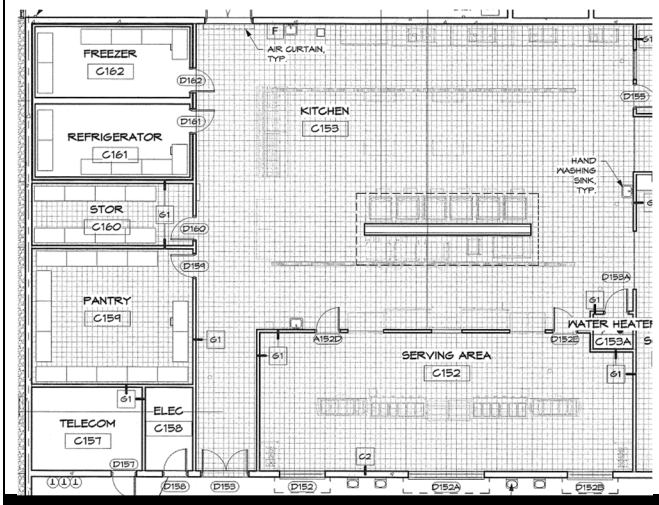
Cafeteria- Service Area



Description	Requirements
Location	C-Wing, Cafeteria Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Quarry tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; Quarry tile cove base.
Ceiling Finishes	Smooth ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide floor drains with trap seals.
Other Requirements	Provide direct access from Cafeteria Dining Hall and Kitchen; min. 4FT W x 3FT H pass through window with counter from cafeteria kitchen; wall openings to accommodate pass-through refrigerators. Accommodate two serving lines.

5.0 ROOM REQUIREMENTS

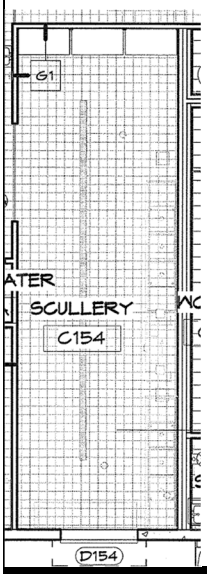
Cafeteria- Service Area



Description	Requirements
Location	C-Wing, Cafeteria Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Quarry tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; stainless steel wall panels behind cooking equipment; quarry tile cove base.
Ceiling Finishes	Smooth ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide handwashing stations at each entrance to the space. Provide floor drains with trap seals.
Other Requirements	Provide direct access to Cafeteria Dining Hall and Service area; secondary double door exit to rear service road, with air curtain.

5.0 ROOM REQUIREMENTS

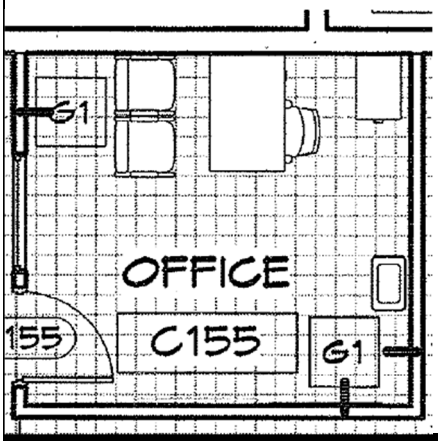
Cafeteria- Scullery



Description	Requirements
Location	C-Wing, Cafeteria Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Quarry tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; quarry tile cove base.
Ceiling Finishes	Smooth ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide floor drains with trap seals.
Other Requirements	Provide access from Cafeteria Kitchen; pass through window to Dining Hall with stainless steel counter and roll up counter shutter.

5.0 ROOM REQUIREMENTS

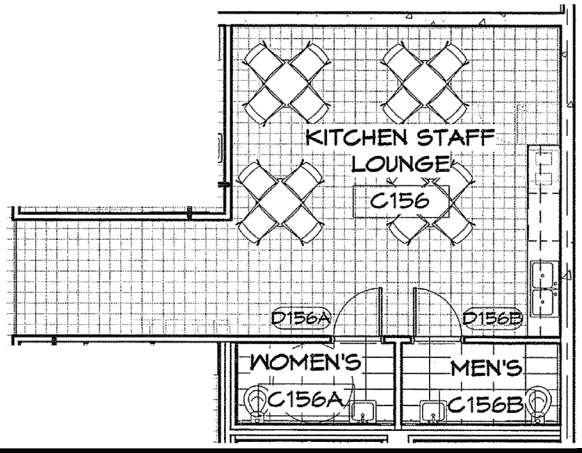
Kitchen Manager's Office



Description	Requirements
Location	C-Wing, Cafeteria Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Quarry tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; quarry tile cove base.
Ceiling Finishes	Smooth ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide access from Cafeteria Kitchen; 4FT x 4FT window for direct supervision into kitchen. Adjacent to Kitchen Staff Lounge

5.0 ROOM REQUIREMENTS

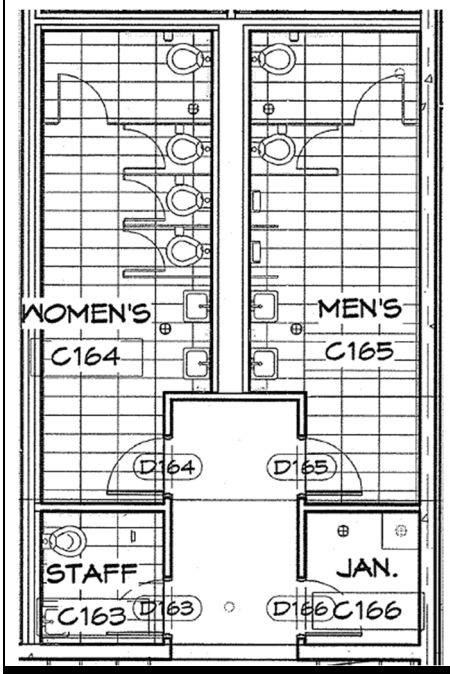
Kitchen Staff Lounge



Description	Requirements
Location	C-Wing, Cafeteria Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Quarry tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; quarry tile cove base.
Ceiling Finishes	Smooth ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide base cabinets with countertop and wall mounted cabinet, minimum 12FT.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide 2-compartment sink, floor drain, tankless electric water heater.
Other Requirements	Provide men and women’s restroom with typical single occupant restroom requirements.

5.0 ROOM REQUIREMENTS

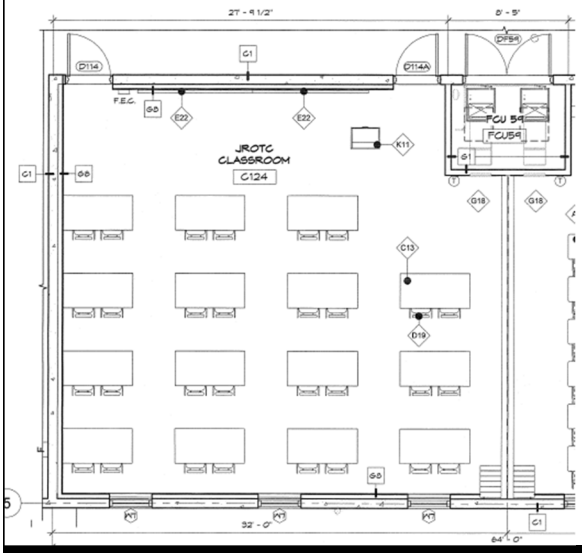
Shared Restrooms



Description	Requirements
Location	C-wing, Cafeteria
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile; vinyl composition tile
Wall Finishes	Porcelain Ceramic Tile; Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Painted gypsum board.
Signage	Room signage; Directional signage at Cafeteria Dining Hall and courtyard covered walkway.
Furnishing	Phenolic Toilet partitions for water closets and urinal dividers.
System Requirements	Provide lavatory, water closet, urinals, floor drain, mop sink as required.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder. Provide sanitary napkin receptacles at Women's restrooms. Provide adjustable storage wall mount organizer with 3 grip hooks and 2-tier, built-in shelves with paint finish at janitorial closet.

5.0 ROOM REQUIREMENTS

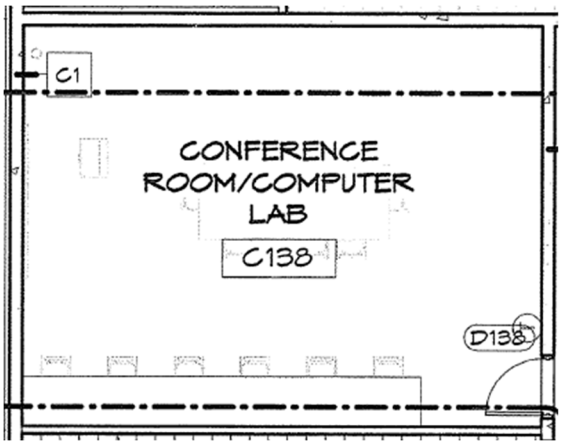
JROTC Classrooms



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system at each classroom.
Other Requirements	Provide movable wall partitions between all JROTC Classrooms.

5.0 ROOM REQUIREMENTS

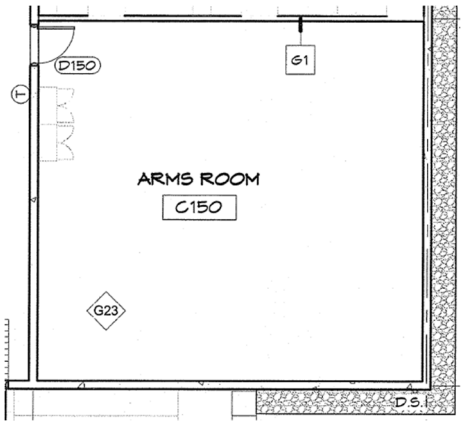
Conference Room/ Computer Lab



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Fixed Furnishing	Provide min. 21FT counter space for 6 computer workstations.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	None.

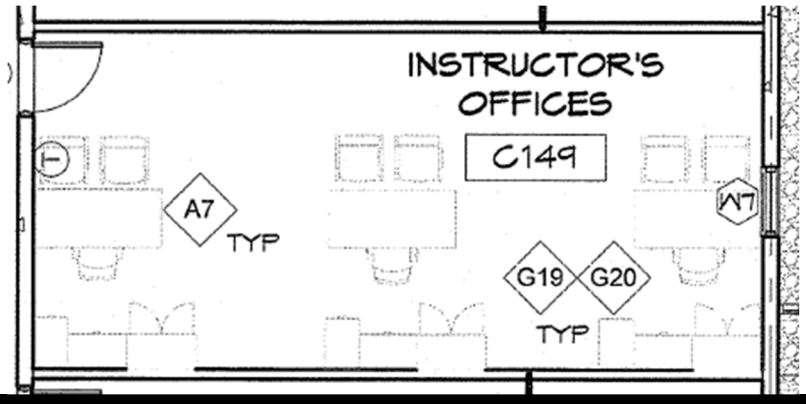
5.0 ROOM REQUIREMENTS

Arms Room



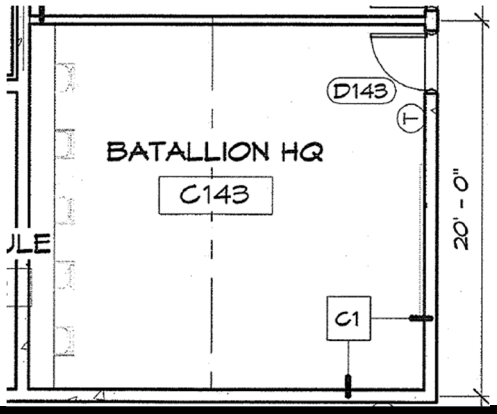
Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Provide heavy duty metal dutch door with double lock and day gate. Locate adjacent to JROTC Instructor's Office with hallway access to Multi-Purpose Training Facility and secondary exit to the campus service road.

5.0 ROOM REQUIREMENTS

JROTC Instructors' Office	
	
Description	**Requirements**
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Adjacent to Arms Room and JROTC Supply Room.

5.0 ROOM REQUIREMENTS

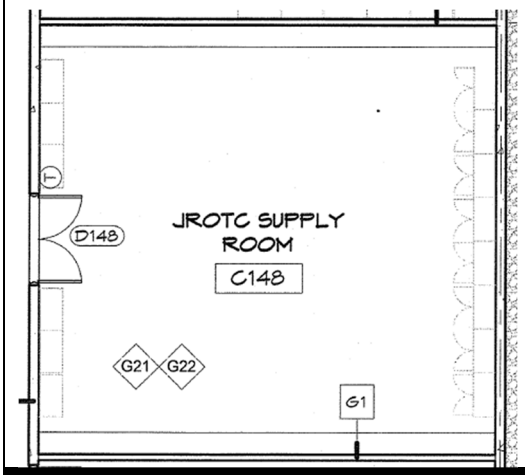
Battallion Headquarters (HQ)



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Fixed Furnishing	Provide min. 19FT 5.5IN counter to accommodate 5 computer work stations.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	

5.0 ROOM REQUIREMENTS

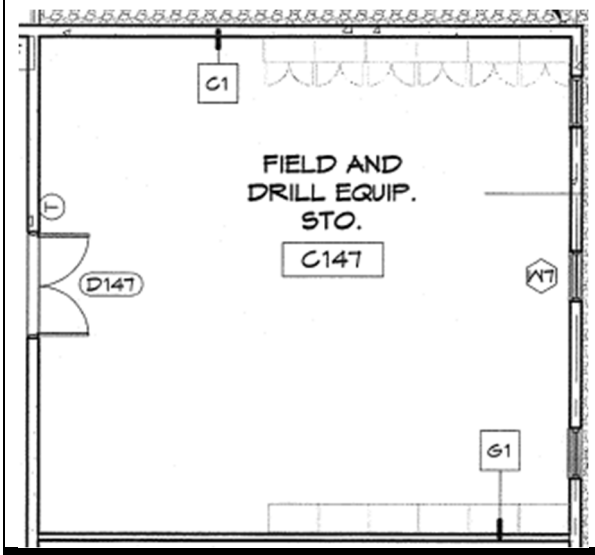
Arms Room



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to JROTC Instructor's Office and Field and Drill Equipment Storage with hallway access to Multi-Purpose Training Facility and secondary exit to the campus service road.

5.0 ROOM REQUIREMENTS

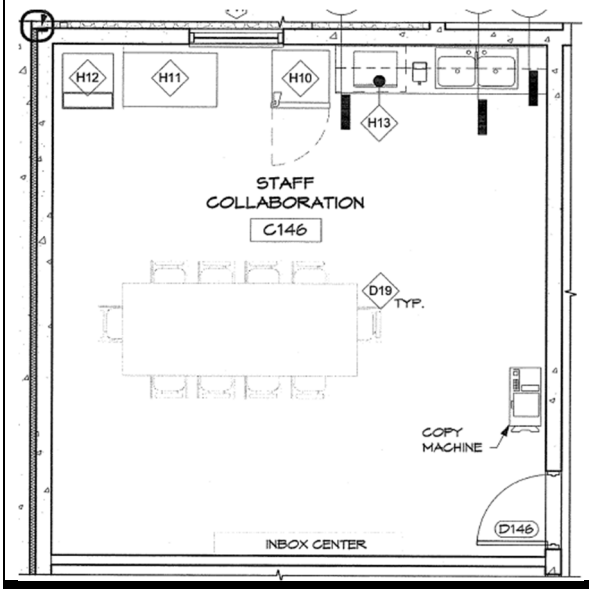
Field and Drill Equipment Storage



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to JROTC Supply Room with hallway access to Multi-Purpose Training Facility and secondary exit to the campus service road/ drill pad.

5.0 ROOM REQUIREMENTS

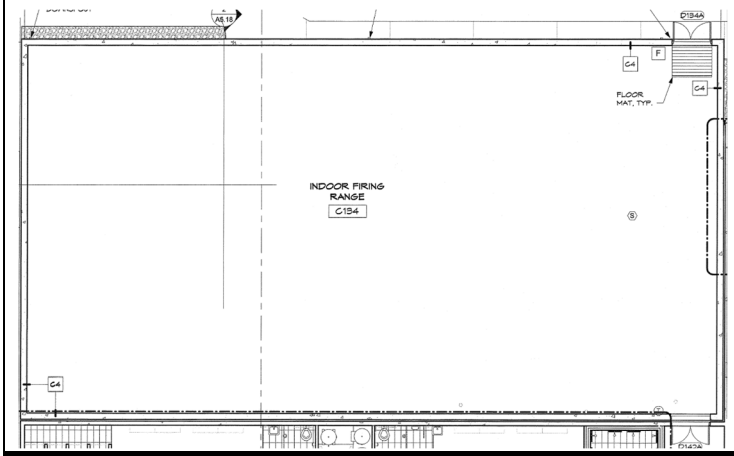
JROTC- Staff Collaboration



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Fixed Furnishing	Provide base and wall mounted cabinets, 9FT in length minimum.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide 2-compartment sink, soap dispenser, tissue dispenser.
Other Requirements	

5.0 ROOM REQUIREMENTS

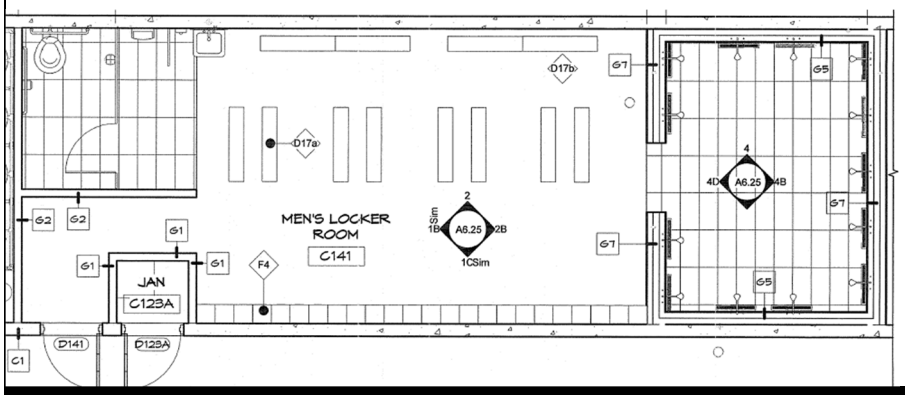
Multi-Purpose Training Facility



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to JROTC Locker rooms; provide secondary exit to the campus service road/ parking lot with electronic access control and permanent entry system/mat, min. width of double door x 5FT in direction of travel.

5.0 ROOM REQUIREMENTS

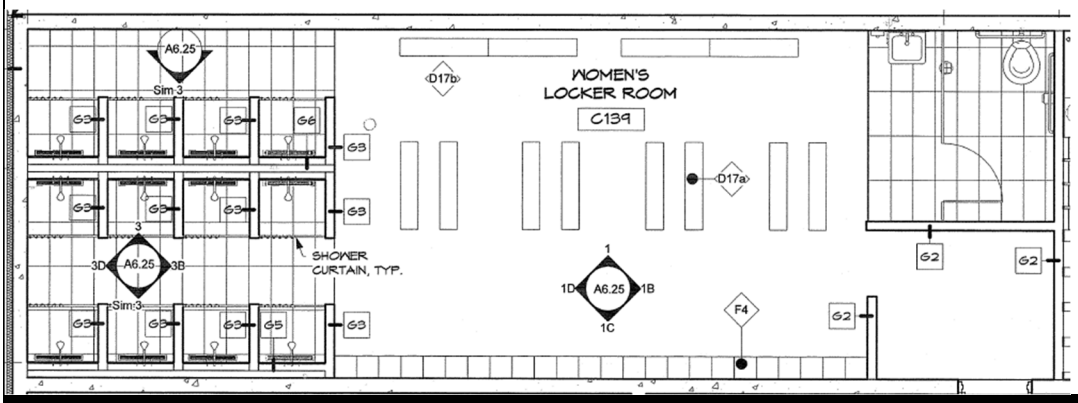
JROTC – Men's Locker Room



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; ceramic floor tiles; porcelain ceramic tile at showers and restroom areas.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; porcelain ceramic tile at showers and restroom areas.
Ceiling Finishes	Painted gyp. bd.
Signage	Provide room signage.
Fixed Furnishing	Separate each shower with partitions and curtains.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Electrical/Plumbing/Telecom. Provide one wheelchair accessible toilet stall, urinal, and handwashing station.
Other Requirements	Adjacent to JROTC Woen's Locker room. Provide screen walls for interior doors/ entrances into the locker room. Provide stainless steel grab bars, bag hooks at toilet partition, soap dispensers at sink, toilet paper holder, paper tissue dispenser, toilet seat cover dispenser at toilet stall, mirrors at sink.

5.0 ROOM REQUIREMENTS

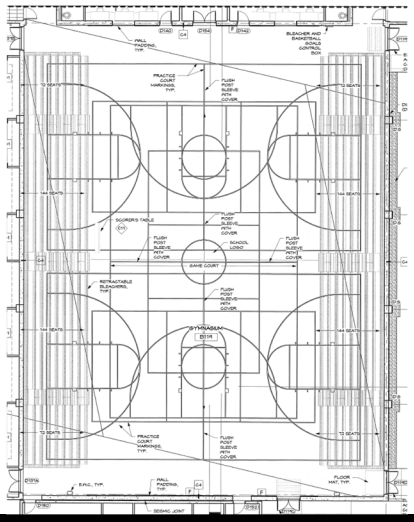
JROTC – Women's Locker Room



Description	Requirements
Location	C-Wing, JROTC Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; porcelain ceramic tile at showers and restroom areas.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; porcelain ceramic tile at showers and restroom areas.
Ceiling Finishes	Painted gyp. bd.
Signage	Provide room signage.
Fixed Furnishing	Separate each shower with partitions and curtains.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Electrical/Plumbing/Telecom.
Other Requirements	Adjacent to JROTC Men's Locker room. Provide screen walls for interior doors/ entrances into the locker room. Provide stainless steel grab bars, bag hooks at toilet partition, soap dispensers at sink, toilet paper holder, paper tissue dispenser, toilet seat cover dispenser at toilet stall, mirrors at sink, sanitary napkin receptacle at toilet stalls.

5.0 ROOM REQUIREMENTS

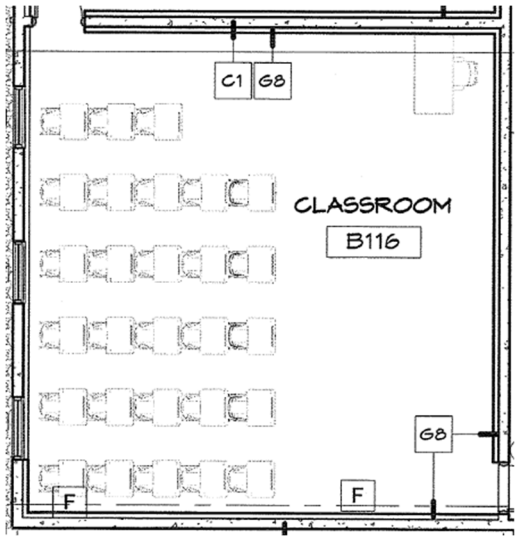
Gymnasium - Courts



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Fluid-applied athletic flooring system with regulation basketball and volleyball main game court and two perpendicular basketball and volleyball game court markings.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; wall padding on both ends of main game court; acoustical wall panels.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage; Exterior signage; directional signage at courtyard.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide 2 drinking fountain/ bottle filling station. Provide A/V system. Provide PA/Bell System speakers.
Other Requirements	Adjacent to PE Teacher's Offices with hallway access to locker rooms and classrooms. Provide electronic access control at public entrance doors to unsecure sides; permanent entry mats at each exterior entrance, min. width of entry door x 5FT in direction of travel. Provide high windows for natural lighting.

5.0 ROOM REQUIREMENTS

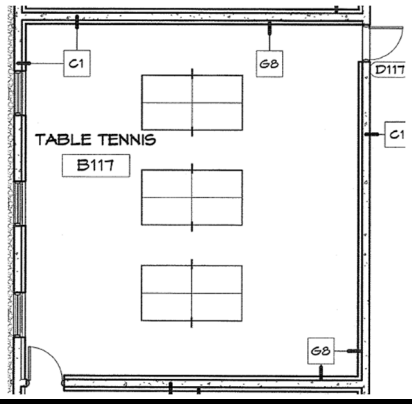
Physical Education (PE) Classroom



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provie PA/Bell/Intercom system.
Other Requirements	Provide 2 means of egress. Provide direct access to Table Tennis Room.

5.0 ROOM REQUIREMENTS

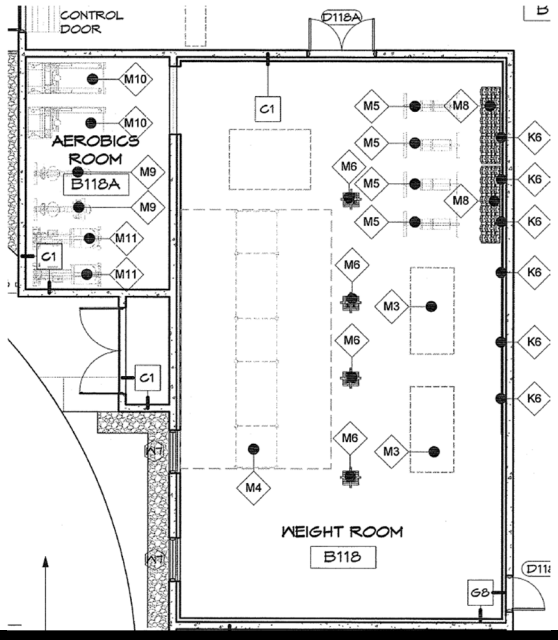
Table Tennis Room



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile
Wall Finishes	Plaster & paint exposed concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system.
Other Requirements	Provide direct access to PE Classroom

5.0 ROOM REQUIREMENTS

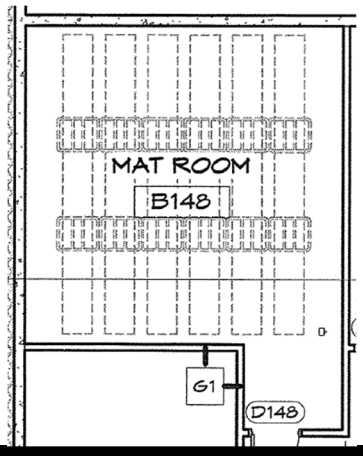
Weight/Aerobics Room



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system.
Other Requirements	Provide two means of egress, including one double door for ease of mobility of large room equipment. Locate adjacent to Table Tennis room and Athletic Director's office with hallway access to secondary exit, with electronic access control, to bus drop off area.

.0 ROOM REQUIREMENTS

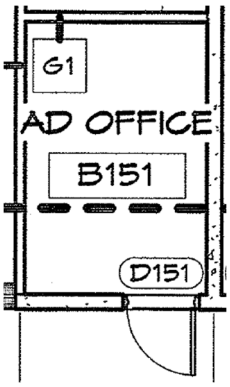
Wrestling Mat Storage Room



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Located adjacent storage rooms and Athletic Director’s Office with hallway access to main court space.

5.0 ROOM REQUIREMENTS

Athletic Director's (AD) Office



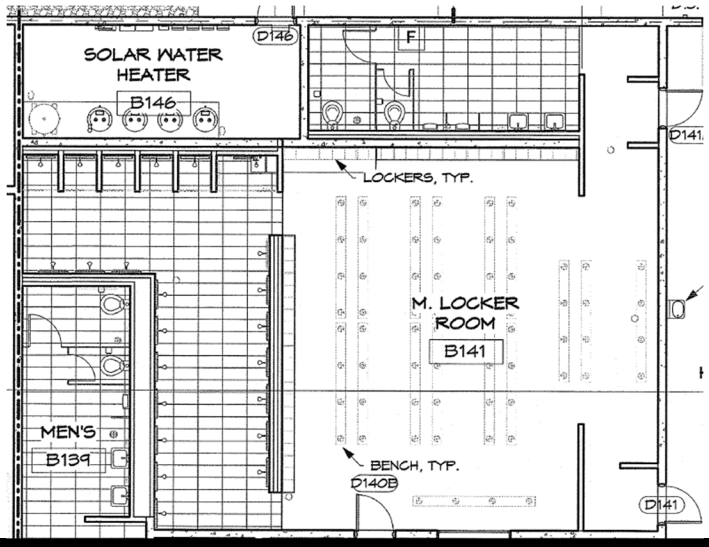
Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system.
Other Requirements	Locate adjacent to Mat room, gymnasium storage, and weight rooms.

5.0 ROOM REQUIREMENTS

Laundry Room	
	
Description	**Requirements**
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide 1 utility sink, 2 tier shelving along wall above washer and dryer. Ice maker.
Other Requirements	Locate adjacent to Athletic Direct’s Office, gymnasium storage, and weight rooms.

5.0 ROOM REQUIREMENTS

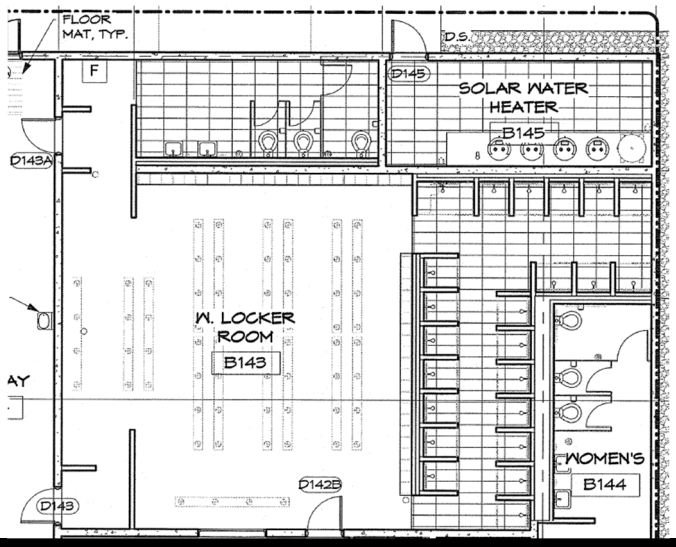
Men's Restroom



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile; Porcelain ceramic tile at restroom and shower areas.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd ; Ceramic Tile, rubber wall base; Porcelain ceramic tile at restroom and shower areas.
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatories, water closets, urinals, showers, floor drains, shower drains. Provide PA/Bell speakers.
Other Requirements	Provide mirrors with stainless steel frame, stainless steel grab bars, robe hooks, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle; 6" concrete base for metal lockers. Provide two means of egress with screen walls for interior doors/ entrances into locker room with hallway access to game courts and secondary exit to outdoor sports field with access control for unsecured side of Gymnasium; direct access from Men's PE Office.

5.0 ROOM REQUIREMENTS

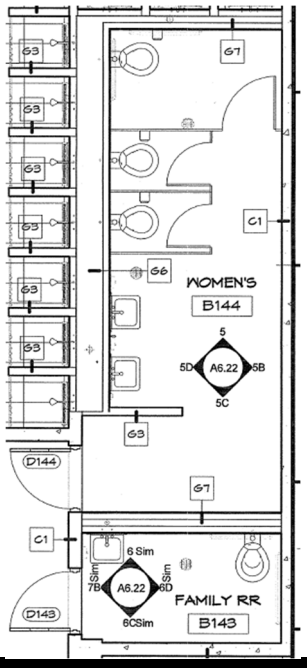
Men's Restroom



Description	Requirements
Location	B-Wing, Gymnasium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber Tile; Porcelain ceramic tile at restroom and shower areas.
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd ; Ceramic Tile, rubber wall base; Porcelain ceramic tile at restroom and shower areas.
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatories, water closets, showers, floor drains, shower drains. Provide PA/Bell speakers.
Other Requirements	Provide mirrors with stainless steel frame, stainless steel grab bars, robe hooks, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle; sanitary napkin receptacles at toilet stalls; 6" concrete base for metal lockers. Provide two means of egress with screen walls for interior doors/ entrances into locker room with hallway access to game courts and secondary exit to outdoor sports field with access control for unsecured side of Gymnasium; direct access from Women's PE Office.

5.0 ROOM REQUIREMENTS

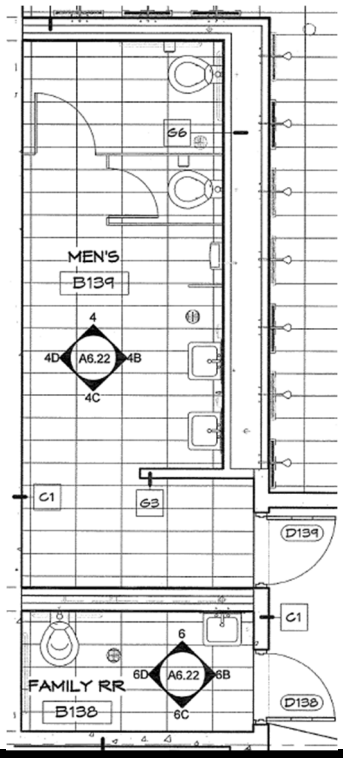
Women's Restroom



Description	Requirements
Location	B-Wing, Gymnasium
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	Phenolic Toilet partitions for water closets.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closets, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle; and sanitary napkin receptacle at toilet stalls.

5.0 ROOM REQUIREMENTS

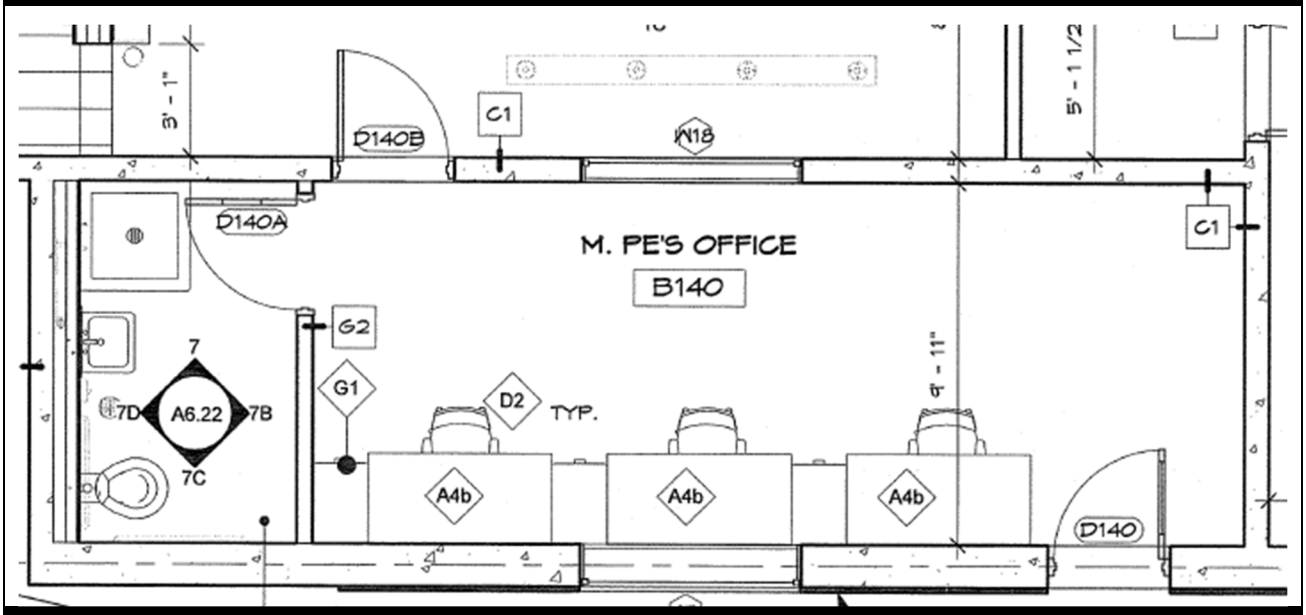
Men's Restroom



Description	Requirements
Location	B-Wing, Gymnasium
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	Phenolic Toilet partitions for water closets and urinal dividers.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide lavatory, water closet, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle.

5.0 ROOM REQUIREMENTS

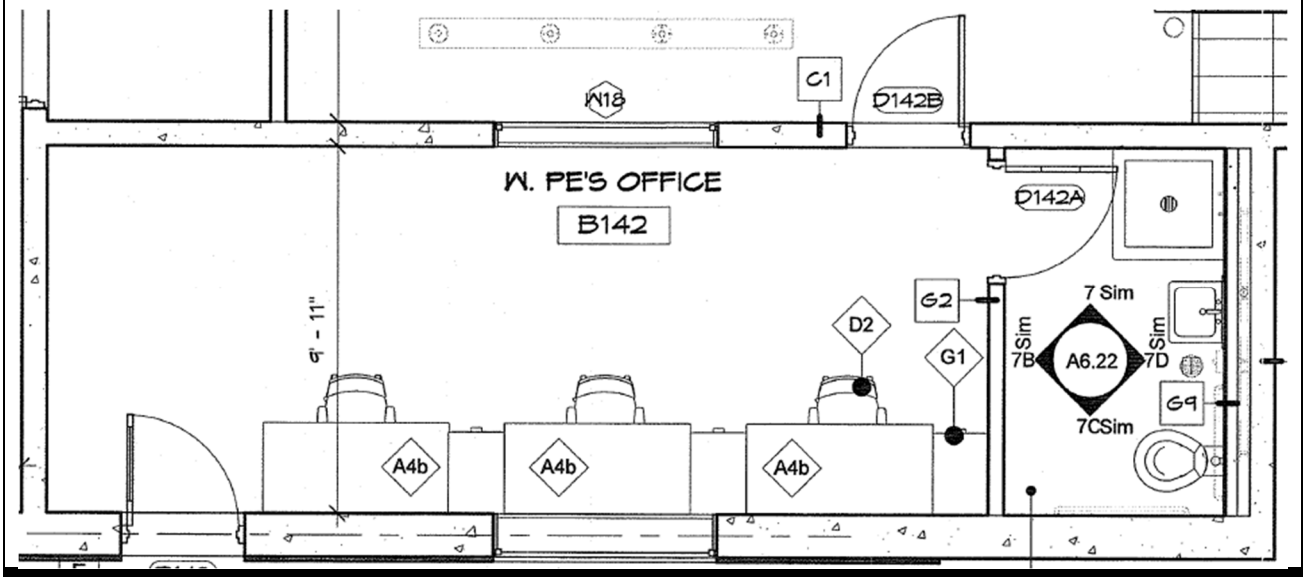
M. PE Teachers' Office



Description	Requirements
Location	B-Wing, Gymnasium
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; Porcelain ceramic tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base; Porcelain ceramic tile
Ceiling Finishes	Acoustical ceiling tile; Painted gyp. bd.
Signage	Room signage.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system.
Other Requirements	Locate adjacent to Men's Locker Rooms and Game Courts with one-way window for direct view/supervision. Provide direct access to Men's Locker room and hallway access to game courts. Provide staff restroom with typical single occupant restroom requirements; add shower and shower curtain.

5.0 ROOM REQUIREMENTS

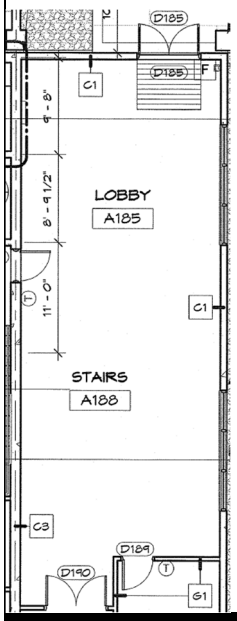
W. PE Teachers' Office



Description	Requirements
Location	B-Wing, Gymnasium
Area/Dimensions	Per Programming Document design; develop design for 4 teachers.
Floor Finishes	Vinyl composition tile; Porcelain ceramic tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base; Porcelain ceramic tile at restroom and shower area.
Ceiling Finishes	Acoustical ceiling tile; Painted gyp. bd.
Signage	Room signage.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system.
Other Requirements	Locate adjacent to Women's Locker Rooms and Game Courts with one-way window for direct view/supervision. Provide direct access to Women's Locker room and hallway access to game courts. Provide staff restroom with typical single occupant restroom requirements; add shower and shower curtain.

5.0 ROOM REQUIREMENTS

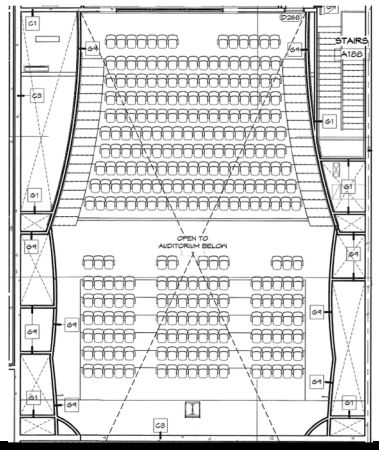
Auditorium-Lobby



Description	Requirements
Location	A-Wing, Auditorium Building, Auditorium Main Entrance
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile
Signage	Room signage; Directional signage at Main entrance.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Locate Building Fire Alarm Control Panel near main entrance.
Other Requirements	Electronic access control at the public main entrance doors. Adjacent to elevator, stairs, and Activity Director's Office with hallway access to restrooms/utility rooms and auditorium. Provide Covered walkway. Provide exterior windows for daylight and views.

5.0 ROOM REQUIREMENTS

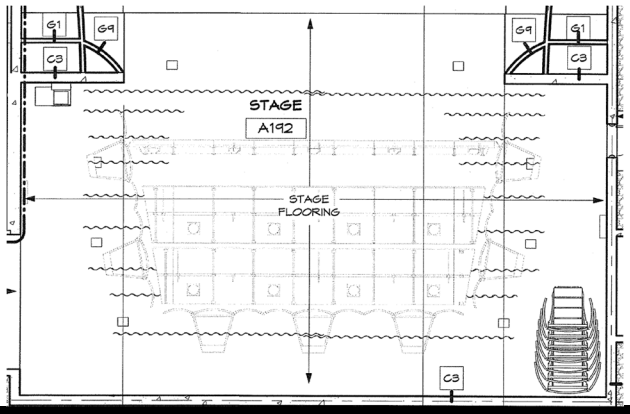
Auditorium-House



Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base; acoustical wall panels at rear wall.
Ceiling Finishes	Painted gyp. bd. and exposed structure; paint gyp.bd. suspended ceiling clouds
Signage	Room signage; Directional signage at A-Wing Hallway.
Furnishing	Refer to FF&E Document. Fabric covered seating.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom. Provide Theater Systems and Audio-Visual systems. Provide aisle egress lighting.
Other Requirements	Provide vestibule for each entrance from auditorium lobby and A-Wing Classroom Building hallway. Provide stadium seating and sloped seating. Provide access to Control Room and stage. Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

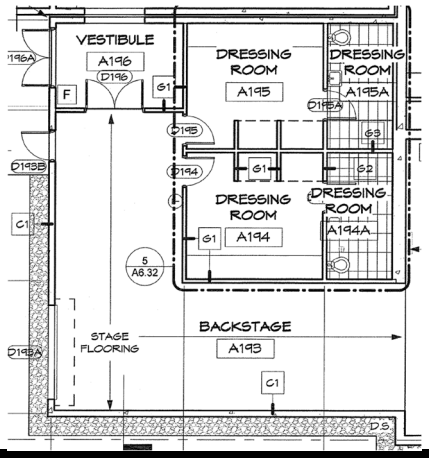
Auditorium-Stage



Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Sprung floor system
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base
Ceiling Finishes	Painted gyp. bd. and exposed structure.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements.
Other Requirements	Provide access from Auditorium House and Backstage; secondary exist to parking lot with electronic access control. Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

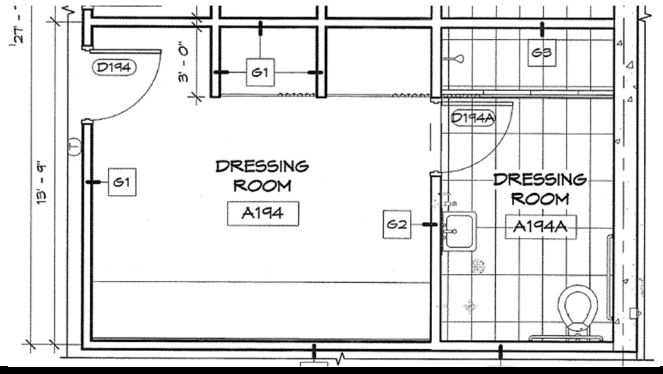
Back Stage



Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Sprung floor system
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base
Ceiling Finishes	Acoustical ceiling tile
Signage	Room signage;
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide Theater Systems and Audio-Visual system.
Other Requirements	Provide access from Auditorium Stage and vestibule entrance from A-Wing Classroom Building hallway; secondary exit to service road with electronic access control; roll up door to service road for mobility of large stage props. Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

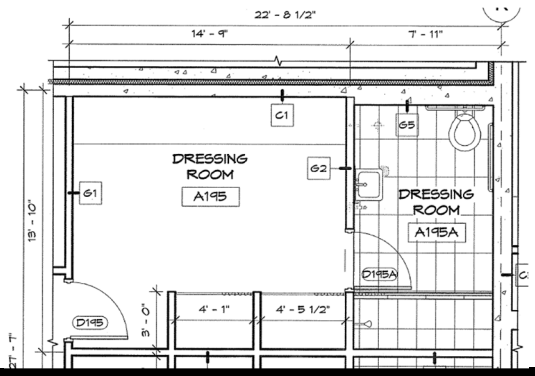
Men's Dressing Room



Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Viny composition tile; Porcelain Ceramic Tile at restroom.
Wall Finishes	Plaster and Paint concrete walls; Paint gyp. bd. walls; Porcelain Ceramic Tile at restroom.
Ceiling Finishes	Acoustical ceiling tile; painted gyp. bd at restroom.
Signage	Room signage.
Fixed Furnishing	Provide built-in counter and mirror at full length of dressing room wall, min. 14FT 4IN in length.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements. Provide lavatory, water closet, shower, floor drain. Provide PA/Bell/Intercom System.
Other Requirements	Provide two dressing rooms with privacy curtain; public restroom with typical single occupant restroom requirements; mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle, shower curtain. Locate adjacent to Women's Dressing Room with direct access from backstage. Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

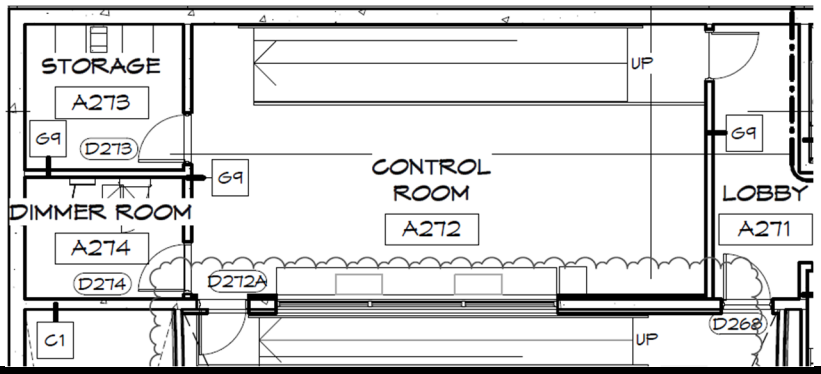
Women's Dressing Room



Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile; Porcelain Ceramic Tile at restroom.
Wall Finishes	Plaster & paint concrete walls; painted gyp. bd; porcelain Ceramic Tile at restroom.
Ceiling Finishes	Acoustical ceiling tile; painted gyp. bd at restroom.
Signage	Room signage.
Fixed Furnishing	Provide built-in counter and mirror at full length of dressing room wall, min. 14FT 4IN in length.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements. Provide lavatory, water closet, shower, floor drain. Provide PA/Bell/Intercom System.
Other Requirements	Provide two dressing rooms with privacy curtain; public restroom with typical single occupant restroom requirements; mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, waste receptacle, shower curtain. Locate adjacent to Men's Dressing Room with direct access from backstage. Comply with Acoustical Design Criteria.

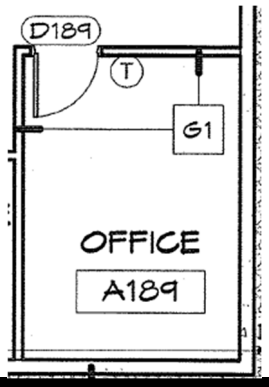
5.0 ROOM REQUIREMENTS

Control Room

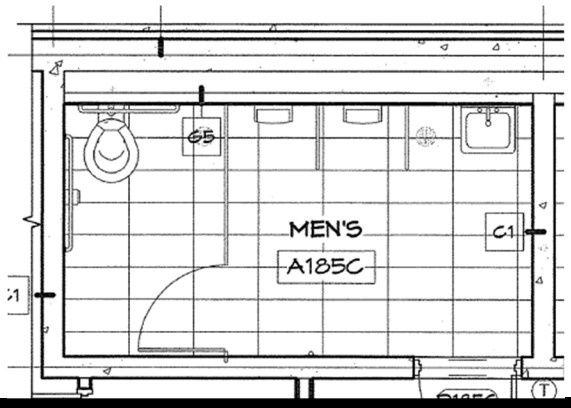


Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Rubber tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base
Ceiling Finishes	Acoustical ceiling tile
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements. Provide PA/Bell/Intercom system.
Other Requirements	Provide direct access from Auditorium House and entrance from elevator lobby; built-in counter adjacent to Auditorium House, min. 18FT; sliding windows for visual monitoring of stage performance; Comply with Acoustical Design Criteria.

5.0 ROOM REQUIREMENTS

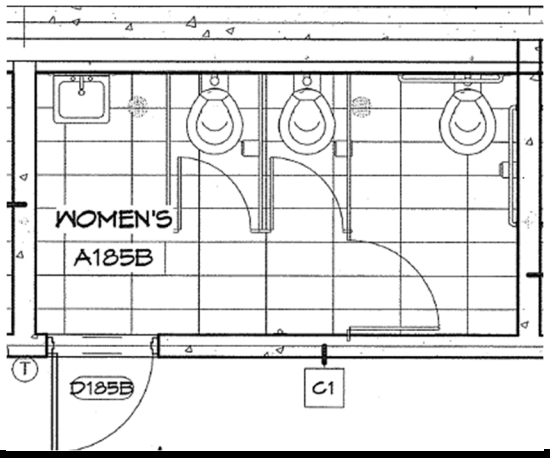
Activity Director's Office	
	
Description	**Requirements**
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile.
Signage	Room signage;
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom system.
Other Requirements	Provide direct access from Auditorium Lobby. Adjacent to vestibule entrance to auditorium House.

5.0 ROOM REQUIREMENTS

Men's Restroom	
	
Description	**Requirements**
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage; directional signage at lobby.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements. Provide lavatory, water closet, urinals, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet paper holder; trash receptacle.

5.0 ROOM REQUIREMENTS

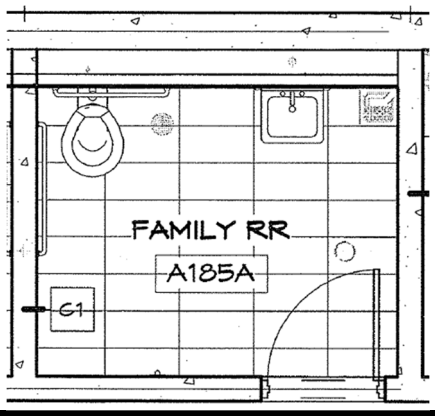
Men's Restroom



Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements. Provide lavatory, water closets, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet paper holder; sanitary napkin receptacle at each stall; trash receptacle.

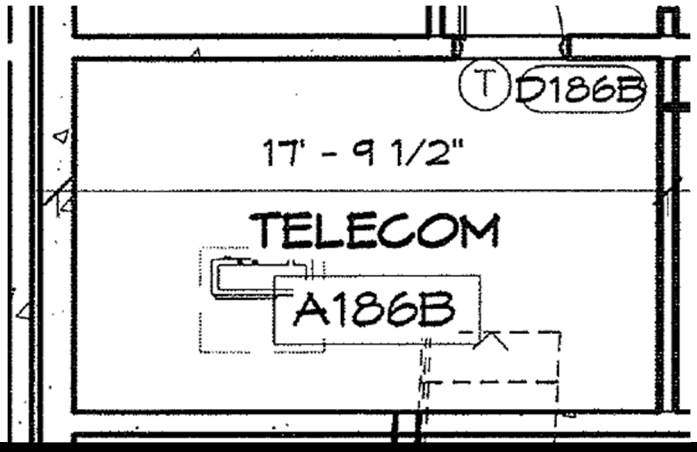
5.0 ROOM REQUIREMENTS

Family Restroom



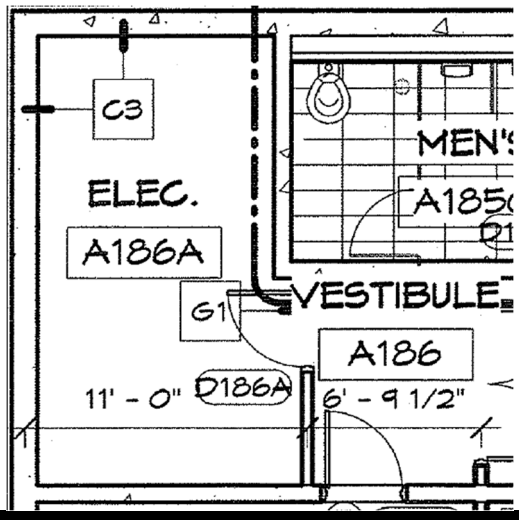
Description	Requirements
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom/Theater System/Audio-Visual requirements. Provide lavatory, water closets, floor drain.
Other Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet paper holder; trash receptacle; baby changing station.

5.0 ROOM REQUIREMENTS

Telecommunication (Telecom) Room	
	
Description	**Requirements**
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	None
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Non-water fire suppression.
Other Requirements	Locate adjacent to Storage A187, Elec Room A186A, and restroom facilities. Provide vestibule entrance, shared with Elec Room A186A.

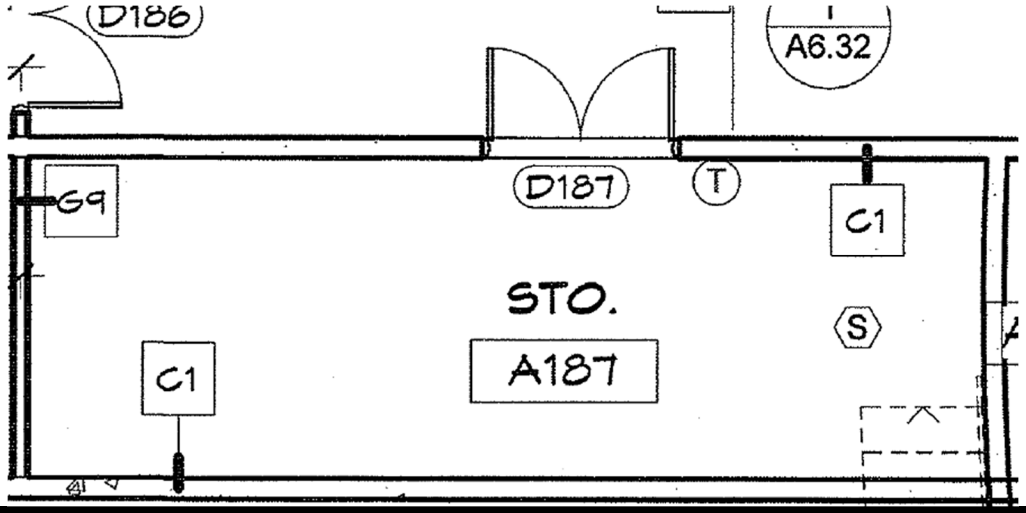
5.0 ROOM REQUIREMENTS

Electrical (Elec) Room

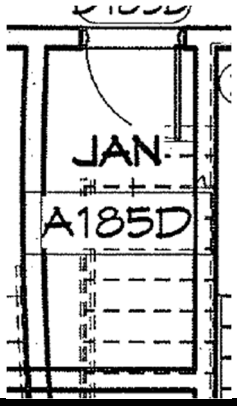


Description	Requirements
Location	A-Wing, Administrative Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to Telecom Room A186B, and restroom facilities. Provide vestibule entrance, shared with Telecom Room A186B.

5.0 ROOM REQUIREMENTS

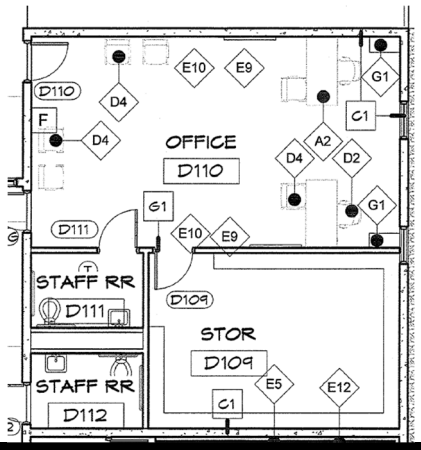
Storage	
	
Description	**Requirements**
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to Telecom Room A187B, restroom facilities, and elevator with hallway access Auditorium Lobby/ public entrance to the covered walkway.

5.0 ROOM REQUIREMENTS

Janitorial (Jan) Closet	
	
Description	**Requirements**
Location	A-Wing, Auditorium Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide mop sink, floor drain.
Other Requirements	Provide adjustable storage wall mount organizer with 3 grip hooks; 2-tier, built-in shelves with paint finish.

5.0 ROOM REQUIREMENTS

Principal's Office



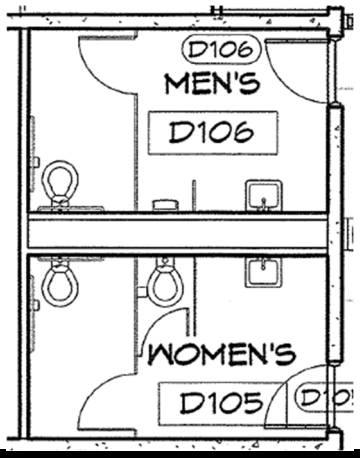
Description	Requirements
Location	Credit Recovery Building
Area/Dimensions	Per Programming Document design.
Floor Finishes	Vinyl Composition Tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Provide room signage.
Fixed Furnishing	Provide base cabinets, countertop, and 3-tier shelving along back wall.
Furnishing	Per FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide PA/Bell/Intercom System control center; Access Control system center; and Security and Surveillance System center.
Other Requirements	Locate at the main entrance to the credit recovery facility as the controlled primary entrance to the facility. Provide restroom with typical single occupant restroom requirements.

5.0 ROOM REQUIREMENTS

Staff Restroom	
	
Description	**Requirements**
Location	Credit Recovery Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain ceramic tile.
Wall Finishes	Porcelain ceramic tile.
Ceiling Finishes	Provide painted gypsum board.
Signage	Room signage;
Furnishing	None.
System Requirements	Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder, baby-changing station.
Other Requirements	Locate adjacent to Office staff restroom with access from common area.

5.0 ROOM REQUIREMENTS

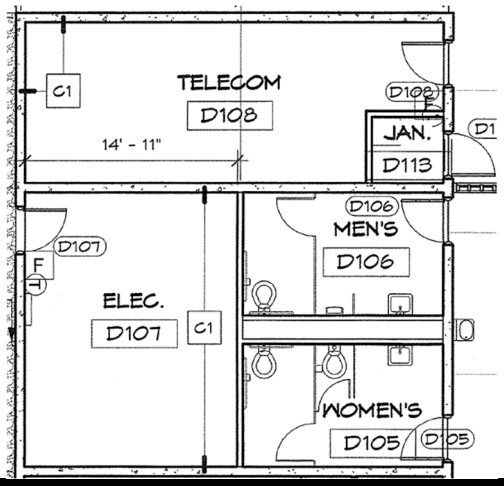
Shared Restrooms



Description	Requirements
Location	Credit Recovery Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gypsum board.
Signage	Room signage; Directional signage at common area
Furnishing	Phenolic Toilet partitions for water closets and urinal dividers.
System Requirements	Provide lavatory, water closet, urinals, floor drain as required. Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder. Provide sanitary napkin receptacles at Women's restrooms.
Other Requirements	Locate adjacent to utility rooms and Principal's Office.

5.0 ROOM REQUIREMENTS

Utility Rooms



Description	Requirements
Location	A-Wing, B-Wing
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Non-water fire suppression.
Other Requirements	Locate adjacent to main entrance to the credit recovery facility.

5.0 ROOM REQUIREMENTS

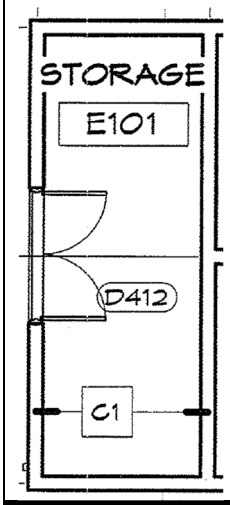
Janitorial (Jan) Closet



Description	Requirements
Location	Credit Recovery Building
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide mop sink, floor drain.
Other Requirements	Provide adjustable storage wall mount organizer with 3 grip hooks; 2-tier, built-in shelves with paint finish. Located adjacent to shared restrooms and utility rooms.

5.0 ROOM REQUIREMENTS

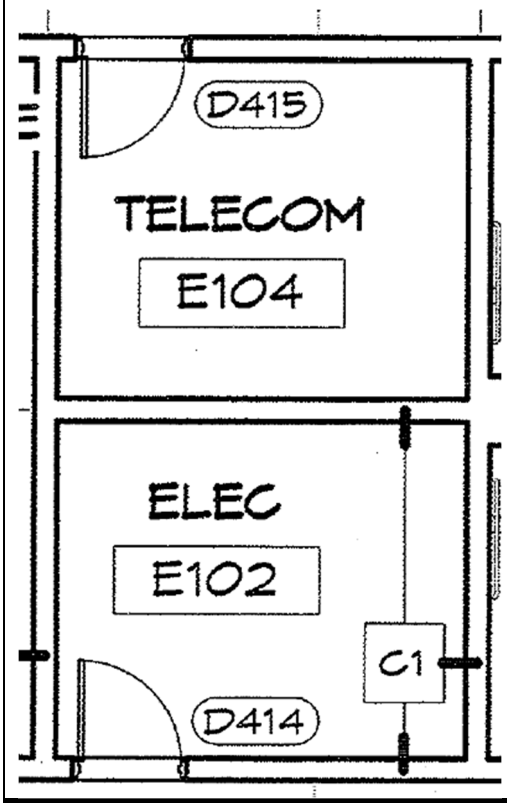
Storage



Description	Requirements
Location	Press Box
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate adjacent to utility rooms. Provide double door access for mobility of large sports equipment.

5.0 ROOM REQUIREMENTS

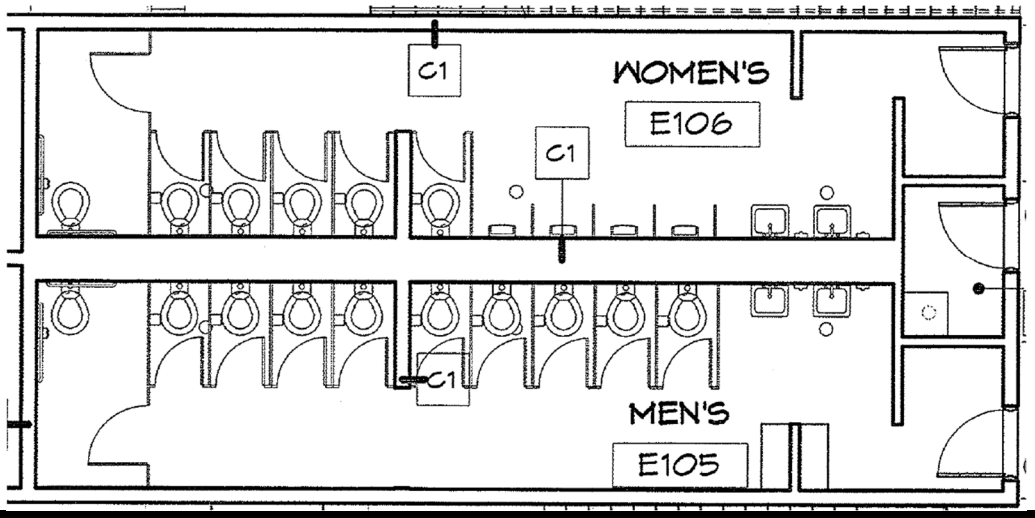
Utility Rooms



Description	Requirements
Location	Press Box
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Acoustical ceiling tile and painted gyp. bd. soffits.
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Non-water fire suppression.
Other Requirements	Locate between storage and shared restrooms.

5.0 ROOM REQUIREMENTS

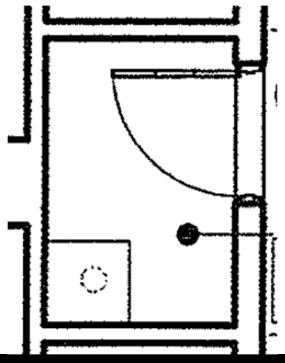
Shared Restrooms



Description	Requirements
Location	Press Box
Area/Dimensions	Per Programming Document design
Floor Finishes	Porcelain Ceramic Tile
Wall Finishes	Porcelain Ceramic Tile
Ceiling Finishes	Painted gypsum board.
Signage	Room signage; Directional signage at walkways
Furnishing	Phenolic Toilet partitions for water closets and urinal dividers.
System Requirements	Provide lavatory, water closet, urinals, floor drain as required.
Other Requirements	Provide screen walls at entry. Provide mirror with stainless steel frame, stainless steel grab bars, robe hook, liquid soap dispenser, paper towel dispenser, toilet tissue holder. Provide sanitary napkin receptacles at Women's restrooms.

5.0 ROOM REQUIREMENTS

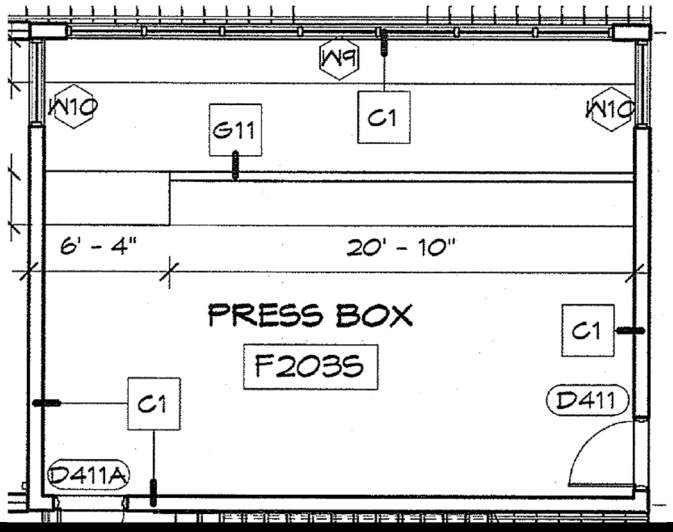
Janitorial (Jan) Closet



Description	Requirements
Location	Pressbox
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base.
Ceiling Finishes	Painted gyp. bd.
Signage	Room signage.
Furnishing	None.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements. Provide mop sink, floor drain.
Other Requirements	Provide adjustable storage wall mount organizer with 3 grip hooks; 2-tier, built-in shelves with paint finish.

5.0 ROOM REQUIREMENTS

Press Box



Description	Requirements
Location	Press Box
Area/Dimensions	Per Programming Document design
Floor Finishes	Vinyl composition tile
Wall Finishes	Plaster & paint concrete walls; paint gyp. bd. walls; rubber wall base
Ceiling Finishes	Acoustical ceiling tile
Signage	Room signage.
Furnishing	Refer to FF&E Document.
System Requirements	Refer to Structural/Mechanical/Fire Protection/Electrical/Telecom requirements.
Other Requirements	Locate at second floor level with third floor roof deck access and two means of egress. Provide two tier interior seating levels; built-in counters along full length of wall with panoramic windows and min. 20FT 6IN at second tier.

ATTACHMENT B-12



Department of Education

Responsible, Respectful, and Ready for Life

Simon A. Sanchez High School

Furniture, Fixtures, & Equipment

Programming Documents

Submitted By:

TRMA

Taniguchi Ruth Makio Architects

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SECTION 1 | DESIGN NARRATIVE

The Design Team's Furniture, Fixtures, and Equipment (FFE) Scope of Work is to specify FFE Items that fall under the Project's Construction Contract. These items will meet applicable Design Standards and will compliment the Interior Design Intent established for the new Simon Sanchez High School. Compliance to GDOE Program Requirements also stands as a key factor in selecting FFE items. Selections will enhance the school's educational environment and will be appropriate for the function of the various spaces.

Where applicable, single source manufacturers will be considered to promote consistent product quality and to also lower production/delivery costs via bulk pricing. This will provide better value for Simon Sanchez High School overall.

Objectives:

- Aesthetically pleasing FFE Items will be chosen without compromising comfort, quality, and budget.
- Tables with adjustable height capability will be specified as necessary to achieve ADA compliance.
- Stackable chairs will be specified, where applicable, so that when they are not in use, they can be stacked for compact storage.
- FFE Selections will be coordinated with SSHS to ensure that they are compatible with current supply or maintenance contracts.

FFE Items will be identified based on which party will provide the items:

- General Contractor/FFE Contractor Scope of Work
- Owner Furnished / Contractor Installed
- Owner Furnished / Owner Installed

Abbreviations

ADA	Americans with Disabilities Act
BLS	Basic Life Skills
CTE	Career Technical Education
CU	Cubic
D	Depth
EA	Each
ESL	English as a Second Language
Exist	Existing
FFE	Furniture, Fixtures, and Equipment
FT	Feet
GC	General Contractor
H	Height
HCS	Health Careers Sciences
HPDE	High Density PolyEthylene
HPL	High Pressure Laminate
HT	Hospitality and Tourism
JROTC	Junior Reserve Officers' Training Corps
L	Length
LF	Linear Feet
MSRP	Manufacturer's Suggested Retail Price
OFCI	Owner Furnished Contractor Installed
OFOI	Owner Furnished Owner Installed
PLAM	Plastic Laminate
PPE	Personal Protective Equipment
PVC	Poly(Vinyl Chloride)
QTY	Quantity
RM	Room
SF	Square Feet
SOW	Scope of Work
SPED	Special Education
SQ	Square
SSTL	Stainless Steel
TTL	Total
W	Width

SECTION 2 I FURNITURE, FIXTURE, AND EQUIPTMENT LIST

A	Desks
A1	*Admin Desk; Double Pedestal*
A2	*Admin Desk; Single Pedestal*
A3	*Admin Desk; Single Pedestal*
A4b	*Teacher Desk*
A5a	*Single Student Desk*
A5b	*Single Student Desk - ADA Compliant*
B	Workstations
B1a	*Student Laboratory Workstation*
B1b	*Student Laboratory Workstation - ADA Compliant*
B2a	*Computer Station; 60x30 @ Library Computer Lab*
B2b	*Computer Station; 48x30 @ Electronics Lab*
B2c	*Computer Station; 60x30 @Business Ed and ProStart*
B3	*Workbench; 64x54 @ Carpentry Work Shop (OFOI)*
B4	*Workbench; 72x30 @ Electronics Work Shop (OFOI)*
B5	*Workbench; 46x24 @ Carpentry Work Shop (OFOI)*
B6	*Workbench Automotive (OFOI)*
C	Tables
C1	*Conference Table @ Administration*
C2a	*Cafeteria Tables w/ Bench*
C2b	*Cafeteria Tables w/ Bench - ADA Compliant*
C3a	*2-Student Classroom; 60x24*
C3b	*2-Student Classroom Table - ADA Compliant; 60x24*
C4	*Art Studio Table @ Art Room*
C5	*Activity Table; 60x30 @ Chamoru Classrooms and Faculty Work Room*
C6	*Science Laboratory Table*
C7	*Café Table; 30" Round @ Staff-Faculty Lounge and Kitchen Staff Lunchroom*
C8	*Café Table @ Credit Recovery Common Room*
C9a	*Library Study Table*
C9b	*Library Study Table - ADA Compliant*
C10	*Carrel*
C11	*Scoring Table @ Gymnasium*
C12	*Utility Table; 60x36 @ Automotive and Carpentry Classrooms*
C15	*Science Prep Laboratory Table*
C18	*Kite Mobile Flip-top Nest Table @ JROTC*
D	Seating
D1	*Executive Chair*
D2	*Office / Task Chair*
D3	*Reception Chair @ Waiting Areas*
D4	*Guest Chair*
D5	*Conference Room Chair*
D6	*Teacher Chair*
D7	*Student Chair*
D8	*Student Stool*

D9	*Café Chair*
D10a	*Task Chair*
D10b	*Task Chair/Stool*
D11	*Medical Stools*
D12a	*Music Chairs and Chair with Optional Move/Storage Cart*
D12b	*Music Chair Cart*
D13	*Library Chair*
D14	*Fixed Seating @ Auditorium*
D15	*Telescoping Bleachers @ Gymnasium*
D16	*Folding Chair*
D17a	*Locker Bench*
D17b	*Locker Bench - ADA Compliant*
D18	*Stackable Chair @ JROTC*
D19	*Assembly Chairs*
E	Audio-Visual / Telecom Equipment
E1	*Multi-Media Projector; Ceiling Mounted*
E2	*Projector Screen; Ceiling Mounted*
E3	*Promethean Board; Mobile*
E4	*Smart Television; Mobile*
E5	*Magnetic White Board; 4x12*
E6	*Magnetic White Board; Grid; 4x6*
E7	*Magnetic White Board; 4x8*
E8	*White Board; Rolling @ ProStart (OF* OI)
E9	*Magnetic White Board; 4x4*
E10	*Bulletin Board; 4x4*
E11	*Recycled Rubber Tackboard; 4x6*
E12	*Bulletin Board; 4x6*
E13	*Bulletin Board; 4x8*
E14	*Bulletin Board; 4x10*
E15	*Recycled Rubber Tackboard; 4x8*
E16	*Computer; Desktop or Laptop*
E17	*Telephone*
E18	*Magnetic White Board; 4x18*
E19	*Projector Screen; Ceiling Mounted @ JROTC Instructional Areas*
E20	*Interactive White Board; Wall-Mounted @ JROTC Instructional Areas*
E21	*Projector; Ceiling-Mounted @ JROTC*
E22	*Whiteboard; 4x8 @ JROTC Instructional Areas*
E23	*Bulletin Board; 4x8 @ JROTC*
F	Lockers
F1	*Double-Tier Lockers; Standard*
F2	*Double-Tier Lockers; Vented*
F3	*Double-Tier Lockers; Standard (17"D)*
F4	*Lockers @ JROTC Locker Rooms*
F5	*Lockers @ JROTC Staff Restroom*
G	Storage and Shelving

SECTION 2 I FURNITURE, FIXTURE, AND EQUIPTMENT LIST

G1	*Vertical File Cabinets; 5-Drawer*
G2	*Lateral File Cabinet; 4-Drawer*
G3a	*Library Shelving; Single-Faced*
G3b	*Library Shelving; Double-Faced*
G4	*Periodical Disply Racks @ Library*
G5	*Tote Tray Storage Cabinet @ Science Prep Room*
G6	*Safety Goggle Cabinet*
G7	*Microscope Storage Cabinet @ Science Prep Room*
G8	*Wood Storage for Acids and Corrosives @ Science Prep Room*
G9	*Wood Storage for Flammables @ Science Prep Room*
G10	*Storage Cabinet (6'H) @ Art Room*
G11	*Wood Storage Cabinet (7'H) @ Art Room*
G12	*Flat File @ Art Room*
G13	*Vertical Art Rack @ Art Room*
G14a	*Wire Shelving; 24x48 @ Kitchen*
G14b	*Wire Shelving; 14x48 @ Isolation Ante Room*
G15	*Trophy Display Case*
G16	*Teacher Mailbox Cubbies*
G17	*Metal Storage Cabinet @ JROTC (OFOI)*
G18	*Storage Cabinet; Mobile @ JROTC Instructional Rooms (OFOI)*
G19	*Vertical Filing Cabinet, 4-Drawer @ JROTC Instructor's Office*
G20	*Lateral Filing Cabinet, 4-Drawer @ JROTC Instructor's Office*
G21	*Storage Rack @ JROTC Supply Room (OFOI)*
G22	*Clothing Racks @ JROTC Supply Room (OFOI)*
G23	*Weapons Rack @ JROTC (OFOI)*
G24	*Storage Shelf @ ProStart Classroom*
G25	*Metal Storage Shelf @ ProStart Dry Storage*
G26	*Storage Cabinet @ HT Classroom*
G27	*Storage Locking Cabinet @ Electronics Classroom*
G28	*Equipment Storage Cabinet @ Business Classrooms*
H	Appliances
H1	*Refrigerator*
H2	*Range*
H3	*Refrigerator; Top-Freezer*
H4	*Ice Maker*
H5	*Microwave*
H6	*Dishwasher*
H7	*Washer*
H8	*Dryer*
H9	*2-Tier Washer/Dryer*
H10	*Refrigerator @ JROTC Break Area*
H11	*Chest Freezer @ JROTC Break Area*
H12	*Microwave @ JROTC Break Area*
H13	*Ice Maker @ JROTC Break Area*
J	Equipment

SECTION 2 I FURNITURE, FIXTURE, AND EQUIPTMENT LIST

J1	*Clock*
J2	*Photocopier (OFOI)*
J3	*Laboratory Hood w/ Base Cabinet*
J4	*Safe (OFOI)*
J5	*Cash Register @ Marketing Lab/Store (OFOI)*
J6	*3-Door Refrigerated Merchandiser @ Marketing Lab/Store (OFOI)*
J7	*Compact Chest Freezer @ Marketing Lab/Store (OFOI)*
J8	*Refrigerator @ Marketing Lab/Store (OFOI)*
J9	*Security Mirror*
J10	*Exit Security Alarm*
J11	*Metal Detector*
J12	*Hand Sanitizer / Temperature Check Station*
J13a	*Serving Counter, Cold Food*
J13b	*Serving Counter, Cold Food (OFCI)*
J14a	*Braising Pan*
J14b	*Braising Pan (OFCI)*
J15	*Griddle*
J16	*Convection Oven*
J17	*Reach-In Refrigerator*
J18	*Holding Cabinet*
J19	*Salad Bar Food Prepration Table*
J20a	*Hot Food Serving*
J20b	*Hot Food Serving (OFCI)*
J21	*Milk Cooler*
J22	*Dishwasher*
J23	*Beverage Dispenser*
J24	*Book Cart @ Book Rooms*
J25	*Reach-In Refrigerator @ ProStart Kitchen Laboratory (OFOI)*
J26	*Freezer @ ProStart Kitchen Laboratory (OFOI)*
J27	*Range @ ProStart Kitchen Laboratory (OFOI)*
J28	*Dishwasher @ ProStart Kitchen Laboratory (OFOI)*
J29	*Convection Oven @ ProStart Kitchen Laboratory (OFOI)*
J30	*Charbroiler @ ProStart Kitchen Laboratory (OFOI)*
J31	*Work Table; 72x24 @ ProStart Kitchen Laboratory*
J32	*Deep Fryer @ ProStart Kitchen Laboratory*
J33	*Microwave @ ProStart Kitchen Laboratory*
J34	*Speed Racks @ ProStart Kitchen Laboratory*
J35	*Pan Carrier @ ProStart Kitchen Laboratory*
J36	*Portable Stage and Accessories*
J37	*Cabinet; Food Pan Carrier*
J38	*Work Table; 24x48 @ Cafeteria Kitchen*
J39	*2-Compartment Sink @ Cafeteria Kitchen*
J40	*Work Table; 7'W @ Cafeteria Kitchen*
J41	*Work Table; 2x7 @ Cafeteria Kitchen*
J42	*3-Compartment Sink @ Scullery*

SECTION 2 I FURNITURE, FIXTURE, AND EQUIPTMENT LIST

J43	*Work Table; 3x6 @ Scullery*
J44	*Work Table; 24x96 @ Scullery*
J45	*3-Compartment Sink w/ Drainboards @ ProStart Kitchen (OFCI)*
J46	*Work Table w/ Sink @ ProStart Kitchen (OFCI)*
J47	*Display Case @ Marketing Lab/Store (OFOI)*
J48	*Display Shelf Unit @ Marketing Lab/Store (OFOI)*
J49	*Food Warmer @ Marketing Lab/Store (OFOI)*
J50	*Slat Wall Panel; 4x8 @ Marketing Lab/Store (OFOI)*
J51	*Microwave Oven @ Marketing Lab/Store (OFOI)*
J52	*Storage Shelf @ Marketing Lab/Store (OFOI)*
J53a	*Cash Wrap; 72"W @ Marketing Lab/Store (OFOI)*
J53b	*Cash Wrap; 48"W @ Marketing Lab/Store (OFOI)*
J54	*Hand Sink w/ Side Splash@ Marketing Lab/Store (OFCI)*
J55	*Tool Grinder @ Carpentry Work Shop (OFOI)*
J56	*Metal Band Saw @ Carpentry Work Shop (OFOI)*
J57	*Floor Shear @ Carpentry Work Shop (OFOI)*
J58	*Tube Bender @ Carpentry Work Shop (OFOI)*
J59	*Drill Press/Milling Machine (OFOI)*
J60	*Table Saw @ Carpentry Work Shop (OFOI)*
J70	*Planer @ Carpentry Work Shop (OFOI)*
J71	*Radial Arm Saw @ Carpentry Work Shop (OFOI)*
J72	*Jointer @ Carpentry Work Shop (OFOI)*
J73	*Belt and Disc Sander @ Carpentry Work Shop (OFOI)*
J74	*Wood Band Saw @ Carpentry Work Shop (OFOI)*
J75	*Menu Board @ Marketing Lab/Store (OFOI)*
J76	*Book Desensitizer @ Library*
K	Classroom Miscellaneous Items
K1	*US Flag w/ Wall-Mounted Pole*
K2	*Guam Flag w/ Wall-Mounted Pole*
K3	*Murphy Bed @ HT Classroom*
K4	*Mirror (Demonstration Mirror)*
K5	*Vanity Mirror @ SPED BLS Classroom*
K6	*Mirror @ Dance Room and Weight Room*
K7	*Twin Bed Set*
K8	*Portable Room Divider; 8'H @ Art Room*
K9	*Lectern*
K10	*Mobile Cart for Laptops @ Business Class Room*
K11	*Podium @ JROTC Instructional Areas*
L	Fine Arts Items
L1	*Portable Stage Risers @ Auditorium Stage*
L2	*Portable Semi-Circular Risers at Choir Room*
L3	*Curtain System @ Auditorium Stage*
L4a	*Music Stand*
L4b	*Music Stand Cart*
M	Physical Education Items

SECTION 2 I FURNITURE, FIXTURE, AND EQUIPTMENT LIST

M1	*Interior Mult-Sport Scoreboard*
M2	*Gymnasium Roll-Up Divider Curtain*
M3	*Dead Lift Platforms*
M4a	*Power Rack*
M4b	*Safety Spotter Arms*
M5a	*Flat Weight Bench*
M5b	*Incline Weight Bench*
M5c	*Decline Weight Bench*
M6a	*Free Weight Tree*
M6b	*Bumper Plates; 10 lb Pair*
M6c	*Bumper Plates; 25 lb Pair*
M6d	*Bumper Plates; 35 lb Pair*
M6e	*Bumper Plates; 45 lb Pair*
M6f	*Bumper Plates; 5 lb Pair*
M7a	*Free Weight Bar*
M7b	*Barbell Collars*
M8a	*Dumbbell Rack*
M8b	*Dumbbell Set; 5-50 lbs*
M8c	*Dumbbell Set; 55-100 lbs*
M9	*Stationary Bike*
M10	*Treadmill*
M11	*Elliptical*
M12	*Table Tennis Table*
M13a	*Bleachers, 10 Rows*
M13b	*Bleachers, 3 Rows*
M13c	*Bleachers, 5 Rows*
M14	*Sideline Bench*
M15	*Combination Football/Soccer Goal*
M16a	*Basketball Hoops, Forward Folding*
M16b	*Basketball Hoops, Rear Folding*
M17	*Volleyball System*
M18	*Baseball Bases*
M19	*Portable Fence*
M20a	*Indoor Scoreboard*
M20b	*Outdoor Scoreboard (Football/Soccer)*
M20c	*Outdoor Scoreboard (Baseball)*
M21	*Portable Discuss Cage*
M20c	*Shot Cage*
N	Medical Items
N1	*Treatment Table @ Nurse's Sick Bay*
N2a	*Bed*
N2b	*Bed @ HCS Classroom (OFOI)*
N3	*Curtain System*
N4	*Medical Cabinet*
N5	*Shower Curtain @ Sick Bay Restroom*

SECTION 2 I FURNITURE, FIXTURE, AND EQUIPTMENT LIST

N7	*First Aid Kits*
P	Trash Containers
P1	*Trash Can; 8-Gallon*
P2	*Biohazard Waste Receptacle*
P3	*Trash Can; 30-Gallon*
P4	*Trash Can; 13-Gallon*
Q	Science Department Collateral Equipment
	Microscopes
	Aquariums
R	Health Careers and Science (HCS) Collateral Equipment
	Kneeling pads (to use during CPR training) (OFOI)
	Wheelchairs (OFOI)
	Nursing Mannequins (OFOI)
	Single head stethoscope (OFOI)
	Dual head stethoscope (OFOI)
	BP Cuff (Adult) (OFOI)
	BP Cuff (Child) (OFOI)
	BP Cuff (XL) (OFOI)
	Electronic thermometer with oral probe (OFOI)
	Physician Scales w/ height rod (OFOI)
	Pulse oximeters (OFOI)
	Standard walker (OFOI)
	Adjustable aluminum crutches (OFOI)
	Quad cane (OFOI)

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SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	MAIN OFFICE			
1	**LOBBY / VISITOR WAITING AREA - ROOM A153**			
D7	Guest Chair	10	---	ea
D2	Office/Task Chair (Greeter's Desk)	3	---	ea
G15	Trophy Display Case	5	---	ea
	Built-In Components			
	Greeter's Desk	1		unit
2	**PRINCIPAL OFFICE - ROOM A155**			
A1	Adminstration Desk; Double Pedestal	1	---	set
D1	Executive Chair	1	---	ea
D7	Guest Chair	6	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
E16	Computer	1		set
E17	Telephone	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
	Built-In Components			
	Base Cabinets with countertop, 3 tier shelving			
3	**TYPICAL ASSISTANT PRINCIPAL OFFICE (4 TOTAL) - ROOMS A156, A157, A158, AND A159**			
A1	Adminstration Desk; Double Pedestal	1	4	set
D1	Executive Chair	1	4	ea
D7	Guest Chair	2	8	ea
E9	Magnetic Whiteboard; 4x4	1	4	ea
E10	Cork Board; 4x4	1	4	ea
E16	Computer	1	4	set
E17	Telephone	1	4	ea
G1	File Cabinet (5-Drawer, Legal)	1	4	ea
P1	Trash Can; 8 gallon	1	4	ea
	Built-In Components			
	Base Cabinets with countertop, 3 tier shelving			
4	**BUSINESS OFFICE - ROOM A161**			
A2	Adminstration Desk; Single Pedestal	1	---	ea
D2	Office/Task Chair	1	---	ea
D7	Guest Chair	2	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J4	Safe (23"x59"x16")	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1		set
E17	Telephone	1	---	ea
	Built-In Components			
	Base Cabinets with countertop, 3 tier shelving			
5	**COMPUTER OPERATOR OFFICE - ROOM A165**			
A2	Adminstration Desk; Single Pedestal	1	---	ea
D2	Office/Task Chair	1	---	ea
D7	Guest Chair	2	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	2	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1		set
E17	Telephone	1	---	ea
	Built-In Components			
	Book Shelves; 5-tier			

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
6	**ADMIN CONFERENCE ROOM - ROOM A163**			
C1	Conference Table	2	---	ea
D5	Conference Room Chair	26	---	ea
E7	Magnetic White Board; 4x8	1	---	ea
	Interactive Display	1		unit
7	**COPY AREA**			
J2	Photocopier	1	---	ea
P4	Trash Can; 13 gallon			
	Heavy Duty Paper Shredder			
	Built-In Components			
	Book Shelves; 5-tier			
8	**VISITOR WAITING AREA (COUNSELING) - ROOM A174**			
D7	Guest Chair	5	---	ea
D2	Task Chair	3	---	ea
G1	File Cabinet (5-Drawer, Legal)	6	---	ea
E14	Cork Board; 4'x10'	1	---	ea
E16	Computer	3	---	set
E17	Telephone	3	---	ea
J2	Copier	1	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
	Built-In Components			
	Clerical Workstations /Counter	3		unit
	Sign-In Podium	1		unit
9	**VISITOR WAITING AREA - NURSE'S OFFICE - ROOM A174**			
D7	Guest Chair	4		
	Copier	1	---	ea
	Office Desk; Double Pedestal			
10	**TYPICAL COUNSELOR OFFICE (8 TOTAL) - ROOMS A180A, A180B, A180C, A180D, A180E, A180F, A180G, AND A180H**			
A3	Adminstration Desk; Single Pedestal	1	8	ea
D2	Office / Task Chair	1	8	ea
D7	Guest Chair	2	16	ea
G1	File Cabinet (5-Drawer, Legal)	1	8	ea
E9	Magnetic Whiteboard; 4x4	1	8	ea
E10	Cork Board; 4x4	1	8	ea
P1	Trash Can; 8 gallon	1	8	ea
E16	Computer	1	8	set
E17	Telephone	1	8	ea
	Surge Protectors		12	
	Multi-Media Projector		1	1
	Multi-Media Projecor Screen; Portable		1	
11	**HOLDING ROOM (2 TOTAL) - ROOMS A151a AND A151b**			
	Table	1	2	ea
D7	Student Chair	2	4	ea
12	**CUMULATIVE FILE STORAGE - ROOM A178**			
G2	Lateral File Cabinet; 4-Drawer	45		unit
C5	Activity Table; 60x30	1	---	ea
D2	Office / Task Chair	2	---	ea
13	**NURSE'S OFFICE / TRIAGE ROOM - ROOM A175**			
A2	Office Desk	1	---	ea
D2	Office / Task Chair	1	---	ea
D7	Guest Chair	2	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
H3	Refrigerator	1	---	ea
N4	Medical Cabinet; Wall-Mounted	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
P2	Biohazard Waste Receptacle; 8 gallon	1	---	ea
E16	Computer	1	8	set
E17	Telephone	1	8	ea
	Built-In Components			
	Casework Counter With Handwashing Station, Base Cabinets, and Overhead Cabinets	1		ea
14	**NURSE'S SICK BAY - ROOM A176**			
N1	Treatment Table	4	---	unit
N3	Curtain System	4	---	set
D11	Medical Stool	1	---	ea
	Built-In Components			
	Casework Counter With Sink, Base Cabinets, and Overhead Cabinets	1	---	unit
	Automated / Touchless Handwashing Station	1	---	ea
15	**ANTE ROOM - ROOM A177**			
D11	Medical Stool	2	---	ea
G14b	Wire Shelving	1	---	unit
	Built-In Components			
	Sink	1		ea
16	**ISOLATION ROOM - ROOM 177A**			
N2a	Bed	1	---	ea
D11	Medical Stool	1	---	ea
P2	Biohazard Waste Receptacle; 8 gallon	1	---	ea
	Built-In Components			
	Casework Counter With Sink, Base Cabinets, and Overhead Cabinets	1	---	unit
17	**NURSE'S OFFICE BATHROOM - ROOM A176A**			
N5	Shower Curtain with Rod	1		
	Built-In Components			
	Adult Changing Station	1		
18	**CONFERENCE ROOM (CRT/COUNSELING) - ROOM A181**			
C1	Conference Table	1	---	ea
D5	Conference Room Chair	12	---	ea
E7	Magnetic Whiteboard; 4x8	1		
	Multi-media Projector	1		
19	**ESL COORDINATOR - ROOM A183**			
A2	Office Desk, Single Pedestal	1	---	set
D2	Office/Desk Chair	1	---	ea
D7	Guest Chair	2	---	ea
G1	File Cabinet (5-Drawer, Legal)	2	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
E16	Computer	1	---	ea
E17	Telephone	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
20	**CRT/ESL TESTING ROOM - ROOM A183a**			
A4b	Teacher Desk	1	---	ea
D6	Teacher Chair	1	---	ea
A5b	Single Student Table - ADA	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
21	**CRT OFFICES LOBBY - ROOM A182**			
D7	Guest Chair	3	---	ea
21	**CRT OFFICES (4 TOTAL) - ROOMS A182a, A182b, A182d, AND A182e**			
A2	Office Desk	1	4	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
D2	Office/Desk Chair	1	4	ea
D7	Guest Chair	2	8	ea
G1	File Cabinet (5-Drawer, Legal)	1	4	ea
E9	Magnetic Whiteboard; 4x4	1	4	ea
E10	Cork Board; 4x4	1	4	ea
P1	Trash Can; 8 gallon	1	4	ea
E16	Computer	1	4	ea
E17	Telephone	1	4	ea
23	**CRT FILE ROOM - ROOM A182c**			
G1	File Cabinet (5-Drawer, Legal)	5		
24	**SPED RELATED SERVICES - ROOM A160**			
A2	Office Desk	1	---	ea
D2	Office/Desk Chair	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	ea
E17	Telephone	1	---	ea
25	**SCHOOL RESOURCES OFFICE (SRO) - ROOMS A151**			
A2	Office Desk; Single Person Pedestal	2	---	ea
D2	Office/Desk Chair	2	---	ea
D7	Guest Chair	4	---	ea
G1	File Cabinet (5-Drawer; Legal)	2	---	ea
E9	Magnetic Whiteboard; 4x4	2	---	ea
E10	Cork Board; 4x4	2	---	ea
P1	Trash Can; 8 gallon	2	---	ea
E16	Computer	2	---	ea
E17	Telephone	2	---	ea
26	**STORAGE / BOOK ROOMS - ROOMS A267, A268, A269, AND A270**			
J24	Book Cart	5	---	ea
	Bulletin			
	Built-In Components			
	Shelving	1	---	unit
29	**STAFF FACULTY LOUNGE - ROOM A169**			
C7	Café Table; 30" Round	8	---	ea
D9	Café Chair	32	---	ea
E7	Magnetic Whiteboard; 4x8	1	---	ea
E13	Cork Board; 4x8	1	---	ea
F3	Double-tier Locker	4	---	unit
G16	Teacher Cubbies/Large File Trays - 120 trays	2	---	unit
H1	Refrigerator	1	---	ea
H5	Microwave	1	---	ea
J1	Clock	1	---	ea
P3	Trash Can; 31-Gallon Recptacle	---	26	ea
E17	Telephone			
	Built-In Components			
	Counter w/ Sink	1		unit
30	**WORK ROOM / RESOURCE CENTER - ROOM A166**			
C5	Activity Table; 60x30	3	---	ea
D10a	Task Chair	11	---	ea
E7	Magnetic White Board; 4x8	1	---	ea
E13	Cork Board; 4x8	1	---	ea
J2	Copy Machine	1	---	ea
J1	Clock	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Die Cut Machine	1	---	ea
	Butcher Paper Rack	1	---	ea
	Laminating Machine	1	---	ea
	Paper Cutter	1	---	ea
	Binding Machine	1	---	ea
	Heavy Duty Hole Puncher	1	---	ea
	Television; 42" Wall-Mounted	1	---	ea
E17	Telephone			
	Built-In Components			
	Computer Station	5	---	unit
	Book Shelf/ Magazine Rack	1	---	unit
31	**HALLWAYS**			
F1	Double-Tier Lockers	---	333	unit
P3	Trash Can; 31-Gallon Recptacle	---	25	ea
32	**MAIN COURTYARD**			
P3	Trash Can; 31-Gallon Recptacle	---	10	ea
	RESTROOMS			
P1	Trash Can; 8 gallon	---	11	ea
P3	Trash Can; 31-Gallon Recptacle	---	26	ea
	CLASSROOMS			
33	**TYPICAL ENGLISH CLASSROOM: 9th/10th GRADE (7 TOTAL) - ROOMS B101, B102, B103, B104, B112, B113, AND B114**			
A4b	Teacher Desk	1	7	ea
K9	Lectern	1	7	ea
D6	Teacher Chair	1	7	ea
A5a	Single Student Table	26	182	ea
A5b	Single Student Table - ADA	2	14	ea
D7	Student Chair	28	196	ea
E3	Promethean Board	1	7	unit
E5	Magnetic Whiteboard; 4x12	1	7	ea
E12	Cork Board; 4x6	2	14	ea
E13	Cork Board; 4x8	3	21	ea
E14	Cork Board; 4x10	1	7	ea
	Multi-Media Projector			
G1	File Cabinet (5-Drawer, Legal)	1	7	ea
J1	Clock	1	7	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	7	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	7	set
P1	Trash Can; 8 gallon	1	7	ea
	Pencil Sharpeners, Electric	1	7	ea
E16	Teacher Laptop	1	7	ea
E17	Telephone	1	7	ea
	Built-In Components			
	Storage Closet	1	7	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	7	unit
34	**TYPICAL ENGLISH CLASSROOM: 11th/12th GRADE (4 TOTAL) - ROOMS B105, B106, B109, AND B111**			
A4b	Teacher Desk	1	4	ea
K9	Lectern	1	4	ea
D6	Teacher Chair	1	4	ea
C3a	2-Student Table	13	52	ea
C3b	2-Student Classroom Table - ADA	1	4	ea
D7	Student Chair	28	112	ea
E3	Promethean Board	1	4	unit
E5	Magnetic Whiteboard; 4x12	1	4	ea
E12	Cork Board; 4x6	2	8	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
E13	Cork Board; 4x8	3	12	ea
E14	Cork Board; 4x10	1	4	ea
	Multi-Media Projector	1	4	ea
G1	File Cabinet (5-Drawer, Legal)	1	4	ea
J1	Clock	1	4	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	4	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	4	set
P1	Trash Can; 8 gallon	1	4	ea
	Pencil Sharpeners, Electric	1	4	ea
E16	Teacher Laptop	1	4	ea
E17	Telephone	1	4	ea
	Built-In Components			
	Storage Closet	1	4	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	4	unit
35	**ENGLISH CLASSROOM: 11th/12th GRADE (2 TOTAL) - ROOMS B107 and 108**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
C3a	2-Student Table	13	26	ea
C3b	2-Student Classroom Table - ADA	1	2	ea
D7	Student Chair	28	56	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E10	Cork Board; 4x4	2	4	ea
E12	Cork Board; 4x6	4	8	ea
E14	Cork Board; 4x8	1	2	ea
	Multi-Media Projector	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
	Pencil Sharpeners, Electric	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Storage Closet	1	2	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	2	unit
36	**TYPICAL ESL ENGLISH CLASSROOM (2 TOTAL) - ROOMS A221 AND B115**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
A5a	Single Student Desk	16	32	ea
A5b	Single StudentDesk - ADA	2	4	ea
D7	Student Chair	20	40	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E12	Cork Board; 4x6	2	4	ea
E13	Cork Board; 4x8	2	4	ea
	Multi-Media Projector	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Storage Closet	1	2	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Book Shelf; 5-Tier, Heavy-Duty	1	2	unit
37	**TYPICAL SPED ENGLISH CLASSROOM (2 TOTAL)**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
A5a	Single Student Desk	12	24	ea
A5b	Single StudentDesk - ADA	2	4	ea
D7	Student Chair	14	28	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E10	Cork Board; 4x4	2	4	ea
E12	Cork Board; 4x6			
E13	Cork Board; 4x8	2	4	ea
	Multi-Media Projector	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Storage Closet	1	2	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	2	unit
	Cubby Hole Shelving	1	2	unit
38	**TYPICAL MATH CLASSROOM (11 TOTAL) - ROOMS B201, B202, B203, B204, B205, B206,B207,B208 B209, B210, B211**			
A4b	Teacher Desk	1	11	ea
K9	Lectern	1	11	ea
A5a	Single Student Table	26	286	ea
A5b	Single Student Table - ADA	2	22	ea
D7	Student Chair	28	308	ea
E3	Promethean Board	1	11	unit
E6	Magnetic Whiteboard; Grid; 4x6	2	22	ea
E12	Cork Board; 4x6	2	22	
E13	Cork Board; 4x8	3	33	ea
E14	Cork Board; 4x10	1	11	ea
	Multi-Media Projector	1	11	ea
G1	File Cabinet (5-Drawer, Legal)	1	11	ea
J1	Clock	1	11	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	11	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	11	set
P1	Trash Can; 8 gallon	1	11	ea
	Pencil Sharpeners, Electric	1	11	ea
E16	Teacher Laptop	1	11	ea
E17	Telephone	1	11	ea
	Built-In Components			
	Storage Closet	1	11	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	11	unit
39	**TYPICAL MATH CLASSROOM (2 TOTAL) - ROOMS B212 AND B213**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
A5a	Single Student Table	26	52	ea
A5b	Single Student Table - ADA	2	22	ea
D7	Student Chair	28	56	ea
E3	Promethean Board	1	2	unit

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
E6	Magnetic Whiteboard; Grid; 4x6	2	4	ea
E12	Cork Board; 4x6	5	10	ea
E13	Cork Board; 4x8	1	2	ea
	Multi-Media Projector	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
	Pencil Sharpeners, Electric	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Storage Closet	1	11	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	11	unit
40	**TYPICAL ESL MATH CLASSROOM - ROOM B214**			
A4b	Teacher Desk	1	---	ea
K9	Lectern	1	---	ea
D6	Teacher Chair	1	---	ea
A5a	Single Student Table	16	16	ea
A5b	Single Student Table - ADA	2	---	ea
D7	Student Chair	18	18	ea
E3	Promethean Board	1	---	unit
E6	Magnetic Whiteboard; Grid; 4x6	2	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	3	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
	Trash Can; 8 gallon	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	---	unit
41	**TYPICAL SPED MATH CLASSROOM - ROOM A103**			
A4b	Teacher Desk	1	---	ea
K9	Lectern	1	---	ea
D6	Teacher Chair	1	---	ea
A5a	Single Student Table	12	12	ea
A5b	Single Student Table - ADA	2	---	ea
D7	Student Chair	20	---	ea
E3	Promethean Board	1	---	unit
E6	Magnetic Whiteboard; Grid; 4x6	2	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	3	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	---	unit
	Cubby Hole Shelving	1	---	unit
42	**SCIENCE CLASSROOM: ANATOMY - ROOM A112**			
D6	Teacher Chair	1	---	ea
B1a	Science Lab Workstation: Forward Vision II	6	---	unit
B1b	Science Lab Workstation: Forward Vision 1 (ADA)	1	---	unit
D8	Laboratory Stool @ Workstations and Demonstration Table	29	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
G6	Lab Safety Goggle Cabinets	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	---	unit
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
	Eye Wash / Safety Shower	1	---	unit
43	**SCIENCE CLASSROOM: BIOLOGY (2 TOTAL) - ROOMS A113 AND A114**			
D6	Teacher Chair	1	2	ea
B1a	Science Lab Workstation: Forward Vision II	6	12	unit
B1b	Science Lab Workstation: Forward Vision 1 (ADA)	1	2	unit
D8	Laboratory Stool @ Workstations and Demonstration Table	29	58	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E10	Cork Board; 4x4	1	2	ea
E12	Cork Board; 4x6	2	4	ea
E14	Cork Board; 4x10	1	2	
	Multi-Media Projector	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
G6	Goggle Storage Cab	1	1	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
	Pencil Sharpeners, Electric	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Teacher Demonstration Table / Desk	1	4	unit
	Storage Closet	1	4	ea
	Mounted Shelves	1	4	unit
	Eye Wash / Safety Shower	1	4	unit
44	**SCIENCE CLASSROOM: BIOLOGY (2 TOTAL) - ROOMS A106, AND A115**			
D6	Teacher Chair	1	2	ea
B1a	Science Lab Workstation: Forward Vision II	6	12	unit
B1b	Science Lab Workstation: Forward Vision 1 (ADA)	1	2	unit
D8	Laboratory Stool @ Workstations and Demonstration Table	29	58	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E12	Cork Board; 4x6	2	4	ea
E13	Cork Board; 4x8	1	2	ea
E14	Cork Board; 4x10	1	2	
	Multi-Media Projector	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
G6	Goggle Storage Cab	1	1	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
	Pencil Sharpeners, Electric	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	4	unit
	Storage Closet	1	4	ea
	Mounted Shelves	1	4	unit
	Eye Wash / Safety Shower	1	4	unit
45	**SCIENCE CLASSROOM: CHEMISTRY - Room A107**			
D6	Teacher Chair	1	---	ea
B1a	Science Lab Workstation: Forward Vision II	6	---	unit
B1b	Science Lab Workstation: Forward Vision 1 (ADA)	1	---	unit
D8	Laboratory Stool @ Workstations and Demonstration Table	29	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
G6	Lab Safety Goggle Cabinets	1	---	ea
J1	Clock	1	---	ea
J3	Fume Hood w/ Base Cabinet	2	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	---	unit
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
	Eye Wash / Safety Shower	1	---	unit

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
46	**SCIENCE CLASSROOM: MARINE BIOLOGY - ROOM A110**			
B1a	Science Lab Workstation: Forward Vision II	6	---	unit
B1b	Science Lab Workstation: Forward Vision 1 (ADA)	1	---	unit
D6	Teacher Chair	1	---	ea
D8	Laboratory Stool @ Workstations and Demonstration Table	29	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	1	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	---	unit
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
	Eye Wash / Safety Shower	1	---	unit
47	**SCIENCE CLASSROOM: MARINE BIOLOGY - ROOM A111**			
B1a	Science Lab Workstation: Forward Vision II	6	---	unit
B1b	Science Lab Workstation: Forward Vision 1 (ADA)	1	---	unit
D6	Teacher Chair	1	---	ea
D8	Laboratory Stool @ Workstations and Demonstration Table	29	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	---	unit
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
	Eye Wash / Safety Shower	1	---	unit
48	**SCIENCE CLASSROOM: PERMACULTURE - ROOM A109**			
D6	Teacher Chair	1	---	ea
B1a	Science Lab Workstation: Forward Vision II	6	---	unit
B1b	Science Lab Workstation: Forward Vision I (ADA)	1	---	unit

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
D8	Laboratory Stool @ Workstations and Demonstration Table	29	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8			
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	---	unit
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
49	**SCIENCE CLASSROOM: PHYSICS (1 TOTAL) - ROOM A108**			
D6	Teacher Chair	1	---	ea
C6	Science Lab Table	14	---	ea
D7	Student Chair	28	---	ea
D8	Laboratory Stool	1	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4		---	ea
E12	Cork Board; 4x6	2	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	---	unit
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
	Eye Wash / Safety Shower	1	---	ea
50	**SCIENCE CLASSROOM: PHYSICAL SCIENCE (3 TOTAL) - ROOMS A117, A118, AND A119**			
D6	Teacher Chair	1	3	ea
C6	Science Lab Table	14	42	ea
D7	Student Chair	28	84	ea
D8	Laboratory Stool	1	3	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	3	ea
E10	Cork Board; 4x4	2	6	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	3	ea
J1	Clock	1	3	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	3	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	3	set

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
P1	Trash Can; 8 gallon	1	3	ea
	Pencil Sharpeners, Electric	1	3	ea
E16	Teacher Laptop	1	3	ea
E17	Telephone	1	3	ea
	Built-In Components			
	Teacher Demonstration Table / Desk	1	3	unit
	Storage Closet	1	3	ea
	Mounted Shelves	1	3	unit
51	**TYPICAL SCIENCE ESL CLASSROOM - ROOM A116**			
D6	Teacher Chair	1	---	ea
A5a	Single Student Table	16	16	ea
A5b	Single Student Table - ADA	2	---	ea
D7	Student Chair	18	18	ea
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	1	---	ea
E14	Cork Board; 4x10	1	---	ea
	Tables (free standing)	3	---	ea
	Multi-Media Projector	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
	Teacher Demonstration Table / Desk	1	---	ea
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
52	**SCIENCE PREP ROOM 3 - ROOM A138**			
G5	ToteTray Storage Cabinet	1	---	ea
G7	Microscope Storage Cabinet 30 Compartments, 48 x 16 x 84" H	1		ea
G8	Mounted Wood Storage for Corrosives and Acids	4	---	unit
G9	Mounted Wood Storage for Flammables	2	---	unit
C15	Laboratory Table; ChemGuard Top	1	---	ea
D7	Chairs	2	---	ea
	Paper Towel Dispenser	1	---	ea
	Soap Dispenser	1	---	ea
	Microscope	30	---	ea
	Built-In Components			
	Wall Mounted Cabinets		---	unit
	Floor Mounted Cabinets and Drawers w/ Counters		---	unit
	Open Storage Cabinets; 48" x 22" x 84"		---	unit
	Sink	1	---	ea
	Eye Wash / Safety Shower	1	---	ea
	Mounted Wood shelves w/ lip		---	unit
53	**SCIENCE PREP ROOM 1 - ROOM A135**			
G7	Microscope Storage Cabinet 30 Compartments, 48 x 16 x 84" H	1		ea
C15	Laboratory Table; ChemGuard Top	1		ea
D7	Chairs	2		ea
	Paper Towel Dispenser	1		ea
	Soap Dispenser	1		ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Microscope	30		ea
	Built-In Components			
	Wall Mounted Cabinets			unit
	Floor Mounted Cabinets and Drawers w/ Counters			unit
	Open Storage Cabinets; 48" x 22" x 84"			unit
	Sink	1		ea
	Eye Wash / Safety Shower	1	---	ea
54	**SCIENCE PREP ROOM 2 - ROOM A137**			
C15	Laboratory Table; ChemGuard Top	1	---	ea
D7	Stackable Chairs	2	---	ea
	Paper Towel Dispenser	1	---	ea
	Soap Dispenser	1	---	ea
	Built-In Components			
	Wall Mounted Cabinets		---	unit
	Floor Mounted Cabinets and Drawers		---	unit
	Open Storage Cabinets; 48" x 22" x 84"		---	unit
	Sink	1	---	ea
	Eye Wash / Safety Shower	1	---	ea
55	**TYPICAL SOCIAL STUDIES CLASSROOM (7 TOTAL) - ROOMS A204, A205, A206, A207,**			
A4b	Teacher Desk	1	7	ea
K9	Lectern	1	7	ea
A5a	Single Student Table	26	182	ea
A5b	Single Student Table - ADA	2	14	ea
D6	Teacher Chair	1	7	ea
D7	Student Chair	28	196	ea
E3	Promethean Board	1	7	unit
E5	Magnetic Whiteboard; 4x12	1	7	ea
E12	Cork Board; 4x6	2	14	ea
E13	Cork Board; 4x8	3	21	ea
E14	Cork Board; 4x10	1	7	ea
G1	File Cabinet (5-Drawer, Legal)	1	7	ea
J1	Clock	1	7	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	7	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	7	set
P1	Trash Can; 8 gallon	1	7	ea
	Pencil Sharpeners, Electric	1	7	ea
E16	Teacher Laptop	1	7	ea
E17	Telephone	1	7	ea
	Built-In Components			
	Storage Closet	1	7	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	7	unit
56	**TYPICAL ESL SOCIAL STUDIES CLASSROOM (1 TOTAL) - ROOM A219**			
A4b	Teacher Desk	1	---	ea
K9	Lectern	1	---	ea
A5a	Single Student Table	16	---	ea
A5b	Single Student Table - ADA	2	---	ea
D6	Teacher Chair	1	---	ea
D7	Student Chair	18	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	3	---	ea
E14	Cork Board; 4x10	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
P1	Trash Can; 8 gallon	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Mounted Shelves	1	---	unit
57	**SPED BASIC LIFE SKILLS (BLS) (2 TOTAL) - ROOMS A104 AND A105**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
A5a	Single Student Table	12	24	ea
A5b	Single Student Table - ADA	2	4	ea
D7	Student Chair	14	28	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E12	Cork Board; 4x6	1	2	ea
E13	Cork Board; 4x8	1	2	ea
E14	Cork Board; 4x10	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
H1	Refrigerator	1	---	ea
H2	Stove w/ front controls	1	---	ea
H5	Microwave	1	---	ea
H7	Washer	1	---	ea
H8	Dryer	1	---	ea
J1	Clock	1	2	ea
N5	Shower Curtain with Rod @ Shower	1	---	set
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
K5	Mirrors (at Vanity Counters)	1	2	ea
K7	Twin Bed	1	2	set
N1	Treatment Table	1	2	unit
P1	Trash Can; 8 gallon	1	2	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Wireless Microphone			
	Built-In Components			
	Storage Closet	1	2	ea
	ADA Restroom w/ Shower	1	---	unit
	ADA Vanity Counter w/ Sink	1	2	unit
	ADA Kitchen Counter / Cabinets w/ sink and hood	1	---	unit
	Adult Changing Station	1	---	ea
	Book Shelf	1	2	unit
	Cubby Hole Shelving	1	2	unit
58	**BUSINESS EDUCATION (6 TOTAL) - ROOMS A208, A209, A210, A211, A214, AND A215**			
A4b	Teacher Desk	1	6	ea
K9	Lectern	1	6	ea
D6	Teacher Chair	1	6	ea
B2c	Computer Table; Portable	14	84	ea
D7	Student Chairs	28	168	ea
E3	Promethean Board ~ 3 Boards Existing	1	6	unit
E5	Magnetic Whiteboard; 4x12	1	6	ea
E12	Cork Board; 4x6	2	12	ea
E13	Cork Board; 4x8	3	18	ea
E14	Cork Board; 4x10	1	6	ea
G1	File Cabinet (5-Drawer, Legal)	1	6	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
K10	Mobile Cart (For Student Laptops)	1	6	ea
G28	Equipment Storage Cabinets	1	6	unit
J1	Clock	1	6	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	6	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	6	set
E16	Laptop	30	180	ea
E17	Telephone	1	6	ea
P1	Trash Can; 8 gallon	1	6	ea
	Built-In Components			
	Storage Closet	1	6	
	Mounted Shelves	1	6	
59	**ART ROOM - ROOMS A101, A102**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
C4	Art Studio Table	6	12	ea
D7	Student Chair	24	48	ea
E5	Magnetic Whiteboard; 4x12	1	2	ea
E11	Recylcle Rubber Tackboard; 4x6	5	10	ea
E15	Recylcle Rubber Tackboard; 4x8	3	---	ea
G10	Storage Cabinet; 6'H	2	4	ea
G11	Storage Cabinet; 7'H	3	6	ea
G12	Flat File	2	4	ea
P1	Trash Can; 8 gallon	1	2	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Industrial Sink w/ Multiple Faucets	1	2	ea
60	**ART ROOM STORAGE - ROOMS A101A AND A101B**			
G11	Storage Cabinet; 7'H	6	---	ea
G13	Vertical Art Rack	5	10	ea
K8	Portable Room Dividers, 8'H	2	---	ea
61	**PHYSICAL EDUCATION CLASSROOM - ROOM B116**			
A4b	Teacher Desk	1	---	ea
K9	Lectern	1	---	ea
D6	Teacher Chair	1	---	ea
A5a	Single Student Table	26	---	ea
A5b	Single Student Table - ADA	2	---	ea
D7	Student Chair	28	---	ea
E3	Promethean Board	1	6	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E13	Cork Board; 4x8	3	---	ea
E14	Cork Board; 4x10	1	---	ea
	Multi-Media Projector	1	---	unit
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	---	unit
62	**HEALTH (2 TOTAL) - ROOMS A116 AND A117**			

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
A4b	Teacher Desk /Lectern	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
A5a	Single Student Table	26	52	ea
A5b	Single Student Table - ADA	2	4	ea
D7	Student Chair	28	56	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E12	Cork Board; 4x6	2	4	ea
E13	Cork Board; 4x8	3	6	ea
E14	Cork Board; 4x10	1	2	ea
	Multi-Media Projector	1	2	unit
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
	Pencil Sharpeners, Electric	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Storage Closet	1	2	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	2	unit
63	**HEALTH - ROOM C122**			
A4b	Teacher Desk	1	---	ea
K9	Lectern	1	---	ea
D6	Teacher Chair	1	---	ea
A5a	Single Student Table	26	---	ea
A5b	Single Student Table - ADA	2	---	ea
D7	Student Chair	28	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	1	---	ea
E12	Cork Board; 4x6	2	---	ea
E14	Cork Board; 4x10	2	---	ea
	Multi-Media Projector	1	---	unit
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P1	Trash Can; 8 gallon	1	---	ea
	Pencil Sharpeners, Electric	1	---	ea
E16	Teacher Laptop	1	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	---	unit
64	**WORLD LANGUAGE (2 TOTAL) - ROOMS A212 AND A213**			
A4b	Teacher Desk	1	2	ea
K9	Lectern	1	2	ea
D6	Teacher Chair	1	2	ea
A5a	Single Student Table	26	52	ea
A5b	Single Student Table - ADA	2	4	ea
D7	Student Chair	28	56	ea
E3	Promethean Board	1	2	unit
E5	Magnetic Whiteboard; 4x12	1	2	ea
E10	Cork Board; 4x4	2	4	ea
E12	Cork Board; 4x6	2	4	ea
E13	Cork Board; 4x8	3	6	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
E14	Cork Board; 4x10	2	4	ea
	Multi-Media Projector	1	2	unit
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
J1	Clock	1	2	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	2	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	2	set
P1	Trash Can; 8 gallon	1	2	ea
	Pencil Sharpeners, Electric	1	2	ea
E16	Teacher Laptop	1	2	ea
E17	Telephone	1	2	ea
	Built-In Components			
	Storage Closet	1	2	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	3	unit
65	**CHAMORU (4 TOTAL) - ROOMS A201, A202, A203, AND A220**			
A4b	Teacher Desk	1	4	ea
K9	Lectern	1	4	ea
D6	Teacher Chair	1	4	ea
C5	Activity Table; 60x30	14	56	ea
D7	Student Chair	28	112	ea
E3	Promethean Board	1	4	unit
E5	Magnetic Whiteboard; 4x12	1	4	ea
E12	Cork Board; 4x6	2	8	ea
E13	Cork Board; 4x8	3	12	ea
E14	Cork Board; 4x10	1	4	ea
	Multi-Media Projector	1	4	unit
	Mobile Carts (for 'devices')	1	4	ea
E2	Large Projector Screen	1	4	ea
	Speakers	1	4	set
	Document Camera (such as ELMO)	1	4	
G1	File Cabinet (5-Drawer, Legal)	1	4	ea
	Locker Storage (for bookbags?)			
J1	Clock	1	5	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	4	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	4	set
P1	Trash Can; 8 gallon	1	4	ea
	Pencil Sharpeners, Electric	1	4	ea
E16	Teacher Laptop	1	4	ea
E17	Telephone	1	4	ea
	Built-In Components			
	Storage Closet	1	4	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	4	unit
66	**CLASSROOM (TOTAL 9) - ROOMS C103, C104, C105, C116, C117, C118, C119, C120, AND C121**			
A4b	Teacher Desk /Lectern	1	9	ea
K9	Lectern	1	9	ea
D6	Teacher Chair	1	9	ea
A5a	Single Student Table	26	234	ea
A5b	Single Student Table - ADA	2	18	ea
D7	Student Chair	28	252	ea
E3	Promethean Board	1	9	unit
E5	Magnetic Whiteboard; 4x12	1	9	ea
E10	Cork Board; 4x4	1	9	ea
E12	Cork Board; 4x6	2	18	ea
E14	Cork Board; 4x10	2	18	ea
	Multi-Media Projector	1	9	unit
G1	File Cabinet (5-Drawer, Legal)	1	9	ea
J1	Clock	1	9	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
K1	US Flag w/ wall-mounted pole; 16"x24"	1	9	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	9	set
P1	Trash Can; 8 gallon	1	9	ea
	Pencil Sharpeners, Electric	1	9	ea
E16	Teacher Laptop	1	9	ea
E17	Telephone	1	9	ea
	Built-In Components			
	Storage Closet	1	9	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	9	unit
67	**BAND ROOM - ROOM A224**			
D12a	Music Chair	30	---	ea
D12b	Music Chair Storage Cart	1	---	set
L4a	Music Stand	40	---	ea
L4b	Music Stand Cart	1	---	ea
L5	Conductor's Podium	1	---	ea
G15	Trophy Display Case	1	---	ea
	Digital Piano	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
	Built-In Components			
	Cubby 30-Hole Shelving	1	---	ea
68	**CHOIR ROOM - ROOM A223**			
L2	Portable Semi-Circular Risers	4	---	unit
D12a	Music Chair	50	---	ea
D12b	Music Chair Storage Cart	1	---	set
L4a	Music Stand	50	---	ea
L4b	Music Stand Cart	2	---	ea
L5	Conductor's Podium	1	---	ea
G15	Trophy Display Case	1	---	ea
	Digital Piano	1	---	ea
	Piano bench with pedal	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
	Multimedia Projector Screen	1	---	ea
	Cajon	1	---	ea
	Djembe	1	---	ea
	Drum set 5-piece	1	---	ea
	Built-In Components			
	Cubby 30-Hole Shelving	1	---	ea
69	**DANCE ROOM - ROOM A222**			
K6	Mirror; 6x8	2		ea
	Ballet Bars			
P1	Trash Can; 8 gallon	1	---	ea
	Built-In Components			
	Cubby 30-Hole Shelving	1	---	unit
70	**CHOIR PRACTICE ROOM (2 TOTAL) - ROOM A227B**			
	Digital Piano	1	2	ea
71	**BAND PRACTICE ROOM (2 TOTAL) - ROOMS A226C AND A226E**			
72	**BAND STORAGE - ROOM A265**			
	Upright Bass			
	Clarinet B♭			
	Bass Clarinets			
	2 Piccolos			
	6 Flutes			
	1 Oboe			
	1 Bassoon			
	Saxophone, alto			
	Saxophone, soprano			

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Saxophone, tenor			
	10 Saxaphones, baritone			
	Tumpet			
	Trombone, tenor			
	Trumbone, bass			
	2 Euphoniums			
	2 Tuba			
	1 Sousaphones			
	4 French (Double) Horns			
	1 Conga & Bongo set			
	1 Djembe			
	2 Concert snare drums with stands			
	2 Floor Toms			
	1 36" Base Drum			
	1 suspended cymbals with stand			
	Drum set, 5-piece			
	Piano bench with pedal			
	1 36" Gong with stand			
	1 Tubular Bells			
	1 Mark Tree Wind Chimes			
	1 Woodblock, set			
	1 Bell Kit/Glockenspiel			
	1 Marimba			
	1 Xylophone			
	1 Percussion table			
	Piano, digital			
	Keyboard, digital			
	1 Set of 4 Timpani			
	Microphone stand with boom	6		
	Microphone, wireless	2		
	Dynamic vocal microphones	4		
	Condenser microphones	4		
	Soundboard	2		
	Loud speaker	2		
	Subspeaker	1		
	Guitar amplifier	2		
	Bass amplifier	2		
	Piano amplifier	2		
	Acoustic electric guitar	2		
	Electric guitar (hallow body)	2		
	Electric Gguitar (strat)	2		
	Electric Guitar (tele)	2		
	Bass guitar	2		
	Built-In Components			
	Adjustable Shelving to suffucient to store: 1 Upright Bass, 8 Clarinets, 2 Piccolos, 6 Flutes, 1 Oboe, 1 Bassoon, 10 Saxaphones, 2 Trumpets, 16 Trumbones, 2 Euphoniums, 2 Tubas, 1 Sousaphones, 4 French (Double) Horns, 1 Conga & Bongo set, 1 Djembe, 2 Concert snare drums with stands, 2 Floor Toms, 1 36" Base Drum, 1 suspended cymbals with stand, 1 36" Gong with stand, 1 Tubular Bells, 1 Mark Tree Wind Chimes, 1 Woodblock set, 1 Bell Kit/Glockenspiel, 1 Marimba, 1 Xylophones, 1 Percussion table, 1 Set of 4 Timpani		---	unit
72	**BAND INSTRUCTOR OFFICE - ROOM A224A**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
D6	Teacher Chair	1	---	ea
E9	White Board; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	unit
73	**CHOIR INSTRUCTOR OFFICE - ROOM A227A**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea
D6	Teacher Chair	1	---	ea
E9	White Board; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	unit
74	**BOOK ROOM (A267,A268,A269,A270)**			
J24	Book Carts; Steel, 3-tiered, w/ casters	5	---	ea
	Built-In Components			
	Shelving			
	GCC CTE CLASSROOMS			
75	**PROSTART CLASSROOM - ROOM C107**			
A6	Teacher (Chef) L-Shaped Desk w/ Double Pedestal	1	---	ea
	Computer			
D6	Teacher Chair	1	---	ea
B2c	Student Computer Table (for 3 computers)		---	ea
D7	Student Chair	20	---	ea
J1	Clock	1	---	ea
P3	Trash Can; 31-Gallon Receptacle	---	1	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	2		ea
	Storage Shelf	1	---	ea
	Tables; Square, Mobile	9	---	ea
E1	Projector; Mounted	1	---	ea
E2	Projector Screen; Ceiling-Mounted	1	---	ea
E3	Promethean Board	1	---	unit
G1	File Cabinet (5-Drawer, Legal)	2	---	ea
	Whiteboard, Rolling	1	---	ea
	Built-In Components			
	Storage Shelf			
	Bookshelf			
	Printer Counter	2	---	unit
76	**PROSTART KITCHEN LABORATORY - ROOM C108**			
J25	Refrigerator; Reach-In	2	---	ea
J26	Freezer; Reach-In	2	---	ea
J27	4 Burner Range w/ griddle and oven	2	---	ea
J29	Convection Oven	1	---	ea
J28	Dishwasher	1	---	ea
J30	Charbroiler; Countertop	2	---	ea
J31	NSF SSTL Work Table; 72x24	5	---	ea
J45	3-Compartment Sink w/ 2 drain boards	1	---	ea
J46	Work Table w/ Sink	2	---	ea
J34	Speed Racks	3	---	ea
J35	Cambros	2		
P3	Trash Can; 31-Gallon Receptacle	---	1	ea
J33	Microwave	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Food Service Work Tables; Portable w/ Shelving	8	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Hood System- Cooking			
	Hood System- Dishwasher Machine			
77	**PROSTART KITCHEN DRY STORAGE - ROOM C107a**			
G14a	Wire Shelving with 6 Shelves	5	---	ea
78	**PROSTART KITCHEN EQUIPTMENT ROOM**			
	Cabinet for electronics storage			
	Cabinet for uniform storage			
79	**HOSPITALITY AND TOURISM (HT) - ROOM C106**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea
D6	Teacher Chair	1	---	ea
C3a	Student Table	9	---	ea
C3b	2-Student Classroom Table - ADA	1	---	ea
D7	Student Chair	20	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	2	---	ea
E14	Cork Board; 4x10	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
K3	Murphy Bed		---	
	Metal Storage Cabinet			
	Student Laptops	20		set
	Banquet Table	5	---	ea
	Chair	50	---	ea
P3	Trash Can; 31-Gallon Receptacle	---	1	ea
	Built-In Components			
	Storage Closet	1	---	ea
	Counter (mock front desk/hostess station)	1	---	unit
	Storage Cabinets	1	---	unit
	Bookshelves	1	---	unit
80	**LAUNDRY / CUSTODIAL ROOM (PROSTART & HT) - ROOM C106a**			
H9	Stackable Washer and Dryer			
	Chemical Metal Storage Cabinet, Large			
	Metal Storage Cabinet, Large			
	Built-In Components			
	Utility Sink			
	Mop sink			
	Shelving			
81	**DISH WASH / BUSSING AREA (PROSTART & HT)**			
H14	Dishwasher			
J77	Overhead Drain Rack or Drying Shelf			
	Built-In Components			
	3-Compartment Sink			
	Garbage Disposal			
82	**MARKETING CLASSROOM - ROOM C102**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea
D6	Teacher Chair	1	---	ea
B2c	Retanglular Tables; Mobile	12	---	ea
D7	Student Chair	40	---	ea
E1	Multi-Media Projector; Ceiling-Mounted	1	---	set
E3	Promethean Board	1	---	unit

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	1	---	ea
E13	Cork Board; 4x8	1	---	ea
	Projector Screen			
	Desktop Computers	20	---	ea
	Printer	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
	Metal Storage Cabinet; Large	2	---	ea
	4 tier Metal Bookshelves	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	2	---	ea
	Built-In Components			
	Computer Stations	20	---	unit
	Storage Closet	1	---	ea
83	**MARKETING LAB / STUDENT STORE - ROOM C101**			
J5	Cash Register	3	---	ea
J6	3-Door Refrigerated Merchandizer	1	---	ea
J7	Compact Chest Freezer	1	---	ea
J8	Refrigerator	1	---	ea
J47	48" Laminate Metal Display Case	2	---	ea
J48	Display Shelf Unit	2	---	ea
J49	Food Warmer	1	---	ea
J50	Slat Wall Panel	1	---	ea
J51	Microwave; 1.6 cu.ft.	1	---	ea
J52	4-tier Heavy Duty Storage Shelf	2	---	ea
J53a	Cash Wrap; 72" W	1	---	unit
J53b	Cash Wrap; 48" W	2	---	unit
J54	Handwash Station	1	---	unit
J75	Menu Board (White Board)	1	---	ea
	6 tier 48 x 72 display shelves	2	---	ea
	Built-In Components			
	Food Prep Counter	1	---	unit
	Display Counter	1	---	unit
	Mop Sink	1	---	unit
84	**HEALTH CAREERS SCIENCES (HCS) CLASSROOM - ROOM C109**			
A4	Teacher Desk w/ Double Pedestal	1	---	ea
D6	Teacher Chair	2	---	ea
A5a	Single Student Table	18	---	ea
A5b	Single Student Table - ADA	2	---	ea
D7	Student Chair	20	---	ea
E3	Promethean Board	1	---	unit
E5	Magnetic Whiteboard; 4x12	1	---	ea
E10	Cork Board; 4x4	2	---	ea
E14	Cork Board; 4x10	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
	Computer Set	4	---	set
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
	Portable white board w/ wheels (3' x 4')	2	---	ea
	Smartboard w/ multi-media projector	1	---	unit
	Desktop Computer	4		set
	Metal Storage Cabinet; Large	6		
	4-Drawer Metal Filing Cabinet	2		
	2-Drawer Metal Filing Cabiner	2		

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Metal Bookshelves (3 or 4-tier)	2		
N2b	Sick Bed	4	---	ea
N3	Curtains	4	---	set
D11	Medical Stool	4	---	ea
	Kneeling pads (to use during CPR training)	4		
	Wheelchairs	2		
	Nursing Mannequins	2		
	Single head stethoscope	20		
	Dual head stethoscope	2		
	BP Cuff (Adult)	20		
	BP Cuff (Child)	5		
	BP Cuff (XL)	2		
	Electronic thermometer with oral probe	4		
	Physician Scales w/ height rod	2		
	Pulse oximeters	2		
	Standard walker	1		
	Adjustable aluminum crutches	1		
	Quad cane	1		
	Built-In Components			
	Storage Closet	1	---	ea
	Demonstration Counter	1	---	ea
	Computer Workstation	4	---	unit
	Cabinets and Storage Space	1	---	ls
	Sinks (at sick bed stations)	4	---	ea
85	**ELECTRONICS COMPUTER LAB - ROOM C111**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea
B8	Teacher Demonstration Table	1	---	ea
D6	Teacher Chair	2	---	ea
B2b	Computer Station; 48x30	20	---	ea
D10a	Task Chair	21	---	ea
E5	Magnetic Whiteboard; 4x12	1	---	ea
E12	Cork Board; 4x6	2	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
	Wire Mesh Cable Tray	4	---	ea
	Server Rack Cabinet	1	---	ea
	Built-In Components			
	Storage Closet	1	---	ea
86	**ELECTRONICS WORK SHOP - ROOM C110**			
C20	Workbench; 72x30	10	---	ea
D8	Student Stool	21	---	ea
E5	Magnetic Whiteboard; 4x12	1	---	ea
E13	Cork Board; 4x8	1	---	ea
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
	4 Drawing			
G27	Metal Office Storage Cabinet; Large	6	---	ea
	4-Drawer Metal Filing Cabinet	2	---	ea
	2-Drawer Metal Filing Cabiner	2	---	ea
	3-4 tier Metal Bookshelves	2	---	ea
	Built-In Components			
	Demonstration Table	1	---	ea
	Storage Closet	1	---	ea
	Cabinet with sink	1	---	ea
87	**CARPENTRY CLASSROOM - ROOM C114**			
C12	Utility Table; 60x30	5	---	ea
D7	Student Chair	20	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
E7	Magnetic Whiteboard; 4x8	1	---	ea
E14	Cork Board; 4x10	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
K9	Lectern	1	---	ea
	Computer Set	4	---	set
	Built-In Components			
	Computer Stations	4		unit
88	**CARPENTRY WORK SHOP - ROOM C115**			
B3	Workbench; 64x54	5	---	ea
B5	Workbench; 24x48			
D8	Stools	20	---	ea
J55	Tool Grinder	1	---	ea
J56	Metal Band Saw	1	---	ea
J57	Floor Shear	1	---	ea
J58	Tube Bender	1	---	ea
J59	Drill Press/Milling Machine	1	---	ea
J60	Table Saw	1	---	ea
J70	Planer	1	---	ea
J71	Radial Arm Saw	1	---	ea
J72	Jointer			
J73	Belt and Disc Sander	1	---	ea
J74	Wood Band Saw	1	---	ea
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
E7	Magnetic Whiteboard; 4x8	1	---	ea
	Storage for Hazardous Materials			
	Metal Bookshelves (3 or 4-tier)			
	Built-In Components			
	Storage Closet	1	---	ea
	Utility Sink			
89	**CARPENTRY OFFICE - ROOM C131**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea
D6	Teacher Chair	1	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	unit
90	**AUTOMOTIVE CLASSROOM - C112**			
C19	Utility Table; 72x24	5		
D7	Chairs	20		
E7	Magnetic Whiteboard; 4x8	1	---	ea
E14	Cork Board; 4x10	1	---	ea
J1	Clock	1	---	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	---	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	---	set
P3	Trash Can; 31-Gallon Receptacle	1	---	ea
K9	Lectern	1	---	ea
	Computer Set	10	---	set
	Built-In Components			
	Computer Stations	10	---	unit
	Storage Closet	1	---	unit
91	**AUTOMOTIVE WORK SHOP - ROOM C113**			
P3	Trash Can; 31-Gallon Receptacle	1	---	
E7	Magnetic Whiteboard; 4x8	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	Self-cleaning water dispenser			ea
	Storage for Hazardous Materials			
	Metal Bookshelves (3 or 4-tier)			
	Wheel Balander - Electronic Type (Road force capable)			
	Brake Lathe (Bench with disc and drum service attachments)			
	Workbench, 6' x 8'	2		
	Small Workbench with vises	2		
	Foldable Engine Hoist/Crane (2 ton)			
	Engine Stands			
	Cylinder head stands			
	Portable Crane (1/2 ton)			
	Floor jack stands			
	Tire changer with clamp			
	10-Drawer Mobile Workbench Tool Chest with Solid Wood Work Top, 52 in. W x 25 in.			
	24 Gauge Steel Frestanging Garage Cabinet (36.6"W x 72"H x 18.3"D)			
	Heavy Duty Metal Shelves (4 or 5-tier)			
B6	Workbench	2		
	Built-In Components			
	Wall mount paper towel tri-fold towel dispenser			
	Utility Sink			
92	**AUTOMOTIVE OFFICE - ROOM C127**			
A4b	Teacher Desk w/ Double Pedestal	1	---	ea
D6	Teacher Chair	1	---	ea
E9	White Board; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	1	---	ea
P1	Trash Can; 8 gallon	3	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	unit
	JROTC DEPARTMENT			
93	**JROTC: Instructional Areas / Learning Studios (3 bays) - ROOMS C124, C125, AND C126**			
A7	Student Desk/Chair Combo: Tablet Chair w/ Bookrack for 1 Bay	28	28	ea
C18	Student Table for 2 bays: Kite Mobile Flip-top Nest Table (Muzo); Dual Lock Caster	28	56	ea
D18	Stackable Chair for 2 bays: Burleigh Armless Stack Chair; Black	28	56	ea
E7	Magnetic Whiteboard; 48"x96" w/ dry eraser	2	6	set
E13	Cork Board w/ Aluminum Frame; 48" x 96"	1	3	ea
E19	Projector Screen, Ceiling-Mounted: Retractable; 100 inch	1	3	ea
E20	Interactive White Board; Wall-Mounted: 77" interactive / Digital Multi-Touch Interactive White Smart board	1	3	ea
E21	Projector; Ceiling-Mounted: Universal Projector Ceiling Mount Kit (ELPMBPJG); MDL; V12H808001	1	3	ea
G26	Storage Cabinet; Mobile: 5-Shelves, Locking Doors; 36" W x 18"D x 72" H	1	3	ea
K11	Podium: AlvinED Model # AMF26 Instructor Podium (color natural walnut); Flat-top; Locking Casters; Locking Cabinet	1	3	ea
J1	Clock	1	3	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	3	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	3	set
P1	Trash Can; 8 gallon	1	3	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
94	**JROTC: Multi-Use Purpose Training Facility - ROOM C134**			
E7	Magnetic Whiteboard; 48"x96" w/ dry eraser	1	1	set
E13	Cork Board; 4x8	2	2	ea
95	**JROTC: Arms Room - ROOM C150**			
G17	Metal Storage Cabinet: 2-Door, 4-Shelf, Lockable, Black, 36" W x 18" D x 72" H	4	---	ea
G23	Weapons Rack	1		ea
	Workbench	2		ea
	Built-In Components			
	Wall Cabinets			
	Shelves			
96	**JROTC: Battalion Headquarters - ROOM C143**			
	Computer set	5	---	unit
D18	Stackable Chairs: Burleigh Armless Stack Chair; Black	6	12	ea
E7	Magnetic Whiteboard, 4x8	2	---	ea
E12	Cork Board; 4x6	1	---	ea
G1	File Cabinet (5-Drawer, Legal)	3	---	ea
	Built-In Components			
	Computer Workstation	5	---	unit
97	**JROTC: Supply Room ROOM C148**			
G17	Metal Storage Cabinet: 2-Door, 4-Shelf, Lockable, Black, 36" W x 18" D x 72" H	8	---	ea
G21	Industrial Storage Rack: 5-Shelves, Stainless Steel, 36" W x 18" D x 72" H	6	---	ea
G22	Clothing Racks: ULINE Wall-Mounted Coat Rack with			
98	**JROTC: JCLC Field and Drill Team Equipment Storage Room C147**			
G17	Metal Storage Cabinet: 2-Door, 4-Shelf, Lockable, Black, 36" W x 18" D x 72" H	6	---	ea
G21	Industrial Storage Rack: 5-Shelves, Stainless Steel, 36" W x 18" D x 72" H	6	---	ea
99	**JROTC: Conference Room / Computer Lab - ROOM C138**			
K11	Podium: AlvinED Model # AMF26 Instructor Podium (color natural walnut); Flat-top; Locking Casters; Locking Cabinet	1		
E7	Whiteboard; 48"x96" w/ dry eraser	2	---	set
E20	Interactive White Board; Wall-Mounted: 77" interactive / Digital Multi-Touch Interactive White Smart board	1	1	ea
E19	Projector Screen, Ceiling-Mounted: Retractable; 100 inch	1	1	ea
E21	Projector; Ceiling-Mounted: Universal Projector Ceiling Mount Kit (ELPMBPJG); MDL; V12H808001	1	1	ea
C19	Conference Table: 10-Person Seating	1	1	ea
D18	Stackable Chair: Burleigh Armless Stack Chair; Black	25	25	ea
P1	Trash Can; 8 gallon	1	---	ea
	Built-In Components			
	Workstation	5	---	unit
100	**JROTC: Instructor Offices - ROOM C149**			
A4b	Teacher Desk w/ Single Pedestal, Locking Drawers	1	3	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
D18	Stackable Chair: Burleigh Armless Stack Chair; Black	1	3	ea
E12	Whiteboard; 48"x96" w/ dry eraser	1	3	set
G19	Vertical Filing Cabinet, 4-Drawer: 2500 Series, 25-Inch Deep; Black	1	3	ea
G20	Lateral Filing Cabinet, 4-Drawer: 9600 Series (9330-4F1H), 30" W, Black	1	3	ea
G17	Metal Storage Cabinet: 2-Door, 4-Shelf, Lockable, Black, 36" W x 18" D x 72" H	1	3	ea
P1	Trash Can; 8 gallon	1	3	ea
101	**JROTC: Staff Collaboration (Break Area) / Copier Room - ROOM C146**			
C5	Work Table, 30x60	2	---	ea
D16	Chairs	5	---	ea
J2	Copy Machine	1	---	ea
	Inbox Center	1	---	ea
H10	Refrigerator	1	---	ea
H11	Chest Freezer	1	---	ea
H12	Ice Maker	1	---	ea
H13	Microwave	1	---	ea
	Coffee Pot	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
	Built-In Components			
	Base/Wall Cabinets w/ Countertop	1	---	unit
	Sink	1	---	ea
102	**JROTC: Male Cadet Restroom/Locker Rooms w/ Showers - ROOM C141**			
F2	Double-Tier Locker	8	---	ea
D17a	Bench	9		ea
P3	Trash Can; 31 gallon	1	---	ea
N5	Shower Curtain with Rod	9		set
103	**JROTC: Female Cadet Restroom/Locker Rooms w/ Showers - ROOM C139**			
F2	Double-Tier Locker	8	---	ea
D17a	Bench	9		ea
P3	Trash Can; 31 gallon	1	---	ea
N5	Shower Curtain with Rod	12		set
104	**JROTC: Staff Restroom - ROOM C136**			
F3	Double-tier Locker	1		
P1	Trash Can; 8 gallon	1	---	ea
	CAFETERIA / DINING HALL			
105	**CAFETERIA - ROOM C151**			
C2a	Table / Bench Set	39	---	unit
C2b	Table / Bench Set - ADA Compliant	5	---	unit
J1	Clock	2	---	
P3	Trash Can; 31-Gallon	4	---	ea
106	**SERVING AREA - ROOM C152**			
J20a	Hot Food Serving	1	---	ea
J20b	Hot Food Serving	1	---	ea
J13a	Serving Counter, Cold Food	1	---	ea
J13b	Serving Counter, Cold Food	1	---	ea
J21	Milk Cooler	2	---	ea
107	**KITCHEN - ROOM C153**			
J14a	Braising Pan	2	---	ea
J14b	Braising Pan	4	---	ea
J15	Griddle	1	---	ea
J16	Double-Stacked Convection Ovens	3	---	ea
J17	Reach-In Refrigerator	3	---	ea
J18	Holding cabinet	4	---	ea
J19	Salad Bar Food Preparation Table	2	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
J23	Beverage Dispenser	1	---	ea
J37	Portable Food Warmers	4	---	ea
J38	SSTl Work Table	5	---	ea
J39	SSTL Work Table w/ 2-Compartment Sink and Backsplash	4	---	unit
J40	SSTL Work Table w/ Backsplash	1	---	ea
J41	SSTL Work Table; 2x7 w/ Backsplash	2	---	ea
J1	Time Clock	1	---	ea
	Microwave	1	---	ea
P3	Trash Can; 31-Gallon	2	---	ea
	Built-In Components			
	Refrigerator; Walk-In	1	---	unit
	Freezer; Walk-in	1	---	unit
108	**KITCHEN MANAGER OFFICE - ROOM C155**			
A2	Office Desk	1	---	ea
D2	Office / Task Chair	1	---	ea
G1	File Cabinet (5-Drawer; Legal)	1	---	ea
E9	White Board; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
P1	Trash Can; 8 gallon	3	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	unit
109	**SCULLERY - ROOM C154**			
J22	Dishwasher	1	---	ea
J42	Work Table w/ 3-Compartment Sink and Backsplash	2	---	unit
J43	Work Table w/ Backsplash; 3x6	1	---	ea
J44	Work Table; 2x8	1	---	ea
P3	Trash Can; 31-Gallon	2	---	unit
110	**PANTRY - ROOM C159**			
G14a	Wire Shelving; 24x48	14		
111	**STORAGE - ROOM C160**			
G14a	Wire Shelving; 24x48	9		
112	**KITCHEN STAFF LOUNGE - ROOM C163**			
C7	Café Table; 30" Round	4	---	ea
D9	Chair	16	---	ea
E12	Cork Board, 4x6	1	---	ea
F3	Double-Tier Locker	2	---	unit
H1	Refrigerator	1	---	ea
H5	Microwave	1	---	ea
P1	Trash Can; 8 gallon	3	---	ea
	Built-In Components			
	Base/Wall Cabinets w/ Countertop	1	---	unit
	Sink	1	---	ea
	LIBRARY			
113	**MAIN AREA - ROOM A248**			
G3a	Library Shelving; Single-Faced	19	---	unit
G3b	Library Shelving; Double-Faced	40	---	unit
G4	Periodical Display Racks	2	---	unit
C9a	Study Table; Rectangular	13	---	ea
C9b	Study Table; Rectangular - ADA	2	---	ea
C10	Study Carrel	10	---	ea
D13	Library Chair	105	---	ea
D2	Office/Task Chair @ Circulation Desk	2	---	ea
E1	Ceiling-Mounted Projector	1	---	set
E2	Recessed Projector Screen	1	---	set
J1	Clock	1	---	ea
J9	Security Mirror	2	---	ea
J10	Exit Security Alarm System	1	---	set

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
P1	Trash Can; 8 gallon	3	---	ea
J76	Book Desensitizer	2	---	ea
	Built-In Components			
	Circulation Desk	1	---	unit
	Cubby holes for student book bags	1	---	unit
114	**LIBRARIAN OFFICE - ROOM A249**			
A2	Office Desk	1	---	ea
D2	Office/Task Chair	1	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer; Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	set
115	**LIBRARY TECHNICIAN OFFICE - ROOM A250**			
A2	Office Desk	2	---	ea
D2	Office/Task Chair	2	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer; Legal)	2	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Telephone	2	---	set
E17	Computer	2	---	set
116	**LIBRARY COMPUTER LAB - ROOM A256**			
B2a	Computer Table	18	---	ea
D7	Student Chair	36	---	ea
	Promethian Board (Existing)	1	---	ea
E1	Multi-Media Projector	1	---	ea
E2	Projector Screen; Ceiling-Mounted	1	---	ea
117	**MEDIA CENTER - ROOM A253**			
C18	Media Table	1	---	ea
D2	Office / Task Chair	5	---	ea
	AUDITORIUM			
	LOBBY - ROOM A185			
P3	Trash Can; 31-Gallon	1	---	unit
118	MAIN FLOOR - ROOM A191			
D14	Auditorium Seating	---	---	LOT
L1	Portable Stage Risers	5	---	set
L3	Proscenium Curtains (Front/Main Curtain)	1	---	set
	Masking Curtains			
	Backdrops or Cycloramas			
	Built-In Components			
	Multia-Media Projector			
	Rail System			
119	**DRESSINGS ROOMS - ROOMS A194, A194A, A195, AND A195A**			
D16	Chairs	4	16	
P3	Trash Can; 31-Gallon	1	---	unit
120	**ACTIVITIES DIRECTOR OFFICE - ROOM A189**			
A2	Office Desk	1	---	ea
D2	Office/Task Chair	1	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer; Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
	GYMNASIUM			
121	**COURT - ROOM B119**			
C11	Scoring Table	1	---	ea
D15	Telescoping Bleacher	6	---	unit
D16	Folding Chair (for Scoring Table)	5	---	ea
D16	Assembly Chairs, to be stored in A-Wing	600		ea
	Full-Tree Cart, 60 steel chair capacity	10		unit
J36	Portable Stage and Accessories	1	---	set
M1	Interior Multi Sport Score board	2	---	ea
M2	Roll-Up Gym Divider Curtain	2	---	set
P3	Trash Can; 31-Gallon	2	---	unit
M16a	Basketball Hoop, Forward Folding	2	---	unit
M16a	Basketball Hoop, Rear Folding	4	---	unit
M17	Volleyball System	2	---	set
M17a	Volleyball Transport Cart	1	---	unit
122	**TICKET BOOTH - ROOM B119A**			
E9	Magnetic Whiteboard; 4x4	1	---	ea
D16	Chairs	2		unit
	6FT Fold-in-Half Table	1		unit
	Built-In Components			
	5-Tier shelving			
123	**ATHLETIC DIRECTOR OFFICE - ROOM B151**			
A2	Office Desk	1	---	ea
D2	Office/Task Chair	1	---	ea
D7	Guest Chair	2	---	ea
E9	Magnetic Whiteboard; 4x4	1	---	ea
E10	Cork Board; 4x4	1	---	ea
G1	File Cabinet (5-Drawer; Legal)	1	---	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	---	set
E17	Telephone	1	---	ea
124	**PE OFFICE (2 TOTAL) - ROOMS B140 AND B142**			
A4b	Teacher Desk	4	8	ea
D6	Teacher Chair	4	8	ea
E9	Magnetic Whiteboard; 4x4	1	2	ea
E10	Cork Board; 4x4	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	4	8	ea
P1	Trash Can; 8 gallon	4	8	ea
E16	Computer	4	8	set
E17	Telephone	4	8	unit
125	**WEIGHT ROOM - ROOM B118**			
K6	Mirrors, 6'x6'	8	---	ea
M3	Dead Lift Platform	2	---	ea
M4a	Power Rack	2	---	set
M4b	Safety Spotter Arms, Pair	12	---	set
M5a	Flat Weight Bench	1	---	ea
M5b	Incline Weight Bench	1	---	ea
M5c	Decline Weight Bench	1	---	ea
M5d	Adjustable Weight Benches	2	---	ea
M6a	Free Weight Tree	6	---	ea
M6b	Bumper Plates; 10lb	8	---	pr
M6c	Bumper Plates; 25lb	8	---	pr
M6d	Bumper Plates; 35lb	8	---	pr
M6e	Bumper Plates; 45lb	8	---	pr
M6f	Bumper Plates; 5lb	8	---	pr
M7a	Free Weight Bar; 45lb	12	---	ea
M7b	Barbell Collars, Pair	10	---	pr
M8a	Dumbbell Rack	2	---	ea
M8b	Dumbell Set; 5-50 lbs	2	---	set
M8c	Dumbell Set; 55-100 lbs	1	---	set

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
126	**AEROBICS ROOM - ROOM 118A**			
M9	Stationary Bike	2	---	ea
M10	Treadmill	2	---	ea
M11	Elliptical	2	---	ea
M23	Rowing Machine	2	---	ea
127	**TABLE TENNIS ROOM - ROOM B117**			
M12	Table Tennis Table	12	---	ea
128	**MAT ROOM - ROOM B148**			
M24	Wrestling Mats	2	---	ea
M24a	Wrestling Mat Transporter	2	---	ea
129	**MALE LOCKER ROOM - ROOM B141**			
F2	Double-Tier Locker	20	---	unit
D17a	Bench	19	---	ea
D17b	Bench - ADA	2	---	ea
N5	Shower Curtain with Rod	23		set
	Whiteboard	1		
P3	Trash can; 31-GAL	1		ea
130	**FEMALE LOCKER ROOM - ROOM B143**			
F2	Double-Tier Locker	20	---	unit
D17a	Bench	19	---	ea
D17b	Bench - ADA	2	---	ea
	Whiteboard	1	---	ea
N5	Shower Curtain with Rod	28		set
P3	Trash can; 31-GAL	1		ea
131	**LAUNDRY ROOM - ROOM B153**			
H4	Ice Maker	1	---	ea
H7	Washer	1	---	ea
H8	Dryer	1	---	ea
	Built-In Components			
	Utility Sink	1	---	ea
	Shelving	1	---	unit
	CREDIT RECOVERY			
132	**OFFICE - ROOM D110**			
A3	Office Desk	1	2	ea
D2	Office/Task Chair	1	2	ea
D7	Guest Chair	2	4	ea
E9	Magnetic Whiteboard; 4x4	1	2	ea
E10	Cork Board; 4x4	1	2	ea
G1	File Cabinet (5-Drawer, Legal)	1	2	ea
P1	Trash Can; 8 gallon	1	---	ea
E16	Computer	1	2	set
E17	Telephone	1	2	unit
133	**COMMON AREA - ROOM D100**			
C8	Café Table	10	---	ea
D16	Folding Chair	40	---	ea
134	**CLASSROOM (4 TOTAL) - ROOMS D101, D102, D103, AND D104**			
A4a	Teacher Desk /Lectern	1	4	ea
A5a	Single Student Table	26	104	ea
A5b	Single Student Table - ADA	2	8	ea
D6	Teacher Chair	1	4	ea
D7	Student Chair	28	112	ea
E3	Promethean Board	1	4	unit
E5	Magnetic Whiteboard; 4x12	1	4	ea
E12	Cork Board; 4x6	3	12	ea
E13	Cork Board; 4x8	2	8	ea
E14	Cork Board; 4x10	1	4	ea

SECTION 3 | ROOM FFE INVENTORY

ITEM	DESCRIPTION	QTY / RM	TTL QTY	UNIT
G1	File Cabinet (5-Drawer, Legal)	1	4	ea
J1	Clock	1	4	ea
K1	US Flag w/ wall-mounted pole; 16"x24"	1	4	set
K2	Guam Flag w/ wall-mounted pole; 16"x24"	1	4	set
P1	Trash Can; 8 gallon	1	4	ea
	Multi-Media Projector			
	Pencil Sharpeners	1	4	ea
E16	Teacher Laptop	1	4	ea
E17	Telephone	1	4	ea
	Built-In Components			
	Storage Closet	1	4	ea
	Book Shelf; 5-Tier, Heavy-Duty	1	4	unit
135	**STORAGE - ROOM D109**			
	Mobile Laptop Cart			
	PRESS BOX BUILDING			
136	**PRESS BOX - ROOM F203**			
D16	Chair	15	---	ea
E17	Telephone	1	---	ea
	Built-In Components			
	Counter	2	---	units
	Sports Fields			
M13a	Bleachers, 10 Rows	4	---	sets
M13b	Bleachers, 3 Rows	8	---	unit
M13c	Bleachers, 5 Rows	6	---	units
M14	Sideline Bench	8	---	units
M15	Combination Football/Soccer Goal, Pair	1	---	set
M18	Baseball Bases, Set	1	---	set
M20a	Outdoor Scoreboard (Football/Soccer)	1	---	ea
M20b	Outdoor Scoreboard (Baseball/Soccer)	1	---	ea
M21	Portable Discuss Cage	1	---	set
M22	Portable Shot Cage	1	---	set
M25	High Jump Pit, Standards (Pair), and Crossbar	1	---	set

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SECTION 4 | FFE PRODUCT DATA SHEETS

Refer to Furniture Schedules, Sheets A8.18 & A8.19. Subject to compliance with the featured requirements indicated herein, provide products by one of the manufacturers indicated below and receive prior written approval by the Architect. The manufacturer shall certify that the substitute product meets or exceeds the stated design criteria.

A1 Administration Desk
- *10700 Series Desk; Double Pedestal*

A2 Administration Desk
- *10700 Series Desk; Single Pedestal*

A3 Administration Desk
- *10700 Series Desk; Small*

A4a Teacher Desk
- *Use A4b.*

A4b Teacher Desk
- *540 Series Teacher Desk; Double Pedestal*

A5a Single Student Desk
- *Text Series - Student Desks; Adjustable-Height*

A5b Student Desk (ADA)
- *Text Series - Student Desks; Adjustable-Height; 36" W*

A6 Teacher Desk
- *Stahl Double Pedestal L-Shaped Desk with Center Drawer. 66” W x 72”D*

A7 Teacher Desk
- *Use A4b.*

B1a Student Laboratory Workstation
- *Forward Vision II Four Student Workstation*

B1b Student Laboratory Workstation
- *Forward Vision I Four-Student Workstation (ADA)*

B2a Computer Station; 60x30 @ Library Computer Lab
- *Flip Top Technology Table*

B2b Computer Station; 48x30 @ Electronics Lab
- *Flip Top Technology Table*

B2c Computer Station; 60x30 @Business Ed and ProStart
- *Flip Top Technology Table*

B3 Workbench; 64x54 @ Carpentry Work Shop
- *4-Station 12-Locker Workbench*

B4 Workbench; 72x30 @ Electronics Work Shop
- *Industrial Workbench With Drawers*

B5 Workbench; 46x24 @ Carpentry Work Shop
- Adjustable Height Work Table

B6 Workbench ; 46x24
- Adjustable Height Work Table

B8 Workbench ; 30x72
- STEM Demonstration Table – Phenolic Top

C1 Administration Conference Table
- *Modern Conference Room Table*

C2a Cafeteria Tables w/ Seating
- *Mobile Bench Cafeteria Table*

C2b Cafeteria Tables /w Seating - ADA Compliant
- *Mobile Bench Cafeteria Table*

C3a 2-Student Classroom Tables; 60x24
- *Text Series - Tilt-Top Table; 60x24; Adjustable-Height*

C3b 2-Student Classroom Tables; 60x24 -ADA Compliant
- *Text Series - T-Leg Table; 60x24; Adjustable-Height*

C4 Art Studio Table @ Art Room
- *A2 Art Media Carrels*

C5 Activity Table
- *Utility Table; Butcher Block Top; 60x30*

C6 Science Laboratory Table
- *Adjustable Height Science Lab Table*

C7 Cafe Table
- *Mode Cafe Table*

C8 Cafe Table
- *46" Round Table*

C9a Library Study Table
- *Mobile EZ Tilt Table; 36x72*

C9b Library Study Table (ADA)
- *Mobile EZ Tilt Table; 36x72*

C10 Carrel
- *Elite Study Carrel*

C11 Scoring Table (Gymnasium)
- *Sport Pride Illuminated Scorer's Table*

C12 Utility Table; 60x36
- *Workbench; Butcherblock Top; 60x36*

C15 Science Laboratory Table
- *Adjustable Height Science Lab Table (Chemguard Top)*

C18 Single Student Desk
- *Kite Mobil Flip-top Nest Table; Dual Lock Caster*

C19 Dual Student Desk
- *At Work Flip Top Table; Dual Lock Caster*

C20 Dual Student Desk
- *Science Lab Table (Solid Epoxy Resin Top)*

D1 Executive Chair
- *Alero Executive Chair*

D2 Office / Task Chair
- *Mesh Back Office Chair Norwood Task Chair*

D3 Reception Chair
- *Use D7*

D4 Guest Chair
- *Use D7*

D5 Conference Room Chair
- *Modern Vinyl Task Chair*

D6 Teacher Chair
- *Crio High-Back Task Chair*

D7 Student Chair
- *Analogy Series Classroom Chair*

D8 Student Stool
- *6200 Series Heavy Duty Stools with Backrest, Black*

D9 Cafe Chair
- *Bushwick Cafe Chair*

D10a Task Chair
- *6700 Series Polyurethane (Kangaroo) Task Chair*

D10b Task Stool
- *6700 Series Polyurethane (Kangaroo) Stool*

D11 Medical Stools
- *Medical Stool*

D12a Music Chair
- *Nota Music Posture Chair*

D12b Music Chair Storage Cart

- *Chair Move and Store Cart*

D13 Library Chair
- *Jude Chair*

D14 Fixed Auditorium Chair
- *Fixed Quattro Series Traditional Auditorium Chair*

D15 Telescoping Bleachers
- *Maxam Retractable Wall Attached Telescopic Bleachers*

D16 Folding Chairs
- *AirFlex Premium Folding Chair*

D17a Locker Room Bench
- *Series 77780 Wood Locker Bench*

D17b Locker Room Bench - ADA Compliant
- *Series 77781-ADA Wood Locker Bench*

D18 Student Chair
- *Armless Stack Chair*

D19 Student Chair
- *Use D18.*

E1 Multi-Media Projector; Ceiling Mounted

E2 Projector Screen; Ceiling Mounted

E3 Promethean Board, Mobile

E4 Smart Television, Mobile

E5 Magnetic White Board; 4x12
- *M1 Series Porcelain Magnetic White Board with Aluminum Frame, with SmartPak Accessory Tray*

E6 Magnetic White Board w/ X-Y Grid; 4x12
- *Grid Magnetic Whiteboard with Aluminum Frame, with SmartPak Accessory Tray*

E7 Magnetic White board; 4x8
- *M1 Series Porcelain Magnetic White Board with Aluminum Frame, with SmartPak Accessory Tray*

E9 Magnetic White board; 4x4
- *M1 Series Porcelain Magnetic White Board with Aluminum Frame , with SmartPak Accessory Tray*

E10 Cork Board; 4x4

- AK Series Natural Cork Board with Aluminum Frame

E11 Recycled Rubber Tackboard, 4x6

- *Recycled Rubber Bulletin Board*

E12 Cork board; 4x6

- AK Series Natural Cork Board with Aluminum Frame

E13 Cork board; 4x8

- AK Series Natural Cork Board with Aluminum Frame

E14 Cork board; 4x10

- AK Series Natural Cork Board with Aluminum Frame

E15 Recycled Rubber Tackboard, 4x8

- *Recycled Rubber Bulletin Board*

E16 Computer; Desktop or Laptop

E17 Telephone

E19 Projector Screen, Ceiling-Mounted, Retractable 100”

E20 Interactive White Board

- 77" interactive / Digital Multi-Touch Interactive White Smart board

E19 Projector, Ceiling Mounted

E22 Magnetic White board; 4x8

- Use E7.

F1 Double Tier Lockers; Standard 3’W x 12” D x 5’ H

- *62000 Series 12” Wide, Three Wide, Double Tier Standard Metal Lockers, with sloping hood, legs, front, and end base, compartment shelfs, number plate*

F2 Double Tier Lockers; Vented

- *74000 Series; 12” Wide, Three Wide, Double Tier Vented Metal Lockers without legs, anchoring brackets, compartment shelfs, number plate*

F3 Double Tier Lockers; Vented

- *52000 Series 12” Wide, Three Wide, Double Tier Standard Metal Lockers, with legs, front and end base, compartment shelfs, number plate*

F3 Double Tier Lockers; Vented

- *Use F2.*

G1 File Cabinets; 5-Drawer

- *Double-walled, five-drawer letter-width file Vertical Filing Cabinet*

G2 Lateral Filing Cabinet; 4-Drawer

- *42" W Double-walled, 4-Drawer Lateral Filing Cabinet, with security lock*

G3a Library Book Shelves; Single-Faced

- *Quik-Lok Steel Library Shelving; Single-Faced, 88" H x 12" D; Black*

G3b Library Book Shelves; Double-Faced

- *Quik-Lok Steel Library Shelving; Double-Faced, 88" H x 24" D; Black*

G4 Periodical Display

- *Steel Rotary Four-Sided Rotating Display Rack w/92 Vertical Openings, Black*

G5 Tote Tray Storage Cabinet

- *Hardwood 48-Tote Tray Storage Cabinet*

G6 Laboratory Safety Goggles Cabinet

- *Sanitizing Monitor Eye Safety Storage Cabinet*

G7 Microscope Storage Cabinet

- *Microscope Cabinet, 48" W x 16" D x 84" H, with Locking Double Glass Doors, Chemical Resistant Finish*

G8 Wood Storage for Acids and Corrosives

- *Protocol Corrosive Chemical Storage Cabinet*

G9 Wood Storage for Flammables

- *Protocol Flammable Liquid Storage Cabinet*

G10 Metal Storage Cabinet (6'H) at Art Room

- *Visual Metal Storage Cabinet with casters*

G11 Storage Cabinet (7'H) @ Art Room

- *Hardwood Storage Cabinet*

G12 Flat File @ Art Room

- *5-Drawer Steel Flat Files for 36" x 48" Documents*

G13 Vertical Art Rack @ Art Room

- *8 Compartment, Vertical Art Rack*

G14a Wire Shelving; 24x48

- *NSF Chrome 4-Shelf Kit*

G14b Wire Shelving; 14x48

- *NSF Chrome 5-Shelf Kit*

G15 Trophy Display

- *Vantage Series Lighted Floor Display Case*

G16 Teacher Mailbox Cubbies

- *72 Letter Compartment, Steel E-Z Stor Literature Organizer*

G18 Storage Cabinet, Mobile

- *Use G26*

G19 File Cabinets; 4-Drawer

- *Double-walled, four-drawer letter-width file Vertical Filing Cabinet*

G20 Lateral Filing Cabinet; 4-Drawer

- *42" W Double-walled, 4-Drawer Lateral Filing Cabinet, with security lock*

G21 Storage Rack

- *5 Shelves, Stainless Steel Industrial Storage Rack*

G22 Coat Rack

- *Wall-Mounted Aluminum coat rack with shelf*

G23 Weapon Rack

G24 Storage Shelf @ ProStart Classroom

G26 Storage Cabinet, Mobile 36" W x 18"D x 72" H

- *5 Shelves, Locking Doors*

G27 Storage Cabinet

G28 Equipment Storage Cabinet

H1 Refrigerator

- *25 cu. ft. Side by Side Refrigerator*

H2 Range

- *30" Free-Standing Electric Range/Oven*

H3 Refrigerator

- *16.6 cu. ft. Top-Freezer Refrigerator*

H4 Ice maker

- *Undercounter Ice Machine; 26"W*

H5 Microwave

- *Countertop Microwave Oven*

H6 Dishwasher

- *Dishwasher; 24"W*

H7 Washer

- *4.8 cu. ft. Capacity Front Loading Washer*

H8 Dryer

- *7.8 cu. ft. Capacity Front Loading Dryer*

H9 Stackable Washer and Dryer

H10 Refrigerator

H11 Chest Freezer

H12 Ice Maker

H13 Microwave

H14 Dish Washer

J1 Clock

- *12-In 12/24 Hour Plastic Wall Clock*

J2a Photocopier @ Main Office/JROTC

- *AltaLink C8170*

J2b Photocopier @ Counseling Office

- *AltaLink C8170*

J2c Photocopier @ Teacher Workroom

- *PrimeLink B9110*

J3 Laboratory Hood

- *Basic 47 Laboratory Hood Package – Fume Hood, Work Surface and Cabinet*

J4 Safe 23"x59"x16"

J5 Cash Register

J6 3-Door Refrigerated Merchandiser

- *EM Series 3- Glass Door Merchandiser Refrigerator*

J7 Compact Chest Freezer

- *Manual Defrost Chest Freezer*

J8 Refrigerator @ Marketing Lab/Store

- *18.3 cu. ft. Top-Freezer Refrigerator*

J9 Security Mirror

- 90° Quarter Dome Security Mirror, 48” diameter

J10 Exit Security Alarm System

- *Tattle-Tape Detection Gate*

J11 Metal Detector

J13a/b Serving Counter, Cold

- Versa Food Bar Ultra Series Serving Buffet

J14a/b Braising Pan
- *VG Series Modular Gas Tilting Braising Pan*

J15 Griddle
- *900RX Series Heavy Duty Gas Griddle*

J16 Convection Oven
- *VC55G Series Double Deck Gas Convection Oven*

J17 Reach-In Refrigerator
- *Horizon Series Bottom Mounted 3-Door Reach-In Refrigerator on castors*

J18 Holding Cabinet
- *VPT Series Pass Through Holding Cabinets, with dutch doors*

J19 Salad Bar Food Preparation Table
- *72" Food Preparation Table; Salad Bar on casters, with sneeze guard and tray slide*

J20a/b Hot Food Serving Counter
- *(6) 12" 20" Sealed Wells Electric Hot Food Serving Counter with individual controls and food shield*

J21 Milk Cooler
- *Hydrocarbon Series School Milk Cold Wall Dual Access Cooler*

J22 Dishwasher
- *EST-44 Conveyor Dishwasher*

J23 Beverage Dispenser
- *Camtainers Beverage Carrier*

J24 Book Cart
- *Scoot Book Truck* 6 sloped Shelves, Steel Book Mobile Cart

J25 Reach-In Refrigerator
- *A Series Reach-In Refrigerator*

J26 Reach-In Freezer
- *19.42 Cu. Ft. Commercial Reach-In Freezer*

J27 Range
- *36" W 4-Burner Range w/ 12"Griddle and Standard Oven*

J28 Dishwasher
- *I-E Single Rack Low Temperature Door-Type Dish Machine*

J29 Convection Oven
- *Double Deck Full-Size Liquid Propane Convection Oven w/ Legs*

J30 Charbroiler
- *Designer Series Gas Broilers*

J31 SSTL Work Table; 72x24

- *18 Ga. SSTL Work Table*

J33 Microwave

J34 Speedrack

- *20-Pan End Load Sheet Pan Rack*

J35 Cambro

- *Ultra Camcarts® Insulated Food Pan Carrier*

J36 Portable Stage and Accessories

- *Portable Stage Group - Hardboard Deck (20' W x 16'D x 24" H); two sets of steps, guardrailed, shirred stage skirting; two stage dolly.*

J37 Portable Food Warmer

- *Ultra Camcart® Insulated Food Carrier, double compartment, front loaded, on casters.*

J38 Work Table; 24x48

- *16-Gauge 24"x48" SSTL Work Table with Undershelf*

J39 2-Compartment Sink

- *16-Gauge 96" SSTL 2-Compartment Sink with 2 drainboards*

J40 Work Table with Backsplash, 7' W

- *16-Gauge SSTL Work Table with Backsplash*

J41 Work Table with Backsplash, 7x2

- *16-Gauge SSTL Work Table with Backsplash*

J42 3-Compartment Sink

- *16-Gauge 124" SSTL 3-Compartment Sink with backsplash and 2 drainboards*

J43 SSTL Work Table, 3x6

- *16-Gauge SSTL Work Table;*

J44 SSTL Work Table, 2x8

- *16-Gauge 24"x96" SSTL Work Table;*

J45 3-Compartment Sink

- *16-Gauge 124" SSTL 3-Compartment Sink with backsplash and 2 drainboards*

J46 SSTL Work Table w/ Sink

- *16-Gauge 72" SSTL Work Table w/ Sink and Undershelf*

J47 Display Case

- *48" full Vision Black Metal Framed Display Case*

J48 Display Shelf Unit

- *Curbside Pickup Wire Shelf w/ 4 locking casters*

J49 Food Warmer
- *Cayenne® 47" Hot Food Mechandizer*

J50 Slat Wall Panel
- *4' x 8' MDF Slatwall Panel with Aluminum Insert*

J51 Microwave Oven
- *1.6 cu. ft. Invertech Microwave Oven*

J52 Storage Shelf
- *4-Tier Heavy Duty Steel Shelving*

J53a Cash Wrap; 72"W
- *72" Cash Wrap w/ Adjustable Storage Shelves & pull-out drawer*

J53b Cash Wrap; 48"W
- *48" Cash Wrap w/ Adjustable Storage Shelves & pull-out drawer*

J54 Hand Sink
- *Wall Mounted Sink with Gooseneck Faucet and Side Splashes*

J55 Tool Grinder
J56 Metal Band Saw
J57 Floor Shear
J58 Tube Bender
J59 Drill Press/Milling Machine
J60 Table Saw
J70 Planer
J71 Radial Arm Saw
J72 Jointer
J73 Belt and Disc Sander
J74 Wood Band Saw
J75 Menu Board
J76 Book Desensitizer

K1 U.S. Flag
- *US Classroom Flag; 12"x18" with school mounting bracket*

K2 Guam Flag
- *Guam Classroom Flag; 12"x18" with school mounting bracket*

K3 Murphy Bed
K4 Demonstration Mirror
K5 Vanity Mirror

K6 Mirror
- *8' Glassless Mirror*

K7 Twin Bed

K8 8'H Portable Room Divider

- *Portable Room Divider on locking caster wheels*

K9 Portable Lectern

- *Portable Room Divider on locking caster wheel*

K10 Mobile Laptop Cart

K11 Portable Lectern @ JROTC

- *AlvinED Model # AMF26 Instructor Podium (color natural walnut); Flat-top; Locking Casters; Locking Cabinet*

L1 Portable Stage Riser (Auditorium)

- *Signature Choral Riser*

L2 Portable Stage Riser (Choir Room)

- *Tourmaster Choral Riser*

L3 Curtain System (Auditorium Stage)

L4a Music Stand

- *Symphony 48 Music Stand*

L4b Music Stand Cart

- *1910 Music Stand Storage Cart*

L5 Conductor's Podium

M1 Multi-Sport Scoreboard

- *Model 2246 Multisport Scoreboard*

M2 Roll-Up Gym Divider Curtains

- *Roll-Up Divider Curtains*

M3 Dead Lift Platform

- *Deadlift Platform*

M4a Power Rig

- *24' Monster Lite Rig 2.0 - Base Edition*

M4b Safety Spotter Arms

- *SAML-24 Monster Lite Safety Spotter Arms*

M5a Flat Weight Bench

- *Flat Utility Bench*

M5b Incline Weight Bench

- *AB-2 Adjustable Bench*

M5c Decline Weight Bench

- *AB-3 Adjustable Bench*

M6a Free Weight Tree
- *Vertical Plate Tree 2.0*

M6b Bumper Plates; 10 lb
- *HG 2.0 Bumper Plates - 10lb Pair*

M6c Bumper Plates; 25 lb
- *Rouge HG 2.0 Bumper Plates - 25lb Pair*

M6d Bumper Plates; 35 lb
- *HG 2.0 Bumper Plates - 35lb Pair*

M6e Bumper Plates; 45 lb
- *HG 2.0 Bumper Plates - 45lb Pair*

M6f Bumper Plates; 5 lb
- *HG 2.0 Bumper Plates - 5lb Pair*

M7a Free Weight Bar
- *The Ohio Bar*

M7b Barbell Collars
- *OSO Barbell Collars, Pair*

M8a Dumbbell Rack
- *3-Tier Dumbbell Rack*

M8b Dumbbell Set; 5-50 lbs
- *5-50 LBS Dumbbell Set*

M8c Dumbbell Set; 55-100 lbs
- *55-100 LBS Dumbbell Set*

M9 Stationary Bike
- *ECHO Bike*

M10 Treadmill
- *TRUEFORM Trainer*

M11 Elliptical
- *411 Elliptical*

M12 Table Tennis Table
- *Advantage Pro Indoor Ping Pong Table*

M13a 10 Row Aluminum Bleachers with foot planks, rail system, and aisle with handrail

M13b 3 Row Aluminum Bleachers with foot planks

M13c 5 Row Aluminum Bleachers with foot planks

M14 One Row Aluminum Bleacher Seat, Portable

M16a Basketball Hoop, Forward Folding

- *TF-20/TF-20-B Basketball Backstop*

M16b Basketball Hoop, Rear Folding

- *TF-20-J Basketball Backstop*

M17a Volleyball System (Poles, Floor socket, Floor plate, Net, Antenna, Padding, Referee Stand)

- *TF-20-J Basketball Backstop Porter Powr-Carbon II 3"INTERNATIONAL Volleyball NetSystem Package w/ Ref Stand*

M17 4 Pole Volleyball Transport Cart

M18 Baseball Bases
M19 Portable Fence
M20a Outdoor Scoreboard (Football/Soccer)
M20b Outdoor Scoreboard (Baseball/Soccer)
M21 Portable Discuss Cage
M22 Shot Cage
M23 Rowing Machine
M24 Wrestling Mat
M24a Wrestling Mat Transporter

N1 Treatment Table

- *Alpha Series Treatment Table w/ Shelving*

N2a Bed

- *Invacare ETUDE HC Full Electric Bed*

N2b Sick Bed

N3 Curtain System

- *Simply 66® Snap System Cubicle Curtains*

N4 Medical Cabinet

- *Single Door Narcotic Cabinet w/ Digital Keypad Lock*

N5 Shower Curtain System

- *Antimicrobial Vinyl Shower Curtain with Stainless Steel Shower Curtain Rod*

N7 First Aid Kits

P1 Trash Can; 8-Gallon

- *Streamline Step-On Container*

P2 Biohazardous Waste Container; 8-Gallon

- *Streamline Step-On Container*

P3 Trash Can; 31-Gallon

- *Streamline Step-On Container*

P4 Trash Can; 13-Gallon

- *Streamline Step-On Container*

Q1 Microscopes

Q2 Aquariums

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Product: **HON 10700 Series; 60"W x 30"D; Free-Standing Double Pedestal Desk with Modesty Panel (Or Approved Equal)**

Manufacturer: The HON Company

Location: Principal and Assistant Principals' Offices

10700 Series laminate desks from HON makes a subtle statement for high achievers. Contoured, real hardwood accents and waterfall-shaped edges combine form and function, giving the 10700 Series a luxurious look and feel. Choose from seven rich, distinctive woodgrain laminates to outfit any inspired space, from the private office to the reception area. Desk units, bookcases, stack-ons and storage feature solid, inner-frame construction. Most models ship assembled, and grommets and removable lock cores are included. The contract-grade, high-pressure laminate provides superior resistance to scratches, stains and spills. So go ahead, work with passion and vigor. This desk can take it.



. 

Hutch and Credenza are sold separately.

HON

10700 Series™



LAMINATE DESKS



ICONIC DESIGN.
LASTING PERFORMANCE.

YOU-CENTRIC DESIGN

There's no such thing as the typical office. We all have different needs, which means you want a space that's totally you. Your brand. Your culture. Your work style. Get everything you want and more with the classic 10700 Series. This collection of desk essentials works together to unify your office and express your taste for refined elegance. Contoured solid wood accents. Graceful waterfall edges. Smart storage solutions. Everything working together to make 10700 your lucky number.



Shown with Ignition® seating. Inspired by Balance palette.
hon.com/fabrics-finishes

Shown with Ignition® seating. Inspired by Vibrant palette. hon.com/fabrics-finishes



JUST YOUR STYLE

Private and focused. Open and collaborative. With the 10700 Series, you can enjoy whatever work style and environment you want. From inviting reception stations to versatile open plan workstations to elaborate private offices, everyone gets exactly what they need. Peninsula, L-shaped or U-shaped worksurfaces. Desk/credenza combinations. The choice is yours. When you go with 10700 Series, you get the work space and storage that help you get the job done.





Shown with Ignition seating. Inspired by Nature palette. hon.com/fabrics-finishes

Regardless of the storage need, the 10700 Series provides the ideal solution. Storage cabinets, modular storage and mobile pedestals allow users to personalize their space. Lateral files and bookcases help organize business materials and display personal items.



Shown with Lota® seating.

Shown with Ignition® seating.

MULTIFUNCTIONAL THINKING

Offices are continuing to shrink, which makes creative storage arrangements more important than ever. 10700 Series stackable storage turns wall space into valuable storage space. Go mobile with pedestals. Get personal in every workstation with modular storage. Conceal files and secure belongings with lateral files and wardrobe towers. It's easy to see how 10700 Series supports the office of tomorrow and the needs of today.







Shown with Nucleus® and Cambia™ seating. Inspired by Sprout palette. hon.com/fabrics-finishes

EXPRESS YOURSELF

Rich laminates. Beautiful glass. Contemporary handles. 10700 Series offers an array of material choices, giving any business culture extensive options to enhance their environment and express their brand. Select scratch-, spill- and stain-resistant high-pressure laminate in one of eight finishes. Specify post or O-legs to create a lighter aesthetic in open areas, while modesty panels increase privacy above and below the worksurface. When you've got choices like these, you're sure to get the look you want...and the quality you deserve.

LAMINATES



Natural Maple | Harvest | Pinnacle | Bourbon Cherry | Cognac | Shaker Cherry | Mahogany | Mocha

HANDLE ACCESSORY OPTIONS*



Sweep | Crescent | Linear | Arch

** Handles are available in multiple finishes.*



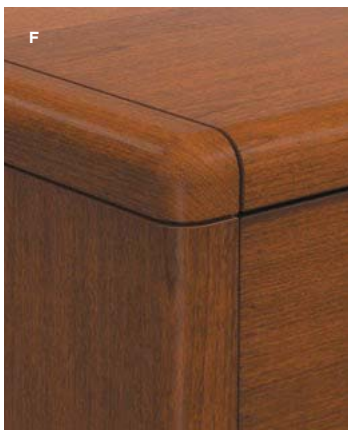












A. BOOKCASE HUTCH
Stack onto a lateral file or storage cabinet to squeeze more storage in less space.

B. BOOKCASE
Two fixed and three adjustable shelves are perfect for housing books, binders, awards and more.

C. PENINSULA
Gimme a U! Gimme an L! This worksurface can create either workstation shape.

D. MOBILE PEDESTAL
Movable. Adaptable. Lockable. The benefits of this mobile pedestal are incomparable.

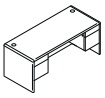
E. RECEPTION STATION
A warm welcome is guaranteed when this full-featured reception station creates the first impression.

F. WATERFALL EDGE
Say hello to the soft contoured edges with fully rounded corners.

DESKS

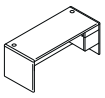

DOUBLE FULL PEDESTAL DESK , W/FROSTED MOD


DOUBLE FULL PEDESTAL DESK, W/LAMINATE MOD


DOUBLE ¾ PEDESTAL DESK

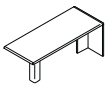

SINGLE FULL PEDESTAL DESK, W/FROSTED MOD


SINGLE FULL PEDESTAL DESK, W/LAMINATED MOD


SINGLE ¾ PEDESTAL DESK, RECTANGLE TOP


SMALL OFFICE DESK


DESK SHELL


PENINSULA DESK


PENINSULA W/END PANEL


CORNER UNIT


CREDENZA W/DOORS, FULL PEDESTALS


CREDENZA W/DOORS, ¾ PEDESTALS


CREDENZA W/LATERAL FILE/STORAGE CABINET


CREDENZA W/KNEESPACE, FULL PEDESTALS


CREDENZA W/KNEESPACE, ¾ PEDESTALS


CREDENZA W/MULTI-FILE


CREDENZA W/LATERAL FILE


SINGLE FULL PEDESTAL CREDENZA


SINGLE ¾ PEDESTAL CREDENZA


CREDENZA SHELL W/FULL MODESTY PANEL


CREDENZA SHELL W/10" MODESTY PANEL


RETURN W/ FULL PEDESTAL


RETURN W/ ¾ PEDESTAL


RETURN SHELL W/FULL MODESTY PANEL


RETURN SHELL W/10" MODESTY PANEL


BRIDGE

MODULAR AND MOBILE PEDESTALS


PENCIL/MEDIA/FILE PEDESTAL

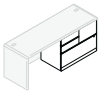

BOX/BOX/FILE PEDESTAL


FILE/FILE PEDESTAL


NARROW BOX/BOX/FILE PEDESTAL


BOX/FILE PEDESTAL


LATERAL FILE PEDESTAL


MULTI-FILE PEDESTAL


CABINET PEDESTAL


CPU STORAGE PEDESTAL


MOBILE PRINTER/ FAX CART

For use under desk, credenza and return shells; unfinished top and back

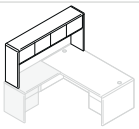




STORAGE


STACK-ON STORAGE W/FROSTED DOORS

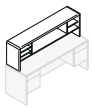

STACK-ON STORAGE W/LAMINATE DOORS


STACK-ON STORAGE FOR "L" WORKSTATION


BACK ENCLOSURE FOR STACK-ON STORAGE


TACKBOARD FOR BACK ENCLOSURE


VERTICAL PAPER MANAGER


STACK-ON ORGANIZER


MOBILE PEDESTAL, PENCIL/MEDIA/FILE


MOBILE PEDESTAL, BOX/BOX/FILE


MOBILE PEDESTAL, FILE/FILE


MOBILE PEDESTAL, SHELF/BOX/FILE


MOBILE PEDESTAL, BOX/FILE

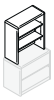

LATERAL FILE, 4-DRAWER

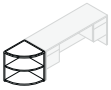

LATERAL FILE, 3-DRAWER

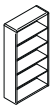

LATERAL FILE, 2-DRAWER


LATERAL FILE, OPEN/DRAWER


STORAGE CABINET W/DOORS


BOOKCASE HUTCH


END CAP BOOKSHELF


5-SHELF BOOKCASE


4-SHELF BOOKCASE


3-SHELF BOOKCASE


2-SHELF BOOKCASE


STORAGE CABINET W/FULL-WIDTH SHELVES


STORAGE CABINET/ LATERAL FILE


PERSONAL WARDROBE/ STORAGE CABINET

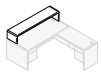

STORAGE CABINET


PERSONAL STORAGE TOWER

ACCESSORIES


ROUND TABLE TOP


CYLINDER BASE FOR TABLE TOP


RECEPTION STATION/ TRANSACTION COUNTER


RECEPTION STATION FOR "L" WORKSTATION


TRANSACTION COUNTER ORGANIZER


CENTER DRAWER


KEYBOARD PLATFORM


FIELD-INSTALLABLE GROMMET


POWER HUB FOR 3" ROUND GROMMET


BLACK REMOVABLE LOCK CORE KIT

FIELD-INSTALLABLE LINEAR HANDLE


FIELD-INSTALLABLE ARCH HANDLE

FIELD-INSTALLABLE SWEEP HANDLE

FIELD-INSTALLABLE CRESCENT HANDLE

MORE OOHS AND AHHS

Go ahead, show off your new space outfitted with 10700 Series desks. After all, you've created a cohesive aesthetic that makes a design statement from the front door to the corner office. Backed by the HON Full Lifetime Warranty, this could be the last desk collection you ever buy, until it's time to expand and add a few more units. And HON will be ready when that day arrives.

The HON Company
200 Oak Street, Muscatine, IA 52761
800.833.3964 | hon.com

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MADE IN THE USA



Shown with Flock and Ignition seating. Inspired by Diplomat palette. hon.com/fabrics-finishes

For more information, visit **hon.com/10700**

10700 SERIES™



10700 Series™ Teaming Workstations shown with Ignition® and Flock® Seating.

10700 SERIES™

Talk about a high achiever! The versatile 10700 Series offers a wide selection of layout configurations — making it easy to get the clean, cohesive look your office needs. Designed to withstand frequent moving and reconfiguration, the 10700 Series boasts contract grade high-pressure laminate and a durable inner-frame construction. Whatever the look you go for, this all-around performer is a smart choice.









FEATURES

- Contoured, solid wood accents and waterfall-shaped edges combine form and function for lasting comfort.
- Make the most of both large and small spaces with flexible storage options that work well together.
- With a variety of mixed materials to choose from, you can customize your look to perfectly match your aesthetic.
- Available in eight woodgrain patterns, our laminate desks are the definition of scratch-, spill- and stain-resistant durability.

Product: **HON 10700 Series; 60"W x 30"D; Free-Standing Desk Shell with Modesty Panel and Mobile Pedestal (Or Approved Equal)**

Manufacturer: The HON Company

Location: Typical Administration Offices

10700 Series laminate desks from HON makes a subtle statement for high achievers. Contoured, real hardwood accents and waterfall-shaped edges combine form and function, giving the 10700 Series a luxurious look and feel. Choose from seven rich, distinctive woodgrain laminates to outfit any inspired space, from the private office to the reception area. Desk units, bookcases, stack-ons and storage feature solid, inner-frame construction. Most models ship assembled, and grommets and removable lock cores are included. The contract-grade, high-pressure laminate provides superior resistance to scratches, stains and spills. So go ahead, work with passion and vigor. This desk can take it.





HON

10700 Series™



LAMINATE DESKS



ICONIC DESIGN.
LASTING PERFORMANCE.

YOU-CENTRIC DESIGN

There's no such thing as the typical office. We all have different needs, which means you want a space that's totally you. Your brand. Your culture. Your work style. Get everything you want and more with the classic 10700 Series. This collection of desk essentials works together to unify your office and express your taste for refined elegance. Contoured solid wood accents. Graceful waterfall edges. Smart storage solutions. Everything working together to make 10700 your lucky number.



Shown with Ignition® seating. Inspired by Balance palette.
hon.com/fabrics-finishes

Shown with Ignition® seating. Inspired by Vibrant palette. hon.com/fabrics-finishes



JUST YOUR STYLE

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Shown with Ignition seating. Inspired by Nature palette. hon.com/fabrics-finishes

Regardless of the storage need, the 10700 Series provides the ideal solution. Storage cabinets, modular storage and mobile pedestals allow users to personalize their space. Lateral files and bookcases help organize business materials and display personal items.



Shown with Lota® seating.

Shown with Ignition® seating.

MULTIFUNCTIONAL THINKING

Offices are continuing to shrink, which makes creative storage arrangements more important than ever. 10700 Series stackable storage turns wall space into valuable storage space. Go mobile with pedestals. Get personal in every workstation with modular storage. Conceal files and secure belongings with lateral files and wardrobe towers. It's easy to see how 10700 Series supports the office of tomorrow and the needs of today.







Shown with Nucleus® and Cambia™ seating. Inspired by Sprout palette. hon.com/fabrics-finishes

EXPRESS YOURSELF

Rich laminates. Beautiful glass. Contemporary handles. 10700 Series offers an array of material choices, giving any business culture extensive options to enhance their environment and express their brand. Select scratch-, spill- and stain-resistant high-pressure laminate in one of eight finishes. Specify post or O-legs to create a lighter aesthetic in open areas, while modesty panels increase privacy above and below the worksurface. When you've got choices like these, you're sure to get the look you want...and the quality you deserve.

LAMINATES



Natural Maple | Harvest | Pinnacle | Bourbon Cherry | Cognac | Shaker Cherry | Mahogany | Mocha

HANDLE ACCESSORY OPTIONS*



Sweep | Crescent | Linear | Arch

** Handles are available in multiple finishes.*













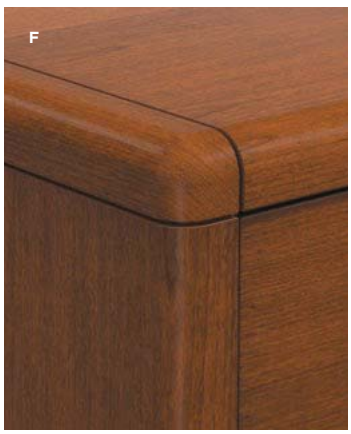

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B. BOOKCASE
Two fixed and three adjustable shelves are perfect for housing books, binders, awards and more.

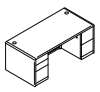
C. PENINSULA
Gimme a U! Gimme an L! This worksurface can create either workstation shape.

D. MOBILE PEDESTAL
Movable. Adaptable. Lockable. The benefits of this mobile pedestal are incomparable.

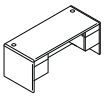
E. RECEPTION STATION
A warm welcome is guaranteed when this full-featured reception station creates the first impression.

F. WATERFALL EDGE
Say hello to the soft contoured edges with fully rounded corners.

DESKS

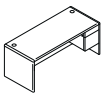

DOUBLE FULL PEDESTAL DESK , W/FROSTED MOD


DOUBLE FULL PEDESTAL DESK, W/LAMINATE MOD


DOUBLE ¾ PEDESTAL DESK

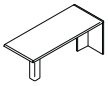

SINGLE FULL PEDESTAL DESK, W/FROSTED MOD


SINGLE FULL PEDESTAL DESK, W/LAMINATED MOD


SINGLE ¾ PEDESTAL DESK, RECTANGLE TOP


SMALL OFFICE DESK


DESK SHELL


PENINSULA DESK


PENINSULA W/END PANEL


CORNER UNIT


CREDENZA W/DOORS, FULL PEDESTALS


CREDENZA W/DOORS, ¾ PEDESTALS


CREDENZA W/LATERAL FILE/STORAGE CABINET


CREDENZA W/KNEESPACE, FULL PEDESTALS


CREDENZA W/KNEESPACE, ¾ PEDESTALS


CREDENZA W/MULTI-FILE


CREDENZA W/LATERAL FILE


SINGLE FULL PEDESTAL CREDENZA


SINGLE ¾ PEDESTAL CREDENZA


CREDENZA SHELL W/FULL MODESTY PANEL


CREDENZA SHELL W/10" MODESTY PANEL


RETURN W/ FULL PEDESTAL


RETURN W/ ¾ PEDESTAL


RETURN SHELL W/FULL MODESTY PANEL


RETURN SHELL W/10" MODESTY PANEL


BRIDGE

MODULAR AND MOBILE PEDESTALS

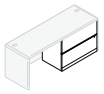

PENCIL/MEDIA/FILE PEDESTAL

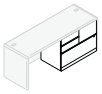

BOX/BOX/FILE PEDESTAL


FILE/FILE PEDESTAL


NARROW BOX/BOX/FILE PEDESTAL


BOX/FILE PEDESTAL


LATERAL FILE PEDESTAL


MULTI-FILE PEDESTAL


CABINET PEDESTAL


CPU STORAGE PEDESTAL

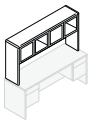

MOBILE PRINTER/ FAX CART

For use under desk, credenza and return shells; unfinished top and back

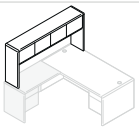




STORAGE


STACK-ON STORAGE W/FROSTED DOORS

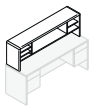

STACK-ON STORAGE W/LAMINATE DOORS


STACK-ON STORAGE FOR "L" WORKSTATION


BACK ENCLOSURE FOR STACK-ON STORAGE


TACKBOARD FOR BACK ENCLOSURE


VERTICAL PAPER MANAGER


STACK-ON ORGANIZER


MOBILE PEDESTAL, PENCIL/MEDIA/FILE


MOBILE PEDESTAL, BOX/BOX/FILE


MOBILE PEDESTAL, FILE/FILE


MOBILE PEDESTAL, SHELF/BOX/FILE


MOBILE PEDESTAL, BOX/FILE

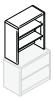

LATERAL FILE, 4-DRAWER

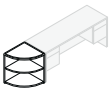

LATERAL FILE, 3-DRAWER

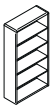

LATERAL FILE, 2-DRAWER


LATERAL FILE, OPEN/DRAWER


STORAGE CABINET W/DOORS


BOOKCASE HUTCH


END CAP BOOKSHELF


5-SHELF BOOKCASE


4-SHELF BOOKCASE


3-SHELF BOOKCASE


2-SHELF BOOKCASE


STORAGE CABINET W/FULL-WIDTH SHELVES


STORAGE CABINET/ LATERAL FILE


PERSONAL WARDROBE/ STORAGE CABINET


STORAGE CABINET


PERSONAL STORAGE TOWER

ACCESSORIES


ROUND TABLE TOP


CYLINDER BASE FOR TABLE TOP


RECEPTION STATION/ TRANSACTION COUNTER


RECEPTION STATION FOR "L" WORKSTATION


TRANSACTION COUNTER ORGANIZER


CENTER DRAWER


KEYBOARD PLATFORM


FIELD-INSTALLABLE GROMMET


POWER HUB FOR 3" ROUND GROMMET


BLACK REMOVABLE LOCK CORE KIT

FIELD-INSTALLABLE LINEAR HANDLE


FIELD-INSTALLABLE ARCH HANDLE

FIELD-INSTALLABLE SWEEP HANDLE

FIELD-INSTALLABLE CRESCENT HANDLE

MORE OOHS AND AHHS

Go ahead, show off your new space outfitted with 10700 Series desks. After all, you've created a cohesive aesthetic that makes a design statement from the front door to the corner office. Backed by the HON Full Lifetime Warranty, this could be the last desk collection you ever buy, until it's time to expand and add a few more units. And HON will be ready when that day arrives.

The HON Company
200 Oak Street, Muscatine, IA 52761
800.833.3964 | hon.com

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MADE IN THE USA



Shown with Flock and Ignition seating. Inspired by Diplomat palette. hon.com/fabrics-finishes

For more information, visit **hon.com/10700**

10700 SERIES™



10700 Series™ Teaming Workstations shown with Ignition® and Flock® Seating.

10700 SERIES™

Talk about a high achiever! The versatile 10700 Series offers a wide selection of layout configurations — making it easy to get the clean, cohesive look your office needs. Designed to withstand frequent moving and reconfiguration, the 10700 Series boasts contract grade high-pressure laminate and a durable inner-frame construction. Whatever the look you go for, this all-around performer is a smart choice.









FEATURES

- Contoured, solid wood accents and waterfall-shaped edges combine form and function for lasting comfort.
- Make the most of both large and small spaces with flexible storage options that work well together.
- With a variety of mixed materials to choose from, you can customize your look to perfectly match your aesthetic.
- Available in eight woodgrain patterns, our laminate desks are the definition of scratch-, spill- and stain-resistant durability.

Product: **HON 10700 Series; 48"W x 30"D; Desk Free-Standing Desk with 3/4 Pedestal (Or Approved Equal)**

Manufacturer: The HON Company

Location: Counselors' Offices

10700 Series laminate desks from HON makes a subtle statement for high achievers. Contoured, real hardwood accents and waterfall-shaped edges combine form and function, giving the 10700 Series a luxurious look and feel. Choose from seven rich, distinctive woodgrain laminates to outfit any inspired space, from the private office to the reception area. Desk units, bookcases, stack-ons and storage feature solid, inner-frame construction. Most models ship assembled, and grommets and removable lock cores are included. The contract-grade, high-pressure laminate provides superior resistance to scratches, stains and spills. So go ahead, work with passion and vigor. This desk can take it.



HON

10700 Series™



LAMINATE DESKS



ICONIC DESIGN.
LASTING PERFORMANCE.

YOU-CENTRIC DESIGN

There's no such thing as the typical office. We all have different needs, which means you want a space that's totally you. Your brand. Your culture. Your work style. Get everything you want and more with the classic 10700 Series. This collection of desk essentials works together to unify your office and express your taste for refined elegance. Contoured solid wood accents. Graceful waterfall edges. Smart storage solutions. Everything working together to make 10700 your lucky number.



Shown with Ignition® seating. Inspired by Balance palette.
hon.com/fabrics-finishes

Shown with Ignition® seating. Inspired by Vibrant palette. hon.com/fabrics-finishes



JUST YOUR STYLE

Private and focused. Open and collaborative. With the 10700 Series, you can enjoy whatever work style and environment you want. From inviting reception stations to versatile open plan workstations to elaborate private offices, everyone gets exactly what they need. Peninsula, L-shaped or U-shaped worksurfaces. Desk/credenza combinations. The choice is yours. When you go with 10700 Series, you get the work space and storage that help you get the job done.





Shown with Ignition seating. Inspired by Nature palette. hon.com/fabrics-finishes

Regardless of the storage need, the 10700 Series provides the ideal solution. Storage cabinets, modular storage and mobile pedestals allow users to personalize their space. Lateral files and bookcases help organize business materials and display personal items.



Shown with Lota® seating.

Shown with Ignition® seating.

MULTIFUNCTIONAL THINKING

Offices are continuing to shrink, which makes creative storage arrangements more important than ever. 10700 Series stackable storage turns wall space into valuable storage space. Go mobile with pedestals. Get personal in every workstation with modular storage. Conceal files and secure belongings with lateral files and wardrobe towers. It's easy to see how 10700 Series supports the office of tomorrow and the needs of today.







Shown with Nucleus® and Cambia™ seating. Inspired by Sprout palette. hon.com/fabrics-finishes

EXPRESS YOURSELF

Rich laminates. Beautiful glass. Contemporary handles. 10700 Series offers an array of material choices, giving any business culture extensive options to enhance their environment and express their brand. Select scratch-, spill- and stain-resistant high-pressure laminate in one of eight finishes. Specify post or O-legs to create a lighter aesthetic in open areas, while modesty panels increase privacy above and below the worksurface. When you've got choices like these, you're sure to get the look you want...and the quality you deserve.

LAMINATES



Natural Maple | Harvest | Pinnacle | Bourbon Cherry | Cognac | Shaker Cherry | Mahogany | Mocha

HANDLE ACCESSORY OPTIONS*



Sweep | Crescent | Linear | Arch

** Handles are available in multiple finishes.*



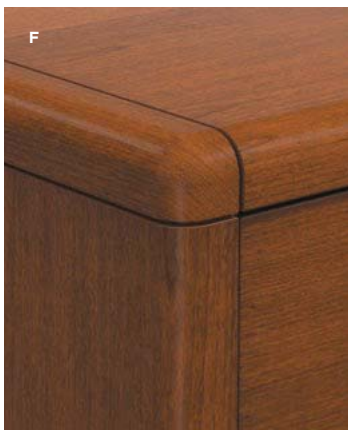












A. BOOKCASE HUTCH
Stack onto a lateral file or storage cabinet to squeeze more storage in less space.

B. BOOKCASE
Two fixed and three adjustable shelves are perfect for housing books, binders, awards and more.

C. PENINSULA
Gimme a U! Gimme an L! This worksurface can create either workstation shape.

D. MOBILE PEDESTAL
Movable. Adaptable. Lockable. The benefits of this mobile pedestal are incomparable.

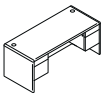
E. RECEPTION STATION
A warm welcome is guaranteed when this full-featured reception station creates the first impression.

F. WATERFALL EDGE
Say hello to the soft contoured edges with fully rounded corners.

DESKS

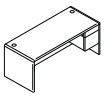

DOUBLE FULL PEDESTAL DESK , W/FROSTED MOD


DOUBLE FULL PEDESTAL DESK, W/LAMINATE MOD


DOUBLE ¾ PEDESTAL DESK

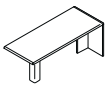

SINGLE FULL PEDESTAL DESK, W/FROSTED MOD


SINGLE FULL PEDESTAL DESK, W/LAMINATED MOD


SINGLE ¾ PEDESTAL DESK, RECTANGLE TOP


SMALL OFFICE DESK


DESK SHELL


PENINSULA DESK


PENINSULA W/END PANEL


CORNER UNIT


CREDENZA W/DOORS, FULL PEDESTALS


CREDENZA W/DOORS, ¾ PEDESTALS


CREDENZA W/LATERAL FILE/STORAGE CABINET


CREDENZA W/KNEESPACE, FULL PEDESTALS


CREDENZA W/KNEESPACE, ¾ PEDESTALS


CREDENZA W/MULTI-FILE


CREDENZA W/LATERAL FILE


SINGLE FULL PEDESTAL CREDENZA


SINGLE ¾ PEDESTAL CREDENZA


CREDENZA SHELL W/FULL MODESTY PANEL


CREDENZA SHELL W/10" MODESTY PANEL


RETURN W/ FULL PEDESTAL


RETURN W/ ¾ PEDESTAL


RETURN SHELL W/FULL MODESTY PANEL


RETURN SHELL W/10" MODESTY PANEL


BRIDGE

MODULAR AND MOBILE PEDESTALS

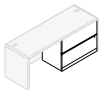

PENCIL/MEDIA/FILE PEDESTAL

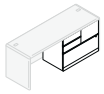

BOX/BOX/FILE PEDESTAL

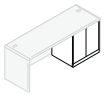

FILE/FILE PEDESTAL


NARROW BOX/BOX/FILE PEDESTAL


BOX/FILE PEDESTAL


LATERAL FILE PEDESTAL


MULTI-FILE PEDESTAL


CABINET PEDESTAL


CPU STORAGE PEDESTAL


MOBILE PRINTER/ FAX CART

For use under desk, credenza and return shells; unfinished top and back

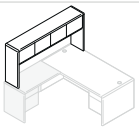




STORAGE


STACK-ON STORAGE W/FROSTED DOORS

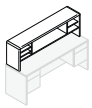

STACK-ON STORAGE W/LAMINATE DOORS


STACK-ON STORAGE FOR "L" WORKSTATION


BACK ENCLOSURE FOR STACK-ON STORAGE


TACKBOARD FOR BACK ENCLOSURE


VERTICAL PAPER MANAGER


STACK-ON ORGANIZER


MOBILE PEDESTAL, PENCIL/MEDIA/FILE


MOBILE PEDESTAL, BOX/BOX/FILE


MOBILE PEDESTAL, FILE/FILE


MOBILE PEDESTAL, SHELF/BOX/FILE


MOBILE PEDESTAL, BOX/FILE

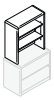

LATERAL FILE, 4-DRAWER

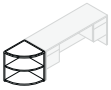

LATERAL FILE, 3-DRAWER

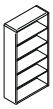

LATERAL FILE, 2-DRAWER


LATERAL FILE, OPEN/DRAWER


STORAGE CABINET W/DOORS


BOOKCASE HUTCH


END CAP BOOKSHELF


5-SHELF BOOKCASE


4-SHELF BOOKCASE


3-SHELF BOOKCASE


2-SHELF BOOKCASE


STORAGE CABINET W/FULL-WIDTH SHELVES


STORAGE CABINET/ LATERAL FILE


PERSONAL WARDROBE/ STORAGE CABINET

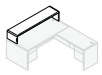

STORAGE CABINET


PERSONAL STORAGE TOWER

ACCESSORIES


ROUND TABLE TOP


CYLINDER BASE FOR TABLE TOP


RECEPTION STATION/ TRANSACTION COUNTER


RECEPTION STATION FOR "L" WORKSTATION


TRANSACTION COUNTER ORGANIZER


CENTER DRAWER


KEYBOARD PLATFORM


FIELD-INSTALLABLE GROMMET


POWER HUB FOR 3" ROUND GROMMET


BLACK REMOVABLE LOCK CORE KIT

FIELD-INSTALLABLE LINEAR HANDLE


FIELD-INSTALLABLE ARCH HANDLE

FIELD-INSTALLABLE SWEEP HANDLE

FIELD-INSTALLABLE CRESCENT HANDLE

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MADE IN THE USA



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10700 SERIES™



10700 Series™ Teaming Workstations shown with Ignition® and Flock® Seating.

10700 SERIES™

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FEATURES

- Contoured, solid wood accents and waterfall-shaped edges combine form and function for lasting comfort.
- Make the most of both large and small spaces with flexible storage options that work well together.
- With a variety of mixed materials to choose from, you can customize your look to perfectly match your aesthetic.
- Available in eight woodgrain patterns, our laminate desks are the definition of scratch-, spill- and stain-resistant durability.

Product: **540 Series Teacher Desk; Double Pedestal**

Manufacturer: Virco, Inc.

Location: Classrooms not requiring Desk A4a (Desk w/ Lectern)

Virco's 540 Series Teacher's Pedestal Desk offers the convenience of a spacious work surface to teachers. The box drawer, file drawer and the center drawer offer required storage space for documents and files. Once you lock the center drawer, all other drawers lock too. This utility feature ensures thorough security of important files.



MODEL #DESK-546-WHT066BRN42-BLK01



MODEL #DESK-546-WAL078BLK01-BLK01

Product Details

- Overall Dimensions: 60" W x 30" D x 30" H
- 1-1/8" thick high-pressure laminate fiberboard top surface with 1-1/8" profile T-mold edge banding
- Scratch and stain resistant laminate
- Frame / Legs: Steel Frame
- Glides / Casters: Adjustable nylon glides or adjustable steel-base glides
- Fitted with a modesty panel
- Integrated locking mechanism
- All drawers automatically lock when center drawer is locked

- Double pedestal with four file drawers
- Each file drawer comprises handy built-in hanging file system
- Chrome legs with luster
- Standard Char Black frame
- Warranty: 10 Years
- Weight: 190 lbs.
- ANSI / BiFMA, GreenGuard, CPSIA

Product: **Text® Series - Student Desk; Adjustable-Height Models (Or Approved Equal)**

Manufacturer: Virco, Inc.

Location: Classrooms (Where single desks are required)



MODEL #DESK-TD2128YADJM-WHT66-BLK01





TEXT Series Desks, designed by the award-winning team of Peter Glass and Bob Mills, feature elliptical legs, swooping yokes, and arched feet. Single-student models are available in FRW™ (Fortified Recycled Wood) hard plastic work surfaces in fixed or adjustable-height configurations. Accessories include book baskets and backback hanger.

Product Details

- Overall Dimensions: 28" W x 21-3/8" D x 36~34" H
- FRW Work Surface: 28"W x 21-3/8" D
- Frame/Legs: Tubular steel frame
- Nylon Glides
- Certifications: BIFMA, GreenGuard, CPSIA
- Backpack hanger
- Available Options: Powder coat finish on all metal surfaces. Optional felt-base and rubber-base glides, wire book basket, paper/pencil tray, plastic book box, and chrome backpack hanger.

Product: **Text® Series - Student Desk; Adjustable-Height Models (Or Approved Equal)**

Manufacturer: Virco, Inc.

Location: Classrooms







TEXT® Series Desks

Virco's TEXT Series of adjustable-height desks and tables are ideal for wheelchair-accessible and ADA compliant applications.

TEXT Series Desks, designed by the award-winning team of Peter Glass and Bob Mills, feature elliptical legs, swooping yokes, and arched feet. Single-student models are available in FRW™ (Fortified Recycled Wood) hard plastic work surfaces in fixed or adjustable-height configurations. Accessories include book baskets and backback hanger.

Product Details

- Overall Dimensions: 36" W x 21-3/8" D x 36~34" H
- FRW Work Surface: 36"W x 21-3/8" D
- Frame/Legs: Tubular steel frame
- Nylon Glides
- Certifications: BIFMA, GreenGuard, CPSIA
- Available Options: Powder coat finish on all metal surfaces. Optional felt-base and rubber-base glides, wire book basket, paper/pencil tray, plastic book box, and chrome backpack hanger.

Product: **Forward Vision™ II Four-Student Workstation w/ Sink and 2-Combination Cold-Water and Gas Fixtures (Or Approved Equal)**

Manufacturer: Diversified Spaces (Formerly Diversified Woodworks)

Location: All Science Classroom Laboratories Except for Physical Science Classroom Laboratories

This workstation is design to allow up to 4 students to work on the one side of the table to allow students to face the instructor during demonstrations. In turn, the instructor can see the students, fixtures, and storage areas from the front of the classroom.

The large work surface, 46"D x 88"W is made of chemical resistant phenolic resin and holds the solid epoxy sink, and two combination cold water and gas fixtures. Data and electrical outlets are provided on the side of the unit. The cabinets provide locked storage space for chemicals, beakers, and other equipment. Side mounted hooks hold book bags off the floor. The units are finished with a chemical resistant, earth-friendly UV finish. Includes two GFI AC duplex outlets. Also available with a flat top (no sink or fixtures). The mechanical area between the storage cabinets is accessed from the front through a removable panel. This model is compact enough to fit multiple units in a small classroom and is easy to assemble.



Product Details

- Dimensions: 88"W x 46"D x 36"H
- Tabletop: 1" thick solid epoxy resin top (Also available in 3/4" phenolic resin surface)
- Constructed of solid oak and oak veneers
- Designed to be used by four students, all facing the instructor
- Diversified Woodcrafts Inc. is SEFA compliant and MAS Certified Green
- Finishing the workstation is rubber base molding and a durable chemical resistant UV finish
- Flat Work surface for maximum workspace
- Full cabinet doors with locks include adjustable shelves
- Two GFI protected AC duplex receptacles and data outlets
- Assembly required
- Product Weight: 503 lbs
- Limited Lifetime Warranty
- Made in the U.S.A.

Product: **Forward Vision™ I Four-Student Workstation w/ Sink and 2-Combination Cold-Water and Gas Fixtures - ADA Compliant (Or Approved Equal)**

Manufacturer: Diversified Spaces

Location: All Science Classroom Laboratories Except for Physical Science Classroom Laboratories

We've taken our most popular workstation and have made it ADA compatible. Constructed of hardwoods and oak veneers and finished with a chemical resistant finish. The 1" epoxy resin top is available with our without a sink and two combination cold water/gas fixtures with paddle handles. The sink includes trap, strainer and stopper. The sloping fronts allows a person in a wheelchair to roll right up to the sink area. The door/drawer cabinet features a dovetailed drawer and storage area with an adjustable shelf, locks and ADA compliant pulls. The door cabinet option includes everything previously listed except the drawer and includes 2 adjustable shelves. The unit also includes 2 GFI protected duplex outlets and rubber base molding. Unit measures: 96"W x 50"D x 34"H.





Product Details

- Tabletop Material: 1" solid epoxy resin top with a drip grove and is resistant to heat and most chemicals
- Wood Material: Solid oak and oak veneer
- Utilities: Two combination water/gas fixtures
  Two GFI protected AC duplex electrical outlets
- Storage: Two locking cabinets w/ adjustable shelves
- Weight Capacity: 600 lbs
- Warranty: Lifetime limited
- Overall Dimensions: 96"W x 50"D x 34"H.
- Sink Dimensions: 12" W x 8" L x 6" D
- Assembly: Assembly Required
- Product Weight: 566 lbs
- Designed to be used by four students, all facing the instructor
- For ADA compliance, front sloping is available to allows a person in a wheelchair to roll right up to the sink area.
- Full cabinet door with ADA compliant pulls, lock and adjustable shelf
- The unit is finished with a chemical resistant, earth-friendly UV finish
- Diversified Woodcrafts Inc. is SEFA compliant and MAS Certified Green
- Made in the U.S.A.

Product: Flip Top Technology Table, 30" x 60" Top (Or Approved Equal)

Manufacturer: Virco, Inc.

Location: Library Computer Lab

Virco's Flip-Top Computer Table offers easy access to cables, wires and surge protectors, making it an excellent choice for your school computer lab. Features include a 6" deep locking flip-top compartment which secures cables, surge protectors, and wires beneath the work surface. The high-pressure laminate top is extremely durable and is supported by a heavy-gauge steel frame. With tops that range in size from 30" to 84" wide, tables can accommodate one, two, and three-student applications.







Product Details

- Models feature a convenient 6" deep lockable flip-top compartment for enhanced wire and cable management
- Top has 2 or 3 scalloped wire management cut outs for ease of passing wires and cables into flip-top compartment.
- Surface: 1-1/8" particleboard-core high pressure laminate work surface
- Frame / Legs: Tubular 15- and 17-gauge steel frame
- Leg Finish: Upper legs have powder-coat paint finish; lower legs are chrome plated
- Adjustable top height of 24" - 34" in 1" increments
- Glides / Casters: Nylon glides
- Warranty: 10 years
- Made in the USA
- Weight: 207.54 lbs
- Certifications: BIFMA, GreenGuard, and CPSIA
- CPU Caddy sold separately.



Single-Student



Two-Student



Three-Student

Optional Accessories:



CPU Caddy



Backpack hanger



Keyboard Mouse Tray

Product: Flip Top Technology Table, 30" x 48" Top (Or Approved Equal)

Manufacturer: Virco, Inc.

Location: Electronics Computer Lab

Virco's Flip-Top Computer Table offers easy access to cables, wires and surge protectors, making it an excellent choice for your school computer lab. Features include a 6" deep locking flip-top compartment which secures cables, surge protectors, and wires beneath the work surface. The high-pressure laminate top is extremely durable and is supported by a heavy-gauge steel frame. With tops that range in size from 30" to 84" wide, tables can accommodate one, two, and three-student applications.







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- Models feature a convenient 6" deep lockable flip-top compartment for enhanced wire and cable management
- Top has 2 or 3 scalloped wire management cut outs for ease of passing wires and cables into flip-top compartment.
- Surface: 1-1/8" particleboard-core high pressure laminate work surface
- Frame / Legs: Tubular 15- and 17-gauge steel frame
- Leg Finish: Upper legs have powder-coat paint finish; lower legs are chrome plated
- Adjustable top height of 24" - 34" in 1" increments
- Glides / Casters: Nylon glides
- Warranty: 10 years
- Made in the USA
- Weight: 207.54 lbs
- Certifications: BIFMA, GreenGuard, and CPSIA
- CPU Caddy sold separately.



Single-Student



Two-Student



Three-Student

Optional Accessories:



CPU Caddy



Backpack hanger



Keyboard Mouse Tray

Product: **Flip Top Technology Table, 30" x 60" Top with Casters (Or Approved Equal)**

Manufacturer: Virco, Inc.

Location: Business and ProStart Classrooms

Virco's Flip-Top Computer Table offers easy access to cables, wires and surge protectors, making it an excellent choice for your school computer lab. Features include a 6" deep locking flip-top compartment which secures cables, surge protectors, and wires beneath the work surface. The high-pressure laminate top is extremely durable and is supported by a heavy-gauge steel frame. With tops that range in size from 30" to 84" wide, tables can accommodate one, two, and three-student applications.



Provide casters.





Product Details

- Models feature a convenient 6" deep lockable flip-top compartment for enhanced wire and cable management
- Top has 2 or 3 scalloped wire management cut outs for ease of passing wires and cables into flip-top compartment.
- Surface: 1-1/8" particleboard-core high pressure laminate work surface
- Frame / Legs: Tubular 15- and 17-gauge steel frame
- Leg Finish: Upper legs have powder-coat paint finish; lower legs are chrome plated
- Adjustable top height of 24" - 34" in 1" increments
- Glides / Casters: Casters
- Warranty: 10 years
- Made in the USA
- Weight: 207.54 lbs
- Certifications: BIFMA, GreenGuard, and CPSIA
- CPU Caddy sold separately.



Single-Student



Two-Student



Three-Student

Optional Accessories:



CPU Caddy



Backpack hanger



Keyboard Mouse Tray

Product: 4-Station 12-Locker Workbench w/ 4 Vises; Black
(Or Approved Equal)

Manufacturer: Diversified Spaces (formerly Diversified Woodcrafts)

Location: Carpentry Work Shop

Diversified Woodcrafts 4-Station Workbench comes with 12 Lockers and 4 Vises. The maple top is 2-1/4 inches thick. The 12 unit baked enamel finish locker base measures 36 x 42 x 30 inches. It is constructed with 20-gauge steel, all-welded, one-section construction with reinforced side panels. The locker doors are constructed with 18 gauge steel and have air vents, spring hinges, padlock hasp and knockout plug for cylinder lock. The doors have an opening size of 12 x 21 x 15 inches. Limited Lifetime Warranty. Made in the USA. Available locker colors are black or gray.



Product Details

- Overall dimensions: 64" W x 54" D x 33-1/4" H
- Top Size: 64" W x 54" D x 2-1/4" Thick
- 12 built-in vertical opening lockers
- Base has a baked enamel finish
- Includes 4 vises
- SEFA compliant and MAS Certified Green
- Includes a limited lifetime warranty
- Made in the USA

Product: **Center Cabinet Industrial Workbench with Drawers Concept 5; Vulcan Black Cabinet/Drawers (Or Approved Equal)**

Manufacturer: Lyon

Location: Electronics Workshop



KK251WBC05 (Cabinet/Drawers in Dove Gray Shown)

The 251WBC05 industrial workbench with drawers offers both a large worksurface as well as high density storage for small parts or tools. This heavy-duty metal workbench with drawers can be used in lots of places. Use it as an electronic assembly workbench in either a factory or repair shop. You can even use this workshop bench with drawers as high density tool storage for an auto repair shop. Lyon workbenches with storage drawers are the most reliable in the industry.

You can choose both a cabinet color and a drawer color for your heavy-duty workbenches. The smaller parts of the workbench will match the cabinet color. The durable powder coat paint finish will help protect cabinets from harsh use. Lyon proudly makes these steel workbenches in the USA.

HARDWOOD WORK SURFACE

The 251WBC05 industrial workbench with drawers includes a 72”W x 30”D hardwood work surface. This hardwood top is made of many sealed kiln-dried hardwoods. This solid-laminated surface also has 3/16-inch radius rounded edges and is ideal for precision work. The round edges will add comfort when leaning over the heavy-duty industrial workbench to perform tasks. The work surface of this heavy-duty workshop table with drawers offers a weight capacity of 5,000 lbs.

MODULAR DRAWER CABINET

The slender wide modular cabinet of the 251WBC05 industrial workbench includes 5 drawers. These steel drawers slide open on smooth, steel glides. Each heavy-duty drawer can hold up to 400 lbs. All of the drawers fully extend to give easy access to the entire contents of the drawer. The aluminum handles include rounded end caps and will withstand years of use. Each cabinet includes both removable labels and plastic shields for the handles.

The modular cabinet of this workbench features a multiple drawer access. This set up allows more than one drawer to open at once. Each heavy-duty drawer cabinet also includes a standard lock. Use this lock to quickly secure all the drawers closed at one time. Each lock includes two keys.

OPEN PANEL LEGS AND STRINGER

The 251WBC05 industrial workbench with drawers comes with a one-piece, heavy-gauge steel panel leg. Lyon welds the frame of the panel leg so that it offers superior support. The leg levelers of the open table leg help ensure a level installation for your bench height workbench. The panel leg also has two knockouts for a customer supplied electrical outlet. This lets workers have easy access to outlets to plug in any equipment they need.

Our 251WBC05 industrial workbench also includes two leg-to-cabinet stringers. The stringers fits in the space between the panel leg and the cabinet to provide further stability to your workbench.

OPTIONAL ACCESSORIES

The 251WBC05 industrial workbench comes with empty drawers. Keep your 251WBC05 industrial workbench with drawers organized by adding *Slender Wide Layout Kits* to the drawers. The steel partitions and dividers help split the drawer into smaller spaces. Easily move or remove dividers to create the best layout for your stored items. Instantly increase your workspace of these factory workbenches by adding a *Shelf Riser* to store items above the work surface.

<u>Product Details</u>

- Overall Dimensions: 72"W x 28-1/2"D
- Number of Drawers: 5
- Lock Type: Standard Lock with Multiple Drawer Access
- Capacity: 400 Lbs per Drawer

- Includes:
  - Slender Wide Bench Height Cabinet 22"W x 33-1/4"H
  - Bench Height Open Panel Leg
  - Hardwood Work Surface 72"W x 30"D
  - Stringer
- Made in the USA
- Cabinet Color: Vulcan Black
- Drawer Color: Vulcan Black

Product: **46 in. Adjustable Height Work Table (Or Approved Equal)**

Manufacturer: Husky

Location: Carpentry Workshop

This 46 in. Husky Work Table's contemporary, adjustable-height feature allows users to have the flexibility to sit or stand while working. Research suggests that there are health benefits to alternating between standing and sitting throughout the day because it both decreases body discomfort and increases blood flow. The ergonomic design could also reduce eye and back strain and boost productivity. The crossbar support can be installed in 2 different locations, depending on your preference. Install the support at the center of the table for an open, 2-sided work area. Or install it along the back of the legs to allow you the versatility of stowing your tool storage and rolling cabinets underneath to further organize your work space. This table allows for mobile use with 3 in. x 2 in. PPR swivel casters with locking brakes. Four level feet are also available to use the table as a stationary work area.

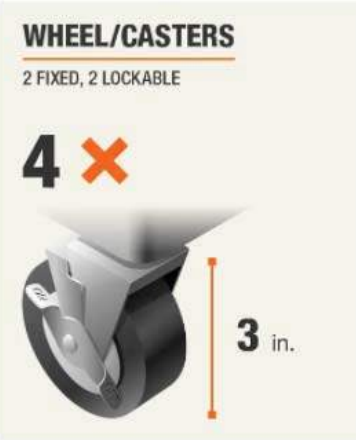


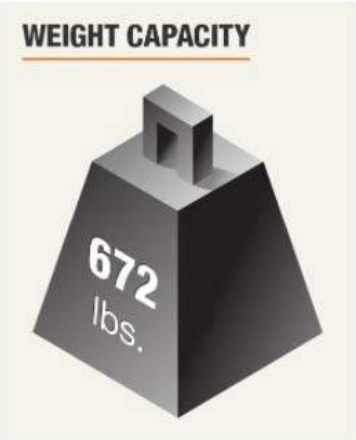
Level feet available to make table stationary.

Product Details

- Assembled dimensions (approximate): 46" W x 24" D x 26"~42 in H
- Work surface dimensions: 46: W x 24"D
- Adjustable Height: 26" ~ 39" H (with leveling feet)
- Adjustable Height: 29" ~ 42" H (with casters)
- Manual crank raises and lowers the work surface height.
- 3 mm steel frame construction with a powder-coated finish to resist rust and corrosion.
- 1.2 in. thick solid woodwork surface with protective coating
- Weight: 87.34 lbs
- Assembly required
- Limited Warranty: 3 years







Product: **16 foot Modern Conference Room Table with Metal Base & Metal Accents (Or Approved Equal)**

Manufacturer: OfficePope.com

Location: Administration Conference Room (2 each) and CRT Conference Room / Mediation Room





Product Data

- Modern Conference Room Table with metal base and metal accents
- Available in 8 foot, 12 foot, or 16 foot lengths
- Depth: 4 feet
- 4 modern textured laminated top finishes: southern tobacco, sand dune, stone gray, or white ash
- Metal base & metal accents in a black powder coated finish for the southern tobacco and sand dune table tops & in a brushed silver finish for the stone gray and white ash table tops.
- Table top thickness: 1-5/8"
- Optional Power / Data Modules are available.
- 2 cutouts and grommet covers included with the 8' - 16' conference tables.
- Matching Pieces are also available.
- Conference table is very easy to assemble
- Constructed with 100% brand new materials
- Five year warranty.
- FREE SHIPPING to anywhere in the continental United States - Curbside Delivery.

Finish Choices



Power Options

Optional Power / Data Modules are available for $500 each with free shipping. Each power / data module has 2 power ports. 2 USB outlets, and one open port. Made from anodized aluminum in a black or silver metal finish. Black metal power modules for southern tobacco and sand dune tops. Silver metal power modules for stone gray and white ash tops.



Product: **Mobile Bench Cafeteria Table - 30" W x 10'-1" L**
(Or Approved Equal)

Manufacturer: AmTab

Location: Cafeteria

This table folds up easily for storage when you need to free up floor space. It opens and closes smoothly with the assist of a gas cylinder stabilizer. An EZ auto-lock keeps each cafeteria table securely folded during storage. The reinforced 14-gauge steel frame rolls smoothly on four heavy-duty casters that automatically lift off the floor when the table is in use. The tabletop is constructed of solid particleboard with a durable vinyl edging to protect against chipping and peeling. AmTab's Mobile Bench Cafeteria Table is available in several top, frame and edging color options. Made in the U.S.A.





Select top color:



Select bench color:



Select frame finish:



Select table edge option:



Product Details

- Opens and closes smoothly and easily
- EZ auto-lock secures folded table
- Scratch-resistant laminate finish
- Reinforced steel legs

- Wide range of colors
- Seating capacity: 12 students
- Core material: Particleboard
- Finish material: Laminate
- Leg/frame material: Tubular steel
- Height: 29" table/17" bench
- Width: 30"
- Length: 10'- 1"
- Folded dimensions: 56"W x 33-1/2"D x 69"H
- Fully assembled
- Warranty: 15 years
- Made in the USA
- Green: MAS Certified Green
- Weight: 335.00 pounds

MOBILE BENCH TABLES



MBT12



MBWT12
WAVE







Cleaning Position
Intermediate locking position allows for easy cleaning, set up and reset up



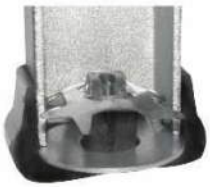
E-Z Free™ Multiple Entrances
E-Z Free™ multiple entrances for easy access and comfort



High Powered High Speed™ Gas Cylinders
For long-lasting opening and closing



E-Z Autolock™
E-Z Autolock™ automatically locks table when folded and opens from either side



DYNAGRIP™ Custom Glides
Extra-wide, high impact, non-marking, load bearing glides for floor safety



Heavy Duty Casters
Heavy duty casters to ensure quality and durability

MODEL NUMBER	TABLE WxL	SEATS	TABLE & BENCH HEIGHT	FOLDED STORAGE POSITION WxLxH	PRODUCT WEIGHT (lbs.)
MBT08	30" x 8'1"	8 - 12	29" - 17" or 27" - 17"	34" x 56" x 59"	315
MBT10	30" x 10'1"	10 - 14	29" - 17" or 27" - 17"	34" x 56" x 69"	335
MBT12	30" x 12'1"	12 - 16	29" - 17" or 27" - 15"	34" x 56" x 82"	350
MBWT10	35" x 10'1"	10 - 14	29" - 17" or 27" - 17"	36" x 62" x 69"	350

PATENT PROTECTED

PRODUCT OPT

STANDARD TABLE TOP AND BENCH LAMINATES (MIX AND MATCH)

WILSONART STANDARD LAMINATES

FORMICA STANDARD LAMINATES

PIONITE STANDARD LAMINATES

NEVAMAR STANDARD LAMINATES

ARBORITE STANDARD LAMINATES

LAMINART STANDARD LAMINATES

STANDARD T-MOLDING TABLE TOP AND BENCH EDGES (MIX AND MATCH)

BLACK, BROWN, GRAY, BEIGE, NAVY BLUE, RED, BURGUNDY, LIGHT GREEN, YELLOW

HUNTER GREEN, ORANGE, PURPLE, GREEN, LIGHT BLUE, GOLD, AQUA TEAL

STANDARD METAL FINISHES

BLACK, BROWN, GRAY, BEIGE, METALLIC CHAMPAGNE, METAL

UPGRADE DYNA-ROCK TABLE TOP AND BENCH EDGES (MIX AND MATCH)

BLACK, BROWN, GRAY, BEIGE, NAVY BLUE, RED, BURGUNDY, LIGHT GREEN, YELLOW

HUNTER GREEN, ORANGE, PURPLE, GREEN, LIGHT BLUE, GOLD, AQUA TEAL

UPGRADE METAL FINISH

CHROME

UPGRADE CORE

PLYWOOD

UPGRADE ADA

1 ADA ACCESSIBLE SPOT

2 ADA ACCESSIBLE SPOTS

UPGRADE WHEEL COLORS (MIX AND MATCH)

BLACK, BROWN, GRAY, BEIGE, NAVY BLUE, RED, BURGUNDY, LIGHT GREEN, YELLOW

HUNTER GREEN, ORANGE, PURPLE, WHITE, GREEN, LIGHT BLUE, GOLD, AQUA TEAL

UPGRADE CUSTOM LOGO TABLE TOP AND BENCH (MIX AND MATCH)





Product: **Mobile Bench Cafeteria Table - 30" W x 10'-1" L**
(Or Approved Equal)

Manufacturer: AmTab

Location: Cafeteria

This table folds up easily for storage when you need to free up floor space. It opens and closes smoothly with the assist of a gas cylinder stabilizer. An EZ auto-lock keeps each cafeteria table securely folded during storage. The reinforced 14-gauge steel frame rolls smoothly on four heavy-duty casters that automatically lift off the floor when the table is in use. The tabletop is constructed of solid particleboard with a durable vinyl edging to protect against chipping and peeling. AmTab's Mobile Bench Cafeteria Table is available in several top, frame and edging color options. Made in the U.S.A.





Select top color:



Select bench color:



Select frame finish:



Select table edge option:



Product Details

- ADA Accessible
- Opens and closes smoothly and easily
- EZ auto-lock secures folded table
- Scratch-resistant laminate finish

- Reinforced steel legs
- Wide range of colors
- Seating capacity: 12 students
- Core material: Particleboard
- Finish material: Laminate
- Leg/frame material: Tubular steel
- Height: 29" table/17" bench
- Width: 30"
- Length: 10'- 1"
- Folded dimensions: 56"W x 33-1/2"D x 69"H
- Fully assembled
- Warranty: 15 years
- Made in the USA
- Green: MAS Certified Green
- Weight: 335.00 pounds

Product: Text Series Tilt-Top Table; 24" x 60" Top w/ Casters (Or Approved Equal)

Manufacturer: Virco, Inc.

Location: 11th/12th Grade English Classrooms, HT Classroom, and Marketing Classroom

Text Series classroom tables, designed by the award-winning team of Peter Glass and Rob Mills, combine elliptical legs, swooping yokes, and arched feet for elegance and versatility. Tables feature a high-pressure laminate work surface and are available in a range of tabletop sizes and top heights including fixed of 30" or an adjustable-height range of 26" to 34", with castors as an option. The options and features make these tables a perfect fit for colleges, universities, public, and private schools.

The TEXT Series Tilt-Top Tables are ideal for selected classrooms, multi-purpose spaces, and other on-campus locations that require variable furniture set-ups. Work surfaces fold vertically for space-saving storage. This top has the ability to tilt from a horizontal to a vertical position by means of locking hinge mechanisms that are hand actuated by a single release mechanism.





Product Details:

- Overall Dimensions: 60" W x 24" D x 30" H
- Weight: 70 lbs
- Metal surfaces are available with a powder coat finish
- Optional grommets.
- Frame / Legs: Tubular steel frame

- Glides / Casters: Casters
- Surfaces: Models are available with a 1-1/8" thick particleboard-core high-pressure laminate work surface with 1-1/8" profile T-mold edge banding
- Optional Features: Grommets, Metal surfaces are available with a powder coat finish
- Assembly required
- Certifications: BIFMA, GreenGuard, CPSIA
- Warranty: 10 years

TEXT® Series – *Technology Tables*

TEXT Series technology tables were designed to meet the needs of technology labs and computer classrooms. Each table includes a perforated steel modesty panel with two generous wire pass-through openings, two grommets and two wire management trays. Models are available with a high-pressure laminate work surface and a 26" to 34" adjustable-height range.

TOP SIZE	ADJ HEIGHT 26"-34"
24" x 60"	TP2460AGMTR
24" x 72"	TP2472AGMTR
30" x 60"	TP3060AGMTR
30" x 72"	TP3072AGMTR



TEXT® Series – *Hinged Wire-Trough Tables*

TEXT Series hinged wire-trough tables offer technology-ready tables with an adjustable-height range of 26" to 34". Models feature a convenient 6" deep wire trough for enhanced wire and cable management as well as scalloped wire management cut outs. Because the wire trough has a hinged rear door, tables have an uninterrupted work surface.

OPTIONAL ACCESSORIES:

POWER/DATA PORT, SWIVEL CASTERS, END CAPS

For information on accessories see page 111.

TOP SIZE	ADJ HEIGHT 26"-34"
24" x 36"	TH24368YADJ
24" x 48"	TH24488YADJ
24" x 54"	TH24548YADJ
24" x 60"	TH24608YADJ
24" x 72"	TH24728YADJ
30" x 36"	TH30368DADJ
30" x 48"	TH30488DADJ
30" x 54"	TH30548DADJ
30" x 60"	TH30608DADJ
30" x 72"	TH30728DADJ





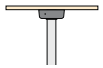
Wire Management Trough

TEXT® Series – *Tilt-Top Tables*



Tilt-top tables have single-post legs.

TEXT Series tilt-top tables deliver space-saving solutions and flexibility with tables that fold vertically, roll away, and neatly nest together for easy storage. Available in rectangular and slide shapes, tables come in a 30" fixed-height or 24" to 32" adjustable-height with casters for quick mobile set-ups. A convenient single release mechanism offers easy folding and unfolding.





OPTIONS: AE SURE EDGE

Rectangle Tops

TOP SIZE	ADJ HEIGHT 24"-32"	FIXED HEIGHT 30"
20" x 42"	TT20428ADJ	TT2042830
20" x 48"	TT20488ADJ	TT2048830
20" x 60"	TT20608ADJ	TT2060830
20" x 72"	TT20728ADJ	TT2072830
24" x 42"	TT24428ADJ	TT2442830
24" x 48"	TT24488ADJ	TT2448830
24" x 60"	TT24608ADJ	TT2460830
24" x 72"	TT24728ADJ	TT2472830
30" x 42"	TT30428ADJ	TT3042830
30" x 48"	TT30488ADJ	TT3048830
30" x 60"	TT30608ADJ	TT3060830
30" x 72"	TT30728ADJ	TT3072830



Slide Tops

TOP SIZE	ADJ HEIGHT 24"-32"	FIXED HEIGHT 30"
30" x 48"	TTSLD30488ADJ	TTSLD3048830
30" x 60"	TTSLD30608ADJ	TTSLD3060830

TEXT® Series – *Table Accessories*

STORAGE



ZBOX - Plastic book box with pencil tray measuring 19⅜"W x 17"D x 4¼"H.



ZBR - Wire book basket: 18"W x 15"D x 4"H.



ZBRT - Wire book basket with a spacious paper/ pencil tray.



UPDRW - Plastic pencil drawer measuring 13" x 22".

UPDRWL - Plastic pencil drawer with lock measuring 13" x 22".

MODESTY PANELS



TMOD27 - Perforated steel modesty panel for use with 27" long TEXT tables.



TMOD36 - Perforated steel modesty panel for use with 36" long TEXT tables.



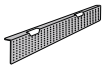
TMOD48 - Perforated steel modesty panel for use with 48" long TEXT tables.



TMOD54 -Perforated steel modesty panel for use with 54" long TEXT tables.



TMOD60 - Perforated steel modesty panel for use with 60" long TEXT tables.



TMOD72 - Perforated steel modesty panel for use with 72" long TEXT tables.

CASTERS



TLCASTER - 4-pack of twin-wheel, 3" diameter locking swivel casters for use with TEXT tables. Please note: casters add 3" to the top height of TEXT tables.

COMPUTER ACCESSORIES



TEXTCPU - Adjustable CPU holder designed to allow leg-mounting of a CPU on a TEXT Series adjustable- or fixed-height table Variable width adjustment to support CPUs between 3⅜" to 7½" wide.

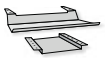
WIRE MANAGEMENT



TWMT36, TWMT48, TWMT54, TWMT60 and TWMT72 - Wire management trays for various widths to accommodate all TEXT models; 36"W, 48"W, 54"W, 60"W, 72"W.



TGANG - A metal plate for ganging two TEXT tables together.



TWMB - Wire management bridge tray allows wires and cables to feed from one table's TEXT wire management tray to the next.

TWC12 - Leg-mounted wire chase for adjustable-height tables neatly provides tabletop to floor routing for cables.

TWC16 - Leg-mounted wire chase for fixed-height tables neatly provides tabletop to floor routing for cables.



THEC - End caps for wire trough tables.

POWER/COMMUNICATIONS



REVEAL - Power port with four individual 15-AMP outlets and 6-foot power cord. The device slides on ball bearing track with 3¾" travel and locks into place.

Additional accessories are listed on page 139.

FRW™ Hard Plastic Chair Colors



Green Apple GRN12 | *Pine* GRN85 | *Sea Mist* GRN07 | *Indigo* BLU61 | *Lagoon* BLU50 | *Merlot* RED60 | *Fuchsia* RED72

Pink RED73 | *Strawberry* RED80 | *Coral* RED53 | *Papaya* YLW44 | *Squash* YLW47 | *Natural* BRN62 | *Chocolate* BRN14

Graphite GRY41 | *Raven* BLK21

Martest 21® Hard Plastic Colors



Forest Green GRN75 | *Navy* BLU51 | *Sky Blue* BLU40 | *Wine* RED50 | *Red* RED70 | *Black* BLK01 | *Sandstone* BRN96

FRW™ Hard Plastic Desk-Top Colors



Fusion Maple BRN38 | *Medium Oak* OAK84 | *Grey Nebula* GRY91 | *Sandstone* BRN96

Asian Sand MPL08 | *Dry Creek Plum* OAK72 | *Looks Likatre* WHT66 | *Thunderstorm* WAL77

Core-A-Gator® ABS Plastic Top Colors



Greystone GRY55 | *Oyster* WHT15

High-Pressure Laminate Colors



Fusion Maple MPL385 | *Medium Oak* OAK084 | *Carmel Sagawood* WOD619 | *Walnut* WAL078 | *Wild Cherry* MHG586 | *Biltmore Cherry* MHG588 | *Dry Creek Plum* OAK072

Looks Likatre WHT066 | *Asian Sand* MPL008 | *Grey Nebula* GRY091 | *Graphite Nebula* BLK535 | *Cloud Nebula* BLU092 | *White Nebula* GRY074 | *Natural Tigris* BRN697

Bronze Legacy BRN416 | *Grey Glace* GRY065 | *Antique White* WHT001 | *Pepperdust* BRN039 | *Grey* GRY005 | *Shadow* BRN415 | *Hollyberry* RED431

Marigold YLW031 | *Atlantis* BLU043 | *DE Ice White* WHT067 | *DE Folkstone Gray* GRY069 | *DE Neutra* BRN068

Dry erase laminates are not recommended for certain surfaces. Ask your Virco Representative for more details.

Frame Finish Colors

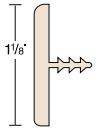


Chrome CHRM | *Char Black* BLK01 | *Silver Mist* GRY02 | *Adobe* BRN42 | *Moonstone* GRY05 | *Eclipse* GRY11 | *El Dorado Bronze* GLD93

Golden Bronze GLD91 | **Mocha* BRN16 | *Espresso* BRN26 | *Red* RED70 | *Squash* YLW47 | *Navy* BLU51 | *Forest Green* GRN75

Clear Coat CLR | *Natural Steel* NST

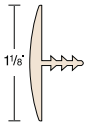
* Mocha is only available on models 162 and 168 folding chairs.



Architectural Edge Banding Colors - 1⅛" Profile

This banding profile is for the following series: TEXT®, Textameter™, Parameter®, Plateau®, Lunada® Tables, Crank-Top Tables, ZBOOM Desks, ZUMA® Two-Student Desks and Wheelchair Height Desks.

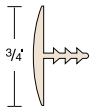
Fusion Maple BRN38
Carmel Sagawood BRN61
Char Black BLK01
Windsor Cherry MHG67
Golden Allusion GLD01
Adobe BRN42
Eclipse GRY11
Moonstone GRY05
Blond Tuscani BRN09



Universal Edge Banding Colors - 1⅛" Profile

This banding profile is for the following series: 4000, 5000, 5700, 6800, Flip-Top Technology, HWT (Hinged Wire Trough), Tilt-Top Training Tables, Café Table Tops, 540 Teacher's Desk, Molecule Desks, and Tetra™.

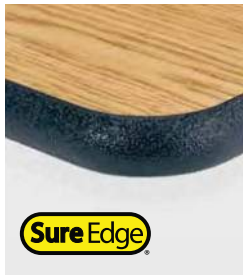
Char Black BLK01
Moonstone GRY05
Blond Tuscani BRN09
Fusion Maple BRN38
Golden Allusion GLD01
Adobe BRN42
Eclipse GRY11
Squash YLW47
Green Apple GRN12
Forest Green GRN75
Sky Blue BLU40
Cobalt Blue BLU65
Navy BLU51
Purple Iris PUR43
Red RED70



Edge Banding Colors - ¾" Profile

This banding profile is for the following series: Mobile Cabinets, Steel Frame Bookcases, Mobile Tables and Folding Tables

Char Black BLK01
Fusion Maple BRN38



Sure Edge® Colors

Virco's durable, water-resistant Sure Edge optional finish is available for an expanded range of tables, student desks and combo units.

Sure Edge forms a seamless, chemically bonded seal that prevents food particles from lodging in table-top edges. As a urethane-based sealant that's applied with an innovative anti-bacterial process for extra cleanliness, Sure Edge won't peel or flake; it even resists fading when exposed to direct sunlight.

We offer urethane-based Sure Edge as an option on our tables, desks and combo units. Whether you choose it for your cafeteria or your classrooms, Sure Edge delivers long-lasting moisture resistant protection. Please consult your current Virco price list for the availability of specific models.

Char Black BLK01
Moonstone GRY05
Blond Tuscani BRN09
Fusion Maple BRN38
Golden Allusion GLD01
Adobe BRN42
Eclipse GRY11
Squash YLW47
Green Apple GRN12
Forest Green GRN75
Sky Blue BLU40
Cobalt Blue BLU65
Navy BLU51
Purple Iris PUR43
Red RED70

Minimum quantities and extended lead-times may apply to some of the Sure Edge colors in this catalog.

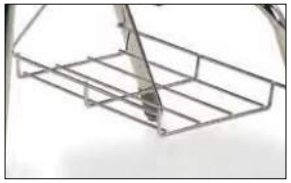
Wood Composite Lacquered Edge Finish

Shown here are standard edge treatments for ¾" plywood, high-pressure laminate tops on Civitas table tops with a beveled edge.

Clear CLR
Smoke GRY22
Black BLK01

Accessories For Optional Configurations

Storage Options



BR BOOKRACK

Virco's welded-on under-seat wire bookrack is still a favorite storage option in many schools.



BH BACKPACK HANGER

Work surfaces for most Virco classroom desks, tables and combo units can be equipped with compact wire backpack hanger.



CH CUP HOLDER

This option – available only on collaborative tops with a high-pressure laminate construction – is positioned in the upper right, as shown below.



Glide & Caster Options



UG FIXED GLIDES

UGLIDE - An optional 5-pack of fixed glides is available for most task chairs and lab stools.

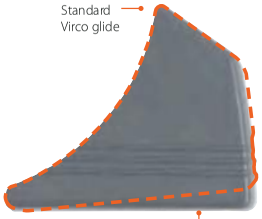


C SOFT-WHEEL CASTERS

A 5-pack of twin-wheel soft casters is available for most task chairs and lab stools, while a 4-pack of twin-wheel soft casters is available for 4-leg mobile chairs with standard casters.

U9024CAST - 5-pack for 5-star base models

U9050CAST - 4-pack for 4-leg base models



BG BUMP GLIDES

Rear bump glides – which limit the rocking range of Virco steel-frame rockers – are designed for environments where limited motion may be desired, such as areas for children with severe sensory integration problems or Autism. Bump glides only come in Graphite.

Chair, Tablet Arm and Combo Glide Options



STANDARD NYLON GLIDES

Nylon-base glides – which are standard on most Virco products with glides – provide the best overall performance for multiple floor applications.



FG FELT-BASE GLIDES

Felt-base glides are the best choice for VCT flooring and gym wood flooring applications.



Rocking Chairs are available with a felt strip on the bottom of each leg for flooring applications where a felt contact surface is appropriate. Rocking Chairs are not recommended for use on VCT flooring.

Comfort & Style Options



P PADDED UPHOLSTERED SEAT

A wide range of models from various product lines can be ordered with a padded, upholstered seat. Different upholstery options are available for different product lines.



A ARM REST

Tubular steel arms with molded polypropylene arm rests are available as a field-installed option for Sage™ Contract chairs and as a factory-installed option for various Analogy, Sage and ZUMA models. Virco's standard arm rest color is Graphite. Check with your Virco sales representative for additional color options, minimums and possible extended lead times..

Writing Surface Options



LH LEFT HANDED

Tablet arm units – and combo units without a dual-entry configuration – are standard with a right-handed (left-side entry) configuration. Models with a left-handed (right-side entrance) configuration are available. Specify left-handed when ordering.



TA TABLET ARM

Sage Contract chairs can be modified to serve as chair desks by adding a field-installed articulating tablet arm. Specify a right-handed (SGTARHKD) or left-handed (SGTALHKD) tablet arm when ordering.

Work Surface Options



M HARD PLASTIC TOP

Selected units that are standard with a high-pressure laminate work surface can be ordered with a hard plastic work surface.



L LAMINATE TOP

Selected units that are standard with a hard plastic work surface can be ordered with a particle-board-core, high-pressure laminate work surface.



PL PLYWOOD TOP

Selected units that are standard with a particleboard-core, high-pressure laminate work surface can be ordered with a plywood-core, high-pressure laminate work surface.



AE SURE EDGE

Virco's durable, water-resistant Sure Edge® forms a seamless, chemically bonded seal. Available for most models with a standard high-pressure laminate work surface.

General Product Information

PRODUCT EVALUATION & TESTING

As a service to our customers and to assure superior levels of quality control, Virco tests and evaluates our products according to rigorous standards. Virco's product evaluation program includes applicable performance testing for strength, durability and stability as established by the Business and Institutional Furniture Manufacturer's Association and accepted by the American National Standards Institute.

ANSI/BIFMA TESTED

Virco's 8800 Series chairs; 2000 Series, 3000 Series, 4000 Series tables with standard-height legs, 4300 Series, 53 Series desks and returns, 53VF Series vertical files and 53LF lateral files, 53MP Series mobile pedestal units, 53CAB Series metal storage cabinets, 54VF Series vertical files, 6000, 6100 (Core-a-Gator®), 62000, 6800, 7900, 785 Series student desks, Sigma® Series desks, 751 lift lid student desks, Jr. Executive student desks, 7900 Series desks, 9000 Series, Analogy® Series (except ROCK models), Civitas® Series Seating (except ROCK models), Flip-Top Technology tables, Lunada® Series tables, N2 Series, Metaphor® Series, Parameter® Series desks and returns, Plateau® Series round, rectangular and racetrack tables, Sage™ Series (except ROCK models), Makerspace, TEXT® Series tables, ZUMA® Series (except ROCK models), 120, 121 and 122 Series Stools, included in this catalog have passed applicable performance tests for strength, durability, and stability as established by the Business and Institutional Furniture Manufacturer's Association International and accepted by the American National Standards Institute.

CARE & USE INSTRUCTIONS NOTICE:

To prevent structural failures and possible injury, furniture should not be used other than for its intended purpose and should be inspected regularly, at least annually, for the following: (1) loose or missing fasteners such as screws, rivets or staples, (2) metal fatigue, rust, cracks or broken welds, (3) any problem that causes instability or tipping, (4) any signs of misuse. Furniture that is damaged or appears to be unstable should immediately be removed from service, reported to the facility manager and replaced or repaired. Repairs should only be made using factory-authorized parts and methods. For information on furniture maintenance, repair, or to report furniture which requires service, call Virco toll-free at 800.448.4726. Furniture should be wiped down with mild soap and water as needed.

UPHOLSTERY TESTING

The following Virco upholstery materials pass California Technical Information Bulletin 117, Section E: Contemporary vinyl, Confetti fabric, Express fabric, Linen vinyl, Pacifica fabric, Sedona fabric, Select vinyl, and fabric for Sage™, Parison®, and Analogy® Series upholstered seating models.

FURNITURE WITH OAK FINISH

Virco's Oak finish highlights the grain and color accents of each furniture item. Because they're crafted from natural hardwood, no two pieces of Oak furniture have exactly the same grain pattern and color; instead, variations in grain and color result in uniquely complementary furniture groupings.

60", 72" AND 84" BOOKCASES

To avoid the risk of a serious tip-over accident, these bookcases must be securely anchored to a wall. Refer to the assembly instructions for more information or see page 150 for details.

GUIDELINES FOR STACKING & MOVING FURNITURE

The number of pieces of furniture that can be safely stacked or moved on Virco's mobile storage equipment will vary depending on many factors, including the furniture's height, weight and general design; the speed at which the unit will be moved; the terrain over which it will travel; and the strength of the operator(s). Care should be taken not to stack to the point of unsteadiness. Virco recommends starting with small, easily handled loads and adding one to two pieces of furniture at a time to determine the safe capacity for each set of conditions. Use Virco mobile storage equipment with appropriate Virco furniture only.

NOTE ON PRODUCT PHOTOGRAPHS:

Many of the Virco products in this catalog have been photographed with "props" to illustrate possible product uses. These props are only included with the product when the accompanying caption explicitly indicates this to be the case. When a caption does not specify that props are included when describing a product, the props are not included with the product.

Virco Warranty

Virco will repair or replace, at its option, any Virco furniture or equipment product which proves to be defective in original material or workmanship that may become evident within the first 10 years of the date of purchase and 5 years from the date of purchase for casters, glides, pneumatic cylinders and torsion bars. This is your sole and exclusive remedy. This warranty covers products manufactured after January 1, 2017, as long as product is owned by original purchaser, and is subject to the following limitations:

Limitations:

From the date of purchase, Virco's warranty covers the items below as follows:

10 Years

Laminates, seating controls, all seating, desk, table and storage products unless otherwise indicated in this warranty.

5 Years

Glides, floor rocker foam pad, casters, pneumatic cylinders and torsion bars on mobile folding tables.

1 Year

Chairs with custom logos applied to their upholstered seats and/or backs.

Exclusions:

This warranty excludes:

- Apparent defects caused by abusive or abnormal use of the product.
- Products not assembled, installed or used in compliance with Virco's product instructions or warnings.
- Failures resulting from inadequate inspection and maintenance.
- The effects of normal usage over time.
- Any damage caused during shipment (see the current Virco price list's "Steps to Take When Receiving Shipments" for more information).
- Product modifications not approved by Virco.
- Vinyl and fabric upholstery material, except as may be offered by the mill source.
- Rust caused by natural elements or high exposure to moisture
- Products used for rental purposes.

Natural Materials, Color Variations & Customer's Own Materials

Leather, wood and other natural materials may have intrinsic grains or patterns that are distinguishing features and not regarded as defects. Virco cannot warrant the matching of grains, patterns, textures, colors, or the color-fastness of such materials. In addition, Virco does not warrant Customer's Own Materials (COM) that are chosen and used in a Virco product at a customer's request.

THERE ARE NO IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY, AND THERE ARE NO OTHER EXPRESS WARRANTIES BEYOND THE WARRANTIES EXPRESSED HERE. ALL INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY ARISE, INCLUDING BUT NOT LIMITED TO BUSINESS LOSSES, PERSONAL PROPERTY DAMAGE, AND THIRD PARTY LIABILITIES ARE HEREBY EXPRESSLY EXCLUDED.

TO OBTAIN SERVICE UNDER THIS WARRANTY:

Please contact your local Virco Sales Representative or Customer Service at 800.448.4726.

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Product: **Text Series w/ T-Leg Table; 24" x 60" Top; Adjustable Height w/ Casters (Or Approved Equal)**

Manufacturer: Virco, Inc.

Location: 11th/12th Grade English Classrooms, SPED English Classroom, SPED Math Classrooms, SPED BLS Classrooms, HT Classroom, and Marketing Classroom

Text Series tables are available with a T-Leg that provides a lower profile upper frame and ensures ADA compliance. As with the other Text Tables, these 24" D tables feature a high-pressure laminate work surface and are available in a range of tabletop sizes and top heights including fixed of 30" or an adjustable-height range of 26" to 34", with castors as an option. The options and features make these tables a perfect fit for colleges, universities, public, and private schools.





Product Details:

- Overall Dimensions: 60" W x 24" D x 24~32" Adj-H
- Weight: 70 lbs
- Metal surfaces are available with a powder coat finish
- Optional grommets.
- Frame / Legs: Tubular steel frame
- Glides / Casters: Casters
- Surfaces: Models are available with a 1-1/8" thick particleboard-core high-pressure laminate work surface with 1-1/8" profile T-mold edge banding
- Optional Features: Grommets, Metal surfaces are available with a powder coat finish
- Assembly required
- Certifications: BIFMA, GreenGuard, CPSIA
- Warranty: 10 years

Preliminary Cost Example *

- MSRP: $990.00



SEMINAR TABLES WITH T-LEGS - 26"-34" ADJUSTABLE-HEIGHT TABLES		
TS24368TADJ	24"W x 36"L x 26"-34"H.	830.00
TS24488TADJ	24"W x 48"L x 26"-34"H.	912.00
TS24548TADJ	24"W x 54"L x 26"-34"H.	951.00
TS24608TADJ	24"W x 60"L x 26"-34"H.	990.00
TS24728TADJ	24"W x 72"L x 26"-34"H.	1071.00

* Price will vary. Bulk rates may apply. Shipping, handling, and installation not included.

5700 Series – *Technology Tables*

5700 Series tables, designed to support technology, training and media-savvy spaces, feature thick-profile legs with built-in wire management access to neatly conceal cables and wires. Tables are available with a high-pressure laminate work surface and a 30" fixed-height or 24" to 32" adjustable-height range.



Optional power port sits flush with table top.

Wires run down the inside of the leg and exit through the opening at the bottom of the leg.

TOP SIZE	ADJ HEIGHT 24"-32"	FIXED 30"
24" x 60"	572460ADJ	57246030
24" x 72"	572472ADJ	57247230
30" x 60"	573060ADJ	57306030
30" x 72"	573072ADJ	57307230

OPTIONS: AE SURE EDGE

OPTIONAL ACCESSORIES:

KEYBOARD MOUSE TRAY, POWER/DATA PORT

For information on accessories see page 143.

6800 Series – *Multi-Purpose Tables*

6800 Series tables are durable and stylish multi-purpose tables ideally suited for general office use. Tables feature a high-pressure laminate work surface with leg selections including a 30" fixed-height or 24" to 34" adjustable-height models with casters.



Adjustable-Height Legs



Adjustable-Height Legs with Casters

TOP SIZE	ADJ HEIGHT 24"-34"	ADJ W/ CASTERS 24"-34"	FIXED 30"
18" x 72"	681872ADJ	681872ADJC	681872
20" x 60"	682060ADJ	682060ADJC	682060
24" x 54"	682454ADJ	682454ADJC	682454
24" x 60"	682460ADJ	682460ADJC	682460
30" x 60"	683060ADJ	683060ADJC	683060
30" x 72"	683072ADJ	683072ADJC	683072
36" x 72"	683672ADJ	683672ADJC	683672
42" x 60"	684260ADJ	684260ADJC	684260
48" Round	6848RADJ	6848RADJC	6848R
60" Round	6860RADJ	6860RADJC	6860R

7900 Series – *Multi-Purpose Tables*

7900 Series heavy-duty tables provide practical solutions for anywhere there's a need for extra durability and support. Models all feature a high-pressure laminate work surface and 22" to 30" adjustable-height steel pedestal legs.





TOP SIZE	ADJ HEIGHT 22"-30"
24" x 48"	792448
30" x 60"	793060
30" x 72"	793072
36" x 72"	793672

TEXT® Series – *Classroom Tables*

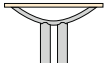
TEXT Series classroom tables, designed by the award-winning team of Peter Glass and Bob Mills, combine elliptical legs, swooping yokes and arched feet for elegance and versatility. Tables feature a high-pressure laminate work surface and are available in a range of tabletop sizes and top heights including fixed-heights of 24" or 30" or an adjustable-height range of 26" to 34", with casters as an option.



Single Post Leg



TOP SIZE	ADJ HEIGHT 26"-34"	FIXED HEIGHT 30"	FIXED HEIGHT 24"
20" x 48"	TE20488YADJ	TE20488Y30	TE20488Y24
20" x 54"	TE20548YADJ	TE20548Y30	TE20548Y24
20" x 60"	TE20608YADJ	TE20608Y30	TE20608Y24
20" x 72"	TE20728YADJ	TE20728Y30	TE20728Y24
24" x 48"	TE24488YADJ	TE24488Y30	TE24488Y24
24" x 54"	TE24548YADJ	TE24548Y30	TE24548Y24
24" x 60"	TE24608YADJ	TE24608Y30	TE24608Y24
24" x 72"	TE24728YADJ	TE24728Y30	TE24728Y24



Double Post Leg



TOP SIZE	ADJ HEIGHT 26"-34"	FIXED HEIGHT 30"	FIXED HEIGHT 24"
30" x 36"	TE30368DADJ	TE30368D30	TE30368D24
30" x 48"	TE30488DADJ	TE30488D30	TE30488D24
30" x 54"	TE30548DADJ	TE30548D30	TE30548D24
30" x 60"	TE30608DADJ	TE30608D30	TE30608D24
30" x 72"	TE30728DADJ	TE30728D30	TE30728D24
36" x 48"	TE36488DADJ	TE36488D30	TE36488D24
36" x 54"	TE36548DADJ	TE36548D30	TE36548D24
36" x 60"	TE36608DADJ	TE36608D30	TE36608D24
36" x 72"	TE36728DADJ	TE36728D30	TE36728D24

OPTIONAL ACCESSORIES:

KEYBOARD MOUSE TRAY, POWER/DATA PORT, MODESTY PANEL, CPU CADDY, SWIVEL CASTERS, WIRE CHASE, WIRE MANAGEMENT TRAY, GANGING DEVICE, PENCIL DRAWER, BOOK BOX/BASKET, BACKPACK HANGER

OPTIONS: AE SURE EDGE C CASTERS GR GROMMET(S)

For information on accessories see pages 113 and 143.

TEXT® Series – *Seminar Tables*

TEXT Series seminar tables feature an elevated cross brace and a narrow footprint, creating a sleek and stylish space-saving solution for seminar and lecture halls. Tables are available with a high-pressure laminate work surface and offer 30" fixed height or 26" to 34" adjustable height, with casters as an option.

OPTIONAL ACCESSORIES:

KEYBOARD MOUSE TRAY, POWER/DATA PORT, MODESTY PANEL, CPU CADDY, SWIVEL CASTERS, WIRE CHASE, WIRE MANAGEMENT TRAY, GANGING DEVICE, PENCIL DRAWER, BOOK BOX/BASKET, BACKPACK HANGER

For information on accessories see pages 113 and 143.

OPTIONS:

AE SURE EDGE C CASTERS GR GROMMET(S)



Seminar Tables - T-Leg

TOP SIZE	ADJ HEIGHT 26"-34"	FIXED HEIGHT 30"
20" x 36"	TS20368TADJ	TS20368T30
20" x 48"	TS20488TADJ	TS20488T30
20" x 54"	TS20548TADJ	TS20548T30
20" x 60"	TS20608TADJ	TS20608T30
20" x 72"	TS20728TADJ	TS20728T30
24" x 36"	TS24368TADJ	TS24368T30
24" x 48"	TS24488TADJ	TS24488T30
24" x 54"	TS24548TADJ	TS24548T30
24" x 60"	TS24608TADJ	TS24608T30
24" x 72"	TS24728TADJ	TS24728T30



Seminar Tables - Y-Leg

TOP SIZE	ADJ HEIGHT 26"-34"	FIXED HEIGHT 30"
20" x 36"	TS20368YADJ	TS20368Y30
20" x 48"	TS20488YADJ	TS20488Y30
20" x 54"	TS20548YADJ	TS20548Y30
20" x 60"	TS20608YADJ	TS20608Y30
20" x 72"	TS20728YADJ	TS20728Y30
24" x 36"	TS24368YADJ	TS24368Y30
24" x 48"	TS24488YADJ	TS24488Y30
24" x 54"	TS24548YADJ	TS24548Y30
24" x 60"	TS24608YADJ	TS24608Y30
24" x 72"	TS24728YADJ	TS24728Y30

FRW™ Hard Plastic Chair Colors



Green Apple GRN12 | *Pine* GRN85 | *Sea Mist* GRN07 | *Indigo* BLU61 | *Lagoon* BLU50 | *Merlot* RED60 | *Fuchsia* RED72

Pink RED73 | *Strawberry* RED80 | *Coral* RED53 | *Papaya* YLW44 | *Squash* YLW47 | *Natural* BRN62 | *Chocolate* BRN14

Graphite GRY41 | *Raven* BLK21

Martest 21® Hard Plastic Colors



Forest Green GRN75 | *Navy* BLU51 | *Sky Blue* BLU40 | *Wine* RED50 | *Red* RED70 | *Black* BLK01 | *Sandstone* BRN96

FRW™ Hard Plastic Desk-Top Colors



Fusion Maple BRN38 | *Medium Oak* OAK84 | *Grey Nebula* GRY91 | *Sandstone* BRN96

Asian Sand MPL08 | *Dry Creek Plum* OAK72 | *Looks Likatre* WHT66 | *Thunderstorm* WAL77

Core-A-Gator® ABS Plastic Top Colors



Greystone GRY55 | *Oyster* WHT15

High-Pressure Laminate Colors



Fusion Maple MPL385 | *Medium Oak* OAK084 | *Carmel Sagawood* WOD619 | *Walnut* WAL078 | *Wild Cherry* MHG586 | *Biltmore Cherry* MHG588 | *Dry Creek Plum* OAK072

Looks Likatre WHT066 | *Asian Sand* MPL008 | *Grey Nebula* GRY091 | *Graphite Nebula* BLK535 | *Cloud Nebula* BLU092 | *White Nebula* GRY074 | *Natural Tigris* BRN697

Bronze Legacy BRN416 | *Grey Glace* GRY065 | *Antique White* WHT001 | *Pepperdust* BRN039 | *Grey* GRY005 | *Shadow* BRN415 | *Hollyberry* RED431

Marigold YLW031 | *Atlantis* BLU043 | *DE Ice White* WHT067 | *DE Folkstone Gray* GRY069 | *DE Neutra* BRN068

Dry erase laminates are not recommended for certain surfaces. Ask your Virco Representative for more details.

Frame Finish Colors

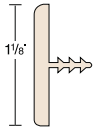


Chrome CHRM | *Char Black* BLK01 | *Silver Mist* GRY02 | *Adobe* BRN42 | *Moonstone* GRY05 | *Eclipse* GRY11 | *El Dorado Bronze* GLD93

Golden Bronze GLD91 | ** Mocha* BRN16 | *Espresso* BRN26 | *Red* RED70 | *Squash* YLW47 | *Navy* BLU51 | *Forest Green* GRN75

Clear Coat CLR | *Natural Steel* NST

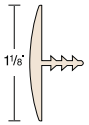
* Mocha is only available on models 162 and 168 folding chairs.



Architectural Edge Banding Colors - 1⅛" Profile

This banding profile is for the following series: TEXT®, Textameter™, Parameter®, Plateau®, Lunada® Tables, Crank-Top Tables, ZBOOM Desks, ZUMA® Two-Student Desks and Wheelchair Height Desks.

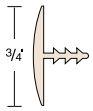
Fusion Maple BRN38
Carmel Sagawood BRN61
Char Black BLK01
Windsor Cherry MHG67
Golden Allusion GLD01
Adobe BRN42
Eclipse GRY11
Moonstone GRY05
Blond Tuscani BRN09



Universal Edge Banding Colors - 1⅛" Profile

This banding profile is for the following series: 4000, 5000, 5700, 6800, Flip-Top Technology, HWT (Hinged Wire Trough), Tilt-Top Training Tables, Café Table Tops, 540 Teacher's Desk, Molecule Desks, and Tetra™.

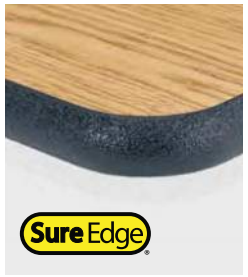
Char Black BLK01
Moonstone GRY05
Blond Tuscani BRN09
Fusion Maple BRN38
Golden Allusion GLD01
Adobe BRN42
Eclipse GRY11
Squash YLW47
Green Apple GRN12
Forest Green GRN75
Sky Blue BLU40
Cobalt Blue BLU65
Navy BLU51
Purple Iris PUR43
Red RED70



Edge Banding Colors - ¾" Profile

This banding profile is for the following series: Mobile Cabinets, Steel Frame Bookcases, Mobile Tables and Folding Tables

Char Black BLK01
Fusion Maple BRN38



Sure Edge® Colors

Virco's durable, water-resistant Sure Edge optional finish is available for an expanded range of tables, student desks and combo units.

Sure Edge forms a seamless, chemically bonded seal that prevents food particles from lodging in table-top edges. As a urethane-based sealant that's applied with an innovative anti-bacterial process for extra cleanliness, Sure Edge won't peel or flake; it even resists fading when exposed to direct sunlight.

We offer urethane-based Sure Edge as an option on our tables, desks and combo units. Whether you choose it for your cafeteria or your classrooms, Sure Edge delivers long-lasting moisture resistant protection. Please consult your current Virco price list for the availability of specific models.

Char Black BLK01
Moonstone GRY05
Blond Tuscani BRN09
Fusion Maple BRN38
Golden Allusion GLD01
Adobe BRN42
Eclipse GRY11
Squash YLW47
Green Apple GRN12
Forest Green GRN75
Sky Blue BLU40
Cobalt Blue BLU65
Navy BLU51
Purple Iris PUR43
Red RED70

Minimum quantities and extended lead-times may apply to some of the Sure Edge colors in this catalog.

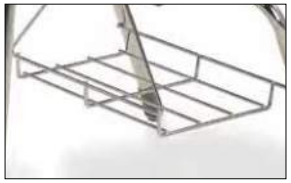
Wood Composite Lacquered Edge Finish

Shown here are standard edge treatments for ¾" plywood, high-pressure laminate tops on Civitas table tops with a beveled edge.

Clear CLR
Smoke GRY22
Black BLK01

Accessories For Optional Configurations

Storage Options



BR BOOKRACK

Virco's welded-on under-seat wire bookrack is still a favorite storage option in many schools.



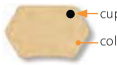
BH BACKPACK HANGER

Work surfaces for most Virco classroom desks, tables and combo units can be equipped with compact wire backpack hanger.



CH CUP HOLDER

This option – available only on collaborative tops with a high-pressure laminate construction – is positioned in the upper right, as shown below.



Glide & Caster Options



UG FIXED GLIDES

UGLIDE - An optional 5-pack of fixed glides is available for most task chairs and lab stools.

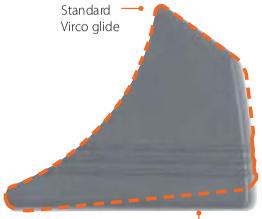


C SOFT-WHEEL CASTERS

A 5-pack of twin-wheel soft casters is available for most task chairs and lab stools, while a 4-pack of twin-wheel soft casters is available for 4-leg mobile chairs with standard casters.

U9024CAST - 5-pack for 5-star base models

U9050CAST - 4-pack for 4-leg base models



BG BUMP GLIDES

Rear bump glides – which limit the rocking range of Virco steel-frame rockers – are designed for environments where limited motion may be desired, such as areas for children with severe sensory integration problems or Autism. Bump glides only come in Graphite.

Chair, Tablet Arm and Combo Glide Options



STANDARD NYLON GLIDES

Nylon-base glides – which are standard on most Virco products with glides – provide the best overall performance for multiple floor applications.



FG FELT-BASE GLIDES

Felt-base glides are the best choice for VCT flooring and gym wood flooring applications.



Rocking Chairs are available with a felt strip on the bottom of each leg for flooring applications where a felt contact surface is appropriate. Rocking Chairs are not recommended for use on VCT flooring.

Comfort & Style Options



P PADDED UPHOLSTERED SEAT

A wide range of models from various product lines can be ordered with a padded, upholstered seat. Different upholstery options are available for different product lines.



A ARM REST

Tubular steel arms with molded polypropylene arm rests are available as a field-installed option for Sage™ Contract chairs and as a factory-installed option for various Analogy, Sage and ZUMA models. Virco's standard arm rest color is Graphite. Check with your Virco sales representative for additional color options, minimums and possible extended lead times..

Writing Surface Options



LH LEFT HANDED

Tablet arm units – and combo units without a dual-entry configuration – are standard with a right-handed (left-side entry) configuration. Models with a left-handed (right-side entrance) configuration are available. Specify left-handed when ordering.



TA TABLET ARM

Sage Contract chairs can be modified to serve as chair desks by adding a field-installed articulating tablet arm. Specify a right-handed (SGTARHKD) or left-handed (SGTALHKD) tablet arm when ordering.

Work Surface Options



M HARD PLASTIC TOP

Selected units that are standard with a high-pressure laminate work surface can be ordered with a hard plastic work surface.



L LAMINATE TOP

Selected units that are standard with a hard plastic work surface can be ordered with a particle-board-core, high-pressure laminate work surface.



PL PLYWOOD TOP

Selected units that are standard with a particleboard-core, high-pressure laminate work surface can be ordered with a plywood-core, high-pressure laminate work surface.



AE SURE EDGE

Virco's durable, water-resistant Sure Edge® forms a seamless, chemically bonded seal. Available for most models with a standard high-pressure laminate work surface.

General Product Information

PRODUCT EVALUATION & TESTING

As a service to our customers and to assure superior levels of quality control, Virco tests and evaluates our products according to rigorous standards. Virco's product evaluation program includes applicable performance testing for strength, durability and stability as established by the Business and Institutional Furniture Manufacturer's Association and accepted by the American National Standards Institute.

ANSI/BIFMA TESTED

Virco's 8800 Series chairs; 2000 Series, 3000 Series, 4000 Series tables with standard-height legs, 4300 Series, 53 Series desks and returns, 53VF Series vertical files and 53LF lateral files, 53MP Series mobile pedestal units, 53CAB Series metal storage cabinets, 54VF Series vertical files, 6000, 6100 (Core-a-Gator®), 62000, 6800, 7900, 785 Series student desks, Sigma® Series desks, 751 lift lid student desks, Jr. Executive student desks, 7900 Series desks, 9000 Series, Analogy® Series (except ROCK models), Civitas® Series Seating (except ROCK models), Flip-Top Technology tables, Lunada® Series tables, N2 Series, Metaphor® Series, Parameter® Series desks and returns, Plateau® Series round, rectangular and racetrack tables, Sage™ Series (except ROCK models), Makerspace, TEXT® Series tables, ZUMA® Series (except ROCK models), 120, 121 and 122 Series Stools, included in this catalog have passed applicable performance tests for strength, durability, and stability as established by the Business and Institutional Furniture Manufacturer's Association International and accepted by the American National Standards Institute.

CARE & USE INSTRUCTIONS NOTICE:

To prevent structural failures and possible injury, furniture should not be used other than for its intended purpose and should be inspected regularly, at least annually, for the following: (1) loose or missing fasteners such as screws, rivets or staples, (2) metal fatigue, rust, cracks or broken welds, (3) any problem that causes instability or tipping, (4) any signs of misuse. Furniture that is damaged or appears to be unstable should immediately be removed from service, reported to the facility manager and replaced or repaired. Repairs should only be made using factory-authorized parts and methods. For information on furniture maintenance, repair, or to report furniture which requires service, call Virco toll-free at 800.448.4726. Furniture should be wiped down with mild soap and water as needed.

UPHOLSTERY TESTING

The following Virco upholstery materials pass California Technical Information Bulletin 117, Section E: Contemporary vinyl, Confetti fabric, Express fabric, Linen vinyl, Pacifica fabric, Sedona fabric, Select vinyl, and fabric for Sage™, Parison®, and Analogy® Series upholstered seating models.

FURNITURE WITH OAK FINISH

Virco's Oak finish highlights the grain and color accents of each furniture item. Because they're crafted from natural hardwood, no two pieces of Oak furniture have exactly the same grain pattern and color; instead, variations in grain and color result in uniquely complementary furniture groupings.

60", 72" AND 84" BOOKCASES

To avoid the risk of a serious tip-over accident, these bookcases must be securely anchored to a wall. Refer to the assembly instructions for more information or see page 150 for details.

GUIDELINES FOR STACKING & MOVING FURNITURE

The number of pieces of furniture that can be safely stacked or moved on Virco's mobile storage equipment will vary depending on many factors, including the furniture's height, weight and general design; the speed at which the unit will be moved; the terrain over which it will travel; and the strength of the operator(s). Care should be taken not to stack to the point of unsteadiness. Virco recommends starting with small, easily handled loads and adding one to two pieces of furniture at a time to determine the safe capacity for each set of conditions. Use Virco mobile storage equipment with appropriate Virco furniture only.

NOTE ON PRODUCT PHOTOGRAPHS:

Many of the Virco products in this catalog have been photographed with "props" to illustrate possible product uses. These props are only included with the product when the accompanying caption explicitly indicates this to be the case. When a caption does not specify that props are included when describing a product, the props are not included with the product.

Virco Warranty

Virco will repair or replace, at its option, any Virco furniture or equipment product which proves to be defective in original material or workmanship that may become evident within the first 10 years of the date of purchase and 5 years from the date of purchase for casters, glides, pneumatic cylinders and torsion bars. This is your sole and exclusive remedy. This warranty covers products manufactured after January 1, 2017, as long as product is owned by original purchaser, and is subject to the following limitations:

Limitations:

From the date of purchase, Virco's warranty covers the items below as follows:

10 Years

Laminates, seating controls, all seating, desk, table and storage products unless otherwise indicated in this warranty.

5 Years

Glides, floor rocker foam pad, casters, pneumatic cylinders and torsion bars on mobile folding tables.

1 Year

Chairs with custom logos applied to their upholstered seats and/or backs.

Exclusions:

This warranty excludes:

- Apparent defects caused by abusive or abnormal use of the product.
- Products not assembled, installed or used in compliance with Virco's product instructions or warnings.
- Failures resulting from inadequate inspection and maintenance.
- The effects of normal usage over time.
- Any damage caused during shipment (see the current Virco price list's "Steps to Take When Receiving Shipments" for more information).
- Product modifications not approved by Virco.
- Vinyl and fabric upholstery material, except as may be offered by the mill source.
- Rust caused by natural elements or high exposure to moisture
- Products used for rental purposes.

Natural Materials, Color Variations & Customer's Own Materials

Leather, wood and other natural materials may have intrinsic grains or patterns that are distinguishing features and not regarded as defects. Virco cannot warrant the matching of grains, patterns, textures, colors, or the color-fastness of such materials. In addition, Virco does not warrant Customer's Own Materials (COM) that are chosen and used in a Virco product at a customer's request.

THERE ARE NO IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY, AND THERE ARE NO OTHER EXPRESS WARRANTIES BEYOND THE WARRANTIES EXPRESSED HERE. ALL INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY ARISE, INCLUDING BUT NOT LIMITED TO BUSINESS LOSSES, PERSONAL PROPERTY DAMAGE, AND THIRD PARTY LIABILITIES ARE HEREBY EXPRESSLY EXCLUDED.

TO OBTAIN SERVICE UNDER THIS WARRANTY:

Please contact your local Virco Sales Representative or Customer Service at 800.448.4726.

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Product: **A2 Art Table Series; 60"W x 42"D x 30"H**

Manufacturer: Hann Manufacturing, Inc.

Location: Art Rooms



Item #:51631-8400

This multi-purpose art table is a sturdy and attractive platform for student projects. The base is constructed of solid hard maple with bolt reinforced mortise and tenon joints for strength and maintainability. The heavy base components and wide feet fitted with adjustable floor glides contribute to excellent table stability. The "double-bolt" lower leg spreader and additional upper spreader provide superior rigidity and resistance to loosening. The leg panels are straight. Table top choices include 1-1/4" thick HPL with either 3mm PVC edgebanding or sprayed-on urethane edging and 1-3/4" thick hard maple. Other table options include bookshelves and tote trays. Standard table height is 30".

Product Options

A2-3060PL3 - 1-1/4" x 30" x 60" 'maple grain' patterned HPL top w/ 3mm PVC edgebanding.
A2-3060M - 1-3/4" x 30" x 60" hard maple butcher-block top.
A2-4260PL3 - 1-1/4" x 42" x 60" 'maple grain' patterned HPL top w/ 3mm PVC edgebanding.

A2-4260PLA - 1-1/4" x 42" x 60" 'maple grain' patterned HPL top w/ sprayed-on urethane edging.

A2-4260M - 1-3/4" x 42" x 60" hard maple butcher-block top.

A2-4272PL3 - 1-1/4" x 42" x 72" 'maple grain' patterned HPL top w/ 3mm PVC edgebanding.

A2-4272PLA - 1-1/4" x 42" x 72" 'maple grain' patterned HPL top w/ sprayed-on urethane edging.

A2-4272M - 1-3/4" x 42" x 72" hard maple butcherblock top.

Table option suffixes:

-26 - Indicates 26" table height rather than standard 30"

-BS - Indicates bookshelves

-TT - indicates tote trays

Product: Utility Table; Butcher Block Top; 60x30 (Or Approved Equal)

Manufacturer: National Public Seating

Location: CHamorro Classrooms, Faculty Workroom / Resource Center, and Cumulative File Storage

Play, work, and study with National Public Seating Utility Tables with butcher block top. Designed for Makerspace and STEM learning environments, these tables are scratch resistant, stain-resistant, and made for long term use.

These durable tables have a 1-3/4" Maple wood coated butcher block that provides a durable and elegant presentation while a urethane-based satin finish minimizes the chance of permanent stains. The 16-gauge steel frame apron and 14-gauge legs create a stable footprint and is designed for years of use. The legs lock firmly in place with K-9 external tooth lock washers and heavy-duty temper-free hex screws. The legs also have simple adjust glides for easy mobility.



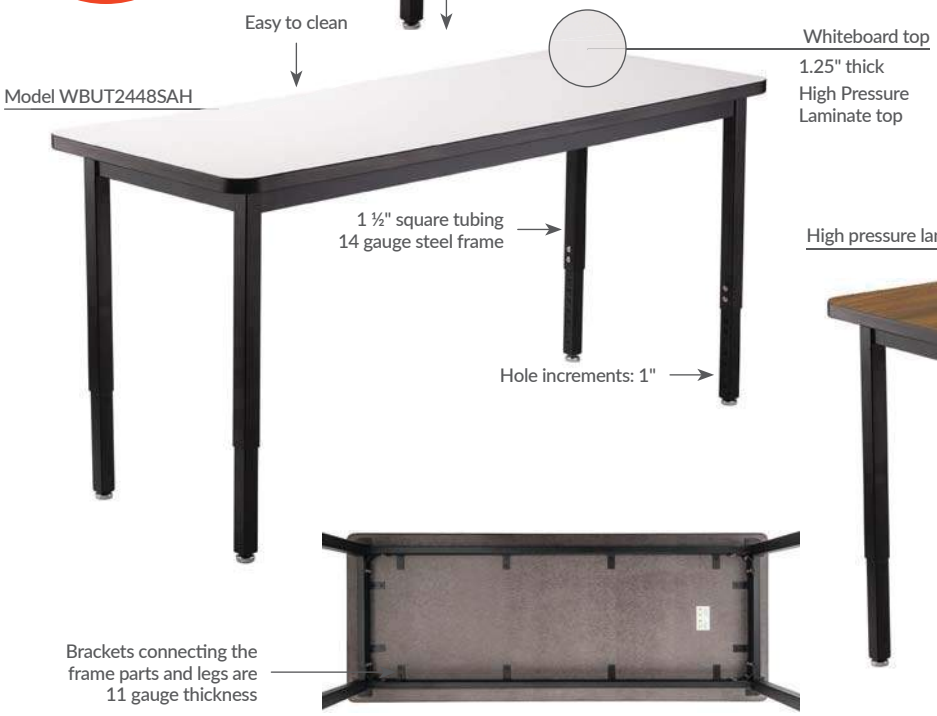


Product Details

- 1-3/4" Maple wood coated butcher block for an elegant and robust presentation
- Urethane-based satin finish reduces permanent stains
- 16-gauge steel frame apron
- 14-gauge steel legs for a stable footprint
- Legs adjustable in 1" increments
- Overall dimensions: 60"W x 30"D
- Table Height: 22-1/4" ~ 37-1/4"
- Weight: 132 lbs
- Warranty: 10 years



MADE WITH TAMPER-FREE HEX-HEAD SCREWS AND THREADED HARDWARE



Collaborative

Unique table top options allows for team work in STEM Labs and Makerspaces.

Adjustable

14 gauge steel legs adjust in 1” increments giving you many options to configure as you see fit.

Durable

1.5’ square legs, tamper-free threaded hardware on industrial grade table tops provide for rugged use.



Ability to have standard height w/ casters

A. BBUT Series
Butcher Block Top

Model #	Description
#BBUT2448SAH	Adjustable Height Utility Table, 24” X 48”, Butcherblock Top
#BBUT2454SAH	Adjustable Height Utility Table, 24” X 54”, Butcherblock Top
#BBUT2460SAH	Adjustable Height Utility Table, 24” X 60”, Butcherblock Top
#BBUT2472SAH	Adjustable Height Utility Table, 24” X 72”, Butcherblock Top
#BBUT3060SAH	Adjustable Height Utility Table, 30” X 60”, Butcherblock Top
#BBUT3072SAH	Adjustable Height Utility Table, 30” X 72”, Butcherblock Top

B. WBUT Series
Whiteboard Top

Model #	Description
#WBUT2448SAH	Adjustable Height Utility Table, 24” X 48”, Whiteboard Top
#WBUT2454SAH	Adjustable Height Utility Table, 24” X 54”, Whiteboard Top
#WBUT2460SAH	Adjustable Height Utility Table, 24” X 60”, Whiteboard Top
#WBUT2472SAH	Adjustable Height Utility Table, 24” X 72”, Whiteboard Top
#WBUT3060SAH	Adjustable Height Utility Table, 30” X 60”, Whiteboard Top
#WBUT3072SAH	Adjustable Height Utility Table, 30” X 72”, Whiteboard Top

C. HPLUT Series
High Pressure Laminate Top

Model #	Description
#HPLUT2448SAH	Adjustable Height Utility Table, 24” X 48”, High Pressure Laminate Top
#HPLUT2454SAH	Adjustable Height Utility Table, 24” X 54”, High Pressure Laminate Top
#HPLUT2460SAH	Adjustable Height Utility Table, 24” X 60”, High Pressure Laminate Top
#HPLUT2472SAH	Adjustable Height Utility Table, 24” X 72”, High Pressure Laminate Top
#HPLUT3060SAH	Adjustable Height Utility Table, 30” X 60”, High Pressure Laminate Top
#HPLUT3072SAH	Adjustable Height Utility Table, 30” X 72”, High Pressure Laminate Top

National Public Seating

800.261.4112
www.nationalpublicseating.com

**For Casters add: -CAST*

Product: **Adjustable-Height Science Lab Table w/ Laminate Top - Silver Powder Coated Legs; 24" x 60" (Or Approved Equal)**

Manufacturer**:** Diversified Spaces (formerly Diversified Woodcrafts)

Location: Science Classroom Laboratories for Physical Sciences

Diversified's Adjustable-Height Science Table allows you to quickly adjust the height of your lab table without the use of tools. The table adjusts from 27 inches to 39 inches high and meets ADA requirements. Raise just one end and create an incline table for physics experiments. Steel legs and a solid oak frame allow the table to support up to 500 pounds. The laminate top is best for classroom situations that do not require high temperatures or severe chemicals.





Adjustable height to meet ADA requirements.



Product Details

- Overall Dimensions: 60" W x 24" D x 27"~39" H Tabletop Material: 1 1/4" Laminate
- Wood Material: Solid oak
- Finish: Powder-coat paint finish on legs
- Glides: Adjustable
- Weight Capacity: 500 lbs.
- Other Info: MAS green certified; SEFA 8 certified
- Warranty: Lifetime limited
- Assembly: Assembly Required
- Product Weight (Lbs): 99 lbs.
- Shipping Method: Freight

Product: Mode Cafe Table With Silver Round Base

Manufacturer: KFI Seating

Location: Staff-Faculty Lounge and Kitchen Staff Lunchroom

Round Mode Cafe Tables are ideal many settings, including school lunchrooms, break rooms, restaurants, cafe and lounges. These cafe tables give the convenience of hassle-free and quick assembly. The cast iron round base comes in the contemporary silver powder coat finish.



Shown with Jive Stack Chairs also by KFI





Product Details

- Counter table height (36'' H)
- Silver round bases
- 1-1/4” High pressure laminated tops
- Strong 16 Gauge 3” Diameter Column
- Fixed height of 29''
- Cast Iron pedestal Base
- Bolt inside the column for speedy attachment
- T-Mold Edge banding
- Leveling glides protect floors from damage

Product: **46" Round Table (Commercial) - White Granite (Or Approved Equal)**

Manufacturer: Lifetime Products

Location: Credit Recovery Common Room

This Lifetime folding table is a convenient and reliable addition to virtually any application. With an incredible combination of affordability and performance, this table is sure to be an integral component to any operation. Its durable, attractive design makes this folding table great for conference rooms, restaurants, banquet halls, and a variety of other establishments. It has a 2" thick top that will not crack, chip, or peel, and its rugged design makes it an excellent choice for both indoor and outdoor use.

This tabletop is made out of high impact white granite-colored polyethylene. It is stronger, lighter, and more durable than wood. Its legs fold flat against the top, making it ideal for catering and other businesses that need to frequently transport or store tables. Floor caps on the feet of this table prevent surfaces from getting scratched and scuffed. An 18 gauge steel frame is backed by a cross brace, center support brace, and leg locks to make this an extremely sturdy table. Measuring 46" in diameter, this unit's spacious tabletop comfortably accommodates four to five people.







MFR #: 22960

Product Details

- Overall Dimensions: 46" Dia x 29" H
- Finish Color: White Granite
- Frame Material: 18 gauge steel
- Ready to use, easy to maintain and simple to store
- Superior strength and durability
- Rust-resistant powder coated steel frame
- Tabletop Material: High-Density Polyethylene
- Max seating capacity: 5
- Exceeds ANSI/BIFMA standards
- Stain resistant and easy to clean
- This item meets ANSI/BIFMA standards for comfort, safety, sustainability, and durability in furniture
- Made in the USA

Product: Mobile E-Z Tilt Table - Rectangle; 36"x72" (Or Approved Equal)

Manufacturer: AmTab Manufacturing Corporation

Location: Library

EZ-Tilt Tables by AmTab are great for offices, classrooms or any multi-use room. These tables feature a flip up top for space saving storage when not in use. Their high-quality state-of-the-art tables are safe, durable, easy to operate, and a great long-term value. The ¾" solid particleboard tabletop will last for years under daily use. Dyna-Rock edges are standard for extra durability. AmTab uses a special high-speed gas cylinder stabilizer with 14 gauge steel to create a stable and sturdy table. Choose from several top, frame and banding color options. All AmTab mobile folding tables are 100% Made in the USA, UL certified, ANSI/BIFMA certified, MAS Green certified, and have a 15 year warranty. These tables are ideal for heavy-use and heavy-turn settings providing years of trusted service.



CB3672

Product Details

- Opened Footprint: 36"W x 72"L x 29"H
- Folded Footprint: 20"W x 72"L x 42"H
- Table Surface Dimensions: 36"W x 72"L x 29"H
- Safety, Quality & Durability, Ease Of Operation, And Value For Your Investment
- Solid ¾" particleboard top
- Balanced 14 Gauge Steel Construction
- Spring-Loaded T-Autolock ensures top stays safely locked
- One-Piece Top Provides Flexibility And Style

- Wide Heavy-Duty Double-Ball-Bearing Non-Marking Swivel Casters For Strength And Easy Movement
- Custom High-Speed Gas Cylinder Stabilizer Assist For Long-Lasting Opening/Closing Functions and easy operation.
- 4” x 1-3/8” casters with double ball bearing
- Select from several top, frame and banding color options
- Compact Nesting And Storage As Tops Folds
- Affordable Long-Term Value
- 100% Made in the USA
- 15 Year Warranty
- UL Certified
- ANSI/BIFMA Certified
- MAS Green Certified
- Patent Protected
- ADA Compliant Models Available

Top Color: *



Edge Type: *

Choose Options

Edge Color: *



Metal Finish: *



Product: Mobile E-Z Tilt Table - Rectangle; 36"x72" (Or Approved Equal)

Manufacturer: AmTab Manufacturing Corporation

Location: Library

EZ-Tilt Tables by AmTab are great for offices, classrooms or any multi-use room. These tables feature a flip up top for space saving storage when not in use. Their high-quality state-of-the-art tables are safe, durable, easy to operate, and a great long-term value. The ¾" solid particleboard tabletop will last for years under daily use. Dyna-Rock edges are standard for extra durability. AmTab uses a special high-speed gas cylinder stabilizer with 14 gauge steel to create a stable and sturdy table. Choose from several top, frame and banding color options. All AmTab mobile folding tables are 100% Made in the USA, UL certified, ANSI/BIFMA certified, MAS Green certified, and have a 15 year warranty. These tables are ideal for heavy-use and heavy-turn settings providing years of trusted service.



Product Details

- ADA Accessible
- Opened Footprint: 36"W x 72"L x 29"H
- Folded Footprint: 20"W x 72"L x 42"H
- Table Surface Dimensions: 36"W x 72"L x 29"H
- Safety, Quality & Durability, Ease Of Operation, And Value For Your Investment
- Solid ¾" particleboard top
- Balanced 14 Gauge Steel Construction
- Spring-Loaded T-Autolock ensures top stays safely locked

- One-Piece Top Provides Flexibility And Style
- Wide Heavy-Duty Double-Ball-Bearing Non-Marking Swivel Casters For Strength And Easy Movement
- Custom High-Speed Gas Cylinder Stabilizer Assist For Long-Lasting Opening/Closing Functions and easy operation.
- 4” x 1-3/8” casters with double ball bearing
- Select from several top, frame and banding color options
- Compact Nesting And Storage As Tops Folds
- Affordable Long-Term Value
- 100% Made in the USA
- 15 Year Warranty
- UL Certified
- ANSI/BIFMA Certified
- MAS Green Certified
- Patent Protected

Top Color: *



Edge Type: *

Choose Options

Edge Color: *



Metal Finish: *



Product: Russwood® Elite™ Study Carrel (Or Approved Equal)

Manufacturer: Russwood Library Furniture

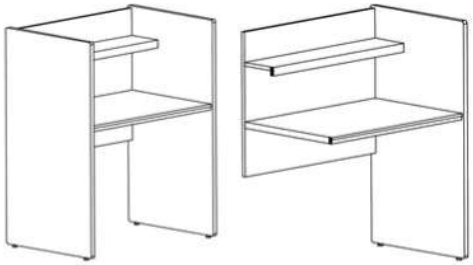
Location: Library

Russwood carrels are ideal for creating computer stations or places to study. Raised panels help reduce distractions and allow students to stay on task. Starter / Adder options allow you to expand as your library grows. With Russwood's full line, the possibilities are almost endless.



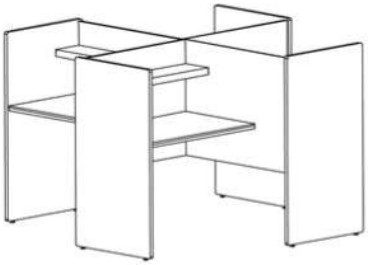


Single Study Carrel (Starter - Adder)



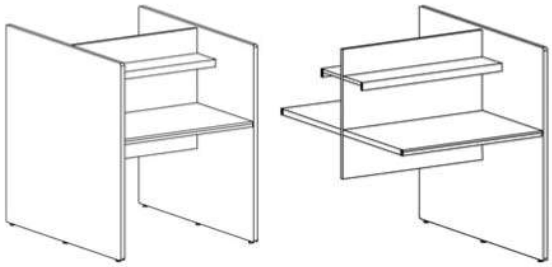
ES-48-S1 ES-48-A1

Study Carrel - Pinwheel



ES-48-PW

Double Study Carrel (Starter - Adder)



ES-48-S2 ES-48-A2

Product Details

- 1” thick veneer core end panels with solid oak wood edgeband.
- 1.25” thick work surface with high-pressure laminate.
- Tops are fastened to end panels using 14 gauge steel brackets and top quality wood screws.
- Leveling glides provide stability on uneven surfaces.
- Starter / Adder design makes it easy to fit your space, or add on later as your needs grow.
- Study Carrels have an 8” deep bookshelf mounted on the back panel above the work surface.
- Single-Faced, Starter: 39"W x 27"D x 48"H
- Single-Faced, Adder: 38"W x 27"D x 48"H
- Double-Faced, Starter: 39"W x 51"D x 48"D
- Double-Faced, Adder: 38"W x 51"D x 48"

Finishes:

WOOD STAINS

ON OAK



ON MAPLE



LAMINATES

TO MATCH RUSSWOOD WOOD FINISH OPTIONS - TO VIEW MATCHING CHART, CLICK HERE


Black Walnut


Castle Oak


Colombian Walnut


English Oak


Figured Mahogany


Finnish Oak


Kensington Maple


Montana Walnut


Solar Oak


Tuscan Walnut


Wild Cherry


Windsor Mahogany


Zanzibar

Product: Sport Pride Illuminated Scorers' Table (Or Approved Equal)

Manufacturer: Bison Inc.

Location: Gymnasium

Let the light shine through with Bison Sport Pride Illuminated Scorers' Tables. Tables have profile identical to Bison's full color graphic and lettered scorers' table models so tables can be configured in any length and in any combination of styles to meet your facility's needs and budget.



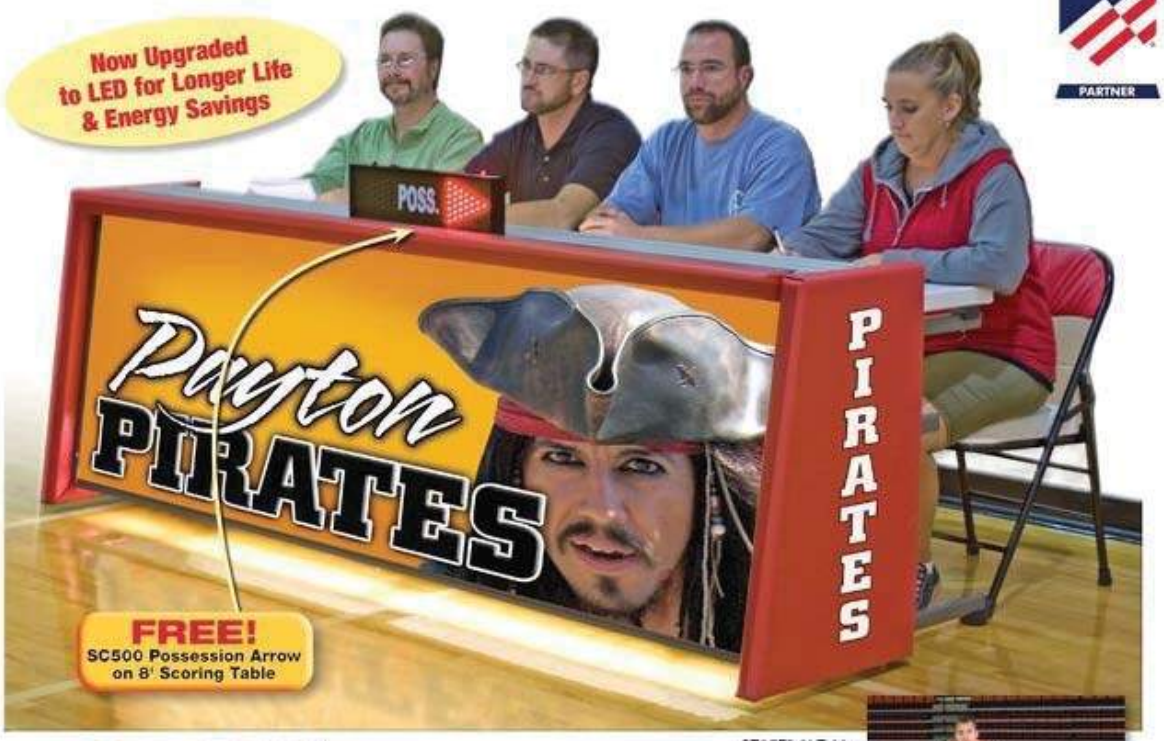


Product Details

- Support legs and 16” deep table top fold for easy transport and storage on built-in, non-marking casters
- Front graphics are printed on a durable, translucent substrate and protected by unbreakable clear polycarbonate for a lifetime of sharp, bright images
- Price includes free artwork design by Bison art department using virtually any photo quality image, logo artwork or lettering
- 8’ table length
- Can be used either on the floor with chairs or mounted on a customer fabricated platform a few rows up in most bleachers
- Ends are fully padded and can be lettered with school name
- Top edge has matching safety padding
- Each table includes a FREE possession arrow and a 120 volt power strip with surge protector
- See Convertible drawing on page 30 for profile information
- Requires 20 amp, 120 volt service
- Illumination is provided by three LED bulbs (included)
- Five-year limited warranty on tables except lamps.

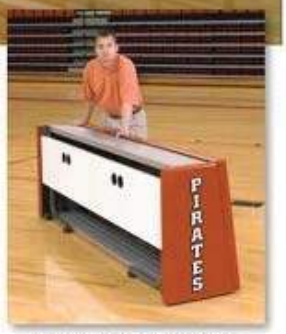
ILLUMINATED SPORT PRIDE™ SCORING TABLES

NFHS PARTNER



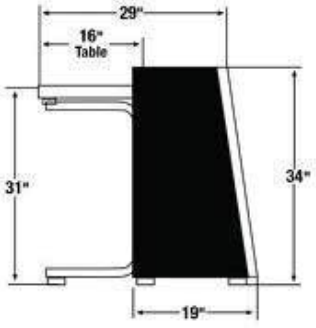
ST85FI Sport Pride™ Illuminated Scorers Tables

Let the light shine through with Bison Sport Pride Illuminated Scoring Tables…Tables have profile identical to Bison's full color graphic models so tables can be configured in any length and in any combination of styles to meet your facility's needs and budget • Support legs and 16" deep table top fold for easy transport and storage on built-in, non-marking casters • Front graphics are printed on a durable, translucent substrate and protected by unbreakable clear polycarbonate for a lifetime of sharp, bright images • Can be used either on the floor with chairs or mounted on a customer fabricated platform a few rows up in most bleachers • Ends are fully padded and can be lettered with school name • Top edge has matching safety padding • Each table includes a 120 volt power strip with surge protector • See Convertible drawing on the following page for profile information • Requires 20 amp, 120 volt service • Illumination is provided by three LED tubes (included) • Five-year limited warranty on tables except lamps.

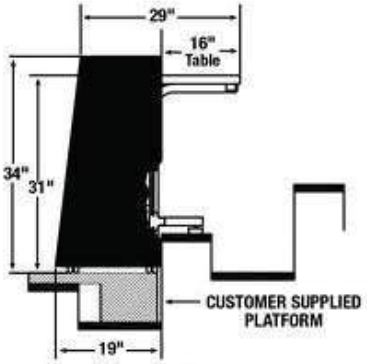


ST85FI 8' Table

Compact For Easy Transport and Storage



Convertible Table on Floor



Convertible Table in Bleachers

Style	8' Convertible
Approx. Graphic Size	31" x 96" (20 sq. ft.)
Actual Overall Dimensions	34" (w) x 34" (h) x 102" (l)
Power Requirement	120 Volt AC, 20 AMP
Table Depth and Height	16" (d) x 31" (h)
Stored Dimensions	20" (w) x 34" (h) x 102" (l)
Possession Arrow Included	Yes

Special liftgate delivery charge or extreme manual lifting required if dock/forklift not available.



Product: **Global Industrial™ 60x36 Adjustable Height Workbench; C-Channel Leg - Maple Square Edge - Black (Or Approved Equal)**

Manufacturer: Global Industrial

Location: Automotive Classroom and Carpentry Classroom

Global workbenches are built to withstand years of heavy-duty use. The hardwood top is kiln dried, electronically glued, sanded to 1-3/4" thickness and has laminated edges. Finished with a penetrating mineral oil for a durable high quality appearance. Adjustable height legs feature removable duplex knockouts on front and rear for installation of either a hard wired electrical outlet or an optional plug-in outlet that easily screws into place with no wiring necessary. All steel parts are undercoated for rust resistance and finished with black powder coat. Bench stringer comes with mounting hardware to assemble legs to the bench top.





Product Details

- Overall Dimensions: 60"W x 30"D
- Adjustable Height: 30-7/8" to 36-7/8"
- Top Material: Maple Butcher Block; 1-3/4" thick
- Edge Type: Square
- Adjustable Steel c-channel leg with bracing and base plates for floor anchoring
- Leg Height: 29-1/8" to 35-1/8"H; adjusts in 1-1/2" increments.
- Weight Capacity: 2000 lbs.
- Assembly Required. Bench stringer comes with mounting hardware to assemble legs to the bench top.

Product: **Adjustable-Height Science Table w/ Silver Powder-Coated Legs - ChemGuard Top (24" W x 60" L)**

Manufacturer**:** Diversified Spaces (formerly Diversified Woodcrafts)

Location: Science Prep Rooms

Diversified's Adjustable-Height Science Table allows you to quickly adjust the height of your lab table without the use of tools. The table adjusts from 27 inches to 39 inches high and meets ADA requirements. Raise just one end and create an incline table for physics experiments. Steel legs and a solid oak frame allow the table to support up to 500 pounds. The ChemGuard™ top is a high-pressure laminate top with extra chemical resistance. It has a Class 1 fire rating.



Product Details

- Overall Dimensions: 60" W x 24" D x 27"~39" H
- Tabletop Material: 1 1/4" Laminate
- Wood Material: Solid oak

- Finish: Powder-coat paint finish on legs
- Glides: Adjustable
- Weight Capacity: 500 lbs.
- Other Info: MAS green certified; SEFA 8 certified
- Warranty: Lifetime limited
- Assembly: Assembly Required
- Product Weight (Lbs): 99 lbs.
- Shipping Method: Freight

Product: Alero Executive Chair (Or Approved Equal)

Manufacturer: Global Industries

Location: Principal and Assistant Principals' Offices

Global's Alero Executive Chair looks stylish and sleek in your office or meeting room. The breathable mesh back with adjustable lumbar support keeps employees comfortable, and the padded seat features a waterfall edge to reduce knee pressure. Adjust the chair tilt, seat height and seat depth to find the perfect sitting position. Arms are height and width adjustable. Choose a chair with or without a headrest.

It is durably constructed out of fiberglass reinforced nylon frame. With all of its features that allow you to sit longer without discomfort, this chair is perfect for anyone that spends most of their day sitting. By allowing you to rock comfortably without heavy pushing, the tension adjustment feature increases or decreases to match body weight and help to reduce muscle fatigue. The tilt movement feature locks into position to accommodate your working posture.



Leather Upholstery



Fabric Upholstery

Features:

- 24.5" Width x 2" Depth x 40.5" Height
- Chair Frame: Fiberglass reinforced nylon frame is very durable.
- Headrest: Optional Headrest is height and angle adjustable to suit your personal preferences.
- Back Support: Back support is made from elasticized, breathable mesh material that provides comfortable support that contours to your body.
- Adjustable Arms: Arms are height adjustable and feature a “sliding armcap” that can be moved forward and rearward to provide better support for keyboarding.
- Lumbar Support: Lumbar support can be moved up and down. Depth can be adjusted by turning the knob.
- Base Options: Standard base is fiberglass reinforced black nylon. Polished aluminum base is optional. Casters are available for both carpet or hard surfaces.

Alero™



adjustability and support

Alero™

Alero combines comfort and performance with exceptional value and design.

In today's modern office where computer related activities are crucial, it is extremely important that one's choice in seating encourages comfort and productivity. Alero's fully upholstered or breathable mesh back and comfortable padded seat create the perfect blend of comfort and design. Many adjustable features and a choice of functional mechanisms ensure the chair will perform well. Choose a sophisticated Multi-tilter for computer intensive activities or a tilter chair for casual offices or meeting rooms. All chairs feature an adjustable lumbar support that allows the user to customize the comfort of the back.



1960-2 High Back Knee-Tilter with adjustable Headrest, shown in GIG GIG1 Stone



1961-2 High Back Knee-Tilter (no Headrest), shown in GIG GIG1 Stone. Also, shown on cover in Momentum OHS Warmth OH12



1966-4 Upholstered High Back Tilter with adjustable Headrest, shown here and on cover in Sprinkle S104 Copper



Alero™

Details



Headrest is height and angle adjustable to suit your personal preferences.



Arms are height adjustable and feature a "sliding armcap" that can be moved forward and rearward to provide better support for keyboarding.



Chair frame Fibre glass reinforced nylon frame is very durable.



Lumbar support can be moved up and down. Depth can be adjusted by turning the knob.



Back support is made from elasticized, breathable mesh material that provides comfortable support that contours to your body.



Standard Base is fiberglass reinforced black Nylon. Polished aluminum base is optional. **Casters** are available for both carpet or hard surfaces.

Ergonomic Features



Knee-Tilter Tilt tension adjustment with infinite position tilt-lock control. Seat height adjustment. Manual seat depth adjustment.



Multi-Tilter Back angle adjustment. Infinite tilt-lock control. Tilt tension control. Seat height adjustment. Manual seat depth adjustment.



Tilt Rearward tilt with upright position tilt-lock. Tilt tension control. Seat height adjustment. Manual seat depth adjustment.



Operator Two lever seat and back angle adjustment. Seat and back adjust independently and lock in any position or free float. Manual seat depth adjustment.



Task Manual seat depth adjustment. Seat height adjustment.

Alero™

DESCRIPTION		DIMENSIONS W	D	H	SEAT HEIGHT
		IN *mm*	IN *mm*	IN *mm*	IN *mm*
	**1960-2**	25 *635*	24.5 *622*	48.5 *1232*	16-20 *406-508*
	High Back Knee-Tilter with adjustable Headrest. Sliding soft urethane (GL) armcaps. Tilt-tension adjustment with infinite position tilt-lock control. Pneumatic seat height adjustment with height/depth adjustable lumbar support. Manual seat depth adjustment. **1966 -2** As above except with fully upholstered back.				
	**1960-3**	25 *635*	24.5 *622*	48.5 *1232*	16.5-20.5 *419-521*
	High Back Multi-Tilter with adjustable Headrest. Sliding soft urethane (GL) armcaps. Back angle adjustment. Tilt-tension adjustment with infinite position tilt-lock control. Pneumatic seat height adjustment with height/depth adjustable lumbar support. Manual seat depth adjustment. **1966-3** As above except with fully upholstered back.				
	**1960-4**	25 *635*	24.5 *622*	48.5 *1232*	16.5-20.5 *419-521*
	High Back Tilter with adjustable Headrest. Sliding soft urethane (GL) armcaps. Back angle adjustment. Tilt-tension adjustment with upright position tilt-lock control. Pneumatic seat height adjustment with height/ depth adjustable lumbar support. Manual seat depth adjustment. **1966-4** As above except with fully upholstered back.				
	**1961-2**	25 *635*	24.5 *622*	40 *1016*	16-20 *406-508*
	High Back Knee-Tilter (no Headrest). Sliding soft urethane (GL) armcaps. Tilt-tension adjustment with infinite position tilt-lock control. Pneumatic seat height adjustment with height/depth adjustable lumbar support. Manual seat depth adjustment. **1967-2** As above except with fully upholstered back.				
	**1961-3**	25 *635*	24.5 *622*	40.5 *1029*	16.5-20.5 *419-521*
	High Back Multi-Tilter (no Headrest). Sliding soft urethane (GL) armcaps. Back angle adjustment. Tilt-tension adjustment with infinite position tilt-lock control. Pneumatic seat height adjustment with height/ depth adjustable lumbar support. Manual seat depth adjustment. **1967-3** As above except with fully upholstered back.				

DESCRIPTION		DIMENSIONS W	D	H	SEAT HEIGHT
		IN *mm*	IN *mm*	IN *mm*	IN *mm*
	**1961-4**	25 *635*	24.5 *622*	40.5 *1029*	16.5-20.5 *419-521*
	High Back Tilter. Sliding soft urethane (GL) armcaps. Back angle adjustment. Tilt-tension adjustment with upright position tilt-lock control. Manual seat depth adjustment. **1967-4** As above except with fully upholstered back.				
	**1961-5**	25 *635*	24.5 *622*	40.5 *1029*	16.5-20.5 *419-521*
	High Back Operator. Sliding soft urethane (GL) armcaps. Pneumatic seat height adjustment with height/depth adjustable lumbar support. Manual seat depth adjustment. **1967-5** As above except with fully upholstered back.				
	**1961-6**	25 *635*	24.5 *622*	41 *1041*	17-22 *432-559*
	High Back Task. Sliding soft urethane (GL) armcaps. Pneumatic seat height adjustment with height/depth adjustable lumbar support. Manual seat depth adjustment. **1967-6** As above except with fully upholstered back.				
	**1962**	25 *635*	24.5 *622*	40 *1016*	17.5 *445*
	Armchair. Black tubular steel cantilever base. Fixed height "T" arms with soft urethane armcaps. **1968** As above except with fully upholstered back.				
	**1963**	19.5 *495*	24.5 *622*	40 *1016*	17.5 *445*
	Armless side chair. Black tubular steel cantilever base. **1975** As above except with fully upholstered back.				

All models are available in Leather or Leather/Mock Leather. Add "LM" after first 4 digits of model #. See Price List for details.
Petite Seat Size is now available on all models. Check the current Price List for a complete listing of these models, as well as, a complete listing of all models available.

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Product: Mesh Back Office Chair (Or Approved Equal)

Manufacturer: OFM

Location: All Other Offices

OFM's Mesh Back Office Chair offers practical seating for any business or home office. The breathable mesh back provides cooling ventilation while the built-in lumbar support prevents back strain. Use the gas-lift height control to customize seat heightight. A star base with five casters makes it easy to move. Supports up to 250 pounds.





Product Details

Material:	Mesh back & fabric seat
Weight Capacity:	275 lbs.
Warranty:	2 years on upholstery, 7 years on gas lift
Other Info:	Lumbar support, 250 lbs. weight capacity, star base
Seat Height:	17 3/4" – 21 1/2" adjustable

Seat Size:	19 1/2" W x 18 1/2" D
Back Size:	17 3/4" W x 23 3/4" H
Base Size:	26 3/4"
Overall Width:	26 3/4"
Overall Depth:	26 3/4"
Overall Height:	35 3/4" – 39 1/2" adjustable
Assembly:	Assembly Required
Product Weight (Lbs):	32

.

Product: **HON Scatter Stacking Guest Chair; Black SofThread Leather (Or Approved Equal)**

Manufacturer: The HON Company

Location: Waiting / Reception Areas

Scatter Guest Chairs stack up to four high when not in use to maximize space. An upholstered seat and back give this chair a broad appeal at a compelling price. The tubular steel frame carries up to 250 lbs. and withstands frequent use, while the contoured seat and back provide extended sitting comfort. This HON Scatter stacking guest chair features smooth tailor-stitched leather upholstery for upscale style, and the lightweight construction offers easy portability. Seat and back SofThread leather color is black.







Product Details

- An unbeatable combination of versatility and value for any environment
- Smooth, pliable SofThread leather seating surfaces with tailored stitching detail; Black
- Tubular steel frame stands up to frequent handling
- Contoured seat and back provide ergonomic support and comfort
- Seat dimensions: 18" W x 19"D
- Weight capacity: 250 lbs
- Weight: 16 lbs
- Limited 5-Year Warranty

Product: Zella Stackable Guest Chair (Or Approved Equal)

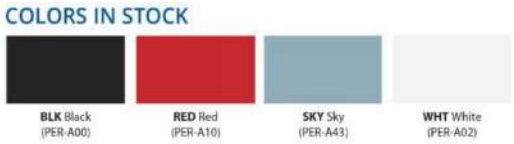
Manufacturer: Lytle

Location: Miscellaneous Offices

The Zella Stackable Guest Chair has a sleek look that will add a touch of modern style to your office or lobby without sacrificing comfort and budget. This guest chair features a generous curved plastic seat with a cut-out back that allows for air flow to your lumbar region. Stack up to five chairs high for storage or floor cleaning. The metal legs have a scratch-resistant chrome finish and plastic glides to protect floors. With the ability to stack, you can also free up usable space when needed..

Would you like to bring a sleek look, without sacrificing comfort to your office space, conference room, break room, or even classroom? Our stackable chair with a chrome frame is your answer. With its generous seat, cutout back, and abbreviated elbow rests, you will get comfort and flexibility without compromising your budget or desired quality. With its four different color options including black, red, sky blue, and white in stock, you will be able to mix and match to create a trendy and fresh look to any space.









Product Details

- Curved plastic seat shell with open back design
- Metal alloy legs with chrome finish and glides
- Stack up to five chairs for compact storage
- Available in several colors
- Seat Material: Plastic
- Frame Material: Metal alloy
- Frame Finish: Chrome
- Seat Dimensions: 16"W x 16-1/2"D x 17-1/2"H
- Overall Dimensions: 23-3/4" W x 22-1/2"D x 31-1/4"H
- Weight Capacity: 300 lbs.
- Warranty: Limited lifetime
- Assembly Required: No
- Shipping Method: Freight
- Weight: 14.48 pounds

ZELLA COLLECTION
MODEL NO. 6054
STACKABLE CHAIR W/CHROME FRAME

STACKS 5 HIGH




Light Blue Plastic Frame


Red Plastic Frame


Optional Cushion Underside (Sticks By DoubleStick Tape)


White Plastic Frame w/Navy Optional Cushion

OPTIONAL TOP CUSHION - UPHOLSTERIES:



BLK Black (PER-BLK1521) | **CHR** Charcoal (PER-CHR1559) | **NAV** Navy (PER-NAV1503)

DESCRIPTION

- Sleek design with a cut-out back available in four unique colors
- Abbreviated elbow rests
- Easy to clean & maintain
- Attractive chrome frame
- Optional cushion for comfort in three colors
- Non-toxic
- Weight Capacity (LBS): 300
- Product Weight (LBS): 13

DIMENSIONS

Overall: 23¾"W x 22¼"D x 31¼"H
Seat: 16"W x 16½"D x 17½"H
Seat to Back Height: 13⁹⁄₁₆-14"
Seat Back Width: 16"
Seat Back Depth: 18⁴⁄₁₆"
Seat Back Height: 13⁹⁄₁₆"
Floor to Seat: 17²⁄₁₆-17⁸⁄₁₆"

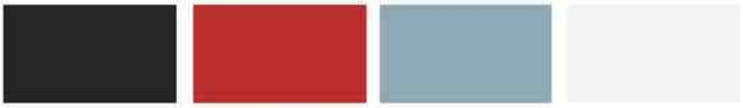
MATERIAL ATTRIBUTES

Plastic Seat
Chrome Frame
Plastic Glides

SHIPPING DETAILS

Carton Length: 38.58"
Carton Depth: 25.59"
Carton Height: 85.43"
Carton Weight (LBS): 14.48

COLORS IN STOCK



BLK Black (PER-A00) | **RED** Red (PER-A10) | **SKY** Sky (PER-A43) | **WHT** White (PER-A02)

FULLY ASSEMBLED

Environmentally Friendly

Warranty: Limited Lifetime

Exclusively at www.SCHOOLSin.com

Last Updated: 01/2020

Product: Modern Vinyl Task Chair; Black (Or Approved Equal)

Manufacturer: Boss Office Products

Location: Conference Rooms

Boss's Modern Vinyl Task Chair offers a sleek design and supportive contoured back. This contemporary office chair features red, black or white faux leather upholstery. Functions include upright locking, 360° swivel, pneumatic seat height and adjustable tilt tension control. The polished chrome base includes five dual-wheel casters. Boss's Modern Vinyl Task Chair is MAS Certified Green and backed by Boss's two-year warranty. Add arms for an additional charge.



Model #B330-BK

Product Details

- Upholstered with breathable black CaressoftPlus™. CaressoftPlus™ is a soft material that has the durability of vinyl with the look and feel of leather and is easy to clean with a little soap and water.
- Contoured button-tufted back
- Pneumatic seat height adjustment
- Adjustable tilt tension control
- 360° swivel

- Chrome base with five dual-wheel casters
- Frame/base material: Metal w/ chrome plating
- Overall Dimensions: 27"W x 27"D x 35-1/2"~38-1/2"H
- Seat height: 18" - 21"
- Seat dimensions: 19" x 18"
- MAS Certified Green
- Assembly required
- Warranty: Two-year limited
- Weight: 27 lbs.
- Imported

Product: HON Crio High-Back Task Chair

Manufacturer: HON Company (HNI CORPORATION)

Location: Classrooms with a Teacher Desk

This ergonomic HON Crio high-back task chair is designed for high performance. The asynchronous control allows you to find whatever posture or reclining position that you prefer. A breathable mesh back cradles you in cool comfort. Height- and width-adjustable arms put the support right where you need it. Advanced, customizable controls make this chair one of the best values in the industry. Mesh and seat fabric colors are black.





Product Details

- Black fabric seat is contoured for comfort
- Breathable reinforced mesh back delivers cool comfort
- Asynchronous control with seat slide lets you fine-tune your posture in any position
- Height- and width-adjustable arms move wherever support is needed
- Simple, clean design gives any space a professional look
- Reinforced five-star base offers incredible durability
- 360-degree swivel provides freedom of movement in any direction
- Adjustable arm height; arm width; seat back depth; seat height; tilt lock; and tilt tension
- Height Adjustment Type: Pneumatic

- Finishing: Black Plastic
- Dimensions: 26" W in. x 30-3/16: D x 46-7/10" H
- Seat Height: 19" to 22" H
- Distance Between Arms: 22"
- Supports Up to 250 lbs
- Disclaimer Statement: Casters supplied with this chair are not suitable for all floor types
- Assembly Required
- Backed by the HON Limited 5-Year Warranty
- Country of Origin: China

Product: Analogy Series Classroom Chair - 18" Seat Height
(Or Approved Equal)

Manufacturer: Virco, Inc

Location: Classrooms with single-student desk and multiple-student tables and Library Computer Lab

Analogy's striking upright design features ergonomic support and durability paired with exceptional value. Four-leg models are built to stack 8-high for added versatility in the learning environment. These chairs feature a tubular steel frame and a comfortable, ergonomically contoured polypropylene shell that flexes to accommodate different body types The Analogy Chairs are available in 12", 14", 16" and 18" seat heights; there's also an Analogy chair with an extra large shell and an 18-1/2" seat height.

The seat shells feature a waterfall front edge to promote good circulation in the user's popliteal arches, lower legs and feet. The chairs also provide an excellent mid-back support and comfort to users of many sizes. The seat has contoured wrap-around flexible ribs, which are dynamically tuned to allow the upper back to flex more easily than the lower sections, a key to combining comfort and support.







Product Details

- Beautiful ergonomic chair that promotes ergonomics and healthy movement in the classroom with a flexible seat back.
- Polypropylene Shell
- 1" diameter 17-gauge tubular steel chromed frame with self leveling nylon swivel glides.

- Waterfall front edge of the seat to promote good circulation in the user's hamstring popliteal arches.
- Chair Bucket: One-piece molded polyproplyene shell in black
- Overall Dimensions: 18-7/8" W x 21-5/16" D x 31-23/32" H
- Seat Height: 18"H
- Seat Dimensions: 16" W x 16-34" D
- Weight: 14 lbs.
- Nylon based glides (ideal for most surfaces)
- Glide sleeves/socks come in graphite grey only.
- Available with optional bookrack, steel-base glides, or felt-base glides
- Available in Extra Large
- Stack 8 high, different 4-leg chair models do not inter-stack
- Several colors to choose from
- Warranty: 10 Years

Analogy® Series – *4-Leg Stack Chairs*

Analogy Series 4-leg stacking chairs feature a striking upright design and an ergonomically contoured shell. 4-leg chair models range in size from 12" to 18" seat heights. 18" Chairs are available with an extra-large (EL) shell to accommodate larger students, as well as a padded seat for additional comfort.



Chairs stack up to 8 high



AN12
12" seat height

AN14
14" seat height

AN16
16" seat height

AN18
18" seat height

AN18ELP
18½" seat height with extra-large shell. Padded upholstered option shown.

OPTIONAL CONFIGURATIONS

FG FELT-BASE GLIDES SG STEEL-BASE GLIDES BR BOOKRACK P PADDED UPHOLSTERED SEAT

Bookrack and extra-large seat is only available on 18" seat height chairs. Padded Seat is only available on 18" extra-large seats.

Analogy® Series – *Rocking Chairs*

Analogy Series rocking chairs encourage healthy movement and provide a moderate range of back-and-forth motion. Rocking chairs feature a sturdy, cantilevered tubular steel frame and a comfortable, ergonomically contoured polypropylene shell.



ANROCK14
13" seat height

ANROCK16
15" seat height

ANROCK18
18" seat height

ANROCK18EL
18" seat height with extra-large shell

OPTIONAL CONFIGURATIONS

FG FELT STRIP ON EACH LEG BG BUMP GLIDES

Recommended for use on carpeted surfaces only; however, an optional factory-installed felt strip on the bottom of each leg is available for flooring applications where a felt contact surface is appropriate. Not recommended for use on VCT flooring (Vinyl Composition Tile).

SEE PAGE **186-187** FOR MORE INFORMATION ON CHAIR OPTIONS

Analogy® Series – *Floor Rockers*

Analogy Series floor rockers feature an ergonomic seat atop a sturdy, one-piece rocking base with a non-marring pad for smooth, quiet movement. With subtle back-and-forth motion, floor rockers offer an ergonomic alternative to floor seating.





ANFLROCK15
Sized for K - 4th Grade

ANFLROCK18
Sized for 5th Grade - Adult

Analogy® Series – *4-Leg Chairs and Stools with Civitas Frame*

Analogy Series 4-leg chairs and stools with Civitas frame feature stylish legs for a casually chic and inviting effect, a tubular steel frame and an extra-large, one-piece, molded polypropylene shell. The Analogy bucket offers a flexible, ergonomic backrest for long lasting comfort.



CA18EL
18" seat height

CA18ELC
18" seat height with casters

CA25EL
25" seat height

CA30EL
30" seat height

OPTIONAL CONFIGURATIONS

FG FELT-BASE GLIDES SG STEEL-BASE GLIDES

SEE PAGE **186-187** FOR MORE INFORMATION ON CHAIR OPTIONS

VIRCO COLOR PROGRAM

Virco products are available in an inspiring array of colors and frame finishes, allowing a full range of expression from traditional to modern. Because color has such an impact on how individual products are perceived, and furthermore because a roomful of furniture can read differently than an individual sample, we encourage you to order samples to confirm compatibility with your overall design plan. Please see the back page of this brochure for information on how to order samples.

Virco offers a variety of lead-time specific color programs – please contact your local Virco Sales Representative for more information. Models and color combinations can be found in our price list.

In addition to our Virco color programs, Virco is capable of providing custom colors and finishes for your specific project. Because of the capabilities and processes available in our U.S. Factories, we have the ability to do custom color matches from samples or swatches for plastics, powder coat, laminates, edge treatments, as well as custom logo designs. Extended lead-times may apply on custom projects.

CAUTION: Due to color reproduction variability in printed materials and digital media, Virco recommends that you review product colors on sample coupons or swatches before purchasing to confirm that your product color choices coordinate with the interior spaces for which these products are intended. Virco will provide complimentary sample coupons or swatches for plastic, laminate, powder coat paint and upholstery colors; however, it is the customer's responsibility to request these sample materials. Once you've submitted your request, your Virco Sales Representative will be happy to assist you with this process.

FRAME FINISH COLORS

Chrome CHRM	*Char Black* BLK01	*Silver Mist* GRY02	*Adobe* BRN42	*Moonstone* GRY05	*Eclipse* GRY11	*El Dorado Bronze* GLD93
Golden Bronze GLD91	**Mocha* BRN16	*Espresso* BRN26	*Red* RED70	*Squash* YLW47	*Navy* BLU51	*Forest Green* GRN75
Clear Coat CLR	*Natural Steel* NST					

** Mocha is only available on models 162 and 168 folding chairs.*

Virco's Clear Coat is a transparent secondary powder coat finish that adds extra sheen and protection when applied over other Virco paint finishes. Clear Coat cannot be used as a secondary finish over Virco's Natural Steel paint finish.

Natural Steel is our unique finishing process that allows the natural patina of raw steel to show through a protective layer of clear urethane-based powder coat. The authentic nature of the steel, including the heat effects of welding, are clearly visible with this finish.

SOFT PLASTIC AND ABS PLASTIC COLORS - Seats, Book Boxes, Stools and Stool Tables Seats

*Celery** GRN19	*Green Apple* GRN12	*Willow* GRN13	*Avocado** GRN08	*Moss* GRN77	*Cucumber* GRN34	*Kelly Green* GRN15
Forest Green GRN75	*Sea Mist* GRN07	*Teal* GRN11	*Turquoise* BLU45	*Horizon* BLU14	*Sky Blue* BLU40	*Cobalt Blue* BLU65
Navy BLU51	*Hyacinth* BLU44	*Lavender* PUR45	*Wisteria* PUR65	*Purple Iris* PUR43	*Wine* RED50	*Fuchsia* RED72
Pink RED73	*Coral* RED53	*Paprika* ORG31	*Red* RED70	*Guava* RED75	*Peach** RED35	*Sunset* ORG30
*Mustard** YLW21	*Papaya* YLW44	*Lemon Yellow* YLW45	*Squash* YLW47	*Gold Finch* GLD22	*Chocolate* BRN14	*Arctic White* WHT74
Moonstone GRY05	*Vapor* GRY65	*Driftwood* WHT21	*Adobe* BRN42	*Dusk* BRN55	*Eclipse* GRY11	*Graphite* GRY41
Black BLK01						

Minimum quantities and extended lead-times may apply to some of the Soft Plastic & ABS Plastic Colors in this catalog. Please contact your Virco representative or consult Virco's current Factory price list for more information.

** Not available on ABS plastic stools and stool tables.*

Virco Stewardship: An Ongoing Commitment

While Virco Stewardship today encompasses a vast array of industry-leading endeavors, Virco Stewardship Initiative can trace its origins back to 1950 when we began working with America's schools as a newly established company. Although terms like "sustainability" and "sustainable business practices" weren't commonly used back then, they accurately describe the vision that inspired Virco's founder, Julian Virtue, to develop long-lasting classroom furniture. As a result of our enduring commitment to product quality and customer service, Virco has grown from a small business with a single customer into the country's largest manufacturer and supplier of furniture for the K-12 market.

RECYCLING

An important advantage of manufacturing at our company-operated facilities in the U.S. is that Virco can control a wide range or recycling and resource recovery processes. Recycling is a key aspect of Virco's commitment to sustainable business practices through our Corporate Stewardship Initiative. Virco started recycling in 1989 with three material categories: scrap metal, office paper and hydraulic oil; now we have more than 40 categories and we've processed over 380,000,000 pounds of recyclables, and even better, updated equipment has resulted in less waste, therefore reducing the need for recycling. Along with our in-house efforts, we've established a "Cash for Cardboard" program that's enabled 35 schools near our Conway facility to earn about $190,000 through recycling. We're proud that the U.S. Environmental Protection Agency recognized our recycling leadership by choosing Virco as a charter member of their WasteWise Hall of Fame in 2003 and as a WasteWise winner for reducing waste in 2019.

GREENGUARD®

In 2005, ZUMA® and ZUMAfrd™ became the first classroom furniture product lines from any manufacturer to earn GREENGUARD indoor air quality certification through the GREENGUARD for Children and Schools program. Today, hundreds of additional Virco classroom furniture models have earned this important certification, now known and GREENGUARD Gold Certification. We're proud to offer you these low-emitting products. See virco.com for link to full list of all GREENGUARD certified products.

Testing: ANSI/BIFMA

Virco is a member of BIFMA, the trade association for business and institutional furniture manufacturers. Since 1973, BIFMA has been the voice of the commercial furniture industry. As a service to our customers and to assure superior levels of quality control, Virco tests and evaluates our products according to rigorous standards. Virco's product evaluation program includes applicable performance testing for strength, durability and stability as established by the Business and Institutional Furniture Manufacturers Association (BIFMA) and accepted by the American National Standards Institute (ANSI).

CPSIA CERTIFICATION

Virco proudly complies with all laws and governmental regulations affecting our products, including the federal Consumer Products Safety Improvement Act of 2008 (CPSIA) and the California Air Resource Board (CARB) regulation on formaldehyde emissions from composite wood. Products purchased by your facility are regulated by CPSIA, which was signed into law on August 14, 2008. CPSIA regulates furniture products (whether for adult or children) that include any lead-containing paint; products intended primarily for children 12 years of age and younger with lead in their components or in the products themselves; and certain products, such as toys and child care articles, that contain phthalates. All applicable Virco products are tested by a third-party laboratory and certified to comply. For more information or to view our CPSIA certificates, please visit virco.com.



General Product Information

PRODUCT EVALUATION & TESTING

As a service to our customers and to assure superior levels of quality control, Virco tests and evaluates our products according to rigorous standards. Virco's product evaluation program includes applicable performance testing for strength, durability and stability as established by the Business and Institutional Furniture Manufacturer's Association and accepted by the American National Standards Institute.

ANSI/BIFMA TESTED

Virco's 8800 Series chairs; 2000 Series, 3000 Series, 4000 Series tables with standard-height legs, 4300 Series, 53 Series desks and returns, 53VF Series vertical files and 53LF lateral files, 53MP Series mobile pedestal units, 53CAB Series metal storage cabinets, 54VF Series vertical files, 6000, 6100 (Core-a-Gator®), 62000, 6800, 7900, 785 Series student desks, Sigma® Series desks, 751 lift lid student desks, Jr. Executive student desks, 7900 Series desks, 9000 Series, Analogy® Series (except ROCK models), Civitas® Series Seating (except ROCK models), Flip-Top Technology tables, Lunada® Series tables, N2 Series, Metaphor® Series, Parameter® Series desks and returns, Plateau® Series round, rectangular and racetrack tables, Sage™ Series (except ROCK models), Makerspace, TEXT® Series tables, ZUMA® Series (except ROCK models), 120, 121 and 122 Series Stools, included in this catalog have passed applicable performance tests for strength, durability, and stability as established by the Business and Institutional Furniture Manufacturer's Association International and accepted by the American National Standards Institute.

CARE & USE INSTRUCTIONS NOTICE:

To prevent structural failures and possible injury, furniture should not be used other than for its intended purpose and should be inspected regularly, at least annually, for the following: (1) loose or missing fasteners such as screws, rivets or staples, (2) metal fatigue, rust, cracks or broken welds, (3) any problem that causes instability or tipping, (4) any signs of misuse. Furniture that is damaged or appears to be unstable should immediately be removed from service, reported to the facility manager and replaced or repaired. Repairs should only be made using factory-authorized parts and methods. For information on furniture maintenance, repair, or to report furniture which requires service, call Virco toll-free at 800.448.4726. Furniture should be wiped down with mild soap and water as needed.

UPHOLSTERY TESTING

The following Virco upholstery materials pass California Technical Information Bulletin 117, Section E: Contemporary vinyl, Confetti fabric, Express fabric, Linen vinyl, Pacifica fabric, Sedona fabric, Select vinyl, and fabric for Sage™, Parison®, and Analogy® Series upholstered seating models.

FURNITURE WITH OAK FINISH

Virco's Oak finish highlights the grain and color accents of each furniture item. Because they're crafted from natural hardwood, no two pieces of Oak furniture have exactly the same grain pattern and color; instead, variations in grain and color result in uniquely complementary furniture groupings.

60", 72" AND 84" BOOKCASES

To avoid the risk of a serious tip-over accident, these bookcases must be securely anchored to a wall. Refer to the assembly instructions for more information or see page 150 for details.

GUIDELINES FOR STACKING & MOVING FURNITURE

The number of pieces of furniture that can be safely stacked or moved on Virco's mobile storage equipment will vary depending on many factors, including the furniture's height, weight and general design; the speed at which the unit will be moved; the terrain over which it will travel; and the strength of the operator(s). Care should be taken not to stack to the point of unsteadiness. Virco recommends starting with small, easily handled loads and adding one to two pieces of furniture at a time to determine the safe capacity for each set of conditions. Use Virco mobile storage equipment with appropriate Virco furniture only.

NOTE ON PRODUCT PHOTOGRAPHS:

Many of the Virco products in this catalog have been photographed with "props" to illustrate possible product uses. These props are only included with the product when the accompanying caption explicitly indicates this to be the case. When a caption does not specify that props are included when describing a product, the props are not included with the product.

Virco Warranty

Virco will repair or replace, at its option, any Virco furniture or equipment product which proves to be defective in original material or workmanship that may become evident within the first 10 years of the date of purchase and 5 years from the date of purchase for casters, glides, pneumatic cylinders and torsion bars. This is your sole and exclusive remedy. This warranty covers products manufactured after January 1, 2017, as long as product is owned by original purchaser, and is subject to the following limitations:

Limitations:

From the date of purchase, Virco's warranty covers the items below as follows:

10 Years

Laminates, seating controls, all seating, desk, table and storage products unless otherwise indicated in this warranty.

5 Years

Glides, floor rocker foam pad, casters, pneumatic cylinders and torsion bars on mobile folding tables.

1 Year

Chairs with custom logos applied to their upholstered seats and/or backs.

Exclusions:

This warranty excludes:

- Apparent defects caused by abusive or abnormal use of the product.
- Products not assembled, installed or used in compliance with Virco's product instructions or warnings.
- Failures resulting from inadequate inspection and maintenance.
- The effects of normal usage over time.
- Any damage caused during shipment (see the current Virco price list's "Steps to Take When Receiving Shipments" for more information).
- Product modifications not approved by Virco.
- Vinyl and fabric upholstery material, except as may be offered by the mill source.
- Rust caused by natural elements or high exposure to moisture
- Products used for rental purposes.

Natural Materials, Color Variations & Customer's Own Materials

Leather, wood and other natural materials may have intrinsic grains or patterns that are distinguishing features and not regarded as defects. Virco cannot warrant the matching of grains, patterns, textures, colors, or the color-fastness of such materials. In addition, Virco does not warrant Customer's Own Materials (COM) that are chosen and used in a Virco product at a customer's request.

THERE ARE NO IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY, AND THERE ARE NO OTHER EXPRESS WARRANTIES BEYOND THE WARRANTIES EXPRESSED HERE. ALL INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY ARISE, INCLUDING BUT NOT LIMITED TO BUSINESS LOSSES, PERSONAL PROPERTY DAMAGE, AND THIRD PARTY LIABILITIES ARE HEREBY EXPRESSLY EXCLUDED.

TO OBTAIN SERVICE UNDER THIS WARRANTY:

Please contact your local Virco Sales Representative or Customer Service at 800.448.4726.

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Product: 6200 Series Heavy-Duty Stools with Backrest; Black; 19" ~ 26-1/2" Seat Height (Or Approved Equal)

Manufacturer**:** National Public Seating Corp.

Location: Science Classroom Laboratories (Including Demonstration Counters), and Electronics Work Shop

National Public Seating's Stool gives students a place to sit in your art room or science lab and will not break your budget. The durable construction and classic design are ideal for hands-on educational settings like art rooms, science labs, home economics, or shop classrooms. The scratch-resistant black finish adds a contemporary touch to this popular chair. The spacious 14" diameter seat with a Masonite board will not chip or crack. A flexible 6" high backrest adjusts 2" up or down for excellent support. The welded steel foot ring offers added stability and extra protection from wear and tear. The seat height adjusts from 19" to 26-1/2". This National Public Seating 6200 Series Heavy-Duty Black Steel Stool with Backrest is backed by a 10-year warranty.



NPS-6224HB-10

Product Details

- Contemporary black finish
- Spacious, adjustable-height seat with durable Masonite board
- Flexible backrest
- Welded steel foot ring

- Seat Height: 19"-26 1/2" adjustable
- Frame Material: 18-gauge tubular steel
- Frame Finish: Black powder-coat paint
- Seat Material: 11-1/2" diameter Masonite
- Weight Capacity: 300 lbs
- Warranty: 10 years
- Backrest Dimensions: 12"W x 6"H
- Width: 14"-16"
- Height: 32"-41 1/2"
- Assembly Required: Yes
- Weight: 17 lbs

6200 Series

ROUND HARDBOARD HEAVY DUTY STEEL STOOLS

MAS CERTIFIED GREEN for a healthier indoor environment

BIFMA INTERNATIONAL

ANSI

products meet or exceed applicable ANSI/BIFMA standards

THE NPS GUARANTEE & COMMITMENT TO EXCELLENCE ten year warranty 10



300lb. weight capacity!

STOOL FRAMES

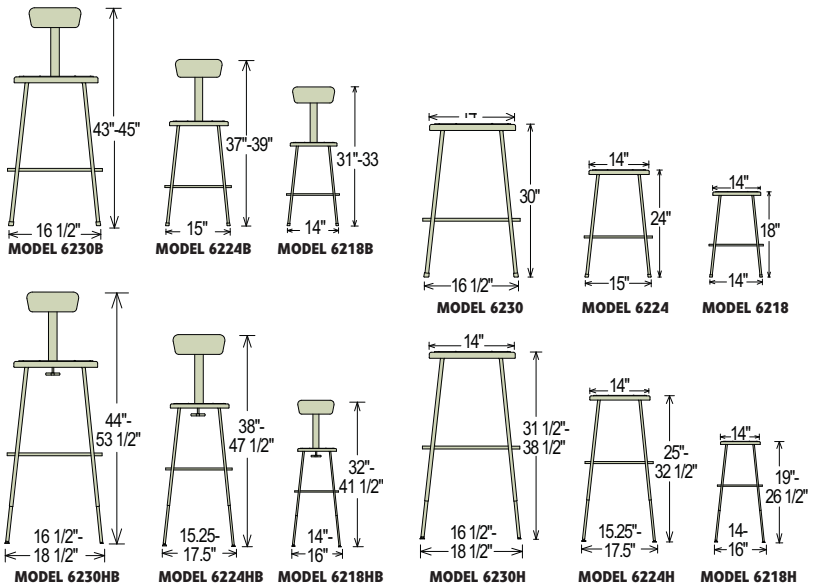
GREY

BLACK

Stools come in 3 convenient sizes:

- **18"** *for use with your* **30" table**
- **24"** *for use with your* **36" table**
- **30"** *for use with your* **42" table**

or use adjustable legs for alternate height options



SPECS:

- 18"H, 24"H or 30"H sizes fixed height and adjustable with an optional backrest
- 7/8"O.D. 18-gauge steel tubing
- Seat is a full 14" diameter with 11 1/2" diameter masonite board recessed into the pan with 8 rivets and will not chip or crack
- Foot rings, 5/8" O.D. are welded to each leg by 4 contact points at each leg for added rigidity
- Optional backrest; 6"H x 12"W, adjusts up/down and forward/back
- Optional height adjustable legs; adjust in 1" increments up to eight additional inches
- Fixed height models feature non-marring polypropylene glides
- Adjustable height stools feature self-leveling steel glides

National Public Seating

800.261.4112 | www.nationalpublicseating.com

Product: Bushwick Cafe Chair

Manufacturer: National Public Seating

Location: Staff-Faculty Lounge and Work Room and Kitchen Staff Lunchroom

The Bushwick Cafe Chair is a clean and modern choice for cafeterias, break rooms and lounges. The molded plywood and laminate seat comes in two wood-tone colors. An off-center vertical handle gives this cafe chair an extra layer of style. Chrome-plated steel legs are reinforced by welded brackets under the seat. Heavy duty bumpers protect the chair frame from damage when stacked, and polypropylene glides prevent floor marks and scuffs. The Bushwick Cafe Chair is backed by a ten-year warranty.



Product Details

- 8 Layer bent plywood seat with HPL finish
- Laminate finish available in two colors: Espresso and Natural
- Seat Material: Poplar and eucalyptus plywood
- Seat Finish: High-pressure laminate
- Leg/Frame Construction: 16 gauge steel tubing with chrome finish

- Overall Dimensions: 21-1/2"W x 23-1/4"D x 33-3/4" H
- Seat Height: 18"
- Weight: 136 lbs
- Weight Capacity: 500 lbs.
- Stackable
- Assembly not required
- Warranty: 10 years

Bushwick Series

Café Chair #BCC | Café Barstool #BCS







National Public Seating

CAFÉ BARSTOOL

Model #BCS21 shown



24 HOUR QUICK SHIP

Introducing the NEW Bushwick Café Chair and Barstool from NPS®!

CAFÉ CHAIR



Model #BCC22 shown

Exceeds BIFMA standards!

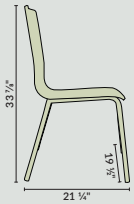
Legs designed for easy stackability

Use Dollies DY81 or DY9000 for the chair. Use Dolly DY81 for the bar stool.

Weight capacity exceeds 500 lbs.

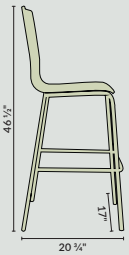
DIMENSIONS | CHAIR

	CAFÉ CHAIR
Seat Width	16 ¼"
Seat Depth	16"
Back Height	17 ½"
Seat Height	18"
Footring Height	N/A



DIMENSIONS | BARSTOOL

	CAFÉ BARSTOOL
Seat Width	16 ¼"
Seat Depth	16"
Back Height	17 ½"
Seat Height	29 ½"
Footring Height	13 ½"



BCC21 Espresso

BCC22 Natural

BCS21 Espresso

BCS22 Natural

BIFMA INTERNATIONAL ANSI products meet or exceed applicable ANSI/BIFMA standards

- ½" thick 8 layer bent plywood seat with HPL finish
- Heavy duty welded footring
- 4 fully welded 12 gauge under-seat support brackets
- Heavy duty bumpers for safe and secure stackability
- Durable non-marring polypropylene glides
- ⅞" 16 gauge chrome steel tubing

800.261.4112
www.nationalpublicseating.com

Product: 6700 Series Polyurethane Task Chair (Or Approved Equal)

Manufacturer: National Public Seating

Location: Electronics Computer Lab, Faculty Work Room and Resource Center, and Cumulative File Storage

The 6700 Series Kangaroo Task Chair provides unique strength and ergonomic function for your industrial seating demands, yet designed with beauty and grace in mind. The heavy-duty 1-1/4" thick polyurethane seat has a waterfall edge for plush comfort and functionality. The comfortably contoured seat and back are embossed for breathability. A pneumatic lever adjusts the seat from 16” - 21” high. The back flexes as you move and features a built-in handle for easy transport. The sturdy five-point base rolls on dual-wheel casters. Backed by a ten-year warranty.



Model# 6716HB

Product Details

- Molded and contoured seat/back
- Polyurethane Construction: Chemical and puncture resistant and cleans easily
- 360 degree swivel
- Height-adjustable pneumatic base
- Rolls on five dual-wheel casters
- Seat/Back Material: Molded polyurethane
- Base Material: Steel; nylon
- Seat Height: 16" - 21"
- Seat Dimensions: 18" W x 17" D
- Backrest Dimensions: 16" W x 12" H
- Overall Height: 27" - 37"
- Weight Capacity: 300 lbs.
- Warranty: 10 years
- Assembly Required: Yes
- Shipping Method: Ground
- Weight: 28 lbs

National Public Seating

800.261.4112
www.nationalpublicseating.com

Kangaroo

STOOL & TASK CHAIR



6700 SERIES

National Public Seating

The Model 6722HB Kangaroo Polyurethane Stool and 6716HB Polyurethane Task Chair from NPS® provides unique strength and function for your industrial seating demands, yet designed with beauty and grace in mind.

Heavy-duty **1¼ inch thick Polyurethane** seat has a waterfall edge for improved circulation, and ribbed ventilation design allows air circulation while seated.

Polyurethane material is resistant to chemicals and punctures, and cleans easily. Includes accent trim for aesthetics.

Polyurethane Task Chair



Polyurethane Stool



- Heavy Duty 1 1/4" thick Polyurethane seat with waterfall edge
- Swivels 360°
- Pneumatic height adjustment level to raise and lower seat height
- Five 2" industrial grade casters (mushroom glides included)

ten year warranty 10

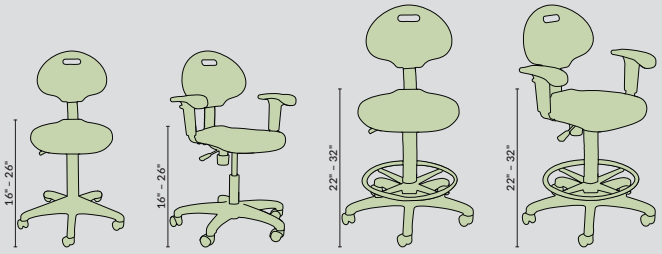
BIFMA INTERNATIONAL ANSI products meet or exceed applicable ANSI/BIFMA standards

GREENGUARD GOLD CERTIFIED

6700 Series

Polyurethane Stool, Polyurethane Task Chair

Model #	Description
6716HB	Polyurethane stool (desk height)
6716HB-A	Polyurethane stool (desk height) w/ arms
6722HB	Polyurethane stool
6722HB-A	Polyurethane stool with arms



Product: 6700 Series Polyurethane (Kangaroo) Stool (Or Approved Equal)

Manufacturer: National Public Seating

Location: Carpentry Work Shop, Carpentry Classroom, and Automotive Classroom

National Public Seating's sleek new Kangaroo Stool is a comfortable place for you to work on projects. The stool features a heavy duty 1-1/4 inch polyurethane seat has a waterfall edge for plush comfort and functionality, and ribbed ventilation design allows air circulation while seated. Polyurethane material is resistant to chemicals and punctures, and cleans easily.

Easily adjust the height from 22" to 32" with the under-seat lever. Control the backrest tilt degree with the turn of a knob. Move the footrest 12 inches up or down for the most comfortable position. The contoured back promotes proper sitting positon and provides lumber support. Rolls easily on five 2" industrial casters; also includes rubber glides. This National Public Seating Kangaroo Stool is MAS Certified Green and comes backed by a 10-year warranty. Meets or exceeds ANSI/BIFMA requirements.



Product Details

- Molded and contoured seat/back
- Polyurethane Construction: Chemical and puncture resistant and cleans easily
- Adjust the seat height from 22" to 32"
- Control the backrest tilt degree with ease
- Rolls easily on 2" industrial casters
- Footrest adjusts 12"
- MAS Certified Green
- Backed by a 10-year warranty
- Meets or exceeds ANSI/BIFMA requirements
- Seat Height: 22" - 32" adjustable
- Seat Material: 1 1/4" thick polyurethane
- Frame Material: Steel
- Weight Capacity: 300 pounds
- Seat Size: 18"W x 17"D
- Backrest Size: 16"W x 12"H
- Overall Height: 38" - 48"
- Assembly Required: Yes
- Weight: 16.00 pounds

Kangaroo Stool

INDUSTRIAL

The Model #6722HB Kangaroo Stool from NPS® provides unique strength and function for your industrial seating demands, yet designed with beauty and grace in mind.

Heavy duty 1¼ inch thick Polyurethane seat has a waterfall edge for improved circulation, and ribbed ventilation design allows air circulation while seated.

Polyurethane material is resistant to chemicals and punctures, and cleans easily. Includes accent trim for aesthetics.



CAL-117 RATED

MAS CERTIFIED GREEN for a healthier indoor environment

THE NPS GUARANTEE & COMMITMENT TO EXCELLENCE 10 from your seat only

National Public Seating

800.261.4112
www.nationalpublicseating.com

Product: Medical Stool (Or Approved Equal)

Manufacturer: Boss Office Products

Location: Nurse's Sick Bay and Isolation Room

This medical stool is upholstered in easy-to-clean faux leather fabric, and equipped with a 4-inch thick molded foam seat that provides improved durability. It is attached with an easy to reach gas lift seat height adjustment lever, providing a vertical range of 6-inch to suit your personal comfort and work environment. Its base has an attractive chrome finish, and provides great stability to the stool. The hooded double wheel casters make it easy to move and shift directions.



B240-BK



Product Details

- Upholstered in durable Caressoft vinyl for easy maintenance and cleaning.
- Gas lift adjustment
- Five dual wheel casters
- Beautiful and durable chrome finish
- Seat material: Foam, faux leather
- Base material: Metal w/ chrome finish
- Seat diameter: 16"
- Seat height: 20" - 26 1/2"
- Overall dimensions: 25" diameter

- Weight Capacity: 250 lbs.
- Available with back cushion (B245)
- Assembly required
- Warranty: Two-year limited
- Green: MAS Certified Green
- Shipping Method: Ground
- Weight: 15 lbs.

Product: Nota Music Posture Chair (Or Approved Equal)

Manufacturer: Wenger Corporation

Location: Band Room

The Nota Music Posture Chair features an attractive, ergonomic design that keeps students comfortable and promotes better breathing. A narrow, convex back, contoured seat, and rounded waterfall front all combine to allow freedom of movement and proper support in engaged (rear) or perched (forward) positions. The 14-gauge steel frame and polypropylene seat and back offer years of durability. Stack up to eight chairs for easy storage when not in use. Matching move and store cart sold separately.





Chair Product Details

- Seat Height: 19"H
- Seat Material: Polypropylene seat/back
- Frame Material: 14-gauge steel w/ powder-coat finish
- Overall Dimensions: 19"W x 21-5/8"D x 33-7/8"H
- Product Weight: 18 lbs.
- Stacks up to 8 high
- Greenguard-Certified
- 5-Year Limited Warranty
- Assembled
- Move and Store Cart sold separately

Preliminary Cost Example *

- From www.schooloutfitters.com:



$174.99
MSRP: $228.00
You Save: $53.01 (23%)

1 Add to Cart

zip code Calculate Shipping

* Price will vary. Bulk rates may apply. Shipping, handling, and installation not included.

NOTA® STANDARD
MUSIC POSTURE CHAIR

Wenger®
Your Performance Partner





Inspired by musicians. Innovative by design.
For almost 70 years, Wenger has shared the passion and enthusiasm of musicians by focusing on the unique needs of music education and performance. Wenger has a proud history of developing innovative products. We were the first to develop a chair specifically designed for music posture because proper posture and alignment is critical for performers to be their best. That spirit of innovation continues. Welcome to the next generation of music posture chairs – the Nota® music posture chair by Wenger.

The design of the Nota chair is based on years of customer research and consultation with medical experts regarding posture principles and key ergonomic issues related to chairs and seating positions. Based on this input and supported by scientific testing, the Nota chair was designed and engineered for optimal comfort, flexibility and proper body support. No other chair promotes easier breathing and freedom of movement or accommodates such a wide variety of seating positions, body types and musical styles. As with all Wenger products, the quality construction and long life of the Nota chair delivers unmatched value for your investment. Discover for yourself how musical inspiration and leading edge innovation combined to create the Nota music posture chair by Wenger.

NOTA® STANDARD MUSIC POSTURE CHAIR

Narrow Convex Back
Helps open the rib cages for better diaphragmatic breathing. Provides lumbar support and allows for greater freedom of movement.

Position-Transition Seat
Allows for a variety of seating positions while still providing support. Proper alignment is encouraged whether the musician is seated back in the "engaged" position, forward in the "perched" position, or angled on the chair.

Rounded Waterfall Front
Helps maintain good circulation, which helps reduce the "fidget factor." Allows one height of chair to accommodate a wider range of body sizes.



Optional desk folds completely out of the way when not in use.





Graphite | Cherry | Fusion Maple | Solar Oak

Black edge banding and support tube assembly.

Seat Contour
Maximum seating comfort over long periods of time. Alleviates pressure points by more evenly distributing the weight of the musician.

Wear resistant polypropylene blend seat and back
Promotes even weight distribution, comfort and a lasting appearance.

Proper Body Support
Mimics the standing posture when seated – the strongest, most natural body position. Reduces the risk of pain and lasting injury.









Ganging Clamps make connecting Nota chairs a snap.

PRODUCT SPECIFICATIONS:

- Wear resistant polypropylene seat and back promote even weight distribution, greater comfort and a lasting appearance.
- Patented design provides two seating zones: "engaged" (rear) and "perched" (forward).
  - The engaged position allows the occupant to sit with a thigh to back angle of 97°.
  - The perched position allows the occupant to sit with a thigh to back angle in the range of 96-106°.
  - A transition area allows users to move seamlessly between zones.
- Each zone enhances performance by promoting a naturally balanced skeletal shape, reducing muscle strain and enabling increased circulation, freedom of movement, and diaphragmatic breathing.
- Narrow convex back provides lumbar support while still allowing for freedom and range of movement.
- Rounded waterfall front allows one height of chair to accommodate a wider range of body sizes.
- Powder coat paint finish for maximum durability. Chrome finish is also available.
- Durable, specially designed floor glides provide stability when seated and ease of movement when arranging chairs.
- Chairs stack for compact storage.
  Note: Accessories prohibit chair stacking.
- Specially designed stacking bumpers provide maximum stability and protection when chairs are stacked.
- Available in heights of 17.5" (445 mm), 19" (483 mm), 20.5" (521 mm).
- Five year warranty.

0330000 Nota Standard Chair, 11 Lbs. (5 kg)

OPTIONAL ACCESSORY:

127A261 Move 'N Store Cart, 30 lbs. (14 kg)
- Stack, move and store up to 18 Nota chairs.
- Steel construction with easy roll casters.

054D500 Posture Chairs Dust Cover

190A184 Nota Chair Sousaphone Holder, 11 lbs. (5 kg)
- Adjustable, vinyl-clad support stand
- Great for storage and prevents damage due to handling

190A187 Nota Chair Tuba Rest, 3 lbs. (1.4 kg)
- Adjustable, vinyl-clad support stand
- Helps student properly position the tuba and focus on technique

0331010 Nota Universal Folding Tablet Arm, 5 lbs. (3 kg)
- Ready-made writing desk
- Folds behind chair when not in use

190A066 Nota Chair Book & Music Storage Rack, 2 lbs. (1 kg)

190A059 Nota Chair Ganging Clamps, set of 2

PURCHASE ONLINE!

Wenger® JR CLANCY GEARBOSS

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555 Park Drive, PO Box 448 | Owatonna | MN 55060-0448

JR CLANCY Phone 800.836.1885 Worldwide +1.315.451.3440 | jrclancy.com | 7041 Interstate Island Road | Syracuse | NY 13209-9713

GEARBOSS Phone 800.493.6437 | email gearboss@wengercorp.com | gearboss.com | 555 Park Drive, PO Box 448 | Owatonna | MN 55060-0448

Product: Chair Move and Store Cart (Or Approved Equal)

Manufacturer: Wenger Corporation

Location: Band Room and Choir Room

This is the mobile storage cart for Wenger posture chairs. These roll easily down hallways, around corners, and through standard doorways to move chairs between rehearsal and performance areas.





Cart Product Details

- Material: 16-gauge steel
- Capacity: 18 Nota Standard, 12 Nota Premier, 18 Nota conBRIO Standard, 12 Nota conBRIO Premier, 18 Student, 10 Musician or 10 Cellist Chairs
- 4 casters (2 fixed, 2 swivel)
- 5-Year Limited Warranty

- Overall Dimensions: 24-1/2"W x 38-1/4"D x 41-1/4"H
- Assembly Required
- Product Weight: 35 lbs.

Preliminary Cost Example *

- From www.schooloutfitters.com:





* Price will vary. Bulk rates may apply. Shipping, handling, and installation not included.

Product: JSI Jude Chair - Black Plastic Seat & Back (Or approved Equal)

Manufacturer: JSI Furniture

Location: Library

From dining or public spaces to relaxing alcoves, Jude seating fits seamlessly into any environment. Form and function go hand in hand with Jude's uncomplicated beauty and compact, durable design. It's simple design and durable materials make the aesthetics last a lifetime.









Product Details

- Chair fits seamlessly into any environment
- Solid wood frame construction with plastic seat & back
- Legs have rubber cushion metal glides
- Overall Dimensions: 16"W x 19 1/2"D x 31 1/2"H
- Seat Dimensions: 15-3/4"W x 16"D x 1/-1/2"H
- Construction: Solid Beech
- Seat Material: Polypropylene
- Back Material: Polypropylene
- Warranty: 5 Year
- Shipping Method: Truck
- Number of Cartons: 1
- Assembly Required: No

Finish Options



Paint



Plastic



a contoured chair



JUDE

JSI #lovewhatyoudo



STYLISH.
COMPACT.
DURABLE.

Jude is a multi-functional seating line with light European styling. From dining or public spaces to relaxing alcoves, Jude seating fits seamlessly into any environment.

meet Jude.





Form and function go hand in hand with Jude's uncomplicated beauty and compact, durable design.
Jude provides comfort and character to the places we converse, focus, learn or wait.



EUROPEAN STYLING.

Jude's simple design and durable materials make the aesthetics last a lifetime.











chair



counter stool



barstool



lounge

Jude designed by Fiorenzo Dorigo for Infiniti Design

love what you do

JSI is quality furniture for work and life.

225 CLAY STREET
JASPER, INDIANA 47546

800.457.4511 **TOLL FREE**
812.482.3204 **OFFICE**

JSIFURNITURE.COM

J.MPS.JU.1119.2500

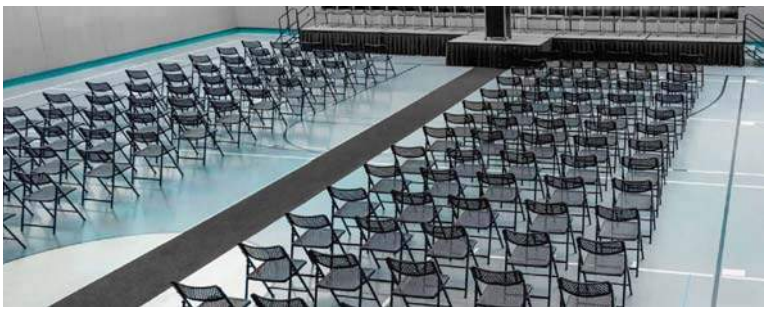
Product: AirFlex Premium Folding Chair (Or Approved Equal)

Manufacturer: National Public Seating

Location: Credit Recovery Common Area, Gymnasium Scoring Table, and Press Box

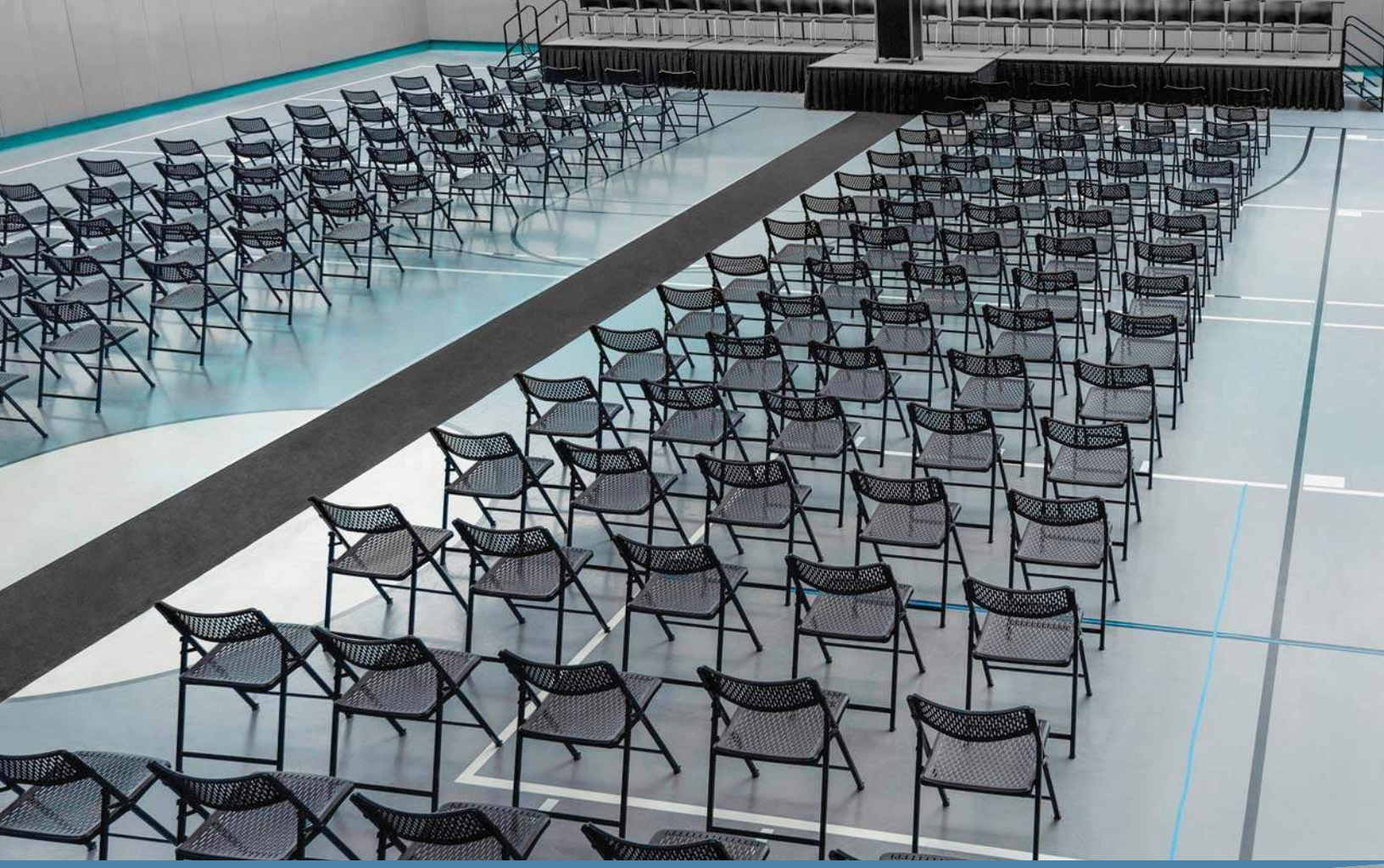
National Public Seating's AirFlex Premium Folding Chair combines ultra-durability with all-day comfort. The industrial grade polypropylene seat and back features a distinct design that contours to each individual for long-lasting comfort and sweat-free ventilation. This chair features a modern look with a strong, 18-gauge steel frame designed to withstand years of use. Plus, it has a weight capacity of 1,000 pounds. Nesting/stacking assist glides on two legs make stacking and storing this chair a cinch.





Product Details

- Features a unique AirFlex design for sweat-free ventilation and comfort.
- Steel frame is designed to withstand years of use.
- Stacks for efficient storage.
- Chair Material: Polypropylene
- Frame Material: 18 gauge steel
- Frame Finish: Powder coat
- Seat Height: 18" H
- Seat Size: Seat Size: 17" W x 18" D
- Warranty: 10 year
- Overall Dimensions: 19-3/4" W x 20-1/4" D x 31" H
- Assembly: Assembled
- Product Weight (Lbs): 10
- Shipping Method: UPS / FedEx
- Dolly is sold separately





AirFlex | 1400 Series

AirFlex Technology blends ultimate comfort with modern design.

National Public Seating

AirFlex

Model 1410 shown



THE **Body Builder** LINE

Comfort

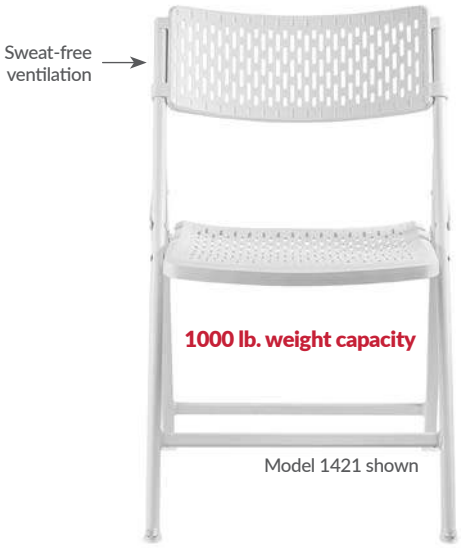
Distinct AirFlex design contours to each individual making for the perfect balance of comfort and strength.

Design

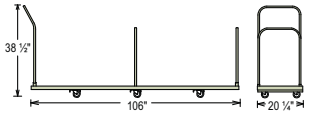
Modern design enhances any event.

Durability

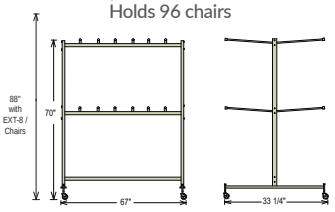
Strong 18 gauge steel frame and seat supports makes for long lasting durability.



Fits Dolly Model #DY1400
Holds 54 chairs



Fits Dolly Model #DY84 + EXT8
Holds 96 chairs



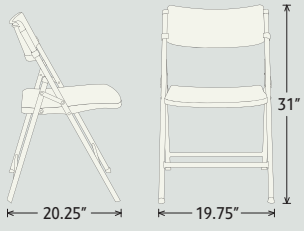
Swatches

1410 BLACK

1421 WHITE

Product Specs

Folded	40.25"H x 19.5"W x 2"D
Open	31"H x 19.75 W x 20.25"D
Seat	17.25"H x 17"W x 18"D
Back	7.5"H x 19.5"W
Product Weight	9.6 lbs.



BIFMA INTERNATIONAL
ANSI
products meet or exceed applicable ANSI/BIFMA standards

National Public Seating

800.261.4112
www.nationalpublicseating.com

Product: **Salsbury Series 77780 Wood Locker Bench; 84" L w/ Light Finish (Or Approved Equal)**

Manufacturer: Salsbury Industries

Location: Male Gym Locker Room, Female Gym Locker Room, Male ROTC Locker Room, and Female ROTC Locker Room



Model # 77787LGT

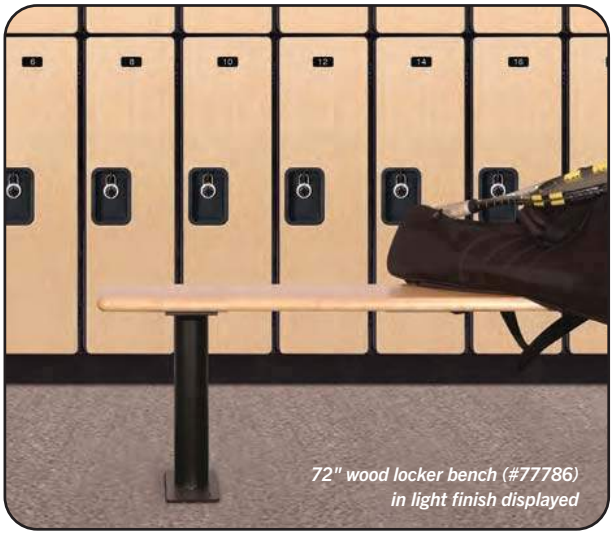
Product Details

- Constructed of solid butcher block wood
- Ideal for industrial, office or recreational locker room facilities
- Combine a classic look with strength and durability
- Available in a light or dark finish
- Available in lengths ranging from 36" to 96" (in 1 foot increments) and are easily assembled
- Over Dimensions: 84" W x 18" H x 9.5" D
- Weight: 40 lbs
- The wood seating area is 1-1/4" thick
- Include two 3" diameter bolt mounted pedestals in a black powder coated finish
- Benches are delivered unassembled - minor assembly required

Wood Locker Benches

WOOD LOCKER BENCHES

Constructed of 1-1/4'' thick solid butcher block wood, Salsbury wood locker benches combine a classic look with strength and durability and are an excellent addition to industrial, office or recreational locker room facilities. Wood locker benches are available in six (6) lengths ranging from 36'' to 96'' in one foot increments and are easily assembled. The wood seating area is 1-1/4" thick and available in a light finish or a dark finish. Each bench is 18'' H x 9-1/2'' D and includes two (2) 3'' diameter bolt mounted aluminum pedestals with four (4) mounting holes to secure to the ground. Pedestals feature a durable powder coated black finish. Minor assembly is required.



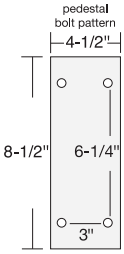
72" wood locker bench (#77786) in light finish displayed



72" wood locker bench (#77786) and wood ADA locker bench with back support (#77781-ADAB) in dark finish displayed







WOOD LOCKER BENCHES

MODEL	DESCRIPTION	BENCH SIZE	WEIGHT	PRICE
77783[1]	36" (3 feet) Bench	36" W x 18" H x 9-1/2" D	20 lbs.	$210.00
77784[1]	48" (4 feet) Bench	48" W x 18" H x 9-1/2" D	25 lbs.	$260.00
77785[1]	60" (5 feet) Bench	60" W x 18" H x 9-1/2" D	30 lbs.	$305.00
77786[1]	72" (6 feet) Bench	72" W x 18" H x 9-1/2" D	35 lbs.	$355.00
77787[1]	84" (7 feet) Bench	84" W x 18" H x 9-1/2" D	40 lbs.	$400.00
77788[1]	96" (8 feet) Bench	96" W x 18" H x 9-1/2" D	45 lbs.	$450.00

Current Pricing and Volume Discounts Available at Lockers.com!

Note: It is recommended that all benches be floor anchored.

WOOD ADA LOCKER BENCHES

Salsbury wood ADA locker benches combine a traditional look with strength and durability and are an excellent addition to facilities that require accessibility. Constructed of solid butcher block wood, the seating area is 1-1/4" thick, 20" deep, 42" or 48" wide and 18" high. Wood ADA locker benches are available in two (2) configurations, one with back support (39" high) and one without back support (18" high). Wood ADA locker benches with back supports can be placed in an open area while those without back supports are designed to be installed flush against a wall. Each seating area meets ADA requirements and include four (4) 3" diameter bolt mounted pedestals with two (2) mounting holes to secure to the ground. Pedestals feature a durable powder coated black finish. Minor assembly is required.







WOOD ADA LOCKER BENCHES

MODEL	DESCRIPTION	BENCH SIZE	WEIGHT	PRICE
77781-ADA[1]	42" ADA Bench	42" W x 18" H x 20" D	50 lbs.	$430.00
77781-ADAB[1]	42" ADA Bench with back support	42" W x 39" H x 23" D	90 lbs.	$780.00
77782-ADA[1]	48" ADA Bench	48" W x 18" H x 20" D	55 lbs.	$510.00
77782-ADAB[1]	48" ADA Bench with back support	48" W x 39" H x 23" D	100 lbs.	$860.00

Note: It is recommended that all benches be floor anchored.

[1] Specify



Product: **Salsbury Series 77780 Wood Locker Bench - 42" L**
(Or Approved Equal)

Manufacturer: Salsbury Industries

Location: Male Gym Locker Room, Female Gym Locker Room, Male ROTC Locker Room, and Female ROTC Locker Room



Model # 77781-ADA-LGT

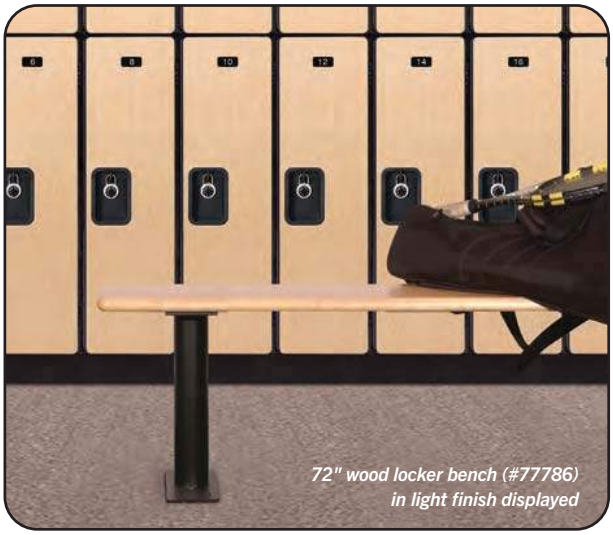
Product Details

- Meets ADA seating area requirements
- Designed to be installed flushed against a wall for back support
- Constructed of solid butcher block wood
- Ideal for industrial, office or recreational locker room facilities
- Combine a classic look with strength and durability
- Available in a light or dark finish
- Available in 42" amd 48" wide lengths
- Overall Dimensions: 42" W x 20" D x 18"H
- Weight: 50 lbs
- The wood seating area is 1-1/4" thick
- Include two (2) bolt mounted pedestals in a black powder coated finish
- Benches are delivered unassembled - minor assembly required

Wood Locker Benches

WOOD LOCKER BENCHES

Constructed of 1-1/4'' thick solid butcher block wood, Salsbury wood locker benches combine a classic look with strength and durability and are an excellent addition to industrial, office or recreational locker room facilities. Wood locker benches are available in six (6) lengths ranging from 36'' to 96'' in one foot increments and are easily assembled. The wood seating area is 1-1/4" thick and available in a light finish or a dark finish. Each bench is 18'' H x 9-1/2'' D and includes two (2) 3'' diameter bolt mounted aluminum pedestals with four (4) mounting holes to secure to the ground. Pedestals feature a durable powder coated black finish. Minor assembly is required.



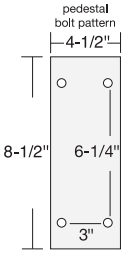
72" wood locker bench (#77786) in light finish displayed



72" wood locker bench (#77786) and wood ADA locker bench with back support (#77781-ADAB) in dark finish displayed







WOOD LOCKER BENCHES

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77784[1]	48" (4 feet) Bench	48" W x 18" H x 9-1/2" D	25 lbs.	$260.00
77785[1]	60" (5 feet) Bench	60" W x 18" H x 9-1/2" D	30 lbs.	$305.00
77786[1]	72" (6 feet) Bench	72" W x 18" H x 9-1/2" D	35 lbs.	$355.00
77787[1]	84" (7 feet) Bench	84" W x 18" H x 9-1/2" D	40 lbs.	$400.00
77788[1]	96" (8 feet) Bench	96" W x 18" H x 9-1/2" D	45 lbs.	$450.00

Current Pricing and Volume Discounts Available at Lockers.com!

Note: It is recommended that all benches be floor anchored.

WOOD ADA LOCKER BENCHES

Salsbury wood ADA locker benches combine a traditional look with strength and durability and are an excellent addition to facilities that require accessibility. Constructed of solid butcher block wood, the seating area is 1-1/4" thick, 20" deep, 42" or 48" wide and 18" high. Wood ADA locker benches are available in two (2) configurations, one with back support (39" high) and one without back support (18" high). Wood ADA locker benches with back supports can be placed in an open area while those without back supports are designed to be installed flush against a wall. Each seating area meets ADA requirements and include four (4) 3" diameter bolt mounted pedestals with two (2) mounting holes to secure to the ground. Pedestals feature a durable powder coated black finish. Minor assembly is required.







WOOD ADA LOCKER BENCHES

MODEL	DESCRIPTION	BENCH SIZE	WEIGHT	PRICE
77781-ADA[1]	42" ADA Bench	42" W x 18" H x 20" D	50 lbs.	$430.00
77781-ADAB[1]	42" ADA Bench with back support	42" W x 39" H x 23" D	90 lbs.	$780.00
77782-ADA[1]	48" ADA Bench	48" W x 18" H x 20" D	55 lbs.	$510.00
77782-ADAB[1]	48" ADA Bench with back support	48" W x 39" H x 23" D	100 lbs.	$860.00

Note: It is recommended that all benches be floor anchored.

[1] Specify



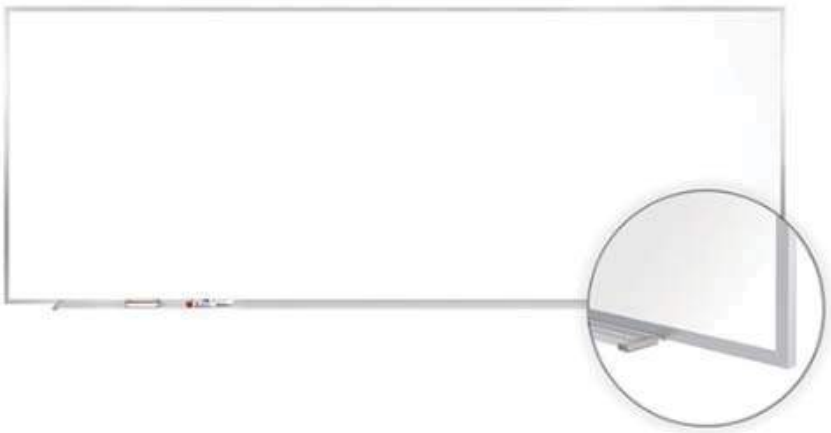
Product: **Porcelain Magnetic Whiteboard with Aluminum Frame; M1 Series, (Or Approved Equal)**

Manufacturer: Ghent

Location: General Education Classrooms, SPED Classrooms, ESL Classrooms, ProStart Classroom, HT Classroom, Marketing Classroom, HCS Classroom, Electronics Computer Lab, and JROTC Instructional Areas

Offering a superior writing surface and unsurpassed durability, Ghent's Porcelain Magnetic Whiteboards were made with customers in mind. The 28-gauge porcelain-on-steel surface is mounted to a 3/8" backing for added strength. The durable porcelain enameled surface keeps the dry erase board from scratching or denting, even when installed in high-traffic schools and offices. The wear resistant surface does not absorb ink, eliminating staining and ghosting that would otherwise result from repeated use. The easy-to-wipe surface requires less cleaning, achieving a long-lasting bright white surface without the hassle.

Ghent's whiteboard holds magnets and can be used to post bulletins without worrying the announcement will be erased. Boards 3'x5' and larger include 1 marker and 1 eraser. Board is available in eight standard sizes up to 4’x12'. Each board comes in our sleek Satin aluminum frame with an accessory tray and protective end caps. Our SmartPak tray is detached for easier installation and reduced waste and damage during delivery. Our boards are shipped to you in Ghent's worry-free packaging, designed specifically for shipping whiteboards. Ghent's porcelain magnetic whiteboard carries a 50-year warranty and is made in the USA.



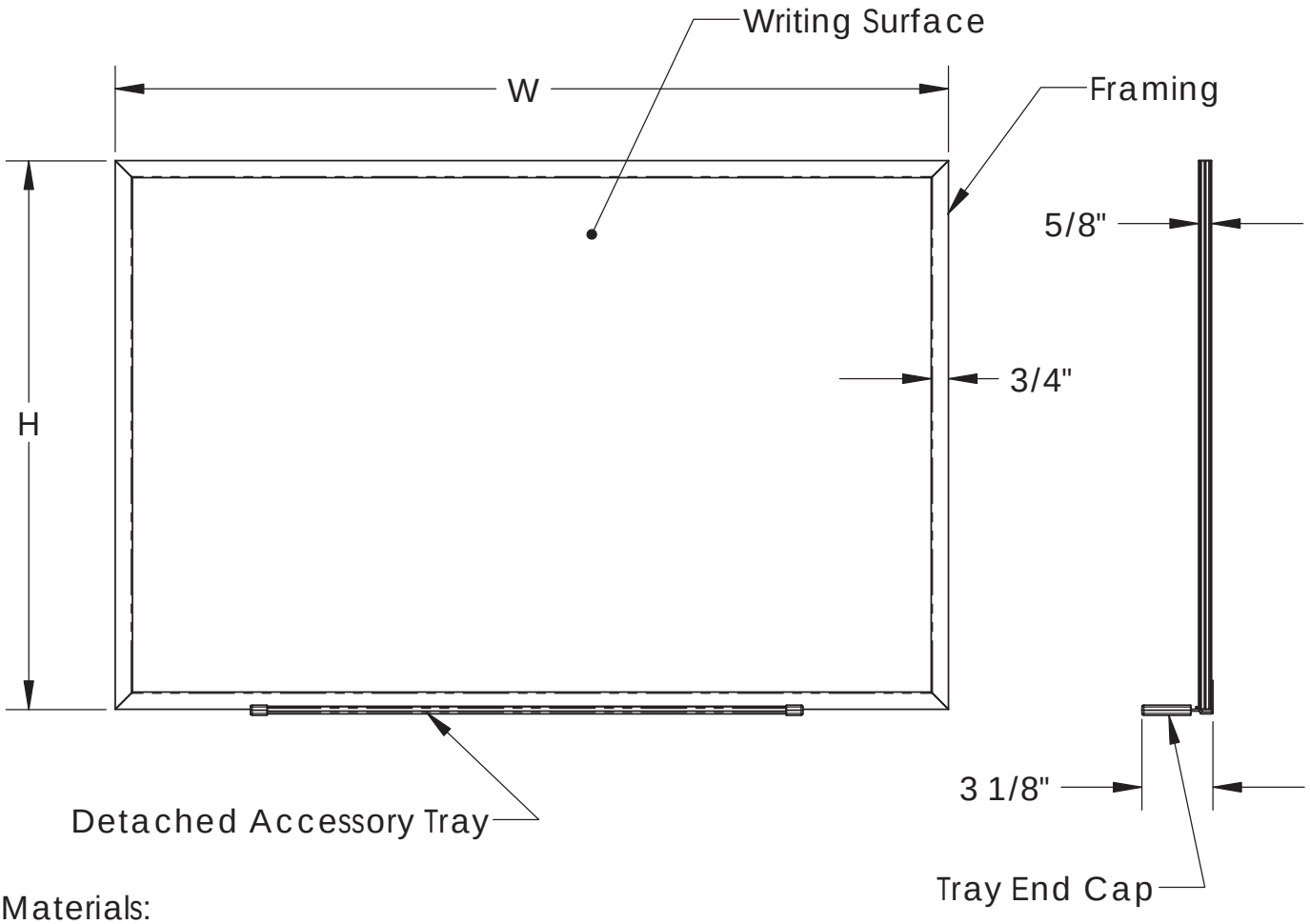
Item # M1-412-4

Product Details

- Highest-quality porcelain-on-steel writing surface
- Scratch and stain-resistant
- Durable fiberboard backing
- Magnetic surface
- Writing Surface: Porcelain-on-steel
- Backing: Fiberboard
- Frame: Aluminum
- Dimensions: 4'H x 12'W
- Other: Four assorted colored markers and eraser included
- Warranty: 50 years
- Made in the USA
- Assembly Required: No
- Weight: 93 lbs

M1 Series

Aluminum Framed Porcelain White H boards



Materials:

- Framing and detached accessory tray: Satin anodized aluminum extrusion
- Writing surface: White porcelain coated 28 gage - steel laminated to 3/8" thick fiberboard, with a mylar film backing.
- Detached accessory tray end caps: Gray thermoplastic.

Features:

- Board hangers are included.
- An eraser and black marker is included with each 3' X 4' and smaller boards.
- An eraser and four assorted color markers are included with each 3' X 5' and larger boards.
- Available in the following sizes:
  2'H x 3"W, 3'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W, or 4'H x 16W' (2 pcs)
- Board is guaranteed 50 years.

Notes:

- Wall mounting fasteners are not included.
- For indoor use only.

Product: Ghent Graphic Boards; Magnetic; 1" x 1" Grid; 4x6

Manufacturer: Ghent

Location: Math Classrooms

Update your science, technology or math classrooms with Ghent's Grid Magnetic Whiteboard, featuring a 1" x 1: grid ideal for charts and graphs. The dry-erase surface won't stain or ghost and the durable steel and aluminum construction withstands years of heavy use. The grid graphic is printed in gray to match any décor. Each board includes a removable tray, black marker, marker clip and an eraser. Available in 4 standard sizes from 2' x 3' to 4' x 8', Non-magnetic surface and 2"x 2" grid also available.



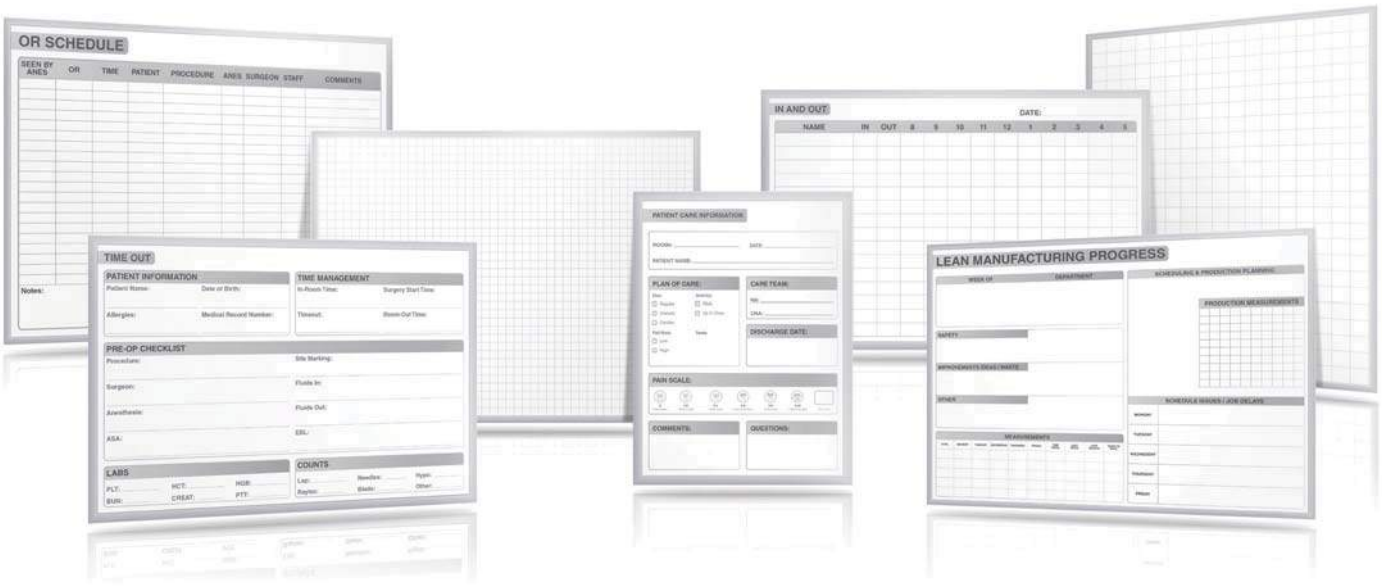
Product Details

- Surface Material: Magnetic 22-gauge coated steel laminated to hardboard
- Backing Material: Mylar Film
- Frame Material: Anodized aluminum
- Tray Material: Anodized aluminum w/ thermoplastic end caps
- Dimensions: 72"W x 48"H
- Grid Size: 1" x 1" (2" x 2" grid also available)
- Product Weight: 18 lbs

- Includes black marker, marker clip, eraser, and board hangers
- Mounting hardware not included
- Assembly not required
- Warranty: 10-Year Limited
- Made in the USA

GHENT GRAPHICS

Visually Enhanced Whiteboards



Communicate, collaborate, and learn with Ghent Graphics, visually enhanced whiteboards. Available in seven different offerings, you'll find a dry erase board that will work to promote communication in your hospital with patient room boards, scheduling and OR count boards; manufacturing facilities with LEAN initiatives and In/Out boards; and grid whiteboards for use in your office or classroom. Each board comes framed in our sleek, ¼" smooth aluminum frame. Graphics are produced in gray to seamlessly match any interior.

Features

- Available in both magnetic and non-magnetic surfaces
- Detachable SmartPak tray comes with every board
- Resists staining and ghosting and graphics will not fade
- Carries a 10-year warranty

Detail Shot



Sleek, ¼" Smooth Aluminum Frame



Detachable SmartPak tray



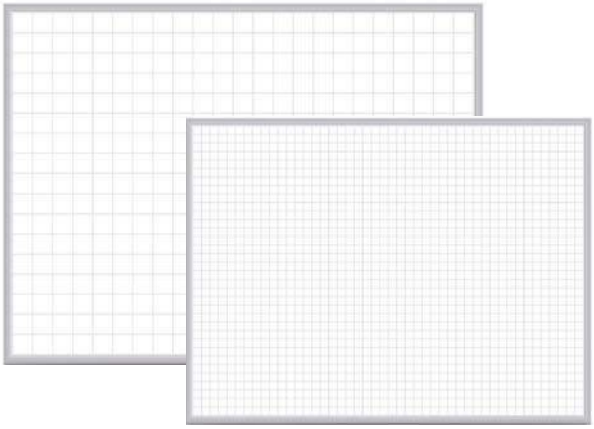
Graphic Embedded into the Surface

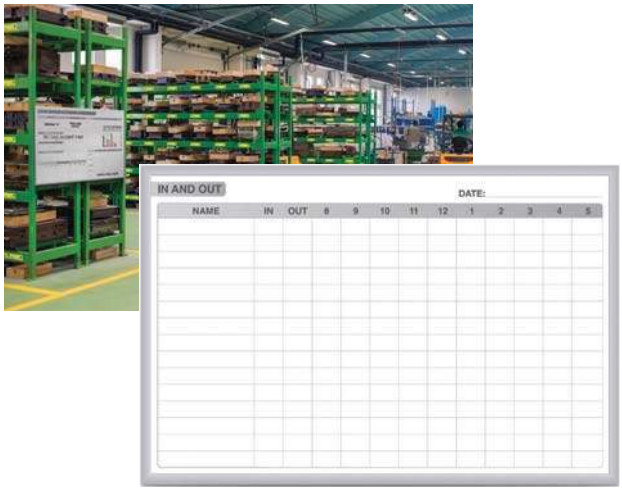
ghent
a GMi company.

GRID BOARDS

Features

- Create quick graphs and sketches
- Choose between 1” x 1” and 2” x 2” boards
- Displays clean and clear information to an audience
- Improves communication in corporate and educational spaces





MANUFACTURING

Features

- Quickly track changes throughout the day
- Choose between in/out and lean manufacturing boards
- Displays important information to employees and managers
- Improves communication in corporate and manufacturing environments



4' x 6' Lean Board Non-Magnetic.

HEALTHCARE

Patient Room Board

Item #	Description	Size
GRPM211P-18	Non-Magnetic	18"x24"
GRPM211P-23	Non-Magnetic	2'x3'
GRPM311P-18	Magnetic	18"x24"
GRPM311P-23	Magnetic	2'x3'

Scheduling

Item #	Description	Size
GRPM213S-34	Non-Magnetic	3'x4'
GRPM213S-46	Non-Magnetic	4'x6'
GRPM213S-48	Non-Magnetic	4'x8'
GRPM313S-34	Magnetic	3'x4'
GRPM313S-46	Magnetic	4'x6'
GRPM313S-48	Magnetic	4'x8'

Time Out

Item #	Description	Size
GRPM212T-18	Non-Magnetic	18"x24"
GRPM212T-23	Non-Magnetic	2'x3'
GRPM312T-18	Magnetic	18"x24"
GRPM312T-23	Magnetic	2'x3'

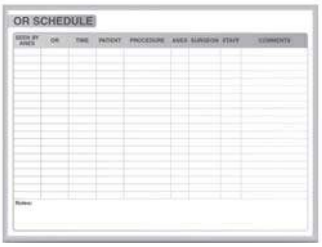
Patient Room Board



Time Out



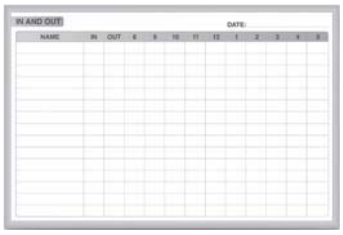
Scheduling



LEAN



In/Out



MANUFACTURING

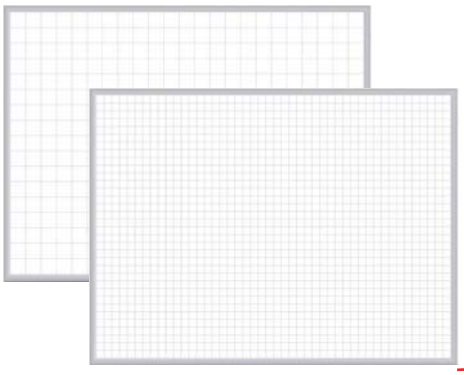
LEAN

Item #	Description	Size
GRPM202M-23	Non-Magnetic	2'x3'
GRPM202M-34	Non-Magnetic	3'x4'
GRPM202M-46	Non-Magnetic	4'x6'
GRPM202M-48	Non-Magnetic	4'x8'
GRPM302M-23	Magnetic	2'x3'
GRPM302M-34	Magnetic	3'x4'
GRPM302M-46	Magnetic	4'x6'
GRPM302M-48	Magnetic	4'x8'

In/Out

Item #	Description	Size
GRPM201E-23	Non-Magnetic	2'x3'
GRPM201E-34	Non-Magnetic	3'x4'
GRPM201E-46	Non-Magnetic	4'x6'
GRPM201E-48	Non-Magnetic	4'x8'
GRPM301E-23	Magnetic	2'x3'
GRPM301E-34	Magnetic	3'x4'
GRPM301E-46	Magnetic	4'x6'
GRPM301E-48	Magnetic	4'x8'

GRID



1" x 1"

Item #	Description	Size
GRPM321G-23	1"x1" Grid Magnetic	2'x3'
GRPM321G-34	1"x1" Grid Magnetic	3'x4'
GRPM321G-46	1"x1" Grid Magnetic	4'x6'
GRPM321G-48	1"x1" Grid Magnetic	4'x8'
GRPM221G-23	1"x1" Grid Non-Magnetic	2'x3'
GRPM221G-34	1"x1" Grid Non-Magnetic	3'x4'
GRPM221G-46	1"x1" Grid Non-Magnetic	4'x6'
GRPM221G-48	1"x1" Grid Non-Magnetic	4'x8'

2" x 2"

Item #	Description	Size
GRPM322G-23	2"x2" Grid Magnetic	2'x3'
GRPM322G-34	2"x2" Grid Magnetic	3'x4'
GRPM322G-46	2"x2" Grid Magnetic	4'x6'
GRPM322G-48	2"x2" Grid Magnetic	4'x8'
GRPM222G-23	2"x2" Grid Non-Magnetic	2'x3'
GRPM222G-34	2"x2" Grid Non-Magnetic	3'x4'
GRPM222G-46	2"x2" Grid Non-Magnetic	4'x6'
GRPM222G-48	2"x2" Grid Non-Magnetic	4'x8'

2999 Henkle Drive | Lebanon, Ohio 45036 | 800.543.0550 | ghent.com/graphic-dry-erase-boards

MADE IN THE USA

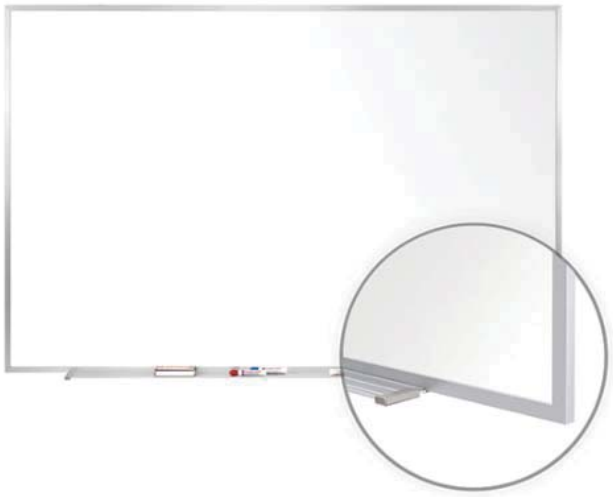
Product: **Porcelain Magnetic Whiteboard with Aluminum Frame; M1 Series (Or Approved Equal)**

Manufacturer: Ghent

Location: Staff Faculty Lounge, Work Room / Resource Center, Administration Conference Room, Carpentry Classroom, and Automotive Classroom

Ghent's Porcelain Magnetic Whiteboards are the ultimate in terms of quality and durability. Constructed with porcelain-on-steel, these boards will withstand years of everyday use with no scratching, staining, or ghosting. This aluminum-framed 4' x 8' Porcelain Magnetic Whiteboard is easy to clean. Backed by Ghent's 50-year guarantee, it is the ideal choice for classrooms, conference rooms and training centers.

Now packaged with Smart-Pak Trays, which include a 23 1/2" recessed marker tray with plastic end caps for safety. Four assorted colored markers and an eraser are included. Designed for better shipping and easier installation, Smart-Pak Trays reduce packaging waste by 25 percent and potential damage by 55 percent.



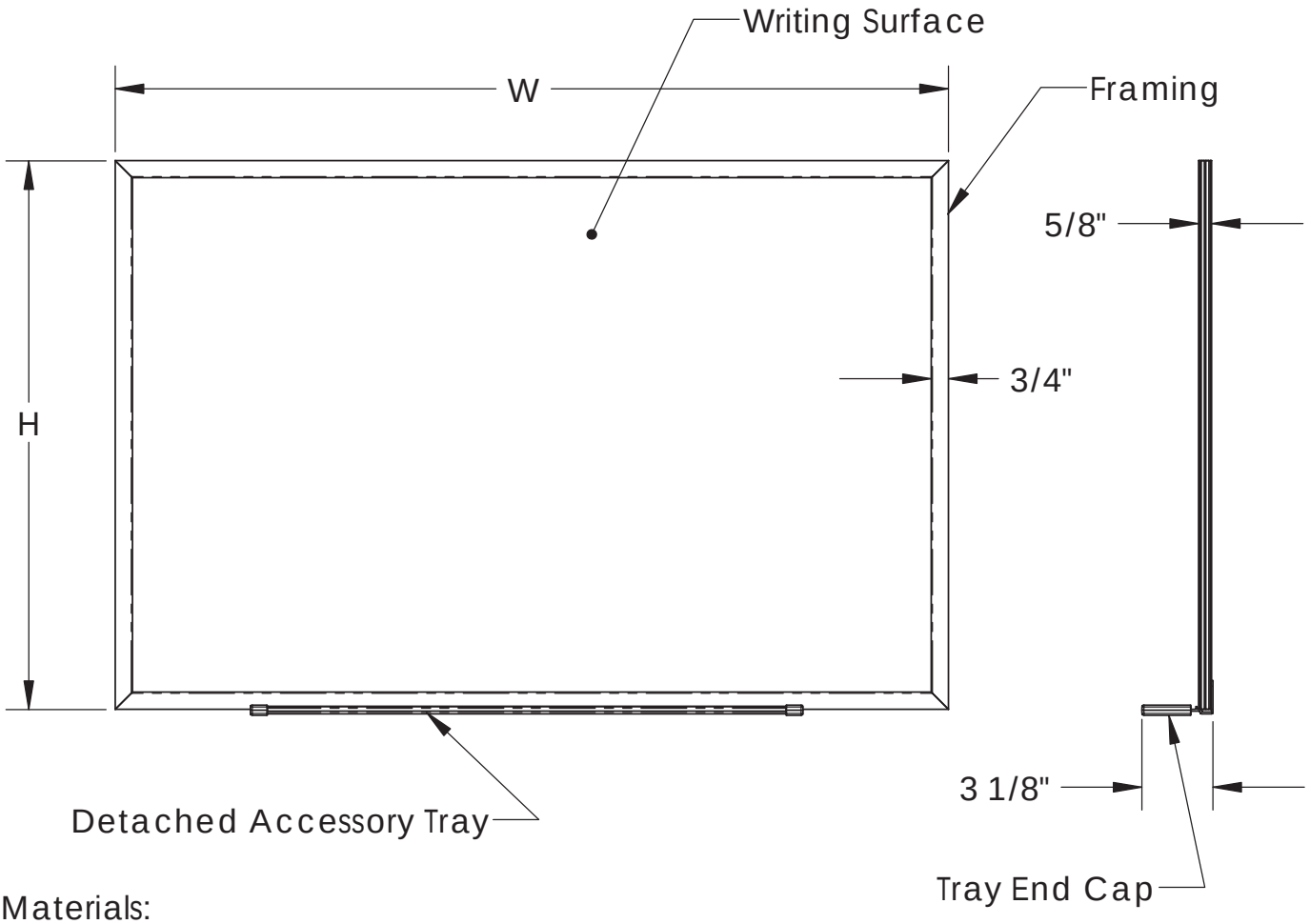
Product Details

- Highest-quality porcelain-on-steel writing surface
- Scratch and stain-resistant
- Durable fiberboard backing
- Magnetic surface
- Writing Surface: Porcelain-on-steel
- Backing: Fiberboard

- Frame: Aluminum
- Dimensions: 4'H x 8'W
- Other: Four assorted colored markers and eraser included
- Warranty: 50 years
- Made in the USA
- Assembly Required: No
- Weight: 66 lbs

M1 Series

Aluminum Framed Porcelain White H boards



Materials:

- Framing and detached accessory tray: Satin anodized aluminum extrusion
- Writing surface: White porcelain coated 28 gage - steel laminated to 3/8" thick fiberboard, with a mylar film backing.
- Detached accessory tray end caps: Gray thermoplastic.

Features:

- Board hangers are included.
- An eraser and black marker is included with each 3' X 4' and smaller boards.
- An eraser and four assorted color markers are included with each 3' X 5' and larger boards.
- Available in the following sizes:
  2'H x 3"W, 3'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W, or 4'H x 16W' (2 pcs)
- Board is guaranteed 50 years.

Notes:

- Wall mounting fasteners are not included.
- For indoor use only.

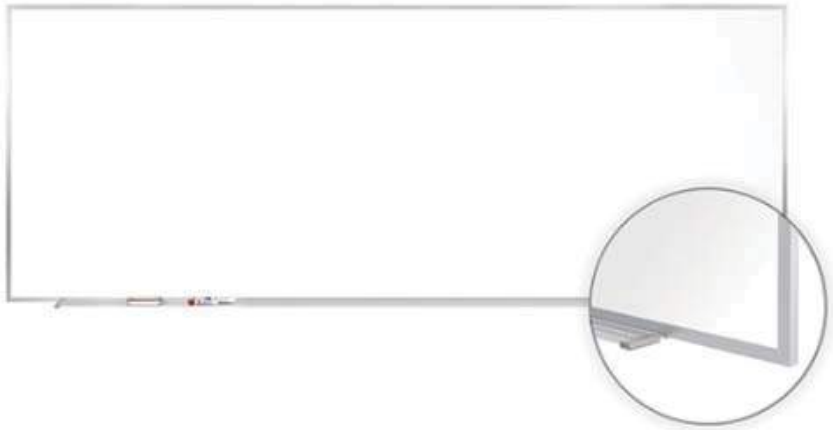
Product: **Porcelain Magnetic Whiteboard with Aluminum Frame; M1 Series (Or Approved Equal)**

Manufacturer: Ghent

Location: Administration/Staff/Faculty Offices

Offering a superior writing surface and unsurpassed durability, Ghent's Porcelain Magnetic Whiteboards were made with customers in mind. The 28-gauge porcelain-on-steel surface is mounted to a 3/8" backing for added strength. The durable porcelain enameled surface keeps the dry erase board from scratching or denting, even when installed in high-traffic schools and offices. The wear resistant surface does not absorb ink, eliminating staining and ghosting that would otherwise result from repeated use. The easy-to-wipe surface requires less cleaning, achieving a long-lasting bright white surface without the hassle.

Ghent's whiteboard holds magnets and can be used to post bulletins without worrying the announcement will be erased. Boards 3'x5' and larger include 1 marker and 1 eraser. Board is available in eight standard sizes up to 4’x12'. Each board comes in our sleek Satin aluminum frame with an accessory tray and protective end caps. Our SmartPak tray is detached for easier installation and reduced waste and damage during delivery. Our boards are shipped to you in Ghent's worry-free packaging, designed specifically for shipping whiteboards. Ghent's porcelain magnetic whiteboard carries a 50-year warranty and is made in the USA.



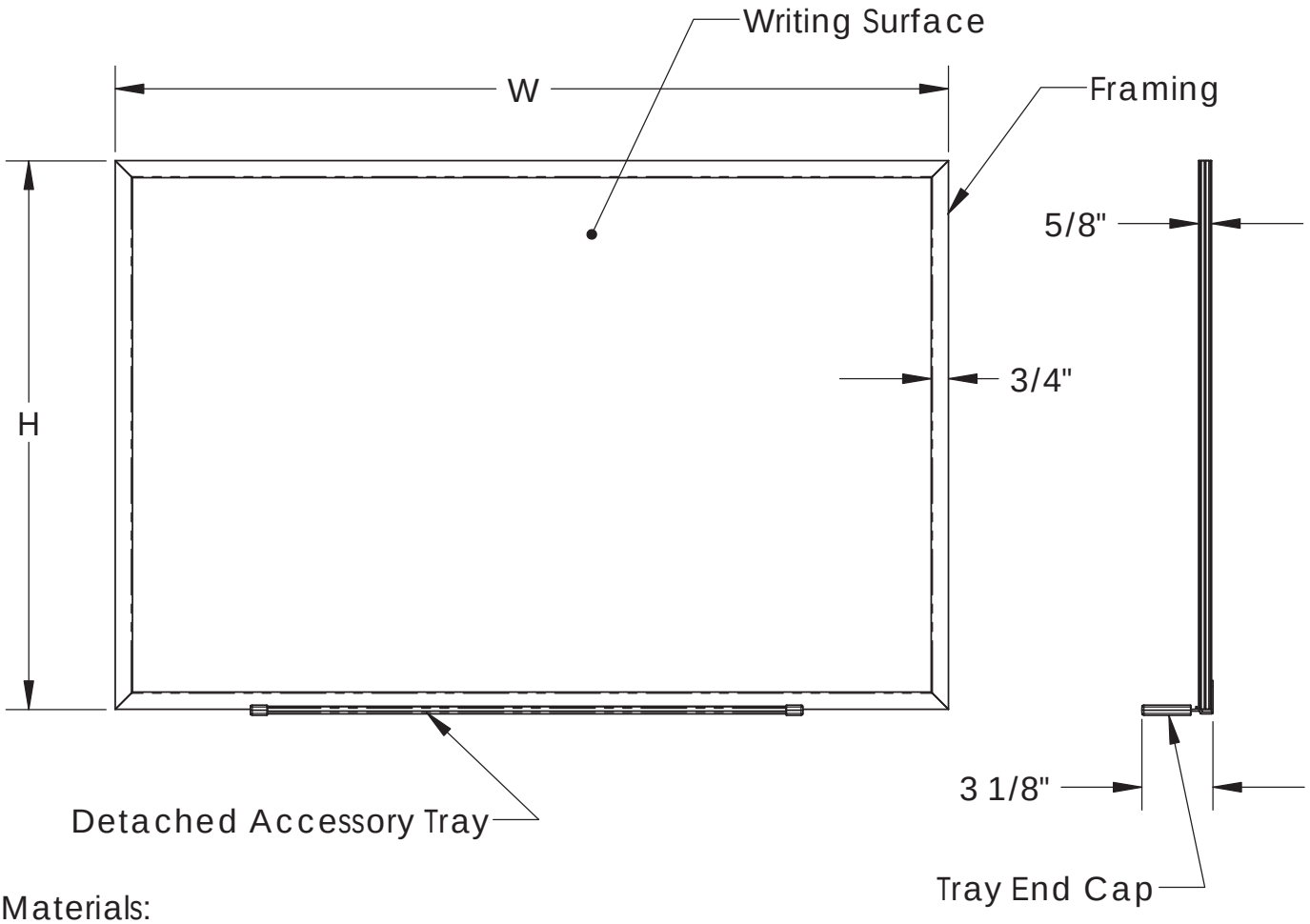
Item # M1-44-4

Product Details

- Highest-quality porcelain-on-steel writing surface
- Scratch and stain-resistant
- Durable fiberboard backing
- Magnetic surface
- Writing Surface: Porcelain-on-steel
- Backing: Fiberboard
- Frame: Aluminum
- Dimensions: 4'H x 4'W
- Other: Four assorted colored markers and eraser included
- Warranty: 50 years
- Made in the USA
- Assembly Required: No
- Weight: 32 lbs

M1 Series

Aluminum Framed Porcelain White H boards



Materials:

- Framing and detached accessory tray: Satin anodized aluminum extrusion
- Writing surface: White porcelain coated 28 gage - steel laminated to 3/8" thick fiberboard, with a mylar film backing.
- Detached accessory tray end caps: Gray thermoplastic.

Features:

- Board hangers are included.
- An eraser and black marker is included with each 3' X 4' and smaller boards.
- An eraser and four assorted color markers are included with each 3' X 5' and larger boards.
- Available in the following sizes:
  2'H x 3"W, 3'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W, or 4'H x 16W' (2 pcs)
- Board is guaranteed 50 years.

Notes:

- Wall mounting fasteners are not included.
- For indoor use only.

Product: **Traditional Natural Cork Board with Aluminum Frame; AK Series (Or Approved Equal)**

Manufacturer: Ghent

Location: Miscellaneous Administration/Staff/Faculty Offices, English Classrooms B107 and B108, Miscellaneous Science Classrooms, Health Classroom C122, World Language Classrooms A212 and A213, Classrooms C103~C105 and C116~C121, ProStart Classroom, HT Classroom, HCS Classroom, and Credit Recovery Office.

Ghent's Traditional Natural Cork Board is the durable display area you need without the big price tag. The 1/32" thick, fine-grain cork surface is laminated to a sealed fiberboard back for extra durability. Since the cork is self healing, the board stays smooth; you won't notice holes made by push pins, staples or tacks. The sturdy aluminum frame adds a stylish touch to your cork board. This 4' 1/2" x 4' 1/2" Ghent Traditional Natural Cork Board is backed by a 10-year warranty.

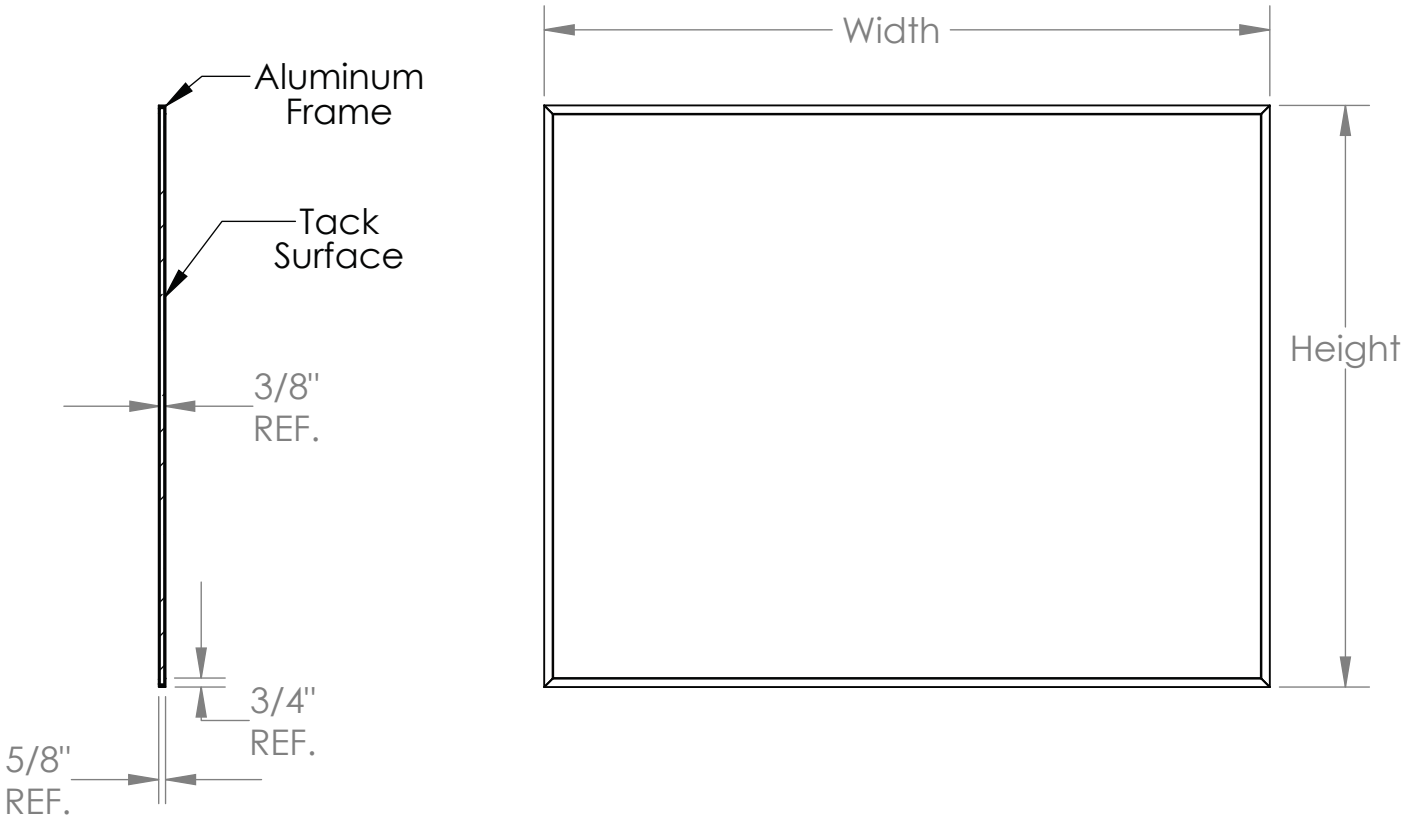


Product Details

- Self-healing fine-grain natural cork
- 1/32" thick, laminated to a sealed fiberboard back
- Stylish aluminum frame
- Cork Thickness: 1/32"
- Fiberboard Back Thickness: 3/8"
- Material: Self-healing , fine-grain natural cork
- Frame Material: Aluminum
- Dimensions: 4'-1/2" W x 4'-1/2" H
- Warranty: 10 years
- Made in the USA
- Assembly Required: No
- Shipping Method: Freight
- Weight: 17.00 lbs

AK Series

Aluminum Framed Cork Bulletin Boards



Materials:

- Framing: Satin anodized 6063-T5 aluminum extrusion.
- Tack surface: 1/32" fine grain natural cork laminated to 3/8" thick fiberboard, with a mylar film backing.

Features:

- Board hangers are included.
- Aluminum frame is permanently attached to the tack surface.
- Available in the following sizes:
  3'H x 5'W, 4'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W.
- Board is guaranteed for 10 years.

Notes:

- For indoor use only.

Product: Ghent Recycled Rubber Tackboard, 4x6 (Or Approved Equal)

Manufacturer**:** Ghent

Location: Art Rooms



Manufactured from 90% recycled materials, the textured recycled rubber surface on these tackboards stands up to heavy use. The textured surface is fashioned to withstand the toughest conditions. This fade-resistant, stain-resistant surface is also self-healing so pinholes will not show. The elasticity of recycled rubber makes this tackboard the perfect choice for classrooms that use bulletin boards daily. This tackboard is also ideal for locations with specifice health standards as the rubber tack surface is washable and allows disinfection without damaging the surface. Ghent Recycled Rubber Tackboards are available in eight sizes, each featuring an anodized satin aluminum frame. The tackboard surface is available in three colors - Black, Confetti, or Tan Speckled. This tackboard is durable enough to carry a 10-year warranty.

<u>Product Details</u>

- Made using recycled tire material
- Self-healing and washable rubber surface
- Satin aluminum frame finish
- 10-year manufacturer warranty
- Made in the USA

RECYCLED RUBBER

Bulletin Boards and Enclosed Message Centers



ghent
a GMi company



4' × 6' Bulletin Board Shown in Confetti Recycled Rubber

Tackable Surfaces that Meet Sustainability Goals

Tire production is one of the most problematic sources of waste. Ghent's Recycled Rubber Bulletin and Enclosed Boards re-purpose tire waste into a green communication tool that is durable, self-healing and washable. Recycled rubber is an ideal choice in high-traffic, high-use areas such as classrooms and offices.



Environmentally Friendly

All Recycled Rubber Boards are made using 90% recycled tire material and 10% post-industrial content.



Durable

Boards resist staining and fading and are easily cleaned with a cloth and warm water. Enclosed boards also feature a full-length piano hinge and locking doors for security.



Reliable

Self-healing surface masks pin holes and stands up to years of repeated tacking and use.

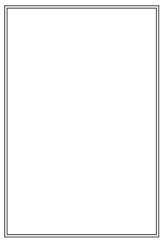


Variety

Available in three surface options, four framing choices, and a variety of sizes that can be hung in multiple orientations.

Recycled Rubber Bulletin & Enclosed Boards

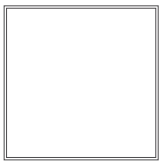
Statement of Line



Vertical Orientation

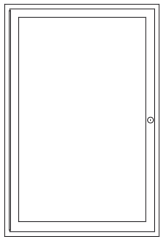


Landscape Orientation

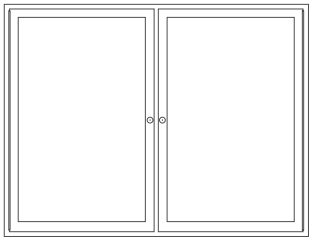


Square

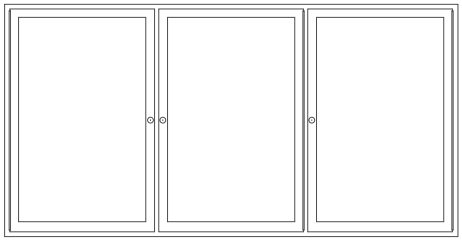
Bulletin Board Options



1 Door



2 Door



3 Door

Enclosed Board Options

Features

- Made from 90% recycled tires and 10% post-industrial content
- Self-healing tackable surface
- Resists staining and fading
- Washable by simply using a damp, warm cloth
- Available in both bulletin boards and enclosed boards
- 10-year warranty

Options

Available Standard Sizes:
Bulletin Boards: 2' × 3', 3' × 4', 3' × 5', 4' × 4', 4' × 5', 4' × 6', 4' × 8', 4' × 10', 4' × 12'

Enclosed Boards:
One Door: 24" × 18", 36" × 24", 36" × 30", 36" × 36"
Two Door: 36" × 48", 36" × 60", 48" × 96"
Three Door: 36" × 72", 48" × 72", 48" × 96"

Surface Options:



Confetti



Tan Speckled



Black

Frame Options:



Natural Oak



Satin Aluminum



Bronze Aluminum

ghent

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MADE IN THE USA

Product: **Traditional Natural Cork Board with Aluminum Frame; AK Series (Or Approved Equal)**

Manufacturer: Ghent

Location: General Education Classrooms, SPED Classrooms, ESL Classrooms, and Electronics Computer Lab

Ghent's Traditional Natural Cork Board is the durable display area you need without the big price tag. The 1/32" thick, fine-grain cork surface is laminated to a sealed fiberboard back for extra durability. Since the cork is self healing, the board stays smooth; you won't notice holes made by push pins, staples or tacks. The sturdy aluminum frame adds a stylish touch to your cork board. This 4' 1/2" x 6' 1/2" Ghent Traditional Natural Cork Board is backed by a 10-year warranty.



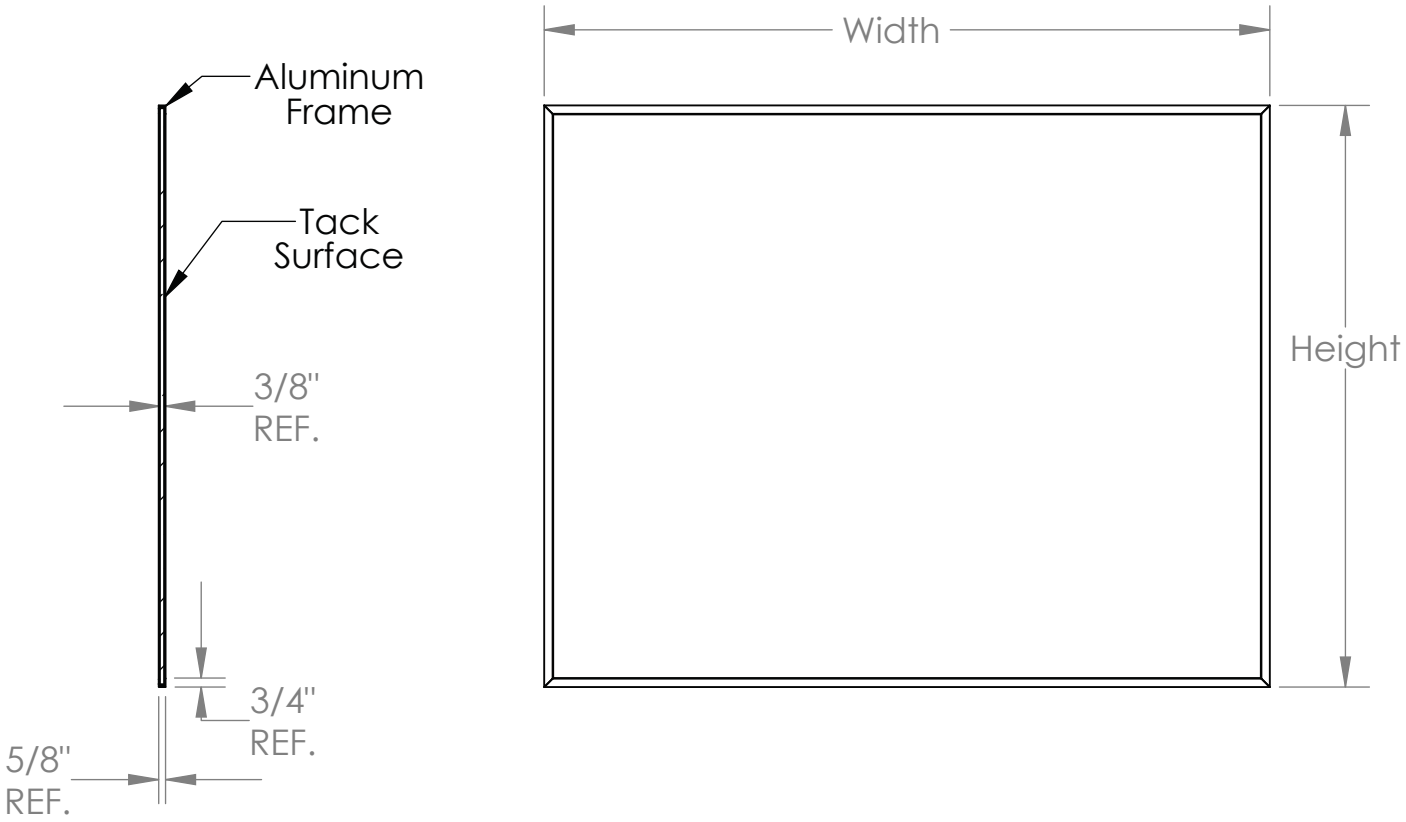
Product Details

- Self-healing fine-grain natural cork
- 1/32" thick, laminated to a sealed fiberboard back
- Stylish aluminum frame
- Cork Thickness: 1/32"
- Fiberboard Back Thickness: 3/8"
- Material: Self-healing , fine-grain natural cork
- Frame Material: Aluminum
- Dimensions: 4'-1/2" W x 6'-1/2" H

- Warranty: 10 years
- Made in the USA
- Assembly Required: No
- Shipping Method: Freight
- Weight: 26.00 lbs

AK Series

Aluminum Framed Cork Bulletin Boards



Materials:

- Framing: Satin anodized 6063-T5 aluminum extrusion.
- Tack surface: 1/32" fine grain natural cork laminated to 3/8" thick fiberboard, with a mylar film backing.

Features:

- Board hangers are included.
- Aluminum frame is permanently attached to the tack surface.
- Available in the following sizes:
  3'H x 5'W, 4'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W.
- Board is guaranteed for 10 years.

Notes:

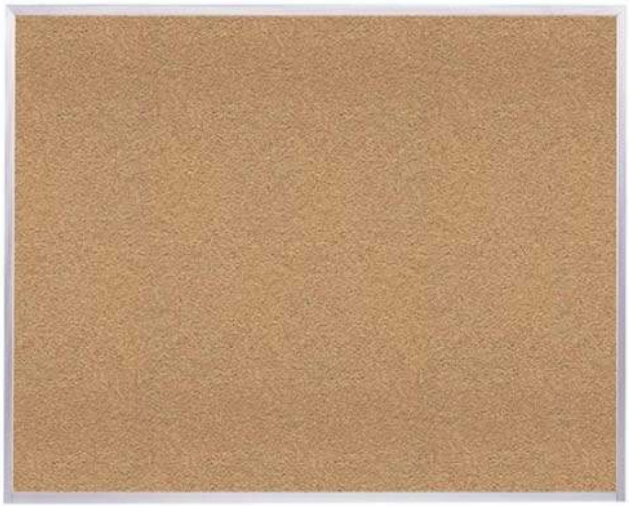
- For indoor use only.

Product: **Traditional Natural Cork Board with Aluminum Frame; AK Series (Or Approved Equal)**

Manufacturer: Ghent

Location: Staff/Faculty Lounge, Work Room / Resource Center, General Education Classrooms, SPED Classrooms, ESL Classrooms, Marketing Classroom, and Electronics Work

Ghent's Traditional Natural Cork Board is the durable display area you need without the big price tag. The 1/32" thick, fine-grain cork surface is laminated to a sealed fiberboard back for extra durability. Since the cork is self healing, the board stays smooth; you won't notice holes made by push pins, staples or tacks. The sturdy aluminum frame adds a stylish touch to your cork board. This 4' 1/2" x 8' 1/2" Ghent Traditional Natural Cork Board is backed by a 10-year warranty.



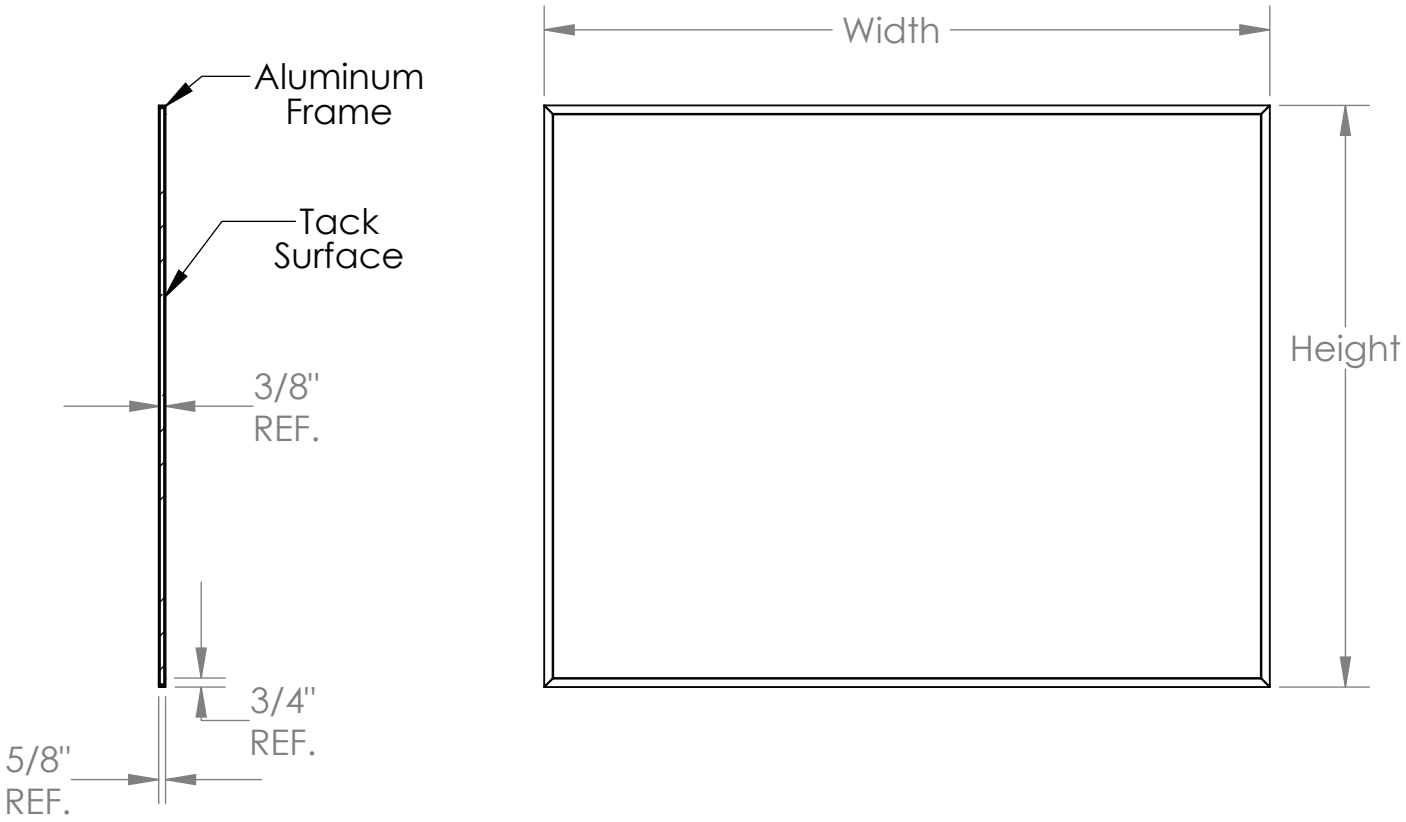
Product Details

- Self-healing fine-grain natural cork
- 1/32" thick, laminated to a sealed fiberboard back
- Stylish aluminum frame
- Cork Thickness: 1/32"
- Fiberboard Back Thickness: 3/8"
- Material: Self-healing , fine-grain natural cork
- Frame Material: Aluminum

- Dimensions: 4'-1/2" W x 8'-1/2" H
- Warranty: 10 years
- Made in the USA
- Assembly Required: No
- Shipping Method: Freight
- Weight: 33.00 lbs

AK Series

Aluminum Framed Cork Bulletin Boards



Materials:

- Framing: Satin anodized 6063-T5 aluminum extrusion.
- Tack surface: 1/32" fine grain natural cork laminated to 3/8" thick fiberboard, with a mylar film backing.

Features:

- Board hangers are included.
- Aluminum frame is permanently attached to the tack surface.
- Available in the following sizes:
  3'H x 5'W, 4'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W.
- Board is guaranteed for 10 years.

Notes:

- For indoor use only.

Product: **Traditional Natural Cork Board with Aluminum Frame; AK Series (Or Approved Equal)**

Manufacturer: Ghent

Location: Visitor Waiting Area, Miscellaneous General Education Classrooms, HT Classrooms, HCS Classrooms, Carpentry Classroom, and Automotive Classrooms

Ghent's Traditional Natural Cork Board is the durable display area you need without the big price tag. The 1/32" thick, fine-grain cork surface is laminated to a sealed fiberboard back for extra durability. Since the cork is self healing, the board stays smooth; you won't notice holes made by push pins, staples or tacks. The sturdy aluminum frame adds a stylish touch to your cork board. This 4' 1/2" x 10' 1/2" Ghent Traditional Natural Cork Board is backed by a 10-year warranty.



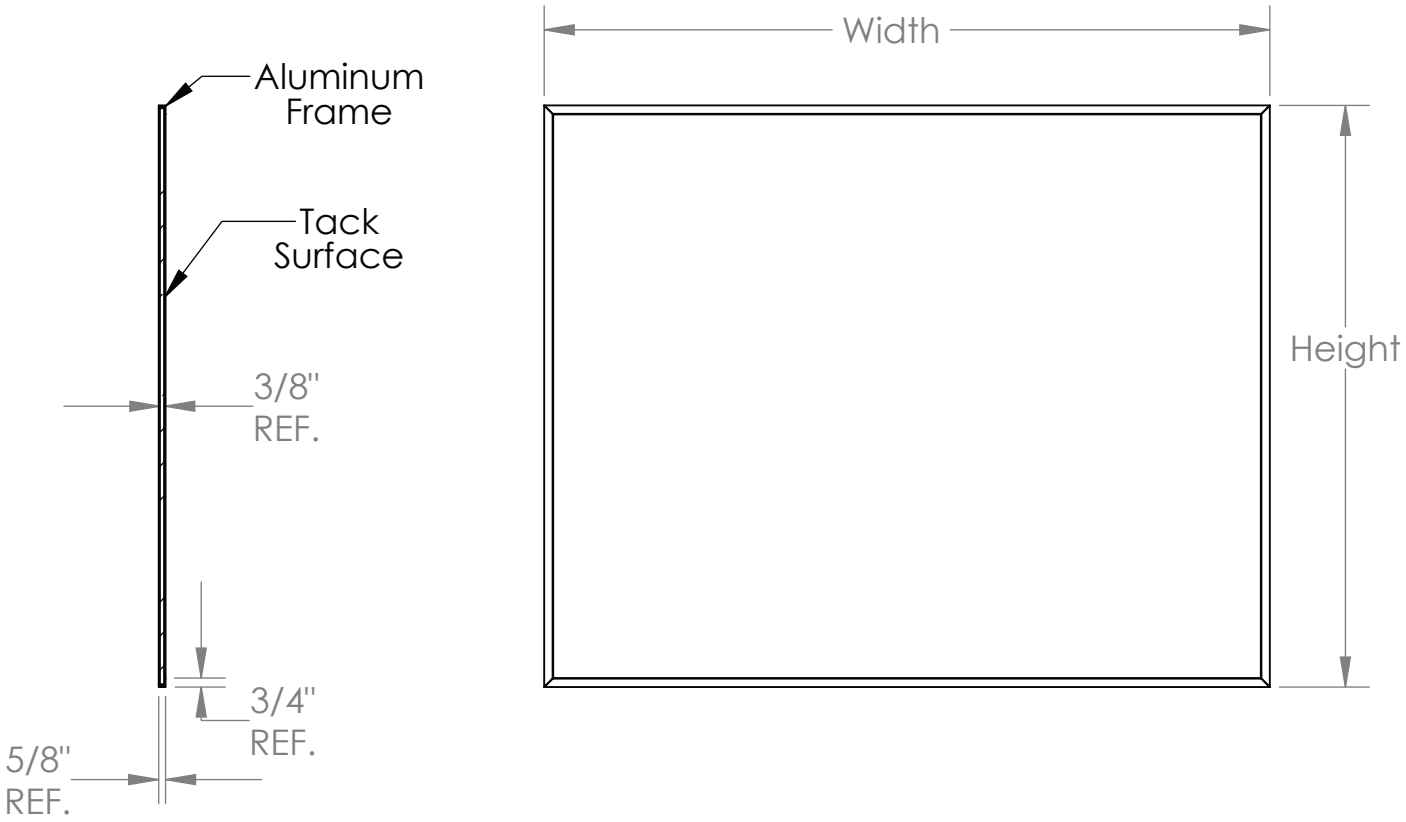
Product Details

- Self-healing fine-grain natural cork
- 1/32" thick, laminated to a sealed fiberboard back
- Stylish aluminum frame
- Cork Thickness: 1/32"
- Fiberboard Back Thickness: 3/8"
- Material: Self-healing , fine-grain natural cork
- Frame Material: Aluminum
- Dimensions: 4'-1/2" W x 10'-1/2" H
- Warranty: 10 years

- Made in the USA
- Assembly Required: No
- Shipping Method: Freight
- Weight: 40.00 lbs

AK Series

Aluminum Framed Cork Bulletin Boards



Materials:

- Framing: Satin anodized 6063-T5 aluminum extrusion.
- Tack surface: 1/32" fine grain natural cork laminated to 3/8" thick fiberboard, with a mylar film backing.

Features:

- Board hangers are included.
- Aluminum frame is permanently attached to the tack surface.
- Available in the following sizes:
  3'H x 5'W, 4'H x 4'W, 4'H x 5'W, 4'H x 6'W, 4'H x 8'W, 4'H x 10'W, 4'H x 12'W.
- Board is guaranteed for 10 years.

Notes:

- For indoor use only.

Product: **Salsbury 62000 Series 12" Wide Double Tier Standard Metal Lockers: 3'W x 12"D x 6'H, Gray, Unassembled (Or Approved Equal)**

Manufacturer: Salsbury Industries

Location: Hallways









Note:
Hallway Lockers will be fitted with front bases, number plates, and a compartment shelf.
Locks not included.

Product Details

- Constructed of 16 gauge steel
- Ideal for colleges, high schools, locker rooms, employee changing rooms, government agencies, gyms and many other applications
- Available as unassembled or assembled (additional charge for assembled)
- Feature a durable powder coated finish available in gray, tan or blue
- Available in heights of 5 feet and 6 feet (add 6" for legs)

- 5 foot high lockers have compartment sizes that are 12" wide, 30" high and 12", 15" or 18" deep
- 6 foot high lockers have compartment sizes that are 12" wide, 36" high and 12", 15" or 18" deep
- Available as 1 wide or 3 wide units
- Each locker compartment features 3 single wall hooks and a double ceiling hook
- Units include a lift up handle and recessed hasp for added security and can accommodate combination or key padlocks. Locks not included.
- Salsbury Industries is an ISO 9001:2015 certified company and has excelled in the field of manufacturing since 1936
- Weight: 145 lbs

Options

- Sloping hoods, end bases and front bases
- Corner, top and vertical fillers
- Finished end panels
- Engraved name/number plates
- Built-in combination or key locks
- Combination or key padlocks
- Lockers without legs

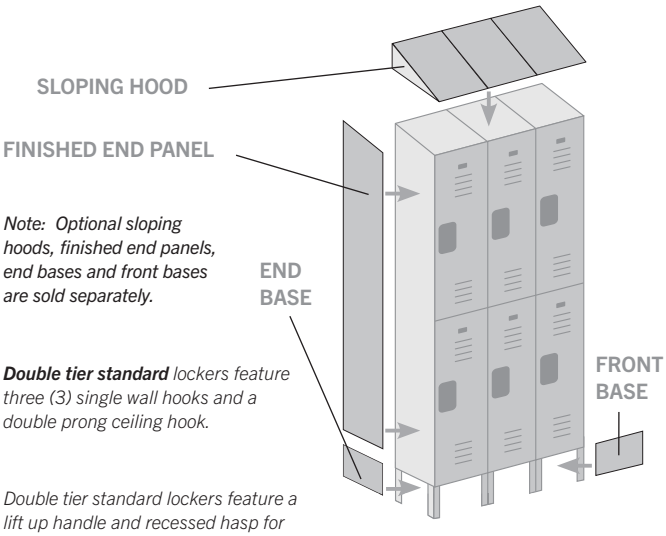
12" Wide Standard Lockers Double Tier

12" WIDE DOUBLE TIER STANDARD LOCKERS
5' HIGH AND 6' HIGH

Constructed of 16 gauge steel, Salsbury 62000 series 12" wide double tier standard lockers provide maximum privacy for individuals and are ideal wherever storage space is limited. Measuring five (5) feet and six (6) feet in height (add 6'' for legs) and depths of 12'', 15'' and 18'', these durable lockers are available in a gray, tan or blue powder coated finish and as unassembled or assembled units. One wide lockers are 12" wide and three (3) wide lockers are 36" wide regardless of height and depth. 12" wide double tier standard lockers feature three (3) single wall hooks and a double prong ceiling hook. Sloping hoods, finished end panels, end bases, front bases, compartment shelves, fillers and lockers without legs are available as options upon request - see all metal locker options and locks on pages 52-53.

Current Pricing and Volume Discounts Available at Lockers.com!

METAL LOCKER OPTIONS



Note: Optional sloping hoods, finished end panels, end bases and front bases are sold separately.

***Double tier standard** lockers feature three (3) single wall hooks and a double prong ceiling hook.*

Double tier standard lockers feature a lift up handle and recessed hasp for added security and can accommodate a built-in lock (#77710 for combination, #77715 for key and #77795 for a factory installed resettable combination lock) and padlock (#77720 for combination and #77725 for key).

Note: It is recommended that all lockers be wall and/or floor anchored.

See ALL metal locker options and locks on pages 52-53
See ALL benches on pages 96-101



#62365's with optional sloping hoods (#77755), front bases (#77742), built-in combination locks (#77710) and engraved name / number plates (#77760) displayed

5' HIGH LOCKERS

12" WIDE DOUBLE TIER - ONE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***ONE WIDE** - unit size: 12'' W x 60'' H (66'' H with legs)*				
62152[1,2]	12" W x 30" H x 12" D	50 lbs.	$295.00	$400.00
62155[1,2]	12" W x 30" H x 15" D	55 lbs.	$305.00	$410.00
62158[1,2]	12" W x 30" H x 18" D	60 lbs.	$315.00	$420.00

12" WIDE DOUBLE TIER - THREE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***THREE WIDE** - unit size: 36'' W x 60'' H (66'' H with legs)*				
62352[1,2]	12" W x 30" H x 12" D	125 lbs.	$810.00	$1,095.00
62355[1,2]	12" W x 30" H x 15" D	135 lbs.	$840.00	$1,135.00
62358[1,2]	12" W x 30" H x 18" D	145 lbs.	$870.00	$1,175.00



62155



62355

6' HIGH LOCKERS

12" WIDE DOUBLE TIER - ONE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***ONE WIDE** - unit size: 12'' W x 72'' H (78'' H with legs)*				
62162[1,2]	12" W x 36" H x 12" D	55 lbs.	$310.00	$420.00
62165[1,2]	12" W x 36" H x 15" D	60 lbs.	$325.00	$440.00
62168[1,2]	12" W x 36" H x 18" D	65 lbs.	$340.00	$460.00

12" WIDE DOUBLE TIER - THREE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***THREE WIDE** - unit size: 36'' W x 72'' H (78'' H with legs)*				
62362[1,2]	12" W x 36" H x 12" D	145 lbs.	$875.00	$1,180.00
62365[1,2]	12" W x 36" H x 15" D	155 lbs.	$895.00	$1,210.00
62368[1,2]	12" W x 36" H x 18" D	165 lbs.	$915.00	$1,240.00



62165



62365

[1] Specify gray, tan, blue

[2] Specify UNASSEMBLED, ASSEMBLED

Metal Locker Options & Locks

for lockers on pages 6-51





SLOPING HOODS

MODEL	DESCRIPTION	WEIGHT	PRICE
77752[1]	Sloping hood - for up to (3) 12'' wide lockers - 12'' deep	10 lbs.	$55.00
77755[1]	Sloping hood - for up to (3) 12'' wide lockers - 15'' deep	10 lbs.	$55.00
77758[1]	Sloping hood - for up to (3) 12'' wide lockers - 18'' deep	10 lbs.	$55.00
77765[1]	Sloping hood - for up to (3) 15'' wide lockers - 15'' deep	15 lbs.	$60.00
77768[1]	Sloping hood - for up to (3) 15'' wide lockers - 18'' deep	15 lbs.	$60.00
77798[1]	Sloping hood - for up to (3) 18'' wide lockers - 18'' deep	15 lbs.	$70.00
77791[1]	Sloping hood - for up to (3) 18'' wide lockers - 21'' deep	20 lbs.	$70.00
77759[1]	Sloping hood - for box style bridge lockers - 18'' deep	25 lbs.	$110.00

FINISHED END PANELS

MODEL	DESCRIPTION	WEIGHT	PRICE
77352[1]	Finished end panel - for 5 feet high - 12'' deep lockers	10 lbs.	$95.00
77355[1]	Finished end panel - for 5 feet high - 15'' deep lockers	15 lbs.	$100.00
77358[1]	Finished end panel - for 5 feet high - 18'' deep lockers	20 lbs.	$110.00
77362[1]	Finished end panel - for 6 feet high - 12'' deep lockers	15 lbs.	$100.00
77365[1]	Finished end panel - for 6 feet high - 15'' deep lockers	20 lbs.	$110.00
77368[1]	Finished end panel - for 6 feet high - 18'' deep lockers	25 lbs.	$120.00
77361[1]	Finished end panel - for 6 feet high - 21'' deep lockers	25 lbs.	$125.00

LOCKERS WITHOUT LEGS

MODEL	DESCRIPTION	WEIGHT	PRICE
77550	Lockers without legs - for one wide and three (3) wide lockers		$50.00
77552	Anchoring brackets (set of 2) - for 12'' deep lockers without legs	2 lbs.	$20.00
77555	Anchoring brackets (set of 2) - for 15'' deep lockers without legs	2 lbs.	$20.00
77558	Anchoring brackets (set of 2) - for 18'' deep lockers without legs	2 lbs.	$20.00
77551	Anchoring brackets (set of 2) - for 21'' deep lockers without legs	2 lbs.	$20.00
77572[1]	Zee base kit - 4" high, 6 foot length - for 12 inch deep lockers	15 lbs.	$90.00
77575[1]	Zee base kit - 4" high, 6 foot length - for 15 inch deep lockers	15 lbs.	$90.00
77578[1]	Zee base kit - 4" high, 6 foot length - for 18 inch deep lockers	15 lbs.	$90.00
77571[1]	Zee base kit - 4" high, 6 foot length - for 21 inch deep lockers	15 lbs.	$90.00

ADDITIONAL COMPARTMENT SHELVES

MODEL	DESCRIPTION	WEIGHT	PRICE
77692[1]	Compartment shelf - for 12'' wide lockers - 12'' deep	2 lbs.	$20.00
77695[1]	Compartment shelf - for 12'' wide lockers - 15'' deep	2 lbs.	$20.00
77698[1]	Compartment shelf - for 12'' wide lockers - 18'' deep	2 lbs.	$20.00
77605[1]	Compartment shelf - for 15'' wide lockers - 15'' deep	3 lbs.	$25.00
77608[1]	Compartment shelf - for 15'' wide lockers - 18'' deep	3 lbs.	$25.00
77618[1]	Compartment shelf - for 18'' wide lockers - 18'' deep	3 lbs.	$30.00
77611[1]	Compartment shelf - for 18'' wide lockers - 21'' deep	3 lbs.	$30.00

For ADA Compliance Guidelines Visit: www.lockers.com/ADA-Metal-Lockers

END BASES

MODEL	DESCRIPTION	WEIGHT	PRICE
77732[1]	End base - for 12'' deep lockers - 10'' W x 6'' H	1 lb.	$15.00
77735[1]	End base - for 15'' deep lockers - 13'' W x 6'' H	1 lb.	$15.00
77738[1]	End base - for 18'' deep lockers - 16'' W x 6'' H	1 lb.	$15.00
77731[1]	End base - for 21'' deep lockers - 19'' W x 6'' H	1 lb.	$15.00

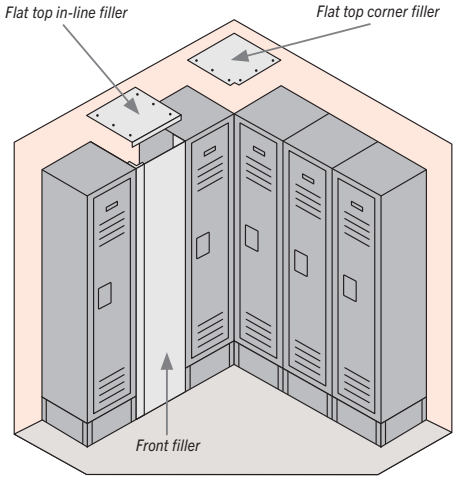
FRONT BASES

MODEL	DESCRIPTION	WEIGHT	PRICE
77742[1]	Front base - for 12'' wide lockers - 10'' W x 6'' H	1 lb.	$15.00
77745[1]	Front base - for 15'' wide lockers - 13'' W x 6'' H	1 lb.	$15.00
77748[1]	Front base - for 18'' wide lockers - 16'' W x 6'' H	1 lb.	$15.00

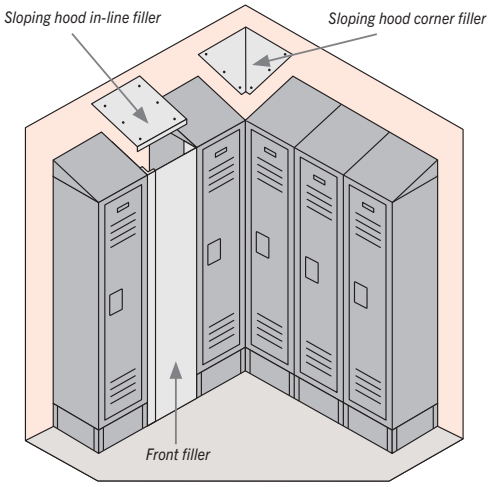
[1] Specify gray, tan, blue

LOCKER FILLERS

Salsbury locker fillers are an ideal option for locker installations that encounter obstructions such as pipes, columns and other obstacles. Corner and in-line top fillers overlap the existing locker tops and are easily attached with hardware (included) providing a finished look to the locker installation. Vertical front fillers include a wall angle slip joint that conceals uneven edges and provides a professional appearance to the locker installation. Locker fillers can be easily field cut for custom installations.



Locker installation with flat tops



Locker installation with sloping hoods

TOP FILLERS - CORNER

MODEL	DESCRIPTION	WEIGHT	PRICE
77832[1]	Flat top filler - corner - for 12'' deep lockers	2 lbs.	$40.00
77835[1]	Flat top filler - corner - for 15'' deep lockers	2 lbs.	$40.00
77838[1]	Flat top filler - corner - for 18'' deep lockers	2 lbs.	$50.00
77831[1]	Flat top filler - corner - for 21'' deep lockers	2 lbs.	$50.00
77872[1]	Sloping hood filler - corner - for 12'' deep lockers	3 lbs.	$40.00
77875[1]	Sloping hood filler - corner - for 15'' deep lockers	3 lbs.	$40.00
77878[1]	Sloping hood filler - corner - for 18'' deep lockers	3 lbs.	$50.00
77871[1]	Sloping hood filler - corner - for 21'' deep lockers	3 lbs.	$50.00

TOP FILLERS - IN-LINE

MODEL	DESCRIPTION	WEIGHT	PRICE
77842[1]	Flat top filler - in-line - 15'' wide - for 12'' deep lockers	2 lbs.	$30.00
77845[1]	Flat top filler - in-line - 15'' wide - for 15'' deep lockers	2 lbs.	$30.00
77848[1]	Flat top filler - in-line - 15'' wide - for 18'' deep lockers	2 lbs.	$40.00
77841[1]	Flat top filler - in-line - 15'' wide - for 21'' deep lockers	2 lbs.	$40.00
77882[1]	Sloping hood filler - in-line - 15'' wide - for 12'' deep lockers	3 lbs.	$30.00
77885[1]	Sloping hood filler - in-line - 15'' wide - for 15'' deep lockers	3 lbs.	$30.00
77888[1]	Sloping hood filler - in-line - 15'' wide - for 18'' deep lockers	3 lbs.	$40.00
77881[1]	Sloping hood filler - in-line - 15'' wide - for 21'' deep lockers	3 lbs.	$40.00

FRONT FILLERS - VERTICAL

MODEL	DESCRIPTION	WEIGHT	PRICE
77859[1]	Front filler - vertical - 9'' wide - for (5) feet high lockers	15 lbs.	$85.00
77855[1]	Front filler - vertical - 15'' wide - for (5) feet high lockers	20 lbs.	$95.00
77869[1]	Front filler - vertical - 9'' wide - for (6) feet high lockers	20 lbs.	$95.00
77865[1]	Front filler - vertical - 15'' wide - for (6) feet high lockers	25 lbs.	$100.00

[1] Specify gray, tan, blue

METAL LOCKER LOCKS AND NAME / NUMBER PLATES

MODEL	DESCRIPTION	PRICE
77710	Built-in lock - combination style	$30.00
77711	Master control key - for built-in combination lock #77710	$10.00
77715	Built-in lock - key style with (2) keys	$30.00
77715-ADA	ADA compliant lock - key style with (2) keys and (2) ADA key heads	$40.00
77716	Master control key - for built-in key lock #77715	$10.00
77799	Key blanks - for #77715 built-in locks - box of (50)	$60.00
77720	Padlock - combination style	$10.00
77721	Master control key - for combination padlock #77720	$10.00
77725	Padlock - key style with (2) keys	$10.00
77729	Key blanks - for #77725 key padlocks - box of (50)	$60.00
77790	Electronic lock - factory installed - for four tier & box lockers (specify: silver or black finish)	$75.00
77795	Resettable combination lock - factory installed (specify: silver or black finish)	$30.00
77796	Master control key - for resettable combination lock #77795	$10.00
77760	Name / number plate - 2-1/4'' W x 1-3/8'' H - engraved	$3.00


#77715


#77710


Sample recessed hasp with built-in combination lock (#77710) displayed


#77725


#77720


Sample recessed hasp with combination padlock (#77720) displayed


For single or multi-use applications.
#77790


#77795


Sample recessed hasp with factory installed resettable combination lock (#77795) in black finish displayed

Note: Built-in locks are pre-installed on assembled lockers.

Product: **Salsbury Salsbury 72000 Series 12" Wide Double Tier Vented Metal Lockers; 3'W x 12"D x 6'H; Gray; Without Legs; Unassembled (Or Approved Equal**

Manufacturer: Salsbury Industries

Location: Locker Rooms









Note:
Gymnasium Lockers will be without legs, fitted with sloping hoods, number plates, and a compartment shelf. Locks not included.

Product Details

- Constructed of 16 gauge steel
- Ideal for health clubs, locker rooms, employee changing rooms, gyms and many other applications where visibility and maximum airflow is needed
- Available as unassembled or assembled (additional charge for assembled)
- Feature a durable powder coated finish available in gray, tan or blue
- Available in 5 feet high and 6 feet height (add 6" for legs)
- 5 foot high lockers have a compartment size that is 12” wide, 30” high and 12”, 15” or 18” deep
- 6 foot high lockers have a compartment size that is 12" wide, 36" high and 12", 15" or 18" deep
- Available as 1 wide or 3 wide units
- Each locker compartment features 3 single wall hooks and a double ceiling hook
- Units include a lift up handle and recessed hasp for added security and can accommodate combination or key padlocks. Locks not included.
- Salsbury Industries is an ISO 9001: 2015 certified company and has excelled in the field of manufacturing since 1936
- Weight: 140 lbs

Options

- Sloping hoods, end bases and front bases
- Corner, top and vertical fillers
- Engraved name/number plates
- Built-in combination or key locks
- Combination or key padlocks
- Factory installed resettable combination lock
- Lockers without legs

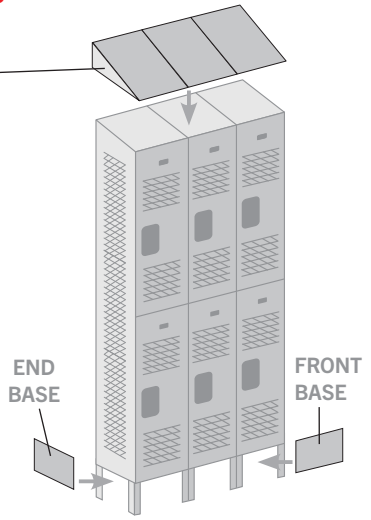
12" Wide Vented Lockers Double Tier

12" WIDE DOUBLE TIER VENTED LOCKERS
5' HIGH AND 6' HIGH

Constructed of 16 gauge steel, Salsbury 72000 series 12" wide double tier vented lockers effectively combine visibility and maximum air flow with security. Vented lockers are ideal for dressing rooms, locker rooms and athletic clubs. Measuring five (5) feet and six (6) feet in height (add 6" for legs) and depths of 12", 15" and 18", these durable lockers are available in a gray, tan or blue powder coated finish and as unassembled or assembled units. One wide lockers are 12" wide and three (3) wide lockers are 36" wide regardless of height and depth. 12" wide double tier vented lockers include three (3) single wall hooks and a double prong ceiling hook. Sloping hoods, end bases, front bases, compartment shelves, fillers and lockers without legs are available as options upon request - see all metal locker options and locks on pages 52-53.

Current Pricing and Volume Discounts Available at Lockers.com!

METAL LOCKER OPTIONS



Note: Optional sloping hoods, end bases and front bases are sold separately.

***Double tier vented** lockers feature three (3) single wall hooks and a double prong ceiling hook.*

Double tier vented lockers feature a lift up handle and recessed hasp for added security and can accommodate a built-in lock (#77710 for combination, #77715 for key and #77795 for a factory installed resettable combination lock) and padlock (#77720 for combination and #77725 for key).

Note: It is recommended that all lockers be wall and/or floor anchored.

See ALL metal locker options and locks on pages 52-53
See ALL benches on pages 96-101



#72368's with optional sloping hoods (#77758), front bases (#77742), built-in resettable combination locks (#77795), engraved name / number plates (#77760) and aluminum locker benches (#77777) displayed

5' HIGH LOCKERS

12" WIDE DOUBLE TIER VENTED - ONE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***ONE WIDE** - unit size: 12'' W x 60'' H (66'' H with legs)*				
72152[1,2]	12" W x 30" H x 12" D	45 lbs.	$205.00	$275.00
72155[1,2]	12" W x 30" H x 15" D	50 lbs.	$215.00	$290.00
72158[1,2]	12" W x 30" H x 18" D	55 lbs.	$225.00	$305.00

12" WIDE DOUBLE TIER VENTED - THREE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***THREE WIDE** - unit size: 36'' W x 60'' H (66'' H with legs)*				
72352[1,2]	12" W x 30" H x 12" D	110 lbs.	$560.00	$755.00
72355[1,2]	12" W x 30" H x 15" D	120 lbs.	$595.00	$805.00
72358[1,2]	12" W x 30" H x 18" D	130 lbs.	$630.00	$855.00



72155 72355

6' HIGH LOCKERS

12" WIDE DOUBLE TIER VENTED - ONE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***ONE WIDE** - unit size: 12'' W x 72'' H (78'' H with legs)*				
72162[1,2]	12" W x 36" H x 12" D	50 lbs.	$365.00	$495.00
72165[1,2]	12" W x 36" H x 15" D	55 lbs.	$385.00	$520.00
72168[1,2]	12" W x 36" H x 18" D	60 lbs.	$405.00	$545.00

12" WIDE DOUBLE TIER VENTED - THREE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***THREE WIDE** - unit size: 36'' W x 72'' H (78'' H with legs)*				
72362[1,2]	12" W x 36" H x 12" D	140 lbs.	$1,010.00	$1,365.00
72365[1,2]	12" W x 36" H x 15" D	150 lbs.	$1,070.00	$1,445.00
72368[1,2]	12" W x 36" H x 18" D	160 lbs.	$1,130.00	$1,525.00



72165 72365

[1] Specify gray tan blue

[2] Specify UNASSEMBLED ASSEMBLED

Metal Locker Options & Locks

for lockers on pages 6-51





SLOPING HOODS

MODEL	DESCRIPTION	WEIGHT	PRICE
77752[1]	Sloping hood - for up to (3) 12'' wide lockers - 12'' deep	10 lbs.	$55.00
77755[1]	Sloping hood - for up to (3) 12'' wide lockers - 15'' deep	10 lbs.	$55.00
77758[1]	Sloping hood - for up to (3) 12'' wide lockers - 18'' deep	10 lbs.	$55.00
77765[1]	Sloping hood - for up to (3) 15'' wide lockers - 15'' deep	15 lbs.	$60.00
77768[1]	Sloping hood - for up to (3) 15'' wide lockers - 18'' deep	15 lbs.	$60.00
77798[1]	Sloping hood - for up to (3) 18'' wide lockers - 18'' deep	15 lbs.	$70.00
77791[1]	Sloping hood - for up to (3) 18'' wide lockers - 21'' deep	20 lbs.	$70.00
77759[1]	Sloping hood - for box style bridge lockers - 18'' deep	25 lbs.	$110.00

FINISHED END PANELS

MODEL	DESCRIPTION	WEIGHT	PRICE
77352[1]	Finished end panel - for 5 feet high - 12'' deep lockers	10 lbs.	$95.00
77355[1]	Finished end panel - for 5 feet high - 15'' deep lockers	15 lbs.	$100.00
77358[1]	Finished end panel - for 5 feet high - 18'' deep lockers	20 lbs.	$110.00
77362[1]	Finished end panel - for 6 feet high - 12'' deep lockers	15 lbs.	$100.00
77365[1]	Finished end panel - for 6 feet high - 15'' deep lockers	20 lbs.	$110.00
77368[1]	Finished end panel - for 6 feet high - 18'' deep lockers	25 lbs.	$120.00
77361[1]	Finished end panel - for 6 feet high - 21'' deep lockers	25 lbs.	$125.00

LOCKERS WITHOUT LEGS

MODEL	DESCRIPTION	WEIGHT	PRICE
77550	Lockers without legs - for one wide and three (3) wide lockers		$50.00
77552	Anchoring brackets (set of 2) - for 12'' deep lockers without legs	2 lbs.	$20.00
77555	Anchoring brackets (set of 2) - for 15'' deep lockers without legs	2 lbs.	$20.00
77558	Anchoring brackets (set of 2) - for 18'' deep lockers without legs	2 lbs.	$20.00
77551	Anchoring brackets (set of 2) - for 21'' deep lockers without legs	2 lbs.	$20.00
77572[1]	Zee base kit - 4" high, 6 foot length - for 12 inch deep lockers	15 lbs.	$90.00
77575[1]	Zee base kit - 4" high, 6 foot length - for 15 inch deep lockers	15 lbs.	$90.00
77578[1]	Zee base kit - 4" high, 6 foot length - for 18 inch deep lockers	15 lbs.	$90.00
77571[1]	Zee base kit - 4" high, 6 foot length - for 21 inch deep lockers	15 lbs.	$90.00

ADDITIONAL COMPARTMENT SHELVES

MODEL	DESCRIPTION	WEIGHT	PRICE
77692[1]	Compartment shelf - for 12'' wide lockers - 12'' deep	2 lbs.	$20.00
77695[1]	Compartment shelf - for 12'' wide lockers - 15'' deep	2 lbs.	$20.00
77698[1]	Compartment shelf - for 12'' wide lockers - 18'' deep	2 lbs.	$20.00
77605[1]	Compartment shelf - for 15'' wide lockers - 15'' deep	3 lbs.	$25.00
77608[1]	Compartment shelf - for 15'' wide lockers - 18'' deep	3 lbs.	$25.00
77618[1]	Compartment shelf - for 18'' wide lockers - 18'' deep	3 lbs.	$30.00
77611[1]	Compartment shelf - for 18'' wide lockers - 21'' deep	3 lbs.	$30.00

For ADA Compliance Guidelines Visit: www.lockers.com/ADA-Metal-Lockers

END BASES

MODEL	DESCRIPTION	WEIGHT	PRICE
77732[1]	End base - for 12'' deep lockers - 10'' W x 6'' H	1 lb.	$15.00
77735[1]	End base - for 15'' deep lockers - 13'' W x 6'' H	1 lb.	$15.00
77738[1]	End base - for 18'' deep lockers - 16'' W x 6'' H	1 lb.	$15.00
77731[1]	End base - for 21'' deep lockers - 19'' W x 6'' H	1 lb.	$15.00

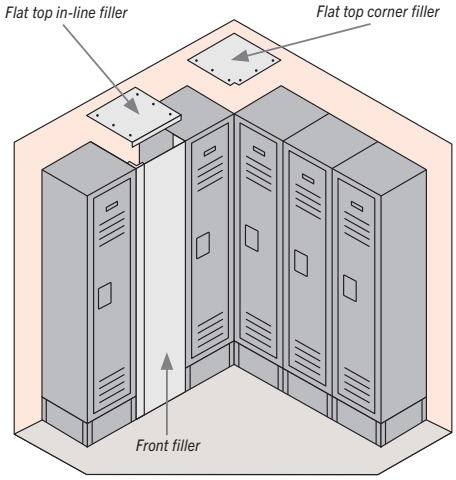
FRONT BASES

MODEL	DESCRIPTION	WEIGHT	PRICE
77742[1]	Front base - for 12'' wide lockers - 10'' W x 6'' H	1 lb.	$15.00
77745[1]	Front base - for 15'' wide lockers - 13'' W x 6'' H	1 lb.	$15.00
77748[1]	Front base - for 18'' wide lockers - 16'' W x 6'' H	1 lb.	$15.00

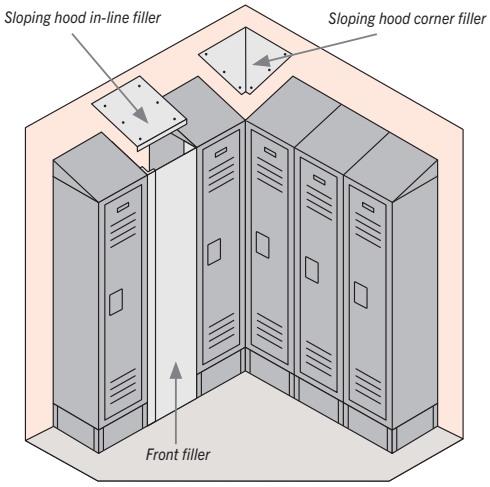
[1] Specify gray, tan, blue

LOCKER FILLERS

Salsbury locker fillers are an ideal option for locker installations that encounter obstructions such as pipes, columns and other obstacles. Corner and in-line top fillers overlap the existing locker tops and are easily attached with hardware (included) providing a finished look to the locker installation. Vertical front fillers include a wall angle slip joint that conceals uneven edges and provides a professional appearance to the locker installation. Locker fillers can be easily field cut for custom installations.



Locker installation with flat tops



Locker installation with sloping hoods

TOP FILLERS - CORNER

MODEL	DESCRIPTION	WEIGHT	PRICE
77832[1]	Flat top filler - corner - for 12'' deep lockers	2 lbs.	$40.00
77835[1]	Flat top filler - corner - for 15'' deep lockers	2 lbs.	$40.00
77838[1]	Flat top filler - corner - for 18'' deep lockers	2 lbs.	$50.00
77831[1]	Flat top filler - corner - for 21'' deep lockers	2 lbs.	$50.00
77872[1]	Sloping hood filler - corner - for 12'' deep lockers	3 lbs.	$40.00
77875[1]	Sloping hood filler - corner - for 15'' deep lockers	3 lbs.	$40.00
77878[1]	Sloping hood filler - corner - for 18'' deep lockers	3 lbs.	$50.00
77871[1]	Sloping hood filler - corner - for 21'' deep lockers	3 lbs.	$50.00

TOP FILLERS - IN-LINE

MODEL	DESCRIPTION	WEIGHT	PRICE
77842[1]	Flat top filler - in-line - 15'' wide - for 12'' deep lockers	2 lbs.	$30.00
77845[1]	Flat top filler - in-line - 15'' wide - for 15'' deep lockers	2 lbs.	$30.00
77848[1]	Flat top filler - in-line - 15'' wide - for 18'' deep lockers	2 lbs.	$40.00
77841[1]	Flat top filler - in-line - 15'' wide - for 21'' deep lockers	2 lbs.	$40.00
77882[1]	Sloping hood filler - in-line - 15'' wide - for 12'' deep lockers	3 lbs.	$30.00
77885[1]	Sloping hood filler - in-line - 15'' wide - for 15'' deep lockers	3 lbs.	$30.00
77888[1]	Sloping hood filler - in-line - 15'' wide - for 18'' deep lockers	3 lbs.	$40.00
77881[1]	Sloping hood filler - in-line - 15'' wide - for 21'' deep lockers	3 lbs.	$40.00

FRONT FILLERS - VERTICAL

MODEL	DESCRIPTION	WEIGHT	PRICE
77859[1]	Front filler - vertical - 9'' wide - for (5) feet high lockers	15 lbs.	$85.00
77855[1]	Front filler - vertical - 15'' wide - for (5) feet high lockers	20 lbs.	$95.00
77869[1]	Front filler - vertical - 9'' wide - for (6) feet high lockers	20 lbs.	$95.00
77865[1]	Front filler - vertical - 15'' wide - for (6) feet high lockers	25 lbs.	$100.00

[1] Specify gray, tan, blue

METAL LOCKER LOCKS AND NAME / NUMBER PLATES

MODEL	DESCRIPTION	PRICE
77710	Built-in lock - combination style	$30.00
77711	Master control key - for built-in combination lock #77710	$10.00
77715	Built-in lock - key style with (2) keys	$30.00
77715-ADA	ADA compliant lock - key style with (2) keys and (2) ADA key heads	$40.00
77716	Master control key - for built-in key lock #77715	$10.00
77799	Key blanks - for #77715 built-in locks - box of (50)	$60.00
77720	Padlock - combination style	$10.00
77721	Master control key - for combination padlock #77720	$10.00
77725	Padlock - key style with (2) keys	$10.00
77729	Key blanks - for #77725 key padlocks - box of (50)	$60.00
77790	Electronic lock - factory installed - for four tier & box lockers (specify: silver or black finish)	$75.00
77795	Resettable combination lock - factory installed (specify: silver or black finish)	$30.00
77796	Master control key - for resettable combination lock #77795	$10.00
77760	Name / number plate - 2-1/4'' W x 1-3/8'' H - engraved	$3.00


#77715


#77710


Sample recessed hasp with built-in combination lock (#77710) displayed


#77725


#77720


Sample recessed hasp with combination padlock (#77720) displayed


For single or multi-use applications.
#77790


#77795


Sample recessed hasp with factory installed resettable combination lock (#77795) in black finish displayed

Note: Built-in locks are pre-installed on assembled lockers.

Product: **Salsbury 52000 Series 15" Wide Double Tier Standard Metal Lockers: 45”W x 18"D x 6'H, Gray, Unassembled (Or Approved Equal)**

Manufacturer: Salsbury Industries

Location: Staff / Faculty Lounge and Kitchen Staff Lounge









Note:
Lounge Lockers will be fitted with front bases, finished end bases, number plates, and a compartment shelf.
Locks not included.

Product Details

- Constructed of 16 gauge steel
- Ideal for colleges, high schools, locker rooms, employee changing rooms, government agencies, gyms and many other applications
- 25% wider than 12” wide standard lockers
- Available as unassembled or assembled (additional charge for assembled)

- Feature a durable powder coated finish available in gray, tan or blue
- Available in heights of 5 feet and 6 feet (add 6" for legs)
- Available in 6 foot height (add 6” for legs)
- Units have compartment sizes that are 15" wide, 36" high and 18" deep
- Available as 1 wide or 3 wide units
- Each locker compartment features 3 single wall hooks and a double ceiling hook
- Units include a lift up handle and recessed hasp for added security and can accommodate combination or key padlocks. Locks not included.
- Salsbury Industries is an ISO 9001:2015 certified company and has excelled in the field of manufacturing since 1936
- Weight: 185 lbs

Options

- Sloping hoods, end bases and front bases
- Corner, top and vertical fillers
- Finished end panels
- Engraved name/number plates
- Built-in combination or key locks
- Combination or key padlocks
- Lockers without legs

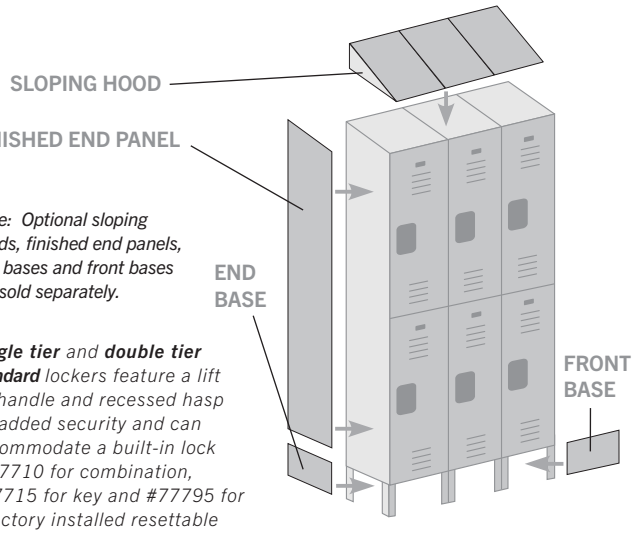
15" Wide Standard Lockers Single Tier & Double Tier

15" WIDE STANDARD LOCKERS
SINGLE TIER AND DOUBLE TIER

Constructed of 16 gauge steel, Salsbury 51000 and 52000 series 15" wide standard lockers offer ample space for personal storage needs. 15" wide single tier and double tier standard lockers are available in a gray, tan or blue powder coated finish and as unassembled or assembled units. One wide lockers are 15" wide and three (3) wide lockers are 45" wide. These spacious lockers are six (6) feet high (add 6'' for legs) and are available in 15" and 18" depths. 15" wide standard single tier lockers include an adjustable hat shelf, a double prong ceiling hook and three (3) wall hooks. The 18'' deep standard single tier lockers include a coat rod that can accommodate full length garments. 15" wide double tier standard lockers include a double prong ceiling hook and three (3) wall hooks. Sloping hoods, finished end panels, end bases, front bases, compartment shelves, fillers and lockers without legs are available as options upon request – see all metal locker options and locks on pages 52-53.

Current Pricing and Volume Discounts Available at Lockers.com!

METAL LOCKER OPTIONS



(Double Tier Displayed)

Note: Optional sloping hoods, finished end panels, end bases and front bases are sold separately.

***Single tier** and **double tier standard** lockers feature a lift up handle and recessed hasp for added security and can accommodate a built-in lock (#77710 for combination, #77715 for key and #77795 for a factory installed resettable combination lock) and padlock (#77720 for combination and #77725 for key).*

Note: It is recommended that all lockers be wall and/or floor anchored.

See ALL metal locker options and locks on pages 52-53
See ALL benches on pages 96-101



#51365's with optional sloping hoods (#77765), front bases (#77745), built-in combination locks (#77710), engraved name / number plates (#77760) and aluminum locker benches (#77778) displayed

SINGLE TIER LOCKERS

15" WIDE SINGLE TIER - ONE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***ONE WIDE** - unit size: 15'' W x 72'' H (78'' H with legs)*				
51165[1,2]	15" W x 72" H x 15" D	60 lbs.	$330.00	$445.00
51168[1,2]	15" W x 72" H x 18" D	65 lbs.	$340.00	$460.00

15" WIDE SINGLE TIER - THREE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***THREE WIDE** - unit size: 45'' W x 72'' H (78'' H with legs)*				
51365[1,2]	15" W x 72" H x 15" D	170 lbs.	$890.00	$1,200.00
51368[1,2]	15" W x 72" H x 18" D	180 lbs.	$950.00	$1,285.00



51165



51365

DOUBLE TIER LOCKERS

15" WIDE DOUBLE TIER - ONE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***ONE WIDE** - unit size: 15'' W x 72'' H (78'' H with legs)*				
52165[1,2]	15" W x 36" H x 15" D	65 lbs.	$365.00	$495.00
52168[1,2]	15" W x 36" H x 18" D	70 lbs.	$385.00	$520.00

15" WIDE DOUBLE TIER - THREE WIDE

MODEL	COMPARTMENT SIZE	WEIGHT	PRICE unassembled	PRICE assembled
***THREE WIDE** - unit size: 45'' W x 72'' H (78'' H with legs)*				
52365[1,2]	15" W x 36" H x 15" D	175 lbs.	$1,010.00	$1,365.00
52368[1,2]	15" W x 36" H x 18" D	185 lbs.	$1,070.00	$1,445.00



52165



52365

[1] Specify gray, tan, blue

[2] Specify UNASSEMBLED, ASSEMBLED

Metal Locker Options & Locks

for lockers on pages 6-51





SLOPING HOODS

MODEL	DESCRIPTION	WEIGHT	PRICE
77752[1]	Sloping hood - for up to (3) 12'' wide lockers - 12'' deep	10 lbs.	$55.00
77755[1]	Sloping hood - for up to (3) 12'' wide lockers - 15'' deep	10 lbs.	$55.00
77758[1]	Sloping hood - for up to (3) 12'' wide lockers - 18'' deep	10 lbs.	$55.00
77765[1]	Sloping hood - for up to (3) 15'' wide lockers - 15'' deep	15 lbs.	$60.00
77768[1]	Sloping hood - for up to (3) 15'' wide lockers - 18'' deep	15 lbs.	$60.00
77798[1]	Sloping hood - for up to (3) 18'' wide lockers - 18'' deep	15 lbs.	$70.00
77791[1]	Sloping hood - for up to (3) 18'' wide lockers - 21'' deep	20 lbs.	$70.00
77759[1]	Sloping hood - for box style bridge lockers - 18'' deep	25 lbs.	$110.00

FINISHED END PANELS

MODEL	DESCRIPTION	WEIGHT	PRICE
77352[1]	Finished end panel - for 5 feet high - 12'' deep lockers	10 lbs.	$95.00
77355[1]	Finished end panel - for 5 feet high - 15'' deep lockers	15 lbs.	$100.00
77358[1]	Finished end panel - for 5 feet high - 18'' deep lockers	20 lbs.	$110.00
77362[1]	Finished end panel - for 6 feet high - 12'' deep lockers	15 lbs.	$100.00
77365[1]	Finished end panel - for 6 feet high - 15'' deep lockers	20 lbs.	$110.00
77368[1]	Finished end panel - for 6 feet high - 18'' deep lockers	25 lbs.	$120.00
77361[1]	Finished end panel - for 6 feet high - 21'' deep lockers	25 lbs.	$125.00

LOCKERS WITHOUT LEGS

MODEL	DESCRIPTION	WEIGHT	PRICE
77550	Lockers without legs - for one wide and three (3) wide lockers		$50.00
77552	Anchoring brackets (set of 2) - for 12'' deep lockers without legs	2 lbs.	$20.00
77555	Anchoring brackets (set of 2) - for 15'' deep lockers without legs	2 lbs.	$20.00
77558	Anchoring brackets (set of 2) - for 18'' deep lockers without legs	2 lbs.	$20.00
77551	Anchoring brackets (set of 2) - for 21'' deep lockers without legs	2 lbs.	$20.00
77572[1]	Zee base kit - 4" high, 6 foot length - for 12 inch deep lockers	15 lbs.	$90.00
77575[1]	Zee base kit - 4" high, 6 foot length - for 15 inch deep lockers	15 lbs.	$90.00
77578[1]	Zee base kit - 4" high, 6 foot length - for 18 inch deep lockers	15 lbs.	$90.00
77571[1]	Zee base kit - 4" high, 6 foot length - for 21 inch deep lockers	15 lbs.	$90.00

ADDITIONAL COMPARTMENT SHELVES

MODEL	DESCRIPTION	WEIGHT	PRICE
77692[1]	Compartment shelf - for 12'' wide lockers - 12'' deep	2 lbs.	$20.00
77695[1]	Compartment shelf - for 12'' wide lockers - 15'' deep	2 lbs.	$20.00
77698[1]	Compartment shelf - for 12'' wide lockers - 18'' deep	2 lbs.	$20.00
77605[1]	Compartment shelf - for 15'' wide lockers - 15'' deep	3 lbs.	$25.00
77608[1]	Compartment shelf - for 15'' wide lockers - 18'' deep	3 lbs.	$25.00
77618[1]	Compartment shelf - for 18'' wide lockers - 18'' deep	3 lbs.	$30.00
77611[1]	Compartment shelf - for 18'' wide lockers - 21'' deep	3 lbs.	$30.00

For ADA Compliance Guidelines Visit: www.lockers.com/ADA-Metal-Lockers

END BASES

MODEL	DESCRIPTION	WEIGHT	PRICE
77732[1]	End base - for 12'' deep lockers - 10'' W x 6'' H	1 lb.	$15.00
77735[1]	End base - for 15'' deep lockers - 13'' W x 6'' H	1 lb.	$15.00
77738[1]	End base - for 18'' deep lockers - 16'' W x 6'' H	1 lb.	$15.00
77731[1]	End base - for 21'' deep lockers - 19'' W x 6'' H	1 lb.	$15.00

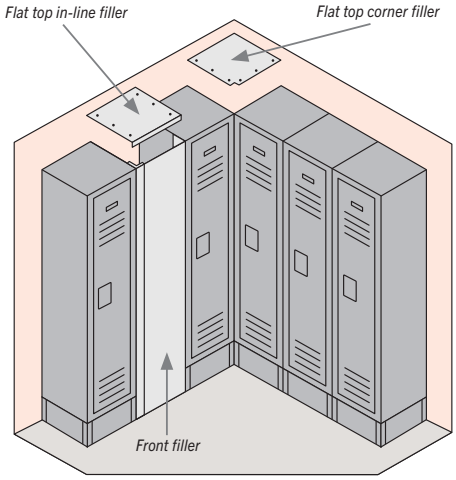
FRONT BASES

MODEL	DESCRIPTION	WEIGHT	PRICE
77742[1]	Front base - for 12'' wide lockers - 10'' W x 6'' H	1 lb.	$15.00
77745[1]	Front base - for 15'' wide lockers - 13'' W x 6'' H	1 lb.	$15.00
77748[1]	Front base - for 18'' wide lockers - 16'' W x 6'' H	1 lb.	$15.00

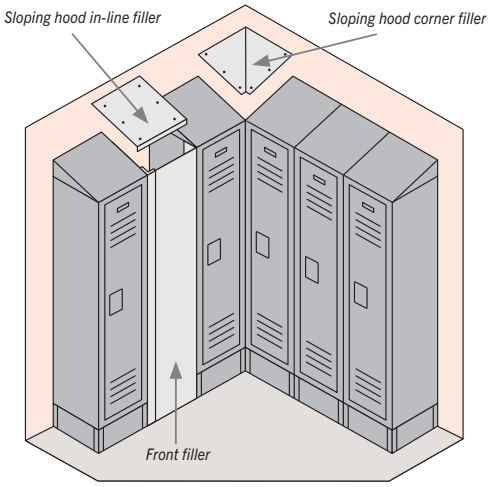
[1] Specify gray, tan, blue

LOCKER FILLERS

Salsbury locker fillers are an ideal option for locker installations that encounter obstructions such as pipes, columns and other obstacles. Corner and in-line top fillers overlap the existing locker tops and are easily attached with hardware (included) providing a finished look to the locker installation. Vertical front fillers include a wall angle slip joint that conceals uneven edges and provides a professional appearance to the locker installation. Locker fillers can be easily field cut for custom installations.



Locker installation with flat tops



Locker installation with sloping hoods

TOP FILLERS - CORNER

MODEL	DESCRIPTION	WEIGHT	PRICE
77832[1]	Flat top filler - corner - for 12'' deep lockers	2 lbs.	$40.00
77835[1]	Flat top filler - corner - for 15'' deep lockers	2 lbs.	$40.00
77838[1]	Flat top filler - corner - for 18'' deep lockers	2 lbs.	$50.00
77831[1]	Flat top filler - corner - for 21'' deep lockers	2 lbs.	$50.00
77872[1]	Sloping hood filler - corner - for 12'' deep lockers	3 lbs.	$40.00
77875[1]	Sloping hood filler - corner - for 15'' deep lockers	3 lbs.	$40.00
77878[1]	Sloping hood filler - corner - for 18'' deep lockers	3 lbs.	$50.00
77871[1]	Sloping hood filler - corner - for 21'' deep lockers	3 lbs.	$50.00

TOP FILLERS - IN-LINE

MODEL	DESCRIPTION	WEIGHT	PRICE
77842[1]	Flat top filler - in-line - 15'' wide - for 12'' deep lockers	2 lbs.	$30.00
77845[1]	Flat top filler - in-line - 15'' wide - for 15'' deep lockers	2 lbs.	$30.00
77848[1]	Flat top filler - in-line - 15'' wide - for 18'' deep lockers	2 lbs.	$40.00
77841[1]	Flat top filler - in-line - 15'' wide - for 21'' deep lockers	2 lbs.	$40.00
77882[1]	Sloping hood filler - in-line - 15'' wide - for 12'' deep lockers	3 lbs.	$30.00
77885[1]	Sloping hood filler - in-line - 15'' wide - for 15'' deep lockers	3 lbs.	$30.00
77888[1]	Sloping hood filler - in-line - 15'' wide - for 18'' deep lockers	3 lbs.	$40.00
77881[1]	Sloping hood filler - in-line - 15'' wide - for 21'' deep lockers	3 lbs.	$40.00

FRONT FILLERS - VERTICAL

MODEL	DESCRIPTION	WEIGHT	PRICE
77859[1]	Front filler - vertical - 9'' wide - for (5) feet high lockers	15 lbs.	$85.00
77855[1]	Front filler - vertical - 15'' wide - for (5) feet high lockers	20 lbs.	$95.00
77869[1]	Front filler - vertical - 9'' wide - for (6) feet high lockers	20 lbs.	$95.00
77865[1]	Front filler - vertical - 15'' wide - for (6) feet high lockers	25 lbs.	$100.00

[1] Specify gray, tan, blue

METAL LOCKER LOCKS AND NAME / NUMBER PLATES

MODEL	DESCRIPTION	PRICE
77710	Built-in lock - combination style	$30.00
77711	Master control key - for built-in combination lock #77710	$10.00
77715	Built-in lock - key style with (2) keys	$30.00
77715-ADA	ADA compliant lock - key style with (2) keys and (2) ADA key heads	$40.00
77716	Master control key - for built-in key lock #77715	$10.00
77799	Key blanks - for #77715 built-in locks - box of (50)	$60.00
77720	Padlock - combination style	$10.00
77721	Master control key - for combination padlock #77720	$10.00
77725	Padlock - key style with (2) keys	$10.00
77729	Key blanks - for #77725 key padlocks - box of (50)	$60.00
77790	Electronic lock - factory installed - for four tier & box lockers (specify: silver or black finish)	$75.00
77795	Resettable combination lock - factory installed (specify: silver or black finish)	$30.00
77796	Master control key - for resettable combination lock #77795	$10.00
77760	Name / number plate - 2-1/4'' W x 1-3/8'' H - engraved	$3.00


#77715


#77710


Sample recessed hasp with built-in combination lock (#77710) displayed


#77725


#77720


Sample recessed hasp with combination padlock (#77720) displayed


For single or multi-use applications.
#77790


#77795


Sample recessed hasp with factory installed resettable combination lock (#77795) in black finish displayed

Note: Built-in locks are pre-installed on assembled lockers.

Product: Vertical File Cabinet w/ Five Drawers; Legal Size; Black

Manufacturer: Norwood Commercial Furniture (Or Approved Equal)

Location: Offices and Classrooms



Keep your office documents in order with the Norwood Commercial Furniture® Vertical File Cabinet. Double-walled, lockable drawers secure hanging files and important papers. Grip handles and precision ball-bearing slide suspension ensure the drawers easily slide open and closed. Accommodates legal-size papers and files. Includes follower blocks to keep papers from shifting when the drawer isn't full.

Product Details

- Cabinet Material: Galvanized steel
- Handle Material: Aluminum
- Other Info: Meets or exceeds ANSI/BIFMA performance and safety standards; GREENGUARD gold certified
- Overall Dimensions: 18"W x 26-1/2"D x 61-3/8"H
- No assembly required
- Product weight: 103 lbs.

Product: Lateral File Cabinet w/ Four Drawers; Black (Or Approved Equal)

Manufacturer: Norwood Commercial Furniture

Location: Cumulative File Storage



Help teachers and administrators stay organized with the Lateral File Cabinet from Norwood Commercial Furniture. Four double-walled drawers accommodate documents or supplies and feature a full-width pull with precision ball bearing suspension to ensure they open and close smoothly. Includes rails for hanging folders.

Product Details

- Overall Dimensions: 42" W x 18-5/8" D x 52-1/2" H
- Product Weight: 196 lbs
- Weight Capacity: 468 lbs
- Drawers accommodate letter-and legal-size documents
- Durable steel construction withstands years of use
- Full-width pulls for easy operation.
- Security: Core-removable lock

- Includes rails for hanging folders.
- Assembly not required
- Meets or exceeds ANSI/BIFMA performance and safety standards
- Greenguard Gold Certified
- Warranty: Lifetime Limited

Product: **Aurora Quik-Lok® Steel Library Shelving; Single-Faced; 88"H x 12"D; Black (Or Approved Equal)**

Manufacturer**:** Aurora Storage Products, Inc.

Location: Library

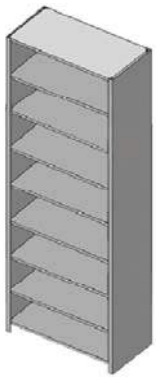
Aurora's Quik-Lok® Shelving has looks, durability, and flexibility - but no braces, hardware or tools. This system can be customized to maximize your space and comes in more standard sizes, colors, and styles than any other brand.

Customized widths and heights provide true design flexibility with your business shelving, library shelving, or any commercial or office storage shelves. Easy-to-assemble and adjustable, Aurora's compact storage solutions are a perfect fit for all your home office and business shelving needs. Shelving systems are a popular choice for facility applications such as healthcare, education, legal, financial, government, law enforcement, industrial/manufacturing, and food service.

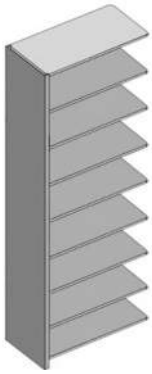
Our metal shelving storage units are manufactured with 40% recycled steel and coated with an environment-friendly powder coat that is safe for documents and other stored items.







Starter Stand Alone Unit



Add On Unit

Standard Colors



#70 Obsidian



Product Details

- A unique design that is easy to assemble and re-configure in a snap
- Uses less floor space than cantilever because of the four post design
- Embodies clean linear appearance and strength with double-walled uprights
- 100% non-emissive, friendly to books, documents and specimens
- Eliminates nuts, bolts and hardware for easy assembly and disassembly
- Diminishes book damage with the absence of hardware
- Provides efficient double access because there are no sway braces
- Shelves adjust in 1-1/2 in. increments
- Eco-Friendly

- Textured powder coat finish
- Construction: 18-gauge Steel
- Shelf Material: 18-gauge & 22-gauge Steel
- Number of Shelves: 2 Fixed, 7 Adjustable
- Shelf Weight Capacity: 348 lbs.
- Shelf Depth: 12"
- Dimensions: 88"H x 36"W x 12"D (Single-Faced)
- Optional Heights: 64"H, 76"H, and 88"H
- Optional Depths: 9"D and 12"D
- Limited Lifetime Warranty
- Assembly Required

AURORA LIBRARY SHELVING



AURORA

A SOLUTION FOR EVERY STORY

LIBRARY STORAGE SOLUTIONS



AURORA STORAGE INSTALLATIONS

- Adams, Kleemeier, Hagan, Hannah & Fouts
- Aurora Public Library
- Caterpillar, Inc.
- Chemical Heritage Foundation
- Clinton Presidential Library
- Harold Washington Library
- Hearst Publishing
- Illinois Institute of Technology
- JFK Presidential Library
- Liberty Intermediate School
- Lincoln Presidential Library
- Nixon Presidential Library
- Northwestern University
- North Carolina State
- Riverside Court of Appeals
- Robert Morris College
- San Diego State University
- University of Chicago
- University of Illinois
- University of Memphis, Law Library
- University of Wisconsin
- West Aurora High School

Our History

For over sixty years Aurora has been a mainstay of librarians who want versatile, sturdy, and beautiful storage for their libraries.

Quik-Lok® Library Shelving

Aurora invented and patented the Quik-Lok® system of shelving which eliminates bolts, sway braces, and protruding hardware that harm priceless library collections. This patented system provides great rigidity with the flexibility to easily reconfigure sections of shelving to change or grow your system.

Expert Design Services

The Aurora Design Department will work with your team to create a customized storage solution taking into consideration growth requirements, accessibility, aesthetics, and budget. If you're challenged for space we can design a system to help your library store more in less space on-site or off-site.



Eco-Friendly Products

We're proud members of the US Green Building Council and have a strong commitment to the environment. Our storage products can help achieve LEED certification.

They contain 40% recycled content and are finished with an exceptionally durable, non-VOC powder coat completely harmless to users and the environment.

Aurora Library Shelving: The Smart Choice for Book Storage

Why settle for old-fashioned cantilever shelving for book storage when you can have Aurora Library Shelving?

Aurora Library Shelving features a unique design that's easy to assemble, reconfigures in a snap and eliminates the problems of book storage common to cantilever-style shelving.



FEATURES	BENEFITS
Easy assembly requires no nuts, bolts or hardware	Reduces installation time
Finished, closed end panels are standard	Aesthetically pleasing look
Compact footprint	Saves floor space and provides more storage capacity than cantilever
Absence of protruding hardware	Reduces book damage
Converts from 4-post static to mobile system	Optimizes floor space
More standard sizes	Design flexibility
Superior weight capacity	Eliminates shelf deflection
Simple to reconfigure	System changes as your needs change



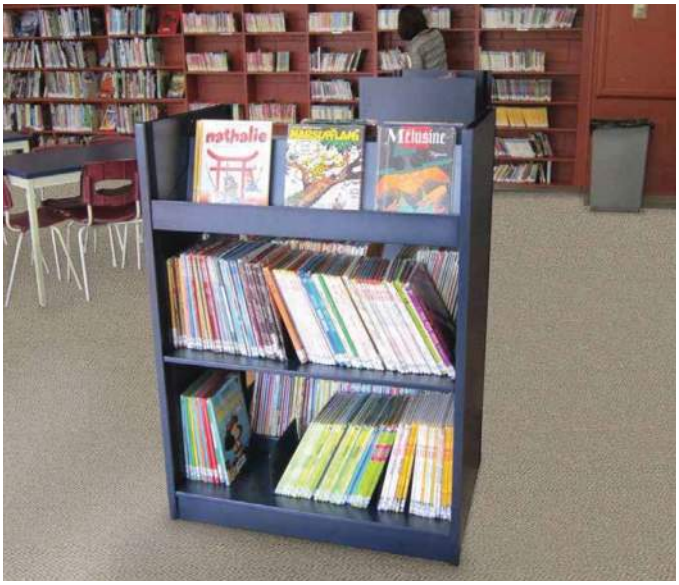
EDUCATION

K-12 Library

Many of today's school libraries are short on space and shorter on funds, causing librarians to serve an ever expanding student population with limited resources.

Libraries have morphed into school media centers, true multimedia environments assisting students with so much more than just book circulation.

Aurora can help to fit more media into tight spaces and tight budgets.



Solutions

- Store more books in less space to gain valuable floor space for other activities.
- Choose multimedia accessories uniquely designed for library use to house magazines, movies, games, oversized books.
- Add counter-high units for easy student accessibility, usable work space, and extra gathering places.



Store games and movies







Higher Education

The academic library environment has special storage considerations for main campus collections, decentralized school libraries within a university, archival storage for dissertations and masters theses, or research departments.

Solutions

Space is frequently at a premium, yet acquisitions continue to grow. The design experts at Aurora have solved these challenges for many high profile universities and colleges.

- Aurora's compact 4-post design stores more books than cantilever per square foot.

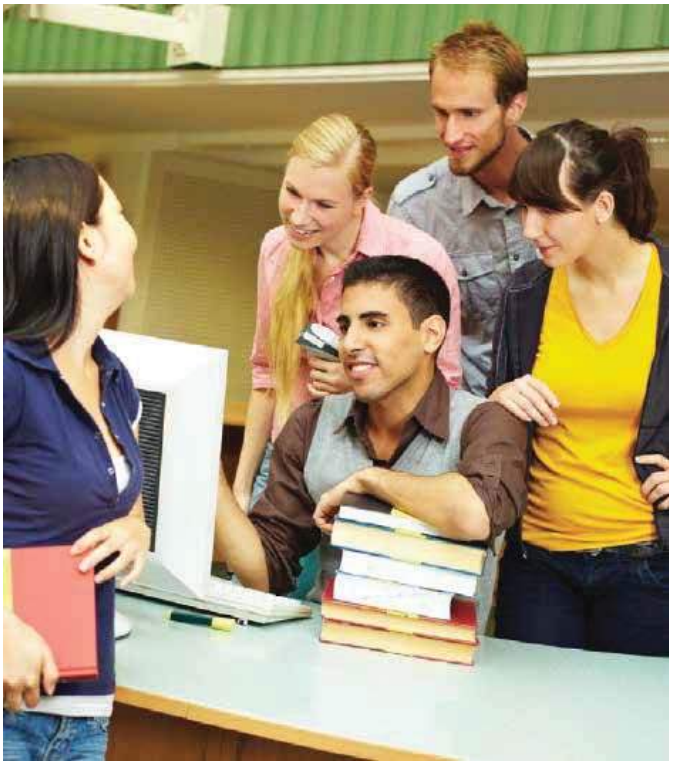


Archival storage for
dissertations and masters theses

PUBLIC LIBRARY

The Public Library is a community's most valued asset providing a learning site, gathering place, and a setting for activities for all ages.

Demand for services increasing? Space constricting as you add programs? Aurora can design a space-efficient system that optimizes every bit of floor and vertical space.



Solutions

- Flexible, reconfigurable library storage assembles and disassembles easily to change when you do.
- Rugged construction holds up under constant patron use.
- High density mobile library storage option uses 50% less space so you can add study carrels, internet stations, and copiers.



Aurora Shelving Offers a Full Range of Library

- Slotted Shelves (optional)
- Reference Shelves
- Magazine Doors
- Sloping Shelves
- Label Holders
- Newspaper Racks
- Wire Book Supports
- Magnetic Followers
- Media Shelves
- Magnetic Card Holders
- Drawers
- Hanging Racks for CDs and Books
- Laminate Countertops and End Panel Treatments



Optional Laminate Countertop



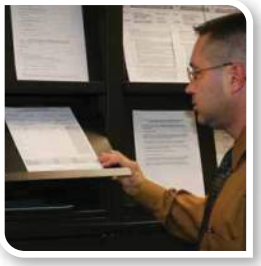
Library Carts



Periodical Display



Browser Boxes*



Magazine Doors



Sample, DVD, and Games Storage*



Drawers*

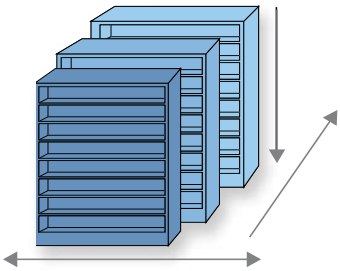
* Accessories depicted require Aurora Shelving Uprights

Color Options

- 31 beautiful colors in Gloss-Tek a document safe finish with no VOC's to harm the environment
- All colors in antimicrobial option

Aurora Library Sizes

Aurora Library Shelving is available in more widths, heights, and depths than any other shelving brand on the market, cantilever included!



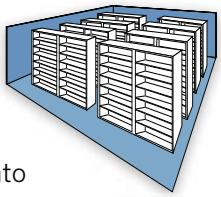
Heights
40¼", 64¼", 76¼", 85¼", 88¼", 97¼", 100¼", 121¼"

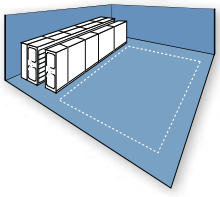
Depths
Single Entry
9",10",12",13",15",16"
Double Entry
18", 20", 24", 26", 30"

Widths
24", 30", 36", 42", 48"

Mobile Ready

- Turn stationary shelving into mobile ready systems
- Save 50% floor space, or store 100% more









Slat Wall

Wood-Tek

Customize Aurora Library Shelving with Wood-Tek, a premium wood option for shelving end panels, crown molding, and shelf edges.

- Doors, conference tables, atlas stands
- Available in 2 wood species and 4 rich stains
- Custom match available

Library Upright

Library inner wall construction allows easy access to books even in tightly packed rows.



THE 4-POST VS. CANTILEVER DEBATE

Why a common solution is not necessarily the best solution.



VS



FEATURES	AURORA 4-POST	CANTILEVER
Aesthetics	Shelving comes with steel end panels for a clean and polished look.	Open cantilever has unfinished look. End panels are a purchased option.
Compact Footprint	Saves floor space and provides more storage than similar sized cantilever unit.	Add to unit depth to accommodate posts.
Book Damage Prevention	Gusseted uprights provide smooth inner sidewalls so books do not slide or lodge behind uprights.	Shelves can exhibit lateral movement away from slots in cantilever uprights causing material to catch between end bracket and upright.
Adjustability of Shelves	Individually adjustable per side on back-to-back units.	Individually adjustable per side.
Size Selection	Available in 5 widths and 11 depths, more than cantilever shelving.	Limited to a maximum of 36" width for most manufacturers.
Collection Cleanliness	Top canopy shelf is standard, protecting books from dust and water damage from accidental fire sprinkler discharge.	Open top is standard. Canopy is non-standard purchased option.
Mobile Ready	Anchors easily to mobile carriages with no loss of stability or additional hardware.	Must be reinforced with gussets on alternate uprights to make mobile ready, adding to system costs.
Single Unit Stability	Rigid uprights and shelf reinforcements make even a single section of shelving stable.	Lateral racking can occur.



Although cantilever style shelving is often specified for library applications, many professional librarians are choosing Aurora 4-post shelving as a superior alternative.

Illinois Institute of Technology
Chicago, IL



AURORA LIBRARY SHELVING YIELDS HIGHER DENSITY

The University of Illinois chose Aurora Shelving over cantilever-type shelving. University planners studied layouts utilizing both types of shelving and discovered that 1/3 of a million more volumes could be stored on Aurora Shelving vs. cantilever shelving.

AURORA

Aurora Storage Products, Inc.
600 South Lake Street • Aurora, IL 60506
Ph: 630-897-6951 • Fax: 630-897-6994
Toll Free: 800-277-1699
www.aurorastorage.com

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GSA Contract Holder
Contract GS-25F-0084M

MADE IN THE USA

For more information go to:
http://www.aurorastorage.com/

For design assistance:
designsupport@aurorastorage.com

Product: **Aurora Quik-Lok® Steel Library Shelving; Double-Faced; 88"H x 24" D; Black (Or Approved Equal)**

Manufacturer**:** Aurora Storage Products, Inc.

Location: Library

Aurora's Quik-Lok® Shelving has looks, durability, and flexibility - but no braces, hardware or tools. This system can be customized to maximize your space and comes in more standard sizes, colors, and styles than any other brand.

Customized widths and heights provide true design flexibility with your business shelving, library shelving, or any commercial or office storage shelves. Easy-to-assemble and adjustable, Aurora's compact storage solutions are a perfect fit for all your home office and business shelving needs. Shelving systems are a popular choice for facility applications such as healthcare, education, legal, financial, government, law enforcement, industrial/manufacturing, and food service.

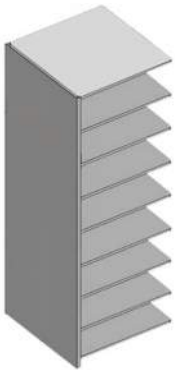
Our metal shelving storage units are manufactured with 40% recycled steel and coated with an environment-friendly powder coat that is safe for documents and other stored items.







Starter Stand Alone Unit



Add On Unit

Standard Colors





#70 Obsidian

Product Details

- A unique design that is easy to assemble and re-configure in a snap
- Uses less floor space than cantilever because of the four post design
- Embodies clean linear appearance and strength with double-walled uprights
- 100% non-emissive, friendly to books, documents and specimens
- Eliminates nuts, bolts and hardware for easy assembly and disassembly
- Diminishes book damage with the absence of hardware
- Provides efficient double access because there are no sway braces
- Shelves adjust in 1-1/2 in. increments
- Eco-Friendly textured powder coat finish
- Construction: 18-gauge Steel

- Shelf Material: 18-gauge & 22-gauge Steel
- Number of Shelves: 2 Fixed, 14 Adjustable
- Shelf Weight Capacity: 348 lbs.
- Shelf Depth: 12"
- Dimensions: 88"H x 36"W x 24"D (Double-Faced)
- Optional Heights: 64"H, 76"H, and 88"H
- Optional Depths: 18"D and 24"D
- Limited Lifetime Warranty
- Assembly Required

Product: Steel Rotary Display Rack w/ 92 Vertical Openings; Black (Or Approved Equal)

Manufacturer: Safeco

Location: Library

Store and showcase magazines in the library with Safco's Steel Rotary Display Rack. This four-sided display rack rotates 360 degrees for access to reading materials. The rotating racks features a removable divider that converts the display from 66, 6-3/8"W pockets to 33, 12-3/4"W pockets. Available with a gray or black, textured powder coat finish. Ships fully assembled.





Product Details

- Material: Steel
- Finish: Powder coat
- Overall Dimensions: 14"W x 14"D x 68"H
- 92 pockets for magazines, literature, forms and other collateral material
- Pocket Opening Dimensions: 9 1/2"W x 3/4"D x 7 1/4"H
- Pocket Capacity: 3 lbs
- Product Weight: 112 lbs
- Fully Assembled

Steel Rotary Magazine & Brochure Racks



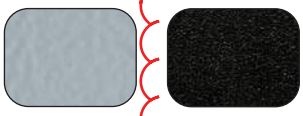
4325GR



4324GR



4326GR
Available in Gray Only



Gray
GR

Black
BL

- textured powder coat finish
- ships fully assembled

GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

Model	Description	W x D x H	Ship Weight
4324	44 Pocket Magazine Rack – Black (BL) or Gray (GR)	14 x 14 x 48"	82 lbs.
4325	92 Pocket Magazine Rack – Black (BL) or Gray (GR)	14 x 14 x 68"	112 lbs.
4326GR	66 or 33 Pocket Brochure Rack – Gray Only	17¼ x 15 x 30¼"	47 lbs.

Safco Products Company
9300 West Research Center Road | Minneapolis, MN 55428
telephone: 888.971.6225 | fax: 763.971.1525
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Product: Tote Tray Storage Cabinet (Or Approved Equal)

Manufacturer: Diversified Spaces (Formerly Diversified Woodworks)

Location: Science Prep Room 3

Give each student a spot to store science projects in Diversified's Tote Tray Storage Cabinet. This all-wood cabinet holds up to 48 plastic trays, so you're sure to have enough space for your entire class. Label the front of each plastic tray with content information or a student's name. Three-point locking handles on the hinged doors keep supplies secure. A clear UV finish protects the solid wood cabinet and keeps it looking great.





Product Details

- Material: Hardwood, oak and oak veneers
- Number of Trays: 48
- Tray Clearance: 4 3/4" H from bottom of tray to the bottom of the tray above
- Overall Dimensions: 46 1/2 W x 22" D x 84"H
- Weight Capacity: 10 lbs. per tote
- Other Info: MAS green certified; SEFA 8 certified
- Warranty: Lifetime limited
- Assembly: Assembly Required
- Product Weight (Lbs): 442

Product: Sanitizing Monitor Eye Safety Storage Cabinet (Or Approved Equal)

Manufacturer: Diversified Spaces (Formerly Diversified Woodcrafts)

Location: Anatomy, Biology, and Chemistry Laboratories

The cabinet holds 6 glasses or 5 goggles to a shelf on 8 shelves. With an average kill rate of 99.2%, the monitor provides excellent protection in 5 minutes. Shuts off automatically if the double doors are opened. Pilot light confirms that the UV lamp is in use. Five minute cycle is controlled by a timer and doors are interlocked with tamper resistant latches. Germicidal lamp has a 20 year limited warranty. Lockable, two keys provided. Wall or shelf mountable with a 7' grounded electrical cord. Underwriters Laboratories Inc. Listed: File # E140818. No direct UV radiation escapes from cabinet when in use. Glasses or goggles are not included.



Product Details

- Ability to clean up to (40) goggles or (48) pairs of safety glasses with a Germicidal lamp in 5 minutes with a kill rate of 99.2%
- Overall Dimensions: 24-1/2" W x 9-1/2" D x 32" H
- Weight: 50 lbs
- Wall or shelf mountable with a 7' grounded electrical cord
- Cabinet is constructed of 24 gauge white enameled steel
- SEFA compliant and MAS Certified Green
- No assembly required
- Warranty: 20 years
- Made in the USA

Product: Microscope Storage Cabinet (Or Approved Equal)

Manufacturer: Diversified Spaces (Formerly Diversified Woodcrafts)

Location: Science Prep Rooms 1 and 3

This microscope storage cabinet from Diversified Woodcrafts is constructed of solid oak, hardwood, and oak veneers. Designed for the science lab, it features a chemical resistant earth-friendly finish.





Product Details

- Solid oak framed glass doors are hinged with three-point locking handles for security.
- Microscopes are stored safely and conveniently on two fixed and three adjustable 1" shelves.
- Adjustable wire dividers allow for storage of microscopes of various sizes and can be removed to use as shelves for general storage.
- Each unit holds 25-30 microscopes, and each individual compartment measures: 7-1⁄4"W x 14"D x 14-1/2"H.
- Dimensions: 48" W x 16" D x 84" H

Product: Corrosive Chemical Storage Cabinet (Or Approved Equal)

Manufacturer: Diversified Spaces (formerly Diversified Woodcrafts)

Location: Science Prep Room 3

The Corrosive Chemical Storage Cabinet is the solution for storing non-flammable acids and corrosive liquids. This storage cabinet is constructed of 3/4" thick exterior grade plywood with a finished top and lined with a 1/4" polyproprylene interior. Included is a removable back panel to access the venting behind the cabinet, 2" plastic containment drip pan, (1) lined adjustable shelf and 99mm pulls. This unit is available in either two doors or single door and is finished in Northwood's UV finish.





Item #3420-3622K

Product Details

- 2" Plastic containment drip pan included
- Overall Dimensions: 36" W x 22" D x 35" H
- Constructed of oak hardwood and oak veneers

- Corrosive chemical storage cabinet for storing non-flammable acids and corrosive liquids
- Diversified Woodcrafts Inc. is SEFA compliant and MAS Certified Green
- Interior is lined with a 1/4" polypropylene
- Limited Lifetime Warranty
- Made in the USA
- Non-locking double door
- Removable back panel to access ventilation needs
- The unit is finished with a chemical resistant, earth-friendly UV finish







3420L-2422K



340-3622K

DIVERSIFIED WOODCRAFTS

PRODUCT DESCRIPTION

Corrosive Chemical Storage Cabinet

The Corrosive Chemical Storage Cabinet is the solution for storing non-flammable acids and corrosive liquids. This storage cabinet is constructed of 3/4" thick exterior grade plywood with a finished top and lined with a 1/4" polypropylene interior. Included is a removable back panel to access the venting behind the cabinet, 2" plastic containment drip pan, (1) lined adjustable shelf and 96mm pulls. This unit is available in either two doors or single door and is finished in Northwood's oak.

ITEM #	WOOD	PRODUCT	DIMENSIONS
3420-3622K	Oak	Double Door, Non-locking	36"W x 22"D x 35"H
3420-3622M	Maple	Double Door, Non-locking	36"W x 22"D x 35"H
3420L-2422K	Oak	Single Door, Left Hinge, Non-locking	24"W x 22"D x 35"H
3420L-2422M	Maple	Single Door, Left Hinge, Non-locking	24"W x 22"D x 35"H
3420R-2422K	Oak	Single Door, Right Hinge, Non-locking	24"W x 22"D x 35"H
3420R-2422M	Maple	Single Door, Right Hinge, Non-locking	24"W x 22"D x 35"H

Product: Flammable Liquid Storage Cabinet (Or Approved Equal)

Manufacturer: Diversified Spaces (formerly Diversified Woodcrafts)

Location: Science Prep Room 3

The Flammable Liquid Storage Cabinet is designed to store flammable liquids safely. Its construction consists of 1" thick exterior grade plywood with 1-1/2" x 3/4" hard wood strips that are dadoed into the 1" interiors to create a seal. It features a 3" high drip tray in case of a leak, the metal adjustable shelf is designed to let the spill contain in the center of the drip pan. This cabinet meets or exceeds NFPA 30 and is UL1275 standard certified. Cabinet comes in Northwood's oak finish and has a 3-poimt key lock.





Item #3440-3622K

Product Details

- Constructed of red oak hardwood and oak veneers
- 1" Thick exterior grade plywood
- Overall Dimensions: 36" W x 22" D x 36" H
- 1-1/2" x 3/4" hardwood strips that are dadoed into the 1" interiors to create a seal
- Adjustable metal shelf
- 3" high drip pan included

- Locking doors
- The unit is finished with a chemical resistant, earth-friendly UV finish
- SEFA compliant and MAS Certificed
- Meets or exceeds NFPA30 and UL1275
- Made in the USA





3440L-2422K



3440-3622K

DIVERSIFIED WOODCRAFTS

PRODUCT DESCRIPTION

Flammable Liquid Storage Cabinet

Keep all of your flammable liquids safe in the Flammable Liquid Storage Cabinet. This storage cabinet is made up of 1" thick exterior grade plywood with 1-1/2" x 3/4" hard wood strips that are dadoed into the 1" interiors to create a seal. It features a 3" high drip tray in case of a leak, the metal adjustable shelf is designed to let the spill contain in the center of the drip pan. This cabinet meets or exceeds NFPA30 and is UL1275 standard certified. Choose from either two doors or single door options. Cabinet comes in a Northwood's oak finish and has a 3-point key lock.

ITEM #	WOOD	PRODUCT	DIMENSIONS
3440-3622K	Oak	Double Door, Locking	36"W x 22"D x 35"H
3440-3622M	Maple	Double Door, Locking	36"W x 22"D x 35"H
3440L-2422K	Oak	Single Door, Left Hinge, Locking	24"W x 22"D x 35"H
3440L-2422M	Maple	Single Door, Left Hinge, Locking	24"W x 22"D x 35"H
3440R-2422K	Oak	Single Door, Right Hinge, Locking	24"W x 22"D x 35"H
3440R-2422M	Maple	Single Door, Right Hinge, Locking	24"W x 22"D x 35"H

Product: **Visual Storage Cabinet; Black; 36''W x 24"D x 72''H**
(Or Approved Equal)

Manufacturer**:** Atlantic

Location: Art Rooms





These cabinets offer convenience, flexibility and mobility. Contents remain secure yet fully visible. Constructed of heavy gauge steel, each shelf has a 200 lb (91 kg) capacity. Features two chrome handles, a three point locking mechanism and four 5" casters, with two that lock. Shelves adjust in 2" increments. Powder coated surface provides a superior finish that is more consistent, durable, and will not mar or chip.

Available in black, blue, dove gray, putty, and sand.

Product: Safco 5-Drawer Steel Flat Files With Base (Or Approved Equal)

Manufacturer**:** Safco

Location: Art Rooms



A classic in flat materials storage. Each handsome unit is self-contained with welded steel construction, wrap-around corners, and a sturdy inner frame. Each 2-1/8" high drawer has ball-bearing side rollers, a stationary back hook, and a piano-hinged front depressor to protect its contents as the drawer is opened and closed.

Safco's Steel Flat Files are available in three sizes and twenty colors, to store standard sheet sizes:

- Small, for sheets up to 24" x 36"
- Medium, for sheets up to 30" x 42"
- Large, for sheets up to 36" x 48"

Use the file units individually on a base or table, or stack them together for a whole bank of files. Each unit is 16-1/2" tall, and the base adds an additional 6" in height. The units stack securely without bolting or brackets, using anti-slip pads (included with each unit). Thus, a 15-drawer ensemble comprising three units and a base will stand slightly more than 55" tall.

Product: Safco Art Rack; 8 Compartments (Or Approved Equal)

Manufacturer**:** Safco

Location: Art Rooms

Safco's Art Rack vertically stores and protects over-sized layouts, original art, mechanicals, and keylines. Upright materials resist warping and are easier to find than stacked or shelved materials.

Tempered hardwood dividers allow for eight, 4¼" wide compartments. It has channels for labeling, top and bottom, allowing you to identify the contents of each storage compartment.

The Art Rack has an attractive, putty-textured vinyl laminate finish. Each rack unit can be stacked vertically, used side-by-side, or used alone. Constructed of a strong wood-core product, the brawny racks easily hold hundreds of pounds of materials.



Product: **Regency 24" x 48" NSF Chrome 4-Shelf Kit with 74" Posts (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: Kitchen Storage and Pantry

The Regency 24" x 48" NSF chrome shelf kit can optimize the space in food storage areas, janitorial closets, and more with (4) 24" x 48" shelves and (4) 74" posts. The chrome construction gives this shelving kit excellent durability in dry areas. It is easy to keep clean and sanitary, while the open grid design allows for excellent air circulation. The space between the shelves is adjustable, giving you the flexibility to store items of varying heights, such as ingredient bins, boxes, cleaning supplies, and anything else with visibility and accessibility.

These shelves can hold a maximum of 600 lb. each of evenly distributed weight. The unit's high-quality design is commercial grade and delivers the reliable performance every business expects and needs..



Item Number: #460EC2448KIT

Product Details

- Overall Dimensions: 48" W x 14" D x 64" H
- 24" x 48" Shelves With Adjustable Height
- Four 64" stationary knock-down posts ship unassembled to reduce freight cost
- Recommended for use in dry environments
- High-quality, commercial-grade construction
- Assembly Required
- Capacity: 2400 lbs.
- Material: Steel
- Finish: Chrome
- Individual Shelf Capacity: 600 lbs.
- Installation Type: Stationary (No Casters)
- NSF Listed
- Usage: Dry Environments
- Accessories sold separately.

REGENCY NSF CHROME WIRE SHELVING

Regency Space Solutions is your source for quality, affordable wire shelving. Offering a large selection of NSF Listed wire shelves and posts, Regency Space Solutions gives you the freedom to create the perfect shelving unit at the perfect price.



Chrome Plated Wire Shelving

Chrome plated wire shelving is ideal for use in areas in which moisture is at a minimum, including:

- Dry storage
- Garage storage
- Personal storage
- Heated environments
- Warehouse use
- Retail

Quick Assembly

Regency Space Solutions' NSF Listed wire shelving is easy to assemble using split sleeves. Simply snap two split sleeves around each wire post to keep shelves level every time. Use the incrementally notched lines to help you install a level shelf. Each wire shelf comes complete with (4) pairs of split sleeves (eight total split sleeves).



Air Flow

Wire shelving offers unparalleled air flow between and around products thanks to its wire design.

Versatility

Regency Space Solutions' wire shelving offers the rigidity of solid metal with the adjustability of plastic. No tools or hardware required. Simply move the split sleeves up or down the posts for quick, efficient change.

Weight Capacity

- Each shelf up to 48" in length: 600 lbs.
- Longer shelves above 54" in length: 450 lbs.

Wire Shelves

These chrome wire shelves are for use only in dry storage and heated environments. They're made of a durable, chrome plated metal, with a clear epoxy coating.

When combined with additional shelves, posts, and accessories (sold separately), these Regency epoxy-coated chrome wire shelves are capable of holding up to 600 pounds of evenly distributed weight.

- May be used with Regency posts, casters, and handles.
- Chrome plated wire with clear epoxy coating
- NSF Listed

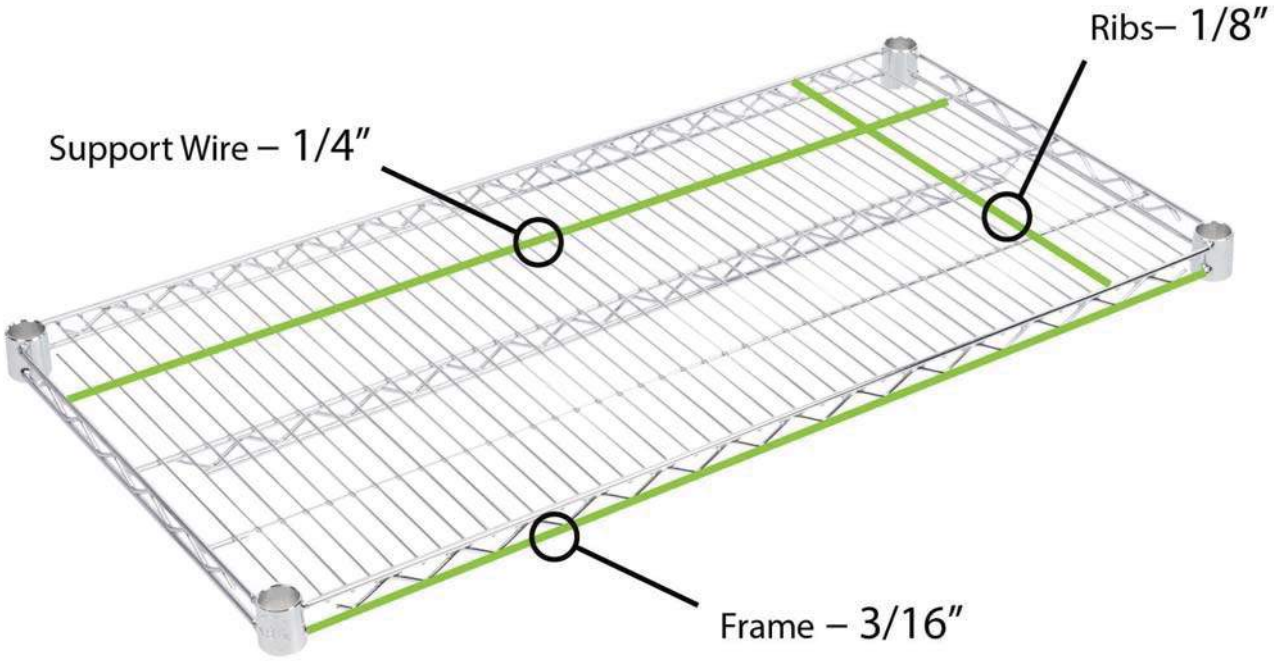
Item #	Width x Length (in.)	Weight
460EC1424	14 x 24	5.40 lbs.
460EC1430	14 x 30	6.39 lbs.
460EC1436	14 x 36	7.50 lbs.
460EC1442	14 x 42	8.49 lbs.
460EC1448	14 x 48	9.48 lbs.
460EC1454	14 x 54	11.13 lbs.
460EC1460	14 x 60	12.24 lbs.
460EC1472	14 x 72	14.11 lbs.
460EC1824	18 x 24	6.06 lbs.
460EC1830	18 x 30	7.17 lbs.
460EC1836	18 x 36	8.27 lbs.
460EC1842	18 x 42	9.37 lbs.
460EC1848	18 x 48	10.58 lbs.
460EC1854	18 x 54	12.35 lbs.
460EC1860	18 x 60	13.45 lbs.
460EC1872	18 x 72	15.87 lbs.

Item #	Width x Length (in.)	Weight
460EC2124	21 x 24	6.50 lbs.
460EC2130	21 x 30	7.72 lbs.
460EC2136	21 x 36	9.04 lbs.
460EC2142	21 x 42	10.14 lbs.
460EC2148	21 x 48	11.35 lbs.
460EC2154	21 x 54	12.90 lbs.
460EC2160	21 x 60	14.22 lbs.
460EC2172	21 x 72	18.74 lbs.
460EC2424	24 x 24	7.61 lbs.
460EC2430	24 x 30	8.93 lbs.
460EC2436	24 x 36	10.36 lbs.
460EC2442	24 x 42	11.79 lbs.
460EC2448	24 x 48	12.35 lbs.
460EC2454	24 x 54	15.21 lbs.
460EC2460	24 x 60	17.86 lbs.
460EC2472	24 x 72	21.83 lbs.





Wire Diameter



Posts

Chrome Posts

These chrome shelving posts ship with an attached leveling foot that easily adjusts to accommodate uneven surfaces. Each post is for use only in dry storage and heated environments. It's made of a durable, chrome plated metal with a clear epoxy coating.

- Chrome plated wire with clear epoxy coating
- NSF Listed

Includes Feet:

Item #	Length (in.)	Weight
460ECP8	8	0.61 lbs.
460ECP14	14	0.80 lbs.
460ECP34	34	1.40 lbs.
460ECP64	64	2.39 lbs.
460ECP74	74	2.63 lbs.
460ECP86	86	3.10 lbs.



For Use with Casters:

Item #	Length (in.)	Weight
460ECPC8	8	0.61 lbs.
460ECPC14	14	0.80 lbs.
460ECPC34	34	1.40 lbs.
460ECPC64	64	2.39 lbs.
460ECPC74	74	2.63 lbs.
460ECPC86	86	3.10 lbs.

Specialty Shelving

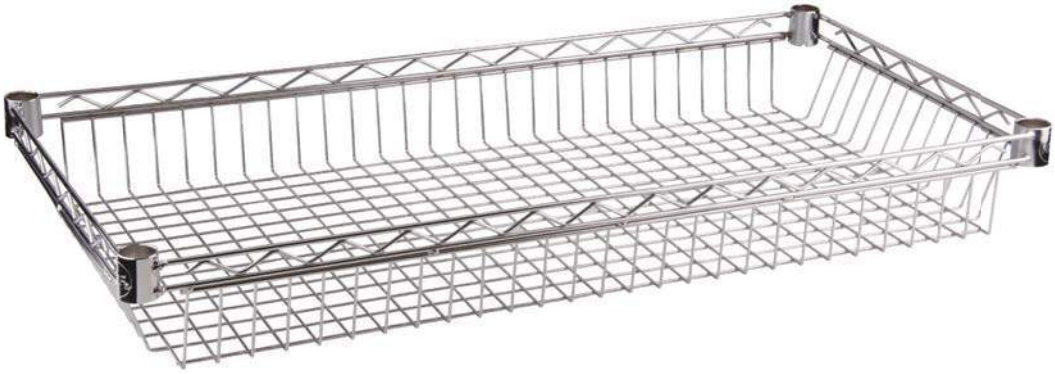
Shelf Basket

- Item #460EC1836BSK
- Width x Length: 18" x 36"
- Weight: 8.38 lbs.

Shelf baskets can be used in place of a traditional flat shelf.

- Able to cradle an array of items, shelf baskets are useful when storing or moving items that may easily roll or fall off of a flat shelf.
- May be used with Regency posts, casters, 18" shelves, and handles.





Triangle Shelves

- Item #460EC18TRI
- Dimensions: 19 3/8"W x 14 7/8"L
- Weight: 3.75 lbs.

- Item #460EC24TRI
- Dimensions: 24 7/8"W x 18 1/8"
- Weight: 4.52 lbs.

Triangle shelves create usable space in corners that may otherwise be left empty.

- May be used with Regency posts, casters, and handles.

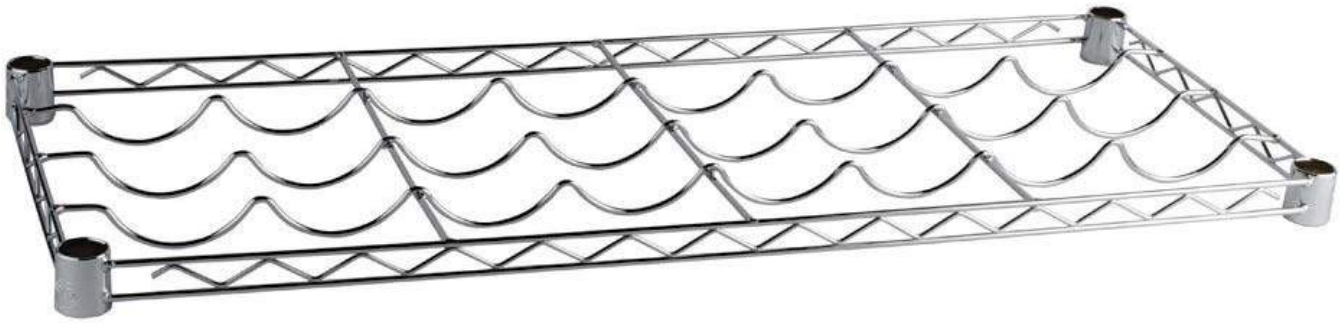




Wine Shelves

These Regency wire wine shelves are the perfect way to store your finest wine! Because of wine's delicate nature, it is important to store bottles on their sides, and bottles should be slightly tilted, cork down, on the shelf for best quality. The shelf features an attractive chrome finish and is designed for use with 750 mL wine bottles.

Item #	Width x Length (in.)	Weight	Bottle Capacity
460ECWIN1424	14 x 24	3.53 lbs.	5
460ECWIN1436	14 x 36	4.41 lbs.	8
460ECWIN1448	14 x 48	5.29 lbs.	11



Three Sided Frame

These Regency three sided chrome epoxy frames for wire shelving dunnage racks add extra stability to your shelving unit. The three-sided design attaches to all four posts of your shelving unit to make sure that your storage unit is strong and secure, no matter how much you need to store. The chrome epoxy finish is ideal for dry storage environments like dry storerooms, warehouses, garages, and even retail environments.

- NSF Listed



Item #	Width x Length (in.)	Weight
460EC1824FRM	18 x 24	3.13 lbs.
460EC1836FRM	18 x 36	3.60 lbs.
460EC1848FRM	18 x 48	4.23 lbs.
460EC2424FRM	24 x 24	3.46 lbs.
460EC2436FRM	24 x 36	3.93 lbs.
460EC2448FRM	24 x 48	4.34 lbs.



Handles

U-Shaped Handles

- Item #460EC18HANDL - for 18" shelves
  - Weight: 1.71 lbs.
- Item #460EC24HANDL - for 24" shelves
  - Weight: 2.15 lbs.

U-shaped handles may be added onto Regency shelving units or cart to assist in moving them. When combined with casters, these handles give you the ability to create a convenient mobile unit.

- May be used with Regency posts, casters, and standard shelves.



Utility Handle

- Item #460EC18UHAND - for 18" shelves
  - Weight: 4.19 lbs.
- Item #460EC24UHAND - for 24" shelves
  - Weight: 5.29 lbs.

Utility handles may be paired with a compatible shelf or shelves and casters to create a utility cart.

- May be used with Regency posts, casters, and 18" standard shelves.



Casters

- Available in either polyurethane or rubber varieties.



Polyurethane Casters for Utility Cart Handles

- Item #460UCRTCSTR (Non-Braking)
  - Weight: 2.03 lbs.
- Item #460UCRTCSTRB (Braking)
  - Weight: 2.26 lbs.



Polyurethane Casters for Wire Shelving

- Item #4615MPX (Non-Braking)
  - Weight: 2.03 lbs.
- Item #4615MPBX (Braking)
  - Weight: 2.26 lbs.
- Item #460EC26 (4 Pack)

Polyurethane casters glide quietly over everything from concrete and carpet, cracks, and cords.

- Soft, yet resilient material.
- Provides ample cushioning to protect loads and floors.



Rubber Casters

- Item #359PLCB5140
  - Weight: 2.69 lbs.
- Item #460EC25 (4 Pack)

Rubber casters work well on rough, oily, or greasy floors.

- Provides quiet movement, good floor protection, and low initial movement.
- Will not crack with heavy loads.

Heavy Duty Rubber Donut Bumpers



- Item #460RUBRDONT3 - 3½"
  - Weight: 0.36 lbs.
- Item #460RUBRDONT5 - 5½"
  - Weight: 0.90 lbs.

Protect your valuable shelving, equipment, and more with these heavy duty rubber donut bumpers! These bumpers are designed to fit Regency carts and posts above your casters so your walls, doors, and other products are safe during collisions.

Wall Mounting

Wall Mounting Bracket Sets

As part of the Regency Space Solutions' wire shelving collection, these deep wall mounting brackets are designed to mount one Regency Space Solutions chrome wire shelf. They feature a 1/4" diameter chrome plated steel wire for maximum durability and strength. Each bracket is specifically constructed to work with Regency Space Solutions chrome wire shelving.

- NSF Listed

Item #	Width x Length (in.)	Weight
460SB14X	14 x 2¾	2.04 lbs.
460SB18X	18 x 2¾	2.26 lbs.
460SB24X	24 x 2¾	2.48 lbs.





Wall Mounting Brackets for Adjoining Shelves

As part of the Regency Space Solutions' wire shelving collection, these wall mounting brackets are designed to adjoin two Regency Space Solutions chrome wire shelves for wall mounting. They feature a 1/4" diameter chrome plated steel wire for maximum durability and strength. Each bracket is specifically constructed to work with Regency Space Solutions chrome wire shelving.

- NSF Listed

Item #	Width x Length (in.)	Weight
460DB14X	14 x 2¾	4.08 lbs.
460DB18X	18 x 2¾	4.52 lbs.
460DB24X	24 x 2¾	4.96 lbs.





Accessories

Shelf Dividers

These Regency chrome shelf dividers allow for quick and easy organization of the contents on your shelving unit. It is 8" high and made of durable chrome wire to easily separate cleaning supplies, boxes, or other loose items.

- NSF Listed

Item #	Length (in.)	Weight
460EC14DVDR	14 x 8	1.12 lbs.
460EC18DVDR	18 x 8	1.38 lbs.
460EC24DVDR	24 x 8	1.70 lbs.





Shelf Ledges

These Regency chrome shelf ledges are designed to easily install onto your wire shelving unit. Its 4" height is perfect for helping to contain items on a shelf and prevent them from falling off, whether you have cleaning supplies, boxes, or other loose items. Ledges are stackable to create a higher wall if needed.

- NSF Listed

Item #	Length (in.)	Weight
460EC14LDG	14 x 4	0.69 lbs.
460EC18LDG	18 x 4	0.82 lbs.
460EC24LDG	24 x 4	1.02 lbs.
460EC36LDG	36 x 4	1.66 lbs.
460EC48LDG	48 x 4	2.14 lbs.
460EC60LDG	60 x 4	2.70 lbs.
460EC72LDG	72 x 4	3.28 lbs.



Storage Baskets

These Regency chrome storage baskets are designed to easily install onto your wire shelving unit. Ideal for storing extra equipment parts, cooking utensils, and other loose items.

- NSF Listed

Item #	Width x Length x Depth (in.)	Weight
460EC1457BSK	13⅜ x 5 x 7	2.90 lbs.
460EC1885BSK	17⅜ x 7½ x 5	4.49 lbs.
460EC1810BSK	17⅜ x 7½ x 10	6.34 lbs.



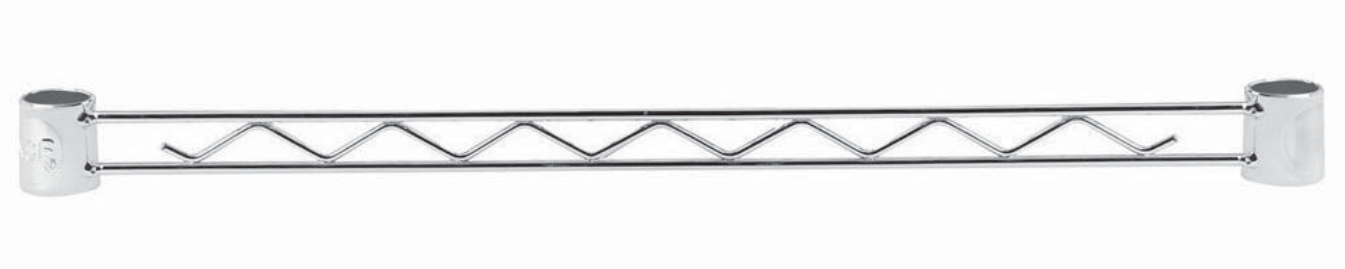


Hanger Rails

As part of the Regency Space Solutions collection of chrome coated wire shelving, you can count on these hanger rails to work with your shelving to provide extra storage space in your dry storage areas like air conditioned storage rooms and closets. These hanger rails have a weight capacity of up to 80 lbs. so that you can store plenty of textiles, pots and pans, and much more!

- NSF Listed

Item #	Length (in.)	Weight
460EC14HGRL	14	0.69 lbs.
460EC18HGRL	18	0.80 lbs.
460EC24HGRL	24	0.99 lbs.
460EC36HGRL	36	1.34 lbs.
460EC48HGRL	48	1.70 lbs.



Swing Hook

- Item #460EC6SWING
- Dimensions: 6 ¼"
- Weight: 0.38 lbs.



As part of the Regency Space Solutions collection of chrome coated wire shelving, you can count on this 6 1/4" swing hook to work with your shelving to provide extra storage space in your dry storage areas like air conditioned storage rooms and closets. This swing hook hanger has a weight capacity of up to 60 lbs. so that you can store plenty of textiles, large pots and pans, and much more!

- NSF Listed

"J" Hooks

This hook simply latches onto hanger rails, mounting rails, and wire shelving, providing simple and instant installation! The hook's zinc plated metal provides maximum longevity and holds up to 30 pounds.

- Organize pots, pans, strainers, spatulas, or tongs
- Hang chef hats, coats, and aprons
- Save floor space picking up brooms, dust pans, mops, or wet floor signs





Item #	Depth x Height (in.)	Size	Weight
460ECHKSM	1¼ x 3½	Small	0.06 lbs.
460ECHKLRG	2 x 3 7/16	Large	0.07 lbs.
460ECHKLRGDB	2 x 3 7/16	Double	0.17 lbs.

"S" Hook

- Item #4619995Z
- Stainless Steel construction
- Weight: 0.07 lbs.

"S" hooks allow you to install side by side shelves with fewer posts. Four "S" hooks are required per shelf for proper use.





Shelving Split Sleeves

- Item #4619985
- Weight: 0.05 lbs.

These Regency 1" split sleeves are ideal for holding shelves in place around wire shelf posts. The two halves easily snap together around your current shelving to give it support throughout the day. Two halves are required for each post.





Post Clamp

- Item #460ECPCLAMP
- Weight: 0.11 lbs.
- Chrome

Post clamps should be used to connect two posts together for greater side-by-side stability.





Post Foot Plate

- Item #460ECPFOOT
- Weight: 0.09 lbs.
- Chrome

Anchor your shelving unit to the floor by securing it in place with a foot plate.

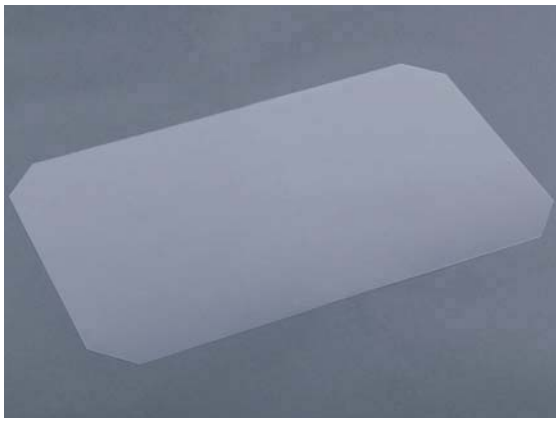
- Simply screw one foot plate into the end of each post and fasten to the floor.



Shelf Mat Overlays

Use these Regency shelf mat overlays to create a smooth, solid surface over your wire shelving! Made of clear PVC, this shelf mat overlay keeps small items from falling through your open grid shelves and can even help prevent damage to items on lower shelves by containing leaks, drips, and spills. These shelf mat overlays are easily removable for thorough cleaning and for when you need to convert your shelf back to an open grid.

Item #	*Width x Length (in.)*	*Weight*
460MATCL1424	14 x 24	0.72 lbs.
460MATCL1436	14 x 36	1.23 lbs.
460MATCL1448	14 x 48	1.36 lbs.
460MATCL1824	18 x 24	0.89 lbs.
460MATCL1836	18 x 36	1.31 lbs.
460MATCL1848	18 x 48	1.73 lbs.
460MATCL11860	18 x 60	2.22 lbs.
460MATCL2424	24 x 24	1.22 lbs.
460MATCL2436	24 x 36	1.78 lbs.
460MATCL2448	24 x 48	2.36 lbs.
460MATCL2460	24 x 60	2.95 lbs.



Label Holders

Add pricing labels to your shelves, or keep your stock room or storage area neatly organized with the help of these clear or gray label holders! These holders easily snap on to your wire shelf so that all you have to do is insert the label.

Item #	Length (in.)	Color
460LABLC3IN	3" x 1"	Clear
460LABLC6IN	6" x 1"	Clear
460LABLC13IN	13"x 1"	Clear
460LABLC19IN	19" x 1"	Clear
460LABLC25IN	25" x 1"	Clear
460LABLC31IN	31" x 1"	Clear
460LABLC43IN	43" x 1"	Clear
460LABLC55IN	55" x 1"	Clear

Item #	Length (in.)	Color
460LABLG6IN	6" x 1"	Gray
460LABLG13IN	13"x 1"	Gray
460LABLG19IN	19" x 1"	Gray
460LABLG25IN	25" x 1"	Gray
460LABLG43IN	43" x 1"	Gray
460LABLG55IN	55" x 1"	Gray
4619990P	3" x 1¼"	Gray
460LH	3" x 1 9/16"	White





Shelving Warranty Information

Regency Space Solutions NSF epoxy wire shelving is guaranteed to be free from defect in material and construction at the time of shipment. Regency Space Solutions will replace a defective piece for a period of up to one year from the original date of installation, provided they have been properly installed and maintained. Regency Space Solutions is liable to replace the defective piece, but under no circumstances will pay any labor or subsequent damage.

Green and black epoxy finish shelves are covered under warranty against rust formation over more than five percent of the shelving surface up to the fifth year of the original installation.

Chrome finish shelves are covered under warranty against rust formation over more than five percent of the shelving surface up to the first year of the original installation in a dry application. Further, chrome finish shelves are not covered under warranty in any wet application, including but not limited to coolers and freezers.

All shelving is NSF Listed.

Product: **Regency 14" x 48" NSF Chrome Wire 5-Shelf Kit with 64" Posts (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: Isolation Ante Room

The Regency 14" x 48" NSF chrome shelf kit can optimize the space in food storage areas, janitorial closets, and more with (4) 14" x 48" shelves and (4) 64" posts. The chrome construction gives this shelving kit excellent durability in dry areas. It is easy to keep clean and sanitary, while the open grid design allows for excellent air circulation. The space between the shelves is adjustable, giving you the flexibility to store items of varying heights, such as ingredient bins, boxes, cleaning supplies, and anything else with visibility and accessibility.

These shelves can hold a maximum of 600 lb. each of evenly distributed weight. The unit's high-quality design is commercial grade and delivers the reliable performance every business expects and needs..



Item Number: #480EC1448K65

Product Details

- Overall Dimensions: 48" W x 24" D x 64" H
- 24" x 48" Shelves With Adjustable Height
- Four 64" stationary knock-down posts ship unassembled to reduce freight cost
- Recommended for use in dry environments
- High-quality, commercial-grade construction
- Assembly Required
- Capacity: 3000 lbs.
- Material: Steel
- Finish: Chrome
- Individual Shelf Capacity: 600 lbs.
- Installation Type: Stationary (No Casters)
- NSF Listed
- Usage: Dry Environments
- Accessories sold separately.

Product: Vantage Series Modern Display Case; 48"W (Or Approved Equal)

Manufacturer: Waddell

Location: Lobby

Unobstructed line of sight and edge-to-edge glass are the hallmarks of the Vantage Premium Glass Office Display Case from Waddell. The Vantage glass showcase does not have exposed hardware, framing or locks, allowing for an uninterrupted area to show off your awards and achievements. Featuring an elegant glass sliding door, the minimalistic design of the display case blends seamlessly in modern spaces. The recessed LED strip lighting offers a sleek, low profile design that illuminates not only your display case, but the contents. The display case comes complete with 3 fixed-position glass shelves that are supported with a steel subframe for structural integrity, ensuring your awards and achievements will be on display safely for years to come. The Vantage glass office display case will be the perfect addition to your lobby, corporate board room, or office space. Place the shelves into their slots and the Vantage case is ready for use. All Waddell display cases ship in worry-free, minimal packaging, ensuring your trophy case arrives as expected. All Waddell display cases carry a limited lifetime manufacturer's warranty from defects.





Waddell WAD-VANT48R

Product Details

- Case Back Material: Laminate
- Frame Material: Laminate
- Base / Cornice Material: Laminate
- No. of Shelves: 3
- LED Lighting: Yes
- Sliding Door: Right
- Type of Shelves: 9"D Full-Length
- Overall Dimensions: 48"W x 73"H x 15"D
- Assembly Required: No
- Warranty: Limited Lifetime

WADDELL®

a GMi company

In this picture: VANT48 floor case in Cherry laminate finish.



VANTAGE MODERN DISPLAY CASE

Unobstructed line of sight and edge-to-edge glass are the hallmarks of Vantage. No matter the viewing angle, the display and it's contents are completely visible. The minimalistic design blends seamlessly in modern spaces. Featuring a beautiful sliding glass door and standard LED lights, Vantage is the world's most premium display case.



VANT24 – 24" wide floor case
(pictured with a Cherry finish)

wood laminate, medium floor case with
3 full-length fixed glass shelves

73" H × 24" W × 15" D
Shipping weight: 230 LBS



VANT48 – 48" wide floor case
(pictured with Uptown Walnut finish)

wood laminate, large floor case with
3 full-length fixed glass shelves

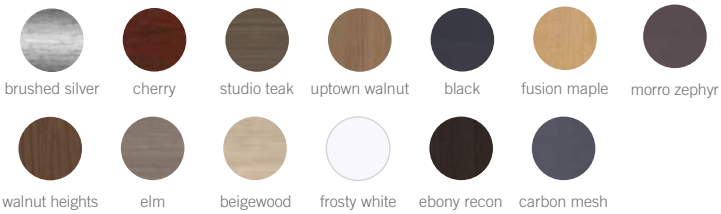
73" H × 48" W × 15" D
Shipping weight: 400 LBS

sliding glass door →



Pictured with Elm finish with right sliding door

finish options



*Custom laminates also available, call 800.622.1331.

- Available in two widths, 73" × 24" and 73" × 48"
- No exposed hardware, framing, or locks, allow for 270 degrees of uninterrupted viewing space
- Built to last; a 1-1/2" metal subframe allows for structural integrity
- Three fixed positioned glass shelves built at pre-determined heights when ordered
- Elegantly designed sliding glass door slides into place from the left or right*
- Premium LED strip lighting is standard
- 14 standard laminate colors, custom laminates also available
- Limited lifetime warranty

*When ordering a Vantage display case, you must choose between a right or left sliding glass door.



Premium LED Strip Lighting
LED strip lights offer a sleek, low profile design that will illuminate your case.



Elegant Sliding Glass Door
The beautifully crafted sliding glass door will highlight your awards by keeping the hardware hidden.



Unobstructed View
Show off your awards with 270° of uninterrupted viewing space.

MADE IN THE USA

GSA Contract Holder
GS 27F 0014W

WD-VANTAGE-REV0117

512 S. Washington Street | Greenfield, Ohio 45123 | 800.622.1331 | T 937.981.7724 | **waddellfurniture.com/vantage**

Product: E-Z Stor Literature Organizer; 72 Letter Size Compartments (Or Approved Equal)

Manufacturer: Safeco

Location: Faculty Workroom / Resource Center

Safco's E-Z Stor Steel Literature Organizer keeps documents and mail neatly sorted in your teacher's lounge or office. Sturdy steel frame stands up to heavy use, and the shelves and four-inch deep dividers interlock to add stability. The 72 compartments measure 9"W x 12 ¼"D x 3"H. The shelf fronts serve as label holders. Compartments hold up to 750 sheets of paper.

Quick-connect, uni-lock steel shell, can rest on floor, desk or mounted to a wall with optional wall mount brackets. All hardware included. Available in three finishes.



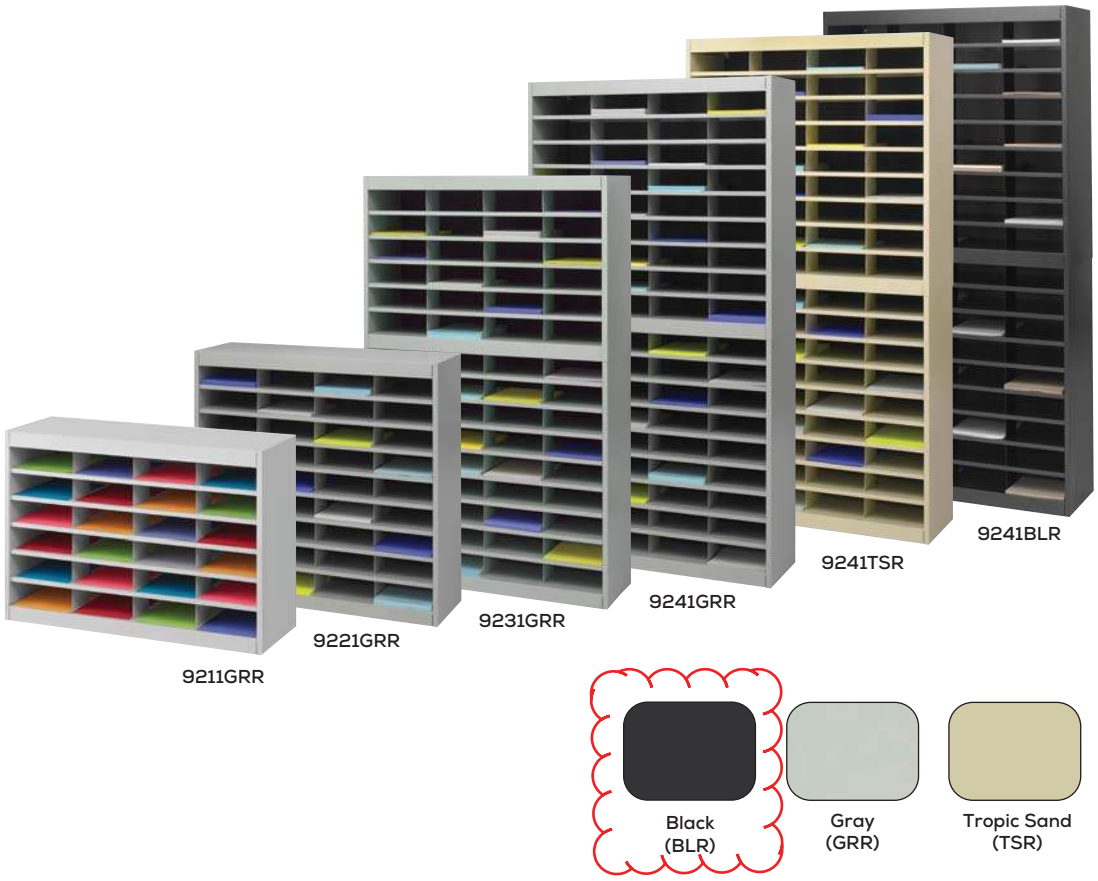
Model 9241

Product Details

- Overall Dimensions: 37-1/2" W x 71" H x 12-3/4" D
- Product Weight: 143 lbs
- Opening Dimensions: Letter

- Number of Compartments: 72
- Compartment Dimensions: 9"W x 12 ¼"D x 3"H
- Shelf Weight Capacity: 40 lbs
- Compartment Capacity: 10 lbs
- Material: Steel frame; 22 ga. (vertical dividers, outer side panels), 24 ga. (inner side panels, top, bottom, shelves)
- Fiberboard back
- Finish: Powder Paint; Black
- Assembly Required
- Lifetime Limited Warranty
- Note: This item is custom with no returns
- 9200BL E-Z Stor Wall Mounting Bracket are sold separately

E-Z Stor® Steel Literature Organizers



- steel frame, shelves and dividers
- fiberboard back
- each compartment holds up to 750 sheets
- interlocking design of shelves and dividers for extra strength
- shelf fronts serve as label holders
- quick-connect, uni-lock steel shell
- floor, desk or mounted to a wall
- optional wall mount brackets for 9211 & 9221 only
- all hardware included
- compartments: 9"w x 12¼"d x 3"h
- assembly required

Model	Number of Compartments	W x D x H	Ship Weight
9211	24	37½ x 12¾ x 25¾"	59 lbs.
9221	36	37½ x 12¾ x 36½"	80 lbs.
9231	60	37½ x 12¾ x 60"	139 lbs.
9241	72	37½ x 12¾ x 71"	158 lbs.
9200BL	Optional wall mount brackets		5 lbs

Safco Products Company
9300 West Research Center Road | Minneapolis, MN 55428
telephone: 888.971.6225 | fax: 763.971.1525
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Product: 25 Cu. Ft. Side-by-Side Refrigerator (Or Approved Equal)

Manufacturer: GE Appliances

Location: SPED BLS Classroom





Model #GSS25GSHSS

Product Details

- Color Appearance: Stainless steel
- Total Capacity: 25.3 cu. ft.
- Adjustable door bins creates additional storage for large items
- Strong and flexible shelf support
- Factory installed ice maker ensures efficient ice production
- Fresh food multi-level drawers
- Arctica Icemaker: A special access door puts ice within reach.
- LED Lighting

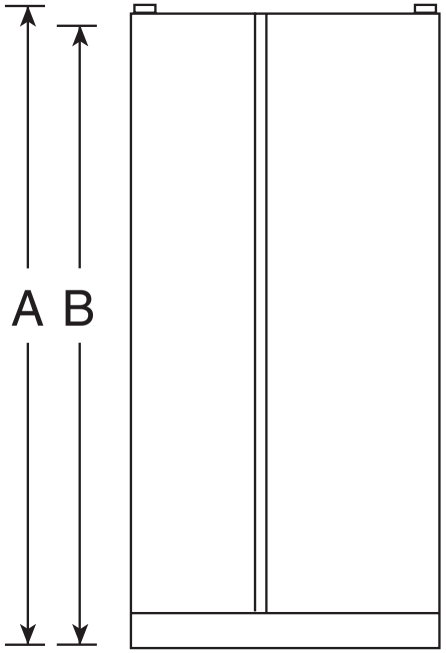
- Integrated shelf support system
- Adjustable slide-out, spillproof glass shelves
- Advanced water filtration
- Net Weight: 320 lbs.
- Parts Warranty: Limited 1-year entire appliance

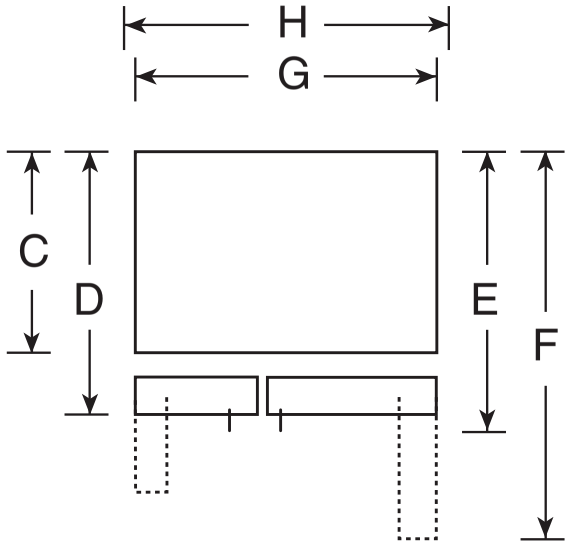
GSS25GSH/GMH

GE® 25.3 Cu. Ft. Side-By-Side Refrigerator with Dispenser

DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

Overall Dimensions	Height to top of hinge (in.) **A**	**69-1/2**
	Height to top of case (in.) **B**	**69**
	Case depth without door (in.) **C**	**28-1/2**
	Case depth less door handle (in.) **D**	**32-3/4**
	Case depth with door handle (in.) **E**	**35-1/4**
	Depth with fresh food door open 90˚ (in.) **F**	**50-1/2**
	Width (in.) **G**	**35-3/4**
	Width with door open 90˚ inc. door handle (in.) **H**	**43-1/2**
Air	Each side (in.)	**1/8**
	Top (in.)	**1**
	Back (in.)	**2**





GE APPLIANCES

For answers to your Monogram, GE Café™ Series, GE Profile™ Series or GE Appliances product questions, visit our website at geappliances.com or call GE Answer Center® Service, 800.626.2000.

Listed by Underwriters Laboratories

Specification Revised 8/17

GSS25GSH/GMH

GE® 25.3 Cu. Ft. Side-By-Side Refrigerator with Dispenser

FEATURES AND BENEFITS

Integrated shelf support system – Provides strong, flexible support

Adjustable slide-out, spillproof glass shelves – Raised edges help contain spills and make cleanup quick and easy

Fresh food multi-level drawers – Provide the ideal environment for storing your fruits and vegetables

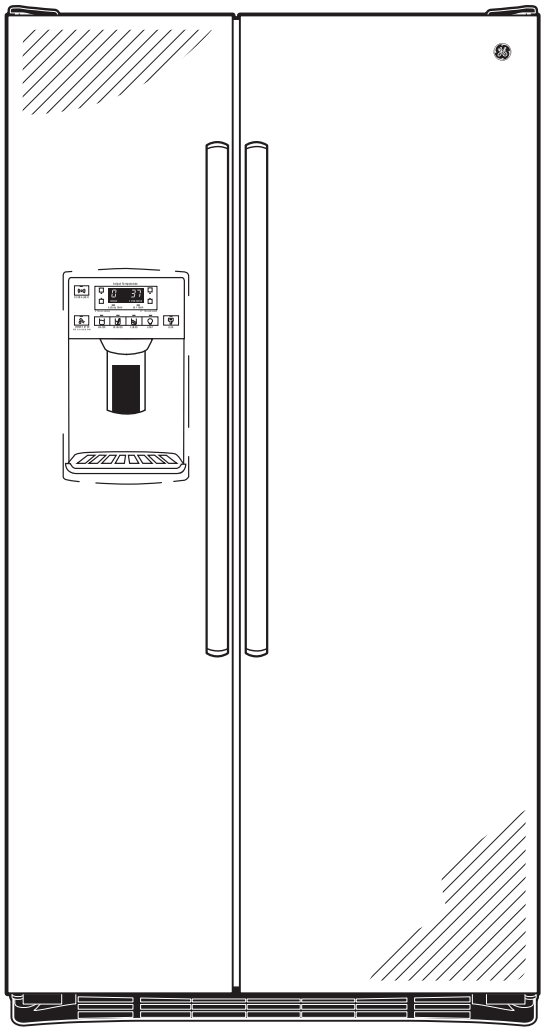
Adjustable gallon door bins – Offer ideal space for storing gallon containers in the door

Arctica icemaker – A special access door puts ice within reach

Advanced water filtration uses MWF replacement filter – Reduces trace pharmaceuticals from water and ice* (* Removes 98% of ibuprofen, atenolol, fluoxetine, progesterone and trimethoprim. These pharmaceuticals are not necessarily in all users' water)

Model GSS25GSHSS – Stainless Steel

Model GSS25GMHES – Slate



UFAS COMPLIANT

GE APPLIANCES

Specification Revised 8/17

Product: **30” Free-standing Electric Radiant Smooth Cooktop Range (Or Approved Equal)**

Manufacturer: GE Appliances

Location: SPED BLS Classroom



Model #:JB480SMSS

Product Details

- ADA Compliant
- Front controls
- 5.0 cu. ft. oven capacity
- Self-clean oven
- Dimensions: 47 H x 30 W x 29 D
- Net Weight: 141 Lbs
- Cooktop Burner: Radiant Smooth
- Element - Left Front: 6" 1500W
- Element -Left Rear: 8" 2000W

- Element - Right Front: 8" 2000W
- Element - Right Rear: 6" 1500W
- Oven Features: 4-Pass Bake Element; 6-Pass Broil Element
- Parts Warranty: Limited 1-year entire appliance
- Labor Warranty: Limited 1-year entire appliance

JB480SM

GE® Free-standing Electric Radiant Smooth Cooktop Range

FEATURES AND BENEFITS

Front controls – Minimize need to reach

5.0 cu. ft. oven capacity – Cook more dishes at once

Self-clean oven – Cleans the oven cavity without the need for scrubbing

Dual-element Bake – Upper and lower elements produce even heat and great results

Removable full-width storage drawer – Store cookware or kitchen accessories

Model JB480SMSS – Stainless steel



GE APPLIANCES

JB480SM

GE® Free-standing Electric Radiant Smooth Cooktop Range

DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

RECEPTACLE LOCATIONS

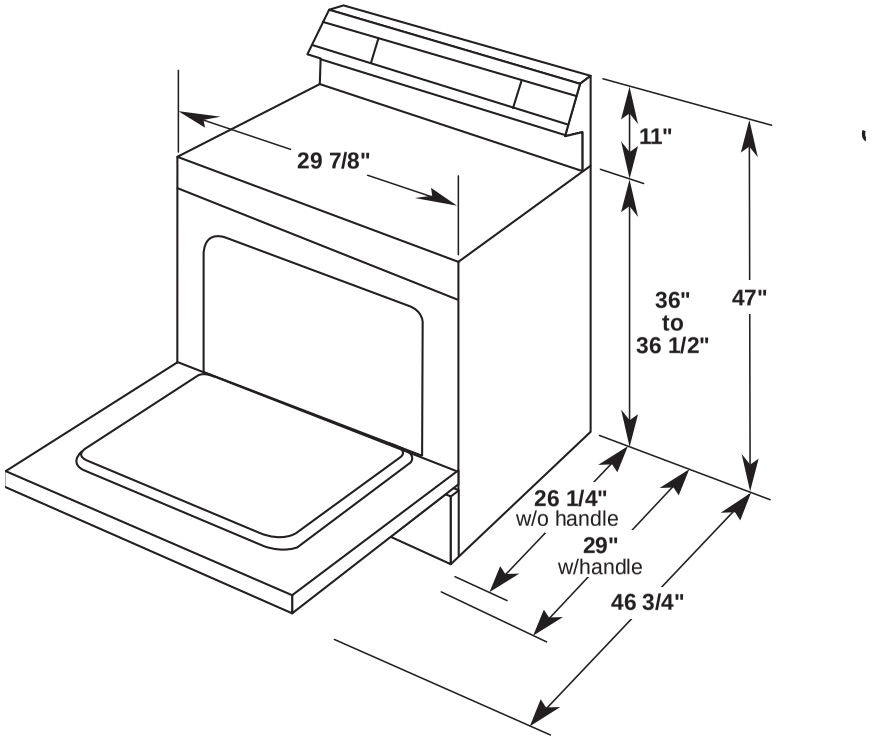
Locally approved flexible service cord or conduit must be used because terminals are not accessible after range installation. See shaded area in drawing for location of electrical outlet box. Recommended outlet locations allow range to be installed directly against wall.

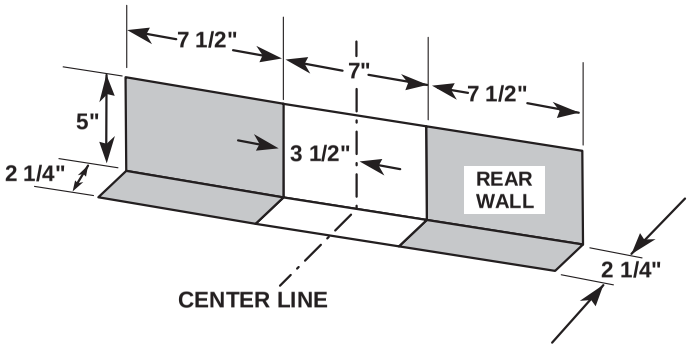
NOTE: This appliance has been approved for 0" spacing to adjacent surfaces above the cooktop. However, a 6" minimum spacing to surfaces less than 15" above the cooktop and adjacent cabinet is recommended to reduce exposure to steam, grease splatter and heat.

INSTALLATION INFORMATION: Before installing, consult installation instructions for current dimensional data and additional requirements.

KW RATING	
240V	10.5
208V	7.9
BREAKER SIZE	
240V	40 Amps†
208V	40 Amps†

†**NOTE:** Check local codes for required breaker size.





GE APPLIANCES

For answers to your Monogram, GE Café™ Series, GE Profile™ Series or GE Appliances product questions, visit our website at geappliances.com or call GE Answer Center® Service, 800.626.2000.

ADA COMPLIANT

All GE Appliances ranges are equipped with an Anti-Tip device. The installation of this device is an important, required step in the installation of the range.

Specification Revised 9/18

Product: 16.6 Cu. Ft. Top-Freezer Refrigerator (Or Approved Equal)

Manufacturer: GE Appliances

Location: Faculty Staff Lounge, Kitchen Staff Lunchroom, and Nurse's Office / Triage Room





Model #: GTS17GSNRSS

Product Details

- Color: Stainless Steel (Also available in white)
- Dimensions: 28" W x 32-5/8" D x 64-3/4" H
- Total Capacity: 16.6 cu. ft.
- Fresh Food Capacity: 12.6 cu. ft.
- Freezer CapacityL 4.04 cu. ft.
- LED Lighting

- Edge-to-Edge Glass Shelves
- Adjustable Wire Freezer Shelf: Easily adjusts between two positions to accommodate items of all shapes and sizes
- Upfront Temperature Controls: Easy-to-use controls regulate both fresh food and freezer sections
- Made in America: 70 to 90% U.S. Content

Product: **26" Air Cooled Undercounter Half Cube Ice Machine - 222 lb. (Or Approved Equal)**

Manufacturer: Avantco

Location: Gymnasium and JROTC Collaboration / Breakroom

Capable of producing up to 222 lb. of half cube ice per day, these larger footprint undercounters are great for meeting high production and capacity needs of busy restaurants, bars, or cafes. This machine also comes with an 80 lb. bin to store a larger amount of ice once its made.



UC-210-HA

Overall Dimensions:

Width:	26 Inches
Depth:	27 Inches
Height:	38 3/16 Inches

Product Details

- Unit makes up to 222 lb. of half cube ice per day while storing up to 80 lb.
- Durable 304 stainless steel exterior with a polyethylene interior
- Digital controller allows user to quickly identify issues and the current stage of production
- Includes bright LED lights to illuminate the ice bin and a removable air filter for quick cleaning a
- Eco-friendly R290 refrigerant; 115V; NEMA 5-15P

ICE MACHINES
AVANTCO

PROJECT: _____

MODEL: _____ SERIAL#: _____

ITEM #: _____ QUANTITY: _____

APPROVAL: _____ DATE: _____

Undercounter Ice Machines

Air Cooled, Half Cube

MODELS #194UC210HA

Always have plenty of ice on demand in bars, restaurants, or concession stands.



FEATURES

- Durable stainless steel exterior
- Digital controller notifies user of any issues, stage of production, cleaning cycle, and adjusts ice thickness
- Air filter is easily removable for cleaning
- Includes mounting holes for OceanLoch water filters
- Includes adjustable legs for leveling your ice machine
- Includes ice scoop

ICE STYLE

This unit produces half cube size ice.



Half Cube
⅜" x ⅞" x ⅞"



Full Cube
⅞" x ⅞" x ⅞"

24 HOUR ICE PRODUCTION

70°F air/50°F water	222 lb.
90°F air/70°F water	147 lb.





OPTIONS & ACCESSORIES

790OCLOKITM
C Pure, Oceanloch-M Water Filtration System, 1 Micron Rating and 1.67 GPM



WARRANTY

RESIDENTIAL: Avantco assumes no liability for parts or labor coverage for component failure, factory defect or any other damages for units installed in non-commercial foodservice or residential applications.

1 year WARRANTY
Parts & Labor

5 year WARRANTY
Compressor

Intertek Intertek DOE COMPLIANT

★ Conforms to UL & NSF-7 Standards

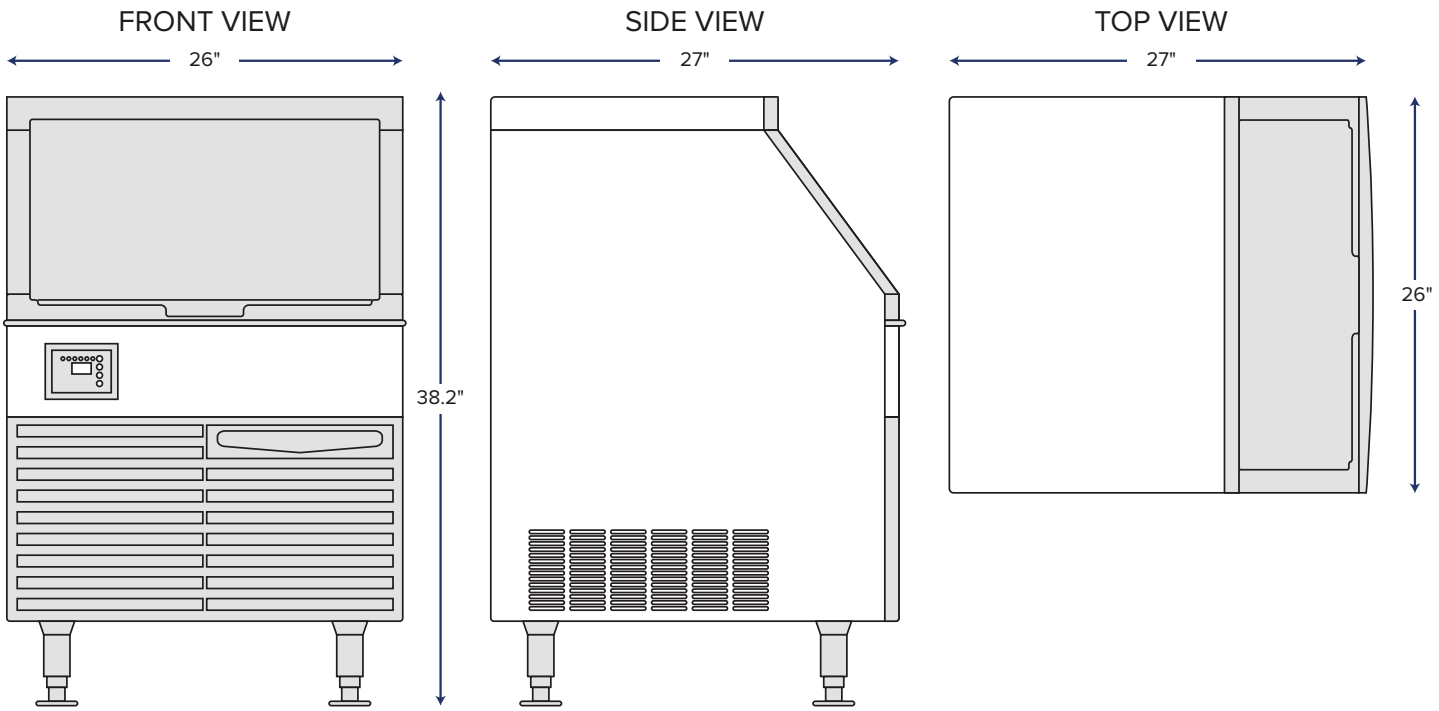
ICE MACHINES
AVANTCO

Undercounter Ice Machines

Air Cooled, Half Cube

MODELS #194UC210HA

PLAN VIEW



TECHNICAL DATA

Installation Requirements

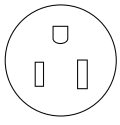
Ambient Temperature Range	40° to 90°F
Water Temperature Range	40° to 90°F
Water Pressure Range	18.75 psi min; 80 psi max
Potable Water Usage	24 gal/100 lbs. ice

Dimensions

Unit Dimensions	26"W x 27"D x 38.2"H
Net Weight	126 lb.
Gross Weight	148 lb.
Packaging Dimensions	30.8"W x 29.4"D x 35.5"H

Electrical

Voltage	115
Amps	5.8
Hz	60
Phase	1
Plug Type	NEMA 5-15P
BTU/hr	1795
Power kWh/100 lbs. Ice	7
Max Fuse Size or HACR Breaker	15
Refrigerant	R290



NEMA 5-15P

© 2020 Avantco Refrigeration

Product: 1.6 cu. ft. Countertop Microwave Oven (Or Approved Equal)

Manufacturer: GE Appliances

Location: Faculty Staff Lounge, Kitchen Staff Lunchroom, and SPED BLS Classrooms





Model #: JES1657SMSS

Product Details

- Color Appearance: Stainless Steel
- 1.6 cu. ft. capacity
- Sensor cooking controls
- Weight and time defrost
- Dimensions: 21-3/4" W x 17- 3/4" D x 12-7/8" H
- Cavity Dimensions: 16-5/8" x 10-1/4
- Weight: 39 lbs.
- 1150 Watts (IEC-705 test procedure)
- Weight And Time Defrost: Simply enter the weight of the food, and the oven automatically sets the optimal defrosting time and power level or set your desired time for defrosting
- Turntable: Glass; Rotates food throughout the cycle
- Turntable Size: 13-5/8" dia.

- Instant On Controls: One-Touch Instant Operation
- Control Lockout: Helps Prevent Accidental Activation
- Add 30 Seconds: Increases Cooking times with one touch
- Timer ON/OFF: Minute timer helps keep you on track
- Warranty: Limited 1-year entire appliance

JES1657DM/SM/BM

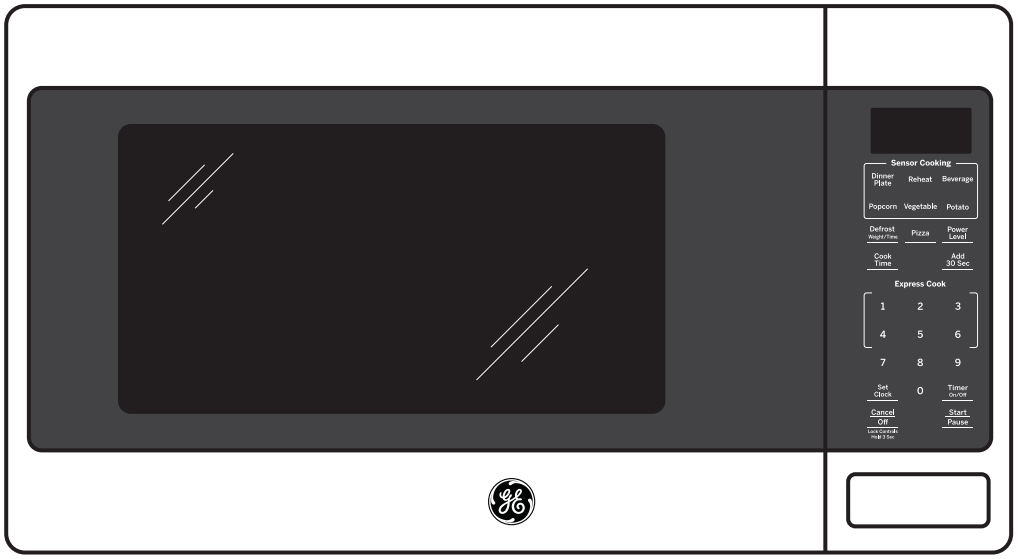
GE® 1.6 Cu. Ft. Countertop Microwave Oven

DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

EXTERIOR DIMENSIONS* (IN INCHES)	
W x H x D	21 3/4 x 12 7/8 x 17 3/4

*Height includes feet.

This unit designed to be placed on countertop.



GE APPLIANCES

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Listed by Underwriters Laboratories

Specification Created 2/18

JES1657DM/SM/BM

GE® 1.6 Cu. Ft. Countertop Microwave Oven

FEATURES AND BENEFITS

1.6 cu. ft. capacity – 1150 Watts (IEC-705 test procedure)

Sensor cooking controls – Automatically adjusts time and power

Auto and time defrost – Defrosting times and power levels are programmed automatically or manually for optimal results

Turntable – Rotates food throughout the cycle

Instant on controls – One-touch instant operation

Control lockout – Helps prevent accidental activation

Cooking complete reminder – Know when your food is ready

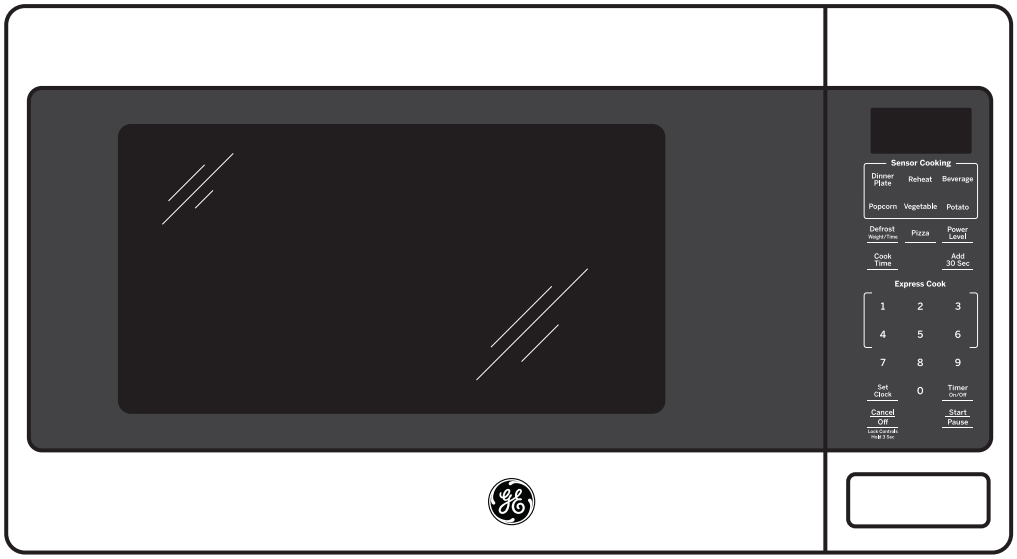
Timer on/off – Minute timer helps keep you on track

Model JES1657DMBB – Black

Model JES1657DMWW – White

Model JES1657SMSS – Stainless steel

Model JES1657BMTS – Black stainless



GE APPLIANCES

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Specification Created 2/18

Product: **ADA Compliant Stainless Steel Interior Dishwasher (Or Approved Equal)**

Manufacturer: GE Appliances

Location: SPED BLS Classroom





Model #:GDT226SSLSS

Product Details

- ADA Compliant with Low-Profile Installation
- 3-Level Wash
- Autosense Cycle - s beam of light measures soil levels and water temperature to adjust to the ideal cycle time
- Dimensions: 32 1/4 H x 23 3/4 W x 23 1/2 D
- Color Appearance: Stainless Steel
- Door Style: Stainless Full-Length Flat door
- Flush Cabinet Installation with Hidden Controls
- Towel Bar
- Sanitize option (NSF certified)

- Piranha hard food disposer with removable filter
- Hidden vent with fan dry
- Floor protect - uncommon leaks can be easily detected and contained
- 51 dBA - motor runs quietly to keep kitchen peaceful
- Limited 1-year entire appliance warranty

GDT226SSL

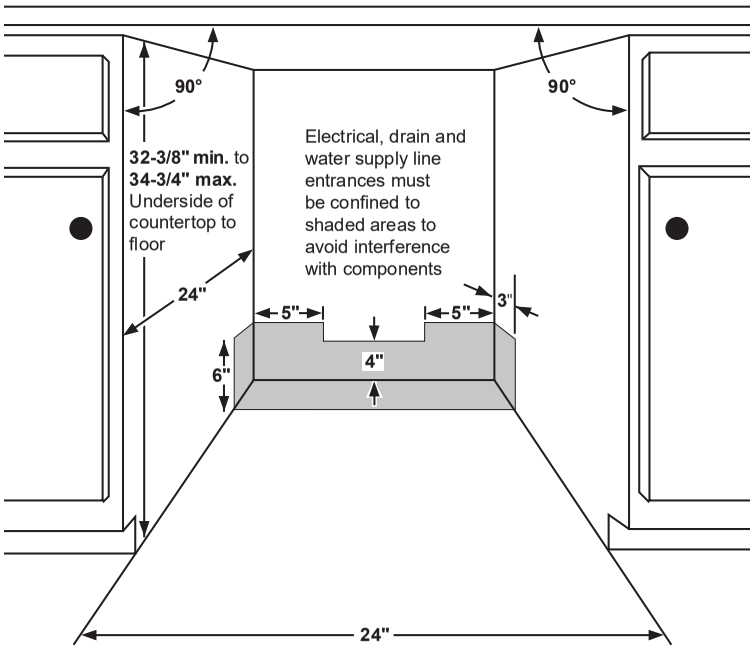
GE® Stainless Steel Interior Dishwasher with Hidden Controls

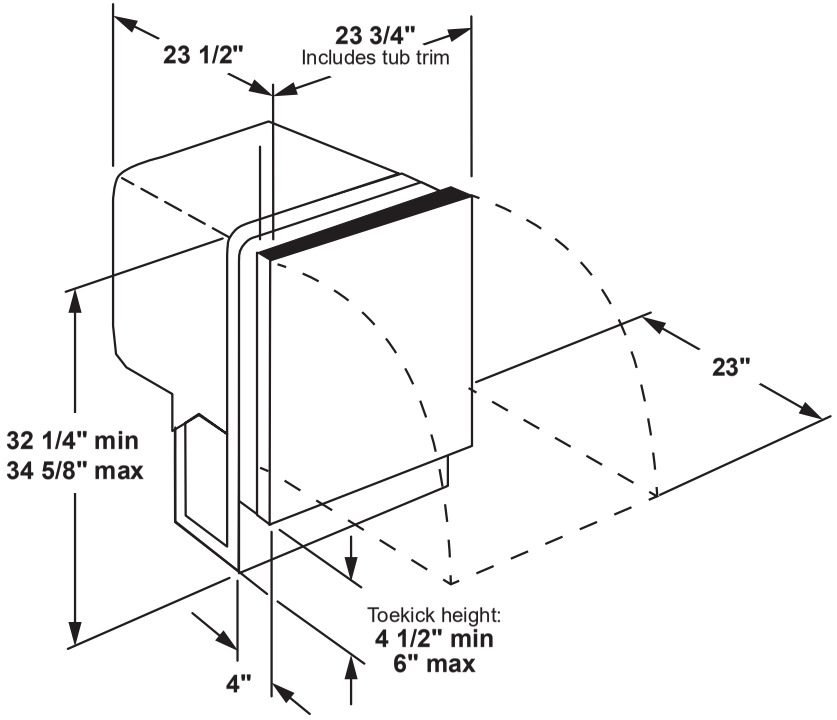
DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

ELECTRICAL RATING

Voltage AC.....120
Hertz.....60
Total connected load amperage.....8.9

For use on adequately wired 120-volt, 15-amp circuit having 2-wire service with a separate ground wire. This appliance must be grounded for safe operation.





GE APPLIANCES

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ADA COMPLIANT

NSF

UL® Listed by Underwriters Laboratories

ENERGY STAR

As an ENERGY STAR® partner, GE has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Specification Created 12/18

GDT226SSL

GE® Stainless Steel Interior Dishwasher with Hidden Controls

FEATURES AND BENEFITS

ADA Compliant with Low-Profile Installation – Great for 34″ counter top heights and raised subfloors

3-Level Wash – Expect exceptionally clean table-ready dishes with powerful wash arms

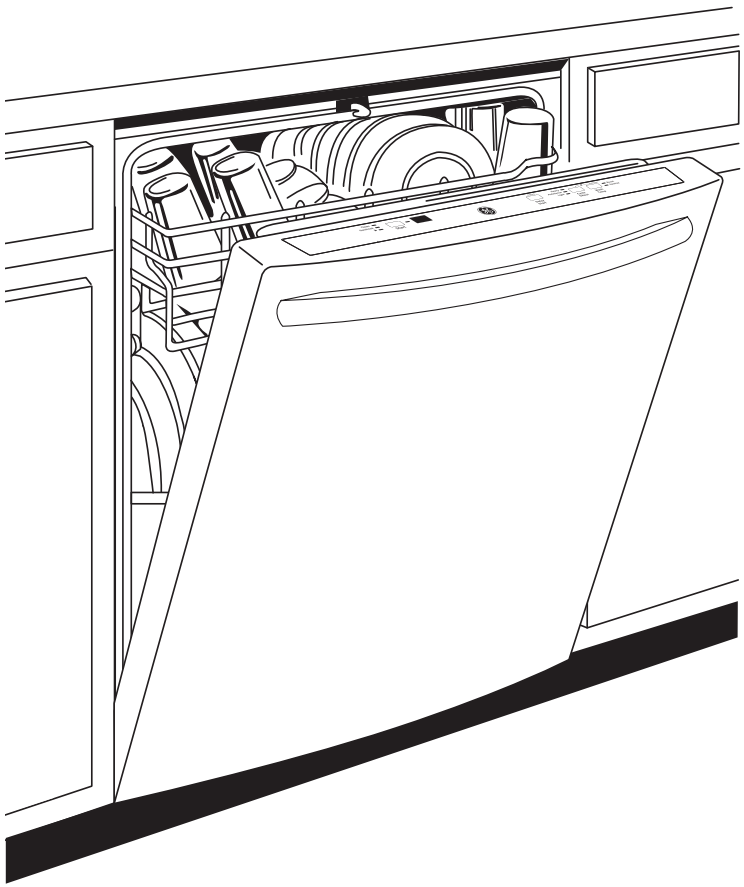
Autosense Cycle – A beam of light measures soil levels and water temperature to adjust to the ideal cycle time

Piranha™ hard food disposer with removable filter – To ensure consistently clean items, this stainless steel blade rotates at 3,600 RPM to pulverize food particles and helps to prevent large particles from clogging the wash arms

Sanitize option (NSF Certified) – High-temperature rinse sanitizes and reduces by 99.999% the bacteria found on dishes

dBA 51

Model GDT226SSLSS – Stainless steel



GE APPLIANCES

As an ENERGY STAR® partner, GE has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Specification Created 12/18

Product: **4.8 cu. ft. Capacity Smart Front Load ENERGY STAR® Washer**

Manufacturer: GE

Location: SPED BLS Classroom



Product Details

- Dimensions: 39 3/4 H x 28 W x 32 D
- ADA-compliant - Designed for easy operation and access as required by the Americans with Disabilities Act
- Color: Diamond Gray
- UltraFresh Vent System With OdorBlock™: The first and only UltraFresh Vent System with OdorBlock™ eliminates excess moisture to help prevent odors ensuring your washer stays fresh and clean
- Microban® antimicrobial technology: Built into components including the gasket, dispenser and draining system delivering protection that lives on load after load
- Built-in WiFi: Start, stop and monitor your laundry from anywhere while receiving real-time notifications and updates

- Sanitize with Oxi: Remove 99% of bacteria with a dedicated cycle that uses an Oxi additive to boost your detergent's cleaning power, while keeping fabrics looking and feeling their best
- Dynamic Balancing Technology (dBT™): Our patented, time saving technology senses and rebalances uneven loads during the spin cycle, providing a quiet wash
- Reversible Door: Easily reverse your washer and dryer door for superior installation flexibility
- Quick Wash Cycle: Provides a fast 20 minute wash for lightly soiled items
- 10-year Limited Warranty: Rest assured knowing your washer is backed by a 10-year warranty

GFW550SSN/SPR

GE® 4.8 cu. ft. Capacity Front Load ENERGY STAR® Washer with UltraFresh Vent System with OdorBlock™

FEATURES AND BENEFITS

UltraFresh Vent System With OdorBlock™ – The first and only UltraFresh Vent System with OdorBlock™ eliminates excess moisture to help prevent odors ensuring your washer stays fresh and clean.

Microban® antimicrobial technology – Built into components including the gasket, dispenser and draining system delivers protection that lives on load after load.

Built-in WiFi – Start, stop and monitor your laundry from anywhere while receiving real-time notifications and updates.

Sanitize with Oxi – Remove 99% of bacteria with a dedicated cycle that uses an Oxi additive to boost your detergent's cleaning power, while keeping fabrics looking and feeling their best

Dynamic Balancing Technology (dBT™) – Our patented, time saving technology senses and re-balances uneven loads during the spin cycle, providing a quiet wash.

Reversible door – Easily reverse your washer and dryer door for superior installation flexibility.

32-In Depth – Fits into more homes, with no additional installation space required.

Quick Wash Cycle – Provides a fast 20 minute wash for lightly soiled items

10-year Limited Warranty – Rest assured knowing your washer is backed by a 10-year warranty.

Model GFW550SSNWW – White

Model GFW550SPRRS – Sapphire Blue



GE APPLIANCES

For answers to your Monogram, GE Café™, GE Profile™ or GE Appliances product questions, visit our website at geappliances.com or call GE Answer Center® Service, 800.626.2000.

ADA COMPLIANT

ENERGY STAR

Specification Revised 5/22

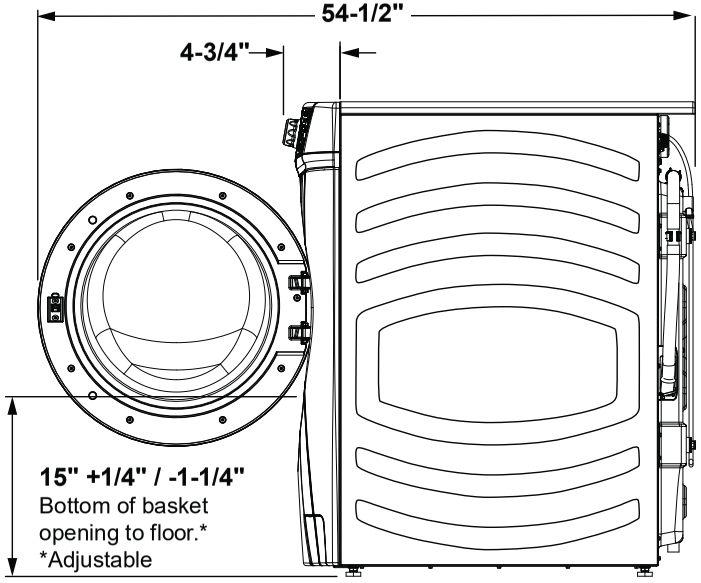
GFW550SSN/SPR

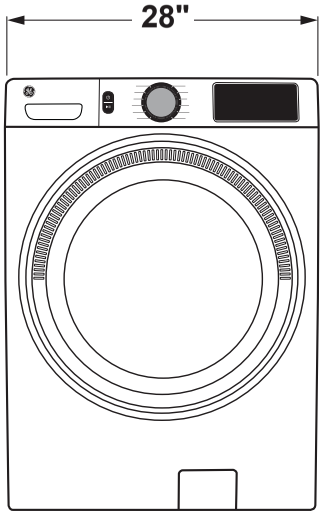
GE® 4.8 cu. ft. Capacity Front Load ENERGY STAR® Washer with UltraFresh Vent System with OdorBlock™

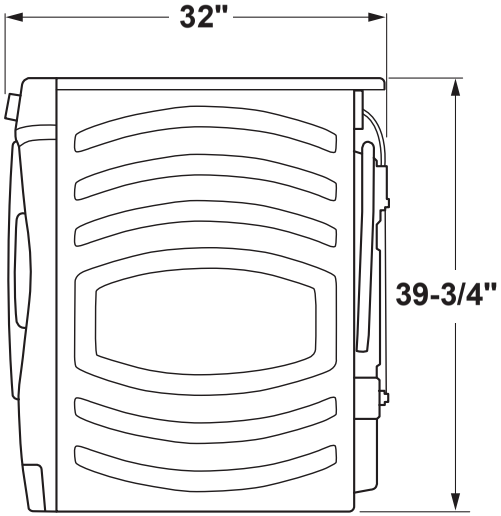
DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

ELECTRIC RATING	
120V	11.0A, 60Hz

INSTALLATION INFORMATION: For complete information, see installation instructions packed with your washer.







*With leveling leg adjust.

GE APPLIANCES

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Listed by Underwriters Laboratories

Specification Revised 5/22

GFW550SSN/SPR

GE® 4.8 cu. ft. Capacity Front Load ENERGY STAR® Washer with UltraFresh Vent System with OdorBlock™

SPECIAL INSTALLATION REQUIREMENTS:

STACKED INSTALLATION:

-Brackets for stacking dryer over washer are not included with the washer. Order part no. GFA28KITN.

ALCOVE OR CLOSET INSTALLATION:

-If your dryer is approved for installation in an alcove or closet, it will be stated on a label on the dryer back.

-The dryer MUST be exhausted to the outside.

-Minimum clearances between dryer cabinet and adjacent walls or other surfaces are: 0" all sides and top.*

-Closet doors must be louvered or otherwise ventilated and must contain a minimum of 60 sq. in. of open area equally distributed. If this closet contains both a washer and a dryer, doors must contain a minimum of 120 sq. in. of open area equally distributed.

-No other fuel-burning appliance shall be installed in the same closet with a gas dryer.

BATHROOM OR BEDROOM INSTALLATION:

-The dryer MUST be exhausted to the outdoors.

-The installation must conform with the local codes, or in the absence of local codes, with the National Electric Code and National Fuel Gas Code, ANSI Z223.

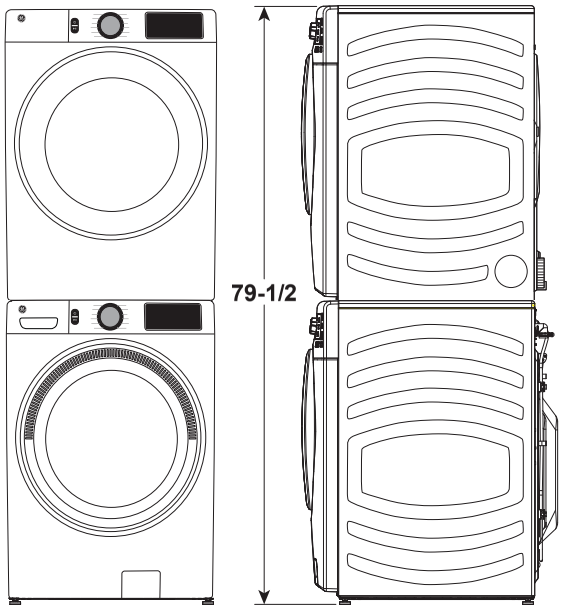
MINIMUM CLEARANCE OTHER THAN ALCOVE OR CLOSET INSTALLATIONS:

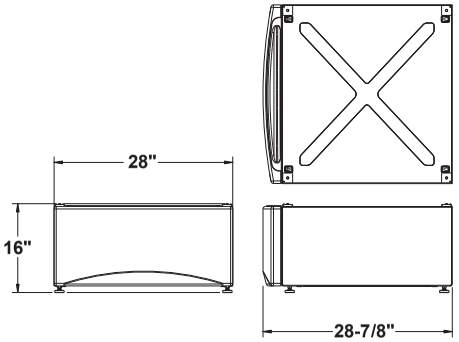
-Minimum clearances to combustible surfaces 0" all sides and top.*

FOR MORE INFORMATION ON VENTING KITS AND ACCESSORIES, PLEASE CALL 1-800-GE-CARES.

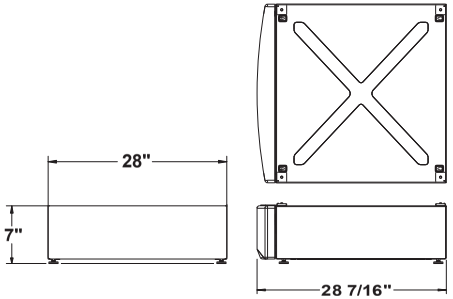
*For improved performance, a 1/2" clearance is suggested on each side.

STACKED DIMENSIONS (IN INCHES)





PEDESTAL DIMENSIONS (IN INCHES)
GFP1528PNRS - SAPPHIRE BLUE
GFP1528SNWW - WHITE
This optional 16" pedestal raises the door opening and height of the washer or dryer.



RISER DIMENSIONS (IN INCHES)
GFR0728PNRS - SAPPHIRE BLUE
GFR0728SNWW - WHITE
This optional 7" riser raises the door opening and height of the washer or dryer while remaining ADA compliant.

GE APPLIANCES

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Specification Revised 5/22

Product: GE® 7.8 cu. ft. Capacity Smart Front Load Electric Dryer

Manufacturer: GE

Location: SPED BLS Classrooms



Product Details

- Dimensions: 39 3/4 H x 28 W x 32 D
- ADA-compliant - Designed for easy operation and access as required by the Americans with Disabilities Act
- Color: Diamond Gray
- Quick Dry: Quickly dries items and small loads for families on the go
- Sanitize Cycle: Sterilize clothing with elevated temperatures designed to kill common household bacteria
- Wrinkle Care: Prevents wrinkles by extending the tumble without heat
- Sensor Dry: Prevent over-drying and protect your clothing thanks to innovative dual thermistor technology, that continually monitors temperature and moisture
- Damp Alert: Signals when delicate clothes reach the ideal dampness level for ironing or final air drying

- Vent Sensor: Provides alerts when a restriction is detected in your dryer vent
- 4-Way Venting: Easy-to-change venting options provide the ultimate installation flexibility to fit in your home
- Reversible Door: Easily reverse your washer and dryer door for superior installation flexibility
- Built-in WiFi: Start, stop and monitor your laundry from anywhere while receiving real-time notifications and updates

GFD55ESSN/ESPR

GE® 7.8 cu. ft. Capacity Front Load Electric Dryer

FEATURES AND BENEFITS

Built-in WiFi – Start, stop and monitor your laundry from anywhere while receiving real-time notifications and updates.

Quick Dry – Quickly dries items and small loads for families on the go.

Sanitize Cycle – Sterilize clothing with elevated temperatures designed to kill common household bacteria.

Wrinkle Care – Prevents wrinkles by extending the tumble without heat.

HE Sensor Dry – Prevent over-drying and protect your clothing thanks to innovative dual thermistor technology, that continually monitors temperature and moisture.

Damp Alert – Signals when delicate clothes reach the ideal dampness level for ironing or final air drying.

Vent Sensor – Provides alerts when a restriction is detected in your dryer vent.

4 Way Venting – Easy-to-change venting options provide the ultimate installation flexibility to fit in your home.

Reversible door – Easily reverse your washer and dryer door for superior installation flexibility.

Model GFD55ESSNWW – White

Model GFD55ESPRRS – Sapphire Blue



ADA COMPLIANT

ENERGY STAR

GE APPLIANCES

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Specification Revised 5/22

GFD55ESSN/ESPR

GE® 7.8 cu. ft. Capacity Front Load Electric Dryer

DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

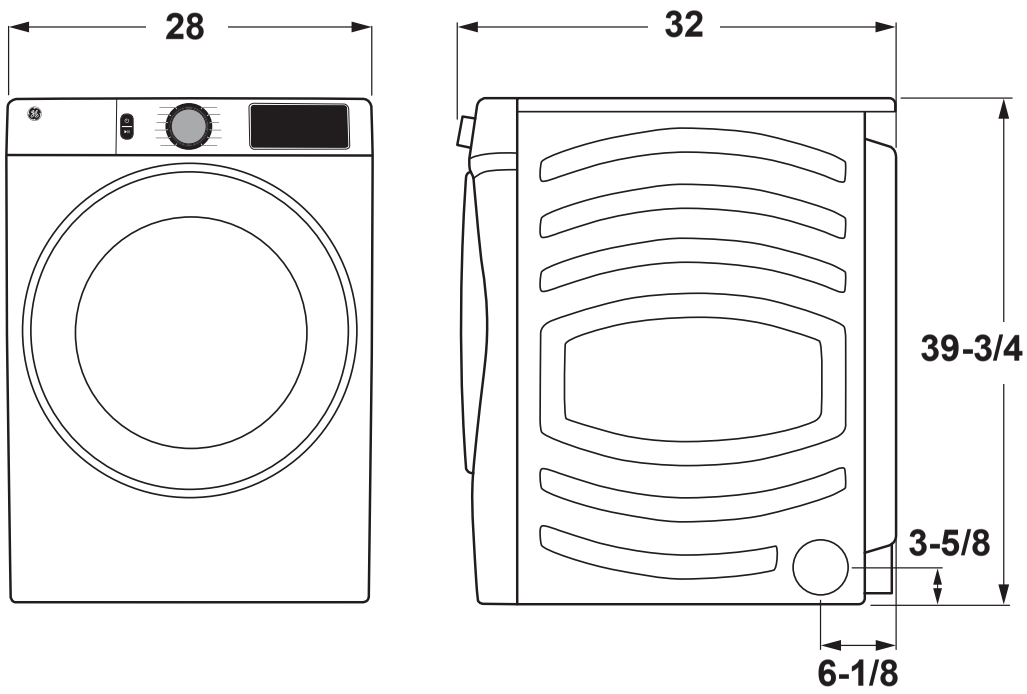
ELECTRIC DRYER RATING	
120V/240V	5600W, 25A, 60Hz
120V/208V	4300W, 23A, 60Hz

EXHAUST OPTIONS: 4-way via rear, left, right, and bottom. (The right, left, and bottom venting options require Side Vent Kit: GFA28DSVN)

CIRCUIT REQUIREMENTS: An individual, properly grounded branch circuit, protected by a 30-amp circuit breaker or a time-delay fuse, is required.

NOTE: Dryer wall outlet must be located within 36" of service cord entry and accessible when dryer is mounted in position.

INSTALLATION INFORMATION: For complete information, see installation instructions packed with your dryer.



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Listed by Underwriters Laboratories

Specification Revised 5/22

GFD55ESSN/ESPR

GE® 7.8 cu. ft. Capacity Front Load Electric Dryer

SPECIAL INSTALLATION REQUIREMENTS:

STACKED INSTALLATION:
Brackets for stacking dryer over washer are not included with the dryer. Order part no. GFA28KITN.

ALCOVE OR CLOSET INSTALLATION:
If your dryer is approved for installation in an alcove or closet, it will be label on the dryer back.

The dryer MUST be exhausted to the outside.

Minimum clearances between dryer cabinet and adjacent walls or other surfaces are: 0" all sides and top.*

Closet doors must be louvered or otherwise ventilated and must contain a minimum of 60 sq. in. of open area equally distributed. If this closet contains both a washer and a dryer, doors must contain a minimum of 120 sq. in. of open area equally distributed.

No other fuel-burning appliance shall be installed in the same closet with a gas dryer.

BATHROOM OR BEDROOM INSTALLATION:
The dryer MUST be exhausted to the outdoors.

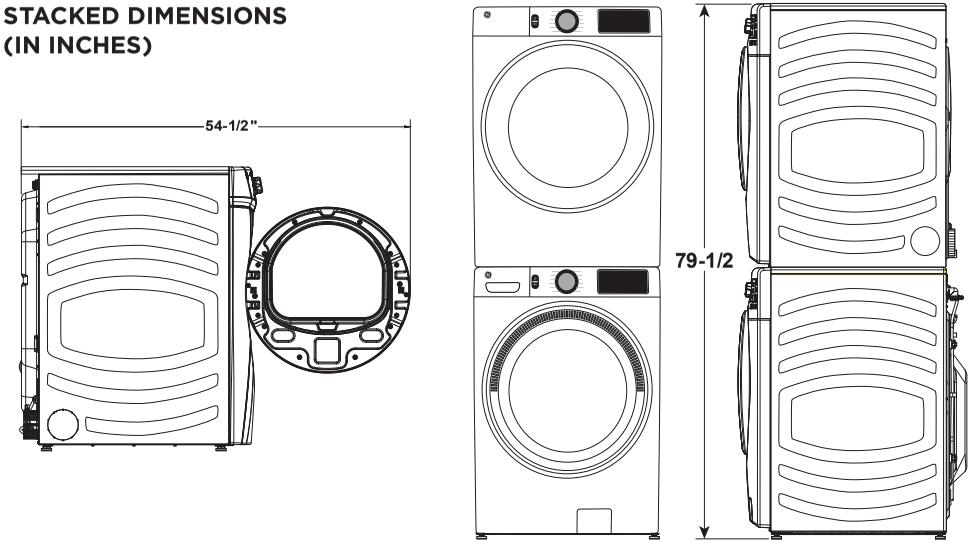
The installation must conform with the local codes, or in the absence of local codes, with the National Electric Code and National Fuel Gas Code, ANSI Z223 for gas dryers.

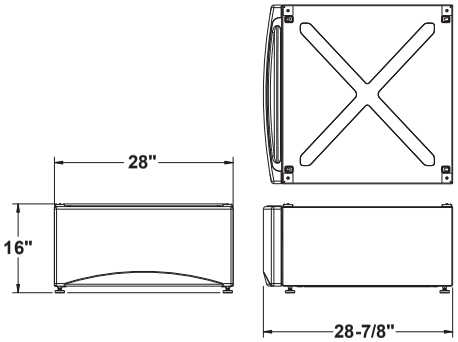
MINIMUM CLEARANCE OTHER THAN ALCOVE OR CLOSET INSTALLATIONS:
Minimum clearances to combustible surfaces 0" all sides and top.*

FOR MORE INFORMATION ON VENTING KITS AND ACCESSORIES,PLEASE CALL 1-800-GE-CARES.

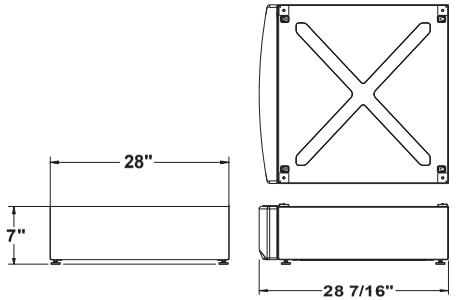
*For improved performance, a 1/2" clearance is suggested on each side.

STACKED DIMENSIONS (IN INCHES)





PEDESTAL DIMENSIONS (IN INCHES)
GFP1528PNRS - SAPPHIRE BLUE
GFP1528SNWW - WHITE
This optional 16" pedestal raises the door opening and height of the washer or dryer.



RISER DIMENSIONS (IN INCHES)
GFR0728PNRS - SAPPHIRE BLUE
GFR0728SNWW - WHITE
This optional 7" riser raises the door opening and height of the washer or dryer while remaining ADA compliant.

GE APPLIANCES

For answers to your Monogram, GE Café™, GE Profile™ or GE Appliances product questions, visit our website at geappliances.com or call GE Answer Center® Service, 800.626.2000.

Listed by Underwriters Laboratories

Specification Revised 5/22

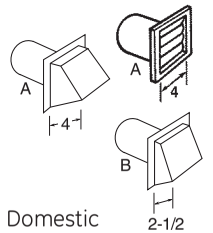
GFD55ESSN/ESPR

GE® 7.8 cu. ft. Capacity Front Load Electric Dryer

DRYER EXHAUSTING INFORMATION –METAL DUCT ONLY

For complete information, see installation instructions packed with your dryer.

DUCTING MATERIALS: For best performance, this dryer should be vented with 4" diameter all rigid metal exhaust duct. If rigid metal duct cannot be used, then UL-listed flexible metal (semi-rigid) ducting can be used (Kit WX08X10077). In special installations, it may be necessary to connect the dryer to the house vent using a flexible metal (foil-type) duct. A UL-listed flexible metal (foil-type) duct may be used ONLY in installations where rigid metal or flexible metal (semi-rigid) ducting cannot be used AND where a 4" diameter can be maintained throughout the entire length of the transition duct. Please see installation instruction packed with your dryer for complete instructions when using flexible metal (foil type) ducting.



Domestic dryer models		Best performance	
		Maximum length of 4" dia. **rigid metal** duct	
		Exhaust hood type	
	Number of 90° turns	**A** 4" opening	**B** 2-1/2" opening
	0	90 ft.	60 ft.
	1	60 ft.	45 ft.
	2	45 ft.	35 ft.
	3	35 ft.	25 ft.
	4	25 ft.	15 ft.

EXHAUST LENGTH CALCULATION:

1. Determine the number of 90° turns needed for your installation. If you exhaust to the side or bottom of dryer, add one turn.
2. The maximum length of 4" rigid (aluminum or galvanized) duct which can be tolerated is shown in the table.

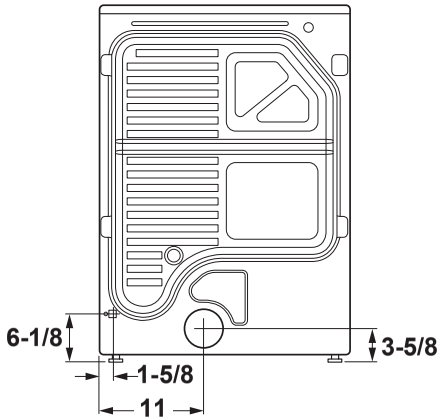
   A turn of 45° or less may be ignored. Two 45° turns within the duct length should be treated as a 90° elbow.

   A turn over 45° should be treated as a 90° elbow.

Dryers must be exhausted to the outside.

CAUTION: For personal safety do not terminate exhaust into a chimney, under any enclosed house floor (crawl space), or into an attic, since the accumulated lint could create a fire hazard or moisture could cause damage. Never terminate the exhaust into a common duct or plenum with a kitchen exhaust, since the combination of lint and grease could create a fire hazard.

Exhaust ducts should be terminated in a dampered wall cap to prevent back drafts, bird nesting, etc. The wall cap must also be located at least 12" above the ground or any other obstruction with the opening pointed down.



FOR MORE INFORMATION ON VENTING KITS AND ACCESSORIES, PLEASE CALL 1-800-GE-CARES.

GE APPLIANCES

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Listed by Underwriters Laboratories

Specification Revised 5/22

Product: 12/24 Hour Wall Clock (Or Approved Equal)

Manufacturer: Infinity Instruments LTD

Location: All Classrooms

The 12-Inch 12/24 Hour Plastic Wall Clock from Infinity Instruments features reliable quartz movements and a secondary set of red numbers for keeping military time. The shatter-resistant safety lens and high-impact plastic casing ensure durability. Bold numbering on a white background makes reading easy from far away. Operates on a AA battery (not included).



Product Details

- Face Color: White
- Frame Finish: Powder coat
- Frame Material: Shatter-resistant plastic
- Display Type: Arabic dial
- Batteries: 1 AA battery (not included)
- Warranty: 3-year limited
- Diameter: 12"
- Product Weight: 2 lbs.

Product: **Basic 47 Laboratory Hood Package - Fume Hood, Work Surface and Cabinet (Or Approved Equal)**

Manufacturer**:** Labconco

Location: Chemistry Classroom Laboratory

Labconco Basic 47 Laboratory Hood, measuring 47"W x 25"D x 53"H, has an epoxy-coated steel interior and exterior for corrosion resistance to low volume chemical fumes and vapors. It has a compact size for areas with low ceilings or narrow aisles such as trailers or temporary buildings. It requires ducting from 10.13 in OD exhaust opening and features by-pass airflow, airfoil, 100 W incandescent light, internal wiring and switches. It comes with a 0.3 hip blower that is capable of overcoming maximum external static pressure of 0.25 in H2O at 720 CFM that is mounted atop the hood or remotely. 4' Flat Solid Epoxy Work Surface and Protector Acid Storage Cabinet included.



Product Details

- By-pass airflow design
- Durable glacier white powder-coated 16 gauge steel exterior and interior resists chemical exposure
- Vertical-rising tempered safety glass sash
- Adjustable two-piece baffle
- Curved air foil that lifts off for cleaning
- Removable front panel for access to electrical wiring
- Right side fixture panel factory-prepared to accept up to three service fixtures, one electrical duplex and one airflow monitor (kits sold separately)
- Right interior wall factory-prepared for one cupsink and turret (cupsink and turret kit sold separately)
- Powder-coated steel 10.3” OD exhaust connection
- Required Accessories Remote Blower (except Built-In Blower Models), Ductwork, Base cabinet(s) or stand, and Solid Epoxy Flat Work Surface
- Fume Hood Dimensions: 47"W x 25"D x 53"H
- Fume Hood Weight: 370 lbs
- Cabinet Dimensions: 48"W x 22"d
- Cabinet Weight: 170 lbs
- Work Surface Dimensions: 48"W x 30"W x 1.25"H
- Work Surface Weight: 165 lbs

Basic 47 Laboratory Hood

View online: https://www.labconco.com/product/basic-47-laboratory-hood-3/718



Overview

Basic Laboratory Hoods are designed specifically for laboratories, classrooms and light duty applications where safe ventilation is required. Constructed of powder-coated steel, Basic Hoods are economical and have a smaller overall height and depth than traditional hoods so they fit in areas with low ceilings or narrow aisles. Choose from 4 and 6-foot widths.

Both standard and built-in blower models are available.

Catalog Number: 2247400

Specifications

- **Weight:** 280.0 lbs
- **Weight metric:** 127.0 kg
- **Dimensions:** 47.0" w x 25.0" d x 48.0" h
- **Dimensions metric:** 119.4 cm x 63.5 cm x 121.9 cm
- **Electrical:** 100-115 volts, 50/60 Hz, 1 amp, Domestic
- **Product Subcategory:** General Chemistry
- **Nominal Width:** 4'
- **Region:** U.S. and Canada
- **Blower Requirements:** Remote blower required
- **Conformance:** ANSI Z9.5, ASHRAE 110, ASTM E84, CAN/CSA C22.2, NFPA 45, SEFA 1, UL
- **Lighting:** incandescent
- **Style:** Benchtop

Description

Features (All Models)

- By-pass airflow design
- Durable glacier white powder-coated 16 gauge steel exterior and interior resists chemical exposure
- Vertical-rising tempered safety glass sash
- Adjustable two-piece baffle
- Curved air foil that lifts off for cleaning
- Removable front panel for access to electrical wiring
- Right side fixture panel factory-prepared to accept up to three service fixtures, one electrical duplex and one airflow monitor (kits sold separately)
- Right interior wall factory-prepared for one cupsink and turret (cupsink and turret kit sold separately)
- Powder-coated steel 10.3” OD exhaust connection
- ETL listed (115V models)
- CE conformity (220V models)

Vapor-Proof Models Feature

- Pre-wired 100-watt vapor-proof incandescent light
- Pre-wired light and blower switches

Explosion-Proof Models Feature

- Explosion-proof incandescent light fixture (requires installation; bulb not included)
- Furnished without switches and wiring as these must conform to local codes

Models with Blower Module Feature

- Belt-driven blower with adjustable sheave
- Powder-coated steel base and housing
- Corrosion-resistant coated steel impeller

Options

- 4' and 6' widths
- Versatile built-in blower that mounts on top of the hood liner, above the hood or at a remote location
- Explosion-proof light and blower
- International electrical configurations
- Unassembled hoods

Required Accessories

- Remote Blower (except Built-In Blower Models)
- Ductwork
- Base cabinet(s) or stand
- Solid Epoxy Flat Work Surface

Optional Accessories

- Service Fixture Kits
- Electrical Receptacle Kits
- Cupsink and Turret Kit
- Guardian Airflow Monitor Kit
- Sash Stop Kit
- Right Side Finish Panel Kit

For Product Assistance



Eric Liu
Regional Sales Manager, Asia



International Customer Service

Labconco Corporation
8811 Prospect Avenue
Kansas City, MO 64132-2696
Phone: (816) 333-8811

Product: Glass Door Merchandiser Refrigerator

Manufacturer: Everest Refrigeration

Location: GCC Marketing Lab/Student Store



Item #EMSGR69

Product Details

See attached.

GLASS DOOR MERCHANDISER REFRIGERATOR
MULTIPLE SWING DOORS

Project Name: _____

Project Location: _____

Model #: _____ Quantity: _____

Available Warehouse: _____

EM Series Model: EMSGR69



Refrigeration System
· Bottom mounted, self-contained and fully detachable Blizzard R290 condensing unit uses environmentally friendly, EPA-compliant R290 refrigerant with zero (0) Ozone Depletion Potential (ODP) and three (3) Global Warming Potential (GWP). Blizzard R290 is easily replaceable and requires no on-site brazing.
· Electronically commutated (ECM) fan motors achieve rapid cooling with less energy consumption.
· Full-length air duct ensures optimal cold air distribution.
· Air circulation guard keeps floor vents from obstruction.
· Time-initiated and temperature-terminated auto defrost cycle for seamless operation.
· Large capacity, corrosion-resistant condenser and evaporator coils.
· Self-maintaining, energy-efficient condensate drain pan requires no external drains or electric heaters.
· High performance, auto-reverse condenser fan motor supports compressor ventilation and condenser coil cleaning.
· Pre-wired and ready to plug, 115V/60Hz/1Ph, NEMA 5-15P.

Cabinet Construction
· Heavy duty white coated steel interior / exterior.
· Open spaced interior with no walls between compartments.
· Stainless steel floor interior has rounded corners and detachable drain plug for ease of cleaning.
· 2.5" thick high density polyurethane insulation.
· Six height adjustable screw legs.

Lighting
· Shielded LED bar lighting with on/off switch provides bright, high color illumination at lower heat output.

Doors
· Low emissivity double glass panes reflect UV rays for efficient cooling.
· Black PVC door frames.
· Self-closing with adjustable torsion system for a positive seal.
· Snap-in magnetic door gasket make cleaning and replacement an easy process.
· High strength, die-cast door handles.

Shelving
· Four epoxy coated, steel wire shelves with airflow guard per section.
· Height adjustable stainless steel clips.

Temperature Control
· Multi-function digital controller with easy to read LED display.
· Factory preset temperature, 35°F. Temperature setting range from 33°F to 54°F.
· Audible overheat protection alarm for compressor and condenser coil.

Options
· Additional shelving.
· 3" swivel casters with locks.
· 3.5" – 6" height-adjustable and interchangeable legs.

Operating temperature range is 33ºF ~ 54ºF

5 YEAR Compressor
3 YEAR Parts & Labor

Please visit our website for updated Energy Efficiency information

Ref/ Frz/Dual	Doors	Capacity		Shelves	Refrigerant	HP	Power V-Hz-Ph	Amps	Crated Weight	Exterior Dimensions		
		Cu. Ft.	20 oz. Bottles							L	D	H*
REF	3	71	672	12	R-290	3/4	115-60-1	7	697 lbs (316kg)	72.875" (1851mm)	32" (813mm)	80.125" (2035mm)

(†)Based on evaporating temperature of 23ºF (-5ºC) & condensing temperature of 131ºF (55ºC). (⚑) Product capacity is calculated based on standard industry figures. (✱) Reference plan view for clarification on caster/unit height. If dimensions and capacity are critical, please contact Everest Refrigeration. Blizzard R290 replacement is at the sole discretion of Everest Refrigeration. Specifications subject to change without notice.

GLASS DOOR MERCHANDISER REFRIGERATOR
MULTIPLE SWING DOORS

EM Series **Model: EMSGR69**

DIMENSIONAL DATA

External Dimensions	L	72.875" (1851mm)
	D	32" (813mm)
	H*	80.125" (2035mm)
Crated Weight		697 lbs. (316kg)
Doors/Drawers/Lids		3
Max Weight Support (LBS)		-

STORAGE DATA

Net Capacity Cu. Ft. ⚑	71
Shelves	12
Barrels	-
20 oz. Bottles	672
12 oz. Bottles	-
12 oz. Cans	-
8" Mugs	-
# of Pans (Top)	-
# of Pans (Drawer)	-
Dividers	-
Trays	-

ELECTRICAL DATA

Voltage	115-60-1
Full Load Amperage	7A
Feed Wires with Ground	3
Cord Length	9ft
NEMA Plug Type	NEMA 5-15P

REFRIGERATION DATA

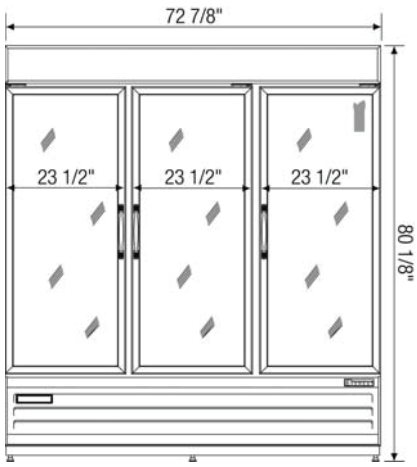
Compressor Mounting	Bottom
Refrigerant	R-290
Compressor HP	3/4
BTU/HR †	N/A

KEY

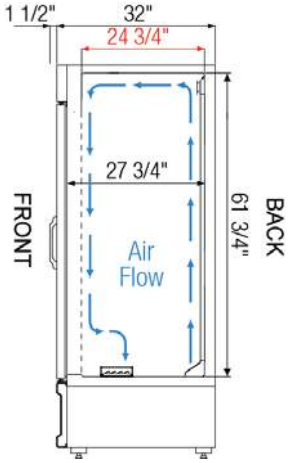
D	Door	R	Refrigerator
L	Lid	REF	Refrigerator
H	Half Door	F	Freezer
FD	Full Door	FRZ	Freezer
SD	Solid Door	DUAL	REF/FRZ Combo
GD	Glass Door	DR	Drawer

	Elevation	Right	Plan	3D	Back
KCL					

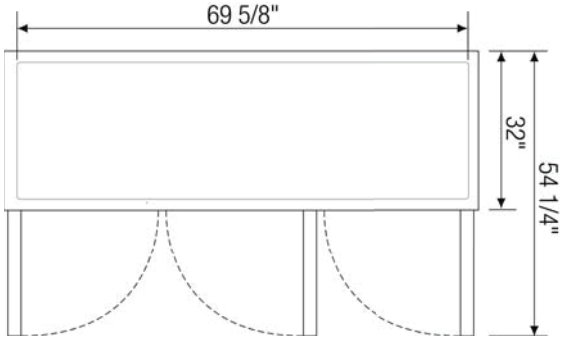
PLAN VIEW



FRONT



SIDE



TOP

ACCESSORIES & OPTIONS

Part Number	Description
Additional Shelving	Contact Everest Refrigeration for more information.
AJL03-00	Interchangeable Leg for Caster
CASA3-02	3" Overall Height Caster Assembly - (3) Front (3) Rear

(†)Based on evaporating temperature of 23ºF (-5ºC) & condensing temperature of 131ºF (55ºC). (⚑) Product capacity is calculated based on standard industry figures. (*) Reference plan view for clarification on caster/unit height. If dimensions and capacity are critical, please contact Everest Refrigeration. Blizzard R290 replacement is at the sole discretion of Everest Refrigeration. Specifications subject to change without notice.

Product: Manual Defrost Chest Freezer in White

Manufacturer: Vissani

Location: GCC Marketing Lab/Student Store



Item #MDCF5WH

Product Details

See attached.

90

VISSANI™

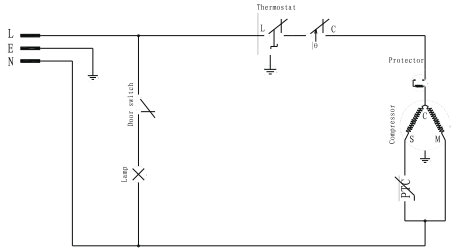
CHEST FREEZER

MODEL: MDCF5WH

Rated Voltage:	115 V~
Rated Frequency:	60 Hz
High Side:	150psig
Low Side:	60psig
Rated Current:	1.4 A
Refrigerant:	R600a,1.62 Oz(46 g)
Volume:	5.0 Cu.ft(142L)
Foaming Agent:	Cyclopentane
Type Of Preventing From Electric Shock:	I
Date Code:	WWYYYY_ 2009318

Made in China

ELECTRIC DIAGRAM



Energy Verified

c UL us LISTED
HOUSEHOLD FREEZER
2GA1

FREE-STANDING
INSTALLATION ONLY

5 cu. ft. Manual Defrost Chest Freezer in White

by VISSANI ★★★★★ (1269)

$189^{00}

TOP

Product Overview | Specifications | Questions & Answers | Customer Reviews

Home / Appliances / Freezers / Chest Freezers

Internet #314186968 Model #MDCF5WH Store SKU #1005657180

VISSANI

5 cu. ft. Manual Defrost Chest Freezer in White

★★★★★ (1269) Questions & Answers (119)













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How to Get It

5 cu. ft. Manual Defrost Chest Freezer in White

by VISSANI ★★★★★ (1269)

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Product Overview | Specifications | Questions & Answers | Customer Reviews

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We found similar options you might like



Frigidaire 5 cu. ft. Chest Freezer in White

★★★★★ (424)

$249.00



GE Garage Ready 5.0 cu. ft. Manual Defrost Chest

★★★★★

~~$370.00~~ $305.00

Was ~~$339~~



GE Garage Ready 7.0 cu. Ft. Manual Defrost Chest

★★★★★

~~$348.00~~ $338.00

Was ~~$379~~



Frigidaire 7.2 cu. ft. Manual Defrost Chest Freezer in

★★★★½ (184)

$289.00



5.0 cu. ft. Manual Defrost Residential Chest Freezer in

★★★★½ (2)

$414.29/box



Kalamera 3.5 Cu.ft compact deep freezer

★★★★½ (65)

$269.00/piece



Hotpo Manu Type Chest

★★★★

~~$[illegible]~~ $299.00

Product Overview

Increase your household's freezer space quickly and easily with this 5 cubic foot chest freezer by Vissani. Designed with convenience in mind, this unit features an exterior temperature control, built-in hinges for increased clearance, and a removable wire basket for added organization. This freezer also includes an interior LED light to help see items in the dark.

Info & Guides

You will need Adobe® Acrobat® Reader to view PDF documents. Download a free copy from the Adobe Web site.

× Get Everything You Need (1)

5 cu. ft. Manual Defrost Chest Freezer in White

by **VISSANI** ★★★★★ (1269)

$189.00

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Product Overview | **Specifications** | Questions & Answers | Customer Reviews



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iRobot Roomba 694 Wi-Fi Connected

★★★★☆ (226)

$274.99

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iRobot Roomba e6 (6198) Wi-Fi Connected

★★★★☆ (21)

$299.99

Was ~~$449.99~~

Add To Cart



iRobot Roomba i3 (3150) Wi-Fi Connected Robot

★★★★☆ (270)

$349.99

Add To Cart

Specifications

Dimensions

Assembled Depth (in.)	21.70 in
Assembled Height (in.)	33.50 in
Assembled Width (in.)	24.90 in
Height With Lid Open 90 Degrees (In)	52.36
Minimum Side Air Clearance (In)	7.87
Product Depth (in.)	21.65 in
Product Height (in.)	33.46 in
Product Width (in.)	24.88 in

Details

5 cu. ft. Manual Defrost Chest Freezer in White

by VISSANI ★★★★★ (1269)

$189.00

TOP

Product Overview | Specifications | Questions & Answers | Customer Reviews

Color/Finish	White
Color/Finish Family	White
Control Type	Manual
Defrost Type	Manual
Energy Consumption (kWh/year)	218
Freezer Features	Adjustable Leveling Legs, door Storage,LED Light Type,Lift-Out Bulk Storage Baskets
Freezer Type	Chest
Minimum Back Air Clearance (In)	7.87
Product Weight (lb.)	59.52 lb
Returnable	90-Day
Temperature Range	10 to -11deg F
Voltage (volts)	115 V

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Live Chat

Feedback

Warranty / Certifications

Certifications and Listings	UL Certified
Warranty Information	Limittied-1year

Questions & Answers

119 Questions

Search Questions & Answers

Ask a Question

Showing **1**-**4** of **119**

Newest Questions

Q: Vissani 7cu.ft.chest freezer model DCM7QRWW does it exist?HD sell…

by Marlon | Feb 2, 2022

1 Answer

Q: How big is the box the freezer comes in? Asking for is I can use backs…

by BorrowedPickup | Jan 20, 2022

5 Answers

Q: Looking to order a few more of the baskets that came with this Vissan…

by Pamela | Jan 1, 2022

3 Answers

Product: 18.3 Cu. Ft. Top-Freezer Refrigerator

Manufacturer: GE Appliances

Location: GCC Marketing Lab/Student Store



Item #GTE18MTRR

Product Details

See attached.

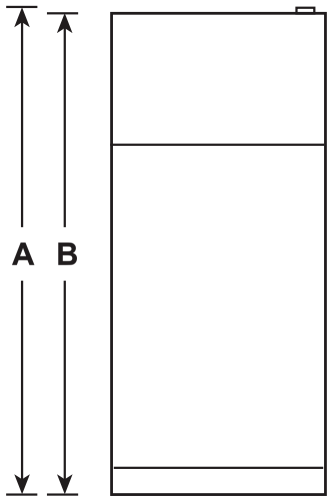
GTE18MTRR

GE® ENERGY STAR® 18.3 Cu. Ft. Top-Freezer Refrigerator

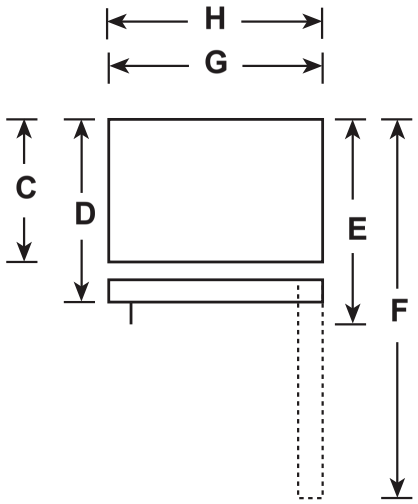
DIMENSIONS AND INSTALLATION INFORMATION (IN INCHES)

OVERALL DIMENSIONS	Height to top of hinge (in.) **A**	**66-3/4**
	Height to top of case (in.) **B**	**65**
	Case depth without door (in.) **C**	**27-3/4**
	Case depth less door handle (in.) **D**	**31-1/10**
	Case depth with door handle (in.) **E**	**32-3/4**
	Depth with fresh food door open 90˚ (in.) **F**	**58-7/10**
	Width (in.) **G**	**29-3/4**
	Width with door open 90˚ with door handle (in.) **H**	**30-1/2**
AIR CLEARANCES	Each side (in.)	**1/8**
	Top (in.)	**1**
	Back (in.)	**1**

FRONT VIEW



TOP VIEW



GE APPLIANCES

For answers to your Monogram, GE Café™, GE Profile™ or GE Appliances product questions, visit our website at geappliances.com or call GE Answer Center® Service, 800.626.2000.

Listed by Underwriters Laboratories

As an ENERGY STAR® partner, GE has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Specification Revised 11/21

GTE18MTRR

GE® ENERGY STAR® 18.3 Cu. Ft. Top-Freezer Refrigerator

FEATURES AND BENEFITS

#1 Quality and Dependability – Among 16-22 cu. ft. refrigerators based on an independent study of property maintenance personnel.
Source: The Stevenson Company, 2020—Market research company with over 20 years of experience in the appliance industry.

Interior LED lighting – Find all your favorite foods under natural-looking light.

Premium Inner Door – Enjoy greater flexibility and organizational options with modular bins right on the door.

2 Adjustable Humidity Controlled Drawers – Adjustable humidity controls help keep food fresh.

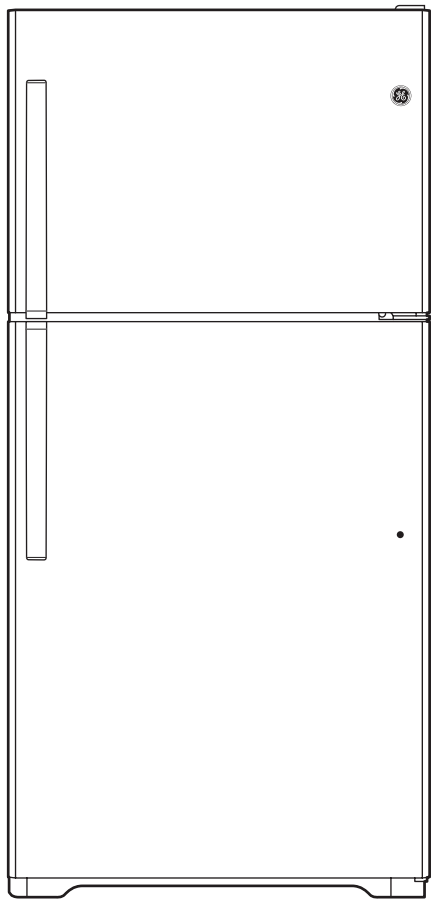
Upfront Temperature Control – Easy-to-access upfront temperature controls help regulate the fresh food section.

Spillproof glass shelves – Raised edges help contain spills and make clean up quick and easy.

Adjustable Wire Freezer Shelf – Provides the flexibility to organize your frozen food items.

Model GTE18MTRRWW – White

Model GTE18MTRRBB – Black



GE APPLIANCES

As an ENERGY STAR® partner, GE has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Specification Revised 11/21

Product: 90° Quarter Dome Security Mirrors; 48" Diameter (Or Approved Equal)

Manufacturer: The Library Store

Location: Library

Quarter dome mirrors eliminate blind spots in libraries, offices, hallways and warehouses. They allow a person see around obstacles for safety, or monitor a wide area for efficient surveillance. Mounts in a corner and reflects a 90 degree angle image for an overhead view of a perpendicular passageway.



Product Details

- Convex Detection Mirrors are first line of defense against shoplifting and pilferage
- Increases aisle visibility and eliminates blind spots
- Excellent as safety mirrors in preventing accidents
- Mirror is lightweight, fade-proof and unbreakable with top-quality silvering and near-perfect convexing which affords the widest angle of vision

- Mount in corners for a clear 90° view of any room
- Construction: High Impact Acrylic
- Available Sizes:
  - 26" Diameter
  - 48" Diameter
- Made in the USA

Product: **bibliotheca® Tattle-Tape™ EM Grey Detection Gate -Direct Mount, 1 Aisle (Or Approved Equal)**

Manufacturer**:** bibliotheca + 3M

Location: Library

This security system can blend nicely with library decor while keeping the collection entirely secure using the latest DSP technology. Designed for use with Tattle-Tape™ Security Strips, this system detects all EM strips in any orientation. Gates can detect an activated strip leaving the library, significantly reducing false alarms at the gate when people enter. With multiple pedestals used to cover a larger entrance-way, the alarm lights on the gates also identify which aisle caused the alarm. This helps the staff locate items that triggered the alarm faster. With powerful algorithms, the genuine Tattle-Tape™ technology can distinguish between common metal items and any EM strip to yield the most accurate results. This means less false alarms and fewer inconveniences for staff and patrons. Using the latest in DSP technology, the gate can detect EM strips regardless of the orientation within the gates, offering the highest level of detection, even in the nosiest of environments.





Product Details

- Construction: Impact-resistant, molded through-color thermoplastic
- Dimensions: 70"H x 23-1/2"W x 2-1/2"D
- Detect EM security strips on all types of library materials
- Baseplate, buried cable or direct mounting installation options available
- All gates feature built-in multi-color, customer selectable LED lights (blue, cyan, green, magenta, red, white or yellow)
- Variable alarm pattern with adjustable volume
- Available in various aisle configurations up to 5 aisles
- Low frequency minimizes interference with surrounding electronic equipment; can be installed within 18" of metal
- Reduces false alarms by detecting activated strips that are leaving and not sounding for patrons entering
- Detects strips regardless of orientation or how the patron is holding the item
- Bi-directional people counter counts people entering and leaving the library and displays count on control box display for live stats
- Integrated digital display to monitor alarm counts, display traffic counts and diagnostics
- Optional staffConnect™ gate software (sold separately) conveniently displays counts at staff computers and can communicate with libraryConnect™ central management software for reporting (also sold separately)
- ADA-compliant and UL-certified
- Two 38-1/4"H x 16"W panels are included with each upright

bibliotheca Tattle-Tape™ gate

superior security, seamless style



This security system can blend nicely with your library décor while keeping your collection entirely secure using the latest DSP technology. Designed for use with Tattle-Tape™ Security Strips, this system detects all EM strips in any orientation. Along with a selection of built-in LED alarm light colors to choose from, it is completely safe for all magnetic media.

connect **engage** **evolve**

bibliotheca® + 3M

the best of both worlds

DEMCO® imagine what's possible™

Have questions or need help?
Email **custserv@demco.com** or call **800.356.1200**

benefits of the Tattle-Tape™ gate

Reduce unwanted alarms
The Tattle-Tape™ gate can detect when an activated strip is leaving the library, significantly reducing false alarms at the gate when people enter. With multiple pedestals used to cover a larger entrance-way, the alarm lights on the gates also identify which aisle caused the alarm, helping staff locate items that triggered the alarm faster.

Integrated with libraryConnect™
Staff can remotely access libraryConnect™ for in-depth statistics and configuration options. This allows staff to remotely upgrade firmware, run monthly reports and change the alarm colors and patterns.

Genuine Tattle-Tape™ technology
With powerful algorithms, the genuine Tattle-Tape™ technology can distinguish between common metal items and any EM strip to yield the most accurate results. This means less false alarms and fewer inconveniences for both users and staff.

Superior detection of items in any orientation
Using the latest in DSP technology, the Tattle-Tape™ gate can detect EM strips regardless of the orientation within the gates, offering the highest level of detection, even in the nosiest of environments.

Integrated, visible people counter
The on-board bi-directional people counter accurately counts the number of people entering and leaving the library. This information is transferred to libraryConnect™ as well as the control box, which has a convenient display for quick access to live stats.

Selectable alarm color and pattern
Both visual and audible security alarm settings are completely configurable by the library. With 8 LED color alarms and patterns to choose from, the Tattle-Tape™ gate ensures both users and staff are alerted of items that have not been properly checked out.

Sleek design with interchangeable graphic sections
We designed our new Tattle-Tape™ gate to fit within new modern and updated library spaces. With easy-to-update panels, your security gates can match your library brand or promote an upcoming program.

Flexible configuration and installation
Simple set-up and maintenance allows our trained technicians to cause little disruption to your library and staff can quickly troubleshoot concerns with our dedicated phone support teams.





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Demco®
imagine what's possible™

bibliotheca® + 3M
the best of both worlds
www.bibliotheca.com

Specifications :
bibliotheca Tattle-Tape™ gate

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Dimensions (w x d x h):	Millimetres: 51 (Max at base) x 597 x 1786 (± 3) Inches: 2.5 (Max at base) x 23.5 x 70.3 (± 0.1)
Weight (per gate):	Kilograms: 36.3 Pounds: 80
Material:	Pantone Cool Grey 4C HIPS
Power:	Supply voltage: 100/120, 220/240 VAC, 50 / 60 Hz Power consumption: 3.0A / 1.5A
Data:	Ethernet (TCP/IP)
Performance:	Optimized for detection of Tattle-Tape™ markers Optimal coverage is achieved within 39.4 inches / 1,000 mm of separation
Alarm:	Multi-color*, customer selectable LED lights Variable alarm pattern and adjustable volume Highly visible integrated digital display to monitor alarm counts, ingoing and outgoing patron traffic, and diagnostics *Available colors: red, cyan, magenta, blue, green, yellow, white, & rotate mode
Standards compliance:	CE, RCM, ETSI, FCC, IC, ADA, DDA, ETL and CSA
Temperature range:	Operating: 10 °C to +40 °C/Storage: –40 °C to +55 °C
Configurations:	Standard configuration can support up to 6 panels to provide total coverage of 6.0m
Installation:	Multiple installation options including direct attachment to the floor with either in floor wiring or a wire way and a baseplate option. The on-board tuning allows the gates to be placed within 45.7cm (18") from any metal objects, giving more freedom than ever to install within confined areas.
Software:	Software is not required for the Tattle-Tape™ gate to operate, however, when used in conjunction with our staffConnect™ gate software, enhanced reporting is available
Additional features:	Integrated bi-directional people counter. Ability to trigger external devices such as CCTV, voice alarms and entry gates.
Options:	Side panels can be customized to fit your libraries décor

Although we make every effort to ensure information is correct at the time of release, it is possible that specifications and features may vary or change over time. bibliotheca therefore makes no representations or warranties as to the completeness or accuracy of the information contained within this document.

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the best of both worlds

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Product **Versa Food Bar™ Ultra Series Serving Buffet**

Manufacturer: Cambros

Location: Cafeteria Kitchen



VBRUHD6110

Product Details

See attached.

CAMBRO

Versa Food Bars™
Ultra Series

Item No. _____

Specifier Identification No. _____

Model No. _____

Quantity _____

StoreSafe

5 Foot (152 cm) Models
- **VBRU5 - with Standard Casters**
- **VBRUHD5 - with Heavy Duty Casters**

6 Foot (183 cm) Models
- **VBRU6 - with Standard Casters**
- **VBRUHD6 - with Heavy Duty Casters**



VBRU6



Features & Benefits

- A stylish, non-electric portable food bar keeps cold food cold for hours with or without ice, using optional Buffet Camchillers® with food pans or Coldfest® Food Pans and Crocks.
- Holds GN 1/1 Full or Fractional Size Food Pans up to 6" (15 cm) deep with Divider Bars.
- Sneeze Guard Side and End Panels are easy to assemble and are made from clear, durable NSF listed material. Sneeze Guard is fully compliant with current NSF requirements.
- Sneeze Guards and Optional Tray Rails fold down quickly and easily to fit through standard 36" (91,5 cm) wide doorways during transportation and to minimize storage space requirements.
- Two separate storage compartments with lockable doors provide convenient storage for non-perishable items. Each compartment holds up to 50 lbs. (22,7 kg) and measures 17 ½" W x 21 ½" D x 18" H (44,5 x 54,6 x 45,7 cm). Doors swing open from the outside to the middle for easy access from each end.
- Top merchandising shelf is 9" (22,9 cm) wide and can be used to display optional Merchandising Sign Holder for even greater visual appeal.
- Straight Connector and Corner Connector attach easily and securely to expand serving options.
- Double-wall polyethylene construction with foam injected polyurethane provides extra strength and durability. Scratch-resistant textured exterior is easy to clean and will not crack, rust, chip or break.
- NSF listed threaded faucet drain with standard hose hook-up on underside of well can be used for quick and easy draining and cleaning.
- Choose from models with 4 each 6" x 1 ¼" (15,2 x 3,2 cm) standard swivel casters with brakes or 6" x 2" (15,2 x 5 cm) heavy duty swivel casters with brakes.
- Molded-in handle on each end offers stable maneuverability.
- Non-electrical.
- Only sneeze guards and optional accessories require assembly.
- Available in 5 colors.
- Optional accessories include, Tray Rails, End Table, Straight and Corner Connectors, Buffet Camchiller, Well Cover, Divider Bars, GN Food Pans, Coldfest Crocks and Pans, Pumps, Crocks and Salad Bowl Holders, Merchandising Sign Holder, LED Light, and Vinyl Cover.
- Food Bar set-up guides and best practices are available at www.cambro.com/schools.

Approvals

NSF

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Telephone 714 848 1555 **Toll Free** 800 854 7631 **Customer Service** 800 833 3003

CAMBRO

Versa Food Bars™
Ultra Series

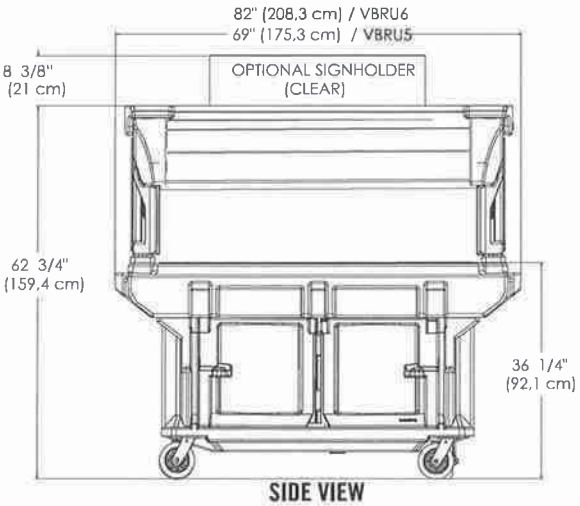
Item No. _____

Specifier Identification No. _____

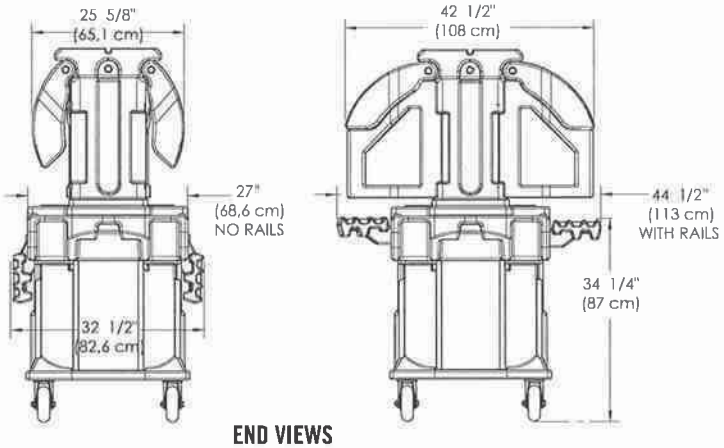
Model No. _____

Quantity _____

Models - VBRU5, VBRUHD5, VBRU6, VBRUHD6



SIDE VIEW



END VIEWS

Specifications

Dimension Tolerance: +/- ¼" (0,64 cm)

Code	Description	GN 1/1 Full Size Food Pan Capacity	Exterior Dimensions (w/Sneeze Guard) L x W x H	Case lbs./ cube Kg/m³
VBRU5	5 Foot (152 cm) Food Bar – Standard Casters	4	69" x 42½" x 62¾" (175,3 x 108 x 159,4 cm)	260 lbs (58.5) 117,9 Kg (1,66 m³)
VBRUHD5	5 Foot (152 cm) Food Bar – Heavy Duty Casters	4	69" x 42½" x 62¾" (175,3 x 108 x 159,4 cm)	269.5 lbs (58.5) 122,2 Kg (1,66 m³)
VBRU6	6 Foot (183 cm) Food Bar – Standard Casters	5	82" x 42½" x 62¾" (208,3 x 108 x 159,4 cm)	274 lbs (75) 124,3 Kg (2,12 m³)
VBRUHD6	6 Foot (183 cm) Food Bar – Heavy Duty Casters	5	82" x 42½" x 62¾" (208,3 x 108 x 159,4 cm)	283.5 lbs (75) 128,6 Kg (2,12) m³)

Optional Accessories

Tray Rails
- ❑ VBRR5 - 5' (152 cm) Versa Food Bars/ Work Tables
- ❑ VBRR6 - 6' (183 cm) Versa Food Bars/ Work Tables

Crock and Salad Bowl Holders
- ❑ CPH3 - Fits all Versa Food Bars / Work Tables and holds 3 Crocks
- ❑ SBH15 - Holds 15" (38 cm) Bowl and 3 Crocks
- ❑ SBH18 - Holds 18" (46 cm) Bowl

Connectors and Well Covers
- ❑ VBRC90 - Corner Connector
- ❑ VBRC - Straight Connector
- ❑ VBRWC - Versa Well Cover

Other Accessories
- ❑ CPB1220 - Buffet Camchiller®
- ❑ VBRTBL - End Table For All Versa Food Bars /Work Tables
- ❑ LED54LIGHTPKG - Versa Food Bar Lighting Kit

Divider Bars
- ❑ DIV12 - 12" (30,5 cm)
- ❑ DIV20 - 20" (50,8 cm)

Merchandising Sign Display
- ❑ VBRSHTS - Versa Food Bar Top Shelf Sign Holder

Vinyl Covers
- ❑ VBRCVR5 - Versa Food Bars 5' (152 CM)
- ❑ VBRCVR6 - Versa Food Bars 6' (183 CM)

Visit www.cambro.com for details on all accessories.

Architect Specs

The non-electric, portable and modular Versa Food Bar – ULTRA SERIES, shall be a Floor Model Food Bar, Models VBRU5, VBRU6, VBRUHD5, VBRUHD6, manufactured by Cambro Mfg. Co., Huntington Beach, CA 92647 USA. It shall be made of double-wall polyethylene with foam-injected polyurethane. It shall include a clear sneeze guard with clear protective end panels. The interior well shall be 6 ½" (16,5 cm) deep. The sneeze guard and optional tray rails shall fold down to fit through 36" (91,5 cm) wide doorways and to minimize storage space requirements during non-use. It shall have a 9" (22,9 cm) wide merchandising shelf. It shall have molded-in handles on each end. It shall have 2 separate storage compartments with lockable doors that swing open from the outside to the middle. It shall have 4 each 6" x 1 ¼" (15,2 x 3,2 cm) swivel casters with brakes or heavy duty 6" x 2" (15,2 x 5 cm) swivel casters with brakes. It shall have an NSF listed threaded faucet drain with a standard hose hook up on the underside of the well. It shall be NSF listed and available in 5 colors. It shall require minimal assembly. It shall connect with other standard height Versa Food Bars, Versa Work Tables and/or Versa Carts using an optional Corner Connector or Straight Connector. Optional accessories shall include Tray Rails, End Table, Straight and Corner Connectors, Buffet Camchiller®, Well Cover, Divider Bars, GN Food Pans, Coldfest® Crocks and Pans, Pumps, Crocks and Salad Bowl Holders, Merchandising Sign Holder, LED Light, and Vinyl Cover.

Versa Food Bar Colors

- ❑ Black (110)
- ❑ Kentucky Green (519)*
- ❑ Hot Red (158)*
- ❑ Bronze (146)*
- ❑ Navy Blue (186)*

*Made to order. Non-returnable.

Approvals

NSF

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Telephone 714 848 1555 Toll Free 800 854 7631 Customer Service 800 833 3003

Product: VG Series Modular Gas Tilting Braising Pan

Manufacturer: Vulcan

Location: Cafeteria Kitchen



Vulcan VG30

Product Details

See attached.

Item # _____ C.S.I. Section 11420

STEAM

VULCAN

VG SERIES
MODULAR GAS TILTING BRAISING PAN



Shown with enclosed faucet bracket

SPECIFICATIONS

Modular gas tilting braising pan. 36"/46" wide open base. Stainless steel front, sides and 12" legs with adjustable flanged feet. Stainless steel back. Front hinged polished stainless steel pan body with coved interior corners and embossed gallon markings. Stainless steel cooking surface bonded to steel plate. Full width 4" return flange with formed pouring lip and removable strainer. Stainless steel spring assist cover with wrap around handle and condensate lip. Faucet mounting bracket (non-enclosed) field reversible "L" bracket either side. Drop away food receiving pan support mounts under pouring lip. Manually operated pan tilting mechanism with removable handle. Pan can be fully tilted to empty completely with approximately 30 crank revolutions. One 30,000 BTU/hr. burner for each 12" pan width. Burners shut off when pan is tilted 5°. Electronic ignition system for automatic burner light. Solid state temperature controls. Water tight controls and enclosures. Requires a 120/60/1 electrical power supply, 9.0 amps total draw. ¾" rear gas connection and internal gas combination valve with integral regulator.

Exterior Dimensions:

____"w x 35½"d x 40½"h on 12" legs.

CSA design certified. Classified by UL to NSF Std. #4.

SPECIFY TYPE OF GAS WHEN ORDERING.
SPECIFY ALTITUDE WHEN ABOVE 2,000 FT.

- ☐ **VG30** 36" wide open base.
- ☐ **VG40** 46" wide open base.

STANDARD FEATURES

- Stainless steel front, back, sides and 12" legs with adjustable flanged feet.
- Front hinged polished stainless steel pan body with coved interior corners and embossed gallon markings. Stainless steel cooking surface bonded to steel plate. Full width 4" return flange with formed pouring lip and removable strainer.
- Stainless steel spring assist cover with wrap around cool to the touch handle and condensate lip.
- Lid stops in place for vented cooking.
- Faucet mounting bracket (non-enclosed) field reversible "L" bracket either side.
- Drop away food receiving pan support mounted under pouring lip.
- Manually operated anti-jam pan tilting mechanism with removable handle. Pan can be fully tilted to empty completely with approximately 30 crank revolutions.
- One 30,000 BTU/hr. burner for each 12" pan width. Burners shut off when pan is tilted 5°. Electronic ignition system for automatic burner lighting.
- Solid state temperature controls, adjustable from 50°F to 425°F.
- Water tight controls and enclosures.
- Requires a 120/60/1 electrical power supply, 9.0 amps.
- ¾" rear gas connection.
- One year limited parts and labor warranty.
- Combination gas valve with built-in regulator.

OPTIONS

- ☐ Motor driven pan lift with removable manual crank handle.
- ☐ Two inch draw-off valve – left front straight with strainer. (BPDOV-1) Pan support will be removed on VG30.
- ☐ Two inch draw-off valve – left front 90° left with strainer. (BPDOV-2) Pan support will be removed on VG30.
- ☐ Two inch draw-off valve – left side 90° front with strainer. (BPDOV-3)
- ☐ Standard security package includes:
  - Security screws and tackwelds.
    - Includes securing crank handle, pan strainer and non-door type panels.
  - Controls protected by lockable cover.
  - Perforated flue cover.
- ☐ Second year extended limited parts and labor warranty.

ACCESSORIES (Packaged & Sold Separately)

- ☐ Set of four casters, (two locking).
- ☐ Faucet bracket assembly (adds 3" to width) enclosed.
- ☐ (12") (18") double jointed single pantry faucet.
- ☐ (12") (18") double jointed double pantry faucet.
- ☐ Double pantry washdown hose with 16" add-on faucet with backflow preventer.
- ☐ Double pantry washdown hose with backflow preventer.
- ☐ Double pantry pot filler and backflow preventer.
- ☐ Steaming pan insert rack to hold 12" x 20" pans. (Qty. ____)
- ☐ 12" x 20" x 4" stainless steel drain waste pan with clear plastic hose.
- ☐ Catch can with bail handle and drain hose for draw-off valve.
- ☐ Stainless steel perforated boiling basket (12" x 20" x 6" deep) with handles.

VULCAN
a division of ITW Food Equipment Group LLC
P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

STEAM

VG SERIES
MODULAR GAS TILTING BRAISING PAN

SERVICE CONNECTIONS:

GAS INPUT: ¾" N.P.T., Nat. 7"-10.5" W.C.; Propane, 11"-13" W.C. See capacity schedule.

ELECTRICAL CONNECTION: Control circuit ⅞" dia. 120 volt,
1 phase, 15 amps, power cord.

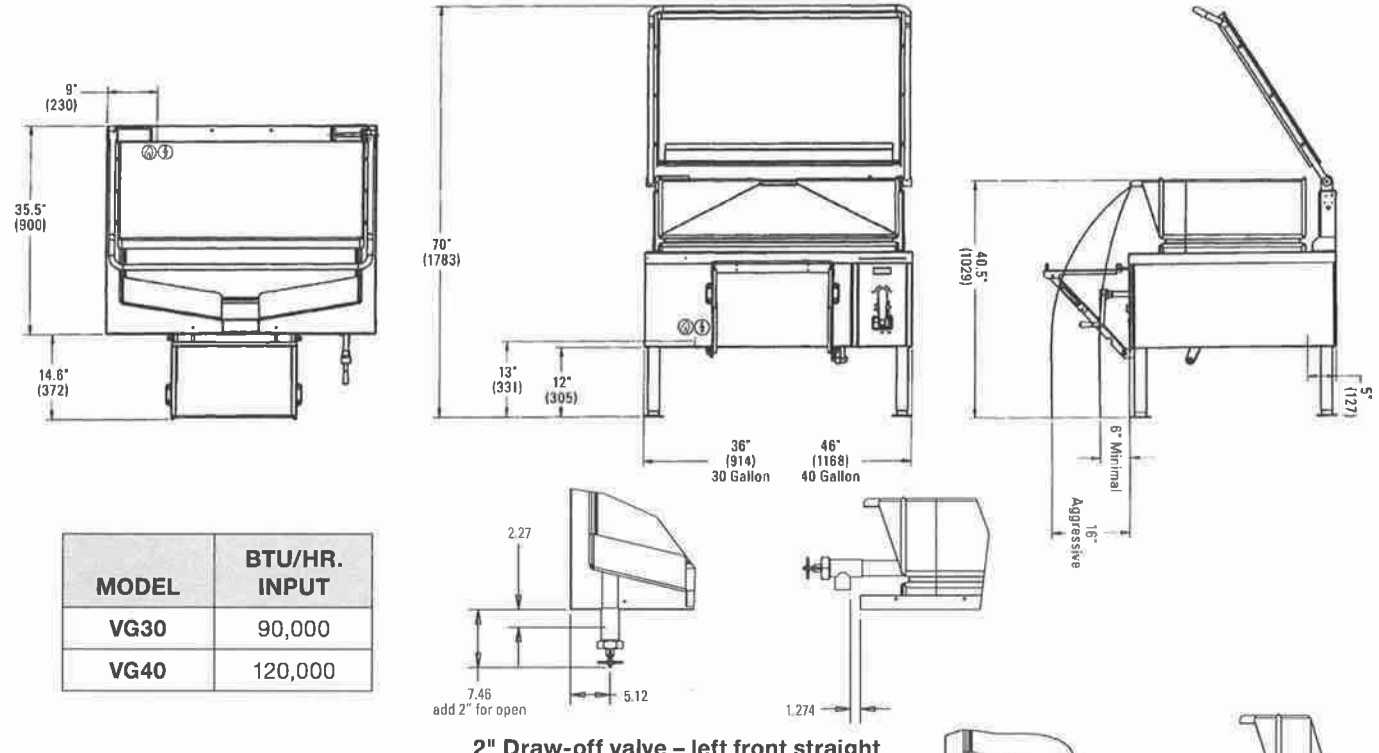
IMPORTANT:

1. A pressure regulator sized for this unit is included. Natural gas 7" W.C., propane gas 11" W.C. supply pressure.
2. Gas line connecting to appliance must be ¾" or larger. If flexible hose with quick connects are used the hose and quick connects BTU flow rate must be a minimum of 120% of the appliance data plate BTU rate.
3. An adequate ventilation system is required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02289. When writing, refer to NFPA No. 96.
4. These units are manufactured for installation in accordance with ANSZ223.1A (Latest edition), National Fuel Gas Code. Copies may be obtained from the American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209.
5. Clearances:

	Combustible	Non-combustible
Rear	6	0
Sides	2	0

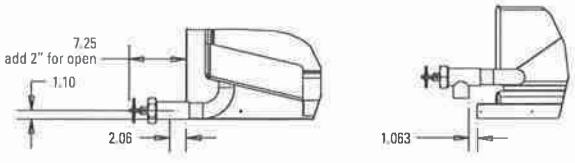
6. This appliance is manufactured for commercial installation only and is not intended for home use.

MODEL	COOKING SURFACE AREA	MAX PAN OPENING	CAPACITY	4 OZ. PORTIONS
VG30	29" x 23"	31" x 28"	30 gal./ 114 liters	960
VG40	39" x 23"	41" x 28"	40 gal./ 152 liters	1280

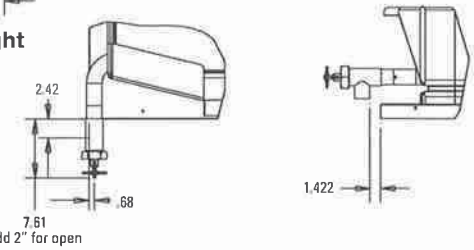


MODEL	BTU/HR. INPUT
VG30	90,000
VG40	120,000

2" Draw-off valve – left front straight (BPDOV-1)



2" Draw-off valve – left front 90° left (BPDOV-2)



2" Draw-off valve – left side 90° front (BPDOV-3)

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NOTE: In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

Product: 900RX Series Heavy Duty Gas Griddles

Manufacturer: Vulcan

Location: Cafeteria Kitchen



936RX-30

Product Details

- 36" W x 36" D Cooking Surface
- See attached.

GRIDDLES & BROILERS

900RX SERIES
HEAVY DUTY GAS GRIDDLES



Model 948RX

- ☐ **924RX** 24" w x 24" d griddle plate
- ☐ **936RX** 36" w x 24" d griddle plate
- ☐ **948RX** 48" w x 24" d griddle plate
- ☐ **960RX** 60" w x 24" d griddle plate
- ☐ **972RX** 72" w x 24" d griddle plate

SPECIFICATIONS

Low profile heavy duty gas griddle, Vulcan Model No._____. Stainless steel front, sides and front top ledge. Fully welded stainless and aluminized steel body frame. 11" low profile cooking height on 4" legs. 1" thick polished steel griddle plate with 12 gage, 4" stainless steel back and tapered side splashes. Grease chute is fully welded to stop grease migration. One 27,000 BTU/hr. "U" shaped aluminized steel burner and mechanical snap action thermostat for each 12" of griddle width. Chrome thermostat knob guards. Temperature adjusts from 200° to 550° F. One pilot safety for every two burners. Manual shut-off valve. 3½" wide stainless steel grease trough. 120V 50/60Hz 1 Amp single phase electric ignition circuit. Plug type is NEMA 5-15 USA. ¾" rear gas connection and gas pressure regulator.

Exterior Dimensions:
_____"w x 33" d x 15½" h on 4" legs.

CSA design certified. NSF listed.

SPECIFY TYPE OF GAS WHEN ORDERING.
SPECIFY ALTITUDE WHEN ABOVE 3,999 FT.

STANDARD FEATURES

- Stainless steel front, sides and front top ledge with "Cool Bullnose" design.
- Fully welded stainless and aluminized steel chassis frame.
- 11" low profile cooking height on 4" adjustable legs.
- 1" thick polished steel griddle plate with 12 gage, 4" stainless steel back and tapered side splashes.
- Spatula wide 3½" grease gutter and chute is fully welded for easier cleaning and to stop grease migration.
- One 27,000 BTU/hr. "U" shaped aluminized steel burner for every 12" of griddle width.
- One embedded snap action thermostat per burner with temperature adjust from 200°F to 550°F.
- Large 6 quart stainless steel grease drawer (2 drawers on 60" and 72" models).
- Heavy duty chromed thermostat knob guards.
- One pilot safety valve for every two burners. Safety will completely shut off gas to pilot and burners if pilot extinguishes.
- Manual shut-off valve for gas inlet.
- Dual (manual/electric) ignition.
- Bottom heat shields
- ¾" rear gas connection and gas pressure regulator.
- 120V 50/60Hz 1 Amp single phase with NEMA 5-15 USA plug.
- One year limited parts and labor warranty.

OPTIONAL FEATURES

- ☐ Hexavalent chrome plated cooking surface.
- ☐ 30" deep plate.
- ☐ Stainless steel stand with marine edges and casters.
- ☐ Cutting board, condiment rail, plate rail and banking strip accessories.
- ☐ Full or partially grooved griddle plate.

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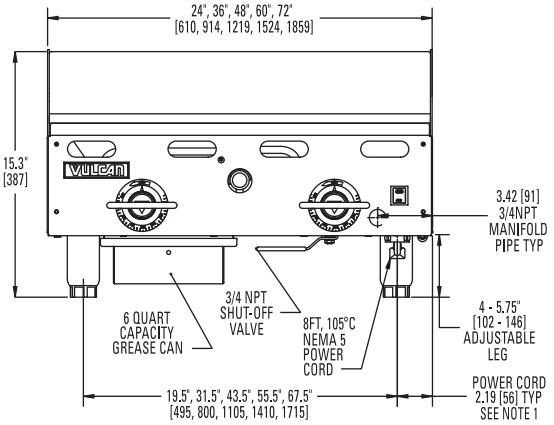
900RX SERIES
HEAVY DUTY GAS GRIDDLES

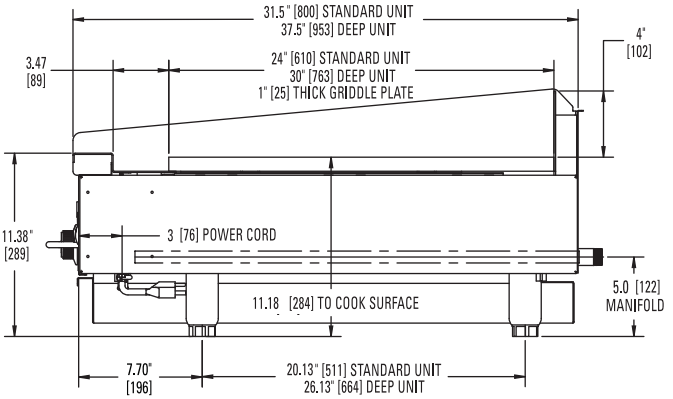
INSTALLATION INSTRUCTIONS

1. A gas pressure regulator supplied with the unit must be installed;
   Natural Gas 4.0" (102 mm) W.C.
   Propane Gas 10.0" (254 mm) W.C.
2. All models require a 6" (152 mm) clearance at both sides and rear adjacent to combustible and 0" from non-combustible constructions. All models require a 4" (102mm) bottom clearance and must be installed with minimum 4" legs.
3. These units are manufactured for installation in accordance with ANSI/NFPA-70, National Electrical code.
   An adequate ventilation system is required for Commercial Cooking Equipment (NFPA No. 96). Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02169.
4. These units are manufactured for installation in accordance with National Fuel Gas Code, ANSI-Z223.1/NFPA #54 (latest edition). Copies may be obtained from The American Gas Association, Accredited Standards Committee Z223 @ 400 N. Capital St. NW, Washington, DC 20001, or the Secretary Standards Council, NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471.
   NOTE: In The Commonwealth of Massachusetts
   All gas appliances vented through ventilation hood or exhaust system equipped with a damper or with a power means of exhaust shall comply with 248 CMR.
5. This appliance is manufactured for commercial installation only and is not intended for home use.

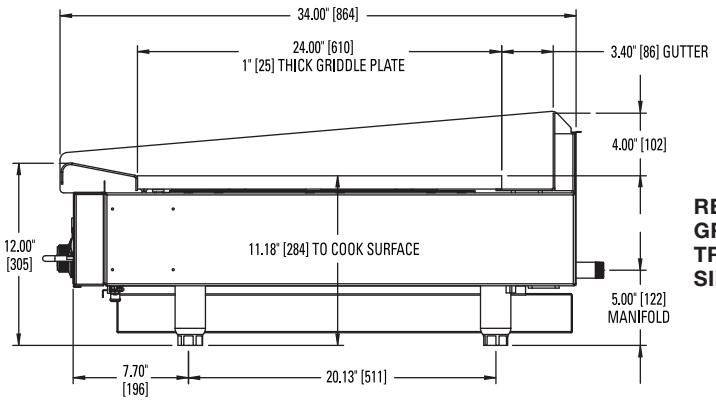


FRONT VIEW

NOTES:
1. 2.19" FROM RIGHT FOR 24, 36 & 48" GRIDDLES
   30.00" FROM RIGHT FOR 60" & 72" GRIDDLES
2. ADJUSTABLE LEGS ARE 2" IN DIAMETER.
   LEGS ARE RECESSED 1¼" FROM EACH SIDE.



FRONT GREASE TROUGH - SIDE VIEW



REAR GREASE TROUGH - SIDE VIEW

MODEL	WIDTH	DEPTH	OVERALL HEIGHT*	WORKING HEIGHT*	NO. OF BURNERS	TOTAL BTU/HR.	NO. OF DRAWERS	APPROX. SHIP. WT.
924RX	24"	31½"	15¼"	11⅛"	2	54,000	1	285 lbs. /129 kg.
936RX	36"	31½"	15¼"	11⅛"	3	81,000	1	400 lbs. /181 kg.
948RX	48"	31½"	15¼"	11⅛"	4	108,000	1	480 lbs. /218 kg.
960RX	60"	31½"	15¼"	11⅛"	5	135,000	2	650 lbs. /295 kg.
972RX	72"	31½"	15¼"	11⅛"	6	162,000	2	790 lbs. /358 kg.

*These are nominal dimensions and can vary by +1.75" with adjustable legs.

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P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

NOTE: In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

Printed On Recycled Paper

Product: **VC55G Series Double Deck Gas Convection Oven With Removable Doors**

Manufacturer: Vulcan

Location: Cafeteria Kitchen



VC55GD

Product Details

See attached.

Item # _____ C.S.I. Section 11420

OVENS

VC55G SERIES
DOUBLE DECK GAS CONVECTION OVEN WITH REMOVABLE DOORS



Model VC55GD
Shown with optional casters

SPECIFICATIONS

Double section gas convection oven, Vulcan Model No. VC55GD. Stainless steel front, sides, top and legs. Independently operated stainless steel doors with double pane windows. Non-sag insulation applied to the top, rear, sides, bottom and doors. Porcelain enamel on steel oven interiors measures 29"w x 22⅛"d x 20"h. One interior oven light per section. Five nickel plated oven racks per section measure 28¼" x 20½" with grab-and-go front cut out. Eleven position nickel plated rack guides with positive rack stops. One 50,000 BTU/hr. burner per section. 100,000 total BTU/hr. Electronic spark igniters. Furnished with a two speed ½ H.P. oven blower-motor per section. Oven cool switch for rapid cool down. 120 volt, 60 Hz, 1 ph power supply required. 6' cord and plug. 7.7 amps total draw per section.

Exterior Dimensions:

40"w x 40"d (includes motor & door handles) 37¼"d (includes motor only) x 68¾"h on 8" legs.

CSA design certified. NSF listed.

SPECIFY TYPE OF GAS WHEN ORDERING.
SPECIFY ALTITUDE WHEN ABOVE 2,000 FT.

☐ **VC55GD** Solid state temperature dial controls adjust from 150° to 500°F with digital display enhancement. 5-hour timer with audible alarm.

STANDARD FEATURES

- Independently operated lift-off stainless steel doors with double pane windows.
- On-board diagnostics for easy servicing
- Stainless steel front, sides and top.
- Five nickel plated grab-and-go oven racks with eleven rack positions.
- Painted legs.
- 5-hour timer with digital display enhancement.
- Cool-to-the-touch handles.
- 50,000 BTU/hr. burner.
- Electronic spark igniter.
- ½ H.P. two speed oven blower-motor. 120/60/1 with 6' cord and plug. 7.7 amps total draw.
- Oven cool switch for rapid cool down.
- Porcelain enamel on steel oven interior.
- ¾" rear gas connection with combination gas valve / pressure regulator and safety solenoid system.
- One year limited parts and labor warranty.
- Three year limited warranty on doors.

OPTIONS

- ☐ Stainless steel legs.
- ☐ Casters.
- ☐ Second year extended limited parts and labor warranty.

ACCESSORIES

- ☐ Extra oven rack(s).
- ☐ Rack hanger.
- ☐ Stainless steel drip pan.
- ☐ Flexible gas hose with quick disconnect and restraining device. Consult price book for available sizes.
- ☐ Down draft flue diverter for direct vent connection.

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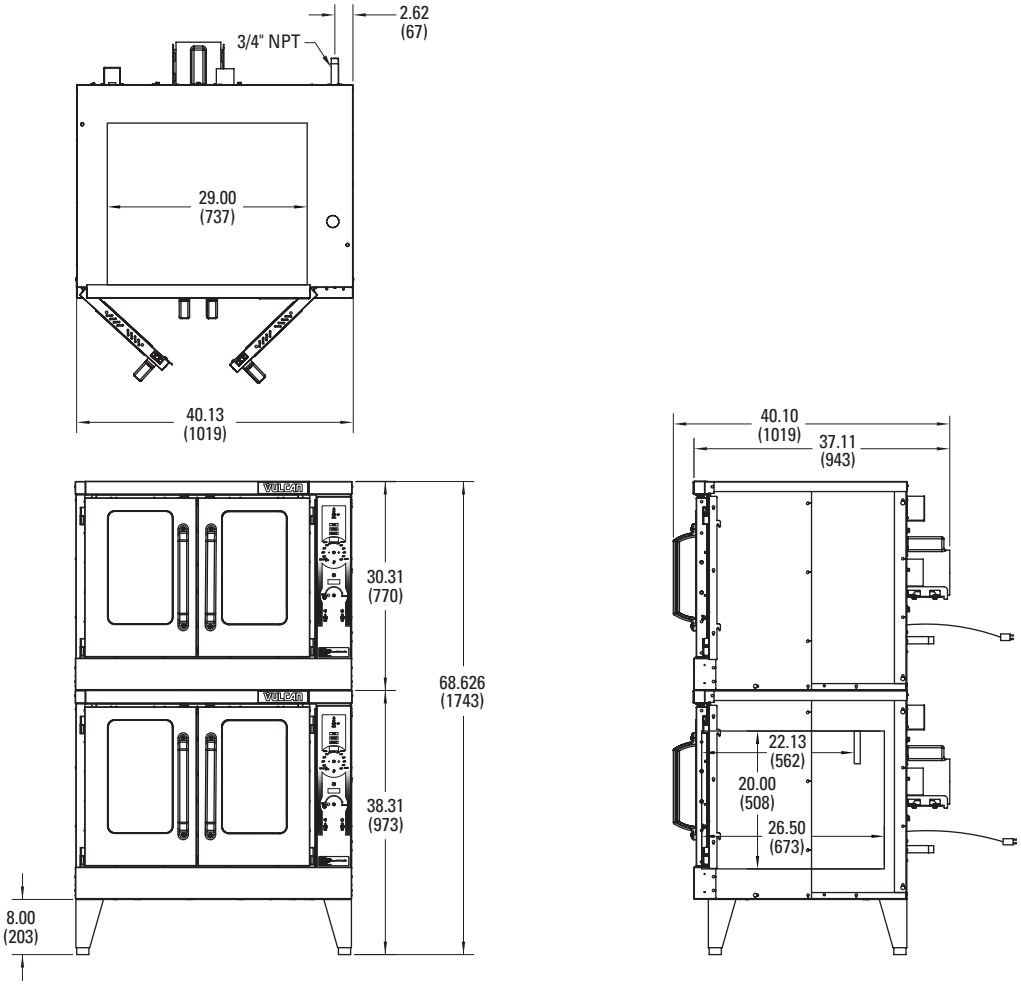
VC55G SERIES
DOUBLE DECK GAS CONVECTION OVEN WITH REMOVABLE DOORS

INSTALLATION INSTRUCTIONS

1. A combination gas valve/pressure regulator and safety solenoid system is included in this unit. Natural gas is 5.0" W.C., Propane gas is 10.0" W.C.
2. An adequate ventilation system is required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02289. When writing, refer to NFPA No. 96.
3. These units are manufactured for installation in accordance with ANSZ223.1 (latest edition), National Fuel Gas Code. Copies may be obtained from American Gas Association Inc., Accredited Standards Committee Z223, 400 N. Capitol St. NW, Washington, DC 20001 or the Secretary Standards Council, NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471.
4. Clearances:

	Combustible	Non-combustible
Rear	0"	0"
Right Side	2"	0"
Left Side	1"	0"

5. This appliance is manufactured for commercial installation only and is not intended for home use.
6. The installation location should not experience temperatures below -20°C (-4°F).



MODEL NO.	WIDTH	DEPTH (INCLUDES HANDLES)	HEIGHT	BTU/HR. PER OVEN	TOTAL BTU/HR.	ELECTRICAL	WEIGHT			
							WITH SKID & PACKAGING		WITHOUT SKID & PACKAGING	
							LBS.	KG	LBS.	KG
VC55G	40"	40"	68¾"	50,000	100,000	120/60/1	778	352	666	302

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P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

NOTE: In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

Printed On Recycled Paper

Item # _____ C.S.I. Section 11420

OVENS

VC55G SERIES
DOUBLE DECK GAS CONVECTION OVEN WITH REMOVABLE DOORS



Model VC55GD
Shown with optional casters

SPECIFICATIONS

Double section gas convection oven, Vulcan Model No. VC55GD. Stainless steel front, sides, top and legs. Independently operated stainless steel doors with double pane windows. Non-sag insulation applied to the top, rear, sides, bottom and doors. Porcelain enamel on steel oven interiors measures 29"w x 22⅛"d x 20"h. One interior oven light per section. Five nickel plated oven racks per section measure 28¼" x 20½" with grab-and-go front cut out. Eleven position nickel plated rack guides with positive rack stops. One 50,000 BTU/hr. burner per section. 100,000 total BTU/hr. Electronic spark igniters. Furnished with a two speed ½ H.P. oven blower-motor per section. Oven cool switch for rapid cool down. 120 volt, 60 Hz, 1 ph power supply required. 6' cord and plug. 7.7 amps total draw per section.

Exterior Dimensions:

40"w x 40"d (includes motor & door handles) 37¼"d (includes motor only) x 68¾"h on 8" legs.

CSA design certified. NSF listed.

SPECIFY TYPE OF GAS WHEN ORDERING.
SPECIFY ALTITUDE WHEN ABOVE 2,000 FT.

☐ **VC55GD** Solid state temperature dial controls adjust from 150° to 500°F with digital display enhancement. 5-hour timer with audible alarm.

STANDARD FEATURES

- Independently operated lift-off stainless steel doors with double pane windows.
- On-board diagnostics for easy servicing
- Stainless steel front, sides and top.
- Five nickel plated grab-and-go oven racks with eleven rack positions.
- Painted legs.
- 5-hour timer with digital display enhancement.
- Cool-to-the-touch handles.
- 50,000 BTU/hr. burner.
- Electronic spark igniter.
- ½ H.P. two speed oven blower-motor. 120/60/1 with 6' cord and plug. 7.7 amps total draw.
- Oven cool switch for rapid cool down.
- Porcelain enamel on steel oven interior.
- ¾" rear gas connection with combination gas valve / pressure regulator and safety solenoid system.
- One year limited parts and labor warranty.
- Three year limited warranty on doors.

OPTIONS

- ☐ Stainless steel legs.
- ☐ Casters.
- ☐ Second year extended limited parts and labor warranty.

ACCESSORIES

- ☐ Extra oven rack(s).
- ☐ Rack hanger.
- ☐ Stainless steel drip pan.
- ☐ Flexible gas hose with quick disconnect and restraining device. Consult price book for available sizes.
- ☐ Down draft flue diverter for direct vent connection.

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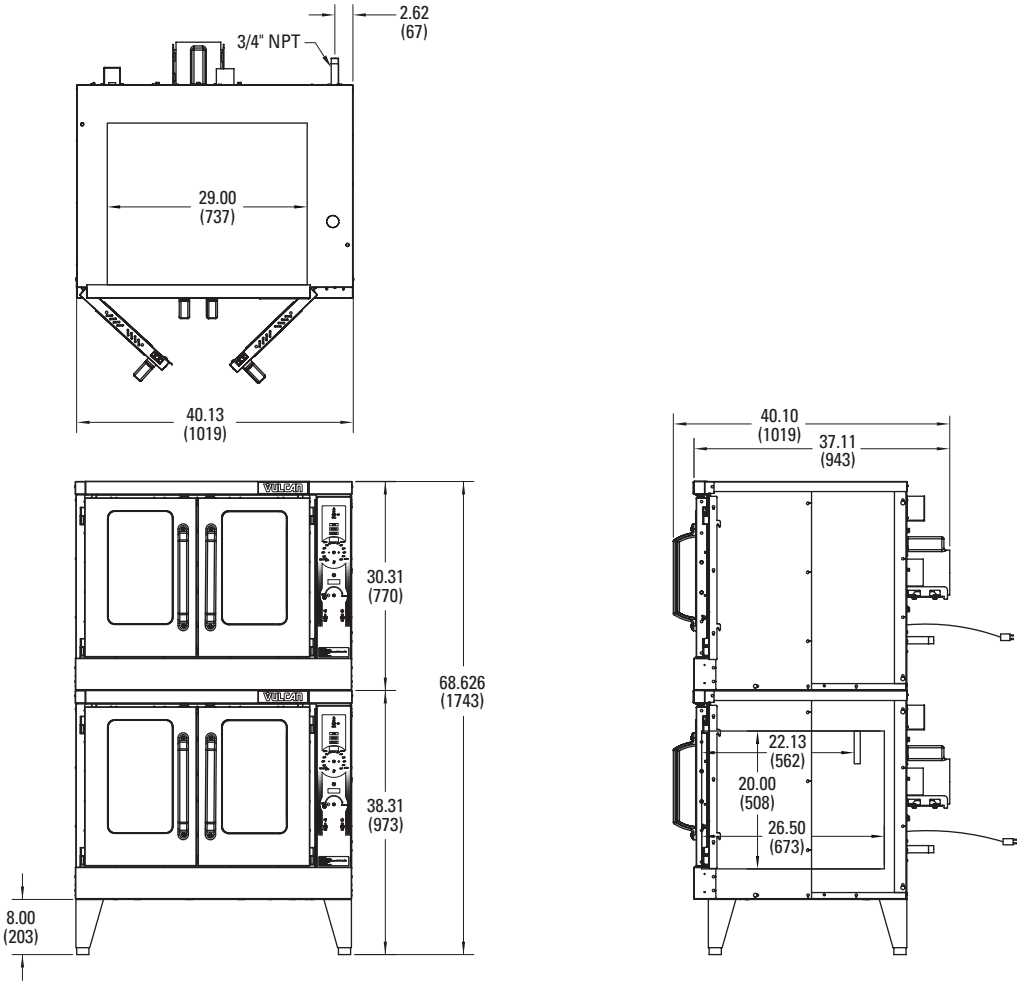
VC55G SERIES
DOUBLE DECK GAS CONVECTION OVEN WITH REMOVABLE DOORS

INSTALLATION INSTRUCTIONS

1. A combination gas valve/pressure regulator and safety solenoid system is included in this unit. Natural gas is 5.0" W.C., Propane gas is 10.0" W.C.
2. An adequate ventilation system is required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02289. When writing, refer to NFPA No. 96.
3. These units are manufactured for installation in accordance with ANSZ223.1 (latest edition), National Fuel Gas Code. Copies may be obtained from American Gas Association Inc., Accredited Standards Committee Z223, 400 N. Capitol St. NW, Washington, DC 20001 or the Secretary Standards Council, NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471.
4. Clearances:

	Combustible	Non-combustible
Rear	0"	0"
Right Side	2"	0"
Left Side	1"	0"

5. This appliance is manufactured for commercial installation only and is not intended for home use.
6. The installation location should not experience temperatures below -20°C (-4°F).



MODEL NO.	WIDTH	DEPTH (INCLUDES HANDLES)	HEIGHT	BTU/HR. PER OVEN	TOTAL BTU/HR.	ELECTRICAL	WEIGHT			
							WITH SKID & PACKAGING		WITHOUT SKID & PACKAGING	
							LBS.	KG	LBS.	KG
VC55G	40"	40"	68¾"	50,000	100,000	120/60/1	778	352	666	302

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NOTE: In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

Printed On Recycled Paper

Product: Bottom Mounted Reach-In Refrigerator

Manufacturer: Beverage-Air

Location: Cafeteria Kitchen



HBR72HC-1

Product Details

See attached.

BEVERAGE-AIR

Project: _____	AIA#
Item: _____	
Location: _____	SIS#
Approved: _____	

BOTTOM MOUNTED REACH-IN REFRIGERATOR

MODEL: HBR72HC-1

HBR72HC Solid Door Bottom Mount Refrigerator
Hydrocarbon Series



3 Year Parts/Labor Warranty
Additional 4 Year Compressor Warranty

CABINET CONSTRUCTION

- Stainless steel front, side, and grille (galvanized back & bottom)
- Stainless steel interior
- LED lighting
- Full electronic control with one-touch defrost
- One–piece grille allow easy removal/installation for preventative maintenance
- Door lock (solid doors only)
- Self closing door with 120° stay open feature
- Spring-loaded style hinges
- Plug-in magnetic door gaskets
- Three (3) heavy duty epoxy coated wire shelves per door section
- 6" Casters with two (2) brakes

OPTIONS & ACCESSORIES

- Stainless steel universal tray slide pair, 1 tray slide set for (1) 18" x 26" or (2) 14" x 18" pans (AC)
- Wine models
- 3" caster or 6" legs
- Epoxy shelves
- Shelf clips
- Remote option* (see note on back page)

REFRIGERATION SYSTEM

- Uses environmentally friendly, energy efficient R290 refrigerant, and meets all regulatory requirements for CARB, SNAP, DOE & more
- Hot gas condensate evaporator
- Adaptive defrost
- Epoxy coated evaporator coil
- Maintains product temperatures between 36°F and 38°F

HBR72HC BOTTOM MOUNT MODELS: HORIZON SERIES

Please verify qualifying units by visiting:
www.energystar.gov/cfs

3779 Champion Blvd., Winston-Salem, NC 27105
1-888-845-9800 Fax: 1-336-245-6453
Beverage-Air.com Sales@bevair.com

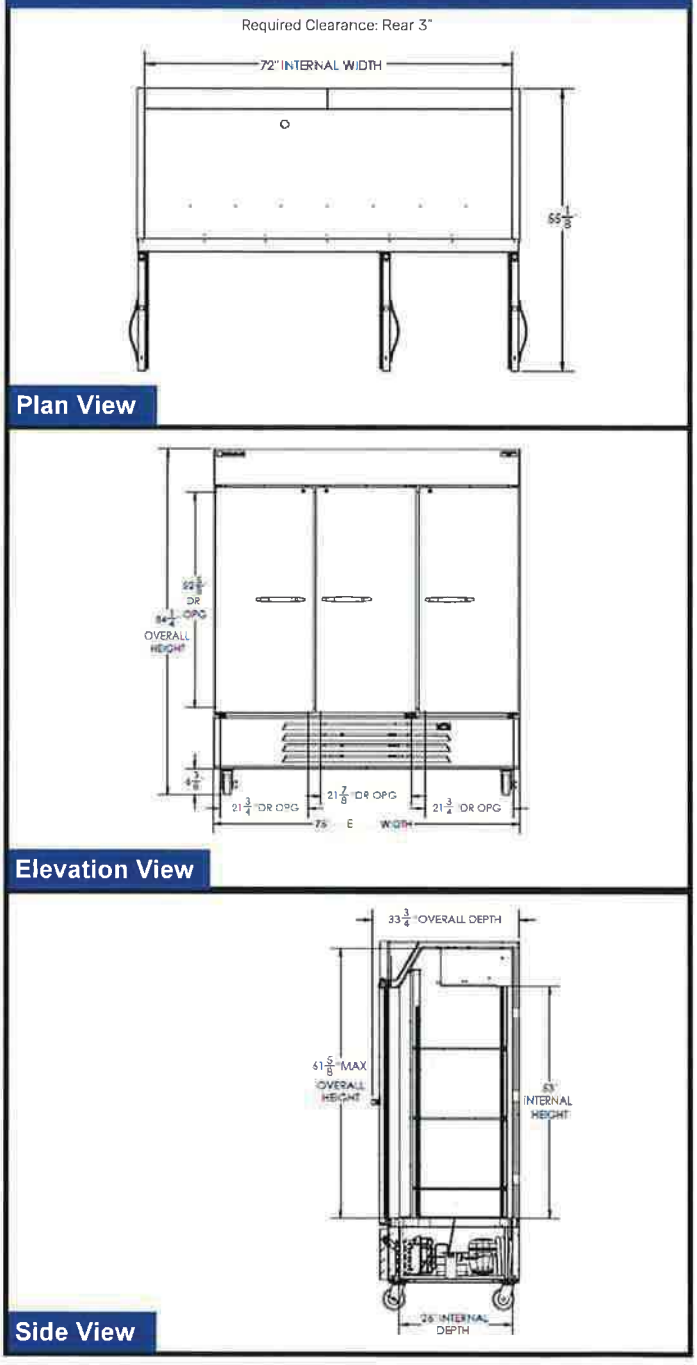
BEVERAGE-AIR

Bottom Mount Reach-ins Refrigerator
Model: HBR72HC-1

MODEL	HBR72HC-1
EXTERNAL DIMENSIONAL DATA	
Width Overall	75"
Depth Overall with Handle	33 3/4"
Height Overall with 6" Casters	84 1/4"
Number of Doors	3
Depth with Door Open 90°	55 1/8"
Door Opening (in)	21 3/4" x 52 5/8" (2) 21 7/8" x 52 5/8" (Center)
INTERNAL DIMENSIONAL DATA	
NET Capacity (cubic ft.)	68.93
Internal Width Overall (in)	72"
Internal Depth Overall (in)	26"
Internal Height Overall (in)	61 5/8"
Internal Height Useable (in)	53"
Number of Shelves	9
ELECTRICAL DATA	
Full Load Amperes 208-230/115	6.2
REFRIGERATION DATA	
Horsepower	1/2
Capacity (BTU/Hr)*	2808
SHIPPING DATA	
Gross Weight - Crated	758 lbs
Height - Crated	85"
Width - Crated	77"
Depth - Crated	36"

*NOTE: Remote units are field wired and come with 6" legs. Refrigerant must be specified at time of order.

Model Views



ELECTRICAL CONNECTION



115/60/1
NEMA-5-15P

Units pre-wired at factory and include 8' long cord and plug set.

3779 Champion Blvd., Winston-Salem, NC 27105 1-888-845-9800 Fax: 1-336-245-6453 Beverage-Air.com Sales@bevair.com

an ALI Group Company

Product: VPT Series Pass Through Holding Cabinets

Manufacturer: Vulcan

Location: Cafeteria Kitchen





VPT18

Product Details

See attached.

HEATED HOLDING

VPT SERIES
PASS THROUGH HOLDING CABINETS



Model VPT15

UL Listed. UL Listed to Canadian safety standards.
Classified by UL to NSF Std. #4.

SPECIFICATIONS

Vulcan Model No. VPT pass through holding cabinets. Blower motor for gentle and even temperature distribution. Complete with 5" heavy duty casters (2 swivel with brakes and 2 rigid). Simple knob actuated electronic control for holding at temperatures up to 190°F. Adjustable racking will hold 18" x 26" or 12" x 20" pans or a combination of both on 1½" centers. Lip-load racking will hold 18" x 26" pans on 3" centers. Shelving will hold a variety of pan sizes. Cabinet interior and exterior are both constructed out of 20 gauge stainless steel. Recessed side-mounted handles, magnetic action door latch, and full insulation; 1½" in side walls and 2" in top. Integrated stainless steel frame for maximum strength. Field reversible doors. Complete with side mounted cord and plug: NEMA 5-15 for 120 volts and NEMA 6-15 for 208-240 volts. One year limited parts and labor warranty. After the first year, 10-year parts warranty on the heating elements.

Units with adjustable racking:
- ☐ **VPT7** (see reverse for capacities)
- ☐ **VPT13** (see reverse for capacities)
- ☐ **VPT15** (see reverse for capacities)
- ☐ **VPT18** (see reverse for capacities)

Units with lip-load racking:
- ☐ **VPT7LL** (Fifteen 18" x 26" x 1" sheet pans)
- ☐ **VPT15LL** (Thirty 18" x 26" x 1" sheet pans)

Units with shelves:
- ☐ **VPT7SL** (Three Shelves)
- ☐ **VPT15SL** (Six Shelves)

STANDARD FEATURES

- Pass-Thru Holding Capacity:
  - 18" x 26" sheet pans.
  - 12" x 20" pans, or a combination of both on 1½" centers.
  - Other pan sizes on shelves.
- Blower motor for gentle and even temperature distribution.
- Dutch doors (VPT15 and VPT18).
- 5" heavy duty casters (2 swivel with brakes and 2 rigid).
- Recessed side mounted handles.
- Simple knob actuated electronic control for holding at temperatures up to 190°F.
- Universal tray slides adjustable on 1½" centers. VPT15 & VPT13 ship with 10 pairs of tray slides, VPT7 ships with 5 pairs and VPT18 ships with 15 pairs.
- Interior and the exterior are both constructed out of 20 gauge stainless steel.
- Fully insulated with 1½" in side walls and 2" in top.
- Integrated stainless steel frame for maximum strength.
- Magnetic action door latch.
- Field reversible doors.
- Side mounted cord.
- Complete with cord and plug: NEMA 5-15 for 120 volts and NEMA 6-15 for 208-240 volts.
- One year limited parts and labor warranty. After the first year, 10-year parts warranty on the heating elements.

OPTIONS

- ☐ 208/240 volt
- ☐ Humidity pan
- ☐ Full perimeter bumper
- ☐ Glass Dutch doors (VPT15 & VPT7 only)
- ☐ Wire shelves to sit on tray slides (RACK-VCH)
- ☐ Additional tray slides
- ☐ Mechanical control

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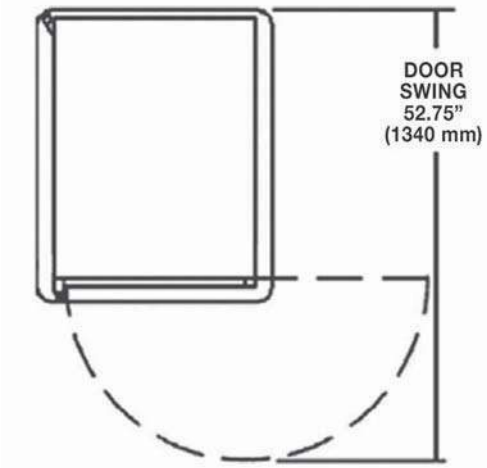
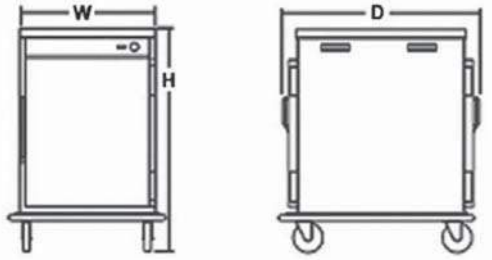
VPT SERIES
PASS THROUGH HOLDING CABINETS

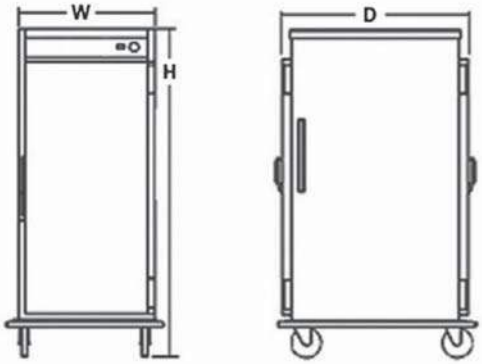
Drawings shown with optional bumper



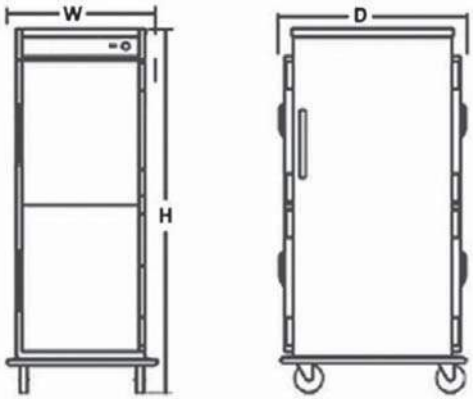
All Models Top View



VPT7 Front & Side Views



VPT13 Front & Side Views



VPT15 Front & Side Views

MODEL	DIMENSIONS	CAPACITY		ELECTRICAL			SHIPPING WEIGHTS	
	EXTERIOR	12" x 20" x 2½" PANS	18" x 26" SHEET PANS	VOLTS	WATTS	AMPS	LBS	KG
VPT7	27" W x 34½" D x 40" H	14	7	120/240	1,500	12.5	198	90
VPT7LL	27" W x 34½" D x 40" H	NA	15	120/240	1,500	12.5	198	90
VPT7SL	27" W x 34½" D x 40" H	Unit comes with 3 shelves		120/240	1,500	12.5	198	90
VPT13	27" W x 34½" D x 61" H	26	13	120/240	1,500	12.5	270	123
VPT15	27" W x 34½" D x 66½" H	30	15	120/240	1,500	12.5	297	135
VPT15LL	27" W x 34½" D x 66½" H	NA	30	120/240	1,500	12.5	297	135
VPT15SL	27" W x 34½" D x 66½" H	Unit comes with 6 shelves		120/240	1,500	12.5	297	135
VPT18	27" W x 34½" D x 73½" H	36	18	120/240	1,500	12.5	337	153

*per compartment
Optional bumper adds 3¼" to the width and 1⅝" to the depth.

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NOTE: In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

Printed On Recycled Paper

Product: Food Preparation Table; Salad Bar

Manufacturer: Beverage-Air

Location: Cafeteria Kitchen



SPE72HC-30-S

Product Details:

See attached.

BEVERAGE-AIR

Project: _____ Item: _____ Location: _____ Approved:	AIA# SIS#

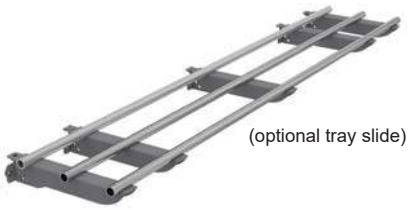
FOOD PREPARATION TABLES

SPE72HC Salad Bar
Hydrocarbon Series

MODEL:
SPE72HC-30-S



(shown with optional sneeze guard)



(optional tray slide)

3 Year Parts/Labor Warranty
Additional 4 Year Compressor Warranty

CABINET CONSTRUCTION

- Stainless steel front, sides, top, doors and grille (galvanized back & bottom)
- Interior liner is made of corrosion resistant aluminum
- Lift-off lids standard
- Heavy-duty aluminum pan liner, easy to clean and prevents spills from falling into cabinet while also ensuring coldest air flows across bottom of pans
- Accommodates up to 6" deep food service pans, 4" deep 1/3 size polycarbonate pans are included
- Locking divider bars
- Self-closing doors with 120˚ stay-open feature, on cartridge style hinges
- Easy door removal for service and cleaning
- Field-reversible doors with snap-in door gaskets
- 6" Casters, 2 with brakes
- Two epoxy-coated steel wire shelves per door section

OPTIONS & ACCESSORIES

- Stainless steel exterior with finished back
- Stainless steel interior
- Sneeze guard
- Foldable tray slides
- Door locks
- 3" casters or 6" legs
- Low profile casters
- Shelf dividers
- Pan Supports
- Digital thermometer

REFRIGERATION SYSTEM

- Uses environmentally friendly, energy efficient R290 refrigerant, and meets all regulatory requirements for CARB, SNAP, DOE & more
- Adaptive defrost
- Epoxy coated evaporator coil
- Enhanced airflow maintains temperature between 36º to 38ºF

SPE72HC SALAD BAR

Please verify qualifying units by visiting:
www.energystar.gov/cfs

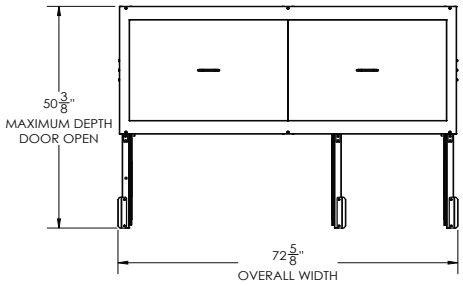
3779 Champion Blvd., Winston-Salem, NC 27105
1-888-845-9800 Fax: 1-336-245-6453
Beverage-Air.com Sales@bevair.com

BEVERAGE-AIR

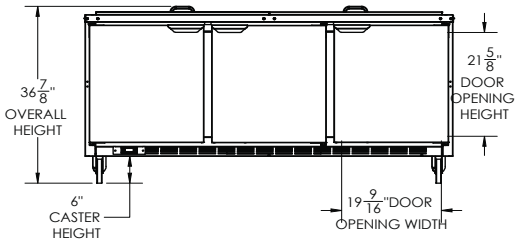
Salad Bar
Model: SPE72HC-30-S

MODEL	SPE72HC-30-S
EXTERNAL DIMENSIONAL DATA	
Width Overall	72 5/8"
Depth Overall	30 1/8"
Height Overall with Casters	36 7/8"
Number of Doors	2
Depth with Door Open Extended	50 3/8"
Door Opening (in)	19 9/16" x 21 5/8"
Number of Shelves	6
Tray Slide Depth	10 1/16"
INTERNAL DIMENSIONAL DATA	
NET Capacity (cubic ft.)	20.02
ELECTRICAL DATA	
Full Load Amperes	5.4
REFRIGERATION DATA	
Horsepower	1/3
Capacity (BTU/Hr)	1549
SHIPPING DATA	
Gross Weight - Crated	446 lbs
Height - Crated	48"
Width - Crated	72"
Depth - Crated	38"

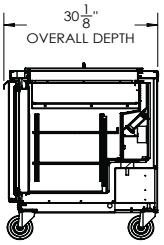
Model Views



PLAN VIEW



ELEVATION VIEW



SIDE VIEW

*ELECTRICAL CONNECTION



115/60/1
NEMA 5-15P

Unit pre-wired at factory and include 8' long cord and plug set.

3779 Champion Blvd., Winston-Salem, NC 27105 1-888-845-9800 Fax: 1-336-245-6453 Beverage-Air.com Sales@bevair.com

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The Spirit of Excellence

Product: Hot Food Serving Counter

Manufacturer: Advance Tabco

Location: Cafeteria Kitchen



HDSW-6-240-BS

Product Details:

See attached.

HEAVY DUTY ELECTRIC SEALED WELL TABLES WITH ENCLOSED BASE

NSF

Item #: Qty #:
Model #:
Project #:





Sealed Well with Drain

Enclosed Base
HDSW-3-240-BS Shown with Optional TA-255P Casters

UL LISTED

FEATURES:

Heavy duty construction
All welded 300 series stainless steel
Sealed wells with manifold drains
Thermostatic controls
Removable front panel to access elements for ease of service
Supplied with dish shelf
Stainless steel shelf with removable 3/8" thick poly cutting board - Ships K.D.

MATERIAL:

TOP: 18 gauge #304 stainless steel with die stamped pan openings and self rimmed. (12" x 20" opening size)
BODY: 18 gauge #304 stainless steel
LEGS: 18 gauge stainless steel with fully adjustable stainless steel bullet foot
INSULATION: Fiberglass insulation between each compartment
DISH SHELF: 18 gauge #304 stainless steel
CUTTING BOARD: White Thermoplastic
HEAT COMPARTMENT: Sealed well pan with "M" shaped tubular element underneath
PLUMBING: Manifold drain assembly included

ELECTRICAL:

120V units yield 640 Watts
208V/240V dual voltage units yield 825 Watts at 208V and 1100 Watts at 240V
6' electrical cord with plug
Infinite control knobs
Indicator lights

NOTE: For international applications, plug may need to be replaced (by others) in field.

Model #	Length	Width	# of Wells	Weight	Cubic Feet	Volts	NEMA Plug	Amps /Watts per Unit
HDSW-2-120-BS	31-13/16"	35-3/4"	2	225	31	120	5-20P	10.67/1280
HDSW-3-120-BS	47-1/8"	35-3/4"	3	340	45	120	5-20P	16/1920
HDSW-4-120-BS	62-7/16"	35-3/4"	4	430	60	120	L5-30P	21.33/2560
HDSW-2-240-BS	31-13/16"	35-3/4"	2	225	31	208/240	6-20P	10.67/2200
HDSW-3-240-BS	47-1/8"	35-3/4"	3	340	45	208/240	6-20P	13.75/3300
HDSW-4-240-BS	62-7/16"	35-3/4"	4	430	60	208/240	L6-30P	18.33/4400
HDSW-5-240-BS	77-3/4"	35-3/4"	5	520	74	208/240	L6-30P	22.91/5500
→ HDSW-6-240-BS	93-1/8"	35-3/4"	6	610	88	208/240	L6-30P	27.5/6600

NOTE: Units are not designed to cook or heat frozen or refrigerated foods. Food placed in tables should already be hot, and the table will maintain the proper temperatures

Includes:



Includes Manifold Drain

NEMA PLUGS: Your plug will look like this...



NEMA 5-20P



NEMA 6-20P



NEMA L5-30P



NEMA L6-30P

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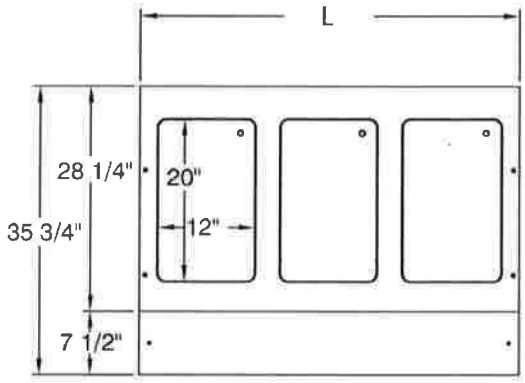
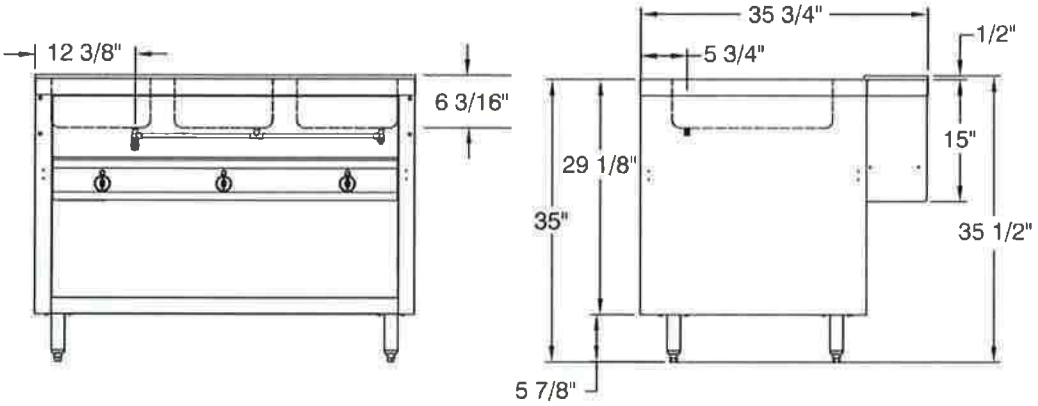
REF-V

DIMENSIONS and SPECIFICATIONS

TOL ± .125" ALL DIMENSIONS ARE TYPICAL





Food Table Shelving & Accessories

Visit our website for additional accessories



19-1/4" Height

Acrylic Food Shield has 10" Clearance from Deck

Double Sided Self-Serve Buffet Shelf
with Built-In Food Shield

Model	Length	Approx Wt.	Cu. Ft.
TBS-2	31-13/16"	34 lbs.	2
TBS-3	47-1/8"	42 lbs.	3
TBS-4	62-7/16"	47 lbs.	4
TBS-5	77-3/4"	55 lbs.	4
TBS-6	93-1/8"	63 lbs.	4



Acrylic Side Panels for Buffet Shelf
Add side panels to meet additional NSF requirements (2 panels per end)
TBP-1 One End
TBP-2 Two Ends
Field Installation Available



15" Height

Acrylic Food Shield has 1" Clearance from Deck

Single Sided Cafeteria Shelf
with Built-In Food Shield

Model	Length	Approx Wt.	Cu. Ft.
TSS-2	31-13/16"	18 lbs.	2
TSS-3	47-1/8"	23 lbs.	3
TSS-4	62-7/16"	30 lbs.	4
TSS-5	77-3/4"	35 lbs.	4
TBS-6	93-1/8"	41 lbs.	4



Acrylic Side Panel for Serving Shelf
Add side panels to meet additional NSF requirements. (1 panel per end)
TSP-1 One end
TSP-2 Two Ends
Field Installation Available

SU-90 Automatically fills & maintains water level. For DISW, DISLSW, SW & HDSW Series. Requires Manifold Drain Assembly (Included on HDSW series).

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OPTIONAL

AUTO-FILL ASSEMBLY FOR ELECTRIC HOT FOOD TABLES

MODEL # SU-90

(Available only on sealed Well Units: SW, HDSW, DISW, DISLSW Series)

FACTORY INSTALLED ONLY

Item #: _____ Qty #: _____
Model #: _____
Project #: _____

FEATURES:

Auto-Fill Sensor (Water sensor installed in one basin but will control water levels in all wells).

Quarter-Turn Valve and Drain Outlet supplied with 3/4" NPT Male Connection.

Basin Overflow Drain with continuous drainage.

Water Supply Inlet supplied with 1/2" NPS Connection.
NOTE: Recommended Shut-Off Valve for water supply (By Others).

MATERIALS:

1/2" & 3/4" Copper Pipe
Lead Free Brass Quarter-Turn Ball Valve
Auto-Fill Sensor: 120V/10W
Controlboard: 110VAC

IMPORTANT NOTE:
A **Manifold Drain** (**-M**) Option is required in order for the Auto-Fill to correctly function.
(Included on HDSW Series and not required for DISW-1 Series)





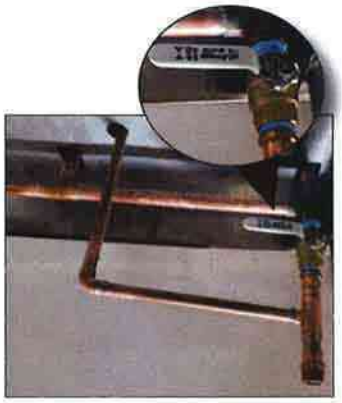
Water will continue to fill until it reaches the Auto-Fill Sensor



Illuminated On/Off Button



Basin Sensor Activates When Water Falls Below 2" Level



Overflow & Drain Assembly With Quarter-Turn Drain Valve



Supplied 1/2" NPS Water Inlet



**Save Time & Money.
Protect Your Equipment
While Providing Efficiency
& Constant Water Level!**

Click Here for SU-90 Operation Guide



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STAINLESS STEEL

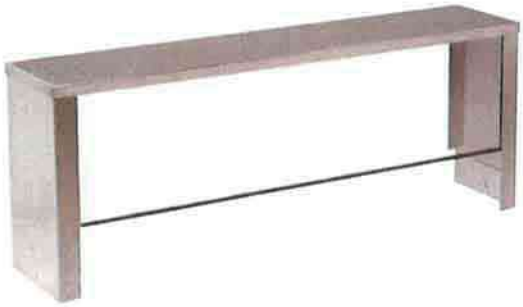
SINGLE SIDED CAFETERIA SHELF

With Built-in Food Shield

Item #: Qty #:

Model #:

Project #:



MODEL	Length (L)		Wt.	Cubic Feet
TSS-2	32"	Fits 2-Well Unit	18 lbs.	2
TSS-3	47-3/8"	Fits 3-Well Unit	23 lbs.	3
TSS-4	62-5/8"	Fits 4-Well Unit	30 lbs.	4
TSS-5	78"	Fits 5-Well Unit	35 lbs.	4
→ TSS-6	93-1/8"	Fits 6-Well Unit	41 lbs.	4

FEATURES:

14 1/2" high.

Built-in single sided cafeteria style acrylic food shield.

Food shield has 1" clearance from deck.

Removable stainless steel top shelf.

Optional acrylic side panels available to further meet additional NSF requirements (1 panel per end).

Field installation available.

MATERIAL:

Shelf: stainless steel

Food Shields: acrylic



Acrylic Side Panel for Serving Shelf

Add side panels to meet additional NSF requirements (1 panel per end)

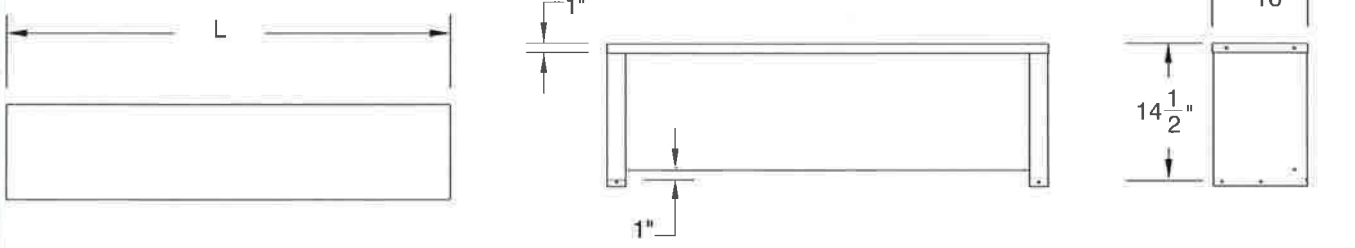
TSP-1 One End

TSP-2 Two Ends

Field Installation Available

DETAILS and SPECIFICATIONS

TOL Overall: ± .500" Interior: ± .250" ALL DIMENSIONS ARE TYPICAL



Acrylic Clearance From Deck

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TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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TABLE MODIFICATIONS & ACCESSORIES

BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf (M). Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)
TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs
TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs
TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty
Set of 4 (Two with Brakes)
TA-256 Super Heavy Duty
Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, AUGUST 2018

Product: **ST School Milk Coolers, ST58HC Dual Access, Cold Wall Hydrocarbon Series**

Manufacturer: Beverage-Air

Location: Cafeteria Kitchen



ST58HC-W

Product Details

See attached.

BEVERAGE-AIR

Project: _____	AIA#
Item: _____	
Location: _____	SIS#
Approved: _____	

ST SCHOOL MILK COOLERS

ST58HC Dual Access, Cold Wall
Hydrocarbon Series

MODEL:
ST58HC-W-02



ST58HC -W-02

OPTIONS & ACCESSORIES

- ☐ Wrap around & corner bumpers
- ☐ Custom graphics

3 Year Parts/Labor Warranty
Additional 2 Year Compressor Warranty

CABINET CONSTRUCTION

- White coated steel exterior and stainless steel interior maximum milk crate support.
- Lids, doors, adjustable hinges and door latches made from stainless steel are standard on all units
- Full electronic Control
- Heavy-duty epoxy coated steel wire floor racks standard
- Floor drain is centrally located for easy cleaning, connecting to drain hose with hose adapter
- Flexible compression door gaskets ensure tight seal
- Self-latching doors/lids with safety bumpers
- Exterior thermometer
- Cylinder lock
- 4” Heavy-duty plate casters (2 with locks)
- Maintains continuous milk temperature between 36º - 38ºF

REFRIGERATION SYSTEM

- Refrigeration system uses R290 refrigerant to comply with all environmental concerns
- Automatic, nom-electric defrost
- Epoxy coated evaporator coil

ST58HC Dual Access, Cold Wall : School Milk Series

3779 Champion Blvd., Winston-Salem, NC 27105
1-888-845-9800 Fax: 1-336-245-6453
Beverage-Air.com sales@bevair.com

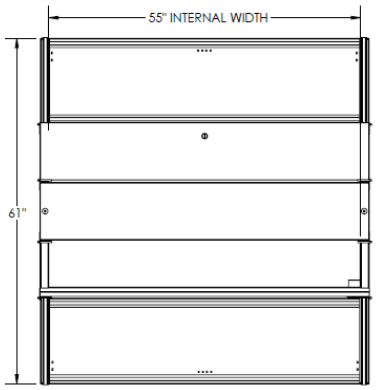
BEVERAGE-AIR

ST Series—School Milk Cooler

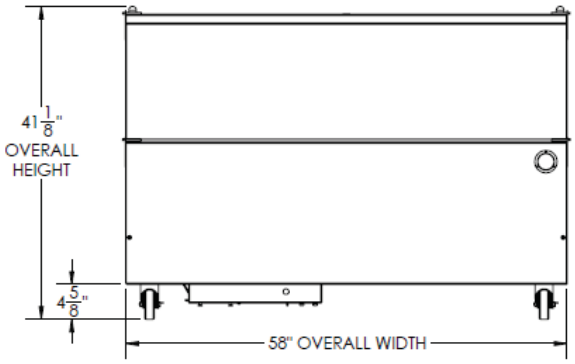
Model: ST58HC-W-02

MODEL	ST58HC-W-02
EXTERNAL DIMENSIONAL DATA	
Width Overall	58”
Depth Overall	31 1/4”
Depth Overall with Lids/Doors Extended	61”
Height Overall with Casters	41 1/8”
Number of Lids/Doors	Dual Access
INTERNAL DIMENSIONAL DATA	
NET Capacity (cubic ft.)	22.5
Internal Width Overall (in)	55”
Internal Depth Overall (in)	27”
Internal Height Overall (in)	25 1/2”
CASE CAPACITIES	
13” x 13” x 11”	16
19” x 13” x 11”	10
ELECTRICAL DATA	
Full Load Amperes 115/60/1	3.7
REFRIGERATION DATA	
Horsepower	1/2
Capacity BTU	2149
WEIGHT DATA	
Gross Weight (Crated lbs)	372 lbs
Height - Crated	47”
Width - Crated	61”
Depth - Crated	34”

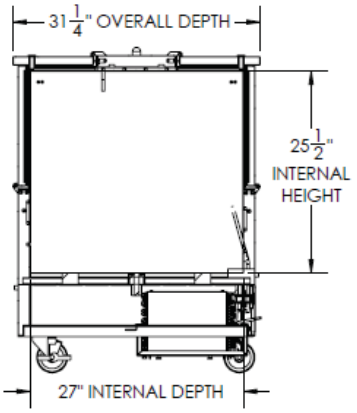
Model Views



Plan View



Elevation View



Side View

ELECTRICAL CONNECTION



115/60/1
NEMA-5-15P

Units pre-wired at factory and include 8’ long cord and plug set.

3779 Champion Blvd., Winston-Salem, NC 27105
1-888-845-9800 Fax: 1-336-245-6453
Beverage-Air.com sales@bevair.com

Product: EST-44 Conveyor Dishwasher

Manufacturer: CMA Dishmachines

Location: Cafeteria Kitchen



EST-44

Product Details

See attached.

EST-44/66

High Temperature
Low Temperature
44"/66" Conveyor Dishwasher



Available as Right or Left.
(must specify)



Available as Right or Left.
(must specify)

FEATURES:

- **ENERGY STAR® Approved.**
- Automatic water control system.
- 249 racks / 996 covers per hour.
- Economical to operate. Uses only .49 gallons of water per rack of dishes.
- Single control switch activation.
- Power rinse heater system.
- Unique 3-stage (EST44) washing process provides wash, power rinse and final rinse all in a 44" machine.
- Unique 4-stage (EST66) washing process provides two wash stations, power heated rinse and final rinse all in a 66" machine.
- Automatic soil purging system filters wash water and traps plate debris into an external tray. Tray can be easily removed for cleaning.
- All stainless steel construction offers durable performance and years of trouble-free operation.
- Chemical resistant industrial heaters are proven to be more durable than commercial grade heaters.
- Large 19" opening accommodates larger items and utensils.
- Auto start/stop makes operation more energy efficient.
- Easy to remove and replace curtains for cleaning.
- Includes table limit switch and rack saver clutch system that protects the machine, dishracks and table from damage.
- Stainless steel chemical injection chamber.

Available Options

- Corner Feed Table (left or right must specify)
  FACTORY INSTALLED ONLY
- Vent Hood with 4" x 16" Vent and Damper Control (2 per set)
- Stainless Steel dishtables
- Drain Water Tempering Kit
- "E Temp" CMA booster heater(40° and 70° rise)
  FACTORY INSTALLED ONLY
- Hatco Booster Heater also available (specify voltage & phase)
- Scrap Trap Single Drain Connection Kit
- 208V-240V / 480V
- Sheet Pan Rack P/N: 1154.00
- 6" EXT height accommodates pots and pans and larger sheet pans
- Exhaust Fan Control
- **Note: E-Temp not available single phase 70° rise.**
- **Note: E-Temp standard voltage 208-230V three phase**

CMA Energy MIZER® Registered Trademark
Intertek 3090590
c UL us LISTED COMMERCIAL DISHWASHER 864T
ENERGY STAR

CMA Dishmachines 12700 Knott Street Garden Grove, CA 92841• 800-854-6417 • 714-898-8781 • Fax: 714-895-2141 • www.cmadishmachines.com

CMA reserves the right to modify specifications or discontinue models without prior notification.

PN: 10124.10

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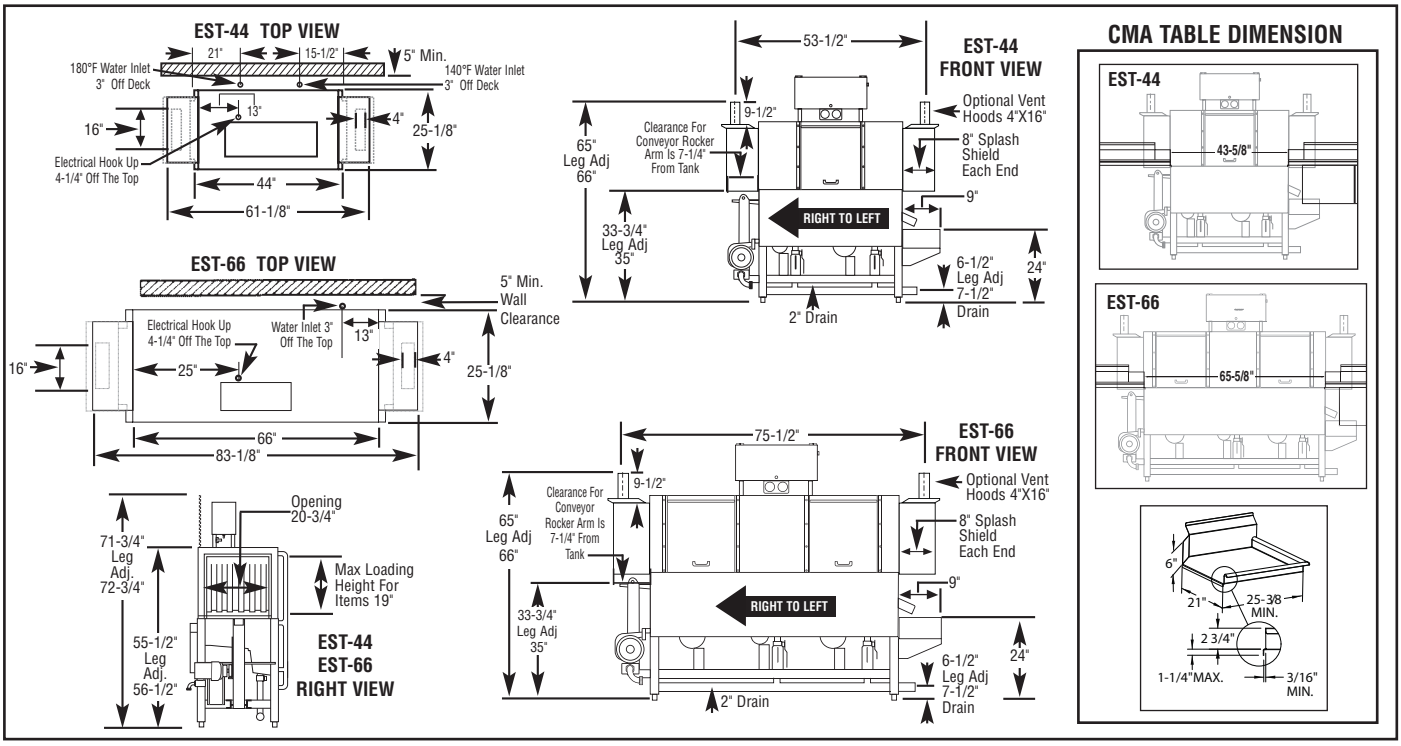
EST-44/66

High Temperature
Low Temperature
44"/66" Conveyor Dishwasher

WARNINGS:

- Plumbing connections must be made by a qualified service company who will comply with all available Federal, State, and Local Health, Plumbing and Safety codes.
- Water hardness above 3 grains per gallon should be treated by a water softener. Failure to provide soft water (3g or less) will void the machine warranty.



Specifications:

MODEL EST-44/66 H/L	USA	METRIC
OPERATING CAPACITY RACKS PER HOUR (NSF RATED)243	243	243
CONVEYOR SPEED	6.75 FT./MIN.	(206 CM/MIN.)
WASH PUMP MOTORS HP	1	1
RINSE PUMP MOTOR HP	1/3	1/3
CONVEYOR MOTOR HP	1/8	1/8
WATER INLET - FILL	1/2"	(1.27cm)
WATER INLET - FINAL RINSE	1/2"	(1.27cm)
DRAIN SIZE	2"	(5.1cm)
FINAL RINSE PRESSURE	20 ± 5psi	(1.41 kg/cm²)
WASH TANK CAPACITY EST-44		
PRE-RINSE	4.25 GAL	(16.0 L)
WASH	11.75 GAL	(44.5 L)
TOTAL	16.0 GAL	(60.5 L)
WASH TANK CAPACITY EST-66		
PRE-RINSE	5.25 GAL	(20.0 L)
WASH	13.25 GAL	(50.0 L)
TOTAL	18.5 GAL	(70.0 L)
WASH PUMP CAPACITY		
EACH	52 GPM	(197 LPM)
OPERATING TEMPERATURE EST-44/66		
WASH	150°F-160°F	(66°C/71°C)
PUMPED RINSE	160°F	71°C)
FINAL RINSE	180°F-195°F	(82°C/90°C)
OPERATING TEMPERATURE EST-44/66		
WASH RECOMMENDED	140°F-150°F	(60°C/68°C)
PUMPED RINSE RECOMME NDED	140°F-150°F	(60°C/68°C)
FINAL RINSE RECOMMENDED	140°F-150°F (60°C/68°C)	
WATER CONSUMPTION		
PER RACK (FINAL RINSE)	0.49 GAL	(1.8 L)
PER HOUR (FINAL RINSE)	119 GPH	(450 LPH)

	USA	METRIC
DIMENSIONS		
DEPTH EST-44/EST-66	25-1/8"	(64cm)
WIDTH EST-44	44"	(111.7cm)
WIDTH EST-66	66"	(167.64cm)
HEIGHT EST-44 / EST66	55-1/2"-56-1/2"	(140.97-143.51cm)
STANDARD TABLE HEIGHT EST-44/EST-66	34"	(86cm)
MAX LOADING HEIGHT FOR ITEMS EST-44/EST-66	19"	(48cm)
STANDARD DISHRACK DIMENSIONS	1 19-3/4"X19-3/4"	1 (50X50cm)

ELECTRICAL RATING	VOLTS	PHASE	AMPS (EST44)	AMPS (EST66)
13kW @ 240V HEATER	208	1	68	76
13kW @ 240V HEATER	240	1	76	83
13kW @ 208V HEATER	208	3	53	56
13kW @ 208V HEATER	240	3	60	53
	480	3	24	26

WASH TANK HEATER 13kW @ 240V (3 PHASE), 13kW @ 208V (1 PHASE)
RINSE TANK HEATER 3kW @ 240V

SPECIFY DIRECTION OF RACK TRAVEL (RIGHT TO LEFT, LEFT TO RIGHT) WHEN ORDERING

EST-44H/EST-66 EXHAUST VENTILATION REQUIREMENTS AT 100% CAPACITY CFM
ENTRANCE END 200 MAX DISCHARGE END 400 MAX TOTAL CFM 600 MAX

SHIPPING WEIGHT

APPROXIMATE EST-44	662#	(300kg)
APPROXIMATE EST-66	750#	(340kg)

Summary Specifications: Model EST-44 / EST-66 Conveyors

The Models EST-44H/ EST-66H high temperature and EST-44L / EST-66L Chemical Sanitizing conveyor dishwashers meets ETL sanitation, UL, and CUL construction standards. The EST-44 / EST-66 performs three separate washing functions including a built-in power rinse, all in a 44" or 66" space. The EST-44 / EST-66 washes up to 243 racks per hour and uses a minimum .49 gallons of water per rack while achieving sparkling, clean, dry dishes. Constructed entirely of stainless steel.

Call For Available Models (800-854-6417 or See web-Site: www.cmadishmachines.com

Advisory: CMA does NOT endorse "Tankless On-Demand" water heaters for use on CMA Dishmachine products. CMA DOES endorse, and highly recommends, the standard "tank" style water heaters, sized properly to handle each particular facility with their water heating requirements.

CMA Energy Mizer® Registered Trademark

CMA Dishmachines 12700 Knott Street Garden Grove, CA 92841• 800-854-6417 • 714-898-8781 • Fax: 714-895-2141 • www.cmadishmachines.com

CMA reserves the right to modify specifications or discontinue models without prior notification.

PN: 10124.10

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Product: Camtainers® Beverage Carrier

Manufacturer: Cambro

Location: Cafeteria Kitchen



100LCD110

Product Details:

See attached.

CAMBRO

Camtainer® Insulated Containers

For Hot and Cold Beverages

Models 100LCD 1½ gallon (5,5 L)
250LCD 2½ gallon (9,4 L)

For Soup (No Spigot)

Model 350LCD 3⅜ gallon (12,7 L)

Item No. _____

Specifier Identification No. _____

Model No. _____

Quantity _____



Features & Benefits

- Attractive design is perfect for front-of the-house hot and cold beverage or soup service. Stacks easily for storage and transportation.
- Serving capacity:
  Model 100LCD - 27 each 7 oz. (210 mL) cups
  Model 250LCD - 45 each 7 oz. (210 mL) cups
  Model 350LCD - 61 each 7 oz. (210 mL) servings
- Single-molded, seamless, double-wall, high-density, polyethylene construction is highly durable, dishwasher safe and resists dings and dents. Textured exterior is scratch-resistant.
- Polyurethane foam insulation provides excellent hot or cold temperature retention for hours. Hot beverages remain hot without the need for a costly external heating source.
- Molded-in handles offer comfortable easy transporting.
- Recessed sturdy plastic latches will not rust or corrode and are protected from being hit or damaged.
- Drip proof recessed spigot (on 100LCD & 250LCD) allows for convenient access. Optional Easy Serve Dispenser lever attaches easily and offers easy and even beverage dispensing.
- Raised edge, spill proof rim prevents spills and leaks during transport.
- Pop-up vent on all models helps to equalize pressure and release steam.
- Self-adhesive beverage labels included for quick identification of contents.
- Optional Condiment Holder and Riser available for 250LCD.
- Optional Camdollies® offer easy transporting.
- Non-electrical.
- No assembly required.
- Available in 8 colors.

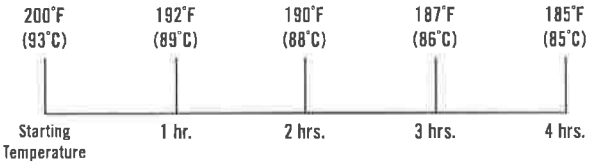


Easy Serve Dispenser



Spill Proof Rim and Molded-in Handle.

HOT



Approvals

NSF

CAMBRO

© Cambro Manufacturing Company 5801 Skylab Road, Huntington Beach, CA 92647-2056, U.S.A.
Telephone 714 848 1555 **Toll Free** 800 854 7631 **Customer Service Department** 800 833 3003

Camtainer® Insulated Containers

For Hot and Cold Beverages

Models 100LCD 1½ gallon (5,5 L)
250LCD 2½ gallon (9,4 L)

For Soup (No Spigot)

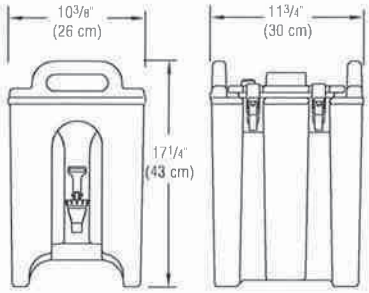
Model 350LCD 3⅜ gallon (12,7 L)

Item No. _____

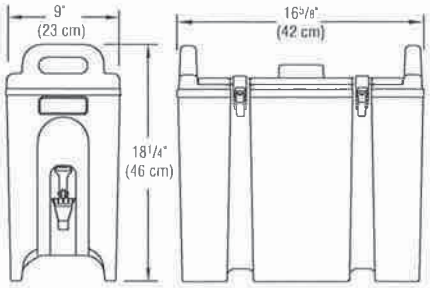
Specifier Identification No. _____

Model No. _____

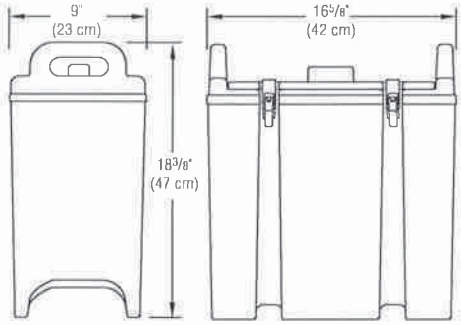
Quantity _____



100LCD



250LCD



350LCD (No Spigot)

Specifications

Dimension Tolerance: +/- ¼" (0,64 cm)

Code	Description	Total Capacity	Serving Capacity 7 oz. (210 mL) cups	Dimensions W x D x H	Case lbs./cube Kg/m³
100LCD	Camtainer	1½ gallon (5,5 L)	27	10⅜" x 11¾" x 17¼" (26 x 30 x 43 cm)	9,5 (1,24) 4,5 (0,035)
250LCD	Camtainer	2½ gallon (9,4 L)	45	9" x 16⅝" x 18¼" (23 x 42 x 46 cm)	12,75 (1,70) 6 (0,05)
350LCD	Camtainer for Soup (No Spigot)	3⅜ gallon (12,7 L)	61	9" x 16⅝" x 18⅜" (23 x 42 x 47 cm)	13,25 (1,70) 6 (0,05)

Optional Accessories

Easy Serve Dispenser ❑ LCDES fits 100LCD & 250LCD
Riser ❑ R500LCD fits 250LCD
Condiment Holder ❑ LCDCH fits 250LCD
Camdolly® ❑ CD100 ❑ CD100H fits 250LCD and 350LCD
❑ CD100HB fits 250LCD and 350LCD

Standard Colors

❑ Navy Blue (186) ❑ Slate Blue (401) ❑ Coffee Beige (157)
❑ Dark Brown (131) ❑ Brick Red (402) ❑ Green (519)
❑ Black (110) ❑ Hot Red (158)

Architect Specs

The portable, non-electrical hot and cold beverage and soup container/server shall be a Camtainer Insulated Container, Models ...., manufactured by Cambro Mfg. Co., Huntington Beach, CA 92647 U.S.A. It shall be made of one-piece, seamless, double-wall polyethylene and foam-injected polyurethane. It shall have a raised edge, spill-proof rim. It shall have a pop-up vent to help equalize pressure and release steam. It shall have durable, plastic latches on recessed, molded-in mounting plates. It shall have molded-in handles. It shall have a drip proof, recessed serving spigot designed with easy finger adjustment on 1½ gallon (5,5 L) and 2½ gallon (9,4 L) container. It shall have the option of an Easy Serve Dispenser lever. It shall be available without a spigot for soup service. It shall have self-adhesive beverage labels to use for quick product identification. It shall have an optional Condiment Holder and Riser except for the 100LCD. It shall require no assembly and shall be offered in 8 colors.

Approvals

NSF

CAMBRO

© Cambro Manufacturing Company 5801 Skylab Road, Huntington Beach, CA 92647-2056, U.S.A.
Telephone 714 848 1555 **Toll Free** 800 854 7631 **Customer Service Department** 800 833 3003

DO41110 Camtainers GS

CAMBRO

Camdollies®

For 13" x 13" (33 x 33 cm) Milk Crates

Without Handle

Models CD1313, CD1327

For 14" x 19" (36,5 x 48,3 cm) Milk Crates

Without Handle

Models CD1420, CD2028

StoreSafe

Features & Benefits

- Make any job easier by smoothly transporting stacks of milk crates with these rugged and reliable Camdollies!
- Load capacity:
  - Model CD1313 - 250 lbs. (114 Kg.)
  - Model CD1327 - 300 lbs. (136 Kg.)
  - Models CD1420, CD2028 - 350 lbs. (159 Kg.)
- One-piece seamless, double-wall, high-density polyethylene construction is extremely durable. Won't rust or corrode.
- Rounded corners protect walls, equipment, and furniture from damage.
- Foamed-in-place polyurethane core adds greater structural strength and reduces noise.
- Easy to clean - can be wiped down or steam cleaned.
- All models have four each 3" (7,6 cm) swivel casters, no brake, bolted into molded-in steel plates. Provides quiet service and greater durability when fully loaded.
- No assembly required.
- Available in 7 colors.

Item No. _____

Specifier Identification No. _____

Model No. _____

Quantity _____



For 13" x 13 " (33 x33 cm) Milk Crates (Not available by Cambro)



CD1313



CD1327



For 14" x 19 " (36,5 x 48,3 cm) Milk Crates (Not available by Cambro)



CD1420



CD2028

Approvals

NSF

CAMBRO MANUFACTURING COMPANY
http://www.cambro.com

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Telephone (1)714 848 1555 **Toll Free** 800 854 7631 **Customer Service Hot Line** 800 833 3003

LIT FCST-0102-08

Camdollies®

For 13" x 13" (33 x 33 cm) Milk Crates

Without Handle

Models CD1313, CD1327

For 14" x 19" (36,5 x 48,3 cm) Milk Crates

Without Handle

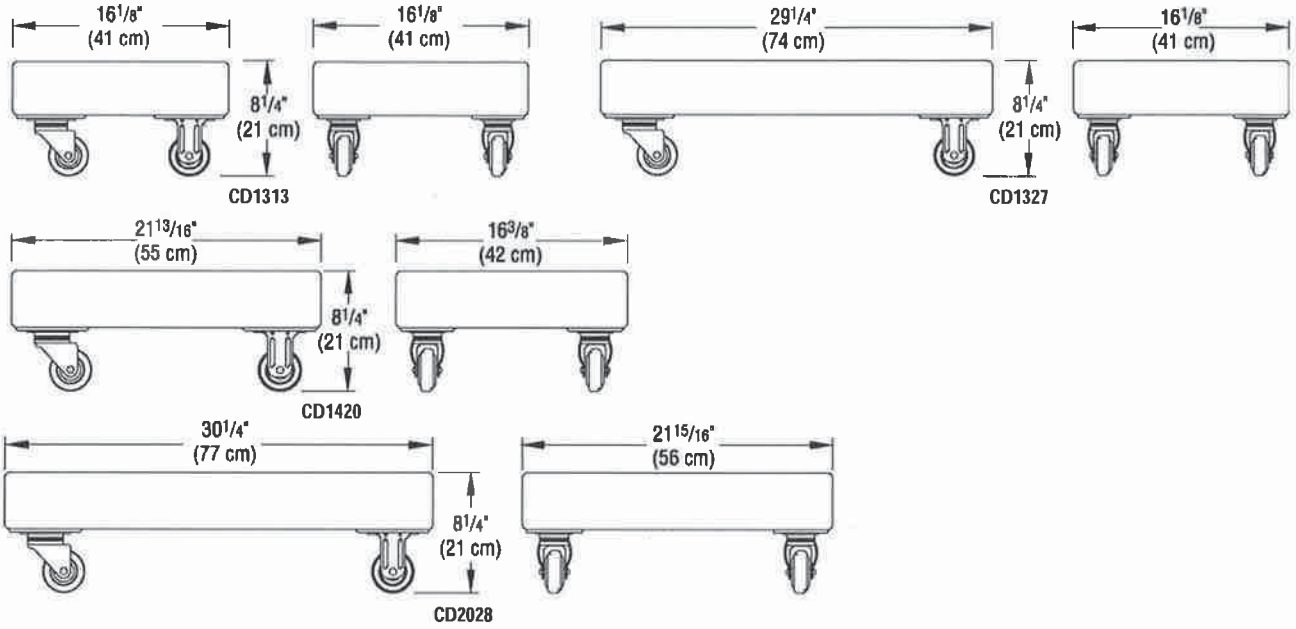
Models CD1420, CD2028

Item No. _____

Specifier Identification No. _____

Model No. _____

Quantity _____



Specifications

Dimension Tolerance: +/- 1/4" (0,64 cm)

Code	Description	Load Capacity	Interior Dimensions W x D	Exterior Dimensions L x W x H	Case lbs./cube Kg/m³
For 13" x 13" (33 x 33 cm) Milk Crate					
CD1313	Camdolly	250 lbs. (114 Kg)	13 11/16" x 13 13/16" (35 x 35 cm)	16 1/8" x 16 1/8" x 8 1/4" (41 x 41 x 21 cm)	13.25 (1.11) 6 (0,03)
CD1327	Camdolly	300 lbs. (136 Kg)	13 13/16" x 26 13/16" (35 x 68 cm)	29 1/4" x 16 1/8" x 8 1/4" (74 x 41 x 21 cm)	15.5 (2.13) 7 (0,06)
For 14" x 19" (36,5 x 48,3 cm) Milk Crate					
CD1420	Camdolly	350 lbs. (159 Kg)	13 15/16" x 19 3/8" (35 x 49 cm)	21 13/16" x 16 3/8" x 8 1/4" (55 x 42 x 21 cm)	15.25 (1.44) 7 (0,04)
CD2028	Camdolly	350 lbs. (159 Kg)	19 9/16" x 27 13/16" (50 x 71 cm)	30 1/4" x 21 15/16" x 8 1/4" (77 x 56 x 21 cm)	19.5 (3.09) 9 (0,09)

Architect Specs

The milk crate transport cart shall be a Camdolly, Cambro Model...,manufactured by Cambro Mfg. Co., Huntington Beach, CA 92648 U.S.A. It shall be constructed of single-molded, seamless, double-wall, high-density polyethylene and thick foam injected polyurethane. It shall be available to accommodate either 13" x 13" (33 x 33 cm) or 14" x 19" (36,5 x 48,3 cm) milk crates. It shall have a load capacity range of 250 to 350 lbs. (114 to 159 Kg.). It shall have rounded corners for added protection. It shall have no handles. It shall have 4 each 3" (7,6 cm) swivel casters with no brake that are bolted into molded-in metal plates. It shall not require any assembly and shall be available in 7 colors.

Standard Colors

- ❑ Coffee Beige (157)
- ❑ Dark Brown (131)
- ❑ Black (110)
- ❑ Slate Blue (401)
- ❑ Gray (180)
- ❑ Brick Red (402)
- ❑ Green (519)

Approvals

NSF

CAMBRO MANUFACTURING COMPANY
http://www.cambro.com

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Telephone (1)714 848 1555 **Toll Free** 800 854 7631 **Customer Service Hot Line** 800 833 3003

Printed in USA

Product: Scoot™ Book Truck - 6 Sloped Shelves

Manufacturer: SAFECO

Location: Book Rooms

The Scoot™ Double-Sided Book Cart is a steel book cart with tubular steel legs and black powder coat finish. The dual-sided cart has six slanted shelves, measuring 8"D with 12" between shelves. The book cart includes a height-adjustable file pocket and complements entire Scoot line of product solutions. Mobile cart moves on over-sized casters.



Model # 5335BL

Product Details

- Steel book cart with tubular steel legs and black powder coat finish
- Overall Dimensions: 41-1/2"H x 44-1/4"W x 17-3/4"D
- Product Weight: 62.4 lbs
- Double-sided cart has six slanted shelves 8"D with 12" between shelves
- Includes a height-adjustable file pocket
- Mobile cart on over-sized casters
- Complements entire Scoot line of product solutions

- 20-Gauge steel construction
- Weight Capacity: 50 lbs per shelf
- Includes height adjustable file pocket
- 3 in. casters (2 locking) for easy mobility
- Assembly required
- Green Guard certified
- Warranty: 5 years
- Made in the USA

Scoot™ Book Carts



5335BL



5336BL

- steel cart with tubular steel legs and black powder coat finish
- two styles: single and double sided
- single-sided cart has three slanted shelves 12½"d x 12¼"h
- double-sided cart has six slanted shelves 8"d with 12" between shelves
- includes a height-adjustable file pocket
- mobile on oversized casters
- complements entire Scoot line of product solutions

GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

Model	Description	W x D x H	Ship Weight
5335BL	Double Sided 6 Shelf Cart	41¼ x 17¾ x 41¼"	74 lbs.
5336BL	Single Sided 3 Shelf Cart	33 x 14¼ x 44¼"	60 lbs.

Safco Products Company
9300 West Research Center Road | Minneapolis, MN 55428
telephone: 888.971.6225 | fax: 763.971.1525
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Product: A Series Solid Door Reach-In Refrigerator

Manufacturer: Avantco Refrigeration

Location: ProStart Kitchen Laboratory



Model #178A35RHC

Product Details

See attached.

REFRIGERATION AVANTCO

PROJECT: _____

MODEL: _____ SERIAL#: _____

ITEM #: _____ QUANTITY: _____

APPROVAL: _____ DATE: _____

A Series

Solid Door Reach-In Refrigerators & Freezers

MODEL #178A35RHC

CABINET CONSTRUCTION

Cabinet construction includes white painted aluminum interior and 430 stainless steel exterior.

Foamed-in-place CFC- and HCFC-free polyurethane insulation helps provide structural rigidity and maintain internal temperatures.

Removable one-piece grill for cleaning and servicing.

Door has stay-open feature beyond 90˚ for easy loading, but will self-close under 90˚ to save energy.

REFRIGERATION SYSTEM

Environmentally-safe R290 refrigerant. Bottom-mounted condensing unit positioned for easy maintenance.

Bottom-mounted condensing unit positioned for easy maintenance.

SHELVING

6 gray epoxy-coated steel shelves included.

Each accommodates up to 90 lb.

MODEL FEATURES

Preprogrammed digital controls feature auto-defrost function.

"No stoop" lower shelf raises product to a higher level for easy access.

A SERIES REACH-IN REFRIGERATOR

Keep ingredients within a safe temperature range in a sleek, durable, and easy-to-clean environment

SPECIAL FEATURES

- Easy-to-clean 430 series stainless steel exterior
- Painted aluminum interior
- Self-closing door with convenient stay-open feature
- Temperature range of 33-40°F
- 6 shelves included
- Environmentally-safe R290 refrigerant
- Digital temperature controller with automatic defrost function
- 115V; 1/4 HP
- ETL Safety & Sanitation Listed



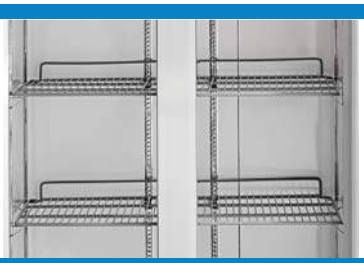
★ Conforms to UL & NSF-7 Standards

WARRANTY

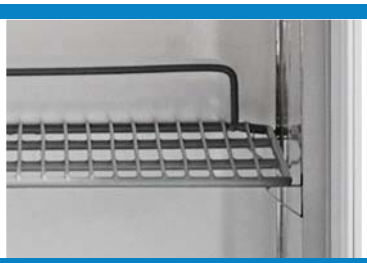
RESIDENTIAL: Avantco assumes no liability for parts or labor coverage for component failure, factory defect or any other damages for units installed in non-commercial foodservice or residential applications.

1 year WARRANTY
Parts & Labor

5 year WARRANTY
Compressor









© 2020 Avantco Refrigeration

REFRIGERATION AVANTCO

A Series
Solid Door Reach-In Refrigerators & Freezers

MODEL #178A35RHC

TECHNICAL DATA

Dimensions

Exterior Dimensions	39½"W x 29½"D x 82½"H
Interior Dimensions	35"W x 24⅜"D x 59½"H
Net Volume	27.6 cu. ft.
Net Weight	265 lb.
Gross Weight	309 lb.
Packaging Dimensions	42"W x 31⅞"D x 84⅝"H

Cooling

Temperature Range	33°F - 40°F
Refrigerant	R290
Max. Ambient Temperature	100°F
Defrosting	Automatic
Temperature Controller	Digital
Horsepower	1/4

Construction

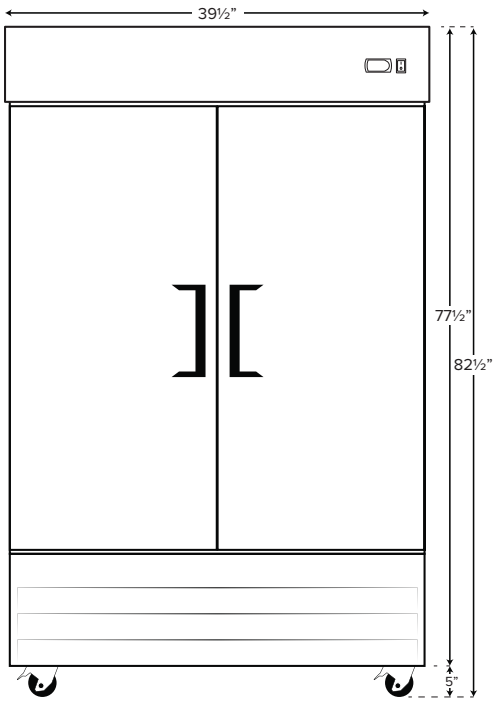
Exterior Material	430 Stainless Steel
Interior Material	Painted Aluminum
Insulation Material	Foamed-In-Place Polyurethane
Shelf Size	(6) 16¹⁵⁄₁₆"W x 21¼"D
Shelf Material	Epoxy-Coated Steel
Shelf Load Capacity	90 lb.

Electrical

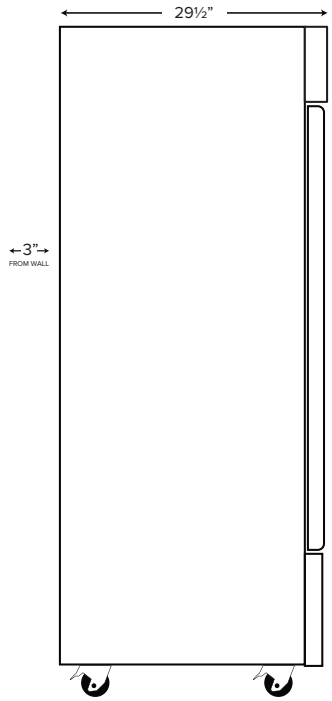
Voltage	115
Amps	4.3
Hz	60
Phase	1
Plug Type	NEMA 5-15P
Electrical Cord Length	96"

PLAN VIEW

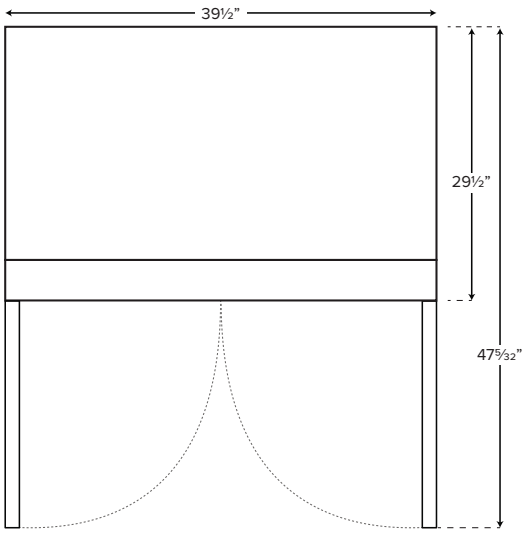
FRONT VIEW

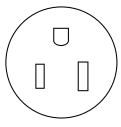


SIDE VIEW



TOP VIEW





NEMA 5-15P

Product: Commercial Reach-In Freezer

Manufacturer: Galaxy Equipment

Location: ProStart Kitchen Laboratory



Item #177GR120FW

Product Details

See attached.

PROJECT: _____

MODEL: _____

ITEM #: _____ QUANTITY: _____

APPROVAL: _____ DATE: _____

1/2021

Item #177GRI20FW

Commercial Reach-in Freezer

19.42 Cu. Ft.



Features:

- Interior LED Lighting
- Full Length Door Handle
- Temperature range of -8–(-1°F.)
- Digital temperature controller with automatic defrost function
- 6 poly-coated metal shelves each hold 66 lb.
- ETL Safety and Sanitation listed
- Includes 4 casters (2 brakes, 2 without).
- Eco-friendly R290 hydrocarbon refrigerant.
- Bottom mount condensing unit for more convenient maintenance.
- 115V; 3/4 hp

Cabinet Construction:

Sturdy design features white powder-coated steel exterior and white painted aluminum interior.

Foamed-in-place CFC- and HCFC-free polyurethane insulation enhances the structural integrity of the cabinet and promotes energy efficiency.

Refrigeration System:

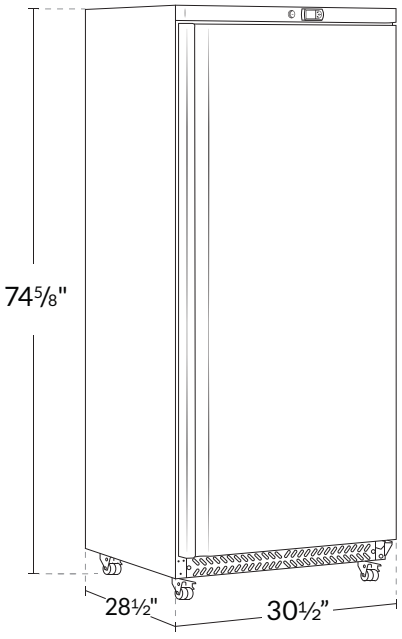
Environmentally-safe R290 refrigerant. Bottom-mounted condensing unit positioned for easy maintenance.

Shelving:

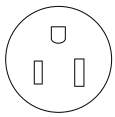
Features 6 poly-coated metal shelves that can each handle up to 66 lb.

Model Features:

- Easy to maneuver with 4 casters, including 2 with brakes to prevent unwanted movement.
- Automatic defrost mode improves the overall effciency of the refrigeration system.
- Full length handle for easy use.
- Digital temperature controller.



Intertek



NEMA 5-15P

Item #177GRI20FW

Commercial Reach-in Refrigerator 19.42 Cu. Ft.

Dimensions

Exterior Dimensions	30½"W x 28½"D x 74⅝"H
Interior Dimensions	25¾"W x 22¼"D x 63⅝"H
Depth with Door Open	56⅞"
Net Volume (cu. ft.)	19.42 cu. ft.
Net Weight	238 lb.
Gross Weight	260 lb.
Packaging Dimensions	31¾"W x 29½"D x 77⅝"H

Cooling

Temperature Range	-8° to -1°F
Refrigerant	R290
Max. Ambient Temperature	100°F
Defrosting	Auto
Temperature Controller	Carel
Horsepower	3/4
BTU (BTU/hr)	2207

Construction

Exterior Material	White painted door, body PCM
Interior Material	Pre-painted Alumium
Door Type	Solid Door
Insulation Material	Cyclopentane
Shelves	6+1 pcs (24¹³⁄₁₆" x 19⅛", 25⅝" x 11¼")
Shelf Material	poly-coated steel shelves
Shelf Load Capacity	66 lb.
Casters	2 w/ brakes 2 without

Electrical

Voltage	115V
Amps	5.5A
Hz	60Hz
Plug	5-15P
Electrical Cord Length	9'10"

Warranty Information

1 Year Limited Replacement Warranty - Valid Only in the Continental United States

Galaxy Kegerators, Chest Freezers, Refrigerated Merchandisers, and Reach-ins Only.
Unless otherwise stated, Galaxy Equipment warrants to the original purchaser of new, qualified Galaxy Equipment units (and all parts thereof), that such equipment will be free from defects in material and workmanship for a period of 1 year from the date of delivery.
If a qualified product is found to be defective during this period, Galaxy Equipment will repair the defective unit, replace any defective parts, or replace the defective unit.

What This Warranty Does Not Cover:

Galaxy Equipment will not warrant coverage for component failure or other damages that arise under the following conditions:

- Failure to install and/or use the unit within proper operating conditions specified by Galaxy Equipment.
- Failure to properly maintain the unit. This includes, but is not limited to, basic preventative maintenance like cleaning the condenser coil.
- Products sold or used outside of the Continental United States.
- Any damage that occurs as a result of negligence or improper handling.
- Overloading or improper loading of the unit in a manner that prevents proper airflow.
- Void in mobile settings.

Additionally, no claims can be made against this warranty for spoilage of products, loss of sales or profits, or any other consequential damages.

Normal wear type parts, such as light bulbs and gaskets, are not included in warranty coverage.

For Warranty Inquiries or Service:

To obtain warranty service, contact the location where you purchased the product:

www.WebstaurantStore.com:
Call 717-392-7472. You must have your order number ready when contacting.

The Restaurant Store:
If you purchased this unit from your local store location, please contact your store directly.

www.TheRestaurantStore.com:
If you purchased this unit online, call 717-392-7261.
You must have your order number ready when contacting.

Failure to contact the designated location prior to obtaining equipment service may void your warranty.

Product: 36" W 4-Burner Range with 12"W Griddle and Standard Oven

Manufacturer: Cooking Performance Group

Location: ProStart Kitchen Laboratory



Item #S36-G12-P

Product Details

See attached.

Project: _____ Date: _____ Approval: _____ Qty: _____ Item #: 351s36g12l







CERTIFICATIONS

3/4" Gas Connection

ETL Sanitation

ETL US

Cooking Performance Group S36-G12-P Liquid Propane 4 Burner 36" Range with 12" Griddle and Standard Oven

#351S36G12L

FEATURES

- (4) 30,000 BTU open top burners with cast iron lift-off grates for easy cleaning
- 12" griddle adds versatility to any operation
- 9 1/2" deep back shelf and 4 1/2" plate rail for added storage and safety
- 6" adjustable stainless steel legs
- Requires a liquid propane connection

TECHNICAL DATA

Width	36 Inches
Depth	32 5/8 Inches
Height	60 3/8 Inches
Interior Width	26 7/8 Inches
Interior Depth	25 7/8 Inches
Interior Height	13 7/8 Inches
Burner BTU	30000 BTU
Burner Style	Grates U-Shaped
Gas Inlet Size	3/4 Inches
Griddle BTU	20000
Griddle Size	12 Inches
Installation Type	Freestanding
Maximum Temperature	550 Degrees F
Number of Burners	4 Burners
Number of Controls	6
Number of Ovens	1

© 2022 Cooking Performance Group

Product: Noble I-E Dishwasher

Manufacturer: Noble Warewashing

Location: ProStart Kitchen Laboratory



Product Details

See attached.

NOBLE WAREWASHING

Project _____
Item _____
Quantity _____
CSI Section 11400
Approval _____
Date _____

NOBLE I-E

NOBLE I-E



Standard Features

- Electronic timer
- Internal sump design
- Built-in waste accumulator
- Delimer switch for easy removal of hard water deposits
- Removable scrap screen
- Air gap instead of vacuum breaker
- Door switch
- Convenient top mounted controls
- Auto start
- Interchangeable upper and lower stainless steel wash / rinse arms
- Wash thermometer
- Low chemical indicator lights
- Stainless steel adjustable bullet feet

Mandatory Specs

Specify voltage _____

Options

- ☐ Water Hammer Arrestor
- ☐ Scaltrol
- ☐ False Panel (for corner installations)
- ☐ Flanged Feet
- ☐ Front Dress Panel
- ☐ Audible Low Product Alarm
  (available only on 115v models)

Accessories

- ☐ 36-Compartment Rack
  - ☐ 4-1/8” tall (105 mm)
  - ☐ 5-5/8” tall (143 mm)
  - ☐ 7” tall (178 mm)
- ☐ Combination Rack
- ☐ Peg Rack

Specifications

- Uses 1.02 gallons (3.86 liters) water per rack
- 41 (39)* racks per hour
- Single point electrical connection
- Self-draining stainless steel pump eliminates soil/detergent carryover between wash and rinse cycles
- Fill and Dump design disposes of dirty water, replacing it with a fresh water rinse every cycle
- Field convertible from straight to corner and vice versa for flexible installations and applications (kit required)
- 17-1/4” (438 mm) vertical inside clearance
- Built-in chemical pumps and priming switches
- Large removable scrap screen
- Durable stainless steel construction

Intertek

Intertek

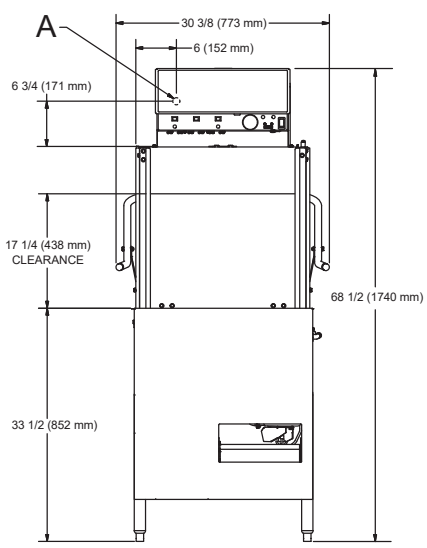
ENERGY STAR

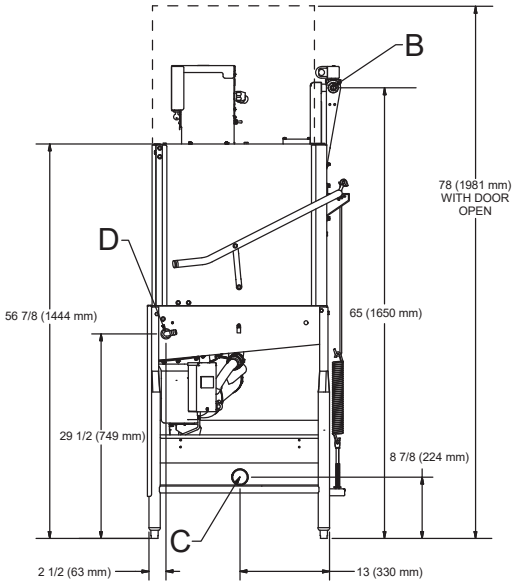
**Racks per hour calculated with NSF suggested load time of five (5) seconds for door-type (straight thru)*

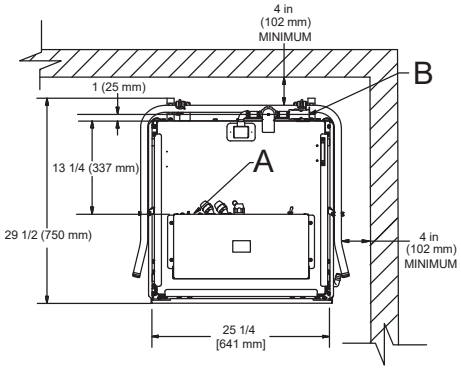
We reserve the right to change specifications in this bulletin without incurring any obligation for equipment previously or subsequently sold.

NOBLE WAREWASHING

NOBLE I-E



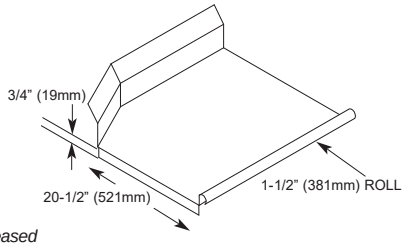




LEGEND
A - Electrical Connection (1 1/8" Hole)
B - Water Inlet (1/2" NPT)
C - Drain Connection (2" NPT)
D - Chemical Connection (7/8" Hole)

All dimensions from the floor can be increased 1 1/8" using the machine's adjustable feet.

TABLE DIMENSIONS
CONNECTION TO DISHMACHINE



MODEL NO.	MACHINE DIMENSIONS				DRAIN HEIGHT	SHIPPING INFORMATION					
	HEIGHT	WIDTH	WIDTH BETWEEN DISHTABLES	DEPTH		WEIGHT	CLASS	CUBE	HEIGHT	WIDTH	DEPTH
NOBLE I-E	68-1/2" (1740 mm)	30-3/8" (773mm)	25-1/4" (641 mm)	29-1/2" (750mm)	8-7/8" (224 mm)	230 lbs (105 kg)	300	58.15 cu. ft.	72-1/2" (1842 mm)	33" (838 mm)	42" (1067 mm)

DIMENSIONS	
Wall Clearance (minimum)	4" (102 mm)
Standard Table Height	34" (864 mm)
Inside Clearance	17-1/4" (438 mm)
Machine Height with Door Open	78" (1981 mm)

OPERATING CAPACITY	
Racks per Hour	41 (39)*
Dishes per Hour	1,025
Glasses per Hour	1,476

OPERATING CYCLE (seconds)	Wash	Rinse	Dwell	Total Cycle
	42	25	20	87

OPERATING TEMPERATURES	
Wash	120 °F min. (49 °C); 140 °F (60 °C) recommended
Rinse	120 °F min. (49 °C); 140 °F (60 °C) recommended

HOW TO SPECIFY: NOBLE I-E

WATER	
Inlet Temperature	120 °F min. (49 °C); 140 °F (60 °C) recommended
Gallons per Hour	41.82 gal (158.31 L)
Gallons per Hour**	39.78 gal (150.58 L)
Gallons per Rack	1.02 gal (3.9 L)
Waterline Size IPS (minimum)	1/2"
Drainline Size IPS (minimum)	2"
Flow Pressure (PSI)	20 ± 5
Wash Tank Capacity	1.02 gal (3.86 L)
Minimum Chlorine Required (PPM)	50

ELECTRICAL REQUIREMENTS			
Power Supply	Total Load	Minimum Circuit Ampacity	Maximum Overcurrent Protection
115/60/1	10.0 A	12.5 A	20 A
230/60/1	5.0 A	6.3 A	15 A

WASH PUMP MOTOR	
Wash Pump	1 HP

*Racks per hour calculated with NSF suggested load time of five (5) seconds for door-type (straight thru)
**Gallons per hour calculated with NSF suggested load time of five (5) seconds for door-type (straight thru)

www.nobleproducts.biz

NO-0005 [08/31/21]

We reserve the right to change specifications in this bulletin without incurring any obligation for equipment previously or subsequently sold.

Product: CG2LK Double Deck Full Size Propane Convection Oven w/ Legs

Manufacturer: Mainstreet Equipment

Location: ProStart Kitchen Laboratory



Item #541CG2LK

Product Details

See attached.

Project _____

Item 541cg2lk Quantity _____

Approval _____ Date _____

Main Street Equipment CG2LK Double Deck Full Size Liquid Propane Convection Oven with Legs - 108,000 BTU

Item #541CG2LK

Special Features

- Two full size cavities each house 3 adjustable wire racks
- Temperature range from 150 to 550 degrees Fahrenheit; automatic ignition system
- 60 minute timers; interior lights controlled by rocker switches
- Independent glass doors; stainless steel exterior and interior
- 120V; liquid propane, 108,000 BTU total



Technical Data

Width	38 Inches
Depth	43 Inches
Interior Width	29 Inches
Interior Depth	25 Inches
Interior Height	20 Inches
Amps	5.9 Amps
Hertz	60 Hertz
Phase	1 Phase
Voltage	120 Volts
Control Type	Dials / Buttons
Door Type	Glass
Gas Inlet Size	3/4 Inches
Installation Type	Freestanding
Maximum Temperature	550 Degrees F
Number of Chambers	2
Number of Decks	Double
Number of Doors	4
Number of Racks	6
Oven Interior Style	Standard Depth
Pan Type	Full Size Food Pans
Plug Type	NEMA 5-15P
Power Type	Liquid Propane
Size	Full Size
Temperature Range	150 - 550 Degrees F
Total BTU	108000 BTU

Certifications

5-15P

ETL Sanitation

ETL US

3/4" Gas Connection

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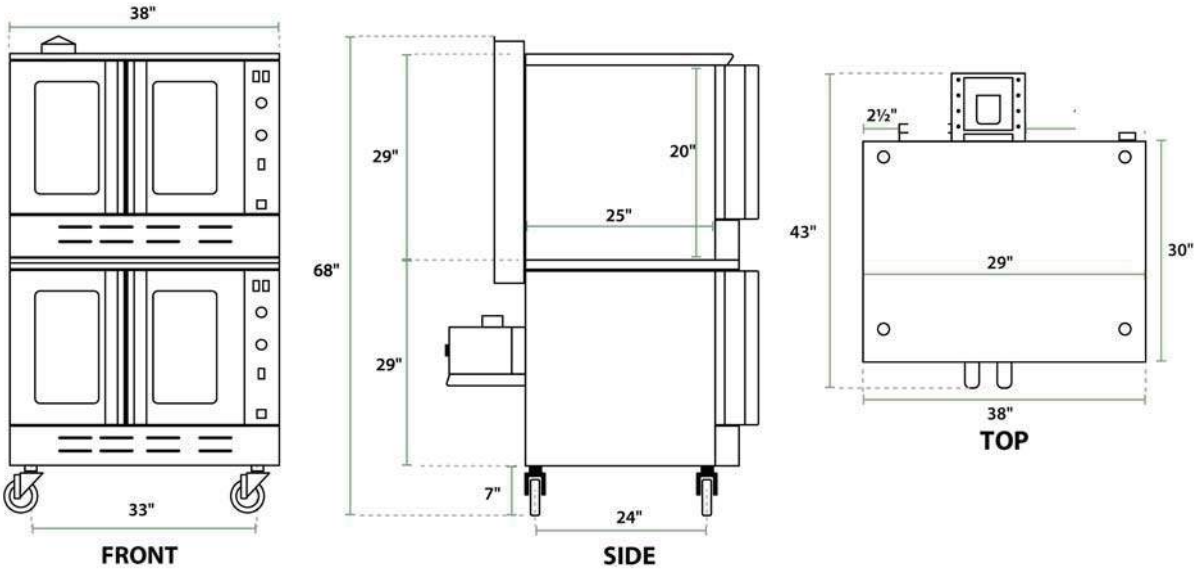
Technical Drawing



⚠ **WARNING:** This product can expose you to chemicals including lead, which are known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information, go to www.p65warnings.ca.gov.

© 2022 Main Street Equipment

Project _____

Item 541cg2lk Quantity _____

Approval _____ Date _____

Main Street Equipment CG2LK Double Deck Full Size Liquid Propane Convection Oven with Legs - 108,000 BTU

Item #541CG2LK

Special Features

- Two full size cavities each house 3 adjustable wire racks
- Temperature range from 150 to 550 degrees Fahrenheit; automatic ignition system
- 60 minute timers; interior lights controlled by rocker switches
- Independent glass doors; stainless steel exterior and interior
- 120V; liquid propane, 108,000 BTU total



Technical Data

Width	38 Inches
Depth	43 Inches
Interior Width	29 Inches
Interior Depth	25 Inches
Interior Height	20 Inches
Amps	5.9 Amps
Hertz	60 Hertz
Phase	1 Phase
Voltage	120 Volts
Control Type	Dials / Buttons
Door Type	Glass
Gas Inlet Size	3/4 Inches
Installation Type	Freestanding
Maximum Temperature	550 Degrees F
Number of Chambers	2
Number of Decks	Double
Number of Doors	4
Number of Racks	6
Oven Interior Style	Standard Depth
Pan Type	Full Size Food Pans
Plug Type	NEMA 5-15P
Power Type	Liquid Propane
Size	Full Size
Temperature Range	150 - 550 Degrees F
Total BTU	108000 BTU

Certifications

5-15P

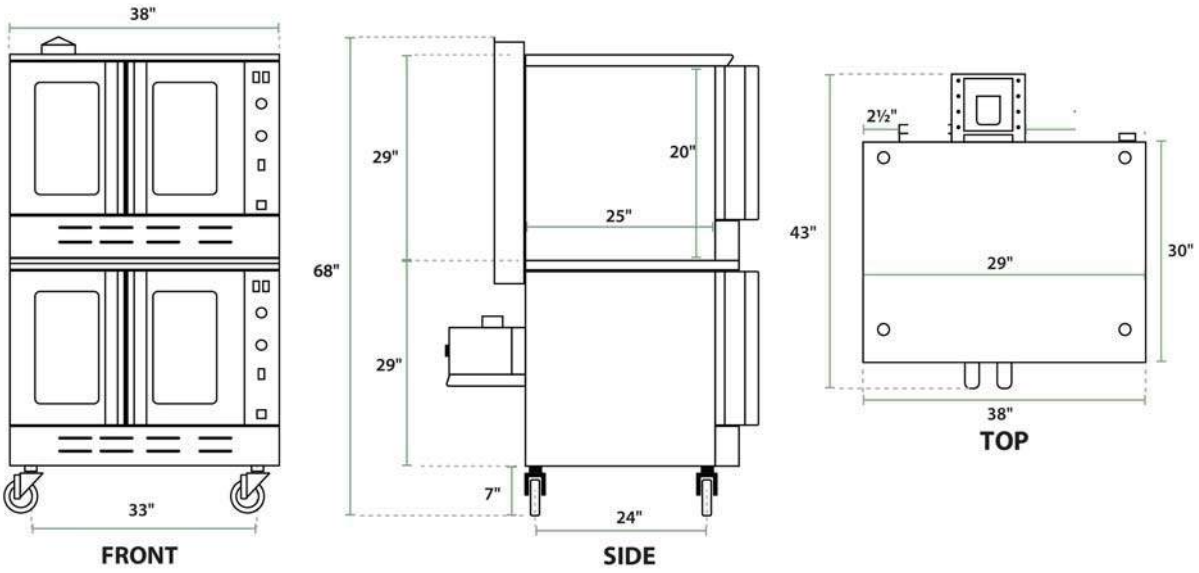
ETL Sanitation

ETL US

3/4" Gas Connection

© 2022 Main Street Equipment

Technical Drawing



⚠ **WARNING:** This product can expose you to chemicals including lead, which are known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information, go to www.p65warnings.ca.gov.

© 2022 Main Street Equipment

Product: Designer Series Gas Broilers

Manufacturer: Garland Commercial Ranges Ltd

Location: ProStart Kitchen Laboratory



Model GD-24RB

Product Details

See attached.

Garland

Designer Series Gas Broilers

Item: _____

Quantity: _____

Project: _____

Approval: _____

Date: _____

Designer Series Gas Broilers

Models:

- ☐ GD-18RB
- ☐ GD-24RB
- ☐ GD-30RB
- ☐ GD-36RB
- ☐ GD-18RBFF
- ☐ GD-24RBFF
- ☐ GD-30RBFF
- ☐ GD-36RBFF



Model GD-24RB

Standard Features:

- Stainless steel front and sides
- 4" (102mm) Sanitary legs
- Easy clean design
- 18" (457mm) deep cooking surface
- Cast iron radiants
- Piezo spark ignition
- Hi-Lo control valve
- Rear gas connection w/pressure regulator
- Natural or propane gas
- 45,000, 60,000, 75,000 or 90,000 BTU total input
- "CE" approved models are equipped with Flame-Failure protection and have suffix "FF"

Optional Features:

- ☐ Stainless steel back and bottom
- ☐ Removable stainless steel 3-piece broiler splatter guard specify width.. Shield will add 10" height around top section of broiler.

Note : Stands are available see form # CS24/CSD

Specifications:

Gas designer series broilers in four widths; models GD-18RB 18" (460mm) wide GD-24RB 24"(610mm) wide GD-30RB 30" (760mm wide) and GD-36RB 36" (914mm) wide. Designed as free standing or to be banked with other GD series equipment. 24" (610mm) deep x 15" (381mm) high, easy clean design with stainless steel front and sides, cast iron radiants, and optional broiler splatter shield. Hi-Lo valve controlled, piezo spark ignition, natural or propane gas, 45,000, 60,000, 75,000 and 90,000 BTU. "CE" approved models are equipped with Flame-Failure protection and have suffix "FF".

CE

Garland Commercial Ranges Ltd.
1177 Kamato Road,
Mississauga, Ontario
L4W 1X4 CANADA

General Inquiries 1-905-624-0260
USA Sales, Parts and Service 1-800-424-2411
Canadian Sales 1-888-442-7526
Canada or USA Parts/Service 1-800-427-6668

Manitowoc

Garland

Designer Series Gas Broilers

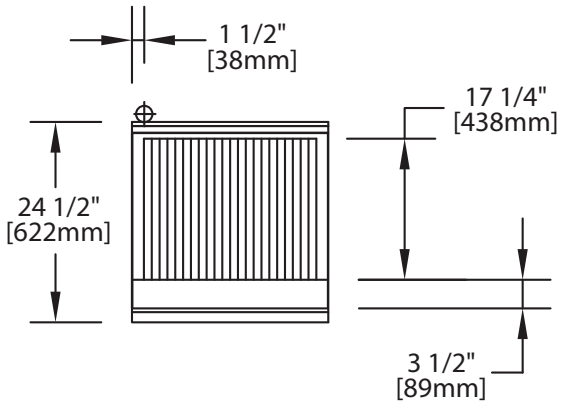
MODEL	Overall Dimensions			Total Input BTU/Kw	Cu. Ft.	Shipping Wt Lb/kg
	Width	Height	Depth			
GD-18RB(FF)	18" (460mm)	15" (381mm)	24" (610mm)	45,000/13.19	8	110/50
GD-24RB(FF)	24" (610mm)	15" (381mm)	24" (610mm)	60,000/17.58	8	150/88
GD-30RB(FF)	30" (760mm)	15" (381mm)	24" (610mm)	75,000/21.98	9	200/91
GD-36RB(FF)	36" (914mm)	15" (381mm)	24" (610mm)	90,000/26.37	11	240/109

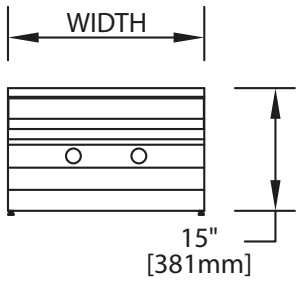
Gas Input ratings shown here are for installations up to 2,000 ft. (610m) above sea level. Specify altitudes over 2,000 ft.

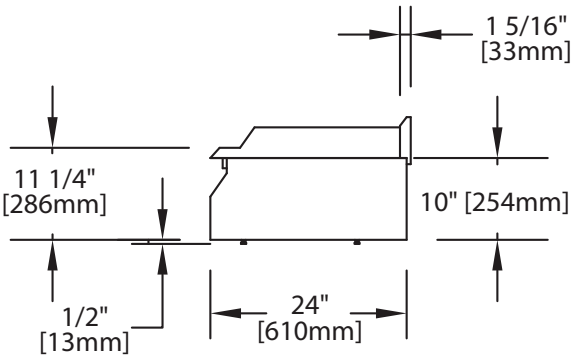
Garland products are not approved or authorized for home or residential use, but are intended for commercial applications only. Garland will not provide service, warranty, maintenance or support of any kind other than in commercial applications.

Non Combustible Installation only		Floor or Base
Sides	Back	
0"	0"	Non Combustible

Manifold Inlet Size NPT	Manifold Operating Pressure			
	Natural		Propane	
	"WC	mbar	"WC	mbar
3/4"	4	10	10	24.9







Form# GD18RB24RB30RB36RB (08/30/12)

Garland Commercial Ranges Ltd.
1177 Kamato Road,
Mississauga, Ontario
L4W 1X4 CANADA

General Inquiries 1-905-624-0260
USA Sales, Parts and Service 1-800-424-2411
Canadian Sales 1-888-442-7526
Canada or USA Parts/Service 1-800-427-6668

Manitowoc

Product: 18 Gauge Stainless Steel Work Table

Manufacturer: Regency

Location: ProStart Kitchen Laboratory



Product Details

See attached.

18 GAUGE STAINLESS STEEL WORK TABLES

REGENCY
Stainless Steel Commercial
Tables And Sinks



FEATURES

- Smooth type 304 stainless steel work surface makes cleaning a breeze
- Galvanized legs & undershelves provide unparalleled stability
- Adjustable bullet feet ensure leveling on uneven surfaces
- Combines unbeatable strength with long-lasting durability

SPECIFICATIONS

NSF

ITEM	LENGTH	WIDTH	WORK HEIGHT	UNDERSHELF DIMENSIONS	TOP SHELF CAPACITY	UNDERSHELF CAPACITY	WEIGHT
600T1824G	24”	18”	34”	18” x 12”	350 lb.	260 lb.	30 lb.
600T1830G	30”	18”	34”	24” x 12”	350 lb.	260 lb.	34 lb.
600T1836G	36”	18”	34”	30” x 12”	370 lb.	280 lb.	37 lb.
600T1848G	48”	18”	34”	42” x 12”	390 lb.	300 lb.	45 lb.
600T1860G	60”	18”	34”	54” x 12”	410 lb.	320 lb.	53 lb.
600T1872G	72”	18”	34”	66” x 12”	430 lb.	340 lb.	61 lb.
600T1896G	96”	18”	34”	90” x 12”	570 lb.	410 lb.	92 lb.
600T2424G	24”	24”	34”	18” x 18”	400 lb.	300 lb.	33 lb.
600T2430G	30”	24”	34”	24” x 18”	400 lb.	300 lb.	37 lb.
600T2436G	36”	24”	34”	30” x 18”	430 lb.	320 lb.	41 lb.
600T2448G	48”	24”	34”	42” x 18”	460 lb.	340 lb.	54 lb.
600T2460G	60”	24”	34”	54” x 18”	480 lb.	360 lb.	64 lb.
600T2472G	72”	24”	34”	66” x 18”	500 lb.	380 lb.	78 lb.
600T2484G	84”	24”	34”	78” x 18”	630 lb.	430 lb.	89 lb.
600T2496G	96”	24”	34”	90” x 18”	650 lb.	450 lb.	100 lb.
600T3030G	30”	30”	34”	24” x 24”	440 lb.	330 lb.	40 lb.
600T3036G	36”	30”	34”	30” x 24”	470 lb.	350 lb.	47 lb.
600T3048G	48”	30”	34”	42” x 24”	500 lb.	370 lb.	59 lb.
600T3060G	60”	30”	34”	54” x 24”	520 lb.	390 lb.	71 lb.
600T3072G	72”	30”	34”	66” x 24”	540 lb.	410 lb.	89 lb.
600T3084G	84”	30”	34”	78” x 24”	660 lb.	460 lb.	102 lb.
600T3096G	96”	30”	34”	90” x 24”	680 lb.	480 lb.	113 lb.

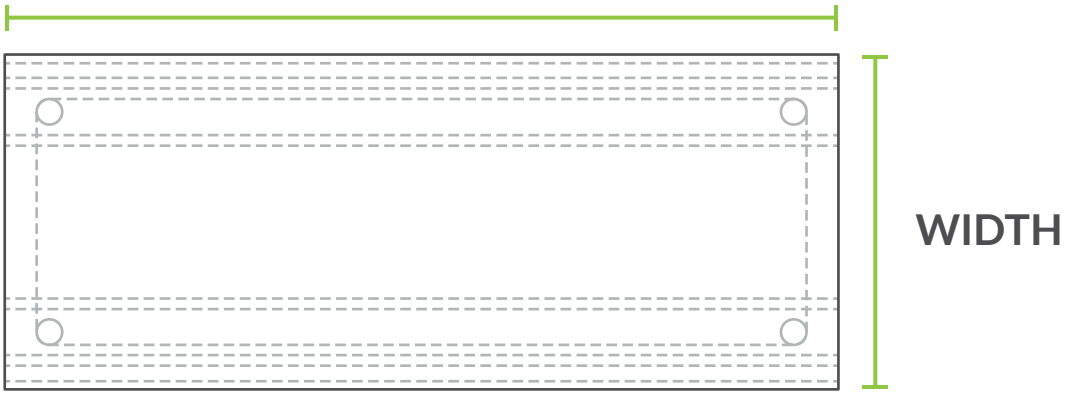
NOTE: 84” & 96” Work Tables Feature (6) Six Legs for Added Stability

18 GAUGE STAINLESS STEEL WORK TABLES

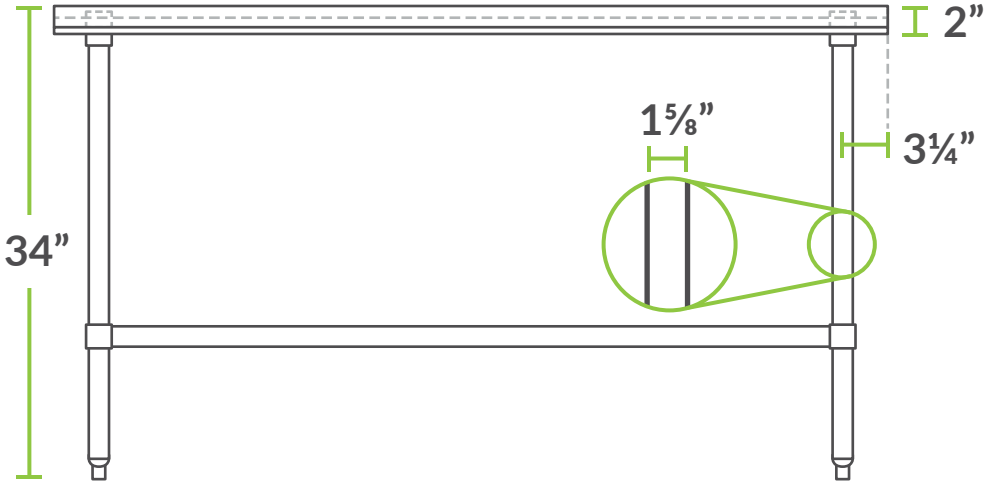
REGENCY
Stainless Steel Commercial
Tables And Sinks

NSF

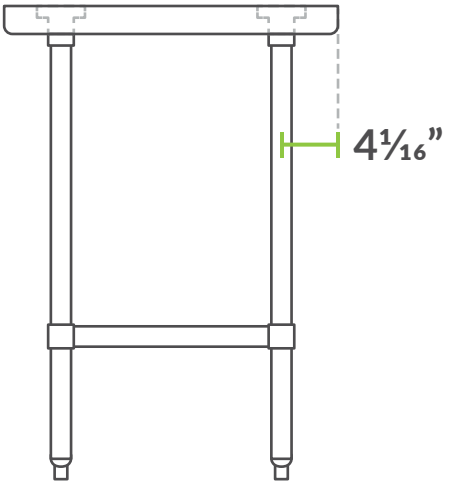
TOP



FRONT



SIDE



ACCESSORIES

CASTERS & FEET

ITEM	DESCRIPTION	#/PACK
600CASTER4	5” Swivel Stem Casters	4
600CASTER6	5” Swivel Stem Casters	6
600CASTERHD4	5” Heavy-Duty Swivel Stem Casters	4
600CASTERHD6	5” Heavy-Duty Swivel Stem Casters	6
600PABF	Adjustable Plastic Bullet Foot	1
600SPABF	Adjustable Stainless Steel Bullet Foot	1
600SSFF	3¼” Stainless Steel Flanged Foot	1

UNDERSHELVES

ITEM	DIMENSIONS	FITS
600UT1824S	18”L x 12”W	24”L x 18”W Work Tables
600UT1830S	24”L x 12”W	30”L x 18”W Work Tables
600UT1836S	30”L x 12”W	36”L x 18”W Work Tables
600UT1848S	42”L x 12”W	48”L x 18”W Work Tables
600UT1860S	54”L x 12”W	60”L x 18”W Work Tables
600UT1872S	66”L x 12”W	72”L x 18”W Work Tables
600UT2424S	18”L x 18”W	24”L x 24”W Work Tables
600UT2430S	24”L x 18”W	30”L x 24”W Work Tables
600UT2436S	30”L x 18”W	36”L x 24”W Work Tables
600UT2448S	42”L x 18”W	48”L x 24”W Work Tables
600UT2460S	54”L x 18”W	60”L x 24”W Work Tables
600UT2472S	66”L x 18”W	72”L x 24”W Work Tables
600UT2484S	78”L x 18”W	84”L x 24”W Work Tables
600UT2496S	90”L x 18”W	96”L x 24”W Work Tables
600UT3030S	24”L x 24”W	30”L x 30”W Work Tables
600UT3036S	30”L x 24”W	36”L x 30”W Work Tables
600UT3048S	42”L x 24”W	48”L x 30”W Work Tables
600UT3060S	54”L x 24”W	60”L x 30”W Work Tables
600UT3072S	66”L x 24”W	72”L x 30”W Work Tables
600UT3084S	78”L x 24”W	84”L x 30”W Work Tables
600UT3096S	90”L x 24”W	96”L x 30”W Work Tables
600UT3636S	30”L x 30”W	36”L x 36”W Work Tables
600UT3648S	42”L x 30”W	48”L x 36”W Work Tables
600UT3660S	54”L x 30”W	60”L x 36”W Work Tables
600UT3672S	66”L x 30”W	72”L x 36”W Work Tables
600UT3696S	90”L x 30”W	96”L x 36”W Work Tables

CASTERS

Each set of Regency casters lets you turn any work table or equipment stand with 4 or 6 standard legs into a mobile work station. With a total weight capacity of 1200 to 1600 lb., these wheels can stand the toughest of tests and are sure to meet your needs. Take your table or equipment on the go and then keep it secure with the flip of a lever, conveniently placed at foot level for easy locking and unlocking.

BULLET FEET

Make sure your table, compartment sink, or dishtable is level and stable by replacing a missing or broken bullet foot with these Regency Bullet Feet! They are designed to fit equipment with 1⅝” outer diameter legs and are adjustable so they can accommodate uneven floors.

FLANGED FEET

If you need to bolt your Regency equipment to the floor for added stability during use, this flanged 3¼” seismic foot is the perfect solution! It is designed to swap out easily for an existing foot on Regency products with legs that measure 1⅝” in outer diameter. Feet like these are typically used to comply with local codes, which require you to secure equipment to the floor, and in situations where keeping your equipment immobile could be useful, like on a food truck.







UNDERSHELVES

Add extra storage space and organization to your kitchen with a Regency adjustable stainless steel work table undershelf! Undershelves provide additional storage for frequently used items like prep tools, cutting boards, bar towels, oven mitts, pans, and trays. These undershelves are adjustable, so you can move them higher or lower to accommodate items of varying sizes. Made of 18 gauge, type 430 stainless steel, Regency undershelves ensure maximum durability and corrosion resistance, and are easy to clean and sanitize.



ACCESSORIES

OVERSHELVES

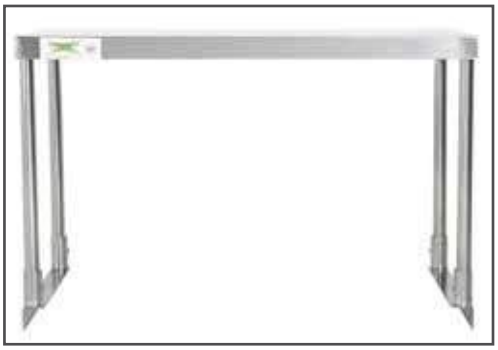
ITEM	TYPE	DIMENSIONS	FITS
600SOS1230	Single Deck	30”L x 12”W x 19¼”H	30”L Work Tables
600SOS1236	Single Deck	36”L x 12”W x 19¼”H	36”L Work Tables
600SOS1248	Single Deck	48”L x 12”W x 19¼”H	48”L Work Tables
600SOS1260	Single Deck	60”L x 12”W x 19¼”H	60”L Work Tables
600SOS1272	Single Deck	72”L x 12”W x 19¼”H	72”L Work Tables
600SOS1284	Single Deck	84”L x 12”W x 19¼”H	84”L Work Tables
600SOS1296	Single Deck	96”L x 12”W x 19¼”H	96”L Work Tables
600SOS1830	Single Deck	30”L x 18”W x 19¼”H	30”L Work Tables
600SOS1836	Single Deck	36”L x 18”W x 19¼”H	36”L Work Tables
600SOS1848	Single Deck	48”L x 18”W x 19¼”H	48”L Work Tables
600SOS1860	Single Deck	60”L x 18”W x 19¼”H	60”L Work Tables
600SOS1872	Single Deck	72”L x 18”W x 19¼”H	72”L Work Tables
600SOS1884	Single Deck	84”L x 18”W x 19¼”H	84”L Work Tables
600SOS1896	Single Deck	96”L x 18”W x 19¼”H	96”L Work Tables
600DOS1230	Double Deck	30”L x 12”W x 32”H	30”L Work Tables
600DOS1236	Double Deck	36”L x 12”W x 32”H	36”L Work Tables
600DOS1248	Double Deck	48”L x 12”W x 32”H	48”L Work Tables
600DOS1260	Double Deck	60”L x 12”W x 32”H	60”L Work Tables
600DOS1272	Double Deck	72”L x 12”W x 32”H	72”L Work Tables
600DOS1284	Double Deck	84”L x 12”W x 32”H	84”L Work Tables
600DOS1296	Double Deck	96”L x 12”W x 32”H	96”L Work Tables
600DOS1830	Double Deck	30”L x 18”W x 32”H	30”L Work Tables
600DOS1836	Double Deck	36”L x 18”W x 32”H	36”L Work Tables
600DOS1848	Double Deck	48”L x 18”W x 32”H	48”L Work Tables
600DOS1860	Double Deck	60”L x 18”W x 32”H	60”L Work Tables
600DOS1872	Double Deck	72”L x 18”W x 32”H	72”L Work Tables
600DOS1884	Double Deck	84”L x 18”W x 32”H	84”L Work Tables
600DOS1896	Double Deck	96”L x 18”W x 32”H	96”L Work Tables

DRAWERS

ITEM	EXTERIOR DIMENSIONS	INTERIOR DIMENSIONS
600DR2015	19½”L x 23¾”W x 5”H	15”L x 20”W x 5”H
600DR2020	25⅛”L x 23¾”W x 5”H	20”L x 20”W x 5”H

STAINLESS STEEL OVERSHELVES

Add extra storage space and organization to your kitchen with these Regency stainless steel overshelves! Available in single or double deck, their 18 gauge, type 430 stainless steel construction ensures long-lasting durability to stand up to repeated use. Installation is simple as the whole shelf easily mounts to the end of your table using the “L” brackets, set screws, and wrench provided.





DRAWERS

Keep your kitchen organized by mounting a Regency galvanized steel drawer to the under structure of your work table. Each drawer features an easy-to-clean stainless steel front and moves on ball-bearing sides.



Product: 20-Pan End-Load Sheet Pan Rack

Manufacturer: Steelton

Location: ProStart Kitchen Laboratory



Product Details

See attached.










Only

$128.99/Each

Ships free with

1 Add to Cart

Wish List | Rapid Reorder

Steelton's 20 pan end load bun pan rack is a space-efficient storage solution for your bakery or supermarket.



A 20 pan end load sheet pan rack from Steelton is designed to hold and transport a variety of your most popular baked goods or meats. This rack is durable, high quality, and will save precious space for your catering business, bakery, cafe, supermarket, or restaurant. This rack provides chefs with the ability to store multiple sheet pans in one convenient location and also facilitates proper cooling of your freshly baked treats. Additionally, this rack works well for storing trays of food at hospitals, cafeterias, or health care facilities.

NSF Listed

This item meets the standards imposed by NSF International, which focuses on public safety, health, and the environment.



Generous Storage Capacity

This rack can hold 20 full size sheet pans or 40 half size sheet pans. It can support up to 75 lb. per pair of slides and up to 350 lb. total, making it a heavy-duty and durable option for any business. Each set of slides are spaced 3" apart, which means there will be plenty of room for your treats to cool properly. This generous spacing also gives you the ability to store foods that are not completely flat.



Non-Marking Casters

This space-saving sheet pan rack features 5" non-marking polypropylene swivel casters. These casters are quiet, will not damage your floors, and make transportation a breeze.



Six Cross Supports

This rack features six cross supports for outstanding strength and durability. These supports pair with a curved top design and heavy-duty aluminum construction for the ultimate in sheet pan storage and transportation.



Ships Unassembled

Because this product ships unassembled, you will save money on shipping and processing costs. Once you receive your tray rack, you will find assembly quick and easy.

NSF International

SPECS	
Quantity	1/Each
Length	26 Inches
Width	20 Inches
Height	69 Inches
Assembled	Assembly Required
Capacity	350 lb.
Casters	Yes
Color	Silver
Individual Shelf Capacity	75 lb.
Loading Style	End Load
Material	Aluminum
NSF Listed	Yes
Pan Capacity	20 Pans
Pan Type	Half and Full Size Sheet Pans
Rack Style	Bun Pan
Shelf / Ledge Spacing	3 Inches
Style	Open
Type	Full Height, Sheet Pan Racks

Related Items



plus

PanPal Teflon Non-Stick Reusable Full



Bun Pan Rack Covers



Bun Pan Trucks & Dollies



Bun Pan Rack Parts and Accessories

Product: Ultra Camcarts® Insulated Food Pan Carrier - Holds 12 Pans

Manufacturer: Cambro

Location: ProStart Kitchen Laboratory



Item # 214UPC800NV

Product Details

See attached.

We ship from the USA to Guam

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Cambro UPC800186 Ultra Camcarts® Navy Blue Insulated Food Pan Carrier - Holds 12 Pans

Item #: 214UPC800NV MFR #: UPC800186





View all Cambro Food Pan Carriers

You May Also Need

plus



CaterGator Blue Full Size Ice Board for Food Pan

$44.49 / Each

1 Add to Cart

plus



Vesture Microcore 10" x 14" Heavy-Duty Thermal Hot

$9.89 / Each

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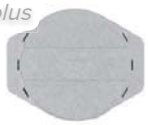
plus



Cambro 1210PW191 Granite Gray Camwarmer

$98.99 / Each

1 Add to Cart



1 Add to

Cambro UPC800186 Details

Keep hot food hot or cold food cold for up to 4 hours with the Cambro navy blue UPC800186 Ultra Camcarts® navy blue insulated food pan carrier. This front loading food pan carrier holds up to twelve, 2 1/2" deep full size food pans for easy transport to your next catered event.

Polyurethane insulation and a removable airtight gasket combine with durable nylon latches to ensure excellent food quality and temperature retention. Molded in handles allow for easy maneuvering while molded-in minimize damage to walls, furniture, and other equipment.

This full size front loading food pan Camcart features two doors which open 270 degrees to the side for easy loading and unloading. It's perfect for storing either hot or cold foods at any catering job.

Overall exterior dimensions are 27 1/8"D x 20 1/2"W x 54"H.

This Item Ships via Common Carrier. For more information and tips to help your delivery go smoothly, click here.

CAMBRO UPC800186 SPECS	
Quantity	1/Each
Width	20 1/2 Inches
Depth	27 1/8 Inches
Height	54 Inches
Interior Width	13 Inches
Interior Depth	21 1/2 Inches

CAMBRO UPC800186 SPECS	
Interior Height	19 1/8 Inches
Color	Blue
Compartment Type	Passive
Features	Casters
Handle Type	Molded
Insulated	Yes
Insulation Material	Polyurethane
Loading Style	Front Load
Made in America	Yes
Material	Polyethylene
NSF Listed	Yes
Number of Latches	2 Latches
Pan Capacity	12 Pans
Power Type	Non-Electric
Product Line	Cambro Ultra Camcart®
Style	Double
Temperature Retention	4 Hours
Type	Food Pan Carriers

Made in America

This item was made in the United States of America.

NSF Listed

This item meets the standards imposed by NSF International, which focuses on public safety, health, and the environment.

Other Products from this Line



Cambro UPC800SP186 Ultra Camcarts® Navy Blue Insulated Food Pan Carrier



Cambro UPC1600SP186 Ultra Camcarts® Navy Blue Insulated Food Pan Carrier



Cambro UPC1600186 Ultra Camcarts® Navy Blue



Cambro UPC1200186 Ultra Camcarts® Navy Blue



Cambro UPC16(Ultra Camcarts® I Insulated Food P

Loading Examples for Cambro® Insulated Transporters

Top Loaders
UPC140-UPC180
UPCS140-UPCS180
125MPC





For a 3-course meal:
2 x GN 1/4
1 x GN 1/2
1 DIV12 divider bar
(approx. 14 meals)



For a 4-course meal:
2 x GN 1/6
2 x GN 1/3
2 DIV12 divider bars
(approx. 14 meals)

Top Loaders
100 series
100MPC
UPC100
UPC101



3 x 2 1/2" (6,5 cm)



2 x 4" (10 cm)



1 x 6" (15 cm)
or 1 x 8" (20 cm)

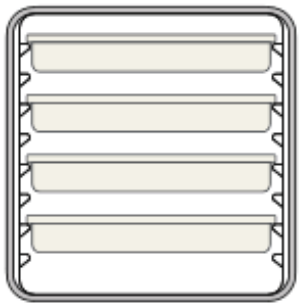


100MPCHL
1 x 8" (20 cm)

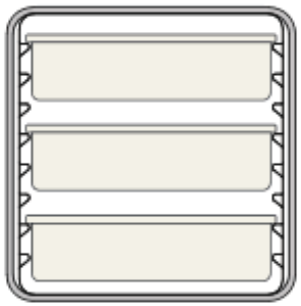
Front Loaders
300MPC
UPC600 (x2)
UPC1200 (x4)



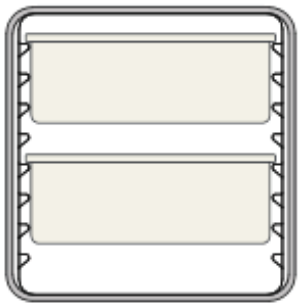
300MPC Rail Configuration



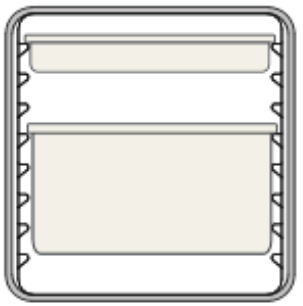
4 x 2 1/2" (6,5 cm)



3 x 4" (10 cm)

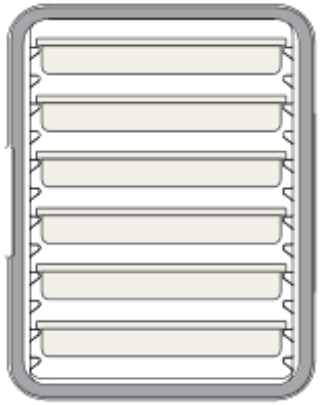


2 x 6" (15 cm)

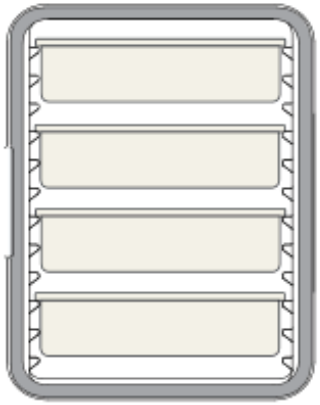


1 x 8" (20 cm)
and 1 x 2 1/2" (6,5 cm)

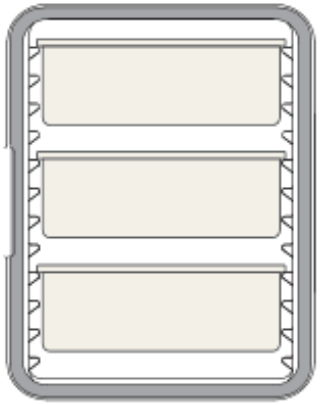
Front Loaders
UPC400
UPCS400
UPCH400
UPC800 (x2)
UPCH800 (x2)
UPC1600 (x4)
CMB1826L (x2)
CMB1826 (x4)



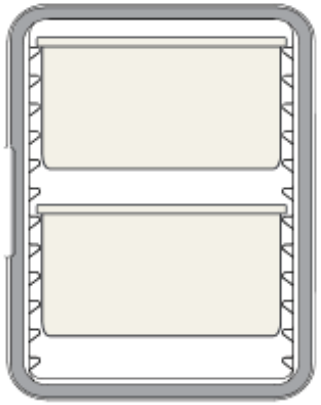
6 x 2 1/2" (6,5 cm)



4 x 4" (10 cm)



3 x 6" (15 cm)



2 x 8" (20 cm)

Product: Portable Stage Group - Hardboard Deck (20'W x 16'D x 24"H)

Manufacturer: National Public Seating

Location: Gymnasium or Cafeteria

This complete all-in one set comes with ten 4' wide x 8' long x 24" high hardboard stage panels, two sets of steps for 24" high stages, eleven 48" wide guardrails, and shirred stage skirting. The stages are made of 3/4" thick plywood with a tempered hardboard surface. Permanent ganging devices on the 16-gauge steel frame allow you to connect units safely and securely. The stage supports up to 200 pounds per square foot. Open and close the folding legs with one hand. The National Public Seating Hardboard Portable Stage Group is MAS Certified Green and comes backed by a 10-year warranty.







Stage Dolly

Product Details

- Includes:
  Ten 4' wide x 8' long x 24" high hardboard stage panels
  Two sets of steps for 24" high stages
  Eleven 48" wide guardrails
  Shirred stage skirting
- Supports up to 200 pounds per square foot
- Folding legs open and close with ease
- Platform Material: 3/4" thick plywood w/ tempered hardboard surface
- Frame Material: 16-gauge tubular steel
- Frame Finish: Powder-coat paint
- Guardrail Material: 14-gauge steel
- Skirting Material: 100 percent polyester; Black
- Warranty: 10 years
- Green: MAS Certified Green
- Assembly Required
- Weight: 1989 lbs
- Made in the USA
- Other Stage Size Options:

12'W x 8'D x 24"H	20'W x 16'D x 24"H	24'W x 16'D x 24"H
16'W x 8'D x 24"H	20'W x 16'D x 32"H	

Stage Dolly

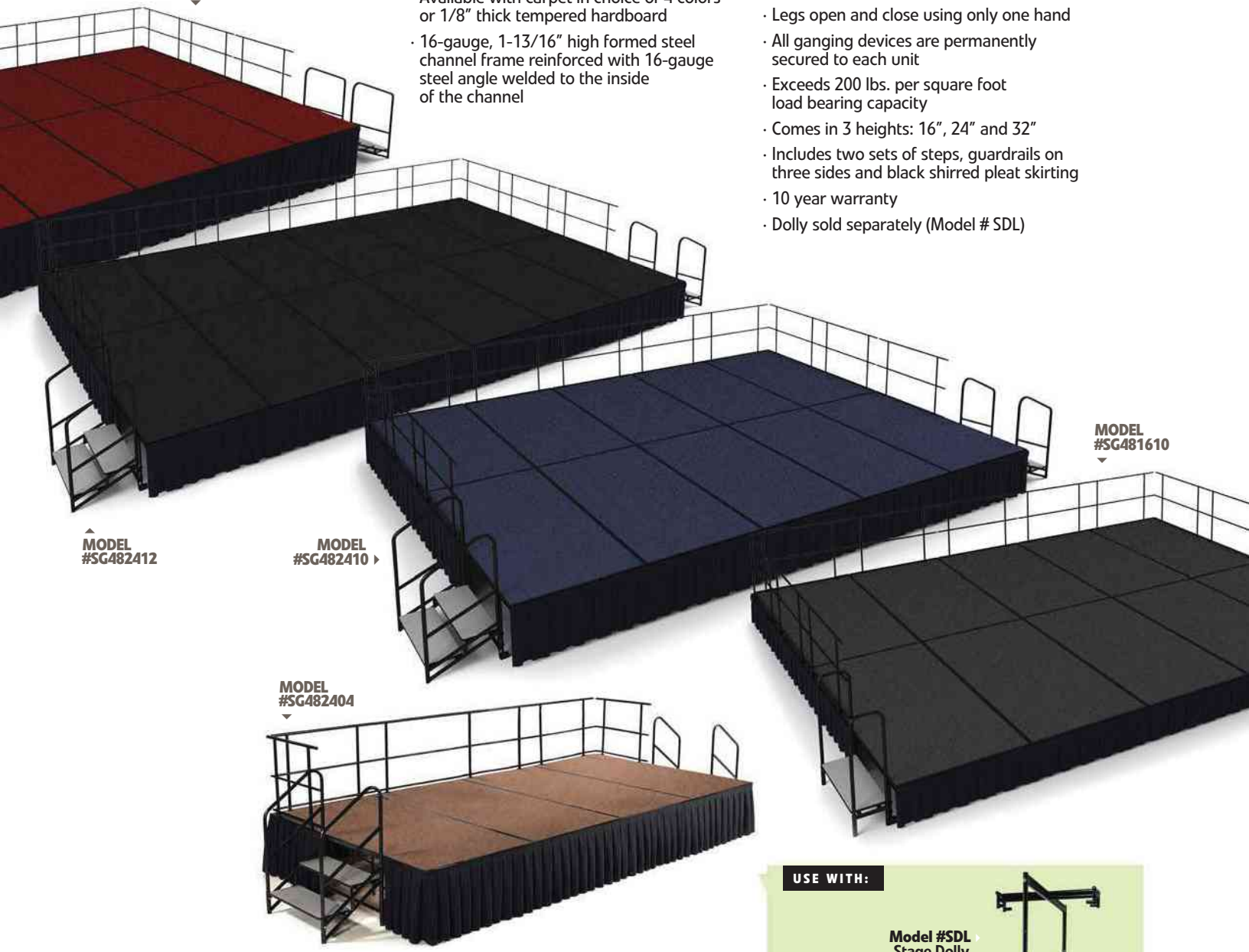
The NPS Stage Dolly provides storage for up to six 3' or 4' wide stages and seated riser platforms. The substantial frame is made from 14-gauge tubular steel with black powder-coated finish. Users can easily maneuver even full loads with the four hard rubber 6" swiveling casters, each with a weight capacity of 325 lbs for a total weight capacity of 1300 lbs. A built-in latch secures the stages to the dolly to prevent tipping during transport.

- Dimensions: 44" W x 30" D x 60" H
- Weight: 65 lbs
- Assembly required
- 10-Year Warranty

products meet or exceed applicable ANSI/BIFMA standards

SPECS:

- Constructed with 3/4" solid plywood core
- Available with carpet in choice of 4 colors or 1/8" thick tempered hardboard
- 16-gauge, 1-13/16" high formed steel channel frame reinforced with 16-gauge steel angle welded to the inside of the channel
- 14-gauge steel tubing capped at the point of floor contact with high impact plastic glides
- Legs open and close using only one hand
- All ganging devices are permanently secured to each unit
- Exceeds 200 lbs. per square foot load bearing capacity
- Comes in 3 heights: 16", 24" and 32"
- Includes two sets of steps, guardrails on three sides and black shirred pleat skirting
- 10 year warranty
- Dolly sold separately (Model # SDL)



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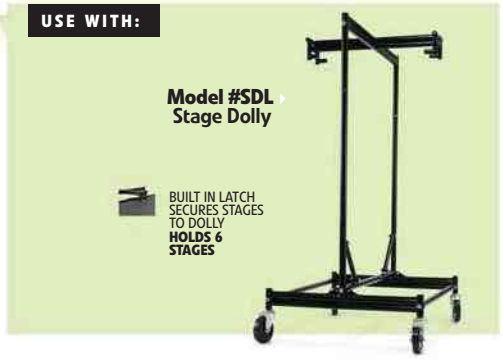


CARPET COLOR OPTIONS



*Stage Groups come in your choice of **4 Carpet Colors** or **Hardboard***

National Public Seating

800.261.4112 | www.nationalpublicseating.com

Product: Ultra Camcart® Insulated Food Carrier

Manufacturer Cambro

Location: Cafeteria Kitchen



UPC800110

Product Details:

See attached.

CAMBRO

Camcarts®

Double Compartment

For GN Food Pans

Models UPC800, UPC1600, UPC1600HD

Security Package

Models UPC800SP, UPC1600SP, UPCGL1600SP

StoreSafe

Features & Benefits

- Large capacity Camcarts easily handle storing and transporting food for any catering job, large or small, hot or cold foods. May also be used for health care meal tray service.
- GN 1/1 Full Size Food Pan capacity per compartment:
  Model UPC800, UPC800SP
  2 each 8" (20 cm) deep, 3 each 6" (15 cm) deep,
  4 each 4" (10 cm) deep, or 6 each 2½" (6,5 cm) deep
  Also holds GN 1/2 & GN 1/3 Size Food Pans and 4 each Metric Camtrays® (#3253).
  Model UPC1600, UPC1600SP, UPC1600HD, UPCGL1600SP
  4 each 20 cm deep, 6 each 15 cm deep
  8 each 10 cm deep, or 12 each 6,5 cm deep
  Also holds GN 1/2 Long Size Food Pans and 8 each Metric Camtrays® (#3253).
- Store hot and cold foods in the same compartment with the use of the optional ThermoBarrier® Insulated Shelf Divider. Keep food chilled for 8 hours or more with the optional Camchiller®. No external power or ice required.
- Maintain hot food holding temperatures at higher levels and for longer when using two Camwarmers® inside each compartment of the UPC800 models.
- Tough, one piece seamless, double-wall, polyethylene construction is easy to maintain and won't dent, crack, rust, chip or break.
- Thick polyurethane foam insulated compartments and air tight gaskets help retain food quality and temperatures without the use of external heat sources.
- Durable nylon door latches are easy to open and close securely to provide maximum temperature retention. Doors open 270° to the side for easy loading and unloading.
- Vent cap on each compartment allows steam to be released and keeps menu items from becoming soggy.
- Mid-height molded-in vertical handles on the back provide effective maneuvering during transport. Molded-in bumper minimizes damage to walls and furniture.
- Four each 6" (15,24 cm) heavy-duty casters, 2 fixed, 2 swivel, 1 with brake, provide for smooth transporting and maneuvering across all types of terrain.
- UPC1600HD, UPC1600SP and UPCGL1600SP have heavy-duty, hi-modulus 6" (15,24 cm) x 2" (5 cm) 2 fixed, 2 swivel with brake casters.
- Security Package models are ideal for correctional facility use: Tamper-resistant screws on latches, non-removable doors, casters and chassis plates mounted with tamper-resistant bolts, locking hasp for padlocks (padlocks not included).
- Non electrical.
- No assembly required.
- Available in 11 colors.

Item No. _____

Specifier Identification No. _____

Model No. _____

Quantity _____



UPC1600



Camwarmer®
(For use in UPC800)

UPC800



Approvals

NSF

© Cambro Manufacturing Company 5801 Skylab Road, Huntington Beach, California 92647-2056-U.S.A.
Telephone 714 848 1555 **Toll Free** 800 854 7631 **Customer Service** 800 833 3003

Camcarts®

Double Compartment

For GN Food Pans

Models UPC800, UPC1600, UPC1600HD

Security Package

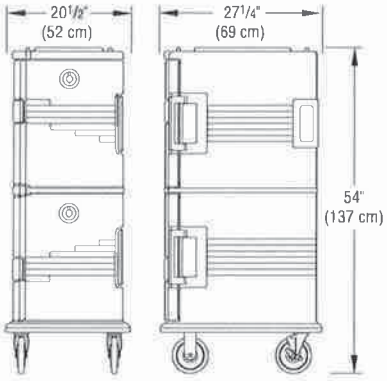
Models UPC800SP, UPC1600SP, UPCGL1600SP

Item No. _____

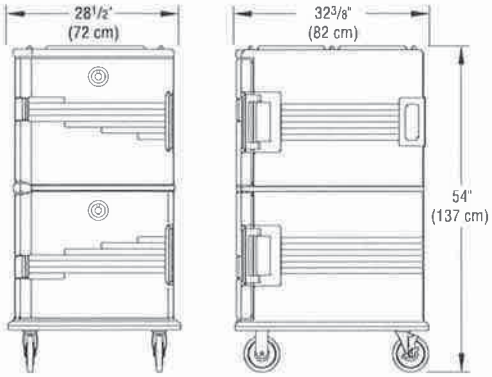
Specifier Identification No. _____

Model No. _____

Quantity _____



UPC800, UPC800TR



UPC1600, UPC1600SP, UPCGL1600SP

Specifications

Dimension Tolerance: +/- ¼" (0,64 cm)

Code	Description	Capaicrty Per Cavity	Exterior Dimensions W x D x H (with casters)	Case lbs./cube kg / m³
UPC800	Camcart	60 qts. (57 L)	20½" x 27⅛" x 54" (52 x 69 x 137 cm)	86 (19.28) 39,01 (0,546)
UPC1600	Camcart	120 qts. (114 L)	28¾" x 33⅜" x 54⅛" (72 x 82 x 137 cm)	111 (32.29) 62,2 (0,92)
UPC1600HD	Camcart	120 qts. (114 L)	28¾" x 33⅜" x 54⅛" (72 x 82 x 137 cm)	121.5 (37.27) 62,2 (0,92)
Security Package				
UPC800SP	Camcart	60 qts. (57 L)	20½" x 27⅛" x 54" (52 x 69 x 137 cm)	95.5 (19.28) 43,3 (0,546)
UPC1600SP	Camcart	120 qts. (114 L)	28¾" x 33⅜" x 54⅛" (72 x 82 x 137 cm)	121.5 (37.27) 62,2 (0,92)
UPCGL1600SP	Camcart	120 qts. (114 L)	28¾" x 33⅜" x 54⅛" (72 x 82 x 137 cm)	121.5 (37.27) 62,2 (0,92)

Optional Accessories

ThermoBarrier®
- ❑ 400DIV for UPC800, UPC800SP – Gray (180)
- ❑ 1600DIV for UPC1600, UPC1600SP, UPC1600HD, UPCGL1600SP – Slate Blue (401)

Camchiller
- ❑ CP1220 – Cold Blue (159)

Camwarmer®
- ❑ 1210PW for UPC800, UPC800TR – Granite Gray (191)

Standard Colors

- ❑ Black (110)
- ❑ Dark Brown (131)
- ❑ Coffee Beige (157)
- ❑ Hot Red (158)
- ❑ Navy Blue (186)
- ❑ Granite Gray (191)
- ❑ Granite Green (192)
- ❑ Granite Sand (194)
- ❑ Slate Blue (401)
- ❑ Brick Red (402)
- ❑ Kentucky Green (519)

Architect Specs

The non-electrical food service and transport cart shall be a Camcart, Model ...., manufactured by Cambro Mfg. Co., Huntington Beach, CA 92647 U.S.A. It shall be made of one-piece, seamless, double-wall, high-density, polyethylene. It shall have 2 separate insulated polyurethane foam-injected compartments. Each compartment shall accommodate a variety of GN 1/1 Full, 1/2 or 1/3 Size Food Pans, from 2½" (6,5 cm) to 8" (20 cm) deep. It shall have nylon door latches and the compartment doors shall swing open 270° to the side. It shall have a vent cap on each compartment. It shall have mid-height molded-in vertical handles located on the back of the cart. It shall have a molded-in bumper. It shall have 4 each 6" (15,24 cm) casters, 2 fixed, 2 swivel, 1 w/ brake. It shall be available with an optional security package for correctional facility use. UPC1600HD, UPC1600SP and UPCGL1600SP shall have 4 each heavy-duty, hi-modulus 6" (15,24 cm) x 2"(5 cm) 2 fixed, 2 swivel with brake casters. GLSP model has no gaskets for security concerns. It shall require no assembly. It shall be available in 11 colors.

Approvals

NSF

CAMBRO
TRUSTED FOR GENERATIONS™

© Cambro Manufacturing Company 5801 Skylab Road, Huntington Beach, California 92647-2056-U.S.A.
Telephone 714 848 1555 Toll Free 800 854 7631 Customer Service 800 833 3003

Product: **Regency 24" x 48" 16-Gauge 304 Stainless Steel Commercial Work Table with Undershelf (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: Cafeteria Kitchen

Utilize the space in your kitchen with this dependable 24" x 48" 16-gauge, 304-series stainless steel commercial work table from Regency Tables and Sinks. This unit not only provides plenty of room on its work surface, but also offers an 18-gauge, 430-series stainless steel undershelf to supply much needed space for food preparation, storing supplies, and other tasks within your business.

This Regency work table is both easy to clean and easy to maintain thanks to its durable, corrosion resistant material. Plus, it is mounted on (4) sturdy, 1 5/8" stainless steel legs with adjustable, metal, bullet feet for ample support. The top shelf boasts a weight capacity of approximately 560 lb., while the undershelf supports 340 lb. This amount of strength is extremely valuable in a restaurant or bar.



Item Number: #600TS2448S

Product Details

- 16-gauge type 304 stainless steel top offers greater durability and corrosion-resistance than type 430
- 18-gauge type 430 stainless steel adjustable undershelf
- 1 5/8" stainless steel legs with adjustable feet
- Dimensions: 48"W x 24"D x 34"H
- Work Surface Height: 34" H
- No Backsplash
- Table Style: Undershelf
- Construction: Stainless Steel
- NSF Listed
- Stainless Steel Type: Type 304
- Table Style - Undershelf
- Top Capacity: 560 lb.
- Undershelf Capacity: 340 lb.
- Usage: Standard Duty

16 GAUGE STAINLESS STEEL WORK TABLES

REGENCY
Stainless Steel Commercial
Tables And Sinks



FEATURES

- Smooth type 304 stainless steel work surface makes cleaning a breeze
- Stainless steel legs, undershelf, and hat channels provide unparalleled stability
- Adjustable bullet feet ensure leveling on uneven surfaces
- Combines unbeatable strength with long-lasting durability
- Simple assembly and installation requires little effort

SPECIFICATIONS

NSF

ITEM	LENGTH	WIDTH	WORK HEIGHT	UNDERSHELF DIMENSIONS	TOP SHELF CAPACITY	UNDERSHELF CAPACITY	WEIGHT
600TS2424S	24”	24”	34”	18" x 18"	500 lb.	300 lb.	35 lb.
600TS2430S	30”	24”	34”	24" x 18"	500 lb.	300 lb.	40 lb.
600TS2436S	36”	24”	34”	30" x 18"	530 lb.	320 lb.	46 lb.
600TS2448S	48”	24”	34”	42" x 18"	560 lb.	340 lb.	59 lb.
600TS2460S	60”	24”	34”	54" x 18"	580 lb.	360 lb.	70 lb.
600TS2472S	72”	24”	34”	66" x 18"	600 lb.	380 lb.	87 lb.
600TS2496S	96”	24”	34”	90" x 18"	760 lb.	450 lb.	110 lb.
600TS3030S	30”	30”	34”	24" x 24"	550 lb.	330 lb.	47 lb.
600TS3036S	36”	30”	34”	30" x 24"	570 lb.	350 lb.	51 lb.
600TS3048S	48”	30”	34”	42" x 24"	600 lb.	370 lb.	66 lb.
600TS3060S	60”	30”	34”	54" x 24"	620 lb.	390 lb.	80 lb.
600TS3072S	72”	30”	34”	66" x 24"	640 lb.	410 lb.	99 lb.
600TS3084S	84”	30”	34”	78" x 24"	780 lb.	460 lb.	113 lb.
600TS3096S	96”	30”	34”	90" x 24"	800 lb.	480 lb.	126 lb.
600TS3636S	36”	36”	34”	30" x 30"	600 lb.	380 lb.	58 lb.
600TS3648S	48”	36”	34”	42" x 30"	630 lb.	400 lb.	72 lb.
600TS3660S	60”	36”	34”	54" x 30"	650 lb.	420 lb.	87 lb.
600TS3672S	72”	36”	34”	66" x 30"	670 lb.	440 lb.	102 lb.
600TS3696S	96”	36”	34”	90" x 36"	820 lb.	510 lb.	139 lb.

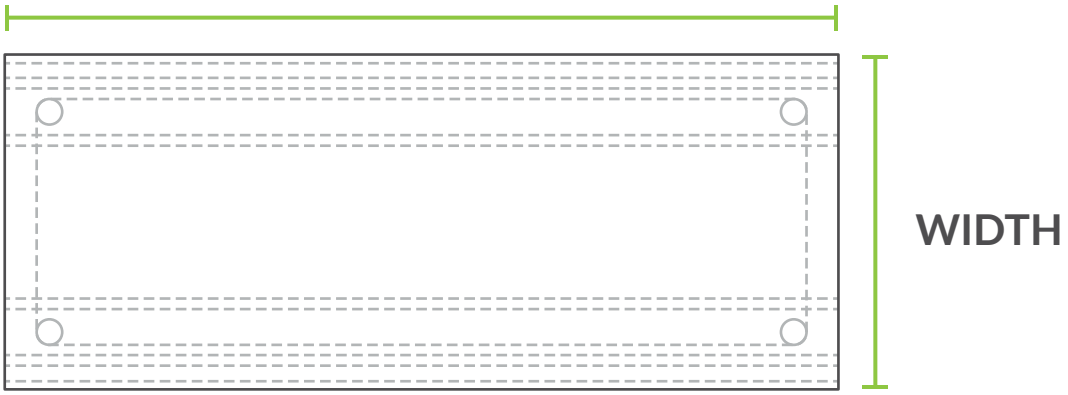
NOTE: 84” & 96” Work Tables Feature (6) Six Legs for Added Stability

16 GAUGE STAINLESS STEEL WORK TABLES

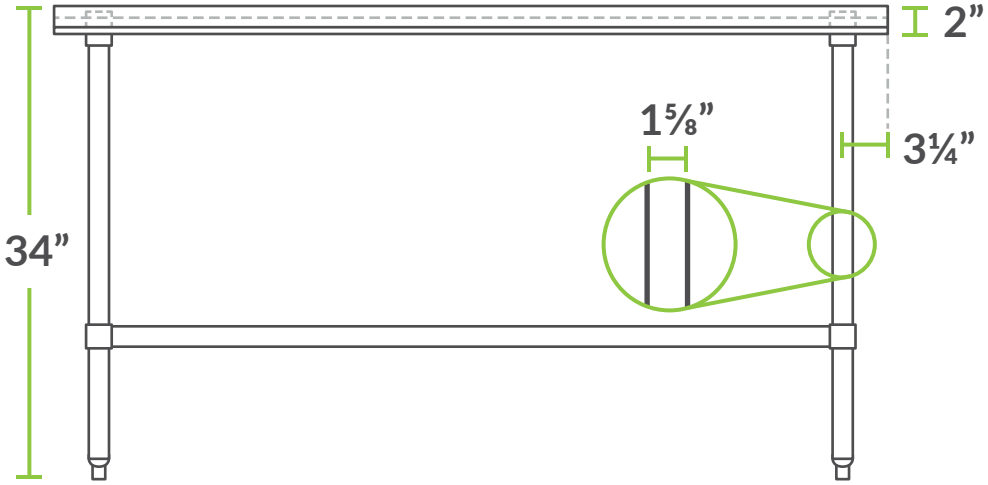
REGENCY
Stainless Steel Commercial
Tables And Sinks

NSF

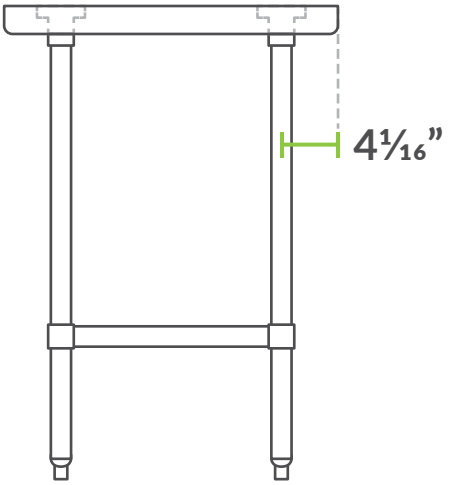
TOP



FRONT



SIDE



ACCESSORIES

CASTERS & FEET

ITEM	DESCRIPTION	#/PACK
600CASTER4	5” Swivel Stem Casters	4
600CASTER6	5” Swivel Stem Casters	6
600CASTERHD4	5” Heavy-Duty Swivel Stem Casters	4
600CASTERHD6	5” Heavy-Duty Swivel Stem Casters	6
600PABF	Adjustable Plastic Bullet Foot	1
600SPABF	Adjustable Stainless Steel Bullet Foot	1
600SSFF	3¼” Stainless Steel Flanged Foot	1

UNDERSHELVES

ITEM	DIMENSIONS	FITS
600UT1824S	18”L x 12”W	24”L x 18”W Work Tables
600UT1830S	24”L x 12”W	30”L x 18”W Work Tables
600UT1836S	30”L x 12”W	36”L x 18”W Work Tables
600UT1848S	42”L x 12”W	48”L x 18”W Work Tables
600UT1860S	54”L x 12”W	60”L x 18”W Work Tables
600UT1872S	66”L x 12”W	72”L x 18”W Work Tables
600UT2424S	18”L x 18”W	24”L x 24”W Work Tables
600UT2430S	24”L x 18”W	30”L x 24”W Work Tables
600UT2436S	30”L x 18”W	36”L x 24”W Work Tables
600UT2448S	42”L x 18”W	48”L x 24”W Work Tables
600UT2460S	54”L x 18”W	60”L x 24”W Work Tables
600UT2472S	66”L x 18”W	72”L x 24”W Work Tables
600UT2484S	78”L x 18”W	84”L x 24”W Work Tables
600UT2496S	90”L x 18”W	96”L x 24”W Work Tables
600UT3030S	24”L x 24”W	30”L x 30”W Work Tables
600UT3036S	30”L x 24”W	36”L x 30”W Work Tables
600UT3048S	42”L x 24”W	48”L x 30”W Work Tables
600UT3060S	54”L x 24”W	60”L x 30”W Work Tables
600UT3072S	66”L x 24”W	72”L x 30”W Work Tables
600UT3084S	78”L x 24”W	84”L x 30”W Work Tables
600UT3096S	90”L x 24”W	96”L x 30”W Work Tables
600UT3636S	30”L x 30”W	36”L x 36”W Work Tables
600UT3648S	42”L x 30”W	48”L x 36”W Work Tables
600UT3660S	54”L x 30”W	60”L x 36”W Work Tables
600UT3672S	66”L x 30”W	72”L x 36”W Work Tables
600UT3696S	90”L x 30”W	96”L x 36”W Work Tables

CASTERS

Each set of Regency casters lets you turn any work table or equipment stand with 4 or 6 standard legs into a mobile work station. With a total weight capacity of 1200 to 1600 lb., these wheels can stand the toughest of tests and are sure to meet your needs. Take your table or equipment on the go and then keep it secure with the flip of a lever, conveniently placed at foot level for easy locking and unlocking.

BULLET FEET

Make sure your table, compartment sink, or dishtable is level and stable by replacing a missing or broken bullet foot with these Regency Bullet Feet! They are designed to fit equipment with 1⅝” outer diameter legs and are adjustable so they can accommodate uneven floors.

FLANGED FEET

If you need to bolt your Regency equipment to the floor for added stability during use, this flanged 3¼” seismic foot is the perfect solution! It is designed to swap out easily for an existing foot on Regency products with legs that measure 1⅝” in outer diameter. Feet like these are typically used to comply with local codes, which require you to secure equipment to the floor, and in situations where keeping your equipment immobile could be useful, like on a food truck.







UNDERSHELVES

Add extra storage space and organization to your kitchen with a Regency adjustable stainless steel work table undershelf! Undershelves provide additional storage for frequently used items like prep tools, cutting boards, bar towels, oven mitts, pans, and trays. These undershelves are adjustable, so you can move them higher or lower to accommodate items of varying sizes. Made of 18 gauge, type 430 stainless steel, Regency undershelves ensure maximum durability and corrosion resistance, and are easy to clean and sanitize.



ACCESSORIES

OVERSHELVES

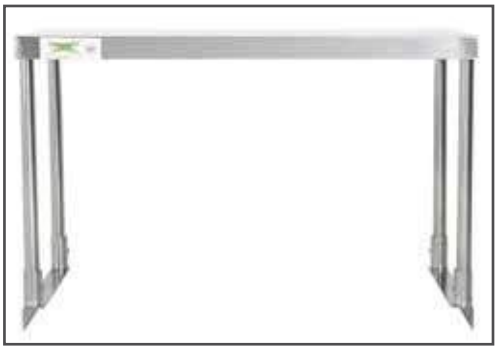
ITEM	TYPE	DIMENSIONS	FITS
600SOS1230	Single Deck	30”L x 12”W x 19¼”H	30”L Work Tables
600SOS1236	Single Deck	36”L x 12”W x 19¼”H	36”L Work Tables
600SOS1248	Single Deck	48”L x 12”W x 19¼”H	48”L Work Tables
600SOS1260	Single Deck	60”L x 12”W x 19¼”H	60”L Work Tables
600SOS1272	Single Deck	72”L x 12”W x 19¼”H	72”L Work Tables
600SOS1284	Single Deck	84”L x 12”W x 19¼”H	84”L Work Tables
600SOS1296	Single Deck	96”L x 12”W x 19¼”H	96”L Work Tables
600SOS1830	Single Deck	30”L x 18”W x 19¼”H	30”L Work Tables
600SOS1836	Single Deck	36”L x 18”W x 19¼”H	36”L Work Tables
600SOS1848	Single Deck	48”L x 18”W x 19¼”H	48”L Work Tables
600SOS1860	Single Deck	60”L x 18”W x 19¼”H	60”L Work Tables
600SOS1872	Single Deck	72”L x 18”W x 19¼”H	72”L Work Tables
600SOS1884	Single Deck	84”L x 18”W x 19¼”H	84”L Work Tables
600SOS1896	Single Deck	96”L x 18”W x 19¼”H	96”L Work Tables
600DOS1230	Double Deck	30”L x 12”W x 32”H	30”L Work Tables
600DOS1236	Double Deck	36”L x 12”W x 32”H	36”L Work Tables
600DOS1248	Double Deck	48”L x 12”W x 32”H	48”L Work Tables
600DOS1260	Double Deck	60”L x 12”W x 32”H	60”L Work Tables
600DOS1272	Double Deck	72”L x 12”W x 32”H	72”L Work Tables
600DOS1284	Double Deck	84”L x 12”W x 32”H	84”L Work Tables
600DOS1296	Double Deck	96”L x 12”W x 32”H	96”L Work Tables
600DOS1830	Double Deck	30”L x 18”W x 32”H	30”L Work Tables
600DOS1836	Double Deck	36”L x 18”W x 32”H	36”L Work Tables
600DOS1848	Double Deck	48”L x 18”W x 32”H	48”L Work Tables
600DOS1860	Double Deck	60”L x 18”W x 32”H	60”L Work Tables
600DOS1872	Double Deck	72”L x 18”W x 32”H	72”L Work Tables
600DOS1884	Double Deck	84”L x 18”W x 32”H	84”L Work Tables
600DOS1896	Double Deck	96”L x 18”W x 32”H	96”L Work Tables

DRAWERS

ITEM	EXTERIOR DIMENSIONS	INTERIOR DIMENSIONS
600DR2015	19½”L x 23¾”W x 5”H	15”L x 20”W x 5”H
600DR2020	25⅛”L x 23¾”W x 5”H	20”L x 20”W x 5”H

STAINLESS STEEL OVERSHELVES

Add extra storage space and organization to your kitchen with these Regency stainless steel overshelves! Available in single or double deck, their 18 gauge, type 430 stainless steel construction ensures long-lasting durability to stand up to repeated use. Installation is simple as the whole shelf easily mounts to the end of your table using the “L” brackets, set screws, and wrench provided.





DRAWERS

Keep your kitchen organized by mounting a Regency galvanized steel drawer to the under structure of your work table. Each drawer features an easy-to-clean stainless steel front and moves on ball-bearing sides.



Product: **Regency 96" 16-Gauge Stainless Steel Two Compartment Commercial Sink (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: Cafeteria Kitchen

This Regency 96" stainless steel two compartment sink with 2 drainboards is constructed from high-quality, 16-gauge type 304 stainless steel, making it more corrosion-resistant and durable than other sinks made from thinner, 18-gauge material. This sink features 2 sturdy, 24" drainboards. It's also dipped a minimum of 1/4" to facilitate better drainage, and the welded construction contributes to the long-lasting use and overall strength of this sink / drainboard combo.

The 12" deep bowls are die-stamped to a minimum of 1/4" to ensure proper drainage. Plus, each bowl includes a 3 1/2" basket strainer to catch food debris, which prevents the drain from clogging. For easy cleaning, each compartment has rounded corners so you can rinse and wipe down the sink.

A 9" tall backsplash is included and comes complete with (2) 1 1/8" diameter holes punched on 8" centers to accommodate 1 faucet (sold separately). This sink also includes a 1 1/2" raised rolled edge, which is 2" tall on the front and both sides to contain splashes and overflow. The legs are constructed of 1 5/8" diameter stainless steel with stainless steel cross-bracing and adjustable plastic feet for added stability. These features serve to prolong the life of your sink while adding exceptional strength to the unit.





Item Number: #600S2232324X

Product Details

- Welded 16-gauge, 304 stainless steel construction 18-gauge type 430 stainless steel adjustable undershelf
- Designed with (2) 12” deep bowls and rounded corners for easy cleaning
- Stainless steel legs, sockets, bullet feet, and crossbracing for maximum strength and longevity
- 3 1/2" drain baskets included
- Rolled edge contains splashes and overflow
- Dimensions: 96"W x 28" D x 44-3/4"H
- Work Surface Height: 34-3/4" H
- Drainboard: 24"W
- Backsplash: 9" H
- Bowl Dimensions: 24"W x 24"D x 12"H
- 1 5/8" stainless steel legs with adjustable metal bullet feet
- Faucet Centers: 8"
- Gauge: 16
- Construction: Stainless Steel
- NSF Listed
- Stainless Steel Type: Type 304
- Type: Straight/Line Sink

16 GAUGE STAINLESS STEEL
TWO COMPARTMENT SINKS
WITH TWO DRAINBOARDS

ITEM #: _____ QUANTITY: ____

PROJECT: _____

APPROVAL: _____

DATE: _____



REGENCY
Tables and Sinks

FEATURES

- Made of high-quality 16 gauge, type 304 stainless steel
- 1 5/8" stainless steel legs with sockets & crossbar
- Adjustable bullet feet for added stability
- Faucet holes pre-punched on 8" centers (faucet sold separately)
- 3 1/2" IPS drain connection
- Rolled edge contains splashes and overflow

SPECIFICATIONS

ITEM	LENGTH	DEPTH	HEIGHT (Total)	HEIGHT (Work)	BOWL DEPTH	BOWL L to R	BOWL F to B	NUMBER OF DRAINBOARDS	SIDE	NET WEIGHT
600S2232324X	96"	28"	44¾"	34¾"	12"	23"	23"	2	Both	48.10 LB.

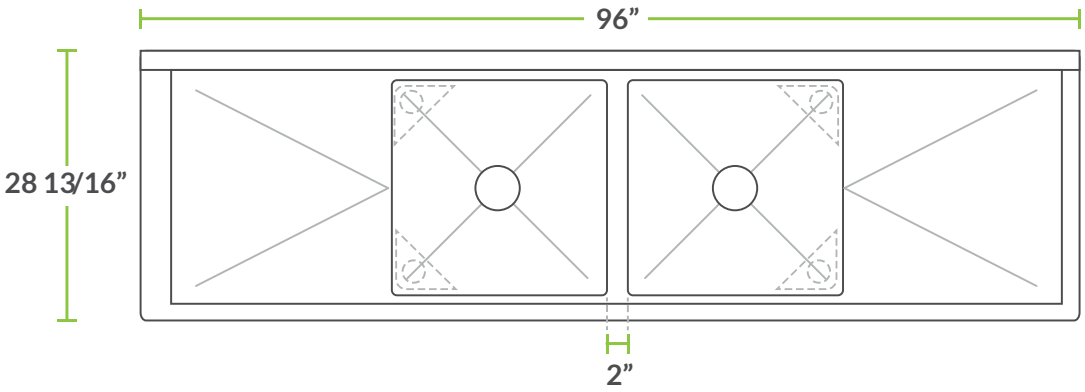
NSF

04/2019

16 GAUGE STAINLESS STEEL
TWO COMPARTMENT SINKS
WITH TWO DRAINBOARDS

REGENCY
Tables and Sinks

TOP



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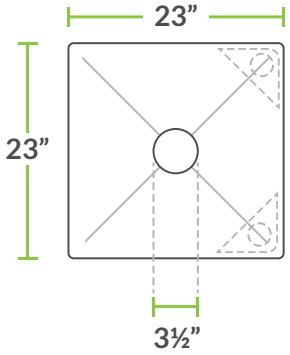

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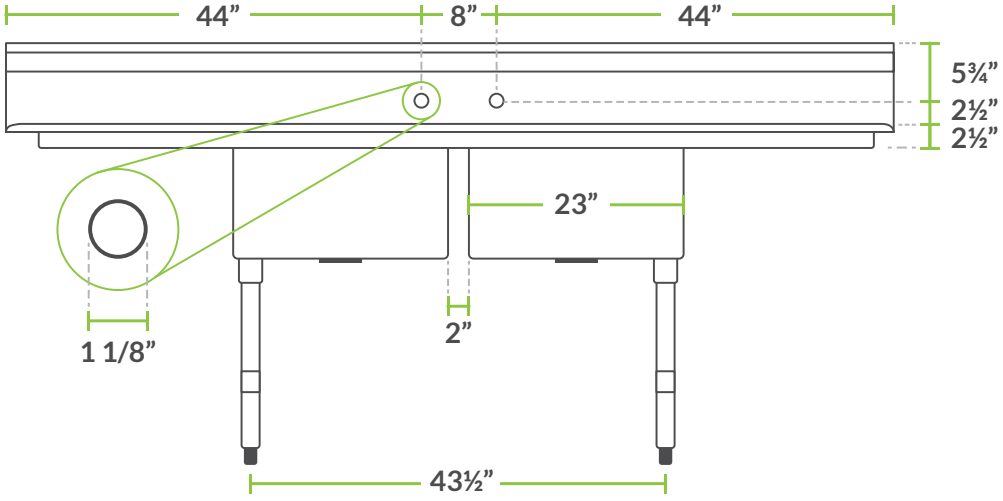

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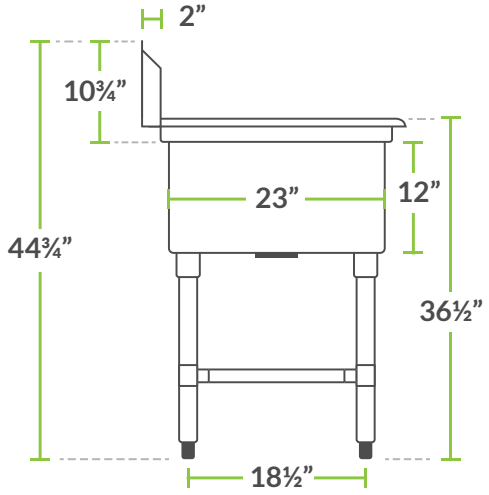


Product: **Regency 124" 16-Gauge Stainless Steel Three Compartment Commercial Sink (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: Scullery

This Regency 124" 3-compartment sink with 2 drainboards is ideal for setting up a washing, rinsing, and sanitation station. It's constructed from high-quality, 16-gauge type 304 stainless steel, making it more corrosion-resistant and durable than other sinks made from thinner, 18-gauge material. Two 24" drainboards allow for washing and drying dishes and utensils in one convenient location. They're also dipped a minimum of 1/4" to facilitate better drainage. Welded construction contributes to the long-lasting use and overall strength of this sink / drainboard combo.

The 14" deep bowls are die-stamped to a minimum of 1/4" to ensure proper drainage. Plus, it includes 3 1/2" basket strainers to catch food debris, which prevents the drain from clogging. For easy cleaning, the compartment has rounded corners so you can rinse and wipe down the sink.

A 10" tall backsplash is included and comes complete with (4) 1 1/8" diameter holes punched on 8" centers to accommodate 2 faucets (sold separately). This sink also includes a 1 1/2" raised rolled edge, which is 2" tall on the front and both sides to contain splashes and overflow. The legs are constructed of 1 5/8" diameter stainless steel with stainless steel cross-bracing and adjustable plastic feet for added stability. These features serve to prolong the life of your sink while adding exceptional strength to the unit.





Item Number: #600S324242X

Product Details

- Made of high-quality 16 gauge, type 304 stainless steel
- Designed with (3) 14" deep bowls and rounded corners for easy cleaning
- Stainless steel legs, sockets, bullet feet, and crossbracing for maximum strength and longevity
- Includes 1 1/2" IPS drain connection and 3 1/2" basket strainers
- Backsplash and rolled edges prevent splashes and overflow
- Dimensions: 124"W x 29-13/16"D x 43-3/4"H
- Work Surface Height: 36 1/2"H
- Drainboard: 24"W
- Backsplash: 7-1/4" H
- Bowl Dimensions: 24"W x 24"D x 14"H
- Basket Drain Size 3-1/2"
- 1 5/8" stainless steel legs with adjustable metal bullet feet
- Faucet Centers: 8"
- Gauge: 16
- Construction: Stainless Steel
- NSF Listed
- Stainless Steel Type: Type 304
- Type: Straight/Line Sink

16 GAUGE STAINLESS STEEL
THREE COMPARTMENT SINK
WITH TWO DRAINBOARDS

ITEM #: _____ QUANTITY: ____

PROJECT: _____

APPROVAL: _____

DATE: _____



REGENCY
Tables and Sinks

FEATURES

- Made of high-quality 16 gauge, type 304 stainless steel
- Galvanized 1⅝" steel legs with sockets
- Adjustable bullet feet for added stability
- Faucet holes pre-punched on 8" centers (faucet sold separately)
- 1½" IPS drain connection
- Rolled front and side edges to contain splashes and overflows

SPECIFICATIONS

ITEM	LENGTH	DEPTH	HEIGHT (Total)	HEIGHT (Work)	BOWL DEPTH	BOWL L to R	BOWL F to B	NUMBER OF DRAINBOARDS	SIDE	NET WEIGHT
600S324242X	124"	29 13/16"	43¾"	36½"	14"	24"	24"	2	Both	153.66 LB.

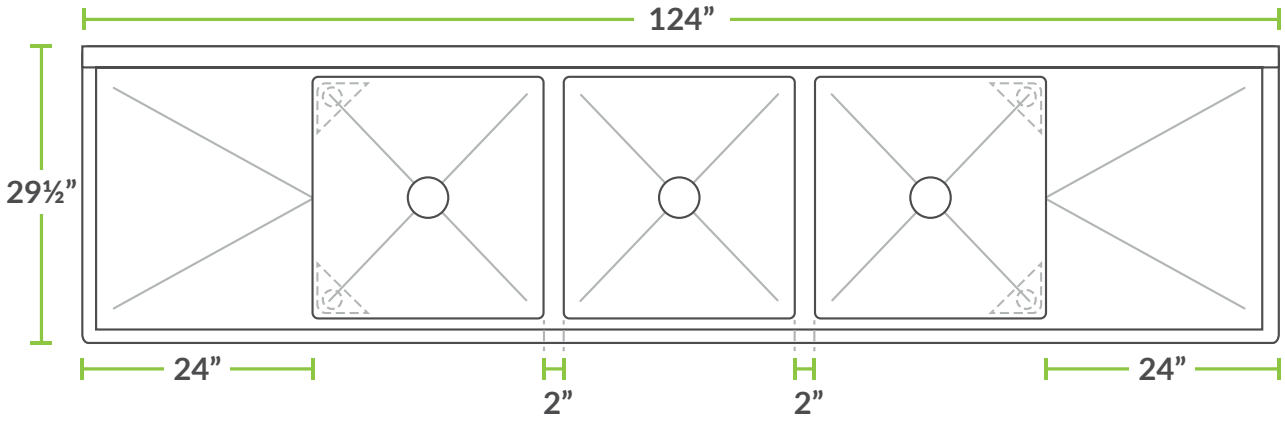
NSF

2/2020

16 GAUGE STAINLESS STEEL
THREE COMPARTMENT SINKS
WITH TWO DRAINBOARDS

REGENCY
Tables and Sinks

TOP



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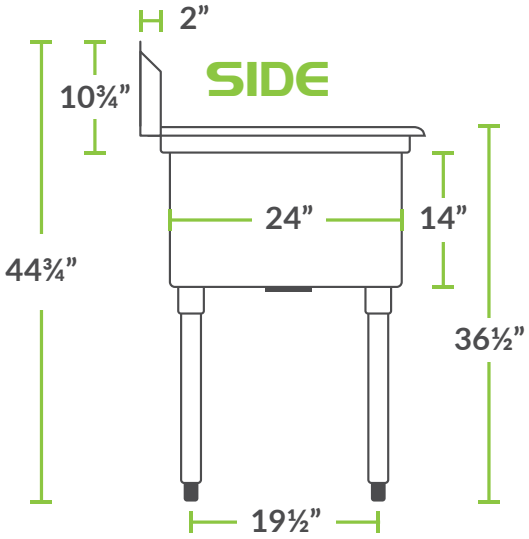

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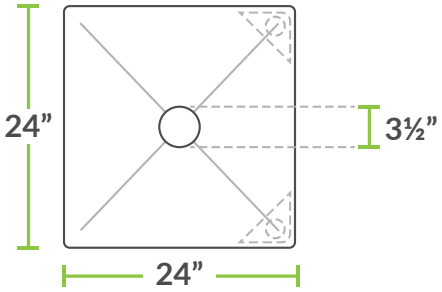

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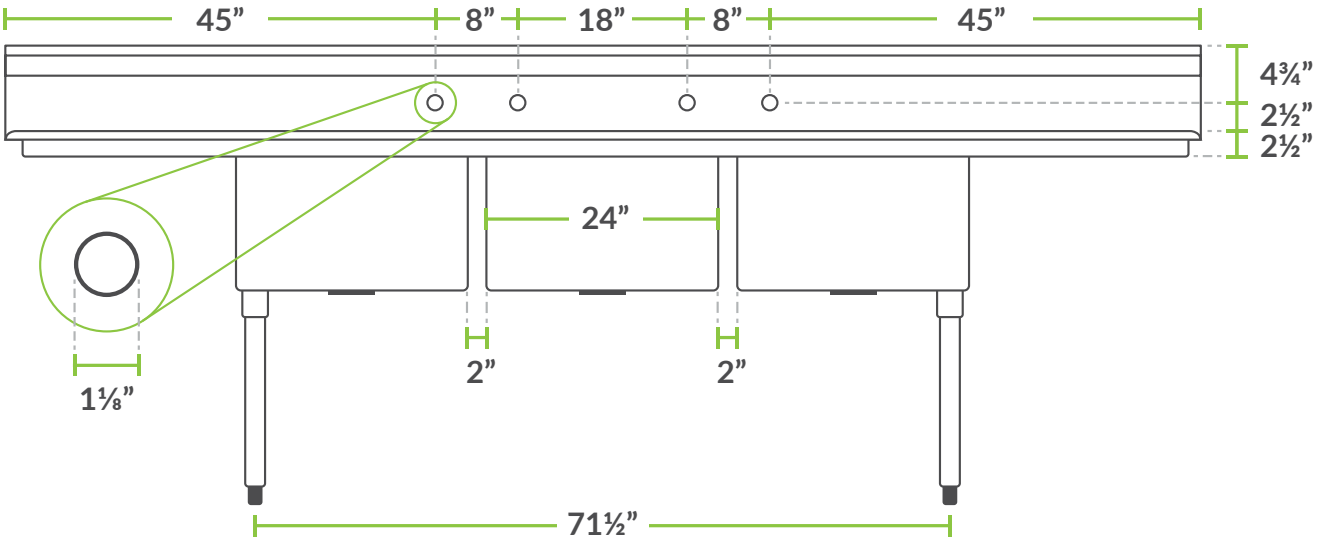


REGENCYTABLESANDSINKS.COM

Product: **Regency 24" x 96" 16-Gauge 304 Stainless Steel Commercial Work Table with Undershelf (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: Cafeteria Kitchen

Utilize the space in your kitchen with this dependable 24" x 96" 16-gauge, 304-series stainless steel commercial work table from Regency Tables and Sinks. This unit not only provides plenty of room on its work surface, but also offers an 18-gauge, 430-series stainless steel undershelf to supply much needed space for food preparation, storing supplies, and other tasks within your business.

This Regency work table is both easy to clean and easy to maintain thanks to its durable, corrosion resistant material. Plus, it is mounted on (4) sturdy, 1 5/8" stainless steel legs with adjustable, metal, bullet feet for ample support. The top shelf boasts a weight capacity of approximately 760 lb., while the undershelf supports 450 lb.! This amount of strength is extremely valuable in a restaurant or bar.



Item Number: #600TS2496S

Product Details

- 16-gauge type 304 stainless steel top offers greater durability and corrosion-resistance than type 430
- 18-gauge type 430 stainless steel adjustable undershelf
- 1 5/8" stainless steel legs with adjustable metal bullet feet
- Dimensions: 96"W x 24" D x 34"H
- Work Surface Height: 34" H
- No Backsplash
- Table Style: Undershelf
- Construction: Stainless Steel
- NSF Listed
- Stainless Steel Type: Type 304
- Table Style - Undershelf
- Top Capacity: 760 lb.
- Undershelf Capacity: 420 lb.
- Usage: Standard Duty

16 GAUGE STAINLESS STEEL WORK TABLES

REGENCY
Stainless Steel Commercial
Tables And Sinks



FEATURES

- Smooth type 304 stainless steel work surface makes cleaning a breeze
- Stainless steel legs, undershelf, and hat channels provide unparalleled stability
- Adjustable bullet feet ensure leveling on uneven surfaces
- Combines unbeatable strength with long-lasting durability
- Simple assembly and installation requires little effort

SPECIFICATIONS

NSF

ITEM	LENGTH	WIDTH	WORK HEIGHT	UNDERSHELF DIMENSIONS	TOP SHELF CAPACITY	UNDERSHELF CAPACITY	WEIGHT
600TS2424S	24”	24”	34”	18" x 18"	500 lb.	300 lb.	35 lb.
600TS2430S	30”	24”	34”	24" x 18"	500 lb.	300 lb.	40 lb.
600TS2436S	36”	24”	34”	30" x 18"	530 lb.	320 lb.	46 lb.
600TS2448S	48”	24”	34”	42" x 18"	560 lb.	340 lb.	59 lb.
600TS2460S	60”	24”	34”	54" x 18"	580 lb.	360 lb.	70 lb.
600TS2472S	72”	24”	34”	66" x 18"	600 lb.	380 lb.	87 lb.
600TS2496S	96”	24”	34”	90" x 18"	760 lb.	450 lb.	110 lb.
600TS3030S	30”	30”	34”	24" x 24"	550 lb.	330 lb.	47 lb.
600TS3036S	36”	30”	34”	30" x 24"	570 lb.	350 lb.	51 lb.
600TS3048S	48”	30”	34”	42" x 24"	600 lb.	370 lb.	66 lb.
600TS3060S	60”	30”	34”	54" x 24"	620 lb.	390 lb.	80 lb.
600TS3072S	72”	30”	34”	66" x 24"	640 lb.	410 lb.	99 lb.
600TS3084S	84”	30”	34”	78" x 24"	780 lb.	460 lb.	113 lb.
600TS3096S	96”	30”	34”	90" x 24"	800 lb.	480 lb.	126 lb.
600TS3636S	36”	36”	34”	30" x 30"	600 lb.	380 lb.	58 lb.
600TS3648S	48”	36”	34”	42" x 30"	630 lb.	400 lb.	72 lb.
600TS3660S	60”	36”	34”	54" x 30"	650 lb.	420 lb.	87 lb.
600TS3672S	72”	36”	34”	66" x 30"	670 lb.	440 lb.	102 lb.
600TS3696S	96”	36”	34”	90" x 36"	820 lb.	510 lb.	139 lb.

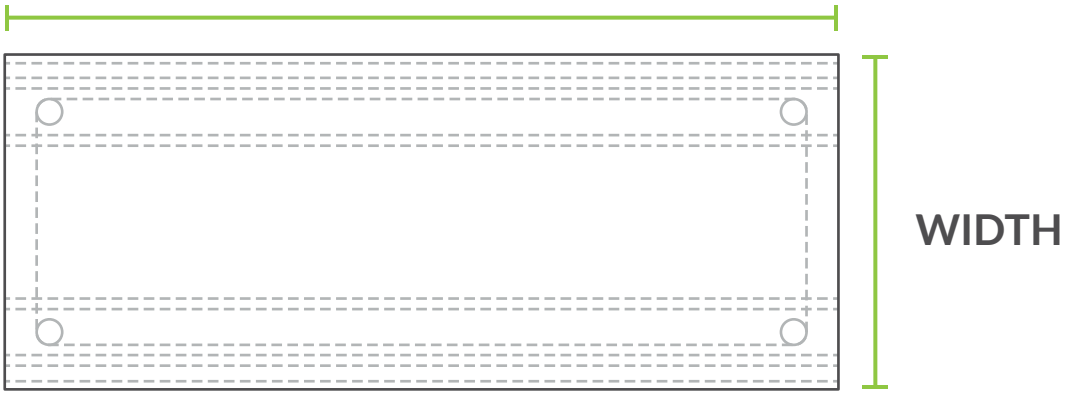
NOTE: 84” & 96” Work Tables Feature (6) Six Legs for Added Stability

16 GAUGE STAINLESS STEEL WORK TABLES

REGENCY
Stainless Steel Commercial
Tables And Sinks

NSF

TOP



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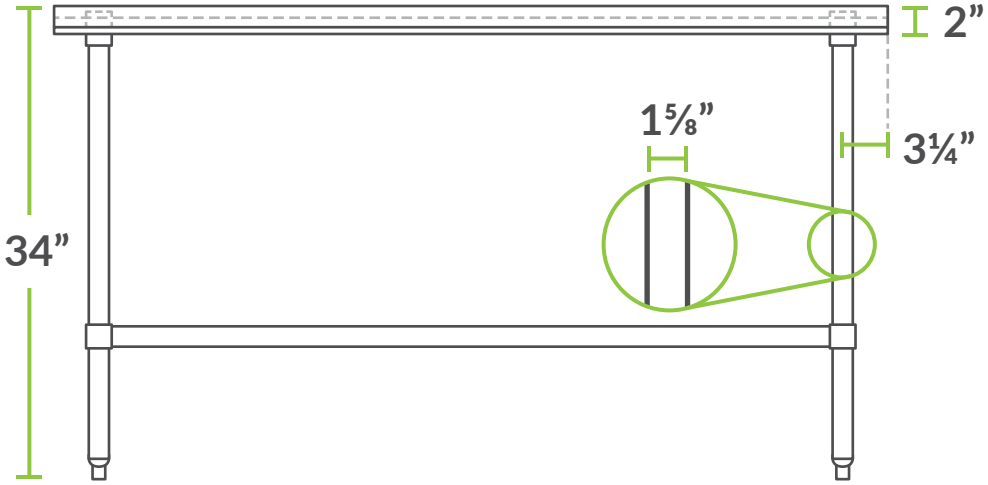

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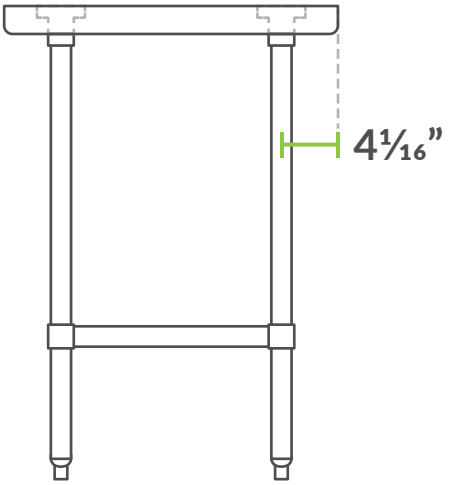


ACCESSORIES

CASTERS & FEET

ITEM	DESCRIPTION	#/PACK
600CASTER4	5” Swivel Stem Casters	4
600CASTER6	5” Swivel Stem Casters	6
600CASTERHD4	5” Heavy-Duty Swivel Stem Casters	4
600CASTERHD6	5” Heavy-Duty Swivel Stem Casters	6
600PABF	Adjustable Plastic Bullet Foot	1
600SPABF	Adjustable Stainless Steel Bullet Foot	1
600SSFF	3¼” Stainless Steel Flanged Foot	1

UNDERSHELVES

ITEM	DIMENSIONS	FITS
600UT1824S	18”L x 12”W	24”L x 18”W Work Tables
600UT1830S	24”L x 12”W	30”L x 18”W Work Tables
600UT1836S	30”L x 12”W	36”L x 18”W Work Tables
600UT1848S	42”L x 12”W	48”L x 18”W Work Tables
600UT1860S	54”L x 12”W	60”L x 18”W Work Tables
600UT1872S	66”L x 12”W	72”L x 18”W Work Tables
600UT2424S	18”L x 18”W	24”L x 24”W Work Tables
600UT2430S	24”L x 18”W	30”L x 24”W Work Tables
600UT2436S	30”L x 18”W	36”L x 24”W Work Tables
600UT2448S	42”L x 18”W	48”L x 24”W Work Tables
600UT2460S	54”L x 18”W	60”L x 24”W Work Tables
600UT2472S	66”L x 18”W	72”L x 24”W Work Tables
600UT2484S	78”L x 18”W	84”L x 24”W Work Tables
600UT2496S	90”L x 18”W	96”L x 24”W Work Tables
600UT3030S	24”L x 24”W	30”L x 30”W Work Tables
600UT3036S	30”L x 24”W	36”L x 30”W Work Tables
600UT3048S	42”L x 24”W	48”L x 30”W Work Tables
600UT3060S	54”L x 24”W	60”L x 30”W Work Tables
600UT3072S	66”L x 24”W	72”L x 30”W Work Tables
600UT3084S	78”L x 24”W	84”L x 30”W Work Tables
600UT3096S	90”L x 24”W	96”L x 30”W Work Tables
600UT3636S	30”L x 30”W	36”L x 36”W Work Tables
600UT3648S	42”L x 30”W	48”L x 36”W Work Tables
600UT3660S	54”L x 30”W	60”L x 36”W Work Tables
600UT3672S	66”L x 30”W	72”L x 36”W Work Tables
600UT3696S	90”L x 30”W	96”L x 36”W Work Tables

CASTERS

Each set of Regency casters lets you turn any work table or equipment stand with 4 or 6 standard legs into a mobile work station. With a total weight capacity of 1200 to 1600 lb., these wheels can stand the toughest of tests and are sure to meet your needs. Take your table or equipment on the go and then keep it secure with the flip of a lever, conveniently placed at foot level for easy locking and unlocking.

BULLET FEET

Make sure your table, compartment sink, or dishtable is level and stable by replacing a missing or broken bullet foot with these Regency Bullet Feet! They are designed to fit equipment with 1⅝” outer diameter legs and are adjustable so they can accommodate uneven floors.

FLANGED FEET

If you need to bolt your Regency equipment to the floor for added stability during use, this flanged 3¼” seismic foot is the perfect solution! It is designed to swap out easily for an existing foot on Regency products with legs that measure 1⅝” in outer diameter. Feet like these are typically used to comply with local codes, which require you to secure equipment to the floor, and in situations where keeping your equipment immobile could be useful, like on a food truck.







UNDERSHELVES

Add extra storage space and organization to your kitchen with a Regency adjustable stainless steel work table undershelf! Undershelves provide additional storage for frequently used items like prep tools, cutting boards, bar towels, oven mitts, pans, and trays. These undershelves are adjustable, so you can move them higher or lower to accommodate items of varying sizes. Made of 18 gauge, type 430 stainless steel, Regency undershelves ensure maximum durability and corrosion resistance, and are easy to clean and sanitize.



ACCESSORIES

OVERSHELVES

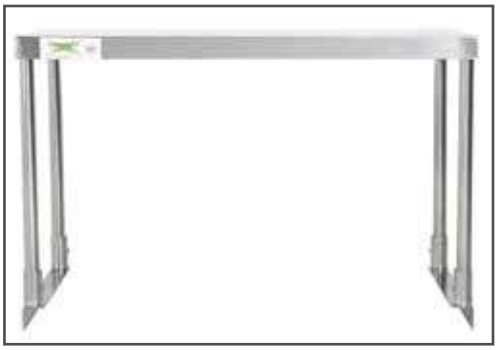
ITEM	TYPE	DIMENSIONS	FITS
600SOS1230	Single Deck	30”L x 12”W x 19¼”H	30”L Work Tables
600SOS1236	Single Deck	36”L x 12”W x 19¼”H	36”L Work Tables
600SOS1248	Single Deck	48”L x 12”W x 19¼”H	48”L Work Tables
600SOS1260	Single Deck	60”L x 12”W x 19¼”H	60”L Work Tables
600SOS1272	Single Deck	72”L x 12”W x 19¼”H	72”L Work Tables
600SOS1284	Single Deck	84”L x 12”W x 19¼”H	84”L Work Tables
600SOS1296	Single Deck	96”L x 12”W x 19¼”H	96”L Work Tables
600SOS1830	Single Deck	30”L x 18”W x 19¼”H	30”L Work Tables
600SOS1836	Single Deck	36”L x 18”W x 19¼”H	36”L Work Tables
600SOS1848	Single Deck	48”L x 18”W x 19¼”H	48”L Work Tables
600SOS1860	Single Deck	60”L x 18”W x 19¼”H	60”L Work Tables
600SOS1872	Single Deck	72”L x 18”W x 19¼”H	72”L Work Tables
600SOS1884	Single Deck	84”L x 18”W x 19¼”H	84”L Work Tables
600SOS1896	Single Deck	96”L x 18”W x 19¼”H	96”L Work Tables
600DOS1230	Double Deck	30”L x 12”W x 32”H	30”L Work Tables
600DOS1236	Double Deck	36”L x 12”W x 32”H	36”L Work Tables
600DOS1248	Double Deck	48”L x 12”W x 32”H	48”L Work Tables
600DOS1260	Double Deck	60”L x 12”W x 32”H	60”L Work Tables
600DOS1272	Double Deck	72”L x 12”W x 32”H	72”L Work Tables
600DOS1284	Double Deck	84”L x 12”W x 32”H	84”L Work Tables
600DOS1296	Double Deck	96”L x 12”W x 32”H	96”L Work Tables
600DOS1830	Double Deck	30”L x 18”W x 32”H	30”L Work Tables
600DOS1836	Double Deck	36”L x 18”W x 32”H	36”L Work Tables
600DOS1848	Double Deck	48”L x 18”W x 32”H	48”L Work Tables
600DOS1860	Double Deck	60”L x 18”W x 32”H	60”L Work Tables
600DOS1872	Double Deck	72”L x 18”W x 32”H	72”L Work Tables
600DOS1884	Double Deck	84”L x 18”W x 32”H	84”L Work Tables
600DOS1896	Double Deck	96”L x 18”W x 32”H	96”L Work Tables

DRAWERS

ITEM	EXTERIOR DIMENSIONS	INTERIOR DIMENSIONS
600DR2015	19½”L x 23¾”W x 5”H	15”L x 20”W x 5”H
600DR2020	25⅛”L x 23¾”W x 5”H	20”L x 20”W x 5”H

STAINLESS STEEL OVERSHELVES

Add extra storage space and organization to your kitchen with these Regency stainless steel overshelves! Available in single or double deck, their 18 gauge, type 430 stainless steel construction ensures long-lasting durability to stand up to repeated use. Installation is simple as the whole shelf easily mounts to the end of your table using the “L” brackets, set screws, and wrench provided.





DRAWERS

Keep your kitchen organized by mounting a Regency galvanized steel drawer to the under structure of your work table. Each drawer features an easy-to-clean stainless steel front and moves on ball-bearing sides.



Product: 16 Gauge Stainless Steel Three Compartment Sink w/ 2 Drainboards

Manufacturer: Regency

Location: ProStart Kitchen Laboratory



Item 600S318242X

Product Details

See attached.

16 GAUGE STAINLESS STEEL
THREE COMPARTMENT SINK
WITH TWO DRAINBOARDS

ITEM #: _____ QUANTITY: ____

PROJECT: _____

APPROVAL: _____

DATE: _____



REGENCY
Tables and Sinks

FEATURES

- Made of high-quality 16 gauge, type 304 stainless steel
- 1⅝" stainless steel legs with sockets
- Adjustable bullet feet for added stability
- Faucet holes pre-punched on 8" centers (faucet sold separately)
- 1½" IPS drain connection
- Rolled front and side edges to contain splashes and overflows

SPECIFICATIONS

ITEM	LENGTH	DEPTH	HEIGHT (Total)	HEIGHT (Work)	BOWL DEPTH	BOWL L to R	BOWL F to B	NUMBER OF DRAINBOARDS	SIDE	NET WEIGHT
600S318242X	94"	29 13/16"	43¾"	36½"	14"	18"	24"	2	Both	128.75 LB.

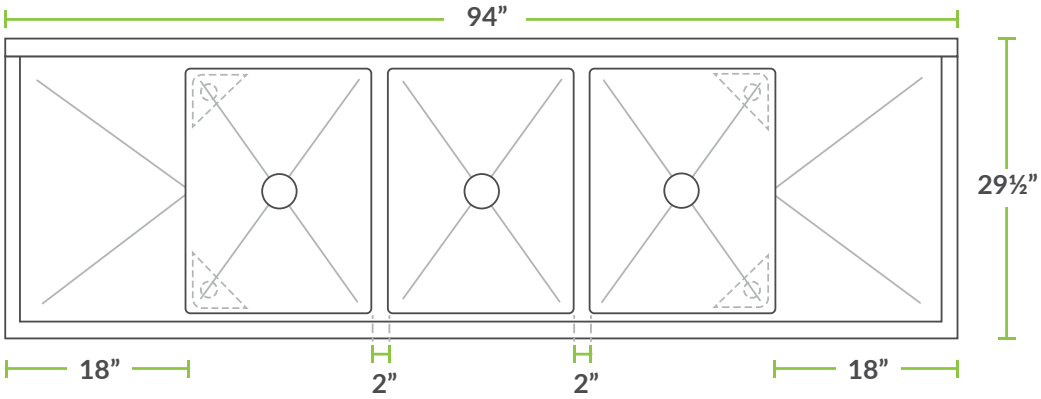
NSF

2/2020

16 GAUGE STAINLESS STEEL
THREE COMPARTMENT SINK
WITH TWO DRAINBOARDS

REGENCY
Tables and Sinks

TOP



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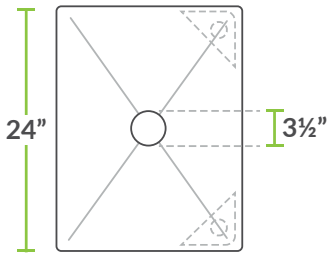

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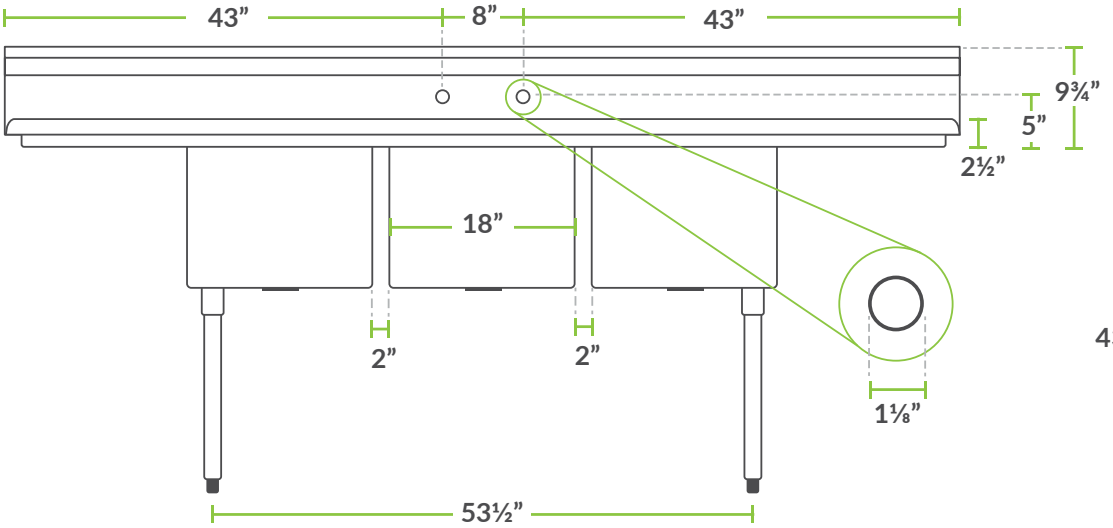

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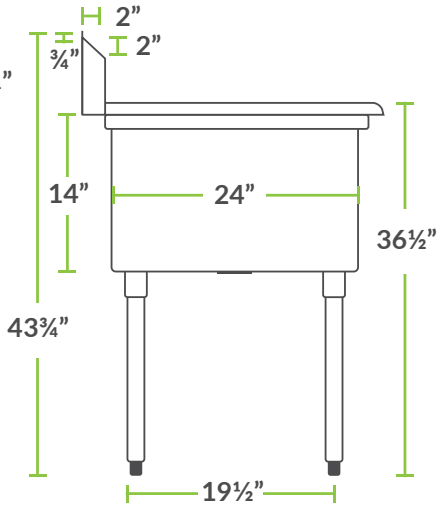


Product: Stainless Steel Work Table w/ Sink and Undershelf

Manufacturer: Regency

Location: ProStart Kitchen Laboratory



Item 600ST3072RT

Product Details

See attached.

STAINLESS STEEL WORK TABLE WITH SINK & UNDERSHELF

ITEM #: _____ QUANTITY: ____

PROJECT: _____

APPROVAL: _____

DATE: _____







REGENCY Tables and Sinks

FEATURES

- 16-gauge type 304 stainless steel top offers greater durability and corrosion-resistance than type 430
- 18 gauge type 430 stainless steel undershelf and hat channels
- Features a 12” deep stainless steel sink with a deck mounted faucet
- Convenient 5” backsplash protects posterior wall
- Stainless steel legs and sockets for maximum support
- Adjustable bullet feet

NSF

SPECIFICATIONS

ITEM	LENGTH	WIDTH	WORK HEIGHT	TOTAL HEIGHT	BACKSPLASH HEIGHT	BOWL DEPTH	BOWL (F TO B)	BOWL (L TO R)	SINK SIDE
600ST3072RT	72"	30"	35½"	40½"	5"	12"	20"	16"	Right

02/2019

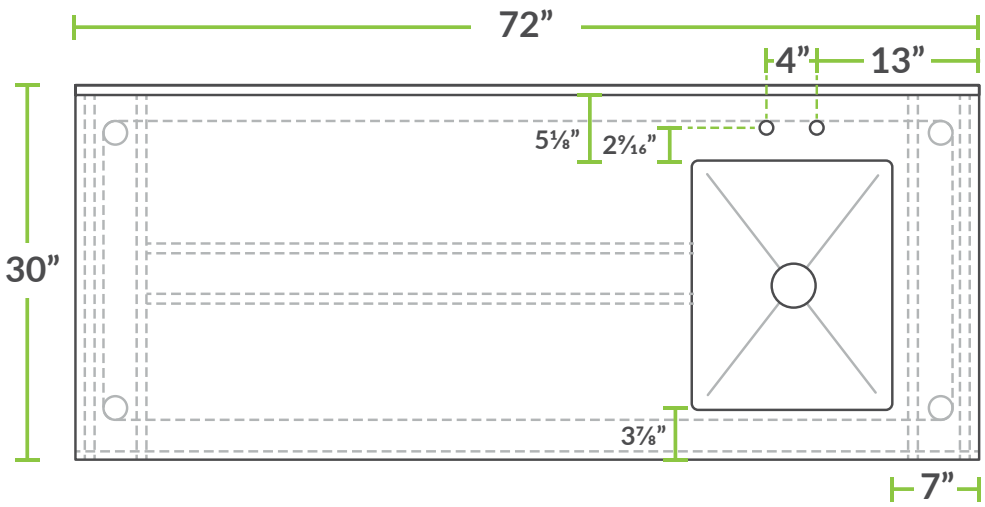
STAINLESS STEEL

WORK TABLE

WITH SINK & UNDERSHELF

REGENCY Tables and Sinks

TOP



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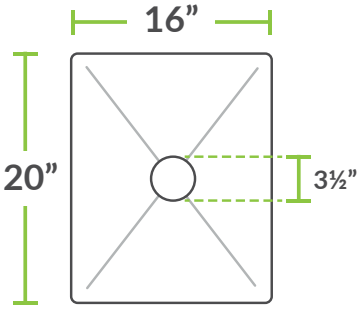

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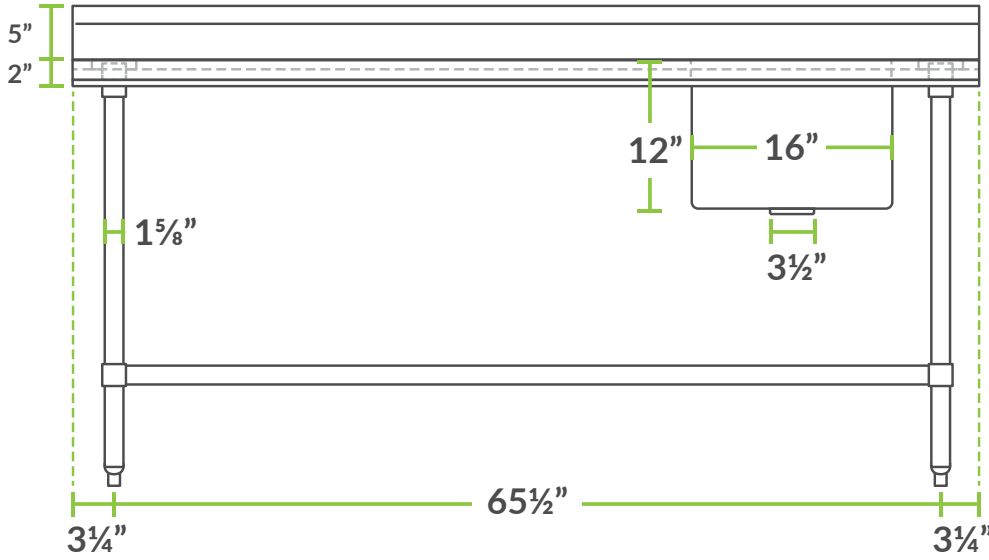

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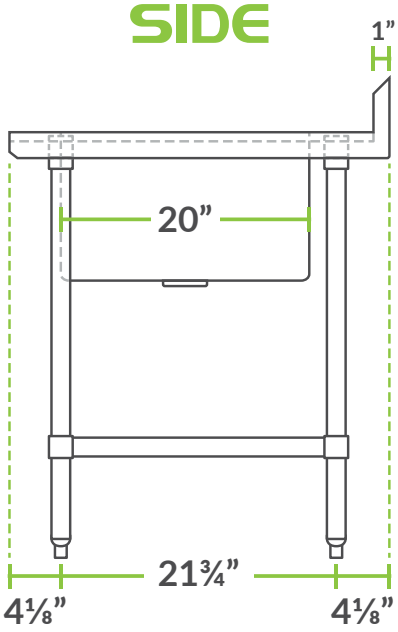

Product: Black Metal Framed Display Case; Full Vision

Manufacturer: Store Supply Warehouse

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

1-800-823-8887

Sign in/Create Account

STORE SUPPLY WAREHOUSE

0

48 inch Full Vision Black Metal Framed Display Case Ready To Assemble

SKU: 65561RTA



$495.00

Features:

- 48"L x 34"H x 24"D
- Adjustable rear storage shelf and bag bins
- 34" high top surface complies with ADA (Americans with Disabilities Act)
- Recessed black kick-plate

Temporarily Out of Stock

Product Options:

Quantity: 1

Add to Cart

Add to Favorites

Checkout accessories for this product!

Norton SHOPPING GUARANTEE 3/8/2022

48 inch LED Light Kit for Display Cases & Wall Units



Ratchet Lock with Keys for Display Cases

Description **Specifications**

FEATURES

- 48"L x 34"H x 24"D
- Adjustable rear storage shelf and bag bins
- 34" high top surface complies with ADA (Americans with Disabilities Act)
- Recessed black kick-plate

Reviews Q&A

We're currently collecting product reviews for this item. In the meantime, here are some reviews from our past customers sharing their overall shopping experience.

4.8

Out of 5.0

5 Star (62.1K)
4 Star (7797)
3 Star (2232)
2 Star (387)
1 Star (414)

Overall Rating

96%

of customers that buy from this merchant give them a 4 or 5-Star rating.

Write a review about this product ▶

Verified Buyer

March 7, 2022 by Denise H. (CA, United States)

“easy web site”

Verified Buyer

March 7, 2022 by Tiffany M. (VA, United States)

“found exactly what we need for our sign business to keep our graphics organized!”

Norton SHOPPING GUARANTEE 3/8/2022

1-800-823-8887

Sign in/Create Account

STORE SUPPLY WAREHOUSE

0

48 inch Full Vision Black Metal Framed Display Case Ready To Assemble

SKU: 65561RTA



$495.00

Features:

- 48"L x 34"H x 24"D
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Norton SHOPPING GUARANTEE 3/8/2022

48 inch LED Light Kit for Display Cases & Wall Units



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“found exactly what we need for our sign business to keep our graphics organized!”

Norton SHOPPING GUARANTEE 3/8/2022

Product: Curbside Pickup Wire Shelf w/ 4 Locking Caster

Manufacturer: Displays 2 Go

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

39.5" Wire Racks w/ (3) Pre-Printed Panels, 4 Locking Caster Wheels - Curbside Pickup





Message: Curbside Pick-Up

Curbside Pick-Up | Mobile Order Pickup (/P-51371/Mobile-Order-Pickup-Stand-Pre-Printed-Color-Graphics-Four-Locking-Caster-Wheels)

Built-To-Order

Ships in approximately 5 business days

$418.99 / Each (USD)

1 Add To Cart

More purchase options

Norton SHOPPING GUARANTEE

- Black Powder-Coated Steel Construction
- Includes Six Wire Shelves with Flat or Angled Mounting
- Bold Pre-Printed Graphics in Matte Finish
- Set of (3) Single-Sided Contour Cut Panels
- 4 Locking Casters Offer Effortless Mobility
- For Outdoor and Indoor Use

Description

Curbside Pickup Wire Shelf with Pre-Printed Graphic Panels and Adjustable Wire Shelves

This curbside pickup wire shelf is the ideal holding station for on-the-go orders. Each wire rack fixture with adjustable tilting shelves is sure to keep orders neatly organized while awaiting your customers' arrival. Four caster locking wheels allow this steel display to be positioned on sidewalks or areas within your restaurant, grocery store, or retail space. Additionally, each rack features three styrene panels that can be removed for easy cleanup at your own convenience. Use this curbside pickup wire shelf with pre-printed graphics to give patrons an instantly-recognizable destination to efficiently pick up their orders today!

Specifications

SKU	SMSDBRGCPU
GTIN	840844173061

Norton SHOPPING GUARANTEE 3/8/2022

Overall Width x Height x Depth	39.5" x 64.0" x 18.5"
Shelf Width x Height x Depth	37.0" x 1.75" x 18.5"
Header Width x Height	37.5" x 8.0"
Number of Shelves	6
Shelf Clearance	9.0"
Weight	64.0lbs
Material	Steel, Polystyrene
Finish	Matte
Placement Type	Floor Standing
Message	Curbside Pick-Up
Features	Wheels, Height Adjustable Shelves, Stock Message/Graphics
Color	Red
Secondary Color	White
Side Graphic Panels Viewable Width	16"
Graphic Panels	Single-Sided
Print Options	Full Color
Printing Type	UV Digital Print
Printing Area	Full Bleed, Header & Sides
Side Graphic Panels Viewable Height	61.5"

Ordering Information

In Stock

Shipping
Ships in approximately 5 business day(s)

Built-To-Order
Product is stocked 90% complete and is only completed when you place your order. Accessories, finishes, lighting, logos and/or graphics are added to complete your order.

Resources: Manuals, Videos, & Templates

Instructions
(https://static.commerceplatform.services/downloadablefiles/Instructions_BAKCRT6W.pdf)

BAKCRT6WBK_RG_Instructions
(https://static.commerceplatform.services/downloadablefiles/Instructions_BAKCRT6W.pdf)
Filename: Instructions_BAKCRT6W.pdf (1.61 MB)

Reviews

Browse reviews from customers who have already purchased this product.

This product has not been reviewed yet. Be the first.

Write a Review (/Review/Write/51370)

CALIFORNIA RESIDENTS

WARNING: This product can expose you to Bisphenol A, which is known to the State of California to cause Birth defects or other reproductive harm. For more information go to www.p65warnings.ca.gov.

Questions & Answers

Q: Are smsdbrgmo and smsdbrgcpu the same item? Can I get it with the signs blank?

Asked 3 months ago by Lynden C.

1 Answer [+]

Feel free to ask a question about this product.

Ask

Norton SHOPPING GUARANTEE 3/8/2022

For questions about stock, replacement parts, shipping, deliveries or customer service issues, please **contact customer service** (/ContactUs) directly.

Built-To-Order

Ships in approximately 5 business days

Quantity	Price Each (USD)
1 - 2	**$418.99**
3 - 4	$397.99
5 - 15	$376.99
16 +	Request a Quote

1 ADD TO CART

Optional Accessories



(/P-42031/Bakery-Bread-Rack-Signage-BAKCRT6WBK)

Bakers Rack Replacement Graphics for BAKCRT6WBK - Custom Printing
(/P-42031/Bakery-Bread-Rack-Signage-BAKCRT6WBK)
$129.99/ ea
Add To Cart (/ShoppingCart/Add?productId=42031&quantity=1)

Users Who Viewed Items In Your Recent History Also Viewed



$418.99
39.5" Wire Racks w/ (3) Pre...
(/P-51371/Mobile-Order-Pickup-Stand-Pre-Printed-



$416.99
39"w Bakery Display Rack ...
(/P-21582/Bakery-Display-6-Tilting-Wire-Shelves)



$129.99
Bakers Rack Replacement G...
(/P-42031/Bakery-Bread-Rack-Signage-



$115.99
Bakers Rack Replacement G...
(/P-41911/Custom-Bakery-Rack-Signage-



$129.99
Bakers Rack Replacement G...
(/P-42031/Bakery-Bread-Rack-Signage-

Contact us for expert advice, sales and all of your customer service (/ContactUs) needs

Live Chat

Phone Support
1-888-991-9684
(tel:1-888-991-9684)

Email Us
info@displays2go.com
(mailto:info@displays2go.com)

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Norton SHOPPING GUARANTEE 3/8/2022

Product: Cayenne® Hot Food Merchandiser; 47-Inch

Manufacturer: The Vollrath Company

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

Outperform every day.™

Project:

Item Number:

Quantity:

CAYENNE® HOT FOOD MERCHANDISERS



Cayenne® Hot Food Merchandiser

ITEMS

Item No.	Model No.	Description
40733	FMA7026	26" Merchandiser
40734	FMA7036	36" Merchandiser
40735	FMA7048	47" Merchandiser

DESCRIPTION

The Cayenne® Hot Food Merchandiser is the ideal solution for presenting and keeping warm a variety of food products. Variable heat control with humidity keeps food at the right temperature. Three adjustable tiered shelves accommodate and attractively merchandise an endless variety of food products. Front and rear sliding lockable doors make restocking easy and are ideal for self-serve operations.

FEATURES

- Thermostatically controlled heat with 85° to 175°F (29° to 79°C) temp range
- Specially designed baffle for even temperature distribution
- Internal humidifying system to keep food looking fresh longer
- Center located water pan is included for additional humidification in display,
- Front and rear sliding doors for easy loading and customer self-serve convenience. Doors can be locked.
- Three adjustable shelves for versatile displays
- Illuminated display for bright, eye-catching merchandising
- Lights controlled separately. Lights can be used without heat
- 5 ft. (1.5 m) cord and plug

Agency certifications

Intertek Intertek

Due to continued product improvement, please consult www.vollrath.com for current product specifications.

WARRANTY: All models shown come with Vollrath's standard warranty against defects in materials and workmanship. For full warranty details, please refer to www.Vollrath.com.

Approvals	Date

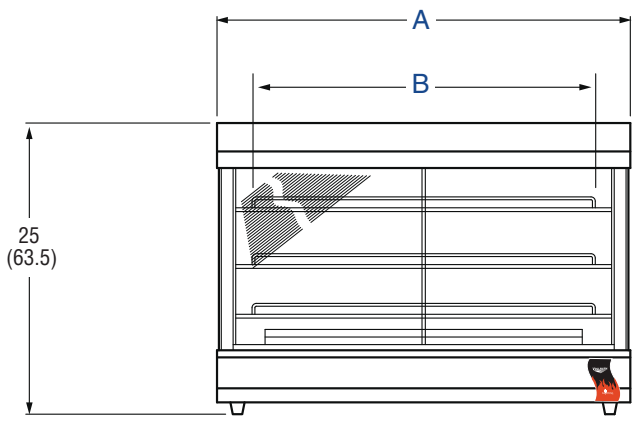
Outperform every day.™
www.vollrath.com

The Vollrath Company, L.L.C.
1236 North 18th Street
Sheboygan, WI 53081-3201 U.S.A.
Customer Service: 800.628.0830
Canada Customer Service: 800.695.8560
Main Fax: 800.752.5620 or 920.459.6573

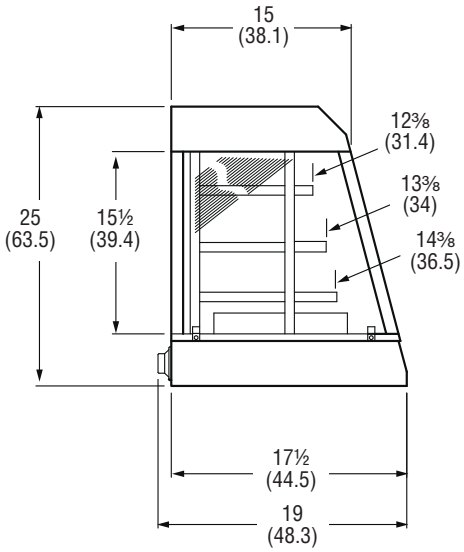
Technical Services: 800.628.0832
Technical Services Fax: 920.459.5462

CAYENNE® HOT FOOD MERCHANDISERS

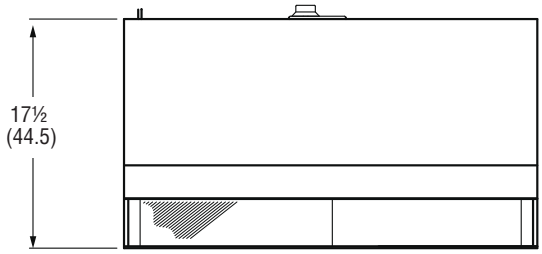
DIMENSIONS (Shown in inches (cm))



Front View



Side View



Top View

SPECIFICATIONS

Item No.	(A) Overall Width	(B) Shelf Width	Voltage	Watts	Amps	Ship Weight Lb (Kg)	Plug
40733	26 (66)	23½ (59.7)	120 AC	1440	12	85 (38.6)	5-15P
40734	36 (91.4)	32¼ (81.9)				108 (49)	
40735	47 (119.4)	44 (11.8)				156 (70.7)	

Receptacle

120V



NEMA 5-15R

VOLLRATH®

Outperform every day.™

www.vollrath.com

The Vollrath Company, L.L.C.
1236 North 18th Street
Sheboygan, WI 53081-3201 U.S.A.
Customer Service: 800.628.0830
Canada Customer Service: 800.695.8560
Main Fax: 800.752.5620 or 920.459.6573

Technical Services: 800.628.0832
Technical Services Fax: 920.459.5462

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Printed in USA

Product: MDF Slatwall Panel 4'x8' Maple Finish with Aluminum Insert

Manufacturer: Tebo Store Fixtures

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

Product: Invertech Microwave Oven

Manufacturer: Toshiba

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

Back to All Products

EM245A5C-BS

1.6 CU. FT. INVERTECH MICROWAVE OVEN

Black Stainless Steel

1.6 Cubic feet 1200 watt Black Stainless Steel microwave with Inverter features innovative cooking technology and a spacious interior. The Inverter technology provides even heating and defrosting so you get great results without overcooking. Sensor buttons let you optimally cook six of the most popular food items with the touch of a button. Choose from ten power levels up to 1200 watts. The large digital display has a clock function and can also display a countdown timer as well as the cooking time remaining. Program up to three favorite time and power combinations for additional one-touch convenience. Easily open or close the microwave with the large, easy-to grip door handle. The Black Stainless Steel exterior looks good in any kitchen.

- Inverter technology for better thawing and reheating
- Pre-programmed sensor menu for optimum heating of popular foods
- Large digital display, easy-to-read control panel, safety lock, interior LED light, glass turntable

Black Stainless Steel





Buy Now

Add to Compare

1.6 cu. ft.
Capacity

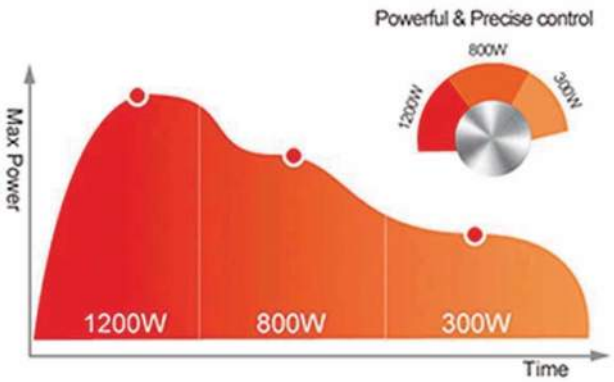
13.6 inch
Turntable Diameter

1250W
Rated Output Power

INVERTECH

Inverter technology provides even heating and defrosting, helping you make delicious food without overcooking. It can cook continuously at low power settings for accurate results, which helps your food maintain those essential vitamins and

nutrients for optimal taste of your favorite meals.





Control Matters

Quick-Touch Sensor Buttons

No guesswork needed for commonly microwaved foods. Press one of the pre-programmed buttons and the microwave automatically adjusts for different foods.



Simple Matters

Cook or Defrost

For reheating or cooking foods, use Cook Time and choose Power one through ten. Thawing meats, vegetables, or casseroles is easy - the inverter technology prevents overcooking.



Movement Matters

Turntable for Even Cooking

No guesswork needed for commonly microwaved foods. Press one of the pre-programmed buttons and the microwave automatically adjusts for different foods. Cook fresh vegetables, potatoes, reheat a frozen pizza, and more.

SPECS

Specifications

Product Dimensions (in) W*D*H 21.77 in x 20.20 in x 12.83 in	**Package Dimensions (in) W*D*H** 24.39 in x 20.53 in x 15.01 in	**Net Gross Weight** 28.7 lbs / 32.83 lbs.	**Rated Voltage** 120V~ 60Hz
Rated Input Power 1350W	**Rated Output Power** 1250W	**Capacity** 1.6 cubic feet	**Turntable Diameter** 13.6 inches

MORE LIKE THIS



EC042A5C-BS



EM925A5A-BS



EM131A5C-BS

Black Stainless Steel

- Use microwave or convection cooking all in one appliance
- Sensor cooking and reheating functions
- Auto menu for roasting, baking, defrosting
- Stainless steel easy to clean interior

Details

Black Stainless Steel

- Digital control panel with interior LED light
- Black stainless steel exterior
- One touch start for six pre-programmed functions
- Power saving mode and child safety lock

Details

Black Stainless Steel

- Digital control panel with interior LED light
- One Touch Start for 5 Food Types
- One touch start for multiple food presets
- Easy Clean interior

Details

Copyright© 2021 Toshiba Lifestyle Products and Services Corporation, All Rights Reserved.

Product: **4-Tier Heavy Duty Industrial Steel Shelving Unit**

Manufacturer: Husky

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

FREE IN-STORE PICKUP Over one million online items eligible. ›

You're shopping
Guam - Tamu…
OPEN until 10 pm

Delivering to
96913

storage shelves

Cart | 0 items

Home / Storage & Organization / Garage Storage / Garage Shelving / Garage Storage Shelves

Internet #310651468 Model #HBR782478W4 Store SKU #1004956918

Best Seller

3

Husky

Black 4-Tier Heavy Duty Industrial Welded Steel Garage Shelving Unit (77 in. W x 78 in. H x 24 in. D)

★★★★★ (10007) Questions & Answers (591)










Hover Image to Zoom

Live Chat

Feedback

$349.00

$59.00 /mo* suggested payments with 6 months* financing Apply Now

Guam - Tamuning Store

6 in stock Aisle 47, Bay 009 Text to Me

Color/Finish: **Black**

Width x Height x Depth: **90 in W x 90 in H x 24 in D**

65 in W x 54 in H x 24 in D | **77 in W x 78 in H x 24 in D** | ~~90 in W x 90 in H x 24 in D~~

How to Get It Delivering to: **96913** | Change

Store Pickup
Pickup **Today**
FREE

Ship to Home
Not available for this item

Scheduled Delivery
Not available for this item

6 in stock at **Guam - Tamuning**
Check Nearby Stores

- 1 +

Add to Cart

— or —

Buy now with PayPal

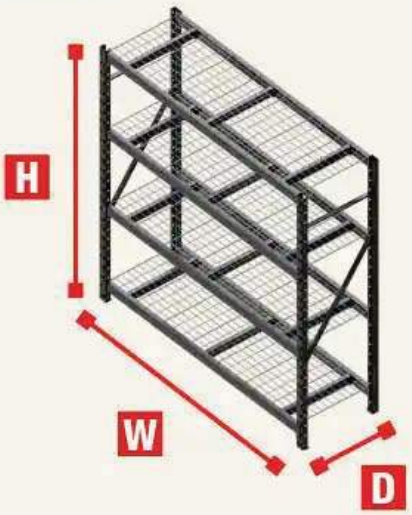
Product Overview



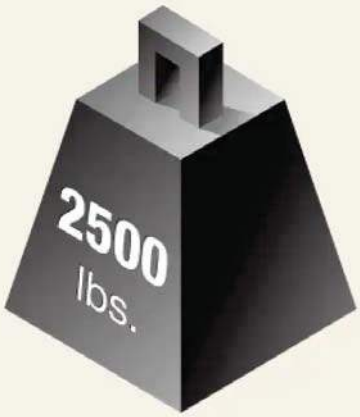
Live Chat
Feedback

DIMENSIONS

W 77 in.
H 78 in.
D 24 in.



WEIGHT CAPACITY PER SHELF



WARRANTY

LIFETIME WARRANTY

Lifetime Warranty with no questions, no receipt required.

More

CONSTRUCTION

WEIGHT PER SHELF

LIGHT	MEDIUM	HEAVY	SUPER HEAVY
PLASTIC	STEEL RIVET	STEEL WELDED	STEEL I-BEAM
Up to 200 lbs.	200 – 1000 lbs.	1000 – 1500 lbs.	1500 – 2500 lbs.

Live Chat
Feedback









Illustrations may vary from actual product.

Perfect for organizing your garage or workshop, Husky's Steel I-Beam Shelving Unit measures 78 in. H x 77 in. W x 24 in. D. The 4 adjustable wire shelves provide ample storage space to accommodate a variety of heavy items, each shelf supporting up to 2500 lb.. This unit is constructed with steel in a powder-coated finish for durability and strength.

Info & Guides

You will need Adobe® Acrobat® Reader to view PDF documents. Download a free copy from the Adobe Web site.

× Shop This Collection from Husky (5)

Product: **72" Cash Wrap w/ Adjustable Storage Shelves & Pull-Out Drawer - Black**

Manufacturer: Displays2go

Location: GCC Marketing Lab/Student Store





Product Details

See attached.

72" Cash Wrap w/ Adjustable Storage Shelves & Pull-out Drawer - Black







★★★★☆ **3.8** out of **5** | (5 Ratings)

Color: Black

Black | Cherry | Maple (/P-7855/Retail-Sales-Counters-72-W-Ledgetop-Maple-Melamine)

White (/P-23758/White-Ledgetop-Counter-with-Open-Shelving-in-Rear)

Overall Width: 72"

48" (/P-6394/Cash-Register-Counter-Stand-Well-Top-Efficient-Customer-Transactions) | 72"

OUT OF STOCK

Notify Me When In Stock

$400.99 / Each (USD)

⚠ This product is temporarily out of stock and is currently unavailable for purchase.
Please check back regularly as we anticipate new stock in the future.

.75" Thick Melamine Construction
wo Adjustable or Removable Shelves
elf For Signing Checks and Receipts

Norton SHOPPING GUARANTEE 3/8/2022

- Conceals Cords in Recessed Well
- Pull-Out Drawer for Additional Storage

CUSTOMIZE IT

Description

Black Retail Counter Measures 72" Wide with Ledgetop Style

This black retail counter is great for handling transactions in a wide variety of stores. The cash wrap stand features a pull-out drawer for storing cash boxes, merchandise bags, extra receipt paper, and writing utensils nearby. This melamine retail counter also features a large ledgetop that gives customers room to place their phones or handbags during checkout. In addition, the cash wrap has a recessed well to conceal unsightly computer and electrical cords to reduce clutter. The sales counter has a large area for further storage, featuring two adjustable or removable shelves to hold merchandising supplies. Choose this 72" wide cash register stand to create an attractive checkout area for your business.

Please Note: We sell this retail sales counter unassembled (knocked down) to save you money on shipping costs. Included with these sales counters is a detailed instruction sheet. Assembly is simple, takes approximately 30 minutes, and requires an assistant.

Specifications

SKU	MRCLT72BK
GTIN	840844134703
Overall Width x Height x Depth	72.0" x 42.0" x 22.0"
Line or Series	MRC
Weight	204.0lbs
Material	Laminated Particle Board
Placement Type	Floor Standing
Features	Height Adjustable Shelves
Color	Black
Drawer Width x Depth	23.0" x 6.0"
Ledgetop Depth	8.8"
Large Shelf Width	46.8"
Small Shelf Width	23.0"

Ordering Information

Out Of Stock
We expect to have more in stock within 60-90 days.

Truck/Freight Shipping Required
Due to the size and/or weight standard shipping is not available. Depending on the method selected please allow 2-14 business days for delivery.
Additional information can be found on the Shipping FAQ Page (/DeliveryMethods).

ources: Manuals, Videos, & Templates

Norton SHOPPING GUARANTEE 3/8/2022

Top

Product: **48" Cash Wrap w/ Adjustable Storage Shelves & Pull-Out Drawer - Black**

Manufacturer: Displays2go

Location: GCC Marketing Lab/Student Store





Product Details

See attached.

72" Cash Wrap w/ Adjustable Storage Shelves & Pull-out Drawer - Black







★★★★☆ **3.8** out of **5** | (5 Ratings)

Color: Black

Black | Cherry | Maple (/P-7855/Retail-Sales-Counters-72-W-Ledgetop-Maple-Melamine)

White (/P-23758/White-Ledgetop-Counter-with-Open-Shelving-in-Rear)

Overall Width: 72"

48" (/P-6394/Cash-Register-Counter-Stand-Well-Top-Efficient-Customer-Transactions) | 72"

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wo Adjustable or Removable Shelves
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Norton SHOPPING GUARANTEE 3/8/2022

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Weight	204.0lbs
Material	Laminated Particle Board
Placement Type	Floor Standing
Features	Height Adjustable Shelves
Color	Black
Drawer Width x Depth	23.0" x 6.0"
Ledgetop Depth	8.8"
Large Shelf Width	46.8"
Small Shelf Width	23.0"

Ordering Information

Out Of Stock
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Truck/Freight Shipping Required
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Additional information can be found on the Shipping FAQ Page (/DeliveryMethods).

ources: Manuals, Videos, & Templates

Norton SHOPPING GUARANTEE 3/8/2022

Top

Product: **Regency 17” x 15” Wall-Mounted Sink with Gooseneck Faucet and Side Splash (Or Approved Equal)**

Manufacturer: Regency Tables and Sinks

Location: GCC Marketing Lab/Student Store



Product Details

See attached.

STAINLESS STEEL WALL MOUNTED HAND SINKS WITH GOOSENECK FAUCETS & SIDE SPLASHES

ITEM #: _____ QUANTITY: ____

PROJECT: _____

APPROVAL: _____

DATE: _____



REGENCY Tables and Sinks

FEATURES

- 20-gauge type 304 stainless steel
- Single bowl with 1½" IPS drain basket
- Easy-to-install 8" gooseneck faucet included
- Holes punched on 4" centers
- 8" backsplash
- 18-gauge type 304 stainless steel side splashes help prevent contamination

NSF

SPECIFICATIONS

ITEM	OVERALL (LEFT TO RIGHT)	OVERALL (FRONT TO BACK)	OVERALL (HEIGHT)	BOWL (LEFT TO RIGHT)	BOWL (FRONT TO BACK)	BOWL DEPTH	SIDE SPLASH
600HS12SP	12"	16"	10"	9"	9"	4"	Left & Right
600HS17SP	17"	15"	13½"	14"	10"	5½"	Left & Right

STAINLESS STEEL WALL MOUNTED

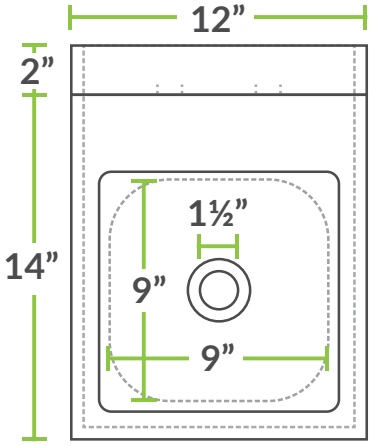
HAND SINKS

WITH GOOSENECK FAUCETS & SIDE SPLASHES

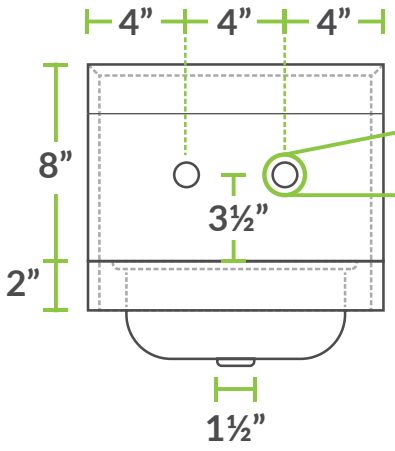
REGENCY Tables and Sinks

600HS12SP • 12" X 16"

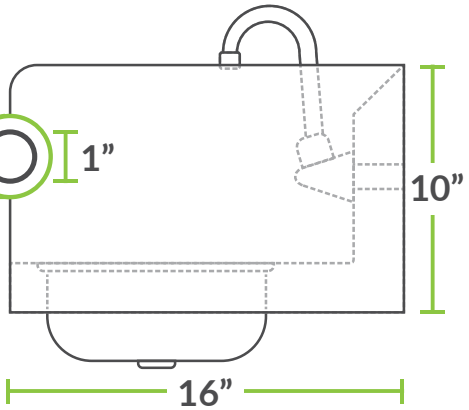
TOP



FRONT

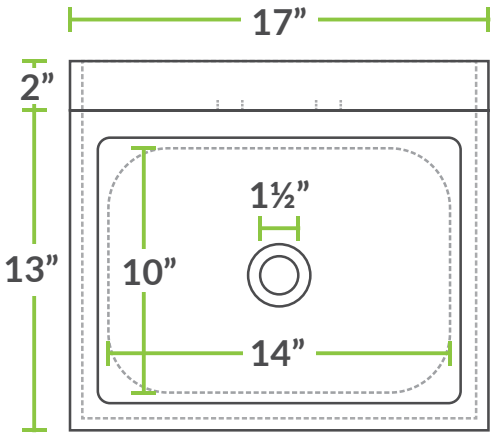


SIDE



600HS17SP • 17" X 15"

TOP



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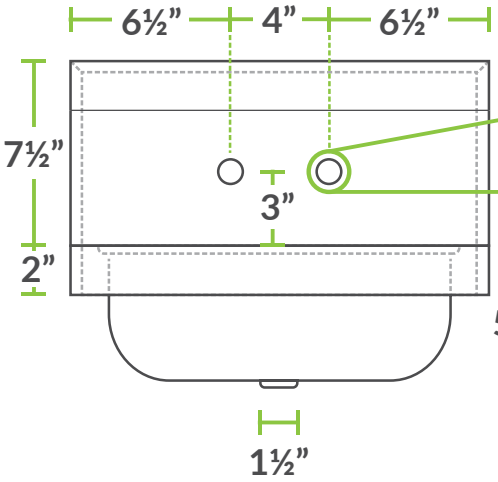

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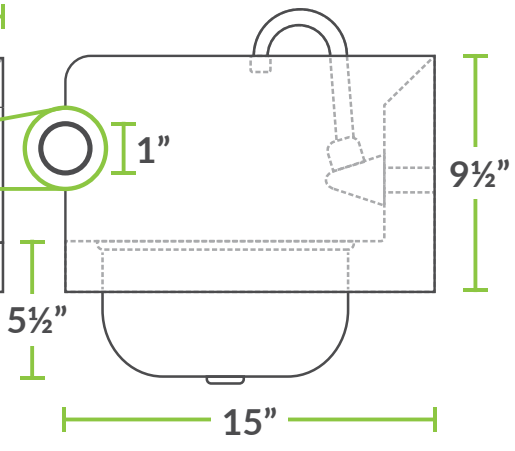


Product: US Classroom Flag (Or Approved Equal)

Manufacturer: Tidmore Flag and Banner

Location: All Classrooms

Lustrous, high quality, silk-like printed 12"x18" flags mounted on black wooden staffs with gilt speartips. Made in the USA.





Chalkboard Holder - 1"

$5.95



Classroom Brackets

$1.59



School Bracket

$3.95

Product: Glassless Mirror; 8' H

Manufacturer: Mirrorlite

Location: Dance Room and Weight Room

These shatterproof, lightweight mirrors provide a durable and safe alternative to traditional glass mirrors in a wide variety of settings.

Glassless Mirrors are much lighter than equivalently-sized plate glass mirrors, making them much easier and safer to install. They are shatterproof, easy to clean, and have a foam backing that absorbs sound instead of reflecting it. Ideal for dance studios, therapy rooms, bathrooms or dressing rooms and especially home gyms. Many mounting options are available to allow the mirror to best fit the intended space.



Product Details

- Foam back absorbs sound
- Easy to clean with soft cloth
- Perfect for gym or dance studio
- Lighter than normal glass panels
- Shatterproof for additional safety

Product: Screenflex Portable Room Dividers (Or Approved Equal)

Manufacturer**:** Screenflex

Location: Art Rooms



Simply roll one or more of these versatile, portable room dividers into position to divide a room or create an exhibit. They require no assembly and have self-leveling , locking caster wheels for instant stability. Set them up straight, in a curved or angled configuration, or lock several together for unlimited possibilities. Caster covers are included.

The durable fabric-covered panels are stain-resistant, sound-absorbent, and fully tackable - they accept pushpins, tacks, and staples. The partitions can double as a teaching tool when used to display artwork or other instructional materials. The frame is black powder-coated metal, with full-length black painted metal hinges. The fabric is treated with Scotchguard fabric protector.

Product: Portable Lectern

Manufacturer: Zimtown

Location: Carpentry and Automotive Classrooms

With a steel frame and mobility on four wheels, this multipurpose lectern is the best of both worlds with durability and versatility. Suitable for conference rooms, teaming rooms, classrooms, auditoriums, or any space that needs a commanding position from which to reach listeners.





Product Details

- Product Dimensions: 21.26" W x 17.32" D x 45.28" H
- Durable furniture-grade wood with stain and scratch resistant laminate finish top
- 2” casters with brakes on all 4 wheels for mobility
- Made from sturdy iron frame and MDF board, extremely high quality and strong durability
- Durable furniture-grade wood with stain and scratch resistant laminate finish top
- Weight: 30.64 lb
- Assembly required

.

Product: Signature Choral Riser

Manufacturer: Wenger Corporation

Locations: Auditorium Stage



Lightweight, easy to set up, durable choral risers.

Signature® Choral Risers were designed to incorporate every meaningful advantage: classic black styling; safe, simple setup; lightweight handling; superb stability; strong, quiet performance; easy mobility; long-lasting service; an integrated backrail with safety crossbar; and a full fifteen-year warranty. But what you might appreciate most of all is the easy-to-reverse design. You can change your riser arrangement quickly and securely. Optional siderails attach without tools. 3- and 4-step models roll easily through standard doorways. From initial set up through final performance, no other riser performs like Signature.

The Wenger Advantage

- The Ultimate Performance Riser – When superb stability and strong, quiet performance are what you're looking for, choose Signature.
- Safe, Simple Set Up – One person set up in a matter of minutes.
- Easy Mobility Within your Facility – Wheels and patented fold-down design makes maneuvering a breeze.
- Safe, strong, and stable – Your singers will feel confident standing on Signature risers. 150 lb live load capacity per square foot (732 kg capacity per square meter).
- Great Flexibility – Steps reverse for more configuration options.
- Quality Assurance – Fifteen-year warranty.

Product Details

- Patented fold-down design allows easy one-person setup
- Integral backrail with safety crossbar
- Optional easy-to-attach siderails for extra security
- Reversible steps provide the safety of bolted construction and lets you create new setup configurations
- 3- and 4-step riser sets available
- Steel construction for unparalleled stability and quiet performance
- Sturdy, permanently attached backrails with child-height crossbar
- Fifteen-year warranty

SIGNATURE® CHORAL RISER



The riser you've always wanted.

Wenger has reinvented the choral riser with every advantage you can imagine in a single, striking, easy-to-handle design. Classic black styling. Simple setup. Lightweight construction. Superb stability. Smooth mobility that fits through standard doorways. Quick step reversibility. Available in a 3-step or 4-step design with permanent backrail and an optional side rail set (2) for added security. A compact footprint for less storage space. All backed by Wenger's fifteen-year warranty. Wenger Signature Choral Risers – now you can have it all.



3-step Signature Riser shown with optional side rail



4-step Signature Riser shown with optional side rail

SIGNATURE® CHORAL RISER



Step supports are welded steel for maximum stability and strength. Backrails are permanently attached for maximum safety.



Signature is designed from top-rail to floor to ensure flawless operation and long-lasting good looks. The level of detail is exquisite, with carpet edges protected by structural aluminum extrusions for a finishing touch that adds both distinction and stability.

Both the 3- and 4-step models have a compact footprint. They tuck away into tiny areas, saving you precious storage space. And both Signature models fit through standard doorways.





Signature is easy for one person to roll and control.



Just maneuver it into place and unfold with a single fluid motion.



It sets up without tools to provide excellent stability.



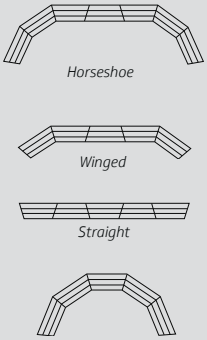
Optional siderails provide additional security for performers of all ages.





RISER STEP REVERSIBILITY

Wenger makes it easy to change riser arrangements. Simply switch the position of the steps on the frame and reverse the horizontal back rail components on the vertical supports.



PRODUCT SPECIFICATIONS:

- Patented fold-down design is easy for one person to set up.
- Steel construction for unparalleled stability and quiet performance.
- Formal black styling is attractive and appropriate for any performance or venue.
- 3-step riser is 6' (1829 mm) wide at back of third step.
- 4-step riser is 6'-6¼" (1988 mm) wide at the back of fourth step.
- Both 3- and 4-step models fit through standard doorways.
- Both models feature a compact footprint for easier storage.
- Sturdy backrail with child-height crossbar.
- Option Siderail Set (2) for additional security is available as an accessory.
- Steps are 18" (457 mm) deep.
- Fifteen-year warranty.
- Assembly required.
- Environmental attributes and LEED compliance can be found at www.wengercorp.com/green-initiatives.php or by contacting your Wenger representative.

098G053 **3-step Signature Riser,** 227 lbs. (103 kg)
098G054 **4-step Signature Riser,** 316 lbs. (143 kg)
098G541 **Siderail (set of 2),** 62 lbs. (28 kg)

PURCHASE ONLINE!

Wenger JR CLANCY GEARBOSS

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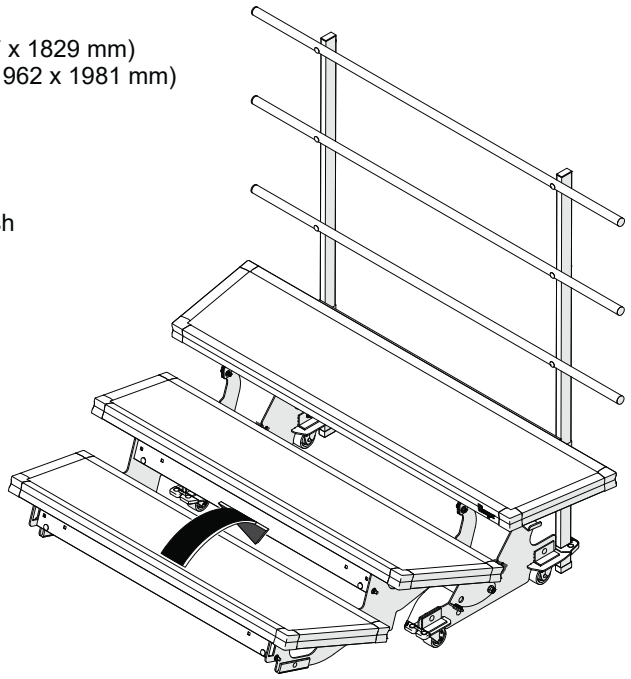
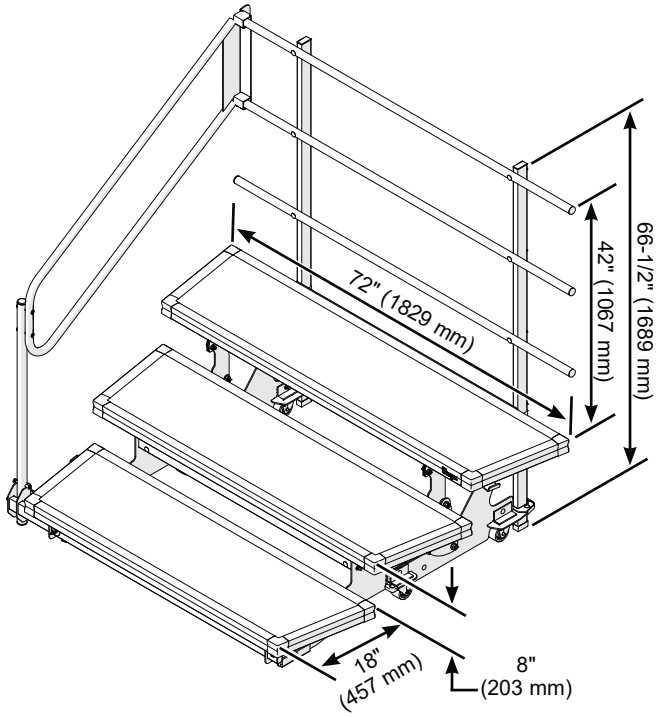
TECHNICAL SHEET

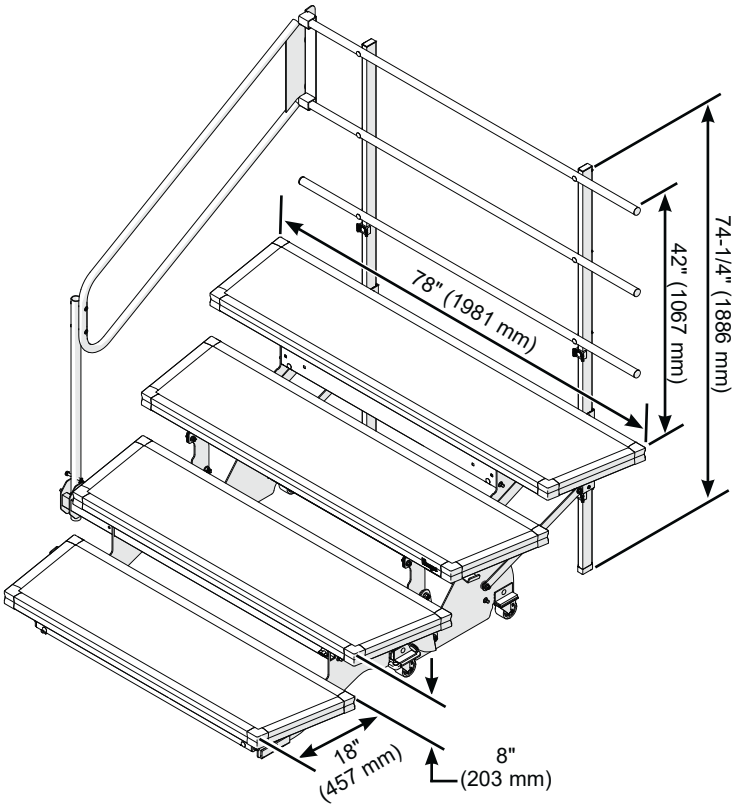
Signature® Choral Risers

- 3-Step 098G053 227 lb (103 kg)
  4-Step 098G054 316 lb (143 kg)
- Load rating of 150 lb live load capacity per ft^2 (732 kg capacity per m^2)
- Steel construction for unparalleled stability and quiet performance
- Portable units are designed for one-person mobility and setup
- 3-Step Riser storage depth is 31" deep x 68" high x 72" wide (787 x 1727 x 1829 mm)
  4-Step Riser storage depth is 31" deep x 77-1/4" high x 78" wide (787 x 1962 x 1981 mm)
  Nesting of additional units reduces storage depth
- Both the 3-Step and 4-Step models have a 42” (1067 mm) high back rail that meets OSHA standards
  Risers fold with the back rail attached
- Riser frame, back rails and side rails have a black powder-coat paint finish for maximum safety and durability
- Steps are 18” (457 mm) deep and the rise of each step is 8” (203 mm)
  Steps are covered with manufacturer’s standard grey carpet
- Built-in reversibility allows for straight or semi-circular configuration
- Designed for in-facility use and easily fits through standard doorways
  Units have built-in swivel action wheels for maneuvering in tight spaces
- Optional Side Rail Accessory (set of 2) 098G541 62 lb (28 kg) attaches to the riser and back rail
  Side Rail can be removed with the mounting brackets left attached during storage
- Assembly is required, approximate assembly time is 45 minutes for the first unit and 30 minutes for each additional unit
  Assembly videos are available at www.wengercorp.com
- Environmental attributes and LEED compliance for this product can be found at www.wengercorp.com/GREEN or by contacting your Wenger representative
- Fifteen-year warranty
- Patented design

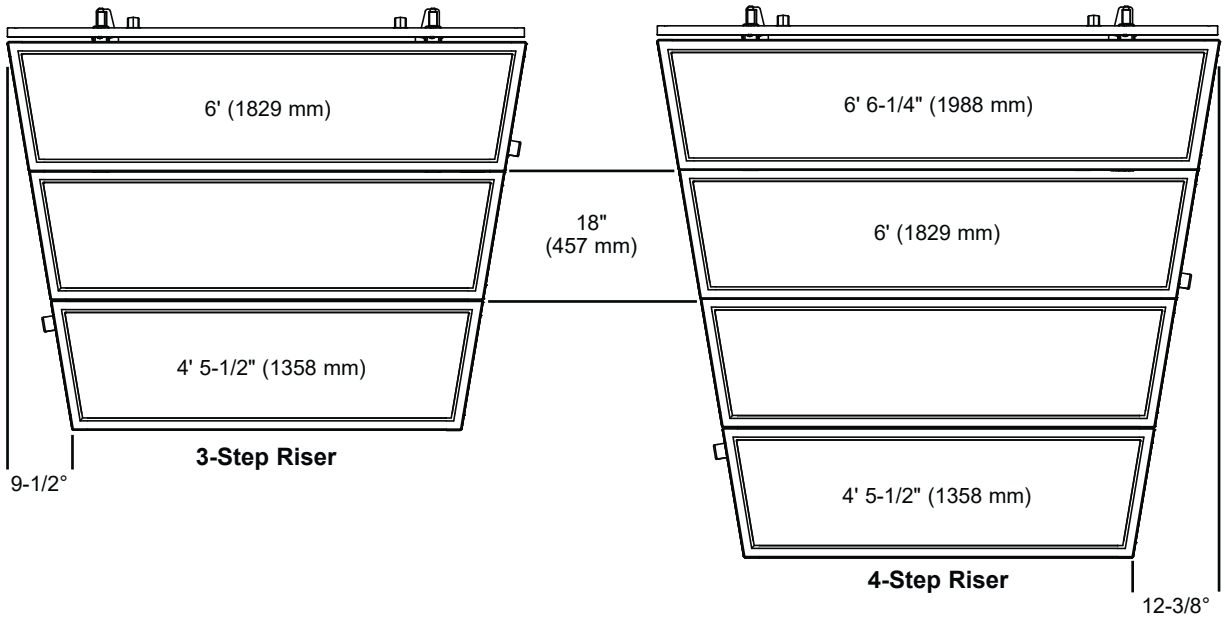




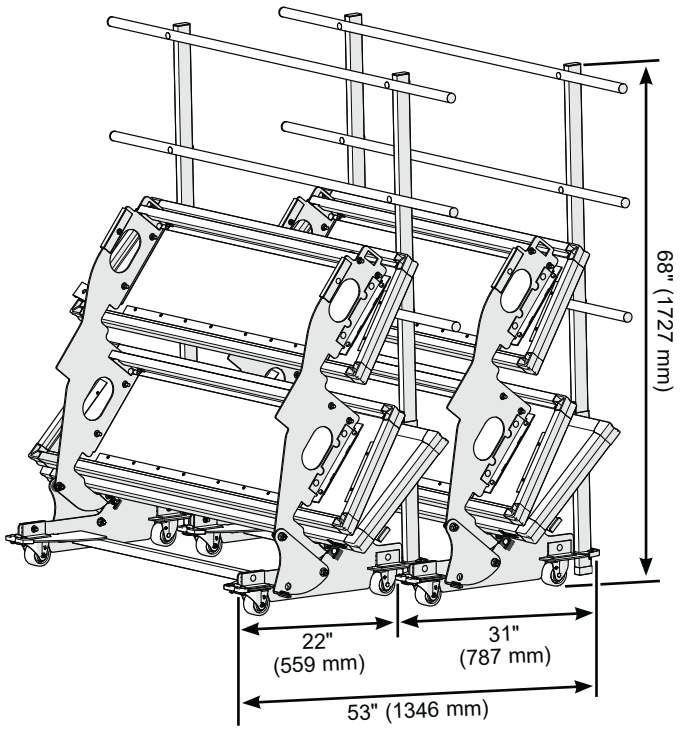
3-Step Riser with Optional Side Rail



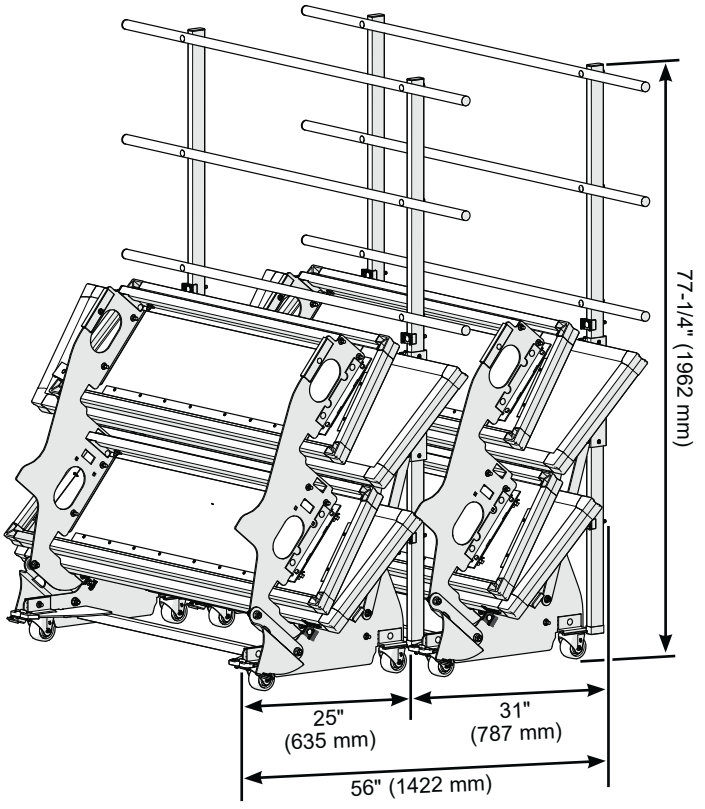
4-Step Riser with Optional Side Rail



Risers nest together in the storage position, minimizing required storage space.



3-Step Risers Nested



4-Step Risers Nested

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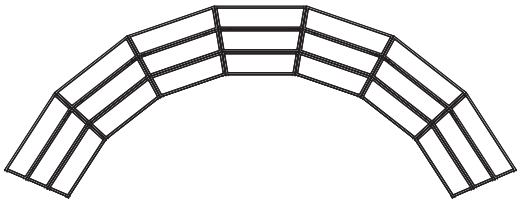
Wenger®

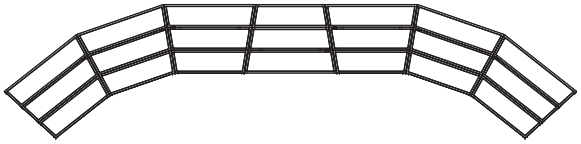
Your Performance Partner

Riser Layouts

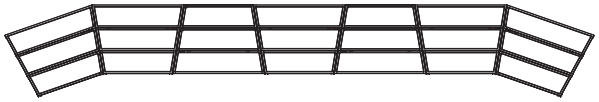
Signature® Choral Risers



Semicircular Arrangement
Set Up Type A



Horseshoe Arrangement
Set Up Type B



Winged Arrangement
Set Up Type C



Straight Arrangement
Set Up Type D

Set Up Type	6' x 18" Deep Steps		3-Step Riser			4-Step Riser		
	Number of Units			Performance Area Required			Performance Area Required	
	Standard	Reverse	Capacity	Width	Depth	Capacity	Width	Depth
D	1		12-16	6' (1.8m)	4' 10" (1.5m)	17-23	6' 6" (2m)	6' 0" (1.8m)
A	2		24-32	11' 10" (3.6m)	6' 4" (1.9m)	34-46	12' 10" (3.9m)	6' 11" (2.1m)
A	3		36-48	17' 5" (5.3m)	6' 3" (1.9m)	51-69	18' 10" (5.7m)	7' 9" (2.4m)
D	2	1	36-48	16' 6" (5m)	4' 10" (1.5m)	51-69	17' 6" (5.3m)	6' 5" (2m)
A	4		48-64	22' 5" (6.8m)	7' 7" (2.3m)	68-92	24' 3" (7.4m)	9' 1" (2.8m)
A	5		60-80	26' 10" (8.2m)	9' (2.7m)	85-115	29' 1" (8.9m)	10' 6" (3.2m)
B	4	1	60-80	27' 11" (8.5m)	6' 4" (1.9m)	85-115	29' 10" (9.1m)	7' 10" (2.4m)
D	3	2	60-80	27' (8.2m)	4' 10" (1.5m)	85-115	28' 6" (8.7m)	6' 5" (2m)
A	6		72-96	30' 7" (9.3m)	10' 10" (3.3m)	102-138	33' 1" (10.1m)	12' 4" (3.8m)
A	7		84-112	33' 6" (10.2m)	12' 9" (3.9m)	119-161	36' 2" (11m)	14' 4" (4.4m)
B	6	1	84-112	37' 5" (11.4m)	9' 1" (2.8m)	119-161	40' 1" (12.2m)	10' 7" (3.2m)
C	5	2	84-112	38' 5" (11.7m)	6' 4" (1.9m)	119-161	40' 10" (12.4m)	7' 10" (2.4m)
D	4	3	84-112	37' 6" (11.4m)	4' 10" (1.5m)	119-161	39' 6" (12m)	6' 5" (2m)
A	8		96-128	35' 5" (10.8m)	15' (4.6m)	136-184	38' 4" (11.7m)	16' 6" (5m)
A	9		108-144	36' 5" (11.1m)	17' 2" (5.2m)	153-207	39' 5" (12m)	18' 8" (5.7m)
B	8	1	108-144	44' (13.4m)	12' 10" (3.9m)	153-207	47' 2" (14.4m)	14' 4" (4.4m)
C	7	2	108-144	47' 10" (14.6m)	9' 1" (2.8m)	153-207	51' 1" (15.6m)	10' 7" (3.2m)
D	5	4	108-144	48' (14.7m)	4' 10" (1.5m)	153-207	50' 6" (15.4m)	6' 5" (2m)
B	10	1	132-176	46' 11" (14.3m)	17' 3" (5.3m)	187-253	50' 5" (15.4m)	18' 9" (5.7m)
D	6	5	132-176	58' 6" (17.8m)	4' 10" (1.5m)	187-253	61' 6" (18.7m)	6' 5" (2m)
C	11	2	156-208	57' 5" (17.5m)	17' 3" (5.3m)	221-299	61' 5" (18.7m)	18' 10" (5.7m)
D	7	6	156-208	69' (21.0m)	4' 10" (1.5m)	221-299	72' 6" (22.1m)	6' 5" (2m)

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Questions? Call.....USA: 800-4WENGER (493-6437) • Worldwide: 1-507-455-4100 • www.wengercorp.com

Product: Tourmaster Choral Riser

Manufacturer: Wenger Corporation

Locations: Choir Room





The lightweight, easy-to-set-up riser that's perfect for travel.

No other risers fold, roll, set up, or travel so smoothly. In fact, it's easy to take it around tight corners, across the parking lot, into a bus or a van. No wonder it's the #1 choral riser in the world.

Precision engineering and using only the best materials means Tourmaster risers will deliver reliable operation for a long, long time. It ensures that Tourmaster™ Choral Risers are definitely your best traveling riser value.

The Wenger Advantage

- #1 Choral Riser in the World – A proven design that can withstand the rigors of institutional use.
- Best Traveling Riser Value – Across country or across town, Tourmaster Risers fold, roll, and travel smoothly.
- Compact Storage Footprint – Minimal storage space required when not in use.
- Safe and Solid – A traveling riser with 125 lb per sq ft load capacity.
- Maximum Flexibility – Complete line of options and accessories available. Steps can be reversed for more configurations.
- Quality Assurance – Warranty.

Product Details

- Durable carpeted plywood steps in both 18" and 24" depth
  (24" option offers extra space for choirs that hold their music)
- Steps can be reversed to create different configurations (tools required)
- Optional 4th-step, backrails and siderails available
- Steel frame with heavy-duty wheels and built-in stair glides stands up to years of use
- 3-step models in 4', 4'-7" and 6' lengths
- Some assembly required
- Fifteen-year warranty

TOURMASTER® CHORAL RISER

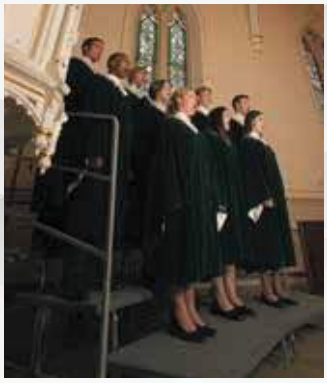


The perfect riser for choirs on the go.

Tourmaster is the only choral riser truly designed to go where choirs go. Whether it's up stairs or around tight corners, each Tourmaster choral riser folds up flat and rolls with the stability and ease of a two-wheel cart. They're easy for anyone to maneuver, transport and set-up. Once in place, it takes just 10 seconds to unfold and lock into the upright position. And the Tourmaster Cart is the ideal tool for moving and storing multiple risers. Each cart holds up to four Tourmaster choral risers, backrails and 4th-step additions - the perfect solution for choirs that travel across the hall or across the country. No other comparable riser sets up so easily or stores in less space.

Tourmaster steps come in either 18" or 24" (457 or 610 mm) depths for performers of all ages. Optional backrails and siderails provide added security and a refined look. And like all Wenger products, Tourmaster is built extremely tough to ensure solid performances, year after year.









TOURMASTER® CHORAL RISER







18" (457 MM) 3-STEP 6' (1829 MM) TOURMASTER SETS

GROUP CAPACITY*	UNITS NEEDED	SPACE REQUIRED
12-16	1	6'w x 4'10"d (1829w x 1473d mm)
24-32	2	11'10"w x 6'4"d (3607w x 1930d mm)
36-48	3	17'5"w x 6'3"d (5309w x 1905d mm)
48-64	4	22'5"w x 7'7"d (6833w x 2311d mm)
60-80	5	26'10"w x 9'd (8179w x 2743d mm)
72-96	6	30'7"w x 10'10"d (9322w x 3302d mm)
84-112	7	33'6"w x 12'9"d (10211w x 3886d mm)
96-128	8	35'5"w x 15'd 10795w x 4572d mm

18" (457 MM) 3-STEP 4' (1219 MM) TOURMASTER SETS

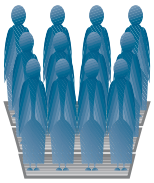
GROUP CAPACITY*	UNITS NEEDED	SPACE REQUIRED
8-12	1	4'3"w x 4'8"d (1295w x 1422d mm)
16-24	2	8'6"w x 5'd (2591w x 1524d mm)
24-36	3	12'7"w x 5'4"d (3835w x 1626d mm)
32-48	4	16'8"w x 6'1"d (5080w x 1854d mm)
40-60	5	20'4"w x 6'8"d (6198w x 2032d mm)
48-72	6	23'10"w x 7'8"d (7264w x 2337d mm)
56-84	7	27'w x 8'8"d (8230w x 2642d mm)
64-96	8	30'w x 9'11"d (9144w x 3023d mm)

24" (610 MM) 3-STEP 4'7" (1397 MM) TOURMASTER SETS

GROUP CAPACITY*	UNITS NEEDED	SPACE REQUIRED
8-12	1	4'7"w x 6'2"d (1397w x 1880d mm)
16-24	2	9'2"w x 6'6"d (2794w x 1981d mm)
24-36	3	13'6"w x 6'10"d (4115w x 2083d mm)
32-48	4	17'10"w x 7'7"d (5436w x 2311d mm)
40-60	5	21'10"w x 8'2"d (6655w x 2489d mm)
48-72	6	25'8"w x 9'3"d (7823w x 2819d mm)
56-84	7	29'2"w x 10'2"d (8890w x 3099d mm)
64-96	8	32'3"w x 11'6"d (9804w x 3505d mm)

18", 4' (457, 1219 mm), 4th-step addition will add space for 3-4 performers per unit. 24" (610 mm), 4th-step addition will add space for 3-4 performers per unit. 18", 6' (457, 1829 mm), 4th-step addition will add space for 4-5 performers per unit.

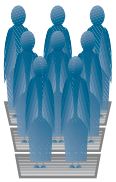
* First number indicates how many performers will fit on a riser set if all performers stand shoulder to shoulder. Second number indicates how many performers will fit on a riser set if they are all facing center with shoulders overlapping. Numbers include a row of performers standing on the floor. Adult groups should use the lower capacity number.



The 6' x 18" (1829 x 457 mm) Tourmaster accommodates 12 - 16 choir members.

Numbers vary depending on the physical size of members, overlapping shoulders and the use of the ground as an additional row. As a general rule, adult choirs should work with the smaller capacity number.

Note: Choral risers are not designed for dance or active choreography.



The 4' x 18" and 24" (1219 x 457 and 610 mm) Tourmaster accommodates 8 - 12 choir members.

Tourmaster Backrails and Siderails



Backrail Swing Bracket

Siderail Swing Bracket

Optional backrails and siderails are recommended for added security. They attach quickly and securely with swing brackets and without the need for tools.

Tourmaster 4th-Step Addition



An optional 4th-step addition is available for all Tourmaster Choral Risers. The 4th-step addition attaches to each corresponding Tourmaster Riser with integral leg clamps, without the need for tools.

Pops up in just 10 seconds.



Four-foot Tourmaster rolls smoothly and securely down the hall, around tight corners, even down stairs.



For set-up, Tourmaster unfolds easily like an accordion.



Just step on the frame and lift. The Lift Assist mechanism helps you raise the riser and lock it into the upright position.



Once set up, Tourmaster is as solid and stable as heavier fold-and-roll risers.



Take down is just as easy. Just activate the foot-pedal release, push and let down.

Tourmaster Cart
Perfect for moving and storing in your facility or traveling across the country.



Tourmaster carts are available for 4' and 6' (1219 and 1829 mm) 18" (457 mm) steps, as well as the 24" (610 mm) step Tourmaster riser.



Carts have heavy-duty swivel casters for easy maneuverability and four pairs of Swing Arms that pivot outward for loading risers.



The Tourmaster cart holds up to four risers including four backrails and four 4th-step additions.



Backrails nest together on Backrail Supports for storage or transport.



Risers stack easily, by alternating the direction of the riser positioning wheels.

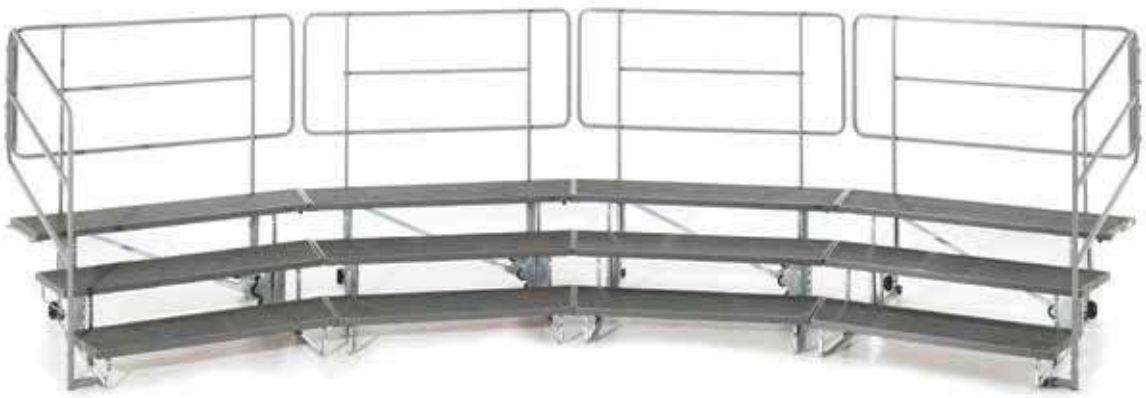


Each Swing Arm lifts upward and pivots outward for stacking each riser then inserts into holding sockets for a secure fit.



Four 4th-step additions can be stacked on top of the fourth Swing Arm then attached securely to the cart frame with buckled straps.

TOURMASTER® CHORAL RISER



COLORS

Grey

PRODUCT SPECIFICATIONS:



- One-piece design makes set-up extremely fast (10 seconds)
- Easily travels up and down stairs and around tight corners
- Foot pedal activated cross brace locks or releases leg structure automatically
- One person set-up for four-foot model; two people recommended for six-foot model
- Quality construction stands up to years of rough treatment
- Narrow footprint for compact storage
- Heavy-duty wheels and built-in stair glides
- Grey metallic powder-coat finish
- Carpet available in Grey
- Steps are bolted to understructure for maximum security and reduced riser noise
- 3-step/18"-deep (457 mm) model available in 4' and 6' (1219 and 1829 mm) lengths, both with optional 4th-step addition
- 3-step/24"-deep (610 mm) model available in 4'7" (1397 mm) length with optional 4th-step addition
- Swing brackets attach the 4th-step addition to each choral riser without the need for tools
- Steps can be removed and reversed to create semi-circular or straight arrangements as group size changes
- Optional backrail and siderail available for all models
- Backrails comply with OSHA standards and can extend the full riser width to create a continuous backrail when multiple units are placed side-by-side
- 15-year warranty against defects in materials and workmanship

PURCHASE ONLINE!



TOURMASTER CART SPECIFICATIONS:

- Cart holds up to four Tourmaster risers, four backrails and four 4th-step additions
- Buckled straps attach 4th-step additions securely to cart frame
- Backrails nest together on backrail supports
- 6" (152 mm) diameter casters, all 4 casters swivel
- Cart is steel construction with black baked on powder paint
- Lift and rotate swing arms move out of the way to allow risers to be easily loaded and unloaded
- Three cart sizes:
  Cart for 6' (1839 mm) Tourmaster risers with 18" (457 mm) steps, Part number: 024F950
  Cart for 4' (1219 mm) Tourmaster risers with 18" (457 mm) steps, Part number: 024F951
  Cart for 4'7" (1397 mm) Tourmaster risers with 24" (610 mm) steps, Part number: 024F952
- Fits through a standard 36" (914 mm) doorway – 24" (610 mm) riser requires 40" (1016 mm) doorway

Wenger® JR CLANCY GEARBOSS®

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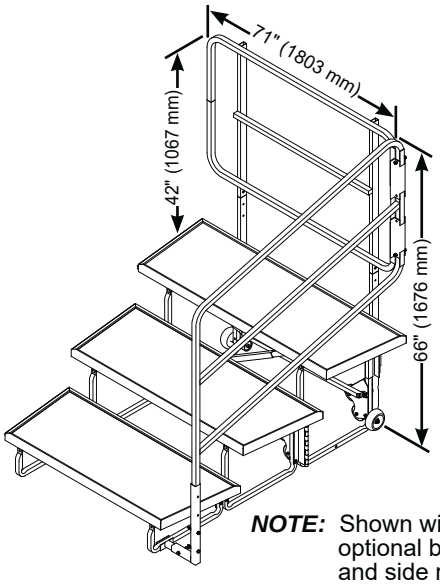
ATHLETICS Phone 800.493.6437 | email gearboss@wengercorp.com | gearboss.com | 555 Park Drive, PO Box 448 | Owatonna | MN 55060-0448

TECHNICAL SHEET

Tourmaster® Choral Risers

- 6' x 18" (1829 x 457 mm) unit 130 lb (59 kg).
  4' x 18" (1219 x 457 mm) unit 103 lb (47 kg).
  4'7" x 24" (1397 x 610 mm) unit 127 lb (58 kg).
- Load rating at 125 lbf/ft^2 (6 kN/m^2)
- Portable 3-step unit, accordion style design folds compactly.
- Ideal for groups that travel.
- Frame is 7/8" (22 mm) 14-gauge square tubing.
- Steps are 19/32" (16 mm) plywood covered with manufacturer's standard grey carpet.
- Step edging is Grey powder-coat paint finish.
- Foot-pedal activated cross brace locks leg structure automatically.
- Built-in reversibility allows for straight or semi-circular configuration.
- Units have 3" (76 mm) non-marring rubber casters, built-in stair glides, two 4" (102 mm) wheels for positioning.
- Available in 4' (1219 mm) and 6' (1829 mm) lengths with 18" (457 mm) usable step depth and 24" (610 mm) usable step depth.
- Environmental attributes and LEED compliance for this product can be found at www.wengercorp.com/GREEN or by contacting your Wenger representative.
- Fifteen-year warranty.

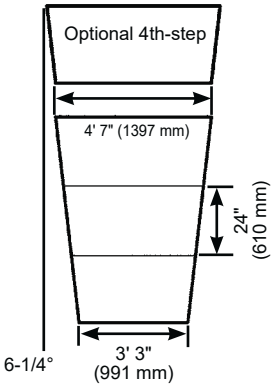


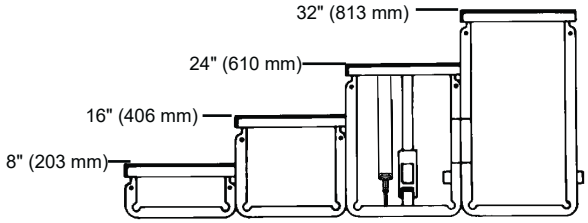
NOTE: Shown with optional back and side rail.

Accessories

- 4th Step Addition:
  - 6' x 18" (1829 x 457 mm) unit 55 lb (25 kg).
    Storage dimensions 5" deep x 22" wide x 94" long (127 x 559 x 2388 mm)
  - 4' x 18" (1219 x 457 mm) unit 45 lb (20 kg).
    Storage dimensions 5" deep x 22" wide x 70" long (127 x 559 x 1778 mm)
  - 24" (610 mm) unit 55 lb (25 kg).
- 4th Step Addition attaches to corresponding Tourmaster Riser with integral leg clamps, no tools needed. Must be removed prior to folding for storage.
- Back rails have positioning wheels so that backrail support bar does not encumber moving riser in setup position. Back rails break down without tools for easy travel.
- Back rails are Grey metallic powder-coat paint finish with quick and easy clamp attachment to 3-step unit or 4th step addition. 42" (1067 mm) height meets OSHA standards.
- 4' (1219 mm) Back rail 24 lb (11 kg).
  6' (1829 mm) Back rail 31 lb (14 kg).
- Optional Side rails 8 lb (22 kg) are Grey metallic powder-coat paint finish and clamp to both the Back rail and the Riser.
- Optional side rails are designed for risers set-up in the standard configuration. They do not fit on units set up in the reverse configuration.

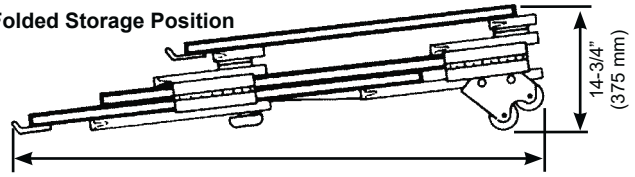
5' 1" (1549 mm) Riser



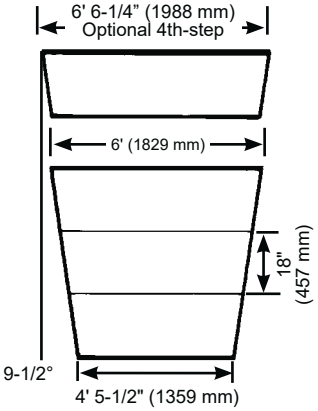


Shown with Optional 4th-Step

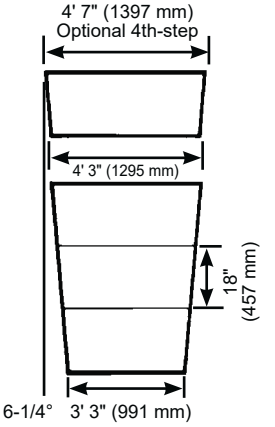
Folded Storage Position



6' (1829 mm) Riser



4' (1219 mm) Riser



6' x 18" (1829 x 457 mm) Riser = 83-1/4" (2115 mm) long x 20.5" (521 mm) wide
4' x 18" (1219 x 457 mm) Riser = 65-1/4" (1657 mm) long x 20.6" (523 mm) wide
24" (610 mm) Riser = 67" (1702 mm) long x 26.8" (681 mm) wide
Optional 4th-Step must be removed prior to folding for storage.

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Product: Manhasset™ Symphony 48 Music Stand (Or Approved Equal)

Manufacturer: Manhasset Specialty Company

Location: Band Room and Choir Room

High quality materials and renowned durability are what make the Manhasset 48 Symphony Music Stand the go-to music stand for all schools and serious musicians. This stand is used by more schools than all other music stands combined. The desk of this music stand measures 20"W x 12-1/2"H with a 2-1/4"D lip. The height of this music stand varies infinitely from 26" to 48" (lip to floor), with a maximum overall height of 60- 1/2 inches.

The powder coated, black textured finish is scratch and chip resistant. Easy, automatic, no-knob friction-tilt neck delivers constant tension at any tilt position. Solid-brass bearings, greaseless heavy-duty chrome inner shaft, and the "Magic Finger Clutch" provide one-hand friction grip. The heavy-gauge, all-steel welded base provides excellent stability. This stand comes with a 10-year manufacturer's warranty. Some assembly required.



Product: Manhasset™ 1910 Music Stand Storage Cart (Or Approved Equal)

Manufacturer: Manhasset Specialty Company

Location: Band Room and Choir Room

The Manhasset Storage Cart holds up to 25 concert music stands. This unit is built to allow easy racking and removal of music stands and provides convenient storage. It is made to strict high-quality standards, and with its strong welded steel construction, durable powder-coat finish, high-density polyethylene rail liner wheels, it will provide service for years to come.

It comes packaged with all the nuts and bolts necessary to easily assemble in minutes. Overall dimensions are 22" W x 92"D x 43" H.



Product: Model 2246 Basketball/Multisport Scoreboard (Or Approved Equal)

Manufacturer: Varsity Scoreboards

Location: Gymnasium

Designed for multiple sport applications, the Model 2246 is an all-around champion. The Model 2246 takes the configuration of the rock-solid Model 2236 and adds 15” displays for Player/Fouls. Conversion kits for Volleyball and Wrestling and a built-in horn are included. Time outs left are optional.



STANDARD COLORS





Product Details

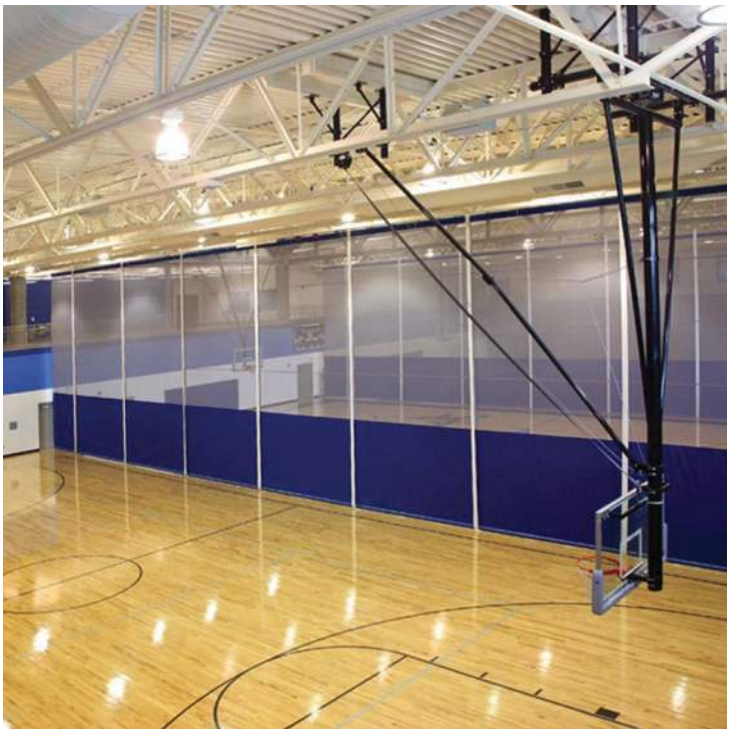
- 15" amber and red super-bright LED numerals are 100,000-hour rated
- 22 gauge galvanneal steel cabinet with powder-coat finish - strongest cabinet in the industry
- 1/10th of a second timing feature in last minute
- Scores 0-199. Clock can count down 99:59 max.
- Includes horn, double bonus and possession indicators, as well as Time Outs Left displays
- Wireless remote control included
- Volleyball and Wrestling captions are available options.
- 5-Year limited warranty
- Dimensions: 8' x 5' x 8"
- Weight: 240 lbs
- Digit Sizes: 15", 2" dots and arrows
- Electrical: 20-amp, 120-volt, 60-hertz, grounded AC circuit
- Black finish and wall-mounted.

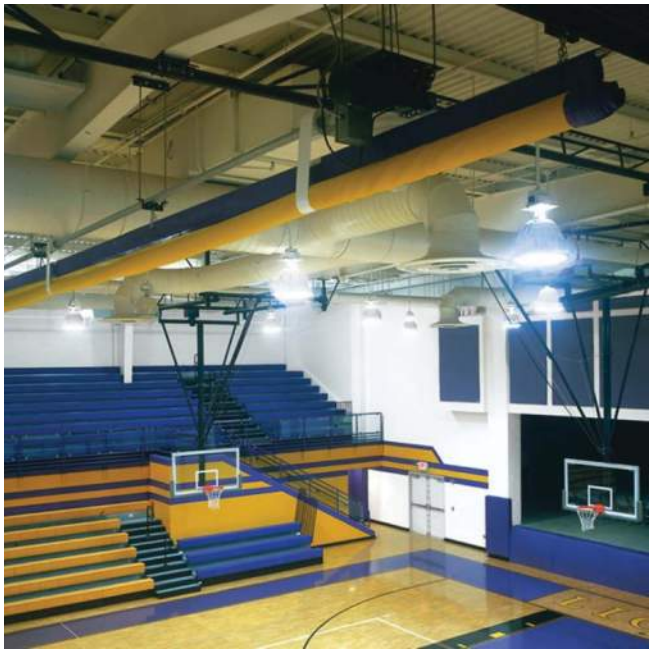
Product: Roll-Up Gym Divider Curtains (Or Approved Equal)

Manufacturer: Draper Inc.

Location: Gymnasium

Easy to operate, the Roll-Up Gym Divider Curtains feature a convenient and simple way to divide an area. The curtain hangs from overhead supporting steel structures. Heavy-duty hoist belts rotate a 4" (10 cm) diameter tube at the bottom of the curtain and with the turn of a key this motorized curtain unrolls as needed or rolls up for storage. Weld seams run horizontally the full width of the curtain. This provides a uniform and compact wrap of material onto the bottom batten as the curtain rolls up to its stored position. All hardware is heavy gauge stampings or welded construction.





Product Details:

- Curtain must be square or rectangular shaped. Vinyl coated polyester material is available in 18 oz and 22 oz.
- Maximum dimensions: 130’ wide, 32’ high.
- Minimum clearance recommended is 6" between vertical edges and all fixed objects.
- Outer edge hems are turned and welded to prevent fraying.
- Electronically welded, 1" wide full contact weld seams.
- Belts are flexible and cut straight and true to insure proper wrapping of belt onto drive pipe.
- Belts that guide roll up action are white polyester webbing.
- A 3’ recommended at ends of curtain for egress.
- Total hanging weight approximately ¾ lb per ft^2.
- Stacking dimension is approximately 2’ from drive attachment point.
- Includes electric winch.

GYM DIVIDER CURTAINS ROLL-UP

ROLLER ACTION, ROLLS UP FROM BOTTOM







- Easy to operate, the Roll-Up Gym Divider Curtains feature a convenient and simple way to divide an area. The curtain hangs from overhead supporting steel structures. Heavy-duty hoist belts rotate a 4" (10 cm) diameter tube at the bottom of the curtain and with the turn of a key this motorized curtain unrolls as needed or rolls up for storage. Weld seams run horizontally the full width of the curtain. This provides a uniform and compact wrap of material onto the bottom batten as the curtain rolls up to its stored position. All hardware is heavy gauge stampings or welded construction and the vinyl coated polyester material is available in 18 and 22 oz (510 and 624 g).

FEATURES:

- Must be square or rectangular shaped.
- Electronically welded, 1" (25 mm) wide full contact weld seams.
- Outer edge hems are turned and welded to prevent fraying.
- Belts that guide roll up action are white polyester webbing.
- Belts are flexible and cut straight and true to insure proper wrapping of belt onto drive pipe.
- Includes electric winch.

WEIGHTS/MEASURMENTS:

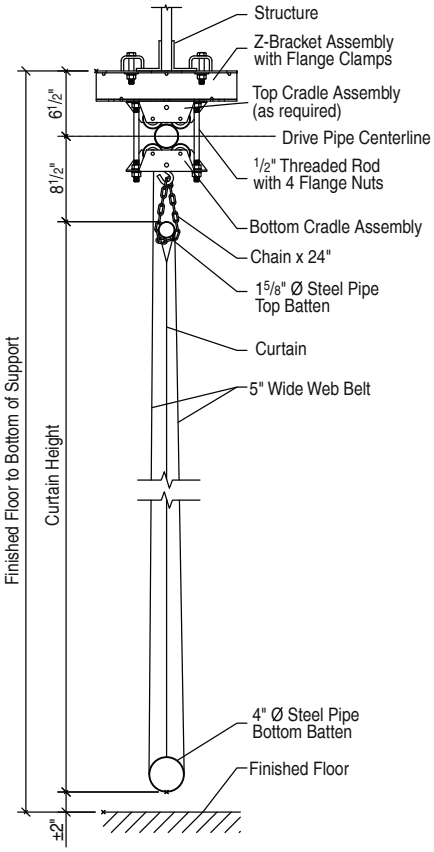
- Maximum dimensions: 32' (9.75 m) high, 130' (39.62 m) wide.
- Stacking dimension is approximately 2' (60.9 cm) from drive attachment point. Minimum clearance recommended is 6" (152 mm) between vertical edges and all fixed objects.
- A 3' (91.4 cm) recommended at ends of curtain for egress.
- Total hanging weight approximately ¾ lb per ft² (3.66 kg/m²).

SUPPORTING DOCUMENTS

All instructions, technical drawings and other supporting documents are located at: *draperinc.com/documents.aspx*

Section Drawing

Shown directly under continuous beam



For more information on this product visit:
draperinc.com/gymequipment/gymdividers.aspx

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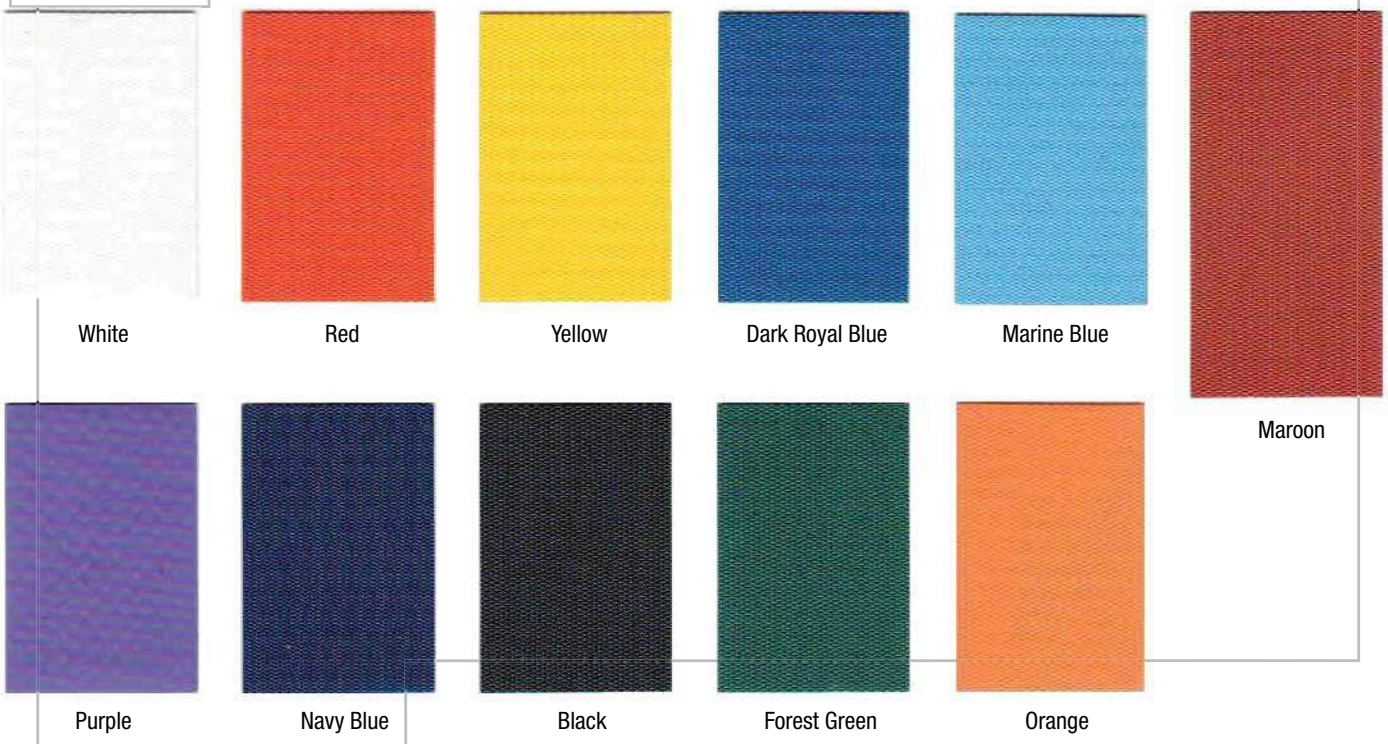
GYM DIVIDERS SWATCH COLORS

SOLID OR MESH STYLE

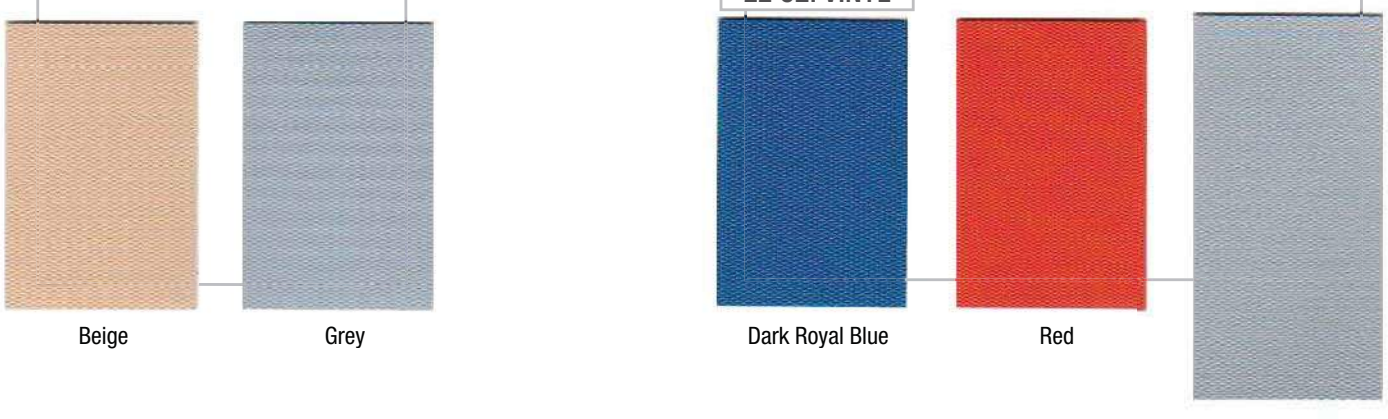
- Gym Dividers by Draper are constructed of the highest quality reinforced vinyl. Select a vinyl-coated polyester mesh to facilitate air flow, a tough solid vinyl to provide a visual barrier between play areas, or a combination of mesh on top and solid on the bottom.

Additional technical data on reverse side.

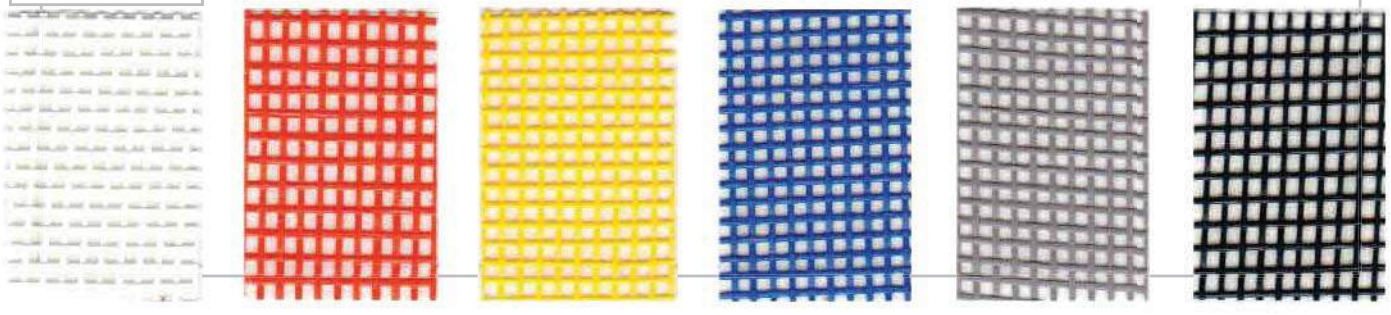
18 OZ. VINYL



22 OZ. VINYL



MESH



GYM DIVIDERS SWATCH COLORS

SOLID OR MESH STYLE

- Only the finest quality goods are used in Gym Dividers by Draper. All Fold-Up, Ridge-Fold and Walk-Draw curtain seams run vertically and are electronically welded with a one–inch full contact weld. Vertical seam fusion has a superior construction advantage over horizontal seams in its resistance to tearing and breakaway. Due to the rolling action of Mid-Roll, Top-Roll and Roll-Up Dividers, horizontal seams are required. Vinyl coated polyester materials are flame, fade and mildew resistant, and washable.

SOLID STYLE

Fabric is a durable vinyl coated polyester. Excellent for creating a visual barrier between play areas.

18 OZ. VINYL TECHNICAL DATA
General: Solid fabric is a vinyl coated polyester
Weight: 17 oz. to 19 oz. per square yard (avg. 18 oz. per square yard)
Resistance to rot, mildew and fungus: Excellent
Ultraviolet resistance: Excellent
Fire retardant ratings: ASTM E 84-Class A Rating; NFPA 701 (Test 1) ; California State Fire Marshall (CSFM) Title 19
Off-Gassing/VOCs: UL GREENGUARD GOLD
(see right for technical details)

22 OZ. VINYL TECHNICAL DATA
General: Solid fabric is a vinyl coated polyester
Weight: 20 oz. to 23 oz. per square yard (avg. 22 oz. per square yard)
Resistance to rot, mildew and fungus: Excellent
Ultraviolet resistance: Excellent
Fire retardant ratings: ASTM E 84-Class A Rating; NFPA 701 (Test 2) ; California State Fire Marshall (CSFM) Title 19
Off-Gassing/VOCs: UL GREENGUARD GOLD
(see right for technical details)

MESH

Fabric is vinyl coated polyester woven from textilene yarn in a one-over-one weave pattern. The yarn is composed of pigmented vinyl, 80%, and 1000 denier polyester, 20%. Economical way to divide floor space without creating sight limitations, and at the same time, facilitate air flow.

TECHNICAL DATA
Weight: Avg. 9 oz. per square yard
Resistance to rot, mildew and fungus: Excellent
Ultraviolet resistance: Excellent
Fire retardant ratings: NFPA 701 (Test 1); California State Fire Marshall (CSFM Title 19
Off-Gassing/VOCs: UL GREENGUARD GOLD
(see right for technical details)

GREENGUARD

TECHNICAL DATA
Draper 18 oz. and 22 oz. Divider Curtain Vinyl and Divider Curtain Mesh have been submitted to IAQ (indoor air quality) evaluation in accordance with UL 2811 test method to show compliance with emissions limits on UL 2818 Section 7.1 and 7.2. Materials are tested in accordance with ANSI/BIFMA M7.1-2011 and determined to comply with ANSI/BIFMA X7.1-2011 and ANSI/BIFMA e3-2014e credit 7.6.1, 7.6.2 and 7.6.3. Material emissions of total volatile organic compounds of < 0.22 mg/m3, formaldehyde ≤ 0.0135 ppm, total aldehydes ≤0.043 ppm, individual volatile organic compounds ≤ 1/1000 TLV and ≤ ½ chronic REL and total phthalates ≤ 0.01 mg/m3.

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Product: Rogue Deadlift Platform (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Speed work is an essential component of any strength program, and a dependable platform can build the literal foundation for it. The 8' x 4' Rogue Deadlift Platform features a 2x2" 11-Gauge Steel frame, and ships standard with (2) floor plates. This design allows for safe band use outside of a power rack without having to bolt the platform to the floor (Rouge Fitness's standard Oly Platform, by comparison, requires bolting to the ground for band work).

Customers can quickly assemble the Rogue Deadlift Platform thanks to a bolt-together design and laser-cut / precision-bent gussets. The provided band pegs are extra long to work with longer specialty barbells in addition to standard barbells, and a set of floor clips are included to secure each end of the platform to the ground.

There are several flooring options for this platform:

- Rubber Tiles: An 8 Pack of 24x24x1.5" Rubber Tiles is available with this product.
- Combination of Plywood and Stall Mats: Lay 1 full sheet of 3/4" plywood down as the base. Cut two 2' wide strips of stall mat and one 4x4' piece of 3/4" plywood to be used as a top layer.
- No Flooring

<u>Optional Upgrade - Custom Built Wood Insert Set</u>

To help create and sustain a more level surface when using the floor plates, we're now offering an optional upgrade with a set of (3) pieces of radiata pine plywood, which can be inserted between the steel floor plates. Two of the wood pieces are 47.5" x 27.5" x .375" thick, and the third (middle) piece is 47.5" x 31.75" x .375". Once the wood pieces are inserted between the slats, customers should still use rubber tiles or stall mats as their lifting surface.



SKU# RF0252

Product Details

- Made in the USA with imported rubber tiles
- Length: 8' 4"
- Width: 4' 4"
- 2x2" 11-Gauge Steel frame
- Laser cut and precision bent gussets
- Bolt together design
- (4) Floor clips to secure each end to the ground
- NEW - Optional Wood Insert Set to create more level surface
- Black Powdercoat Finish

Product: Rogue Monster Lite Rig 2.0 - Base Edition (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

The Base Edition of the Rogue Monster Lite Rig 2.0 maintains the specs of the original model, with 3x3" 11-Gauge Steel uprights, 5/8” holes, and a combination of X-43 and X-70 crossmembers. It’s a versatile variation on the heavy-duty Monster Rig that offers full compatibility with Infinity Series crossmembers.

The Monster Lite Rig is manufactured in Columbus, OH, and designed with infinite customization options in mind. Available in four standard lengths (10', 14', 20', 24'), the unit can be expanded by 4' and 6' sections and is compatible with a broad range of accessories, including Monster Lite Plate Storage Posts, Safety Spotter Arms, the Matador, and more.

Well suited to garage gyms and large-scale training facilities, a standard-size Monster Lite Rig can instantly create between 2 and 6 squat/bench stations and 6-14 pull-up stations (see sizing breakdown below). The system includes fully adjustable pull-up bars (with optional Dirty South Bar), all necessary Black Zinc 5/8" bolts and fasteners, Monster Lite J-cups, and 9-foot uprights. 10 Custom Semi Gloss Powdercoat Color Uprights are available, along with the Original Rogue Black Powdercoat. Original Black Powdercoat comes with Bright Zinc 5/8" bolts and fasteners.



ML-24

- SKU RF06158-24
- 4'+6'+4'+6'+4'
- 6 Squat/Bench Stations
- 14 Pull-Up Stations
- 6 Pair Monster Lite J-Cups
- 12 108" Uprights
- 6 X-43 Parallel Pull-Up Bars
- 10 X-70 Parallel Pull-Up Bars

Product: **SAML-24 Monster Lite Safety Spotter Arms; Pair**
(Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Compatible with all Monster Lite racks, Rogue's heavy-duty 24" Safety Spotter Arms are designed to protect both the weightlifter and the bar itself.

When adding spotter arms to an existing rack, dependability is always the optimum word--particularly for athletes training alone in a home gym or garage gym. This is why Rogue manufactures its Monster Lite Spotter Arms from 3x3" 11-gauge steel tubing, with welded-on end-plates for additional safety and specially designed hitch-pins to lock the spotters in place. The arms feature a UHMW plastic insert on top to protect the knurling of your bars.

Like all products in the Monster Lite line, these spotters feature 5/8" holes and a 5/8" pin, rather than the 1" varieties of the standard Monster Spotter Arms.



SKU #RA0402

Product Details

- Sold in Pairs
- Steel: 3x3” 11-gauge tubing
- Length: 24”
- Width: 3”
- Weight: 44 lb
- 5/8” bolts and fasteners
- UHMW plastic inserts
- Monster Lite Compatible
- Made in USA

Product: Rogue Flat Utility Bench 2.0 (Or Approved Equal)

Manufacturer: Rogue Fitness

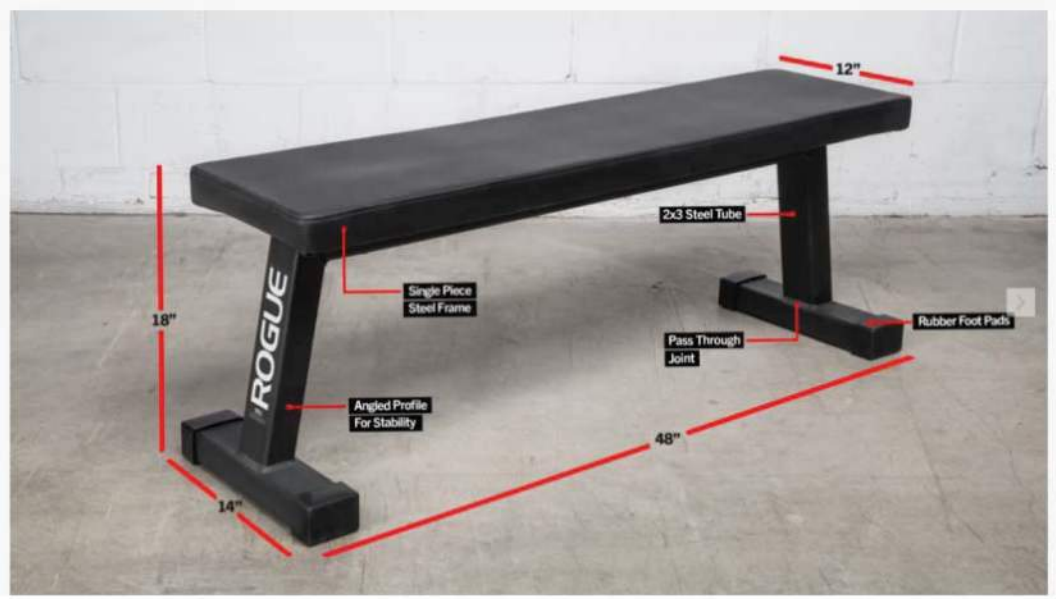
Location: Weight Room

No nonsense. No limitations. No assembly required. The redesigned Rogue Flat Utility Bench takes the weight bench back to basics, featuring 2x3" 11-gauge steel construction, a high-density Neoprene pad, and a pair of angled, wide-set legs for maximized stability.

Ergonomically designed and built in the USA, the Flat Utility Bench 2.0 ships fully assembled and offers a needed antidote to the wobbly flat benches and unwieldy FID weight benches routinely imported by the big box stores. While easy to maneuver at just 40 pounds, the Flat Utility Bench is also heavy-duty enough for a tank to sit on it. So no matter the size of the athlete or the intensity of the workout, you've got a rock solid foundation underneath you.

Built in Columbus, Ohio, Version 2.0 of the Rogue Flat Utility Bench introduces a new single-piece frame, made from thicker 2x3" 11-gauge steel, notched and formed. We've also replaced the original butt joint at the base of the unit with a stronger pass-through joint. These upgrades not only improve the bench's durability, but also remove any assembly requirements for the user.

Another key update with the Rogue Flat Utility Bench 2.0 is a new angled profile, as the legs jet out slightly to form an even more stable foundation. A set of attachable rubber feet are also now included with each order, replacing the original plastic caps. These attachments not only add another stabilizing element, but also protect your flooring from scrapes and scuffs.



Product Details

- Overall Dimensions: 14" W x 47" L x 18" H
- Foot Print: 14" x 48"
- Steel Notes: 2x3" 11-gauge steel
- Pad Dimensions: 12" W; 2-1/4" thick
- Made in the USA

Product: AB-2 Adjustable Bench (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

With more than 50 combinations of seat and back-rest positions to choose from, the AB-2 Rogue Adjustable Bench can easily adapt to each individual athlete, improving the overall efficiency and productivity of any strength training facility. No matter your size, workout preferences, or available training space, this compact, 11-gauge steel bench provides the rare combination of sturdiness and maneuverability that few other adjustable weight benches even attempt to match.

The AB-2 Rogue Adjustable Bench includes six different seat settings and nine additional back rest positions, making it easily among the most versatile weight benches on the market. Unlike most commercial-brand FID benches, though, this customization element is not achieved at the expense of quality craftsmanship. Made in America, the AB-2 is a direct descendant of the time-tested Nebula 1080 Utility Bench, and includes load-bearing rubber feet for stability, cordura edges for enhanced durability, and a convenient handle and wheels for easy mobility.



RA0280-12

Product Details

- Adapted from the Nebula 1080 "Awesome" Utility Bench
- Weight: 94 lbs.
- Length: 52”
- Pad Width: 12”
- Height: 18”
- Footprint: 51 ¼” x 22 ½”
- Steel: 2 x 2" and 3 x 3" 11-Gauge Steel
- 6 Adjustable Seat Settings
- 9 Adjustable Back Pad Settings (from flat bench to 85 degrees upright)
- Made in the USA

Product: AB-3 Adjustable Bench (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

The heavy-duty Rogue AB-3 Adjustable Bench features the same 50+ seat and back-pad position combinations as our AB-2 Bench, but with unique functionality in either the incline or decline position at each setting.

Built in the USA from 11-gauge steel, the AB-3 is a direct descendant of the time-tested Nebula 1080 Utility Bench, with a sturdy but maneuverable design ideally suited for dynamic training or for gyms serving multiple athletes. An updated spine construction also allows for the connection of a new telescoping foot catch assembly, which locks firmly into place using a simple pop pin. The foot catch sets the user up for movements including the decline bench, decline dumbbell press, and decline sit-ups, among others.

Other standard features on the AB-3 Adjustable Bench include load-bearing rubber feet for stability, cordura edges for enhanced durability, and a convenient handle and wheels for easy mobility.



RF07072

Product Details

- Adapted from the Nebula 1080 "Awesome" Utility Bench
- Includes NEW Decline Bench feature
- 6 Adjustable Seat Settings
- 9 Adjustable Back Pad Settings
- Weight: 117 lb
- Length (with bench flat): 68"
- Pad Width: 12"
- Height: 18"
- Steel: 2x2" and 2x3" 11-Gauge Steel
- Made in the USA

Product: Rogue Vertical Plate Tree 2.0 (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

The simple, old-school plate tree is still the gold standard when it comes to efficient bumper storage at affiliates and garage gyms around the globe. That said, there's always room for a little refinement. Rogue's updated Vertical Plate Tree—built in the USA—improves on traditional models with a reinforced triangle-plate base, optional wheels for mobility, and re-positioned posts that enable full-size Oly plate storage on all three tiers. The unit's new bolt-together design also reduces shipping costs while maximizing overall stability.

Compatible with any and all IWF standard Olympic plates, the Vertical Plate Tree 2.0 is equipped with six 12" long storage posts (three on each side) constructed from 1.5" Schedule 40 pipe. Each of the posts on the roughly four-foot tall tree are evenly spaced at 18.275" on center to offer a good mix of versatility and storage capacity.

Note: Any metal-to-metal contact with the coated storage posts (such as adding and/or removing plates) may cause wear on the finish over time.



SKU# RF0644

Product Details

- 26" , 12" post length L x 24" W x 50" H
- New, Bolt-Together Base Design w/ Triangle Plates
- (6) 12” Plate Storage Posts - Schedule 40 construction
- All 3 Tiers compatible with Full-Size 450mm / 1.9" OD Olympic Plates
- Weight post spacing: 18.275" on center
- Optional Set of (4) Wheels Available (Imported)
- Made in the USA

Product: Rogue HG 2.0 Bumper Plates- 10lb Pair (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Same quality plates, revamped design. Rogue HG 2.0 Bumpers feature new artwork (still black, still old school), with the consistent dead bounce, durability, and distinctive smooth finish athletes have come to expect from the HG line. These quality, budget-priced plates are the IWF standard 450mm in diameter, but are cut thinner than a lot of comparable bumpers to allow for more weight to be loaded on the bar. HG 2.0's also score an average of 88 on the Shore A Durometer scale, giving them a dead blow on par with a lot of the pricier comp plates in the industry.

Battle-tested at the CrossFit Games and Regionals, HG Bumper Plates are both a high-performance and smart economical choice for any training facility. Check out the wide range of plate sets or simple pairs available to order on the right column, or read the reviews below to see what current HG Bumper owners have to say about the product.





SKU# IP0514-10-2

Product Details

- Diameter: 17.72" (IWF Standard)
- 10lb Plate Width: 1"
- Collar Opening: 1.98"
- Stainless Steel Inserts
- Weight Tolerance: +/- 1% of claimed weight
- Minimal Bounce
- Updated artwork with Rogue logo in black on black
- Imported from China

Product: Rogue HG 2.0 Bumper Plates- 25lb Pair (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Same quality plates, revamped design. Rogue HG 2.0 Bumpers feature new artwork (still black, still old school), with the consistent dead bounce, durability, and distinctive smooth finish athletes have come to expect from the HG line. These quality, budget-priced plates are the IWF standard 450mm in diameter, but are cut thinner than a lot of comparable bumpers to allow for more weight to be loaded on the bar. HG 2.0's also score an average of 88 on the Shore A Durometer scale, giving them a dead blow on par with a lot of the pricier comp plates in the industry.

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SKU# IP0514-25-2

Product Details

- Diameter: 17.72" (IWF Standard)
- 25lb Plate Width: 2"
- Collar Opening: 1.98"
- Stainless Steel Inserts
- Weight Tolerance: +/- 1% of claimed weight
- Minimal Bounce
- Updated artwork with Rogue logo in black on black
- Imported from China

Product: Rogue HG 2.0 Bumper Plates- 35lb Pair (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Same quality plates, revamped design. Rogue HG 2.0 Bumpers feature new artwork (still black, still old school), with the consistent dead bounce, durability, and distinctive smooth finish athletes have come to expect from the HG line. These quality, budget-priced plates are the IWF standard 450mm in diameter, but are cut thinner than a lot of comparable bumpers to allow for more weight to be loaded on the bar. HG 2.0's also score an average of 88 on the Shore A Durometer scale, giving them a dead blow on par with a lot of the pricier comp plates in the industry.

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SKU# IP0514-35-2

Product Details

- Diameter: 17.72" (IWF Standard)
- 35lb Plate Width: 2.75"
- Collar Opening: 1.98"
- Stainless Steel Inserts
- Weight Tolerance: +/- 1% of claimed weight
- Minimal Bounce
- Updated artwork with Rogue logo in black on black
- Imported from China

Product: Rogue HG 2.0 Bumper Plates- 45lb Pair (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Same quality plates, revamped design. Rogue HG 2.0 Bumpers feature new artwork (still black, still old school), with the consistent dead bounce, durability, and distinctive smooth finish athletes have come to expect from the HG line. These quality, budget-priced plates are the IWF standard 450mm in diameter, but are cut thinner than a lot of comparable bumpers to allow for more weight to be loaded on the bar. HG 2.0's also score an average of 88 on the Shore A Durometer scale, giving them a dead blow on par with a lot of the pricier comp plates in the industry.

Battle-tested at the CrossFit Games and Regionals, HG Bumper Plates are both a high-performance and smart economical choice for any training facility. Check out the wide range of plate sets or simple pairs available to order on the right column, or read the reviews below to see what current HG Bumper owners have to say about the product.





SKU# IP0514-45-2

Product: The Ohio Bar - Black Zinc (Or Approved Equal)

Manufacturer: Rogue Fitness

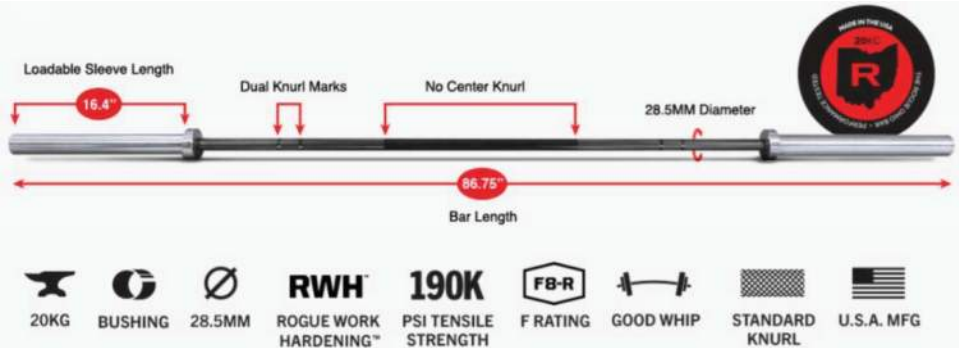
Location: Weight Room

Each Rogue Ohio Bar is machined and assembled in Columbus, Ohio, and includes a lifetime guarantee against bending. Each bar will come with an Ohio Bar card that has the initials of the Rogue team member that built the bar.

The Ohio Bar is assembled with bronze bushings which act as bearing surfaces between the bar sleeve and bar shaft. The bushing sleeves on the Ohio Bar promise a reliable spin, and their snap ring design maintains optimal stability throughout any type of weightlifting regimen—from basic high school or collegiate strength training programs to intense Crossfit workouts.

Each Ohio Bar finish offers a different level of oxidization protection and has a direct effect on the feel of the knurl. Black Oxide is a mild oxidization protectant process. This type of steel treatment will still require some maintenance but will give the best knurl feel, more like a naked bar. Zinc is a medium oxidization protectant process. This type of steel treatment requires minimal maintenance and is used on The Rogue and Bella Bars.





SKU# RA1571-AN-GM

Product Details

Loadable Sleeve Length: 16.4"
Diameter: 28.5MM
F Rating™: F8-R
Bar Typed: Men's Bars
Bar Use: Multipurpose
Bushing/Bearing: Bushing
Bar Weight: 20KG
Knurl: Multi
Center Knurl: No
Knurl Mark: Dual
Shaft and Sleeve Coating: Black Oxide
Tensile Strength: 190,000 PSI
Made in the USA
Warranty: Lifetime Warranty

Product: OSO Barbell Collars (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

This is the exclusive, Rogue-branded version of the OSO Barbell Collar—an innovative, aircraft-grade aluminum clamp designed are manufactured in Columbus, Ohio.

Sold in pairs and equipped with a rubberized interior lining to protect the bar, OSO Collars deliver a secure, stable hold through repeated, high-impact drops, and allow easy adjustments or removal with a simple lever and lock/unlock mechanism. It's the OSOs unique look, though, that generates the most attention. With this design, that means an industrial gear-style shape in gunmetal gray with the Rogue logo down the side.





SKU# RA1571-AN-GM

Product Details

- Width: 1.5"
- Material: 6061 Billet Aircraft Grade Aluminum
- Rubberized Interior Lining
- Available in Pairs
- Made in the USA
- Warranty: Lifetime Warranty

Product: Rogue 3-Tier Dumbbell Rack (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

This is the same dumbbell storage rack that Rogue has installed in some of the country's leading collegiate training centers and CrossFit affiliates. With the 3 Tier Dumbbell Rack, you can now securely store up to 30 dumbbells - or 15 pairs - all within a space-efficient 93" x 30" footprint.

This rack is compatible with most Pro-Style and Rubber Hex dumbbells, as well as any weight increment from 5LB to 125LB. Certain Rubber Hex dumbbells may require you to remove the saddle for a better fit.

To better protect both the equipment and the athletes using them, the 3 Tier Rack features rubber-encased saddles and a central rail divider to prevent the dumbbells from sliding, jarring loose, or catching an athlete's hand on a misplacement. The unit is manufactured in the USA, ships fully assembled, and does not need to be bolted to the ground- though laser-cut mountable foot plates are included standard.



SKU# RA0445

Product Details

- Steel: 0.375" Laser Cut Steel End Plates
- Dimensions: 93" L x 30" W x 33" H
- Product Weight: 269 lbs
- Capacity: 30 dumbbells
- Protective Dumbbell Saddles Encased in Rubber
- Steel: 0.375" Laser Cut Steel End Plates
- Ships Fully Assembled
- Made in the USA

Product: Rogue 5-50 LBS Dumbbell Set (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Also available to order by the pair, Rogue Rubber Hex Dumbbells are available in three complete, standard sets--broken down into 5LB increments. These sets allow you to quickly equip an entire training facility serving any type of athlete, all at an affordable cost.

Rogue Dumbbells feature heavy-duty, rubber-encased heads that help minimize noise and limit wear and tear (to both the bells and your flooring). They also include chrome-plated handles ergonomically designed for a firm but comfortable feel in any grip style.

All smaller Rogue Dumbbells up to 10LB feature a 25MM diameter handle, while those 12.5LB and up have a larger 35MM diameter handle.



SKU# RF0549

Product Details

- 5LB - 50LB Set - Includes pairs of dumbbells from 5LB to 50LB in 5LB increments. 550LB total
- Handle Diameter: 25MM up to 10LB, 35MM for anything over 10LB
- Heavy-duty Rubber Encased Heads: minimize noise, floor damage, and wear and tear on the dumbbells themselves.
- Easy-grip, ergonomic Chrome-Plated Handle
- Proprietary head to handle construction ensures the head does not come loose

Product: Rogue 55-100 LBS Dumbbell Set (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

Also available to order by the pair, Rogue Rubber Hex Dumbbells are available in three complete, standard sets--broken down into 5LB increments. These sets allow you to quickly equip an entire training facility serving any type of athlete, all at an affordable cost.

Rogue Dumbbells feature heavy-duty, rubber-encased heads that help minimize noise and limit wear and tear (to both the bells and your flooring). They also include chrome-plated handles ergonomically designed for a firm but comfortable feel in any grip style.

All smaller Rogue Dumbbells up to 10LB feature a 25MM diameter handle, while those 12.5LB and up have a larger 35MM diameter handle.



SKU# RF0550

Product Details

- 55LB - 100LB Set - Includes pairs of dumbbells from 55LB to 100LB in 5LB increments. 1,550LB total.
- Handle Diameter: 25MM up to 10LB, 35MM for anything over 10LB
- Heavy-duty Rubber Encased Heads: minimize noise, floor damage, and wear and tear on the dumbbells themselves.
- Easy-grip, ergonomic Chrome-Plated Handle
- Proprietary head to handle construction ensures the head does not come loose

Product: Rogue ECHO Bike (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Weight Room

The Rogue Echo Bike combines heavy-duty steel, precision engineering, and convenient customization to forge a stronger, sturdier fan bike. This overbuilt 127 LB unit provides a rock solid foundation for max output bursts, while still offering easy portability around the gym via a set of 1" polyurethane front wheels. A quiet, belt-driven steel fan blade produces a smooth, consistent ride, while a high-contrast, battery-powered LCD console allows athletes to track intervals, distance, calories burned, heart rate, and more. Rogue Fitness warrants that the ECHO Bike shall be free from defects in material and workmanship for a period of two years from the date of purchase when the product is used under normal uses and conditions and as recommended in the User Guide.

THE ROGUE ECHO BIKE IS COMPATIBLE WITH THESE OPTIONAL ADD-ONS:

- Echo Bike Wind Guard - Plastic shield that covers part of the cage to reduce air blowback. Transparent grey finish.
- Echo Bike Phone Holder - Plastic mount that screws onto the mast of the bike. Holder has inside dimensions of 3.5" wide x 6.125" tall with open north/south ends for taller phones.
- Bottle Cage - Fits a wide variety of bottles currently offered through Rogue, including: BlenderBottle, Camelback Podium Bottle, and most standard 16.9oz water bottles (it is NOT compatible with YETI bottles or larger 32oz Nalgene bottles). Hardware for mounting the cage is already pre-installed on the bike for an easy, convenient install.
- Echo Bike Turf Tire & Handle Kit - The Turf Tire and Handle Kit is designed to replace the standard front foot of the unit, adding a new level of maneuverability to this overbuilt 127 LB "stationary" bike.



Product Details

- Overall Dimensions: 29.875" W x 58.875" D x 52.75" H
- Footprint Dimensions: 23.75" W x 44.5" D
- Weight: 127 lbs
- Weight Capacity: 350 lbs
- Steel Construction: 2x3", 1.25x3", and 1.625x3.125" Steel
- Textured Black Powder Coat Finish
- Belt Driven Steel Fan
- LCD Console Display (Batteries Included) with customizable modes
- Adjustable padded seat with 8 height and 5 front-to-back settings.
- 1.5” Diameter Rubber Grip Handles
- Rubber Leveling Feet
- Metal Pedals
- Front polyurethane wheels allow for mobility
- Assembly required. All hardware and assembly tools included

Product: TRUEFORM Trainer (Or Approved Equal)

Manufacturer: Rogue Fitness

Location: Aerobics Room

The TRUEFORM Trainer is an advanced, non-motorized treadmill that's compact, lightweight, and uniquely simple to use. Equipped with a slightly curved deck (less steep than comparable products in the industry), this innovative manual treadmill design requires no outside power source, relying instead on the athlete's own level of force to determine the pace of the machine. As a result, the TRUEFORM Trainer gives the user greater control of their workout—from a light stroll to an all-out sprint - promoting technically sound running technique, posture, balance, and cadence in the process.

Made from quality formed steel tubing and utilizing 112 sealed steel ball bearings, the TRUEFORM Trainer is overbuilt to the high standard of a pro training facility, with efficiency in space and cost still suited to a home gym. The unit also comes with a convenient LED battery display screen, delivering immediate reports on the runner's pace, speed, distance and time. This display is compatible with Polar heart monitors, as well.

The unit's polyurethane-reinforced Responsive Belt Technology (RBT) and molded thermoplastic elastomer tread not only re-create a more natural running surface, but also react to even the most subtle of changes in movement, including the strike force of the foot, hip position, and posture. When your body isn't in the optimal position, you'll feel it immediately and learn to adjust, developing superior long-term form and better overall results. That's the difference with a well designed, truly manually-operated treadmill.



Product Details

- Brand: Samsara Fitness
- Non-Motorized, Manual Treadmill
- Dimensions: 64” L, 31” W, 63” H
- Running Surface: 17” wide
- Weight: 280 LBS
- LED Display
- Frame and Handrails: 2” steel tubing
- Handrail Uprights: 6” steel tubing
- Bearing Rail: Formed and Welded 7-gauge steel
- Finish: Light Texture Black Powdercoat
- 112 Sealed Steel Bearings
- Covers: Molded Plastic
- Tread Surface: Molded Thermoplastic Elastomer
- Color: Black
- Product Weight: 280 Lb
- Dimensions: 31"W x 64"L x 63"H
- Imported
- Running Surface: 17"W

Product: **Clinton Alpha Series Treatment Table with Shelving (Or Approved Equal)**

Manufacturer: Clinton Industries

Location: Nurse's Sick Bay and SPED BLS Classroom



13030-30

The ETA (Easy To Assemble) Alpha Series of tables features contemporary styling and durable, all-welded, steel frame construction and a powder-coated finish for great looks and easy maintenance. Because it's Clinton engineered, the ETA Alpha Series saves you money and goes together fast.

Clinton uses only premium, woven knit-backed upholstery that resists stretching and bunching associated with ordinary vinyl upholstery. Plus, Clinton upholstery is topcoated with Perma-Block-3 to resist stains, scuffs and abrasions.

The Clinton 3030 Alpha Series Straight Line Treatment Table is a durable medical exam table with a load capacity of 450 lbs. For added style and easy maintenance the frame is welded, made of steel and powder coated gray. The strong frame construction provides stability, while the 2" firm foam padding provides comfort. The Clinton 3030 treatment table comes ready to assemble with pre-threaded hardware, as well as the tools necessary to assemble.

Product Details

- Features powder-coated, all-steel frame, laminate shelf, storage compartment and adjustable backrest.
- Dimensions: 72" L x 30" W x 31" H
- Easy bolt-through assembly.
- Paper dispenser included.
- Adjustable leg levellers.
- Seamless rounded corner top.
- 2" firm foam padding.
- Heavyweight, knit-backed upholstery.
- Also available with non-adjustable backrest.
- 450 lbs. load capacity under normal use.
- Easy assembly

Dimensions

Model #	Length	Height	Width
3013-27	72"	31"	27"
3013-30	72"	31"	30"

Color Options

Standard Upholstery



Optional Accessories



009 Nosehole

- Permits patients to lie face down without turning head. 9" *(22.86cm)* long x 2" *(5.08cm)* wide
- Standard placement is in the head end of the table top.



020 Small Pillow

- 14" x 12" x 3" thick *(35.56cm x 30.48cm x 7.62cm)*



040 Paper Cutter

- Clear plastic with elastic straps and buckle



060 Large Pillow

- 14" x 21" x 3" thick *(35.56cm x 53.34cm x 7.62cm)*



077-Safety Strap

- 2" x 89.5" *(5.08 cm x 228 cm)* Strap secures with quick fasten hook and loop fastener

Product: **Clinton Alpha Series Treatment Table with Shelving (Or Approved Equal)**

Manufacturer: Clinton Industries

Location: Nurse's Sick Bay and SPED BLS Classroom



13030-30

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- 450 lbs. load capacity under normal use.
- Easy assembly

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Model #	Length	Height	Width
3013-27	72"	31"	27"
3013-30	72"	31"	30"

Color Options

Standard Upholstery



Optional Accessories



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077-Safety Strap

- 2" x 89.5" *(5.08 cm x 228 cm)* Strap secures with quick fasten hook and loop fastener

Product: Simply 66® Snap System Cubicle Curtains (Or Approved Equal)

Manufacturer: Cubicle Curtain Factory, Inc.

Location: Nurse's Sick Bay and Health Careers Sciences Classroom



Simply 66® Snap System is the original snap cubicle curtain and the highest quality 'one size fits all' easy-maintenance hospital privacy curtain. Choose from a full line of antimicrobial and sustainable designer fabrics**.** Vinyl and disposable liners are available to protect fabric panels in high-risk areas.

Product Details

- Can be used on most any existing ceiling-mounted cubicle curtain track
- No ladders or tools needed to install or remove hospital curtain panels, reducing the risk of fall & installation injuries
- Always be in code with privacy curtain fabric panels that standardize every room in your facility

- Heavy-duty nickel-plated brass snaps are rust-proof & safe for laundering, allow for optional vinyl/disposable snap-on liners to protect designer fabric hospital curtains
- Cost is the same as traditional cubicle curtains; Save on laundry, labor & reorder costs



Cubicle Curtain Factory

Appendix

Page 1: Cover

Page 2: Intro to CCF

Page 3-11: Cubicle Curtain Fabrics

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Product Catalog

Cubicle Curtain Factory *is a Certified Woman-Owned Business*

Cubicle Curtain Factory
7810 S. Dixie Hwy
West Palm Beach, FL 33405
800.588.9296 F: 866.804.5692

Intro to CCF

Cubicle Curtain Factory, Inc.

Attention to Detail

Family owned and operated, Cubicle Curtain Factory's cubicle curtains, window treatments and other textile decorative products are fabricated in a 23,000 square-foot air-conditioned manufacturing facility in West Palm Beach, Florida. This provides the ability to keep costs down and reduce order lead times. CCF's skillful and experienced sewing machine operators utilize quality control making sure all products meet only the highest industry and customer standards.

Product Offerings

- New! **Simply Snap™** Affordable Cubicle Curtains
  Interlocking curtains starting at $60.00
- New! **Disposable Curtains** Traditional or Snap
  99.9% Germ Kill – Reduce HAIs
- New! **Off The Hook** Universal Carrier Hook
  Never misplace a curtain hook again
- **Simply 66® Snap System** Cubicle Curtains
  Standardize your facility, reduce cost
- **Traditional Cubicle Curtains & Hardware**
  Designer, Blackout, Disposable & More
- **Decorative Window Treatments & Hardware**
  Sheers, Valances, Cornices, Blinds, etc.
- **White & Silver Anodized Aluminum Track**
  Includes all hardware, carriers & caps
- **Table Toppers, Napkins, Bed Covers & More**







The quality of our service sets a higher industry standard…

The quality of our products sets us apart.

Simply 66® Snap Curtains

The One-Size-Fits-All Snap System



Design. Quality. Service.

Simply 66® Snap Cubicle Curtains

The most desired and purchased snap hospital privacy panel system in the industry

Standardize your Facility

All panels are one size only and fit all mesh and tracks



First Step: Hang the Simply 66® continuous Antimicrobial mesh on your existing ceiling track.

-No need to replace existing cubicle curtain ceiling track. All mesh will fit most every standard hospital privacy curtain track that uses carrier hooks.

-Simply 66® cubicle mesh is manufactured to fit any horizontal cubicle curtain track size in your facility.

-Simply 66® curtain mesh is made to accommodate various ceiling heights in a facility.

-Rustproof, nickel-plated brass grommets placed every 6" along the top hem.

No Ladder Necessary

Snap panels on with ease, no tools or risk of falling off ladder



Second Step: Snap on the first cubicle curtain panel, starting at one side, until you get to the end of that privacy curtain panel.

-For your convenience, all Simply 66® cubicle curtain panels are manufactured with small tabs that show exactly where each Simply 66® privacy curtain panel begins and where it ends.

-All Simply 66® panel cubicle curtains are made to fit ANY Simply 66® mesh top, in any room, in any facility.

Use your Own Track

Installed on existing cubicle track without the need to retrofit



Protect your Simply 66® designer fabric hospital curtain panels with inexpensive Vinyl or Disposable overlay panels for high risk areas.

-Lower hospital curtain laundry costs. Use Simply 66® Disposable cubicle curtain panels in areas where hospital curtains must be laundered regularly.

-Vinyl cubicle curtain panels give the benefit of low maintenance. Simply wipe down after every use, or as often as your facility requires.

Curtain Track & Hardware

Ceiling Mounted & Suspended Cubicle Track



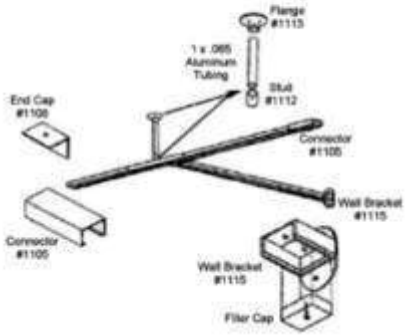
CARRIERS & TRACK HARDWARE



SUSPENDED CUBICLE CURTAIN TRACK







I.V. TRACK & CARRIERS







Product: **Deluxe Single Door Audit Narcotic Cabinet with Digital Keypad Lock - 24" H x 16" W x 8" D (Or Approved Equal)**

Manufacturer: Omnimed

Location: Nurse's Office / Triage Room



#181486

This Deluxe Single Door Audit Narcotic Cabinet with Digital Keypad helps combat drug theft, provide secure patient drug dispensing, and control healthcare costs. *Programmable audit lock with heavy gauge locking bolt* keeps contents secure and ensures that all lock activity is controlled and traceable. Constructed of durable, heavy duty stainless steel. Meets schedule 2 drug storage requirements. Strong piano hinged door. 4 adjustable aluminum shelves for added storage capacity. Top of the cabinet lifts so that the unit can be flipped to accommodate left or right door swing.

If audit capabilities are required, the *Audit Digital Lock Security Software Package* is a required accessory. With the optional Audit Digital Software Package item# 181490, the digital lock can be programmed for up to 250 individual users and you can trace the last 1,500 access attempts.

Product Details

- Constructed of durable, heavy duty stainless steel
- Meet schedule 2 drug storage requirements
- Strong hinged door and 4 adjustable aluminum shelves for added storage capacity
- The ambi top of the cabinet lifts so that the unit can be flipped to accommodate left or right door access
- Pre-drilled holes are reinforced with stainless steel mounting discs for secure wall attachment
- Low battery indicator
- 6-AA battery pack; premium brand Alkaline batteries recommended (not included)
- Jump start battery override available through mini USB communications port allows the user, with a valid credential, to access the CompX eLock when the batteries are exhausted
- This product does not ship with any mounting hardware due to the number of different mounting specifications each facility may have.

OMNIMED Narcotic Cabinets

Improve business efficiency • Improve employee workplace safety • Improve patient care & management



Deluxe Narcotic Cabinet **#181486**



CompX eLock LV5 Flash Drive



CompX elock LV5 USB Cable

Deluxe Narcotic Cabinet - with Audit Digital Lock

#181486 - Audit Narcotic Cabinet with Keypad Lock
#181487 - Audit Narcotic Cabinet with Keypad and HID Proximity Reader
#181488 - Audit Narcotic Cabinet with Keypad and HID iClass Reader

Constructed of durable, heavy duty stainless steel and meet schedule 2 drug storage requirements. They have a strong piano hinged door and four adjustable aluminum shelves for added storage capacity. The ambi top of the cabinet lifts so that the unit can be flipped to accommodate left or right door access. A programmable audit lock with its heavy gauge locking bolt keeps contents secure and ensures that all lock activity is controlled and traceable. The #181490 Audit Software Package is a required accessory for this lock. The package allows the software to control and audit the locking system and includes programming and flash drive to transfer information to and from the lock. One Audit Software Package is required per facility. These units are warranted for life & include 1 year on the locks.

- Ambi top for left/right outer door access
- Pre-drilled holes reinforced with stainless steel mounting discs
- Measures 24”H by 16”W by 8”D
- Low battery indicator
- 6-AA battery pack; premium brand Alkaline batteries recommended
- Jump start battery override available through mini USB communications port allows the user, with a valid credential, to access the CompX eLock when the batteries are exhausted
- Unit Has lifetime Warranty (1 Year On Locks)

Audit Software Package #181490

Basic lock functions may be performed at the lock without the software. Efficient administration and full audit capability may only be achieved once the software has been installed. Lock can be programmed for up to 250 individual users.

- Mini USB: transfers information directly from the lock to the computer
- Provides a comprehensive audit trail of the last 1,500 access attempts

OMNIMED

800.257.2326 • www.omnimedstore.com

Product: **Streamline® Step-On Container; 13-Gallon; Beige or Gray (Or Approved Equal)**

Manufacturer: Rubbermaid Commercial Products

Location: Classrooms and Offices

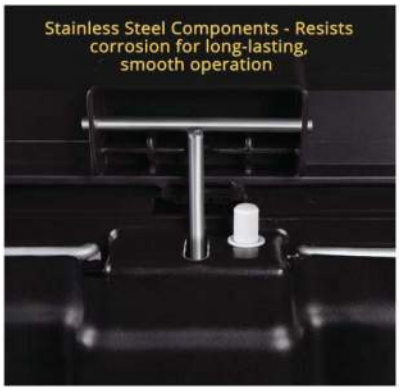
The Rubbermaid Commercial Streamline® Step-On Container features a slim profile and small footprint to fit in tightest spaces. Streamline® Step-On containers are constructed with premium-quality materials and meet the needs of any environment with efficiency, safety, and durability.











Product Details

- Wide design with a small footprint hugs the wall to provide maximum volume while using space efficiently
- Quiet and controlled lid closure reduces noise
- Convenient foot pedal allows hands-free waste disposal while the tall pedal clearance allows easy foot access
- Internal hinge design prevents wall damage
- Liner retainer band securely holds garbage bags
- Capacity: 13 gallons
- Dimensions: 18"W x 11.5"D x 28.3"H
- Weight: 8.5 lbs.
- Material: Plastic
- Opening Mechanism: Step-On



STREAMLINE™ STEP-ON

Blending aesthetics and best-in-class durability, Streamline™ Step-On containers have a slim profile and small footprint, which maximize space to fit in the tightest spaces. Color-coded bins meet regulatory needs.



SLOW CLOSE LID

Quiet and controlled lid-closure minimizes noise to enhance guest and patient satisfaction.

OUTLASTING DURABILITY

New, redesigned lid hinge improves performance and increases durability.

IMPROVED PRODUCTIVITY

Liner retainer band and cinch easily and securely hold polyliners.

SUITED FOR ANY SPACE

2 STYLES

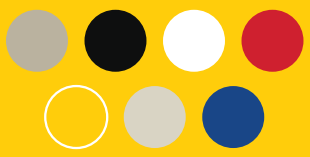


FRONT STEP



END STEP

7 COLORS



5 SIZES



4 GAL | 8 GAL | 13 GAL | 18 GAL | 24 GAL

FEATURES & BENEFITS



Durable, commercial-grade construction is designed to last 300,000 step cycles*



Optional dual-stream rigid liner simplifies sorting, making recycling quick and easy



Hands-free disposal



Meets OSHA and OBRA standards for worker and environmental safety



1883459

Rubbermaid® Commercial Products

*Based on internal testing standards



CONTAINERS FM APPROVED OSHA OBRA

	ITEM #	COLOR	DESCRIPTION	L × W × H
4 GAL	1883554	WHITE	FRONT STEP	14.8" × 9.1" × 15.7"
	1883563	RED	FRONT STEP	14.8" × 9.1" × 15.7"
	1883599	GRAY	FRONT STEP	14.8" × 9.1" × 15.7"
	1883608	BLACK	FRONT STEP	14.8" × 9.1" × 15.7"
	1883455	BEIGE	FRONT STEP	14.8" × 9.1" × 15.7"
8 GAL	1883555	WHITE	FRONT STEP	16.7" × 10.6" × 21.1"
	1883564	RED	FRONT STEP	16.7" × 10.6" × 21.1"
	1883600	GRAY	FRONT STEP	16.7" × 10.6" × 21.1"
	1883609	BLACK	FRONT STEP	16.7" × 10.6" × 21.1"
	1883456	BEIGE	FRONT STEP	16.7" × 10.6" × 21.1"
	1883565	RED	END STEP	19.6" × 12.3" × 22.3"
	1883610	BLACK	END STEP	19.6" × 12.3" × 22.3"
	1883457	BEIGE	END STEP	19.6" × 12.3" × 22.3"
13 GAL	1883575	YELLOW	FRONT STEP	17.9" × 11.5" × 28.3"
	1883557	WHITE	FRONT STEP	17.9" × 11.5" × 28.3"
	1883566	RED	FRONT STEP	17.9" × 11.5" × 28.3"
	1883602	GRAY	FRONT STEP	17.9" × 11.5" × 28.3"
	1883593	BLUE	FRONT STEP	17.9" × 11.5" × 28.3"
	1883611	BLACK	FRONT STEP	17.9" × 11.5" × 28.3"
	1883458	BEIGE	FRONT STEP	17.9" × 11.5" × 28.3"
	1883612	BLACK	END STEP	20.8" × 13.5" × 28.4"
	1883459	BEIGE	END STEP	20.8" × 13.5" × 28.4"
18 GAL	1883559	WHITE	FRONT STEP	19.7" × 12.2" × 31.6"
	1883568	RED	FRONT STEP	19.7" × 12.2" × 31.6"
	1883604	GRAY	FRONT STEP	19.7" × 12.2" × 31.6"
	1883613	BLACK	FRONT STEP	19.7" × 12.2" × 31.6"
	1883460	BEIGE	FRONT STEP	19.7" × 12.2" × 31.6"
	1883614	BLACK	END STEP	22 .1" × 14.7" × 30.8"
	1883551	BEIGE	END STEP	22 .1" × 14.7" × 30.8"
24 GAL	1883579	YELLOW	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883561	WHITE	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883570	RED	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883606	GRAY	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883597	BLUE	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883615	BLACK	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883552	BEIGE	FRONT STEP	22 .4" × 13.9" × 32.5"
	1883616	BLACK	END STEP	25.1" × 15.9" × 32.0"
	1883553	BEIGE	END STEP	25.1" × 15.9" × 32.0"

OPTIONAL RIGID LINERS

ITEM #	DESCRIPTION	CAPACITY	L × W × H
1883618	RIGID LINER FOR 30 L/8 G RESIN FS	6 GAL	14.8" × 9.1" × 18.1"
1883623	RIGID LINER FOR 30 L/8 G RESIN FS	7.5 GAL	16.5" × 8.7" × 19.5"
1883619	RIGID LINER FOR 50 L/13 G RESIN FS	10.5 GAL	15.8" × 9.8" × 18.1"
1883617	RIGID LINER FOR 50 L/13 G RESIN FS	13 GAL	12.8" × 7.4" × 12.8"
1883624	RIGID LINER FOR 50 L/13 G RESIN FS	13 GAL	17.8" × 9.9" × 25.5"
1883620	RIGID LINER FOR 68 L/18 G RESIN FS	15 GAL	17.8" × 10.2" × 28.3"
1883625	RIGID LINER FOR 68 L/18 G RESIN FS	17.5 GAL	19.2" × 11.1" × 28.0"
1883629	DUAL LINER FOR 90 L/24 G RESIN FS	18.5 GAL	20.3" × 11.8" × 29.5"
1883621	RIGID LINER FOR 90 L/24 G RESIN FS	20 GAL	20.3" × 11.8" × 29.5"
1883626	RIGID LINER FOR 90 L/24 G RESIN FS	23.5 GAL	22.1" × 11.8" × 29.5"

ATTACHMENT B-13

D. L. ADAMS ASSOCIATES
acoustics | performing arts | technology

970 N. Kalaheo Ave.
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Kailua, HI 96734
www.dlaa.com
808.254.3318

February 7, 2022

Taniguchi Ruth Makio Architects
P.O. Box EA
Hagatna, Guam 96932

Attention: Mr. Elmer Prudente

RE: GDOE Simon Sanchez High School – Exterior Noise Study Report (DLAA #20-019)

Dear Mr. Prudente:

DLAA conducted noise measurements to assess the existing and expected future exterior noise environment at the location of the Simon Sanchez High School project. The following report includes the project's recommended exterior noise criteria, a summary of the results of our noise measurements and analysis, and recommendations for the exterior glazing to meet the interior noise design criteria.

Please note our recommendations are based on meeting acoustical objectives only and should be reviewed by qualified personnel prior to implementation.

DESIGN CRITIERA

The exterior shell of the building, including all walls, windows, and exterior doors, should be selected such that the spaces inside of the building are quiet enough to meet the project's interior noise design criteria. ANSI/ASA S12.60-2010/Part 1 "Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools" establishes the interior noise level criteria for core learning spaces due to outdoor exterior noise sources at 35 dBA and 55 dBC and further specifies composite OITC criteria for façade elements for hourly noise levels exceeding 55 dBA Leq.

NOISE MEASUREMENTS

Measurement Procedure

Continuous 24-hour long-term environmental noise level measurements were conducted at one location (L1) in the access road south of the existing sports fields approximately 230 feet set back from Juan Jacinto Drive from January 18 through January 20, 2022, to assess the existing noise environment. The meter was calibrated in the field before and after measurements were conducted.

The measurement location is shown in **Figure 1** below. This location represents the loudest expected noise levels at classrooms throughout the project.

The measurements recorded the overall A-weighted sound level (LA_{eq}) and C-weighted sound level (LCeq) in 1-hour intervals, as well as the average sound level in each octave and one-third octave frequency band. Statistical metrics, such as the L_{MAX}, L_{MIN}, L_{90}, L_{50}, L_{10} and L_{01} were also measured in terms of overall A-weighted level, octave, and one-third octave bands. The primary noise source was traffic noise from Juan Jacinto Drive, with audible contributions from traffic along Marine Corps Drive. Depending on the hour, noise from local sports field activities and pedestrians along the access road contributed to the noise environment.



Figure 1: Measurement Location

Measurement Results

Traffic noise from cars, trucks, motorcycles, and buses were prevalent throughout the measurement period, as well as noise from overhead airplanes.

Measurements were conducted during the COVID-19 pandemic, however DLAA understands full in-person classes had resumed at the school at the time of the survey. Since roads immediately surrounding the project site are primarily used for school access, noise levels at the site are not expected to be significantly affected by reduced tourist traffic on Guam. Therefore, noise levels presented below are considered a reasonable expectation of noise levels for the site due to typical local traffic conditions.

The LA_{EQ} and LCeq during school hours were recorded. School hours are defined as 8:00AM-4:00PM. The maximum overall sound levels (L_{MAX}) and minimum overall sound levels (L_{MIN}) during school hours were also recorded. **Table 1** below summarizes the results at each measurement location during the entire measurement period.

Table 1: Measurement Result Summary (8AM to 4PM)

Meter	3-day L_{eq} dBC	3-day L_{eq} dBA	Maximum Hourly LA_{eq} dBA	Minimum Hourly LA_{eq}
Location 1	67	54	59	49

Attached **Figure 2** shows a detailed graphs of the L_{EQ} levels recorded at Location 1 throughout the entire measurement period.

D. L. ADAMS ASSOCIATES
acoustics | performing arts | technology

EXTERIOR WINDOW AND LANAI DOOR RECOMMENDATIONS

Criteria for classroom windows is based on meeting 35 dBA and 55 dBC interior noise levels and established in based on maximum hourly LAeq noise levels. Unless noted otherwise, all OITC / STC ratings are based on a complete window assembly performance, including glazing, framing, hardware, etc.

Based on the results of acoustic testing on site, the entire façade must provide a minimum OITC 34 rating, including the exterior wall and window. With the currently shown 10" thick pre-cast concrete panels, a minimum OITC 25 rated window, glazed with standard 1" IGU (consisting of two layers of 1/4" glazing separated by a 1/2" air space, STC 35/OITC 28) will be sufficient to reduce exterior traffic noise to levels at or below the background noise criteria for all classrooms on the project.

Please feel free to contact us if you have any questions or comments.

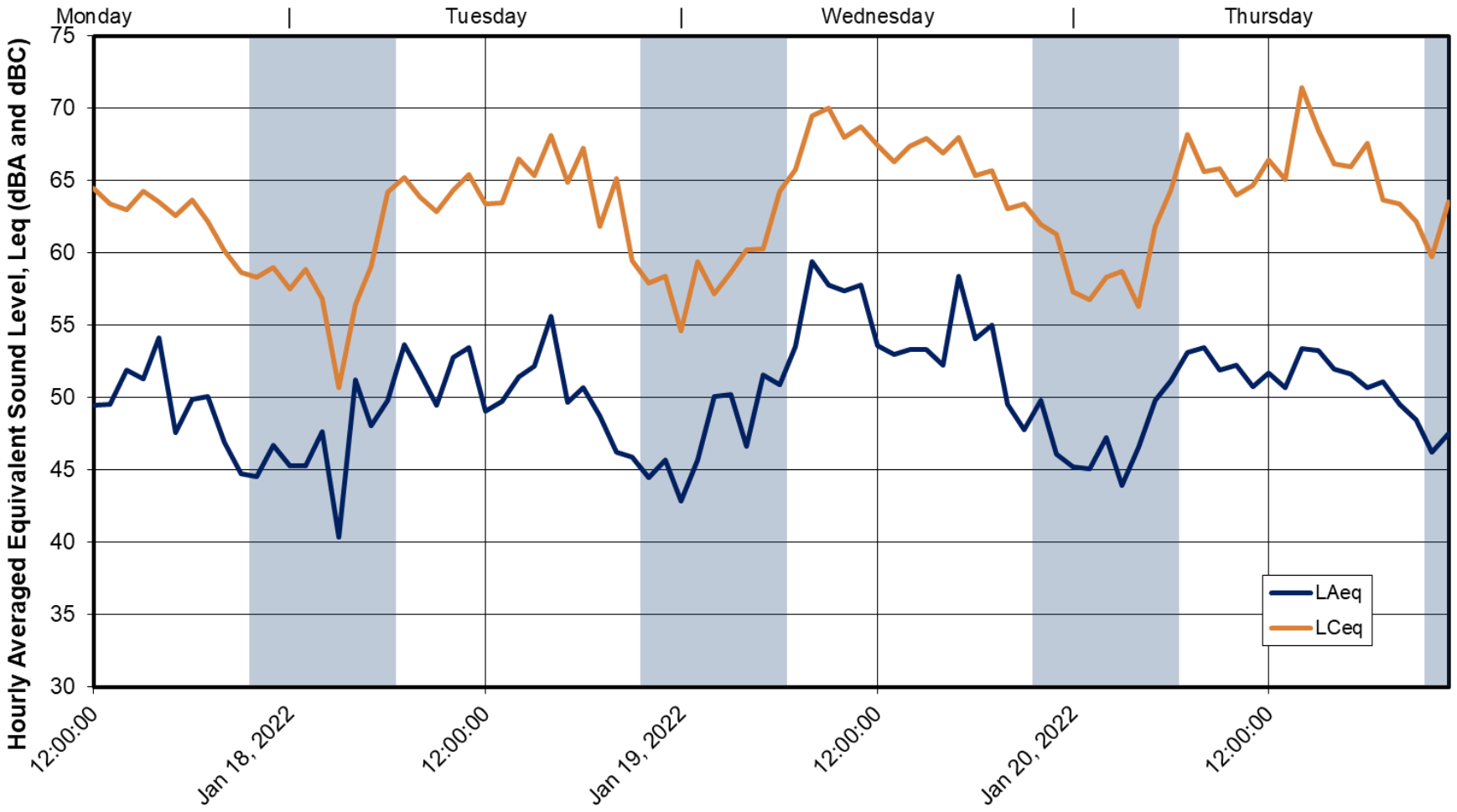
Sincerely,



Lucas Johnson
Project Consultant
D.L. Adams Associates

Encl. Figure 2

Location 1



Date & Time of Measurement

L_{eq}: Equivalent Sound Level - Logrithmic average of sound levels of time.

D. L. ADAMS ASSOCIATES acoustics | performing arts | technology	PROJECT: GDOE SSHS		
	PROJECT NO: 20-019	DATE: February 2022	FIGURE: 2

D. L. ADAMS ASSOCIATES
acoustics | performing arts | technology

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February 5, 2021

Taniguchi, Ruth, Makio Architects
P,O, Box EA
Hagatna, Guam 96932

Attention: Mr. Elmer Prudente

RE: Simon Sanchez High School Auditorium – Initial Acoustical Design Guidelines (DLAA #20-019)

Dear Mr. Prudente:

This report summarizes discussions between DLAA, TRMA and the SSHS GDOE Design Committee regarding best practices for the auditorium design. Discussions occurred throughout January 2021. The intent of this report is to serve as a guide, providing general concepts and "rules of thumb" for the design architect and design team members at early stages of project development. More detailed recommendations will follow in subsequent reports as the design progresses.

Acoustical Criteria

From our discussions to date, DLAA understands the primary function of the auditorium will be for band, choral and orchestral concerts as well as dance presentations, with secondary functions identified for lectures, award ceremonies, and video presentations. The high school does not currently include a theatre program, however limited functionality for theatrical performance is requested to allow flexibility should such a program develop in the future. This report provides initial recommendations for acoustical criteria of the Simon Sanchez High School Auditorium spaces only. Acoustical recommendations for all other buildings associated with the development will be provided separately. Theatre and A/V systems recommendations are not included herein, but will be included in future Basis of Design Narratives.

Room Acoustics

Room acoustics includes all phenomena associated with how sound travels and persists within an enclosed space. The most relevant room acoustics concepts for this auditorium include room shaping and reverberation time.

Room Shaping

Room shaping considers how the walls, ceiling, floor, and audience seating areas are aligned to provide a comfortable and easy visual and auditory experience during a performance. Important concepts include sightlines, side wall shaping, rear wall textures, floor sloping, balcony design,

shaping and placement of ceiling hung baffles, etc. In general, the following "rules of thumb" should be considered when creating the initial auditorium layout:

- Room Dimensions:
  - Room Volume: 300 cubic feet per person.
  - Room height-to-width ratio: > 0.7.
  - Minimize distance between stage and audience.
- Seating area
  - Minimize back-to-back and center-to-center seat spacing within life-safety and comfort guidelines.
  - Stagger seating.
  - Seating area slope: Between 7 and 26 degrees.
  - Seating area width to extend no more than 30 degrees from vertical plane of proscenium opening.
- Balconies
  - Depth of underbalcony should not exceed height of balcony opening. Depth-to-opening ratio 1:1.
  - Slope underside of balcony so that it is visible from the stage.
  - The rear row under the balcony should be able to see the front 1/3 of the auditorium ceiling.
  - Top balcony row should be less than 65 feet above the stage
  - Proscenium opening should be high enough so that back row of balcony can see the bottom 7 feet of the stage rear wall.
- Ceiling
  - Include suspended sound reflective, pre-manufactured ceiling clouds. Slight convex curvature is preferred over flat planes.
  - The ceiling directly above the proscenium to be of hard material, and angled upwards from the proscenium opening. The proscenium edge of this ceiling should be oriented to continue the angle established by the orchestra shell ceiling.
- Walls
  - Side walls nearest stage to fan outward from stage and include a hard finish.
  - The auditorium rear wall should include a diffusive shape, with large-scale irregularities. The rear wall should not be flat/parallel to the proscenium opening.
  - Avoid parallel flat surfaces.
- Orchestra shell maximum depth: 30 feet
- Orchestra pit 14 to 16 ft^2 per person

Reverberation Time

Reverberation time is the time required for a sound to decrease 60 decibels in an enclosed space, identified as RT60. The ideal reverberation time for a space is a function of its use and volume. Generally, effective speech communication requires a lower RT60, while musical performance requires longer RT60. For multi-use facilities, such as high school auditoriums, it can be difficult to balance the needs of all potential uses for the space. However, based on the latest discussions with the Fine Arts department and DOE design committee members, DLAA understands the primary function of this auditorium is for musical performance. Therefore, the RT60 of the space

will be designed towards the longer range recommended for multi-use facilities. Additional speech reinforcement can be provided by audio systems when understanding spoken word is more important than the musical environment.

Based on available preliminary plans and the recommended 300 ft^3 per person, the room volume of the auditorium will be approximately 180,000 cubic feet. The recommended RT60 for the space is as follows:

- 1.7 seconds with orchestra shell in place
- 1.3 seconds without orchestra shell in place and orchestra pit open

While precise quantities and locations of acoustically absorptive materials will be determined as the design progresses, for initial planning purposes the following finish guidelines are recommended:

- Audience seating to be fabric-covered with cushioned back and seat.
- Floor under seating area to be concrete.
    - Carpet flooring everywhere else.
- Hard surface walls (e.g., gypsum, concrete, metal) towards front of auditorium.
- Irregularly shaped, hard rear wall.
- Hard (e.g, gypsum, metal) ceiling baffles located toward front of auditorium.

Sound Isolation

Reducing sound transfer to the Auditorium space will be critical to audience and performer satisfaction in the space. **Table 1** below presents our initial recommendations for partition sound isolation criteria and wall types within the Fine Arts Building based on preliminary plans. **Table 2** presents sound isolation criteria for floor/ceiling assemblies. DLAA's schematic wall type details are included as attachments.

Table 1: Wall Types at Critical Adjacencies

Adjacency		STC	DLAA Recommended Wall Types	Notes
Auditorium	Lobby	65	CONC-2	1
	Corridor/Mezzanine	65	CONC-2	1
	Stairwell	70	CONC-2	1
	Backstage /Dressing Rooms/Offices	75	CONC-2A	1
Band Room	Office (Band Director)	45	WA-01	
	Corridor	60	CONC-2 OR WA-23	1
	Band Practice Room	60	CONC-2 OR WA-23	1
	Stairwell	60	CONC-2 OR WA-28	1
	Storage Room	45	WA-01	

Table 1: Wall Types at Critical Adjacencies

Adjacency		STC	DLAA Recommended Wall Types	Notes
Choir Room	Office (Choir Director)	45	WA-01	
	Corridor	60	CONC-2 OR WA-23	1
	Choir Practice Room	60	CONC-2 OR WA-23	1
	Storage	45	WA-01	
Practice Room	Corridor	60	CONC-2 OR WA-23	1
Office	Corridor	50	WA-09	
Control Room	Auditorium	60	WA-11	
	Corridor/Mezzanine	50	WA-09	
Classroom	Corridor	45	WA-01	
	Storage	45	WA-01	
	Restroom	53	WA-08	
Dance Room	Band Practice Room	60	CONC-2 OR WA-23	1
	Corridor	50	WA-09	

Notes: 1. Concrete wall recommendations assume minimum 6” thick cast-in-place normal weight concrete or 8” thick grout-filled CMU.

Table 2: Floor/Ceiling Assembly STC and IIC ratings

Adjacency		STC	IIC	Notes
Rooftop with Mech. Equipment	Classroom / Auditorium / Rehearsal Room	75	--	Where occurs, minimum 8” concrete slab and Type 3 ceiling with double gypsum. Refer to CLG-00.
Band/Choir Room	Band/Choir Room	65	70+	8” CIP slab + Type 1 Wire Suspended Ceiling (Double layer gypsum). Refer to CLG-00. Hard floor finish (vinyl, LVT, wood) on resilient underlayment.
	Practice Room	65	60	8” CIP slab and Type 1 Wire Suspended Ceiling.
	Office	60	--	8” CIP slab and Type 1 Wire Suspended Ceiling.
	Storage Room (Above)	45	--	Minimum 6” CIP Slab.
	Classroom	60	50	8” CIP slab and Type 1 Wire Suspended Ceiling LVT flooring will require acoustical underlayment.

Doors

Auditorium ingress and egress doors should be STC-rated assemblies. These are packaged systems, where the door panel, frame, hardware, threshold, seals, etc., are tested together as an assembly, according to the ASTM E90 standard. These doors require automatic door bottoms, and full perimeter sound seals, as recommended and provided by the door manufacturer. Undercuts are not allowed for ventilation on STC-rated doors. The following list provides initial recommendations for door minimum STC ratings in the Fine Arts Building:

- Auditorium Entry/Exit: STC 50.
    - Standard solid core or hollow metal (stuffed with honeycomb) doors are acceptable where vestibules are used for ingress/egress. Such doors will require full perimeter sound seals, including an automatic door bottom. Hollow metal frames to be stuffed completely with grout or 3 pcf mineral wool.
- Band/Choir Room Entry: STC 45.
- Practice Rooms: STC 45.

Mechanical Systems

Table 3 lists the background noise level requirements per space.

Table 3: HVAC Noise Design Guide

Space	NC/RC Criteria	Notes
Auditorium	25-30	
Band Room	25-30	
Choir Room	25-30	
Practice Room (Recording Capabilities	20-25	
Lobby	40	
Classroom	35	
Dance Room	35	

The following general guidelines and best practices are presented to help the engineer design an acoustically acceptable HVAC system in the Fine Arts Building:

- At minimum 3 equivalent duct diameters of straight duct between fire damper and diffuser/grilles.
- Select grilles/diffuser rated at least 10 NC points below the room requirement. Plaque-style diffusers are preferred over louvered.
- Use rectangular duct as much as possible.
- Assume fiberglass lining minimum 30 feet from outlet/inlet of fans, AHUs, etc.
- Do not locate mechanical equipment, including VAVs, over noise-sensitive spaces.
- Maximize distance between AHUs, chillers, condensers, or any other mechanical system and walls of Fine Arts Building.

- For best practices HVAC system noise control, refer to DLAA details HVAC-01, HVAC-06, HVAC-72, HVAC-73, HVAC-74, HVAC-75 and HVAC-78.

This concludes our preliminary input regarding the Fine Arts Building Acoustics at this time. More detailed recommendations will be provided in future reports as the design develops. Please feel free to contact us if you have any questions or comments.

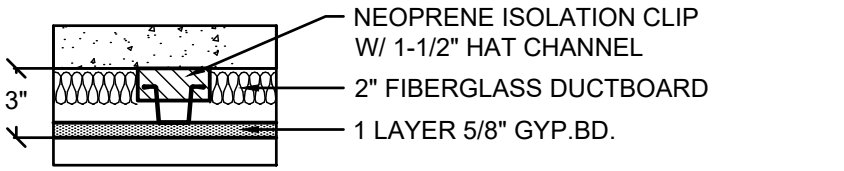
Sincerely,



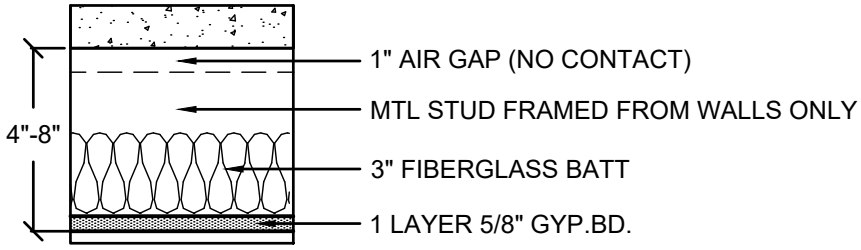
Lucas Johnson
Senior Consultant

TYPICAL ISOLATED CEILINGS
(CONCEPTUAL DETAILS)

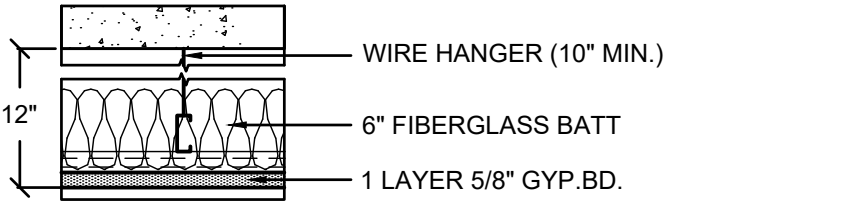
TYPE 1
NEOPRENE ISOLATED
(KINETICS ISOMAX, PLITEQ GENIECLIP, OR EQUAL)



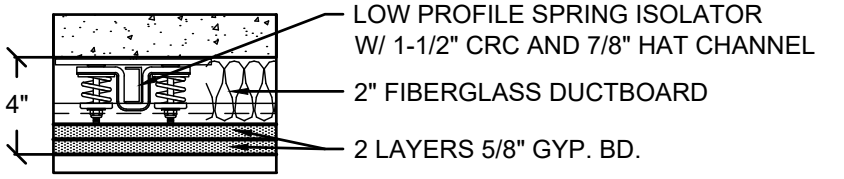
FRAMED FROM WALLS



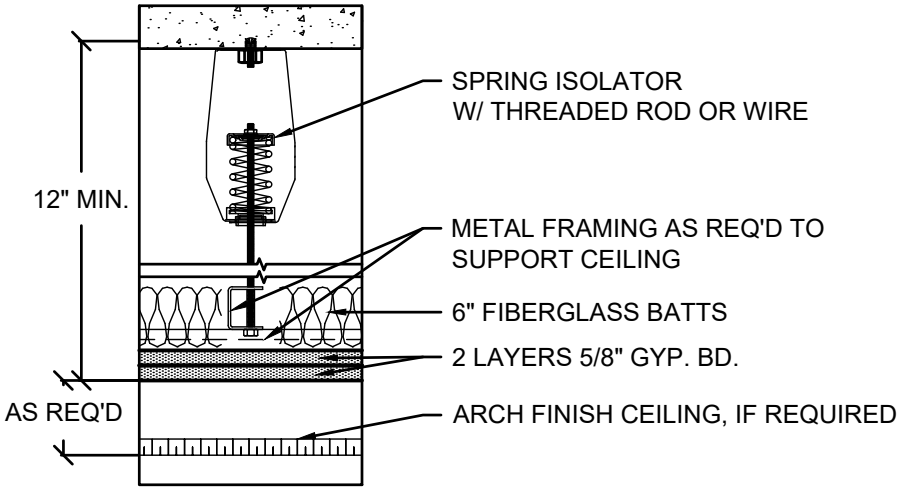
WIRE SUSPENDED



TYPE 2
LOW-PROFILE SPRINGS
(KINETICS KSCH, MASON 30 CSCH, OR EQUAL)



TYPE 3
STANDARD SPRINGS
(KINETICS ICC,
MASON 30CC,
OR EQUAL)



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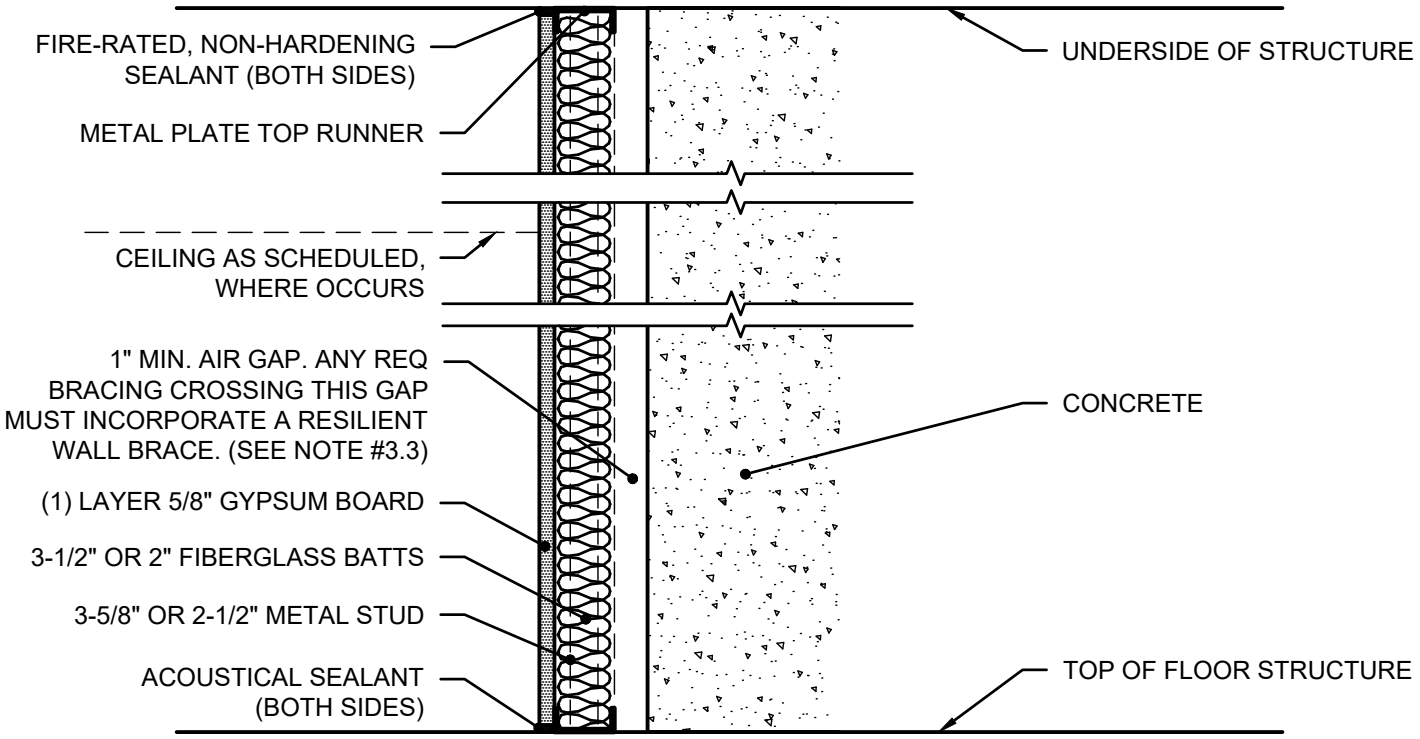
PROJECT: Simon Sanchez High School - Auditorium

PROJECT NO:	DATE:	DETAIL:
20-019	February 2021	CLG-00

CONCRETE WALL W/ SINGLE LAYER GYPSUM BOARD FURRED OUT (1-SIDE)



GENERAL NOTES:

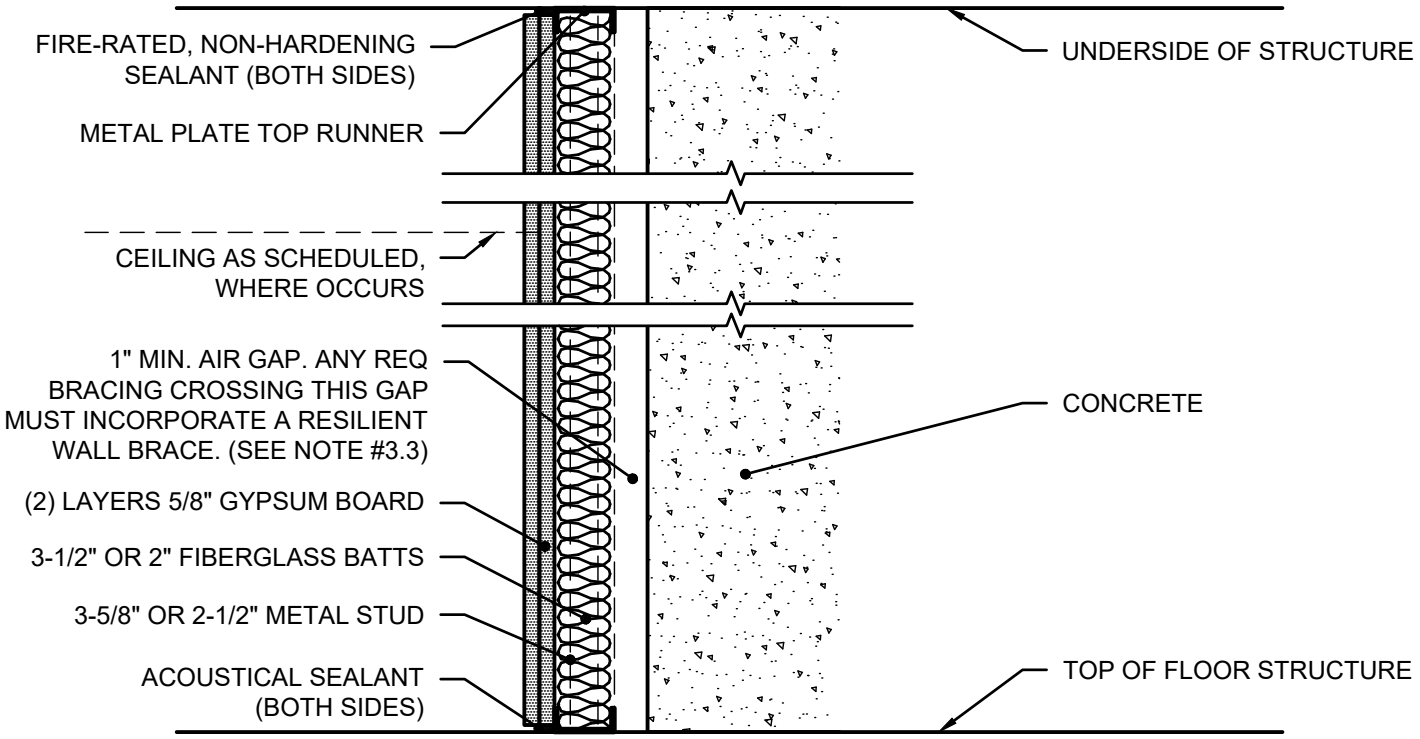
1. SEAL AIR TIGHT AT FLOOR, SIDES, & CEILING ON BOTH SIDES WITH RESILIENT NON-HARDENING FIRESTOP OR ACOUSTICAL SEALANT. HEAD-OF-WALL FIRE RATED SEALANT FLEXIBILITY SHALL BE BASED ON MAXIMUM STRUCTURAL DEFLECTION.
2. SEAL ALL DUCT, PIPE, CONDUIT & STRUCTURAL PENETRATIONS WITH ACOUSTICAL SEALANT OR FIRE STOPPING, AND THE CAVITY IN-BETWEEN PACKED WITH LOOSE FIBERGLASS OR MINERAL FIBER. SEAL ALL WALL INTERSECTIONS AND CONTROL JOINTS.
3. IN STC RATED PARTITIONS WHERE GYPSUM BOARD IS FURRED AWAY FROM CMU OR CONCRETE WITH AN AIR GAP, THE FOLLOWING SHALL APPLY:

   3.1. CONDUIT FOR ELECTRICAL BOXES SHALL ONLY BE ATTACHED TO STUD WALL AND MUST NOT CONTACT THE CONCRETE WALL.

   3.2. SEAL ALL OUTLET BOXES WITH ACOUSTICAL OR FIRE-RATED PUTTY PADS (E.G. KINETICS TYPE ISOBACKER).

   3.3. NO BRACING SHOULD BE USED BETWEEN STUDS AND CONCRETE WALL WHENEVER POSSIBLE. IF REQUIRED, ONLY RESILIENT WALL BRACES SHOULD BE USED SUCH AS KINETICS UNIBRACE-L, PSB, OR EQUAL.

CONCRETE WALL W/ SINGLE LAYER
GYPSUM BOARD FURRED OUT (1-SIDE)



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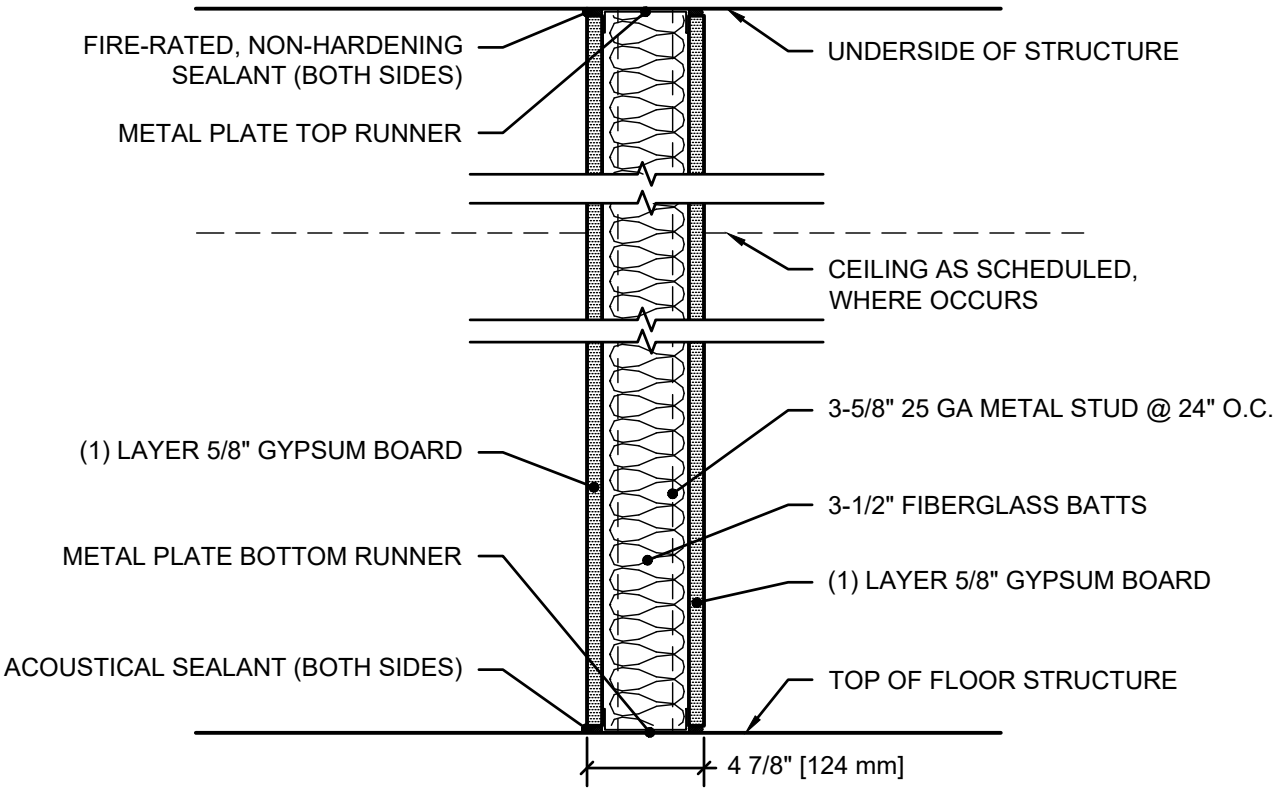
SINGLE LAYER GYPSUM BOARD WALL
SINGLE 3-5/8" METAL STUD



(PARTITION WIDTH IS APPROXIMATE)

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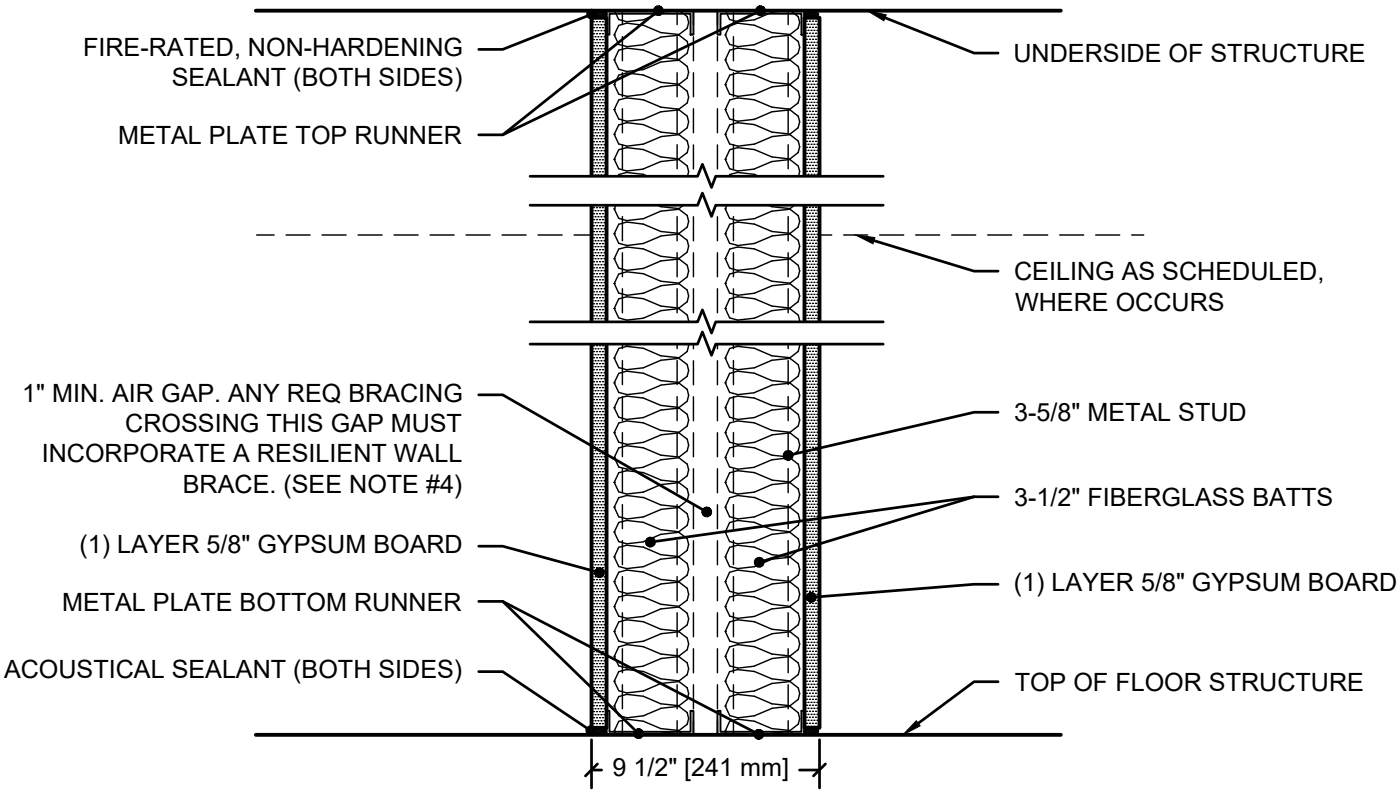
4. WALL ASSEMBLY STC RATING ASSUMES 25GA STUDS, 24" O.C. UNLESS OTHERWISE NOTED. LOWER (I.E. THICKER) GAGE STUDS OR CLOSER STUD SPACING WILL LOWER THE STC RATING OF THE WALL ASSEMBLY.

SINGLE LAYER GYPSUM BOARD WALL
WITH DOUBLE 3-5/8" METAL STUDS



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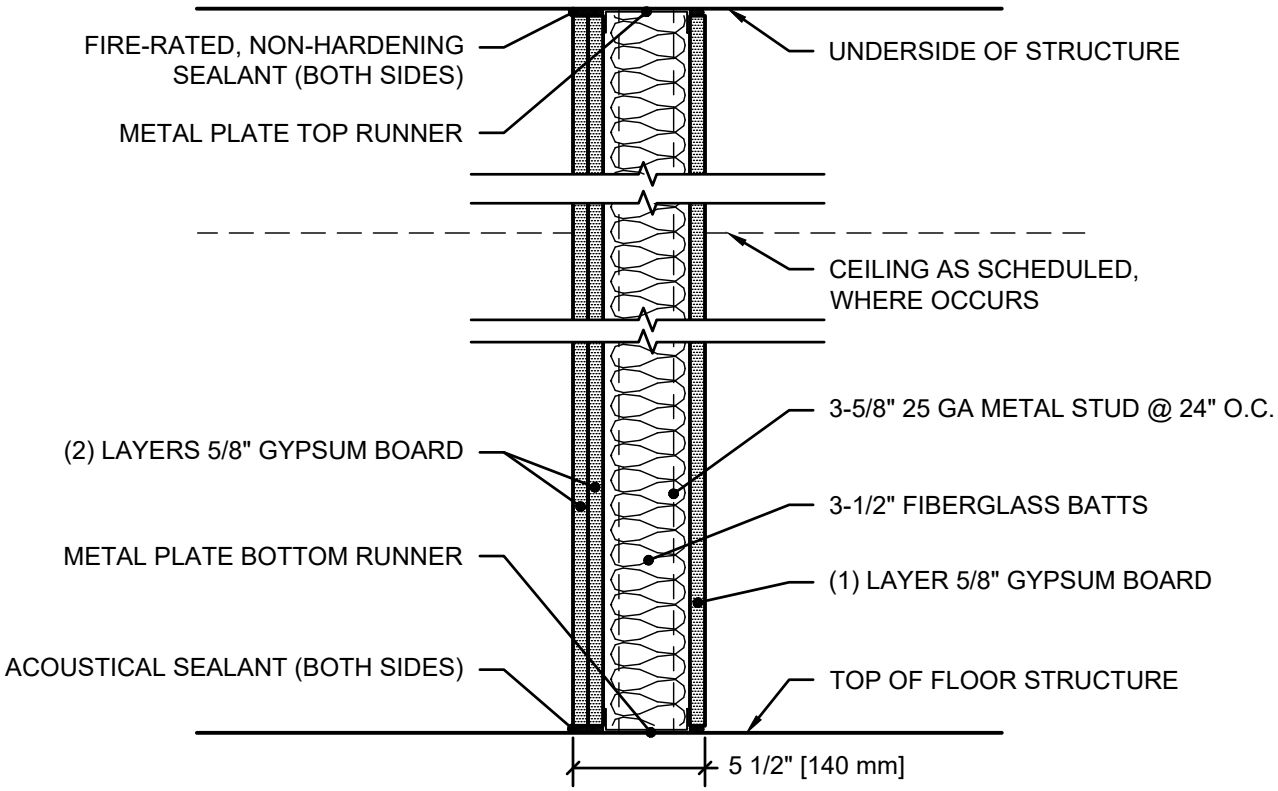
4. NO BRACING SHOULD BE USED ACROSS DOUBLE STUDS WHENEVER POSSIBLE. IF REQUIRED, ONLY RESILIENT WALL BRACES SHOULD BE USED SUCH AS KINETICS UNIBRACE-L, PSB, OR EQUAL.

UNBALANCED GYPSUM BOARD WALL
WITH SINGLE 3-5/8" METAL STUD



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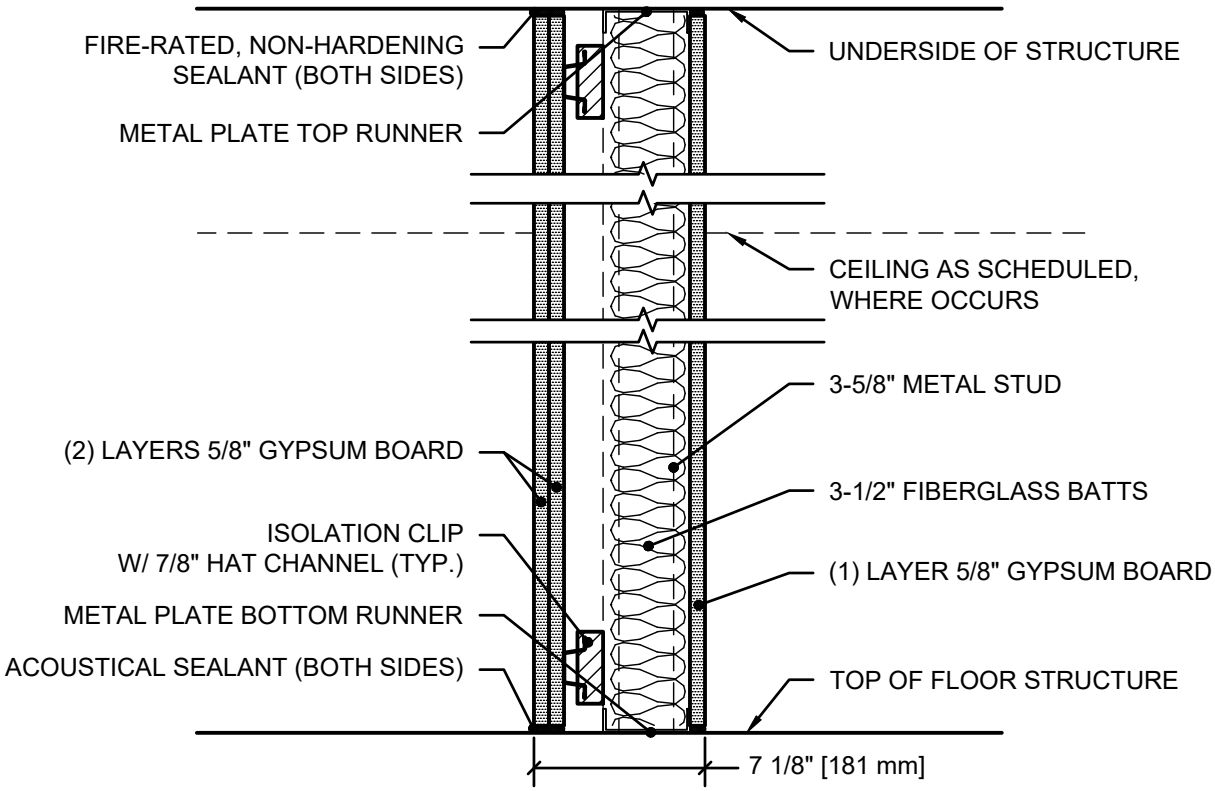
4. ALL JOINTS IN 2-LAYER GYPSUM BOARD PARTITIONS SHALL BE STAGGERED. TAPE & SEAL EACH LAYER SEPARATELY.
5. WALL ASSEMBLY STC RATING ASSUMES 25GA STUDS, 24" O.C. UNLESS OTHERWISE NOTED. LOWER (I.E. THICKER) GAGE STUDS OR CLOSER STUD SPACING WILL LOWER THE STC RATING OF THE WALL ASSEMBLY.

UNBALANCED GYPSUM BOARD WALL
SINGLE 3-5/8" METAL STUD W/ ISOLATION CLIP



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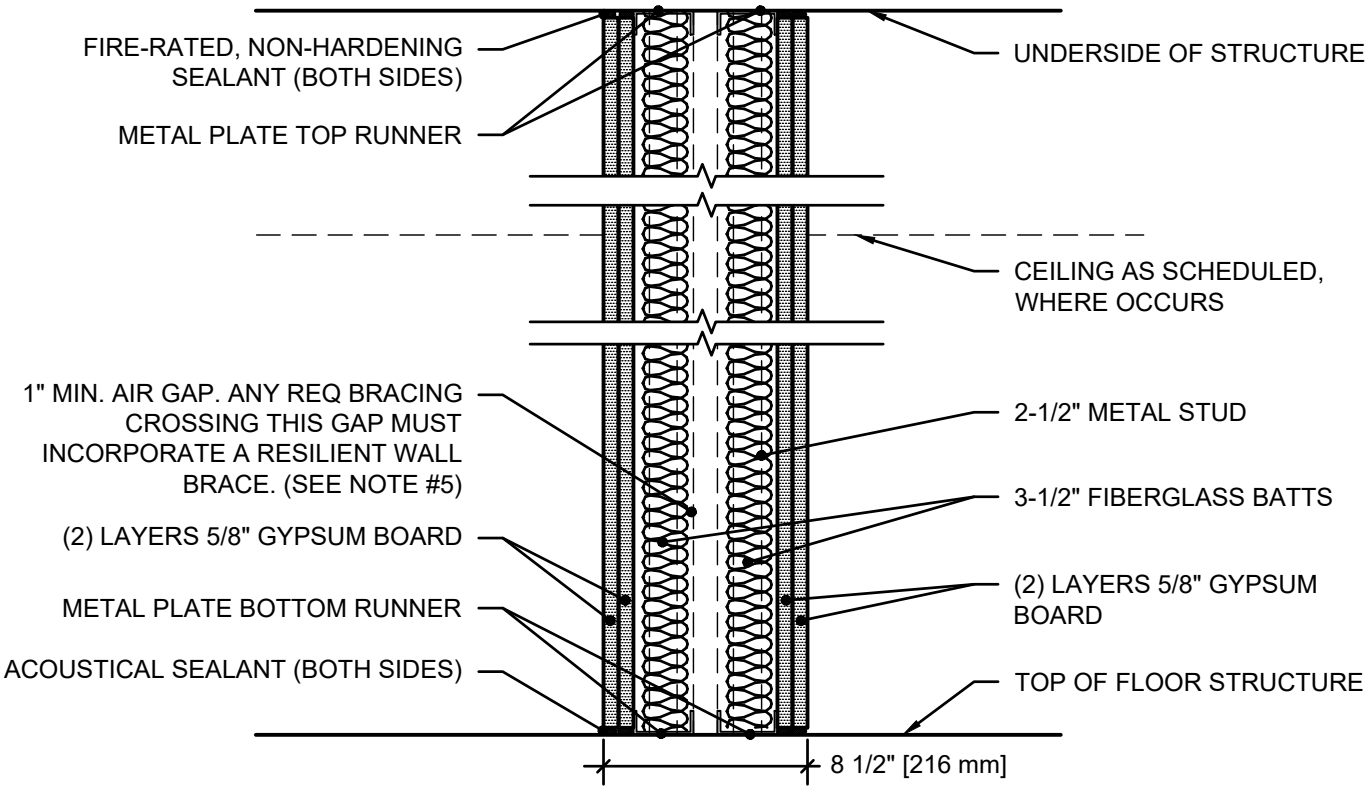
4. ALL JOINTS IN 2-LAYER GYPSUM BOARD PARTITIONS SHALL BE STAGGERED. TAPE & SEAL EACH LAYER SEPARATELY.
5. ACCEPTABLE ISOLATION CLIPS INCLUDE: KINETICS ISOMAX, PLITEQ GENIE CLIP, AND PAC INTL. RSIC-1.

DOUBLE LAYER GYPSUM BOARD WALL
WITH DOUBLE 2-1/2" METAL STUDS



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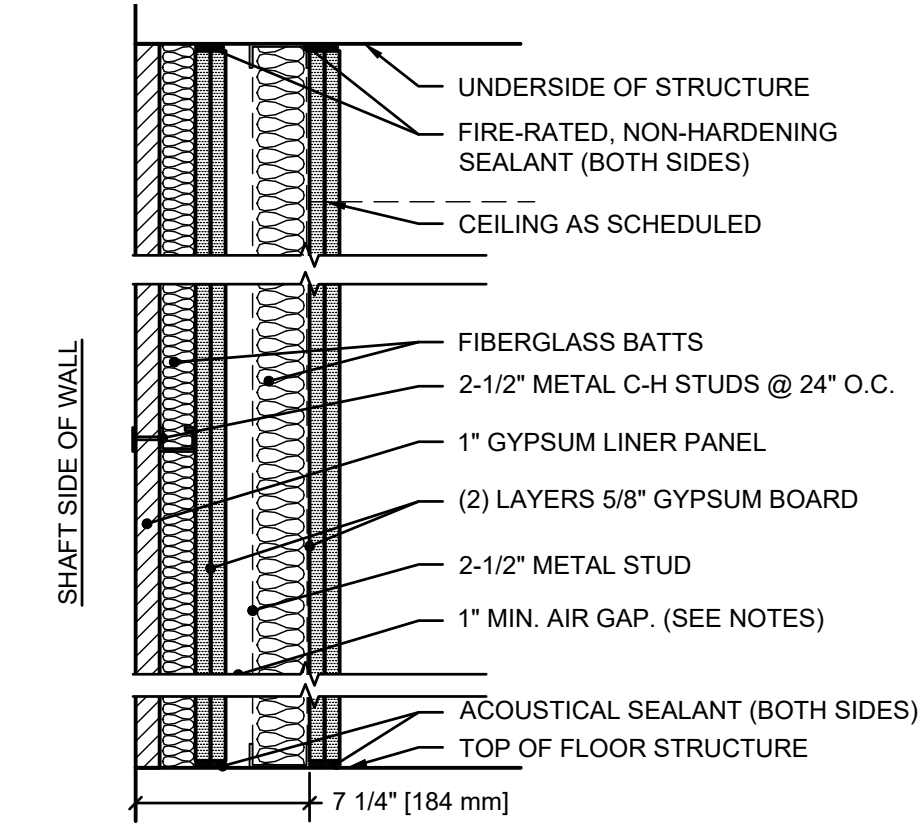
FINE ARTS FACILITY STAIR SHAFT WALL



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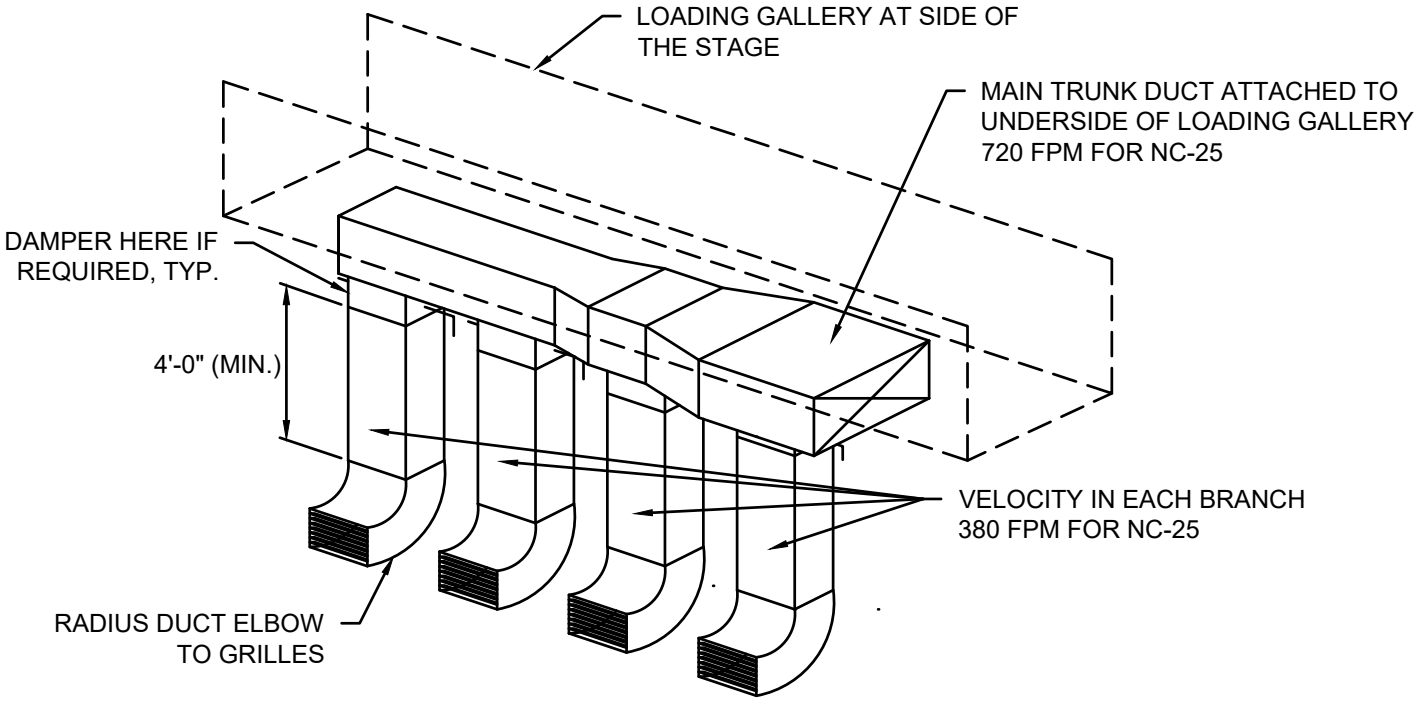
ON-STAGE DUCT CONFIGURATION AND VELOCITIES



NOTES
TOTAL SLOPE AT EACH TRANSITION TO BE 1:4 (15 DEGREES) OR LESS.
ALL DUCTWORK TO BE LINED WITH 1" THICK FIBERGLASS DUCT LINER.

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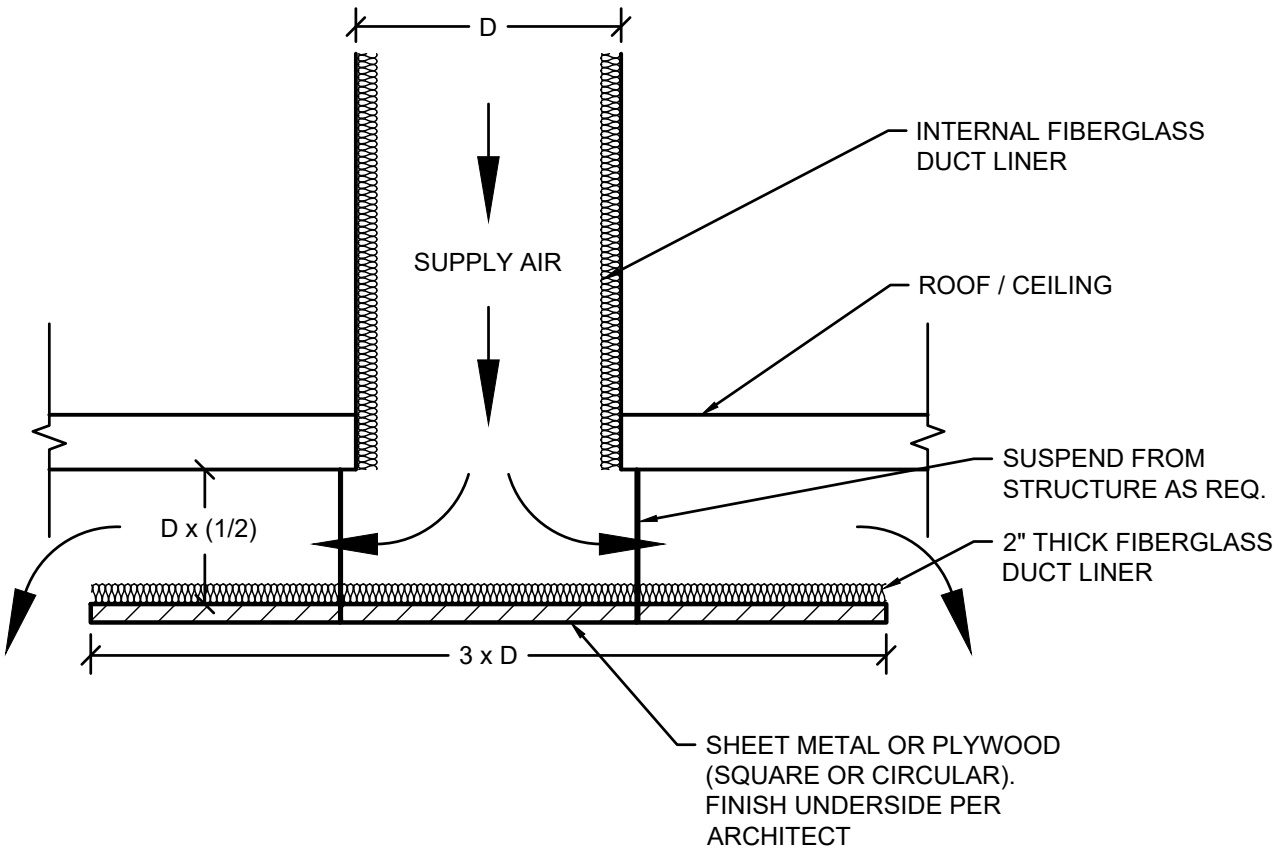
PROJECT: Simon Sanchez High School - Auditorium		
PROJECT NO: 20-019	DATE: February 2021	DETAIL: HVAC-01

TYPICAL HVAC LINED PLAQUE DIFFUSER



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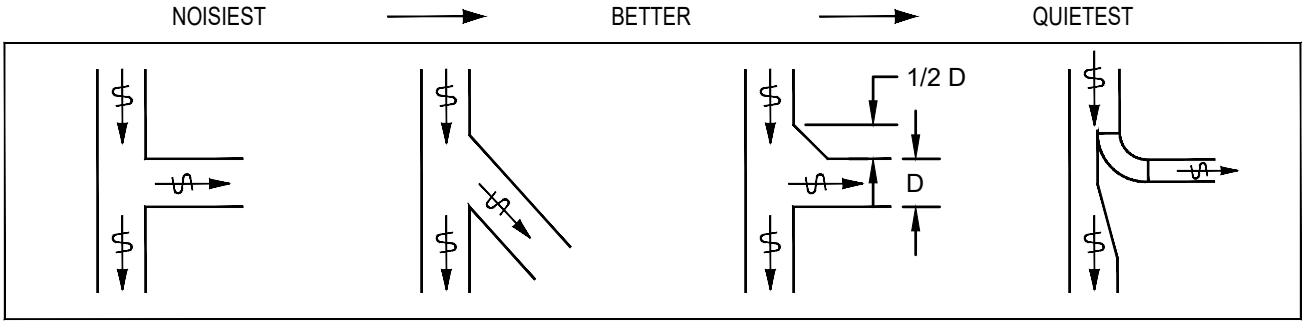
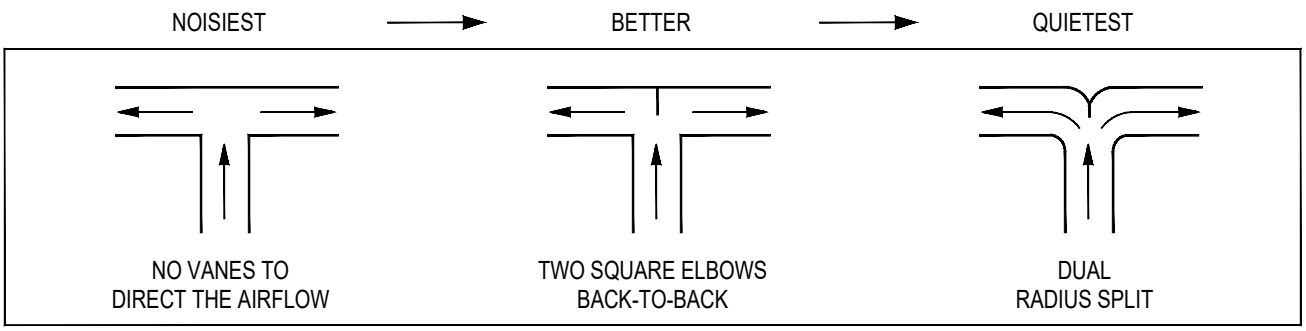
PROJECT: Simon Sanchez High School - Auditorium		
PROJECT NO: 20-019	DATE: February 2021	DETAIL: HVAC-06

DUCT BRANCH AND TRANSITION GUIDELINES

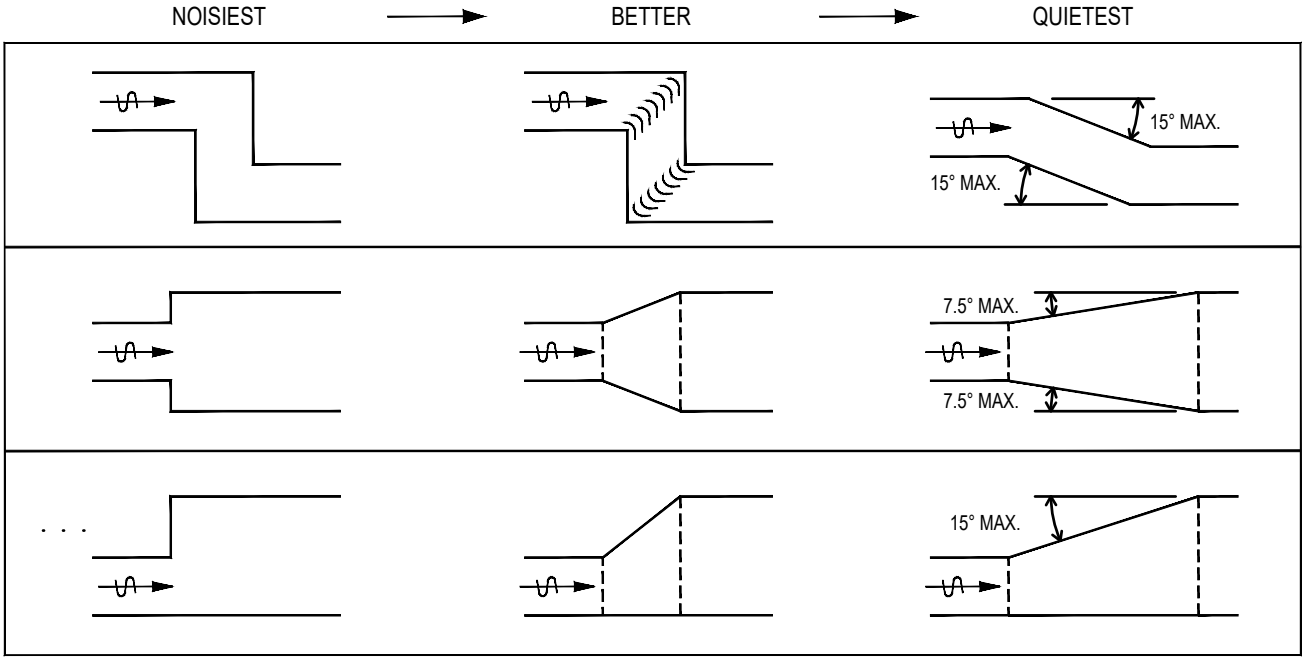
MINIMIZING REGENERATED NOISE IN TAKEOFFS



MINIMIZING REGENERATED NOISE IN TEE BRANCHES



MINIMIZING REGENERATED NOISE IN TRANSITIONS AND OFFSETS



Source: A Practical Guide to Noise and Vibration Control for HVAC Systems, Mark E. Schaffer, 1991

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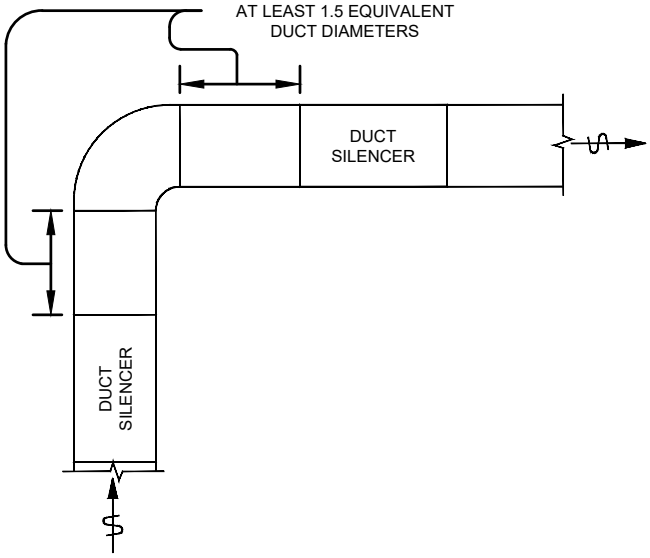
PROJECT: Simon Sanchez High School - Auditorium		
PROJECT NO: 20-019	DATE: February 2021	DETAIL: HVAC-72

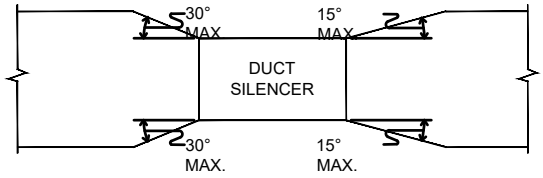
DUCT SILENCER PLACEMENT NEAR DUCT FITTINGS AND TRANSITIONS



NOTE:
DUCT SILENCER BAFFLES SHOULD BE PARALLEL TO THE PLANE OF THE ELBOW TURN.

DUCT SILENCERS AT RADIUS TURNS AND SQUARE TURNS WITH TURNING VANES





UPSTREAM AND DOWNSTREAM OF TRANSITIONS

Source: A Practical Guide to Noise and Vibration Control for HVAC Systems, Mark E. Schaffer, 2005

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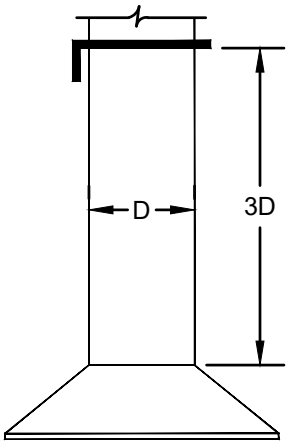
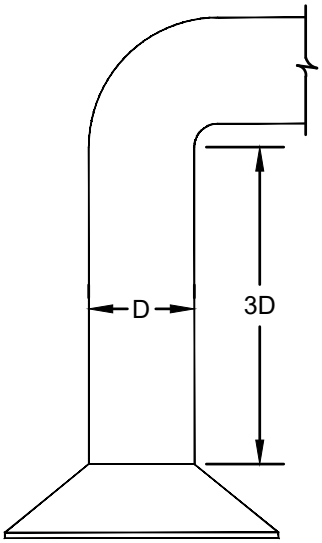
PROJECT: Simon Sanchez High School - Auditorium		
PROJECT NO: 20-019	DATE: February 2021	DETAIL: HVAC-73

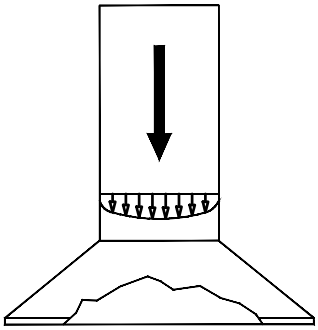
DIFFUSOR DUCT GUIDELINES

DUCTED DISCHARGE

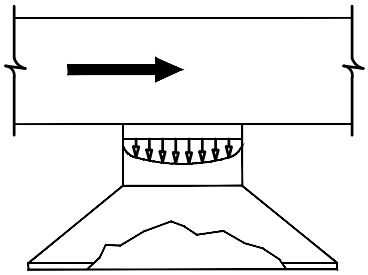




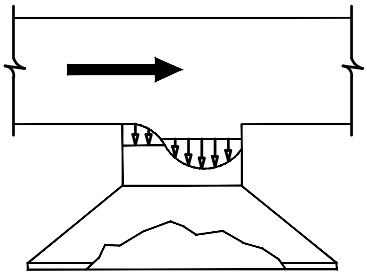
AIR FLOW PATTERNS



BASIS OF MANUFACTURER'S RATING

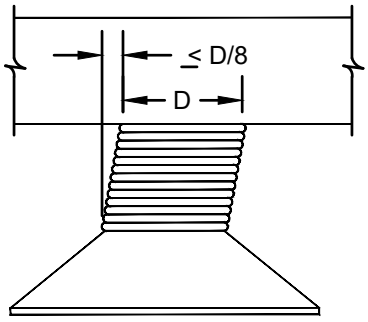


SOUND LEVELS SAME AS MANUFACTURER'S RATING WITH EQUALIZING GRID

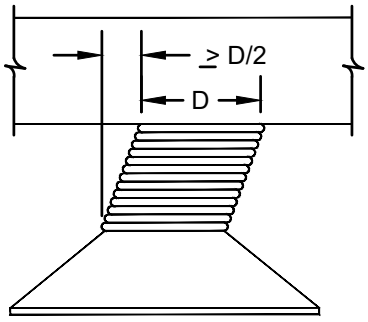


SOUND LEVELS UP TO 12dB HIGHER WITH NO EQUALIZING GRID

FLEX DUCT CONNECTORS



SOUND LEVELS SAME AS MANUFACTURER'S RATINGS



SOUND LEVELS 12 TO 15 dB HIGHER THAN MANUFACTURER'S RATINGS

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PROJECT: Simon Sanchez High School - Auditorium

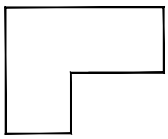
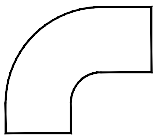
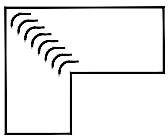
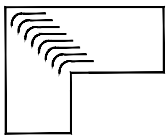
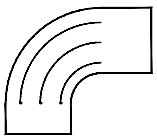
PROJECT NO:	DATE:	DETAIL:
20-019	February 2021	HVAC-74

MAXIMUM DUCT VELOCITIES

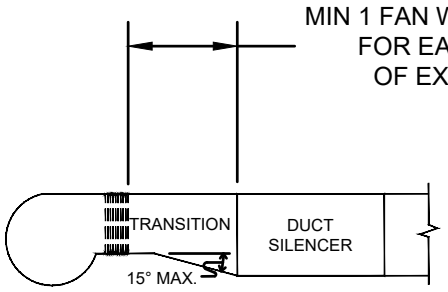
MAXIMUM AIRFLOW VELOCITIES FOR STRAIGHT DUCT SECTIONS AT VARIOUS LOCATIONS

DUCT LOCATION ⇨		IN SHAFT OR ABOVE SOLID DRYWALL CEILING			ABOVE SUSPENDED ACOUSTICAL CEILING		
NC RATING IN ADJACENT OCCUPANCY		45	35	25	45	35	25
MAXIMUM AIRFLOW VELOCITY IN FEET PER MINUTE	RECTANGULAR	3500	2500	1700	2500	1750	1200
	CIRCULAR	5000	4500	2500	4500	3500	2000

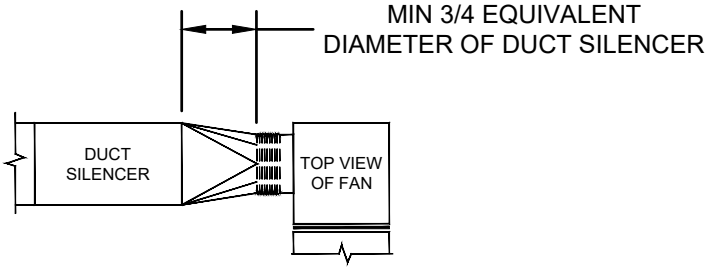
MAXIMUM AIRFLOW VELOCITIES IN RECTANGULAR ELBOWS TO MEET VARIOUS RC RATINGS

LOWEST NC RATING SERVED BY DUCT SYSTEM ⇨		50+	45	40	35	30	25	20 OR LESS
 SQUARE	MAXIMUM VELOCITY IN FPM	2000	1600	1300	1000	800	600	-----
 RADIUS		2500	2000	1700	1300	1000	800	500
 SQUARE, SHORT VANES		2500	2000	1700	1300	1000	800	500
 SQUARE; LONG VANES		2800	2400	2300	1700	1200	1000	600
 RADIUS WITH VANES		3000	2600	2500	1800	1500	1200	600

DUCT SILENCER PLACEMENT NEAR MECHANICAL EQUIPMENT OUTLETS AND INLETS

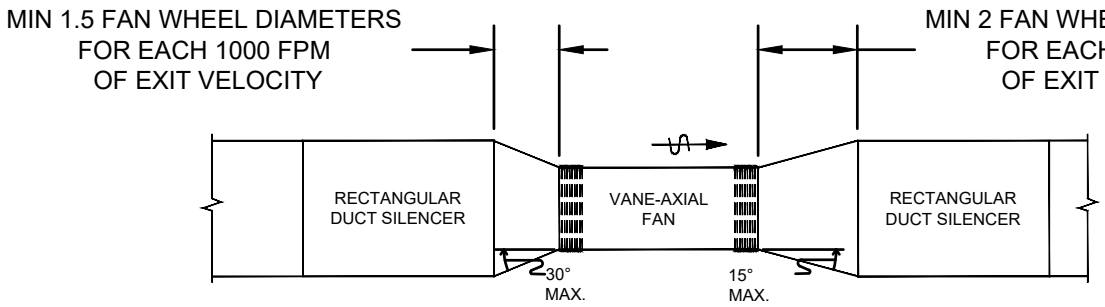


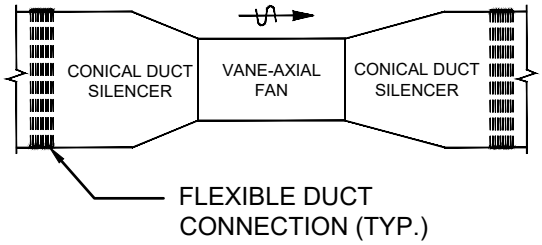
CENTRIFUGAL FAN DISCHARGE

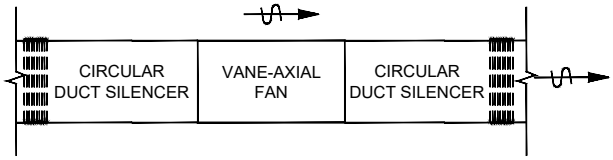


CENTRIFUGAL FAN INLET

NOTE:
SOUND ATTENUATOR BAFFLES SHOULD BE PERPENDICULAR TO FAN SHAFT.







Source: A Practical Guide to Noise and Vibration Control for HVAC Systems, Mark E. Schaffer, 2005

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PROJECT: Simon Sanchez High School - Auditorium

PROJECT NO:	DATE:	DETAIL:
20-019	February 2021	HVAC-78

WILLIAMSSOUND

SPECIFICATION DATA

Simultaneous Interpretation • Audio Description • Conferences • Multi-Media Rooms
• Boardrooms • Courtrooms • Schools • Universities • Cinemas • Churches

WIR RX22-4

SoundPlus™ Infrared Receiver



The RX22-4 is a four-channel infrared receiver, compatible with transmitters operating on the 2.3-3.8 MHz frequency bandwidth. The sleek, comfortable design features a convenient rotary channel selector and an easy-to-use on/off/volume control. The RX22-4 can be used with mono or stereo headphones and earphones, or a neckloop. Dual infrared detectors provide maximum sensitivity and operating range.

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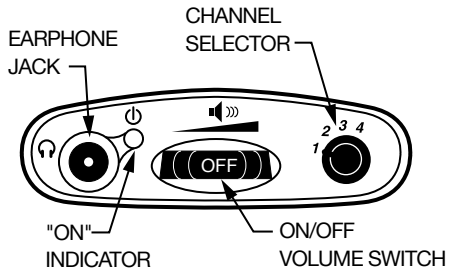
SoundPlus™ Infrared Receiver

WIR RX22-4 Receiver:

RX22-4 TOP



RX22-4 FRONT



Receiver Style:	Body-Pack, dual-lens detector, lanyard
Size:	4.1" L x 2.85" W x 1.2" H (104.1 mm x 72.4 mm x 30.4 mm)
Weight:	4.5 oz (127 g) with batteries
Color and Material:	Black
Lanyard:	3 ft (.91 m), allows receiver to be worn around the neck
Operating Temperature:	-10° C to +50° C
Battery Type:	2 x AA, alkaline (BAT 001) or NiMH (BAT 026)
Battery Life:	Alkaline: 60 hours, NiMH: 30 hours/charge
Battery Drain:	25 mA, nominal
Charging Contacts:	For use only with CHG 3512
Carrier Frequency:	Channel 1: 2.3 MHz, Channel 2: 2.8 MHz
	Channel 3: 3.3 MHz, Channel 4: 3.8 MHz
De-Emphasis:	50 uS
FM Deviation:	±50 kHz
Signal-to-Noise Ratio:	60dB min.
Squelch:	Receiver squelches (mutes) at 28 dB S/N ratio
Frequency Response:	25 Hz to 16 KHz, +1 dB, -3 dB, electrical response
Total Harmonic Distortion:	Less than 1%, electrical response
Controls:	ON/OFF/VOLUME: combination thumbwheel knob
	Channel Selector: four-position rotary switch
Indicators:	Red LED "ON" indicator, flashes to indicate Low battery
Audio Output Jacks:	3.5 mm stereo mini phone jack Accepts 3.5 mm mono or stereo phone plug
Audio Output Power:	15 mW max at 32 Ω
Acoustic Output:	125 dB SSPL90 with HED 021; 110 dB SSPL90 w/ EAR 013
Sensitivity:	Better than 1 nW/cm2 for 40 dB signal-to-noise ratio
Approvals:	CE, FCC, RoHS, WEEE
Warranty:	5 years on receiver, 90 days on accessories
Compatible Headphones/ Earphones:	Mono or stereo, 8-32 ohms, 3.5 mm mini phone plug, HED 021, HED 026, EAR 013, EAR 014, EAR 022, NKL 001

NOTE: SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE!

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SoundPlus™ Infrared Receiver

Bid Specs:

The receiver shall be a body-pack type with IR detector lens behind face of the unit. The unit shall have a lanyard for hands-free operation. The receiver shall have a rotary-type volume control. The receiver shall operate for 60 hours with two AA alkaline batteries and for 30 hours per charge with NiMH AA batteries. The receiver shall be charged without battery removal via charger contacts in the case. A drop-in charger accessory shall recharge the batteries in 16 hours when used with CHG 3512 charger. The receiver shall be housed in an impact resistant plastic case with a hinged battery door that does not separate from the receiver. The receiver shall receive 2.3 MHz, 2.8 MHz, 3.3 MHz or 3.8 MHz modulated IR signals with 50 µS de-emphasis. The receiver shall have a 3.5 mm stereo phone jack and accommodate low-impedance mono or stereo earphones and headphones. The receiver shall accommodate neckloop telecoil couplers. The receivers shall provide 125 dB SSPL90 output with HED 021 headphone and 110 dB SSPL90 with EAR 013 earbud-type earphone.

The system electrical frequency response shall be 25 Hz to 16 kHz, +1, -3 dB and the S/N ratio shall be 60 dB. The receiver shall have CE, FCC RoHS and WEEE approval. The receiver shall be covered by a five-year parts and labor warranty, excluding earphones, headphones, batteries and chargers.

The receiver shall be the Williams AV model WIR RX22-4.

Domestic Sales
Williams AV
10300 Valley View Rd
Eden Prairie, MN 55344
Ph: 800-328-6190 / 952-943-2252
FAX: 952-943-2174
Email: info@williamsav.com
Web: www.williamsav.com

International Sales
International Sales Department
Williams AV
10300 Valley View Rd
Eden Prairie, MN 55344 USA
Phone: +1 952 943 2252
Fax: +1 952 943 2174
Email: info@williamsav.com
Web: www.williamsav.com

WILLIAMSAV

info@williamsav.com / www.williamsav.com
800-843-3544 / INTL: +1-952-943-2252

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ERK Series
enclosure

The ERK Series 19" welded stand-alone / gangable enclosures. Advanced manufacturing techniques provide highest quality and lowest price.

features:

- Fully welded construction
- 2,500 lb. weight capacity
- 1/8" thick structural steel internal braces
- UL Listed in the US and Canada
- Seismic certified (when used with ERK-Z4 option) with an Ip value of 1.5
- 22" OD width, available 20", 25" or 28" OD depth
- 1/2" , 3/4", 1" & 1-1/2" electrical knockouts on removable split rear plates top and bottom, easily removable for cable pass-through. Top plates additionally include UHF / VHF knockouts
- Standard front, optional rear 11-gauge 10-32 threaded, fully adjustable rackrail with numbered rackspace increments
- Keylocked solid rear door standard, optional vented rear doors available
- Optional front doors available
- Configurable top options on 44, 40, and 35 space sizes
- Durable black textured powder coat finish



ERK-4425

specifications:

EIA compliant 19" stand-alone / gangable equipment rack shall be Middle Atlantic Products model # ERK-__-__(see chart for available models). Overall dimensions of rack shall be __"H x __"W x __"D (refer to chart). Useable height shall be __ rackspaces, useable depth shall be __" (refer to chart). Rack shall be of fully welded construction. Weight capacity shall be 2,500 lbs. ERK shall be finished in a durable black powder coat. ERK shall come equipped with one pair of fully adjustable 11-gauge steel rackrail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rackspaces. ERK shall include solid locking rear door standard and solid sides with vertical slotted vent pattern at top and bottom (and laser knockouts for cable pass-through on 44, 40, and 35 space models). Top and bottom of ERK shall feature vertical slotted vent pattern. ERK shall have removable split rear knockout panels with 1/2", 3/4", 1", and 1-1/2" electrical knockouts installed in base and a removable rear knockout panel with 1/2", 3/4", 1", and 1-1/2" electrical knockouts and BNC knockouts for UHF/VHF antennae installed in top. Grounding and bonding stud shall be 1/4-20 threaded (1 location), bonding stud shall be 10-32 threaded (3 locations). ERK Series enclosures shall satisfy the 2005 & 2010 Editions of ASCE Standard 7; 2006, 2009 & 2012 editions of the IBC; 2007, 2010 & 2013 editions of the CBC; 2010 editions of the NBC and 2012 edition of the BCBC for use in areas of high seismicity, Occupancy Category IV facilities. Seismic design force is an assumed Site Class D soil conditions, and top floor or rooftop installations. Design for High Importance or Post-disaster installation uses an importance factor (Ip or Ie) of 1.5 when used with ERK-Z4 seismic floor anchor bracket. ERK shall be UL Listed in the US to UL2416 (NWIN) and Canada to CSA C22.2 No. 60950-1. ERK shall be GREENGUARD Gold Certified. ERK Series Series shall meet the RoHS EU Directive 2011/65/EU. ERK shall be manufactured by an ISO 9001 and ISO 14001 registered company. ERK shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

Customizable specification clips available at middleatlantic.com

EIA/TIA COMPLIANT

SEISMIC CERTIFIED

RoHS

c UL us LISTED

GREENGUARD GOLD

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

PEP ecoPASSPORT®

options:

- Front doors shall be model #FD-XX (solid), VFD-XX (vented, 22% open area), LVFD-xx (vented 63% open area-not available for 27 space rack) PVFD-44 (vented plexi), (X=# of rackspaces of ERK rack)
- Rear door, vented, shall be ERK-VRD-XX, Cable management shall be ERK-RDC-XX (XX= # of rackspaces of ERK Rack)
- Top panels for 35, 40 or 44 space ERK, multiple styles available including model #ERK-ST (solid), ERK-10FT (10" fan), ERK-6FT (two 6" fans) ERK-4FT (three 4-1/2" fans), ERK-VT (vented) and ERK-LVT (large perf vented) see A&E spec 96-01063 for more details
- Caster base, four casters shall have a total weight capacity of 1300 pounds, model # CBS-ERK-YY (Y= cabinet depth), raises racks 3.9" (commercial grade) or 4.1" (fine floor)
- Rear rail kit, 11-gauge, 10-32 threaded, sold in pairs, hardware included, model #ERK-RRXX (X=# of rackspaces)
- Seismic compliancy floor anchor kit, model # ERK-Z4
- 18, 21 and 27 space ERK come preconfigured with solid top that includes knockouts to accommodate up to two 4-1/2" fans, or included vent panels
- Optional bonding kit for UL-2416 (NWIN) compliance shall be PET-K-RD (for rear door to enclosure), PET-K-RDC (for cable management rear door to enclosure), PET-K-EXT (for extender bay to enclosure)
- Extender bay adds 3" of usable depth, front mount shall be ERK-(44, 40)-F-EXT3, rear shall be ERK-(44,40)-R-EXT3
- Grommet for 4" electrical knockout in side of ERK shall be model # GK4 and include 4 pieces
- Gland grommet for 4" electrical knockout in side of ERK shall be model #GK-4G. 4 Pieces.
- Slide out option available (See AXS Spec sheet 96-055S)

ERK Series

configured A/V enclosure

Configured A/V enclosure ships complete with the most commonly used accessories.

features:

- Integrated fan top
- Configurable rear door with bottom vent, solid locking front door
- 3-1/4" wide vertical lacer strip (height varies based on model)
- Six horizontal lacer bars
- Twelve 8" Velcro® cable management straps
- Thin power strip, 20 Amp, 20 outlet with cord (44 space enclosures) or 2 qty. thin power strip, 20 Amp, 10 outlet with cord (35 & 40 space enclosures)
- Leveling feet
- 100 qty. 10-32 mounting hardware



ERK-4425-AV

specifications:

EIA compliant 19" stand-alone / gangable equipment rack shall be Middle Atlantic Products model # ERK-__-__-AV(see chart for available models). Overall dimensions of rack shall be __"H x __"W x 25"D (refer to chart). Useable height shall be __ rackspaces, useable depth shall be 23-1/2". Rack shall be of fully welded construction. Weight capacity shall be 2,500 lbs. ERK shall be finished in a durable black powder coat. Solid front door and vented, locking and latching rear door and all structural elements shall be finished in a durable black powder coat. Rack shall come equipped with two pairs of 11-gauge steel rackrail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rackspaces. Rack shall include 100 qty. 10-32 mounting screws. Rack shall be equipped with one 3-1/4" vertical lacer strip Middle Atlantic Products model # LACE-__-OP (refer to chart), four 'L' shaped straight and two 4" offset horizontal lacer bars and twelve, 8" Velcro® straps for cable management. The ERK shall have a solid locking rear door standard and solid side panels with vertical slotted vent pattern at top and bottom with laser knockouts for cable pass-through. Rack shall have feature integrated fan top, Middle Atlantic Products model # ERK-4FT-285CFM for active thermal management. The ERK-4FT-285CFM shall consist of three 4-1/2" fans and airflow shall be 285 CFM. Rack shall have removable split rear knockout panels with 1/2", 3/4", 1" and 1-1/2" electrical knockouts and top BNC knockouts for UHF/VHF antennae. Grounding and bonding stud shall be 1/4-20 threaded (1 location), bonding stud shall be 10-32 threaded (3 locations). ERK Series enclosures shall satisfy the 2005 & 2010 Editions of ASCE Standard 7; 2006, 2009 & 2012 editions of the IBC; 2007, 2010 & 2013 editions of the CBC; 2010 editions of the NBC and 2012 edition of the BCBC for use in areas of high seismicity, Occupancy Category IV facilities. Seismic design force is an assumed Site Class D soil conditions, and top floor or rooftop installations. Design for High Importance or Post-disaster installation uses an importance factor (Ip or Ie) of 1.5 when used with ERK-Z4 seismic floor anchor bracket. . ERK-__-AV shall include a high-density thin power distribution and shall be Middle Atlantic Products model # PDT-____-NS with __ outlets and 20 amps (refer to chart). Thin power distribution shall be ____" long (refer to chart) x 1" deep x 1.9" wide. J-Box shall be 2" deep x 2" wide. Thin power distribution shall feature __ NEMA 5-20R outlets. Corded power strip includes 20 amp protection and mounting hardware. Corded model shall be terminated with 10-foot power cord and a NEMA 5-20P plug. PDT Series shall feature a black anodized finish. ERK shall be UL Listed in the US to UL2416 (NWIN) and Canada to CSA C22.2 No. 60950-1. ERK shall be GREENGUARD Gold Certified. ERK shall be RoHS EU Directive 2002/95/EC and 2011/65/EU compliant. ERK shall be manufactured by an ISO 9001 and ISO 14001 registered company. ERK shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the product.

Customizable specification clips available at middleatlantic.com

EIA/TIA COMPLIANT

SEISMIC CERTIFIED

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GREENGUARD GOLD

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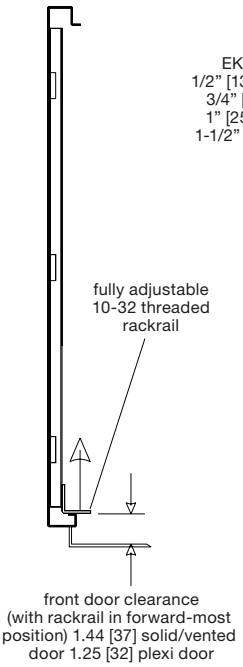
UL 2818

PEP eco PASS PORT®

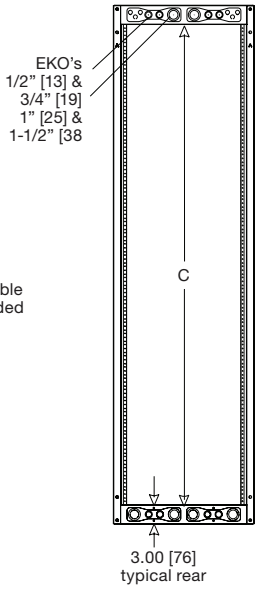
ERK Series
basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]

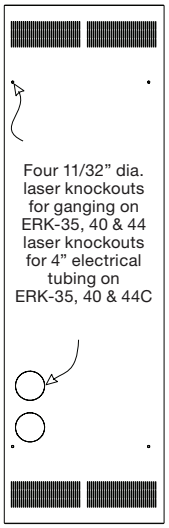
top view of ERK side sectional view



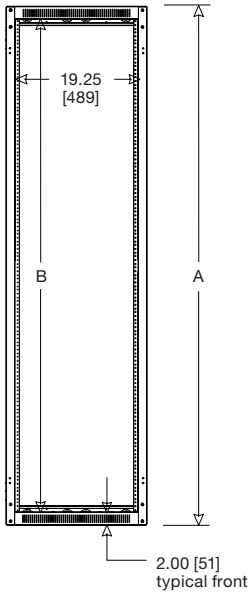
rear view



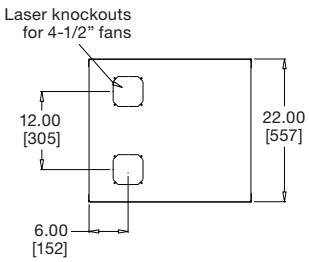
side view



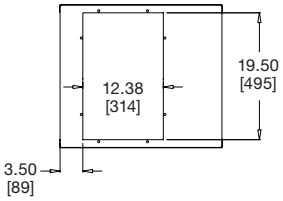
front view



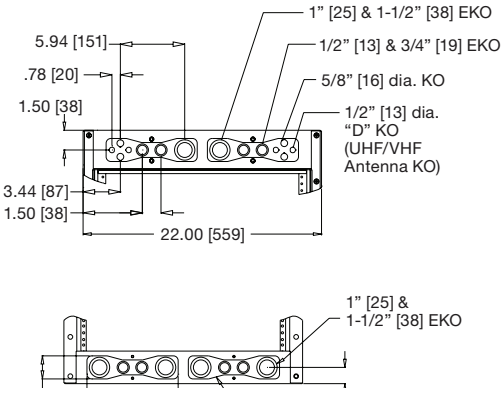
top view
ERK-18XX / ERK-21XX / ERK-27XX



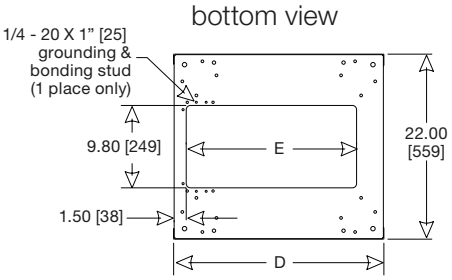
top view
ERK-35XX / ERK-40XX / ERK-44XX



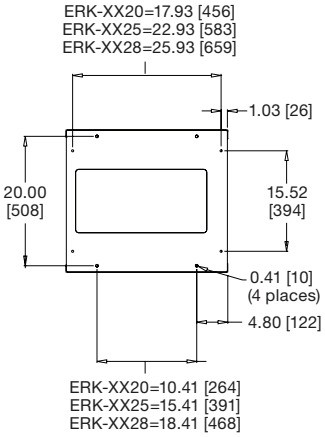
rear view



bottom view



bottom view
mounting holes

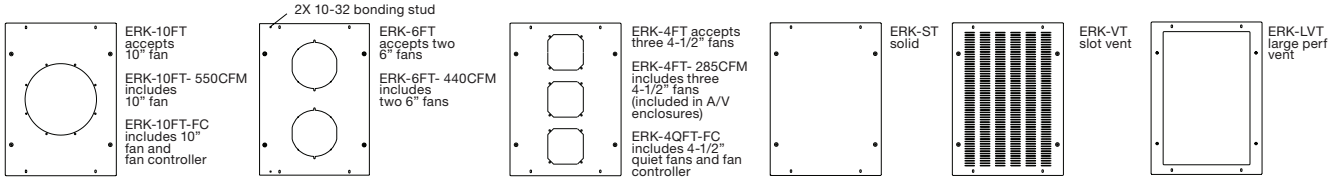


ERK Series
basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]

Part #	A Overall Height	B Useable Height	C Rear Height	D Overall Depth	E Bottom Opening Depth	Useable Depth
ERK-4428	81.130 [2061]	77.130 [1959]	75.130 [1908]	28.00 [711]	23.25 [591]	26.47 [672]
ERK-4028	74.130 [1883]	70.130 [1781]	68.130 [1731]	28.00 [711]	23.25 [591]	26.47 [672]
ERK-3528	65.380 [1661]	61.380 [1559]	59.380 [1508]	28.00 [711]	23.25 [591]	26.47 [672]
ERK-2728	51.380 [1305]	47.380 [1203]	45.380 [1153]	28.00 [711]	23.25 [591]	26.47 [672]
ERK-2128	40.880 [1038]	36.880 [937]	34.880 [886]	28.00 [711]	23.25 [591]	26.47 [672]
ERK-1828	35.630 [905]	31.630 [803]	29.630 [753]	28.00 [711]	23.25 [591]	26.47 [672]
ERK-4425	81.125 [2061]	77.125 [1959]	75.125 [1908]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-4025	74.125 [1883]	70.125 [1781]	68.125 [1703]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-3525	65.375 [1661]	61.375 [1559]	59.375 [1508]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-2725	51.375 [1305]	47.375 [1203]	45.375 [1153]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-2125	40.875 [1038]	36.875 [937]	34.875 [886]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-1825	35.625 [905]	31.625 [803]	29.625 [752]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-4420	81.125 [2061]	77.125 [1959]	75.125 [1908]	20.00 [508]	15.25 [387]	18.47 [469]
ERK-4020	74.125 [1883]	70.125 [1781]	68.125 [1703]	20.00 [508]	15.25 [387]	18.47 [469]
ERK-3520	65.375 [1661]	61.375 [1559]	59.375 [1508]	20.00 [508]	15.25 [387]	18.47 [469]
ERK-2720	51.375 [1305]	47.375 [1203]	45.375 [1153]	20.00 [508]	15.25 [387]	18.47 [469]
ERK-2120	40.875 [1038]	36.875 [937]	34.875 [886]	20.00 [508]	15.25 [387]	18.47 [469]
ERK-1820	35.625 [905]	31.625 [803]	29.625 [752]	20.00 [508]	15.25 [387]	18.47 [469]
ERK-4425-AV	81.125 [2061]	77.125 [1959]	75.125 [1908]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-4025-AV	74.125 [1883]	70.125 [1781]	68.125 [1703]	25.00 [635]	20.25 [514]	23.47 [596]
ERK-3525-AV	65.375 [1661]	61.375 [1559]	59.375 [1508]	25.00 [635]	20.25 [514]	23.47 [596]

top view
(35, 40, and 44 space only)

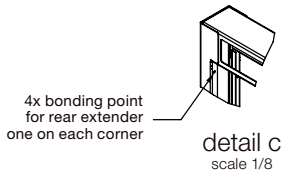


ERK A/V Enclosure Power Distribution						
Rack Part #	Part #	Terminated	Circuit	Outlets	Overall Length	Qty
ERK-4025-AV / ERK-3525-AV	PDT-1020C-NS 5-20P	20 Amp	10, 5-20R	37.75 [959]	2	26.47 [672]
ERK-4425-AV	PDT-2020C-NS 5-20P	20 Amp	20, 5-20R	72.75 [1848]	1	23.47 [596]

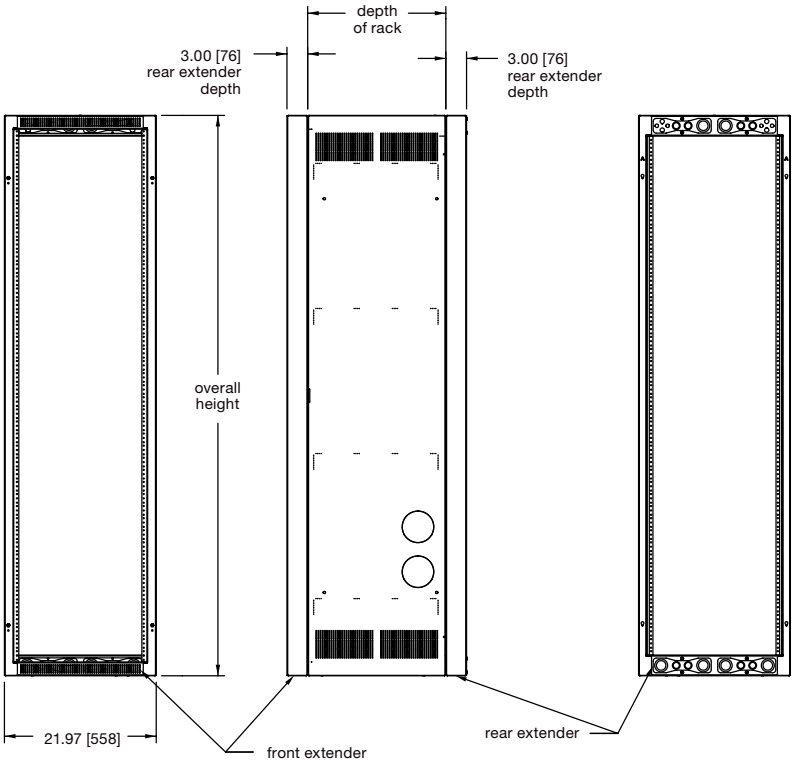
ERK A/V Enclosure Vertical Lacer Bar Chart			
Part #	Lacer Bar	# of Rackspaces	Width
ERK-4425-AV	LACE-44-OP	44	3.25 [83]
ERK-4025-AV	LACE-40-OP	40	3.25 [83]
ERK-3525-AV	LACE-37-OP	37	3.25 [83]

ERK Series
basic dimensions

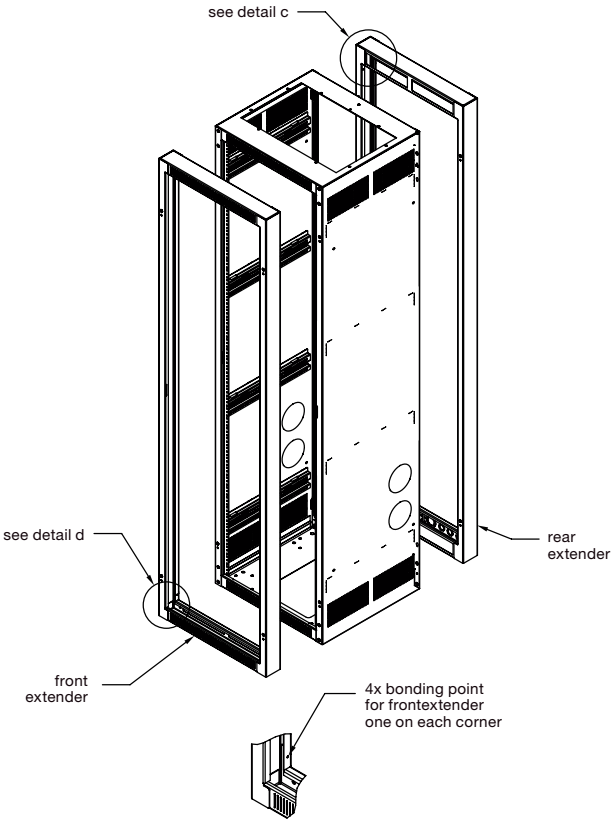
all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]



detail c
scale 1/8



front view | side view | rear view

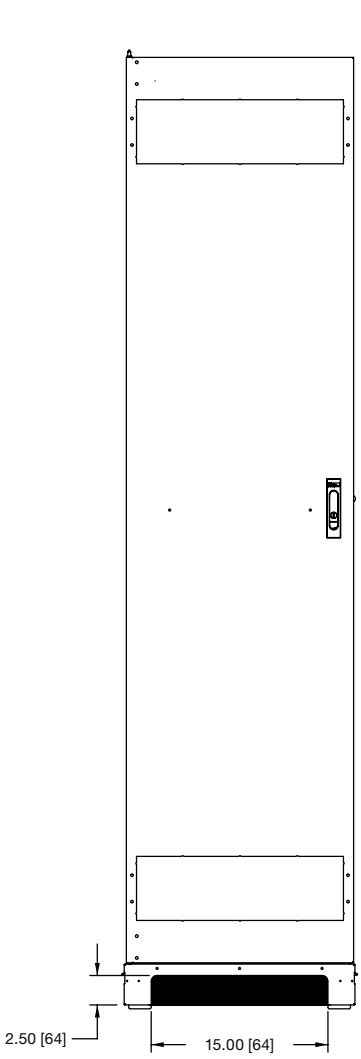


detail d
scale 1/8

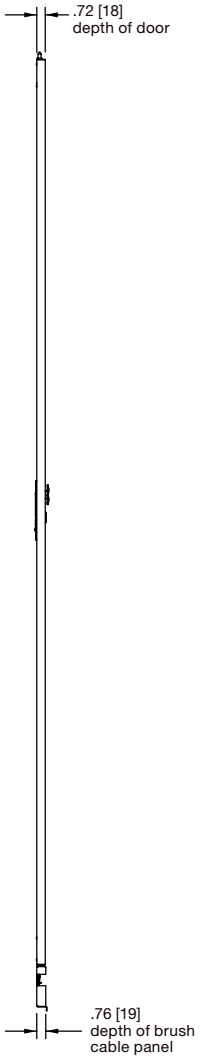
Part #	Rackspaces	Overall Height	Used On	Mounting Location
ERK-44-F-EXT3	44	81.13 [2061]	ERK-44XX	front
ERK-44-R-EXT3	44	81.13 [2061]	ERK-44XX	rear
ERK-40-F-EXT3	40	74.13 [1883]	ERK-40XX	front
ERK-40-R-EXT3	40	74.13 [1883]	ERK-40XX	rear

ERK Series
basic dimensions

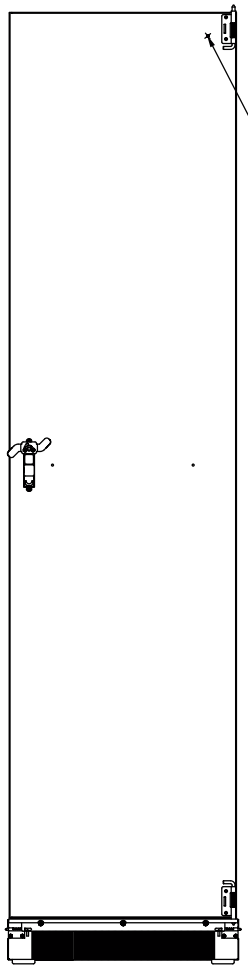
all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]



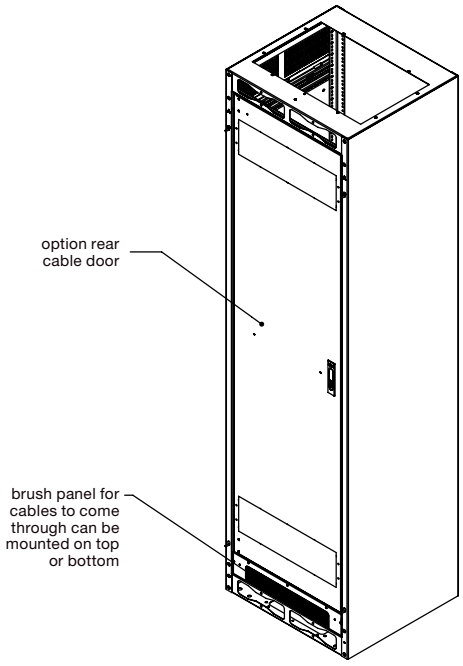
front view



side view



rear view



NOTE: Brush panel can be mounted on top or bottom of rack

Part #	Used On
ERK-RDC18	ERK-18XX
ERK-RDC21	ERK-21XX
ERK-RDC27	ERK-27XX
ERK-RDC35	ERK-35XX
ERK-RDC40	ERK-40XX
ERK-RDC44	ERK-44XX



DN-500BD MKII

Blu-Ray, DVD and CD/SD/USB Player

Key Features:

- Plays Blu-Ray, DVD, CD and files from SD/USB media
- Supported Blu-Ray disc formats: BD25, BD50, BD-RE, BD-ROM and BD-R
- Supported DVD formats: DVD, DVD+R, DVD+RW and DVD-RW
- Supported audio disc formats: CD, CD-R, CD-RW, DTS Music Disc (DTS Audio CD, 5.1 Music Disc), HDCD, Super Video CD (SVCD) and Video CD (VCD)
- SD/USB supported video, audio and picture file formats: .3gp, .asf, .avi, .dat, .divx, .mkv, .mov, .mp4, .mpg, .m2ts, .ogm, .rmvb, .tp, .ts, .wmv, .ass, .smi, .srt, .ssa, .sub, .ape, .flac, .m4a (AAC), .mp3, .wav, .gif, .jpg (or .jpeg) and .png
- USB/SD file systems: FAT16, FAT32 and NTFS
- Discrete 7.1ch analog audio output
- XLR balanced audio output
- RS-232C and IP control capability
- Power-on Play button eliminates extra steps, and provides simplified, ultra-fast startup
- Panel lock and IR remote lock functions prevent unwanted or accidental operation
- Improved, easy-to-read OLED display
- OSD (On Screen Display) hiding mode eliminates unwanted menu items and disc transport icons
- Transport controls located conveniently on the front panel
- Repeat mode offers an uninterrupted playback loop
- Occupies only a single rack space (1RU)

Overview:

DENON PROFESSIONAL'S VERSATILE DN-500BDMKII BLU-RAY PLAYER

The Denon Professional DN-500BDMKII Blu-ray disc and media player is a compact, high performance unit that handles all popular optical video and audio CD playback formats for unrivaled capability from a single disc playback device. For even more versatility, front-loading SD and USB ports deliver access to video, audio and picture files such as AVI, MOV, MP4, MP3, WAV, FLAC, GIF, JPEG, PNG, and more.

The DN-500BDMKII offers a tremendous amount of performance and flexibility in a space-saving single rack unit (1RU) chassis. It provides the wide range of connection and control capabilities that are essential to the professional user, making it ideal for use in corporate A/V, education, theaters, house of worship, and more. These include RS-232C and IP controllability and XLR balanced audio outputs. The DN-500BD also has discrete 7.1 channel analog outputs

Specifications:

- Digital System
  - System
    - Digital media player (Blu-ray Disc, DVD, CD, SD, USB device [mass storage class]) AVCHD playback format
  - Supported Disc Formats
    - Blu-ray Disc: BD25, BD50, BD-ROM, BD-R, BD-RE
      - BD25, BD50, BD-ROM, BD-R, BD-RE
    - DVD:
      - DVD, DVD+R, DVD-R, DVD+RW, DVD-RW
    - CD:
      - CD, CD-R, CD-RW, DTS Music Disc (DTS Audio CD, 5.1 Music Disc), HDCD, Super Video CD (SVCD), Video CD (VCD)
  - Supported File Formats
    - Video:
      - .3gp, .asf, .avi, .dat, .divx, .mkv, .mov, .mp4, .mpg, .m2ts, .ogm, .rmvb, .tp, .ts, .wmv
    - Subtitles:
      - .ass, .smi, .srt, .ssa, .sub
    - Audio:
      - .ape, .flac, .m4a (AAC), .mp3, .wav, .wma
    - Picture:
      - .gif, .jpg (or .jpeg), .png
  - Supported File Systems
    - FAT16, FAT32, NTFS
    - SD card with 128GB total capacity
    - USB drive (mass storage class) with 2 TB total capacity
  - Video
    - Resolutions
      - Auto, 480i/576i, 480p/576p, 720p, 1080i, 1080p
    - Aspect Ratios
      - 16:9 Full, 16:9 Normal, 4:3 Pan & Scan, 4:3 Letterbox
    - System
      - NTSC, PAL, Multi (if supported by TV)
    - HDMI Color Space: 4
      - RGB PC Level, RGB Video Level, YCbCr (4:4:4), YCbCr 4:2:2
  - Decoding
    - Video:
      - DivX 3, 4, 5, 6; DivX HD; MPEG-1; MPEG-2; MPEG-4; MPEG-4 AVC (H.264); VC-1 (Windows Media Video); Xvid
    - Audio:
      - AAC; Dolby Digital; Dolby Digital Plus; Dolby TrueHD; DTS Digital Surround; DTS-HD; WMA
  - Audio
    - Analog Outputs
      - Output Level (balanced XLR):
        - +4 dBu = +1.786 dBV
      - Output Level (unbalanced RCA):
        - +6 dBV
    - Digital Output
      - Output Level (coaxial):
        - 0.5V, 75â„¦
      - Signal Format:
        - AES/EBU

for simple connection to powered speakers or signal management devices.

The Denon Professional DN-500BDMKII will play virtually every Blu-ray, DVD, and audio CD format, making it easy to utilize multiple disc formats within a system. Supported formats include BD25, BD50, BD-RE, DVD, DVD+R, DVD+RW, DVD-R, DVD-RW and Audio CD (CD-R, CD-RW), DTS Music Disc, and HDCD. Using the built-in LAN port, users may optionally access additional content via BD Live.

In addition to its extremely high performance and wide range of format playback capabilities, the DN-500BDMKII anticipates your requirements and operational patterns by providing features that maximize the unit's ease of use.

The Denon Professional DN-500BDMKII combines no-compromise performance, wide-ranging connection and control capability, and compatibility with virtually every disc and digital file format there is—all in a compact single rack space unit. Its unique combination of performance, versatility and compact size is ideally suited to the professional user.

- Surround Audio
  - DTS-Master Audio, DTS-HD High Resolution Audio, DTS Digital Surround, Dolby TrueHD, Dolby Digital (AC-3), Dolby Digital Plus (7.1ch)
- Frequency Response:
  - 20 Hz – 20 kHz (+0.5 dB)
- Signal-to-Noise Ratio:
  - > 100 dB (A-weighted)
- Total Harmonic Distortion:
  - < 0.05%
- Dynamic Range:
  - > 100 dB (A-weighted)
- Headroom:
  - 6 dB
- Channel Separation:
  - > 90 dB

- Outputs
  - (2) XLR audio outputs (L/R, balanced)
  - (2) RCA audio outputs (L/R, unbalanced)
  - (8) RCA audio outputs (7.1 surround sound)
  - (1) Coaxial digital audio/visual output
  - (1) HDMI audio/visual output
  - (1) RJ-45 LAN port
  - (1) 9-pin D-Sub female RS-232C port
  - (1) IEC power connection
- Communication
  - Remote Control
    - Infrared protocol, > 200 mV transmission output level
  - Serial Remote
    - Connector:
      - 9-pin D-Sub female, RS-232C
    - Mode:
      - Full duplex
    - Baud Rate:
      - 9600 or 38400 bps (selectable)
  - Ethernet
    - Connector:
      - LAN port
    - Standards:
      - Ethernet (10 Mbps), Fast Ethernet (100 Mbps)
  - Environmental Conditions
    - Operating temperature:
      - 41 – 95 °F (5 – 35 °C)
    - Operating humidity:
      - 25 – 85%, no condensation
  - General
    - Power
      - Connection:
        - IEC
      - Requirement:
        - 100–240 VAC, 50/60 Hz
      - Consumption:
        - 15 W typical, < 0.5 W standby
    - Dimensions (width x depth x height, with rack ears)
      - 19.00" x 10.75" x 1.73" (483 mm x 273 mm x 44 mm)
    - Weight (with rack ears)
      - 5.9 lbs. (2.7 kg)

Q-SYS Core 110f

Unified Core



Features

- 128x128 Network Audio Channels
- 16x16 USB Audio Channels
- 24 Channels of Total Analog Audio
- 8 Configurable Flex Channels
- 16x16 GPIO Logic Ports
- 16 Channels of Routable AEC
- Multiple Instance VoIP Lines
- Single POTS Telephone line
- 3 Year Warranty

The Q-SYS™ Core 110f provides a solution for small, single room allowing the Q-SYS platform to accommodate every-day, simple projects up to the largest Enterprise scale deployments. QSC's software based DSP Platform Q-SYS, gives the systems integrator and end-user a unified software design tool and feature set suitable for projects of any scale. The continuity of the Q-SYS software based DSP platform is unique within the competitor space and allows the Q-SYS Core 110f to leverage all the features that are available across the entire Q-SYS Platform to be used in the following applications: Acoustic Echo Canceling (AEC) and sound reinforcement in small to large meeting or multipurpose rooms, sound reinforcement in performance venues such as house of worship and theater, background music systems, wide area paging in airports, convention centers and hospitals.

The Q-SYS Core 110f is a multipurpose software based digital audio signal processor with a total of 8 balanced analog line level audio inputs and 8 balanced analog line level audio outputs. In addition to the fixed 8x8 analog audio I/O, the Core 110f features a software definable bank of 8 balanced analog audio Input/Output Flex Channels, a unique QSC innovation, where each channel can be independently configured during design or run time as either a microphone/line level input or a line level output. As such, the Core 110f offers class leading 24 analog I/O density plus additional specialized I/O such as VoIP, POTS, Internal Media Playback/Recording HDD and USB.

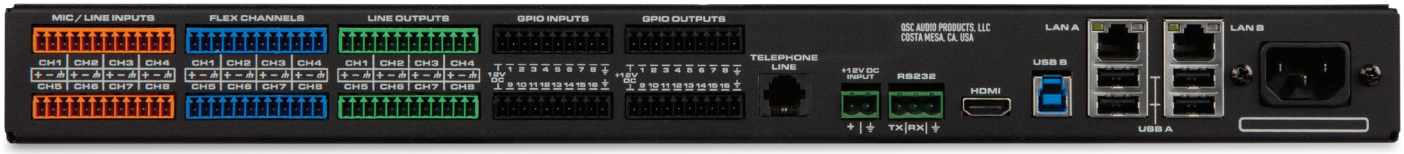
The Q-SYS Core 110f supports a class leading USB audio device port connection that enables the processor to appear in a Microsoft Windows or Mac OS host operating system simultaneously as both a USB Audio and Communications device. The USB Device port (B type) implementation supports up to 16x16 digital audio channels in a flexible, design time configuration environment that can advertise as multiple virtual USB device instances to the host operating system concurrently over a single physical USB connection. In addition to the USB Device port, the Core 110f provides 6 USB Host ports (A type) which enable the Core to host external USB devices and future Q-SYS peripheral products.

Benefits

- **Class leading I/O:** Q-SYS Core 110f has 24 analog I/O + USB, POTS and VoIP simultaneously in a single rack space and one SKU, offering the best cost to I/O ratio in a single chassis product available on the market from any manufacturer.
- **Flex Channels:** Nearly all the flexibility of a card based DSP solution without the cost and inconvenience of multiple SKU's and custom parts ordering.
- **Unified software platform:** Single training investment in one software design tool rather than needing to learn several platforms to scale from small to large systems or support different applications.
- **Industry leading hardware design:** Future proof investment in standards based software and computer technology running on Intel processors.
- **Industry first, software based DSP:** Q-SYS suite of conferencing technology applications built and owned by QSC from the ground up allowing for continued refinement.
    - o Software based routable AEC; no additional hardware needed
    - o SIP Softphones offering multiple instances per Q-SYS Core; no additional hardware needed
    - o Gain sharing and gating automixers
- **True IT Software Integration:** The Core 110f provides more than just networked audio integration and is not just another hardware DSP. Q-SYS is primarily a software platform that offers greater software integration functionality such as native support for LDAP contact server integration, SNMP monitoring, SIP Softphones, and software based routable AEC implementation; it truly is a next generation AV/IT product that is free of the fixed hardware limitations seen in competing products.

Key Features

- 128x128 networked audio channels (Q-LAN / AES67), reduced to 64x64 when using Video Bridging capability on built-in USB-B port.
- Up to 24 configurable analog audio I/O
- 8 mic/line level analog audio inputs
- 8 line level analog audio outputs
- 8 Flex Channel mic/line level analog audio inputs or outputs
- Up to 16 assignable and routeable AEC processor instances
- Dual Gigabit Ethernet ports with assignable application resources offering any combination of VoIP, Q-LAN Control, Q-LAN audio or network redundancy
- Up to 16x16 channels of digital audio in and out via software definable USB instances advertised to the host operating system
- 16 General Purpose Inputs (GPI) x 16 General Purpose Outputs (GPO)
- Internal Universal Power Supply plus 12 Volt DC External Power Supply input for redundancy or non-mains power supply sources
- Single software platform for system configuration, control and monitoring via Q-SYS Designer software over Ethernet with support for static or Auto/DHCP TCP/IP addressing
- POTS telephone interface via a standard RJ-11 connector
- Supports up to 4 VoIP Softphone instances in addition to the onboard POTS telephone interface
- Fully compatible with all existing and future Q-SYS accessories such as IO Frames, Paging Stations, and Touch Screen Control Surfaces running Q-SYS user control interfaces
- CE marked, UL listed, and RoHS compliant
- Covered by QSC Systems 3-year warranty



Q-SYS Core 110f

Inputs — Q-SYS Core 110f

Input Frequency Response	
20Hz to 20kHz @ +21dBu	+0.05% / -0.5%
Input THD+N @ 1KHz	
@ +21 dBu Sensitivity & +21 dBu input	< 0.1%
@ +21 dBu Sensitivity & +10 dBu input	< 0.0015%
@ +10 dBu Sensitivity & +8 dBu input	< 0.0007%
@ -10 dBu Sensitivity & -10.5 dBu input	< 0.0006%
@ -39 dBu Sensitivity & -39.5 dBu input	< 0.007%
EIN (no weighting, 20Hz to 20kHz)	< -121dB
Input to Input Crosstalk @1kHz	> 110dB typical, 90dB Max
Input Dynamic Range	
@ +21 dBu Sensitivity	> 109.5dB
@ +10 dBu Sensitivity	> 106.4dB
@ -10 dBu Sensitivity	> 104.6dB
@ -39 dBu Sensitivity	> 104.6dB
Input Common Mode Noise Rejection	
@ +21 dBu Sensitivity	50.7dB
@ +10 dBu Sensitivity	56.5dB
@ -10 dBu Sensitivity	73.2dB
@ -39 dBu Sensitivity	63.2dB
Input Impedance (balanced)	5K ohms nominal
Input Sensitivity Range (1dB Steps)	-39 dBu min to +21 dBu max
Unbalanced Input Signal Level	+ 8 dBu max
Phantom Power	+48V DC, 10mA per input max
Sampling Rate	48kHz
A/D – D/A Converters	24-bit

Outputs

Output Frequency Response	
20Hz to 20kHz @ all settings	+0.2 / -0.5 dB
Output THD	0.003%, +10 dBu max output level
Output Crosstalk @1kHz	> 100dB typical, 90dB max
Output Dynamic Range	> 108dB
Output Impedance (balanced)	220 ohms
Output Level Range: (1dB Steps)	-39 dBu min to +21 dBu max

USB Inputs & Outputs

USB B	
Bit Depth	16-bit
Number of Channels	up to 16x16
Sample Rate	48kHz
Power Consumption	60 watts, typical. 120 watts max
BTU/Heat load:	205 BTU/Hour
Compliance	FCC Part 15B (USA), FCC part 68 / TIA-968-B (USA), JATE (Japan), AS/ACIF S002 (Australia), PTC200 (New Zealand), ES203 021 (Europe), ANATEL Resolution 473 (Brazil), NOM-151-SCTI (Mexico), PSTN01 (Taiwan), Industry Canada CS-03 (Canada), CE marked (Europe), UL and C-UL listed (USA & Canada), RCM (Australia), EAC (Eurasian Customs Union) & RoHS Directive (Europe)

Overall Dimensions/Weight	Device Height: 1.75 inches (44 mm)	Shipping Height: 6.0 inches (152 mm)
	Device Width: 19.0 inches (483 mm)	Shipping Width: 23 inches (584 mm)
	Device Depth: 11.12 inches (282.5 mm)	Shipping Depth: 14 inches (356 mm)
	Device Weight: 11 lbs. (5.0 kg)	Shipping Weight: 12.4 lbs. (5.6 kg)

Specifications subject to change without notice.

A&E SPECIFICATIONS

The system processor shall provide up to 128 x 128 networked audio channels individually configurable as either Q-LAN or AES67 formatted networked audio, channel count will reduce to 64 x 64 when using video bridging capability on the built-in USB-B device port. The system processor shall support 24 total analog I/O capacity and shall be presented in the following groupings; 8 Mic/Line inputs, 8 Line outputs and 8 Flex Channel I/O which shall be software definable analog inputs or outputs in single channel increments in any combination ratio.

The system processor shall have the following front panel controls and indicators: blue monochrome OLED display with page forward capacitive touch button, Unit ID capacitive touch button, Power On blue LED, Two USB A Type ports. The system processor shall provide a monochrome 304x96 blue OLED graphics display displaying the device name, design name and system status, LAN A and B settings, and the firmware version. Device Status shall be displayed on the OLED display including I/O status, muting, level present indication, and system status.

On the rear panel, the system processor shall have one 3-pin RS232 Euro Block Connector, HDMI Video Out, 16 GPI general purpose control inputs on 20-pin Euro Block Connector, 16 GPO general purpose control outputs on 20-pin Euro Block Connector. Q-SYS Network: LAN A RJ45 1000 MBps only, LAN B: RJ45 1000 MBps only. The dimensions of the System processor shall be 1.75” x 19” x 11.12” (44 mm x 483 mm x 356 mm).

The system processor shall store a single design which can be comprised of components, wiring, links, text, and graphics on a single or multiple schematic pages. Designs shall include any of the following DSP function blocks, test and measurement components, control components, and layout components: Acoustic Echo Cancellers, SIP Softphone instances, USB Audio host and device blocks, Audio Players, Audio Streaming components, Crossfaders, Crossovers, Delay components, Auto Gain control elements, Compressors, Gates, Duckers, Expanders, Ambient Noise Compensators, Limiters, Gain blocks, Graphic Equalizers, Parametric Equalizers, FIR Filters, All-Pass Filters, Band-Pass Filters, Band-Stop Filters, High-Pass Filters, Low-Pass Filters, FIR High-Pass filters, FIR Low-Pass Filters, Dual-Shelf Equalizers, Notch Filters, Meters, Matrix Mixers, Gain-Sharing Automatic Mixers, Gated Automatic Mixers, Signal Routers, Public Address Routers, Room Combiners, Signal Presence Meters, Tone Generators, Tone and Noise Generators, Dual Trace FFT Measurement Modules, Real Time Analyzers, Signal Injectors, and Signal Probes.

The system processor shall support custom user control interfaces on either proprietary touch screen controllers, or network computers utilizing a control application, or iOS devices on Wi-Fi. Custom control interfaces shall be capable of having multiple user-selectable pages with different controls on each.

The system processor and control engine shall be the QSC Q-SYS Core 110f Flex Channel Processor.

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Conference and lectern
Houses of worship
Theater, onstage miking
Broadcast and recording



- Immune to RF interference
- Speech optimized frequency range
- Enhanced hypercardioid polar pattern
- High SPL capability
- Premium microphone for ubiquitous application

C 747 V11

A History of Sound: The C 747, the so called „pencil microphone“, was first built in 1987. Due to its excellent technical specifications, especially the wide and flat frequency range, it was used for the recording of all kinds of musical instruments, even those with very low frequencies. Because of its brilliant sound reproduction and its inconspicuous optical appearance, it was quickly known as an ideal overhead microphone.
Thank to the narrow polar pattern it solved the crosstalk problem (when recording multiple instruments at once) and the problem of picking up sounds from distant spots in a room. But for all that, due to the help of the acoustically well balanced, short interference tube, it didn't face one of the biggest problems of most shotgun microphones – the change of the polar pattern over the frequency. This is one of many reasons why this microphone found its way into a great number of Broadcast Stations, Recording Studios, Theatres, Opera Houses, Churches, Conference Rooms and Lecture Halls.

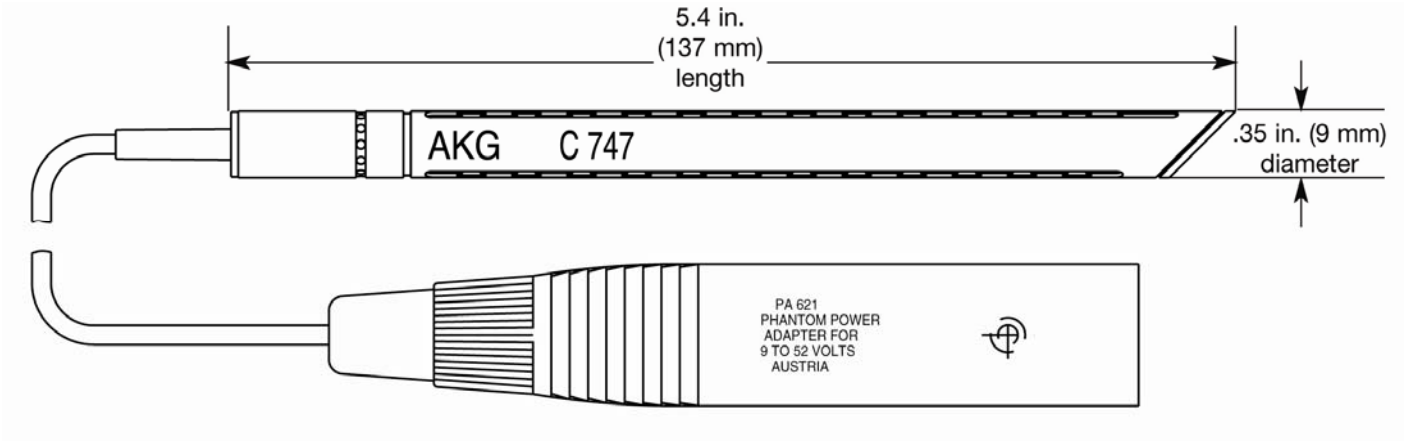
Another big advantage of the C 747 is that the microphone will not change the sound or level too much even when the person speaking is moving a lot. So it came that the C 747 finally found its way into installed sound systems as a perfect speech and lectern microphone. The C 747 is now one of the most versatile microphones in the AKG product range and over the years it has been available in various versions and model types such as hanging module, capsule for modular gooseneck microphones and in a boundary layer microphone.

What's New in V11: As it is more and more used in conference applications, we carefully redesigned the C 747 to better cope with some specific installed sound issues.
The new C 747 V11 will have an integrated RFi shield to block out unwanted interference by mobile phones, wireless mics and the like. Also we have fine tuned the frequency response to give especially the spoken word an outstanding presence, without changing the flavour of the classic C 747 sound.

An enhanced polar pattern provides consistent off-axis rejection to control ambient noise and feedback in acoustically difficult environments. This makes the C 747 V11 an excellent choice for noisy discussion groups or reverberant pulpits while it is forgiving enough to clearly pick up talkers moving around in front of the microphone. A switchable LF roll-off filter suppresses mechanical noise. The low-impedance transformerless preamp operates on 9 to 52 V phantom power.
The C 747 V11 ships with an extensive accessory set including a shock mount/adapter, mini gooseneck, stand adapter, mounting clamp, thread link, and windscreen.

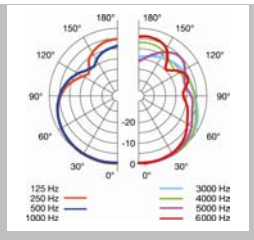
Architects' and Engineers' Specifications

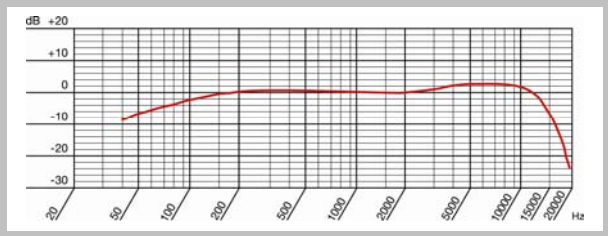
The microphone shall be a directional condenser type utilizing a combination of gradient and interference actions to produce a well defined hypercardioid polar pattern.
The microphone shall be no larger in diameter than 0.35 in. (9 mm), and the finish shall be stage blue. On-axis frequency response shall be maintained within the range of 30 Hz to 18 kHz, as measured at 1 meter. Microphone sensitivity shall be at least 8.5 mV/Pa, and the self A-weighted noise level of the microphone shall be no higher than 21 dB. The microphone shall operate in a sound field of 133 dB-SPL with no greater than 1% THD.
The microphone shall operate on phantom powering, covering the range from 9Vdc to 52Vdc. The microphone shall be the AKG Acoustics Model C 747 V11



Specifications:

Polar pattern:	hypercardioid
Frequency response:	30 Hz to 18,000 Hz
Sensitivity:	8,5 mV/Pa (-42 dBV)
Impedance:	< 400 ohms
Equivalent noise level:	21 dB-A
Signal/Nose ratio:	73 dB (A-weighted)
Maximum SPL:	133 dB
Powering:	9 to 52 V phantom power (DIN 45596)
Current consumption:	< 2 mA
Cable:	3 m (10 ft.)
Finish:	stage blue
Dimensions:	9 dia x 137 mm (0.35 dia. x 5.4 in.)
Net/shipping weight:	25 / 750 g (0.9 oz./1.7 lbs.)
Item number:	2226Z00110





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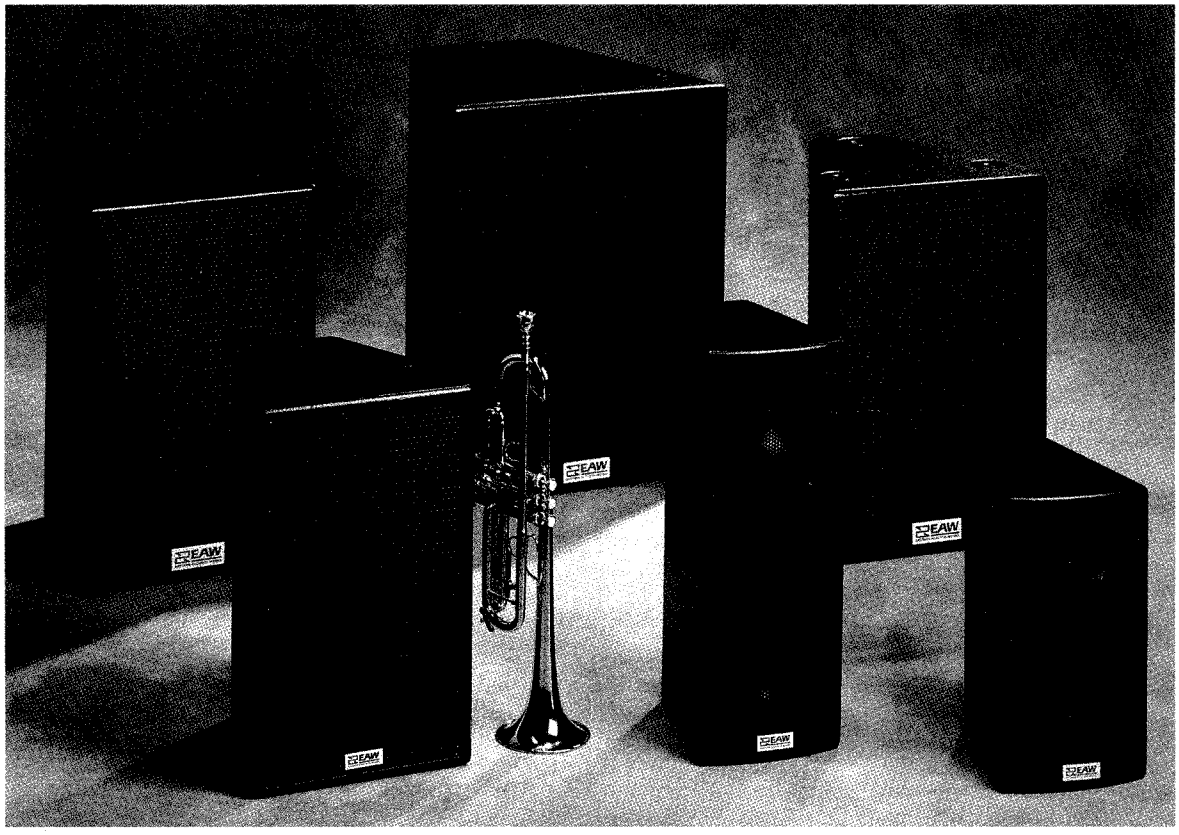
FORSYTHE SERIES

JF Series

High Definition Full Range Systems

Compact Systems With Unique Capabilities



JF Series systems have been engineered for a diverse set of applications that share certain key requirements. Among these are flat power response and consistent dispersion, high output with minimal distortion, compact, unobtrusive packaging, and exceptional power handling.

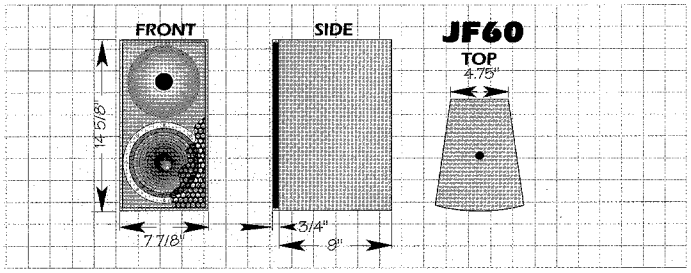
Combining high output, linear response and consistent dispersion is difficult enough when size is not a factor. When the total package must be as small as 7.5" x 9" x 14.5", the challenges become enormous. In developing the JF Series, EAW engineers integrated new ideas from such acclaimed products as the KF300 Virtual Array™ system, the SM200 high-definition stage monitor, and the MS63 Ultimate Fidelity Nearfield system. They have also developed new approaches to minimize enclosure volume. Proprietary waveguides and purpose-designed woofers optimize power response across the operating bandwidth. Complex crossovers incorporate driver protection and up to five bands of parametric equalization for linear response in both passive and bi-amped operation. Wide conical coverage allows vertical or horizontal mounting. A comprehensive hardware system facilitates stand-mounting, flying or hanging.

The result of this comprehensive engineering effort is a group of systems that set new standards of performance and versatility. Compatible with EAW subwoofers for extended bass output, JF Series systems offer advanced solutions for a wide range of portable and permanent applications. Their advanced construction technology was developed for world renowned EAW concert touring systems. With materials such as exterior-grade cross-grain laminated hardwood, water-resistant glue joints, recessed hardware, vinyl-coated perforated steel grills and exterior finishes chosen for durability, these systems are designed for long trouble-free operating life.

EAW

EASTERN ACOUSTIC WORKS, INC. One Main Street, Whitinsville, MA 01588 ▪ (508) 234 - 6158 ▪ FAX (508) 234 - 8251

JF60 Ultra-Compact System



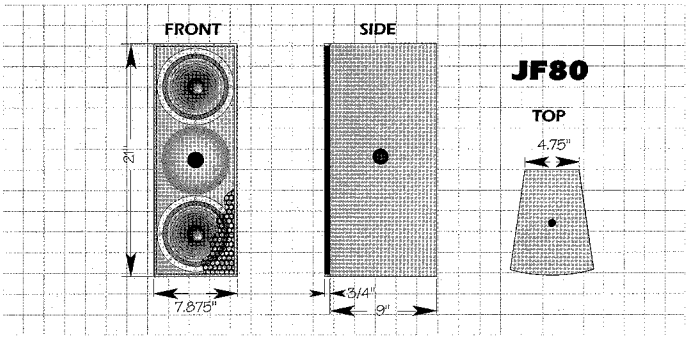
The JF60 combines a single 6.5" carbon fiber cone woofer with a WGP™ waveguide-coupled soft dome tweeter in an enclosure that measures only 7.9" x 9" x 14.7". Exceptionally stiff, the carbon fiber mid/bass cone functions as a true piston for minimal distortion at maximum output levels. Carbon fiber is inherently resistant to damage from water and UV radiation.

The soft dome tweeter exhibits higher internal damping and lower inherent ringing than metal domes. This allows accurate reproduction without ear-fatiguing "sizzle" from bell mode resonance distortion.

The JF60 crossover's transfer function is optimized for phase-coherent summing at the crossover point. Driver protection circuitry and parametric equalization are also integrated into the complex network.

The JF60 tweeter is coupled to the air using a specially designed WGP™ waveguide. This unique loading technique produces the consistent coverage of an exponential horn, without the throat distortion typically found in such devices. The result is stunningly natural and open reproduction.

JF80 Ultra-Compact System



The JF80 packs a pair of 6.5" carbon fiber midbass cones and a 1" compression driver on a WGP™ waveguide into a package that measures only 7.5" x 9" x 21".

The JF80's unique HF subsystem combines the sweet and open high end of a dome tweeter with the increased output capability of a traditional horn and compression driver. The use of dual carbon fiber woofers doubles power handling capacity, while the use of a compression driver increases total system sensitivity. The end result is a 6 dB increase in maximum SPL in an enclosure that is nearly as compact as the JF60.

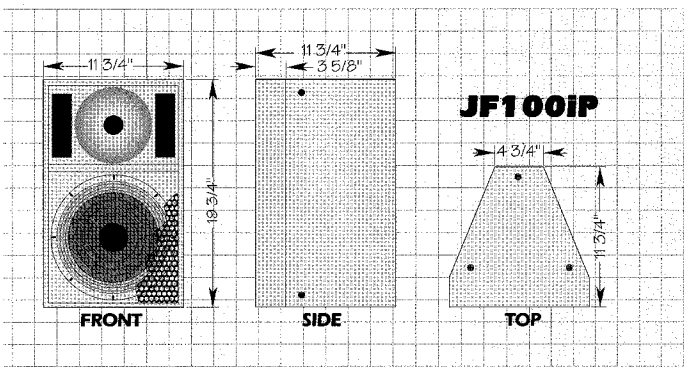
EAW's proprietary WGP™ subsystem produces a wide conical coverage pattern that is consistent over the system's extended operating bandwidth. Optimum power response helps to maintain the reflected energy in correct frequency balance, producing a more natural sound.

JF60/JF80 Applications

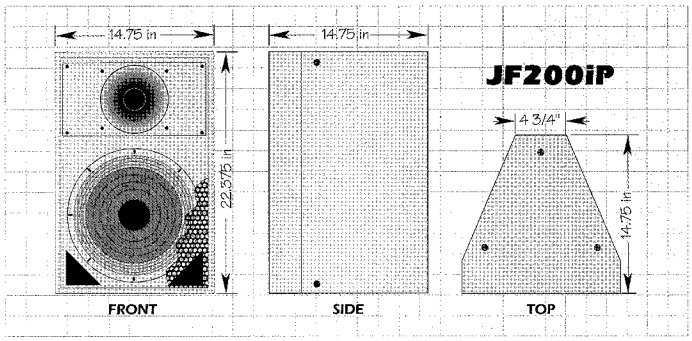
Virtually invisible yet able to cover large areas, these systems are ideal wherever the sound system must avoid obscuring architectural details. Versatile hardware includes fittings for Omnimount 75 Series and stand mounts. The JF80's unique yoke mount allows angled mounting on a wide range of stands . Applications include:

- theatrical production
- underbalcony and delay fills
- high-output distributed systems
- stage lip systems
- high-quality background/foreground music systems.

JF100i/JF200i High Definition Full Range Systems



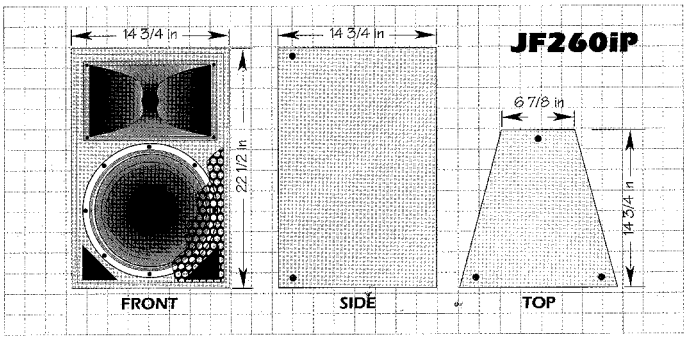
The JF100i is only 11.75" x 11.75" x 19.125", yet produces 124 dB SPL from its 10" vented woofer and 1" compression driver, mounted on EAW's proprietary WGP™ waveguide. The JF200i is only 14.75" x 14.75" x 22.5", yet produces peak SPLs of 126 dB from a 12" vented woofer and 2" compression driver, coupled to the air using a new larger version of EAW's proprietary WGP™ high frequency device. Complex crossover networks produce linear response in either full passive or bi-



amped operation. EAW CCEP™ processors are recommended for optimum bi-amped performance (see below for options).

The JF100i and JF200i are available in portable Road versions for small band PA, A/V presentations, etc. Hardware includes recessed handles and internal stand mount sockets: Tee nuts for external stand mount brackets are also included. For fixed installations, Permanent configurations are available without handles or stand mounts, but with steel-reinforced hanging points on the top and sides, and tee nuts for Omnimount 100 Series (JF100i) or 300 Series (JF200i) brackets.

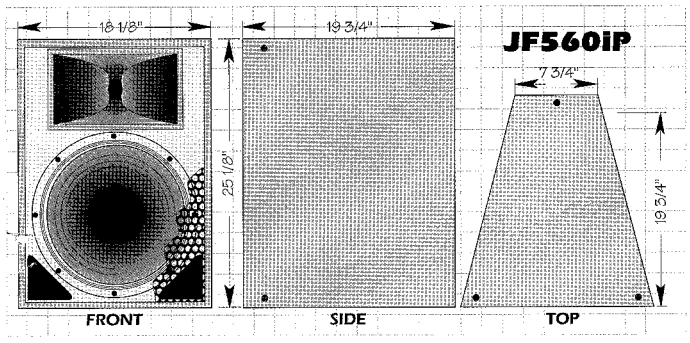
JF260 High Definition Full Range System



The ultra-compact JF260 is engineered for smaller and medium-range installations requiring the highest levels of definition in live and recorded sound reproduction at concert sound pressure levels.

The JF260 employs a purpose-designed 12" woofer and a 2" compression driver mounted on a 60° x 45° constant coverage horn. Performance is similar to the JF200i, but with somewhat greater maximum SPL and tighter directional control above 900 Hz. This combination helps preserve intelligibility in reverberant spaces without the need for large distributed systems. The complex crossover network includes rear-panel switching for bi-amp or full range passive operation. EAW CCEP™ processors are recommended for optimum bi-amped performance (see below for options).

JF560 High Definition Full Range System



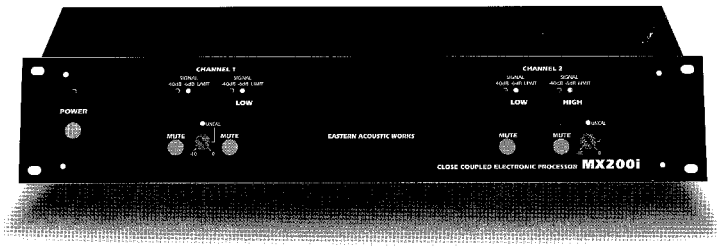
Installations desiring exceptional fidelity in live and recorded sound reproduction at concert sound pressure levels find that the JF560 is an excellent choice. Performance is similar to the acclaimed JF200i, but with slightly higher overall output capability and tighter directional control above 900 Hz.

The JF560 employs a 2" compression driver mounted on a 60° x 45° constant coverage horn. The high-output 15" woofer is crossed over using a complex network equalized for optimal power response in bi-amped or passive modes. Bi-amped performance can be enhanced with the use of EAW CCEP™ processors (see below for options).

The JF260 and JF560 are available in Road configurations for portable applications, with recessed handles, internal stand mount sockets and tee nuts for external stand mounts. Permanent versions include steel-reinforced top and side hanging points and mounting hardware for Omnimount 300 Series brackets.

JF Series Processors & Subwoofers

Closely Coupled Electronic Processing™ is an integral element of EAW system design. Close Coupling™ adjusts parameters such as crossover frequency, slope and filter shape, driver protection thresholds, phase compensation and parametric equalization to each specific system. The results are maximum



linearity and phase coherence with minimal processor interaction. The MX200i processor is available in specific configurations for bi-amping the JF100i, JF200i, JF260 and JF560. A rear panel switch configures the internal crossover network for bi-amp or full range passive operation.

While they are designed for full range operation in passive or bi-amped modes, all JF Series systems require subwoofers for high-level reproduction of the lowest octaves. The JF Series has been engineered for smooth coupling with EAW SB Series subwoofers. Special MX200i configurations are available for powering the JF60 and JF80 with SB Series subwoofers. When using the JF100i, JF200i, JF260 and JF560 with subwoofers, special configurations of the MX300i CCEP™ processor provide optimum performance.

Preliminary Specifications

Model	JF60	JF80	JF100	JF200	JF260	JF560
Frequency Response						
19.125" x +-2 dB:	90 Hz to 19 k Hz	90 Hz to 18 k HZ	70 Hz to 18 k Hz	70 Hz to 18 k Hz	70 Hz to 18 k Hz	65 Hz to 18 k Hz
- 10 dB:	55 Hz	50 Hz	55 Hz	55 Hz	60 Hz	55 Hz
Axial Sensitivity (dB SPL 1W @ 1M)						
LF / Full Range:	92 dB SPL	94 dB SPL	97 dB SPL	98 dB SPL	98 dB SPL	98 dB SPL
HF:	NA	NA	103 dB SPL	106 dB SPL	106 dB SPL	106 dB SPL
Nominal Impedance						
Full Range / LF:	4 Ω	8 Ω	8 Ω	8 Ω	8 Ω	8 Ω
HF:	NA	NA	8 Ω	8 Ω	16 Ω	16 Ω
Power Handling						
LF AES:	200 W	400 W	400 W	500 W	500 W	750 W
LF 100H Sine Wave:	80 W	160 W	150 W	200 W	200 W	300 W
HF AES:	NA	NA	125 W	200 W	200 W	200 W
HF 100H Sine Wave:	NA	NA	50 W	80 W	80 W	80 W
Maximum Output						
LF Long Term:	111 dB SPL	116 dB SPL	118 dB SPL	121 dB SPL	121 dB SPL	122 dB SPL
LF Peak:	115 dB SPL	120 dB SPL	123 dB SPL	125 dB SPL	125 dB SPL	126 dB SPL
HF Long Term:	NA	NA	120 dB SPL	125 dB SPL	125 dB SPL	125 dB SPL
HF Peak:	NA	NA	124 dB SPL	129 dB SPL	129 dB SPL	129 dB SPL
Nominal Coverage Angles (-6 dB)						
Horizontal:	120°	90°	90°	90°	60°	60°
Vertical:	120°	90°	90°	90°	45°	45°
General Information						
HF Subsystem:	33mm Soft Dome WGP™	1-in Exit Compression Driver On WGP™	1-in Exit Compression Driver On WGP™	2-in Exit Compression Driver On WGP™	2-in Exit Compression Driver On CD Horn	2-in Exit Compression Driver On CD Horn
LF Subsystem:	1x 6.5-in Vented	2x 6.5-in Vented	1x 10-in Vented	1x 12-in Vented	1x 12-in Vented	1x 15-in Vented
Crossover Data						
Type:	Fourth Order Equalized Network					
Mode:	Passive	Passive	Switchable Bi-amp or Fullrange Passive	Switchable Bi-amp or Fullrange Passive	Switchable Bi-amp or Fullrange Passive	Switchable Bi-amp or Fullrange Passive
MX200 for Biamp:	NA	NA				
MX300 Biamp + Sub:	NA	NA				
Additional Descriptive Data						
Finish:	Black catalyzed polyurethane Coating					
Grill:	Vinyl Coated Perforated Steel					
Tee-nut For Omni Mount:	75	75	100	300	300	300
Configurations:	i	i	P or R	P or R	P or R	P or R
i Configurqation:	2 pin Barrier Strip and NL4 Connector, Reinforced Hang Points (Yoke Mounts on JF80 only)					
R Configuration:	NL4 Connector, Recessed Handles, Hang Points on Top, Bottom & Sides					
P Configuration:	NL4 Connector, Hang Points on Top, Bottom & Sides					
Preliminary Dimensions & Weights						
Height:	14.5 in	21 in	19 3/4 in	22 3/8 in	22 1/2 in	25 1/8 in
Width:	7 7/8 in	7 7/8 in	11 3/4 in	14 3/4 in	14 3/4 in	18 in
Depth:	9 in	9 in	11 3/4 in	14 3/4 in	14 3/4 in	19 3/8 in
Net Weight:	17 lbs	25 lbs	52 lbs	81 lbs	90 lbs	95 lbs

Cisco 350 Series Managed Switches

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World-class service and support

Your time is valuable, especially when you have a problem affecting your business. Cisco 350 Series switches are backed by Cisco SMARTnet® Total Care™ which provides affordable peace-of-mind coverage. Delivered by Cisco and backed by your trusted partner, this comprehensive service includes software updates and access to the Cisco Support Center, and it extends technical service to three years.

Cisco SMB products are supported by professionals in the Cisco Support Center, a dedicated resource for small business customers and networks, with locations worldwide that are specifically trained to understand your needs. You also have access to extensive technical and product information through the Cisco Support Community, an online forum that enables you to collaborate with your peers and reach Cisco technical experts for support information.

Product specifications

Table 1 gives the product specifications for the Cisco 350 Series Switches.

Table 1. Product specifications

Feature	Description		
Performance			
Switching capacity and forwarding rate	**Model Name**	**Capacity in Millions of Packets per Second (mpps) (64-byte packets)**	**Switching Capacity in Gigabits per Second (Gbps)**
All switches are wire speed and nonblocking	SF350-08	1.19	1.6
	SF352-08	4.17	5.6
	SF352-08P	4.17	5.6
	SF352-08MP	4.17	5.6
	SF350-24	9.52	12.8
	SF350-24P	9.52	12.8
	SF350-24MP	9.52	12.8
	SF350-48	13.09	17.6
	SF350-48P	13.09	17.6
	SF350-48MP	13.09	17.6
	SG350-8PD	46.13	62.0
	SG350-10	14.88	20.0
	SG350-10P	14.88	20.0
	SG350-10MP	14.88	20.0
	SG355-10MP	14.88	20.0

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Feature	Description		
	SG350-10SFP	14.88	20.0
	SG350-20	29.76	40.0
	SG350-28	41.66	56.0
	SG350-28P	41.66	56.0
	SG350-28MP	41.66	56.0
	SG350-28SFP	41.66	56.0
	SG350-52	77.38	104.0
	SG350-52P	77.38	104.0
	SG350-52MP	77.38	104.0
Layer 2 Switching			
Spanning Tree Protocol	Standard 802.1d Spanning Tree support Fast convergence using 802.1w (Rapid Spanning Tree [RSTP]), enabled by default Multiple Spanning Tree instances using 802.1s (MSTP); 8 instances are supported Per-VLAN Spanning Tree Plus (PVST+) and Rapid PVST+ (RPVST+); 126 instances are supported		
Port grouping/link aggregation	Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP) • Up to 8 groups • Up to 8 ports per group with 16 candidate ports for each (dynamic) 802.3ad link aggregation		
VLAN	Support for up to 4,094 VLANs simultaneously Port-based and 802.1Q tag-based VLANs; MAC-based VLAN; protocol-based VLAN; IP subnet-based VLAN, Management VLAN Private VLAN with promiscuous, isolated, and community port Private VLAN Edge (PVE), also known as protected ports, with multiple uplinks Guest VLAN; unauthenticated VLAN Dynamic VLAN assignment via RADIUS server along with 802.1x client authentication CPE VLAN		
Voice VLAN	Voice traffic is automatically assigned to a voice-specific VLAN and treated with appropriate levels of QoS Auto voice capabilities deliver networkwide zero-touch deployment of voice endpoints and call control devices		
Multicast TV VLAN	Multicast TV VLAN allows the single multicast VLAN to be shared in the network while subscribers remain in separate VLANs. This feature is also known as Multicast VLAN Registration (MVR)		

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Feature	Description
VLAN Translation	Support for VLAN One-to-One Mapping. In VLAN One-to-One Mapping, on an edge interface C-VLANs are mapped to S-VLANs and the original C-VLAN tags are replaced by the specified S-VLAN
Q-in-Q	VLANs transparently cross a service provider network while isolating traffic among customers
Selective Q-in-Q	Selective Q-in-Q is an enhancement to the basic Q-in-Q feature and provides, per edge interface, multiple mappings of different C-VLANs to separate S-VLANs Selective Q-in-Q also allows configuring of Ethertype (TPID) of the S-VLAN tag Layer 2 protocol tunneling over Q-in-Q is also supported
Generic VLAN Registration Protocol (GVRP)/Generic Attribute Registration Protocol (GARP)	Generic VLAN Registration Protocol (GVRP) and Generic Attribute Registration Protocol (GARP) enable automatic propagation and configuration of VLANs in a bridged domain
Unidirectional Link Detection (UDLD)	UDLD monitors physical connection to detect unidirectional links caused by incorrect wiring or cable/port faults to prevent forwarding loops and blackholing of traffic in switched networks
Dynamic Host Configuration Protocol (DHCP) Relay at Layer 2	Relay of DHCP traffic to DHCP server in different VLAN; works with DHCP Option 82
Internet Group Management Protocol (IGMP) versions 1, 2, and 3 snooping	IGMP limits bandwidth-intensive multicast traffic to only the requesters; supports 2K multicast groups (source-specific multicasting is also supported)
IGMP Querier	IGMP querier is used to support a Layer 2 multicast domain of snooping switches in the absence of a multicast router
Head-Of-Line (HOL) blocking	HOL blocking prevention
Loopback Detection	Loopback detection provides protection against loops by transmitting loop protocol packets out of ports on which loop protection has been enabled. It operates independently of STP
Layer 3	
IPv4 routing	Wirespeed routing of IPv4 packets Up to 990 static routes and up to 128 IP interfaces
IPv6 routing	Wirespeed routing of IPv6 packets
Layer 3 Interface	Configuration of Layer 3 interface on physical port, LAG, VLAN interface, or loopback interface
Classless Interdomain Routing (CIDR)	Support for classless interdomain routing
Policy-Based Routing (PBR)	Flexible routing control to direct packets to different next hop based on IPv4 or IPv6 ACL

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Feature	Description
DHCP Server	Switch functions as an IPv4 DHCP server serving IP addresses for multiple DHCP pools/scopes Support for DHCP options
DHCP relay at Layer 3	Relay of DHCP traffic across IP domains
User Datagram Protocol (UDP) relay	Relay of broadcast information across Layer 3 domains for application discovery or relaying of bootP/DHCP packets
Security	
Secure Shell (SSH) Protocol	SSH is a secure replacement for Telnet traffic. SCP also uses SSH. SSH v1 and v2 are supported
Secure Sockets Layer (SSL)	SSL support: Encrypts all HTTPS traffic, allowing highly secure access to the browser-based management GUI in the switch
IEEE 802.1X (Authenticator role)	802.1X: RADIUS authentication and accounting, MD5 hash; guest VLAN; unauthenticated VLAN, single/multiple host mode and single/multiple sessions Supports time-based 802.1X Dynamic VLAN assignment
Web-based authentication	Web based authentication provides network admission control through web browser to any host devices and operating systems
STP Bridge Protocol Data Unit (BPDU) Guard	A security mechanism to protect the network from invalid configurations. A port enabled for BPDU Guard is shut down if a BPDU message is received on that port
STP Root Guard	This prevents edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes
STP loopback guard	Provides additional protection against Layer 2 forwarding loops (STP loops)
DHCP snooping	Filters out DHCP messages with unregistered IP addresses and/or from unexpected or untrusted interfaces. This prevents rogue devices from behaving as DHCP Servers
IP Source Guard (IPSG)	When IP Source Guard is enabled at a port, the switch filters out IP packets received from the port if the source IP addresses of the packets have not been statically configured or dynamically learned from DHCP snooping. This prevents IP Address Spoofing
Dynamic ARP Inspection (DAI)	The switch discards ARP packets from a port if there are no static or dynamic IP/MAC bindings or if there is a discrepancy between the source or destination addresses in the ARP packet. This prevents man-in-the-middle attacks
IP/MAC/Port Binding (IPMB)	The preceding features (DHCP Snooping, IP Source Guard, and Dynamic ARP Inspection) work together to prevent DOS attacks in the network, thereby increasing network availability
Secure Core Technology (SCT)	Makes sure that the switch will receive and process management and protocol traffic no matter how much traffic is received
Secure Sensitive Data (SSD)	A mechanism to manage sensitive data (such as passwords, keys, and so on) securely on the switch, populating this data to other devices, and secure autoconfig. Access to view the sensitive data as plaintext or encrypted is provided according to the user-configured access level and the access method of the user

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Feature	Description
Trustworthy systems	Trustworthy systems provide a highly secure foundation for Cisco products Run-time defenses (Executable Space Protection [X-Space], Address Space Layout Randomization [ASLR], Built-In Object Size Checking [BOSC])
Private VLAN	Private VLAN provides security and isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic; supports multiple uplinks
Layer 2 isolation Private VLAN Edge (PVE) with community VLAN	PVE (also known as protected ports) provides Layer 2 isolation between devices in the same VLAN, supports multiple uplinks
Port security	Ability to lock source MAC addresses to ports and limits the number of learned MAC addresses
RADIUS/TACACS+	Supports RADIUS and TACACS authentication. Switch functions as a client
RADIUS accounting	The RADIUS accounting functions allow data to be sent at the start and end of services, indicating the amount of resources (such as time, packets, bytes, and so on) used during the session
Storm control	Broadcast, multicast, and unknown unicast
DoS prevention	Denial-Of-Service (DOS) attack prevention
Multiple user privilege levels in CLI	Level 1, 7, and 15 privilege levels
ACLs	Support for up to 1K rules Drop or rate limit based on source and destination MAC, VLAN ID or IPv4 or IPv6 address, IPv6 flow label, protocol, port, Differentiated Services Code Point (DSCP)/IP precedence, TCP/UDP source and destination ports, 802.1p priority, Ethernet type, Internet Control Message Protocol (ICMP) packets, IGMP packets, TCP flag; ACL can be applied on both ingress and egress sides Time-based ACLs supported
Quality of Service	
Priority levels	8 hardware queues
Scheduling	Strict priority and Weighted Round-Robin (WRR) Queue assignment based on DSCP and class of service (802.1p/CoS)
Class of service	Port based; 802.1p VLAN priority based; IPv4/v6 IP precedence/Type of Service (ToS)/DSCP based; Differentiated Services (DiffServ); classification and remarking ACLs, trusted QoS Queue assignment based on DSCP and class of service (802.1p/CoS)
Rate limiting	Ingress policer; egress shaping and rate control; per VLAN, per port, and flow based; 2R3C policing
Congestion avoidance	A TCP congestion avoidance algorithm is required to minimize and prevent global TCP loss synchronization

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Feature	Description
Standards	
Standards	IEEE 802.3 10BASE-T Ethernet, IEEE 802.3u 100BASE-TX Fast Ethernet, IEEE 802.3ab 1000BASE-T Gigabit Ethernet, IEEE 802.3ad Link Aggregation Control Protocol, IEEE 802.3z Gigabit Ethernet, IEEE 802.3x Flow Control, IEEE 802.1D (STP, GARP, and GVRP), IEEE 802.1Q/p VLAN, IEEE 802.1w Rapid STP, IEEE 802.1s Multiple STP, IEEE 802.1X Port Access Authentication, IEEE 802.3af, IEEE 802.3at, IEEE 802.1AB Link Layer Discovery Protocol, IEEE 802.3az Energy Efficient Ethernet, RFC 768, RFC 783, RFC 791, RFC 792, RFC 793, RFC 813, RFC 826, RFC 879, RFC 896, RFC 854, RFC 855, RFC 856, RFC 858, RFC 894, RFC 919, RFC 920, RFC 922, RFC 950, RFC 951, RFC 1042, RFC 1071, RFC 1123, RFC 1141, RFC 1155, RFC 1157, RFC 1213, RFC 1215, RFC 1286, RFC 1350, RFC 1442, RFC 1451, RFC 1493, RFC 1533, RFC 1541, RFC 1542, RFC 1573, RFC 1624, RFC 1643, RFC 1700, RFC 1757, RFC 1867, RFC 1907, RFC 2011, RFC 2012, RFC 2013, RFC 2030, RFC 2131, RFC 2132, RFC 2233, RFC 2576, RFC 2616, RFC 2618, RFC 2665, RFC 2666, RFC 2674, RFC 2737, RFC 2819, RFC 2863, RFC 3164, RFC 3176, RFC 3411, RFC 3412, RFC 3413, RFC 3414, RFC 3415, RFC 3416, RFC 4330
IPv6	
IPv6	IPv6 host mode; IPv6 over Ethernet; Dual IPv6/IPv4 stack IPv6 neighbor and router discovery (ND); IPv6 stateless address autoconfiguration; Path Maximum Transmission Unit (MTU) discovery Duplicate Address Detection (DAD); ICMP version 6 DHCPv6 stateful client IPv6 over IPv4 network with Intrasite Automatic Tunnel Addressing Protocol (ISATAP) tunnel support USGv6 and IPv6 Gold Logo certified
IPv6 QoS	Prioritize IPv6 packets in hardware
IPv6 ACL	Drop or rate limit IPv6 packets in hardware
IPv6 First Hop Security	RA guard ND inspection DHCPv6 guard Neighbor binding table (snooping and static entries) Neighbor binding integrity check
Multicast Listener Discovery (MLD v1/2) snooping	Deliver IPv6 multicast packets only to the required receivers
IPv6 applications	Web/SSL, Telnet server/SSH, ping, traceroute, Simple Network Time Protocol (SNTP), Trivial File Transfer Protocol (TFTP), SNMP, RADIUS, syslog, DNS client, Telnet Client, DHCP Client, DHCP Autoconfig, IPv6 DHCP Relay, TACACS+
IPv6 RFCs supported	RFC 4443 (which obsoletes RFC2463): ICMP version 6 RFC 4291 (which obsoletes RFC 3513): IPv6 address architecture RFC 4291: IPv6 addressing architecture RFC 2460: IPv6 specification RFC 4861 (which obsoletes RFC 2461): neighbor discovery for IPv6

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Feature	Description	
	RFC 4862 (which obsoletes RFC 2462): IPv6 stateless address autoconfiguration RFC 1981: path MTU discovery RFC 4007: IPv6 scoped address architecture RFC 3484: default address selection mechanism RFC 5214 (which obsoletes RFC 4214): ISATAP tunneling RFC 4293: MIB IPv6: textual conventions and general group RFC 3595: textual conventions for IPv6 flow label	
Management		
Web user interface	Built-in switch configuration utility for easy browser-based device configuration (HTTP/HTTPS) Supports simple and advanced mode, configuration, wizards, customizable dashboard, system maintenance, monitoring, online help, and universal search	
Smart Network Application	Smart Network Application (SNA) is an innovative network-level monitoring and management tool embedded in Cisco 100 to 500 Series switches. It can discover network topology, display link status, monitor events, apply configurations, and upgrade software images across multiple switches in the network (Note: Management of your network using Smart Network Application requires the use of either a 350, 350X, or 550X Series switch model as a part of your network)	
SNMP	SNMP versions 1, 2c, and 3 with support for traps, and SNMP version 3 User-based Security Model (USM)	
Standard MIBs	lldp-MIB lldpextdot1-MIB lldpextdot3-MIB lldpextmed-MIB rfc2674-MIB rfc2575-MIB rfc2573-MIB rfc2233-MIB rfc2013-MIB rfc2012-MIB rfc2011-MIB RFC-1212 RFC-1215 SNMPv2-CONF SNMPv2-TC p-bridge-MIB q-bridge-MIB rfc1389-MIB rfc1493-MIB	rfc2668-MIB rfc2737-MIB rfc2925-MIB rfc3621-MIB rfc4668-MIB rfc4670-MIB trunk-MIB tunnel-MIB udp-MIB draft-ietf-bridge-8021x-MIB draft-ietf-bridge-rstpmib-04-MIB draft-ietf-hubmib-etherif-mib-v3-00-MIB draft-ietf-syslog-device-MIB ianaaddrfamnumbers-MIB ianaifty-MIB ianaprot-MIB inet-address-MIB ip-forward-MIB ip-MIB

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Feature	Description	
	rfc1611-MIB	RFC1155-SMI
	rfc1612-MIB	RFC1213-MIB
	rfc1850-MIB	SNMPv2-MIB
	rfc1907-MIB	SNMPv2-SMI
	rfc2571-MIB	SNMPv2-TM
	rfc2572-MIB	RMON-MIB
	rfc2574-MIB	rfc1724-MIB
	rfc2576-MIB	dcb-raj-DCBX-MIB-1108-MIB
	rfc2613-MIB	rfc1213-MIB
	rfc2665-MIB	rfc1757-MIB
Private MIBs	CISCOSB-lldp-MIB CISCOSB-	CISCOSB-ip-MIB
	brgmulticast-MIB CISCOSB-	CISCOSB-iprouter-MIB
	bridgemibobjects-MIB	CISCOSB-ipv6-MIB
	CISCOSB-bonjour-MIB	CISCOSB-mnginf-MIB
	CISCOSB-dhcpcl-MIB	CISCOSB-lcli-MIB
	CISCOSB-MIB	CISCOSB-localization-MIB
	CISCOSB-wrandomtaildrop-MIB	CISCOSB-mcmngr-MIB
	CISCOSB-traceroute-MIB	CISCOSB-mng-MIB
	CISCOSB-telnet-MIB	CISCOSB-physdescription-MIB
	CISCOSB-stormctrl-MIB	CISCOSB-Poe-MIB
	CISCOSB-ssh-MIB	CISCOSB-protectedport-MIB
	CISCOSB-socket-MIB	CISCOSB-rmon-MIB
	CISCOSB-sntp-MIB	CISCOSB-rs232-MIB
	CISCOSB-smon-MIB	CISCOSB-SecuritySuite-MIB
	CISCOSB-phy-MIB	CISCOSB-snmp-MIB
	CISCOSB-multisessionterminal-MIB	CISCOSB-specialbpdu-MIB
	CISCOSB-mri-MIB	CISCOSB-banner-MIB
	CISCOSB-jumboframes-MIB	CISCOSB-syslog-MIB
	CISCOSB-gvrp-MIB	CISCOSB-TcpSession-MIB
	CISCOSB-endofmib-MIB	CISCOSB-traps-MIB
	CISCOSB-dot1x-MIB	CISCOSB-trunk-MIB
	CISCOSB-deviceparams-MIB	CISCOSB-tuning-MIB
	CISCOSB-cli-MIB	CISCOSB-tunnel-MIB
	CISCOSB-cdb-MIB	CISCOSB-udp-MIB
	CISCOSB-brgmacswitch-MIB	CISCOSB-vlan-MIB
	CISCOSB-3sw2swtables-MIB	CISCOSB-ipstdacl-MIB
	CISCOSB-smartPorts-MIB	CISCOSB-eee-MIB

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Feature	Description	
	CISCOSB-tbi-MIB	CISCOSB-ssl-MIB
	CISCOSB-macbaseprio-MIB	CISCOSB-qosclimib-MIB
	CISCOSB-policy-MIB	CISCOSB-digitalkeymanage-MIB
	CISCOSB-env_mib	CISCOSB-tbp-MIB
	CISCOSB-sensor-MIB	CISCOSMB-MIB
	CISCOSB-aaa-MIB	CISCOSB-secsd-MIB
	CISCOSB-application-MIB	CISCOSB-draft-ietf-entmib-sensor-MIB
	CISCOSB-bridgesecurity-MIB	CISCOSB-draft-ietf-syslog-device-MIB
	CISCOSB-copy-MIB	CISCOSB-rfc2925-MIB
	CISCOSB-CpuCounters-MIB	CISCO-SMI-MIB
	CISCOSB-Custom1BonjourService-MIB	CISCOSB-DebugCapabilities-MIB
	CISCOSB-dhcp-MIB	CISCOSB-CDP-MIB
	CISCOSB-dlf-MIB	CISCOSB-vlanVoice-MIB
	CISCOSB-dnscl-MIB	CISCOSB-EVENTS-MIB
	CISCOSB-embweb-MIB	CISCOSB-sysmng-MIB
	CISCOSB-fft-MIB	CISCOSB-sct-MIB
	CISCOSB-file-MIB	CISCO-TC-MIB
	CISCOSB-greeneth-MIB	CISCO-VTP-MIB
	CISCOSB-interfaces-MIB	CISCO-CDP-MIB
	CISCOSB-interfaces_recovery-MIB	
Remote Monitoring (RMON)	Embedded RMON software agent supports 4 RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis	
IPv4 and IPv6 dual stack	Coexistence of both protocol stacks to ease migration	
Firmware upgrade	• Web browser upgrade (HTTP/HTTPS) and TFTP and upgrade over SCP running over SSH • Upgrade can be initiated through console port as well • Dual images for resilient firmware upgrades	
Port mirroring	Traffic on a port can be mirrored to another port for analysis with a network analyzer or RMON probe. Up to 8 source ports can be mirrored to one destination port. A single session is supported	
VLAN mirroring	Traffic from a VLAN can be mirrored to a port for analysis with a network analyzer or RMON probe. Up to 8 source VLANs can be mirrored to one destination port. A single session is supported	
DHCP (options 12, 66, 67, 82, 129, and 150)	DHCP options facilitate tighter control from a central point (DHCP server) to obtain IP address, autoconfiguration (with configuration file download), DHCP relay, and hostname	
Secure Copy (SCP)	Securely transfer files to and from the switch	
Autoconfiguration with Secure Copy (SCP) file download	Enables secure mass deployment with protection of sensitive data	

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Feature	Description
Text-editable config files	Config files can be edited with a text editor and downloaded to another switch, facilitating easier mass deployment
Smartports	Simplified configuration of QoS and security capabilities
Auto Smartports	Applies the intelligence delivered through the Smartport roles and applies it automatically to the port based on the devices discovered over Cisco Discovery Protocol or LLDP-MED. This facilitates zero-touch deployments
Textview CLI	Scriptable command-line interface. A full CLI as well as a menu-based CLI is supported. User privilege levels 1, 7, and 15 are supported for the CLI
Cloud services	Support for Cisco FindIT Network Manager and Cisco Active Advisor
Embedded Probe for FindIT Network Manager	Support for embedded FindIT Network Probe running on the switch. Eliminates the need to set up a separate hardware or virtual machine for the FindIT Network Probe on site
Cisco Network Plug and Play (PnP) agent	The Cisco Network Plug and Play solution provides a simple, secure, unified, and integrated offering to ease new branch or campus device rollouts or for provisioning updates to an existing network. The solution provides a unified approach to provision Cisco routers, switches, and wireless devices with a near-zero-touch deployment experience Supports Cisco PnP Connect
Localization	Localization of GUI and documentation into multiple languages
Login banner	Configurable multiple banners for web as well as CLI
Other management	Traceroute; single IP management; HTTP/HTTPS; SSH; RADIUS; port mirroring; TFTP upgrade; DHCP client; BOOTP; SNTP; Xmodem upgrade; cable diagnostics; ping; syslog; Telnet client (SSH secure support); automatic time settings from Management Station
Time-based port operation	Link up or down based on user-defined schedule (when the port is administratively up)
Time-based PoE	Capability for power to be on or off based on a user-defined schedule to save energy
Power Efficiency	
Energy Detect	Automatically turns power off on Gigabit Ethernet and 10/100 RJ-45 port when detecting link down. Active mode is resumed without loss of any packets when the switch detects the link up
Cable length detection	Adjusts the signal strength based on the cable length for Gigabit Ethernet models. Reduces the power consumption for shorter cables
EEE Compliant (802.3az)	Supports IEEE 802.3az on all copper Gigabit Ethernet ports
Disable port LEDs	LEDs can be manually turned off to save on energy
Time-based port operation	Link up or down based on user-defined schedule (when the port is administratively up)
Time-based PoE	Capability for power to be on or off based on a user-defined schedule to save energy

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Feature	Description
General	
Jumbo frames	Frame sizes up to 9K bytes. The default MTU is 2K bytes
MAC table	16K addresses
Discovery	
Bonjour	The switch advertises itself using the Bonjour protocol
Link Layer Discovery Protocol (LLDP) (802.1ab) with LLDP-MED extensions	LLDP allows the switch to advertise its identification, configuration, and capabilities to neighboring devices that store the data in a MIB. LLDP-MED is an enhancement to LLDP that adds the extensions needed for IP phones
Cisco Discovery Protocol	The switch advertises itself using the Cisco Discovery Protocol. It also learns the connected device and its characteristics via Cisco Discovery Protocol
Power over Ethernet (PoE)	
802.3af PoE, 802.3at PoE+, or 60W PoE are delivered over the RJ-45 ports within the listed power budgets	The following switches support 802.3at PoE+, 802.3af PoE, and Cisco prestandard (legacy) PoE on any of the RJ45 network ports. 60W PoE is also supported on selected RJ-45 network ports Maximum power of 60W is delivered to any of the 60W PoE ports, and maximum power of 30W is delivered to any of the other RJ45 network ports, until the PoE budget for the switch is reached The total power available for PoE per switch is as follows

Model Name	Power Dedicated to PoE	Number of Ports That Support PoE
SF352-08P	62W	8
SF352-08MP	128W	8
SF350-24P	185W	24 (4 support 60W PoE)
SF350-24MP	375W	24 (4 support 60W PoE)
SF350-48P	382W	48 (8 support 60W PoE)
SF350-48MP	740W	48 (8 support 60W PoE)
SG350-8PD	124W	8
SG350-10P	62W	8
SG355-10P	62W	8
SG350-10MP	124W	8
SG350-28P	195W	24 (4 support 60W PoE)
SG350-28MP	382W	24 (4 support 60W PoE)
SG350-52P	375W	48 (8 support 60W PoE)
SG350-52MP	740W	48 (8 support 60W PoE)

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Feature	Description
PoE powered device and PoE passthrough	In addition to AC power, compact switch models can work as PoE powered devices and be powered by PoE switches connected to the uplink ports. The switch can also pass through the power to downstream PoE end devices if required Maximum of 60W can be drawn per uplink port if the peer PoE switch supports 60W PoE. When multiple uplink ports are connected to PoE switches, the power drawn from these ports is combined When AC power is connected and functioning properly, it will have priority over the PoE powered device function. The PoE powered device function will then act as a backup power source to the AC power. The PoE powered device function will be the primary power source for the switch if AC power is not connected

Model	Power Option	Available PoE Power (W)	Can Switch Be Powered with Uplinks?
SG350-10P	1 PoE uplink	0W	Yes
	2 PoE uplink	0W	Yes
	1 PoE+ uplink	0W	Yes
	2 PoE+ uplink	22W	Yes
	1 60W PoE uplink	22W	Yes
	2 60W PoE uplink	50W	Yes
	AC power	62W	Yes
SG350-10MP	1 PoE uplink	0W	Yes
	2 PoE uplink	0W	Yes
	1 PoE+ uplink	0W	Yes
	2 PoE+ uplink	22W	Yes
	1 60W PoE uplink	22W	Yes
	2 60W PoE uplink	50W	Yes
	AC power	128W	Yes
SG355-10P	1 PoE uplink	0W	Yes
	2 PoE uplink	0W	Yes
	1 PoE+ uplink	0W	Yes
	2 PoE+ uplink	22W	Yes

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Feature	Description				
		1 60W PoE uplink	22W	Yes	
		2 60W PoE uplink	50W	Yes	
		AC power	62W	Yes	
Power consumption (worst case)	**Model**	**Green Power (mode)**	**System Power Consumption**	**Power Consumption (with PoE)**	**Heat Dissipation (BTU/hr)**
	SF350-08	Energy Detect	110V=5.6W 220V=5.8W	N/A	30.0
	SF352-08	Energy Detect	110V=6.9W 220V=6.9W	N/A	23.5
	SF352-08P	Energy Detect	110V=10.4W 220V=11.2W	110V=78.7W 220V=79.3W	207.4
	SF352-08MP	Energy Detect	110V=10.4W 220V=11.2W	110V=157.2W 220V=156.2W	536.1
	SF350-24	Energy Detect	110V=10.6W 220V=10.9W	110V=240W 220V=230W	43.3
	SF350-24P	Energy Detect	110V=10.6W 220V=10.9W	110V=240W 220V=230W	684.1
	SF350-24MP	Energy Detect	110V=29.2W 220V=28.3W	110V=238W 220V=233W	1333.0
	SF350-48	Energy Detect	110V=23.4W 220V=24.2W	N/A	82.6
	SF350-48P	Energy Detect	110V=50.8W 220V=52.1W	110V=464.3W 220V=453.1W	1584.3
	SF350-48MP	Energy Detect	110V=58.4W 220V=58.5W	110V=866.7W 220V=843.5W	2957.3
	SG350-8PD	EEE, Energy Detect, Short Reach	110V=29.8W 220V=31.3W	110V=167W 220V=165.2W	569.5
	SG350-10	EEE, Energy Detect, Short Reach	110V=9.0W 220V=9.8W	N/A	33.4
	SG350-10P	EEE, Energy Detect, Short Reach	110V=13.0W 220V=13.5W	110V=84.7W 220V=83.5W	289.0

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Feature	Description				
	SG355-10P	EEE, Energy Detect, Short Reach	110V=12.4W 220V=12.6W	110V=83.5W 220V=83.4W	284.8
	SG350-10MP	EEE, Energy Detect, Short Reach	110V=13.2W 220V=13.5W	110V=152.8W 220V=151.6W	521.5
	SG350-10SFP	EEE, Energy Detect, Short Reach	110V=11.1W 220V=11.9W	N/A	40.6
	SG350-20	EEE, Energy Detect, Short Reach	110V=14.5W 220V=15.2W	N/A	51.8
	SG350-28	EEE, Energy Detect, Short Reach	110V=19.7W 220V=19.9W	N/A	67.9
	SG350-28P	EEE, Energy Detect, Short Reach	110V=35.7W 220V=36.9W	110V=263W 220V=255.1W	897.4
	SG350-28MP	EEE, Energy Detect, Short Reach	110V=41.3W 220V=42.1W	110V=261.1W 220V=451.2W	1573.3
	SG350-28SFP	EEE, Energy Detect, Short Reach	110V=32.0W 220V=34.3W	N/A	117.0
	SG350-52	EEE, Energy Detect, Short Reach	110V=40.4W 220V=40.6.8W	N/A	136.4
	SG350-52P	EEE, Energy Detect, Short Reach	110V=62.4W 220V=61.8W	110V=440.0W 220V=431.0W	1429.4
	SG350-52MP	EEE, Energy Detect, Short Reach	110V=72.5W 220V=73.6W	110V=858.0W 220V=833.0W	2674.8

Ports	Model Name	Total System Ports	RJ-45 Ports	Combo Ports (RJ-45 + SFP)
	SF350-08	8 Fast Ethernet	8 Fast Ethernet	N/A
	SF352-08	8 Fast Ethernet + 2 Gigabit Ethernet	8 Fast Ethernet	2 Gigabit Ethernet combo
	SF352-08P	8 Fast Ethernet + 2 Gigabit Ethernet	8 Fast Ethernet	2 Gigabit Ethernet combo
	SF352-08MP	8 Fast Ethernet + 2 Gigabit Ethernet	8 Fast Ethernet	2 Gigabit Ethernet combo

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Feature	Description			
	SF350-24	24 Fast Ethernet + 4 Gigabit Ethernet	24 Fast Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SF350-24P	24 Fast Ethernet + 4 Gigabit Ethernet	24 Fast Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SF350-24MP	24 Fast Ethernet + 4 Gigabit Ethernet	24 Fast Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SF350-48	48 Fast Ethernet + 4 Gigabit Ethernet	48 Fast Ethernet 2 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SF350-48P	48 Fast Ethernet + 4 Gigabit Ethernet	48 Fast Ethernet 2 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SF350-48MP	48 Fast Ethernet + 4 Gigabit Ethernet	48 Fast Ethernet 2 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SG350-8PD	6 Gigabit Ethernet + 2 2.5G + 2 Multigigabit	6 Gigabit Ethernet + 2 2.5G	2 Multigigabit/SFP+ combo
	SG350-10	10 Gigabit Ethernet	8 Gigabit Ethernet	2 Gigabit Ethernet combo
	SG350-10P	10 Gigabit Ethernet	8 Gigabit Ethernet	2 Gigabit Ethernet combo
	SG355-10P	10 Gigabit Ethernet	8 Gigabit Ethernet	2 Gigabit Ethernet combo
	SG350-10MP	10 Gigabit Ethernet	8 Gigabit Ethernet	2 Gigabit Ethernet combo
	SG350-10SFP	10 Gigabit Ethernet	8 Gigabit SFP Slots	2 Gigabit Ethernet combo
	SG350-20	20 Gigabit Ethernet	16 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SG350-28	28 Gigabit Ethernet	24 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SG350-28P	28 Gigabit Ethernet	24 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SG350-28MP	28 Gigabit Ethernet	24 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SG350-28SFP	28 Gigabit Ethernet	24 Gigabit SFP slots	2 Gigabit Ethernet combo + 2 SFP
	SG350-52	52 Gigabit Ethernet	48 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP

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Feature	Description			
	SG350-52P	52 Gigabit Ethernet	48 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
	SG350-52MP	52 Gigabit Ethernet	48 Gigabit Ethernet	2 Gigabit Ethernet combo + 2 SFP
Console port	Cisco Standard RJ45 console port			
USB slot	USB Type-A slot on the front panel of the switch for easy file and image management			
Buttons	Reset button			
Cabling type	Unshielded Twisted Pair (UTP) Category 5 or better for 10BASE-T/100BASE-TX; UTP Category 5e or better for 1000BASE-T			
LEDs	System, Link/Act, PoE, Speed			
Flash	256 MB			
CPU	800 MHz ARM			
CPU memory	512 MB			
Packet buffer	All numbers are aggregate across all ports as the buffers are dynamically shared:			
	Model Name	**Packet Buffer**		
	SF350-08	1.5 MB		
	SF352-08	1.5 MB		
	SF352-08P	1.5 MB		
	SF352-08MP	1.5 MB		
	SF350-24	1.5 MB		
	SF350-24P	1.5 MB		
	SF350-24MP	1.5 MB		
	SF350-48	3 MB		
	SF350-48P	3 MB		
	SF350-48MP	3 MB		
	SG350-8PD	1.5 MB		
	SG350-10	1.5 MB		
	SG350-10P	1.5 MB		
	SG355-10P	1.5 MB		

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Feature	Description			
	SG350-10MP		1.5 MB	
	SG350-10SFP		1.5 MB	
	SG350-20		1.5 MB	
	SG350-28		1.5 MB	
	SG350-28P		1.5 MB	
	SG350-28MP		1.5 MB	
	SG350-28SFP		1.5 MB	
	SG350-52		3 MB	
	SG350-52P		3 MB	
	SG350-52MP		3 MB	
Supported SFP modules	**SKU**	**Media**	**Speed**	**Maximum Distance**
	MGBSX1	Multimode fiber	1000 Mbps	500 m
	MGBLX1	Single-mode fiber	1000 Mbps	10 km
	MGBLH1	Single-mode fiber	1000 Mbps	40 km
	MGBT1	UTP cat 5e	1000 Mbps	100 m
	GLC-LH-SMD	Single-mode fiber	1000 Mbps	10 km
	GLC-BX-U	Single-mode fiber	1000 Mbps	10 km
Environmental				
Unit dimensions (W x H x D)	**Model Name**		**Unit Dimensions**	
	SF350-08		279.4 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)	
	SF352-08		279.4 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)	
	SF352-08P		279.4 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)	
	SF352-08MP		279.4 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)	
	SF350-24		440 x 44 x 202 mm (17.3 x 1.73 x 7.95 in)	
	SF350-24P		440 x 44 x 257 mm (17.3 x 1.73 x 10.12 in)	
	SF350-24MP		440 x 44 x 257 mm (17.3 x 1.73 x 10.12 in)	
	SF350-48		440 x 44 x 257 mm (17.3 x 1.73 x 10.12 in)	

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Feature	Description	
	SF350-48P	440 x 44 x 350 mm (17.3 x 1.73 x 13.78 in)
	SF350-48MP	440 x 44 x 350 mm (17.3 x 1.73 x 13.78 in)
	SG350-8PD	344.4 x 44 x 252.5 (13.6 x 1.73 x 9.94 in)
	SG350-10	280 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)
	SG350-10P	280 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)
	SG355-10P	440 x 44 x 203 mm (17.3 x 1.73 x 7.99 in)
	SG350-10MP	280 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)
	SG350-10SFP	279.4 x 44 x 170 mm (11.0 x 1.73 x 6.69 in)
	SG350-20	440 x 44 x 203 mm (17.3 x 1.73 x 7.99 in)
	SG350-28	440 x 44 x 202 mm (17.3 x 1.73 x 7.95 in)
	SG350-28P	440 x 44 x 257 mm (17.3 x 1.73 x 10.12 in)
	SG350-28MP	440 x 44 x 257 mm (17.3 x 1.73 x 10.12 in)
	SG350-28SFP	440 x 44 x 203 mm (17.3 x 1.73 x 7.99 in)
	SG350-52	440 x 44 x 257 mm (17.3 x 1.73 x 10.12 in)
	SG350-52P	440 x 44 x 350 mm (17.3 x 1.73 x 13.78 in)
	SG350-52MP	440 x 44 x 350 mm (17.3 x 1.73 x 13.78 in)
Unit weight	**Model Name**	**Unit Weight**
	SF350-08	1.18 kg (2.60 lb)
	SF352-08	1.06 kg (2.34 lb)
	SF352-08P	1.16 kg (2.56 lb)
	SF352-08MP	1.16 kg (2.56 lb)
	SF350-24	2.72 kg (6.0 lb)
	SF350-24P	4.08 kg (8.99 lb)
	SF350-24MP	4.12 kg (9.08 lb)
	SF350-48	3.58 kg (7.89 lb)
	SF350-48P	5.59 kg (12.32 lb)
	SF350-48MP	5.61 kg (12.37 lb)

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Feature	Description	
	SG350-8PD	2.5 kg (5.51 lb)
	SG350-10	1.09 kg (2.40 lb)
	SG350-10P	1.19 kg (2.62 lb)
	SG355-10P	2.36 kg (5.20 lb)
	SG350-10MP	1.19 kg (2.62 lb)
	SG350-10SFP	2.08 kg (4.59 lb)
	SG350-20	2.12 kg (4.67 lb)
	SG350-28	2.75 kg (6.06 lb)
	SG350-28P	3.83 kg (8.44 lb)
	SG350-28MP	3.37 kg (7.43 lb)
	SG350-28SFP	2.7 kg (5.95 lb)
	SG350-52	2.75 kg (6.06 lb)
	SG350-52P	3.81 kg (8.40 lb)
	SG350-52MP	3.83 kg (8.44 lb)
Power	100-240V 50-60 Hz, internal, universal: SF350-24, SF350-24P, SF350-24MP, SF350-48, SF350-48P, SF350-48MP, SG350-8PD, SG355-10P, SG350-20, SG350-28, SG350-28P, SG350-28MP, SG350-28SFP, SG350-52, SG350-52P, SG350-52MP 100-240V 50-60 Hz, external: SF350-08, SF352-08, SF352-08P, SF352-08MP, SG350-10, SG350-10P, SG350-10MP, SG350-10SFP	
Certification	UL (UL 60950), CSA (CSA 22.2), CE mark, FCC Part 15 (CFR 47) Class A	
Operating temperature	32° to 122°F (0° to 50°C): SF350-08, SF352-08, SF352-08P, SF352-08MP, SF350-24, SF350-24P, SF350-24MP, SF350-48, SF350-48P, SF350-48MP, SG350-10, SG350-10P, SG355-10P, SG350-10MP, SG350-10SFP, SG350-20, SG350-28, SG350-28P, SG350-28MP, SG350-28SFP, SG350-52, SG350-52P, SG350-52MP 32° to 113°F (0° to 45°C): SG350-08PD	
Storage temperature	-4° to 158°F (-20° to 70°C)	
Operating humidity	10% to 90%, relative, noncondensing	
Storage humidity	10% to 90%, relative, noncondensing	

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Feature	Description			
Acoustic noise and MTBF	Model Name	FAN (Number)	Acoustic Noise	MTBF @40C (hr)
	SF350-08	Fanless	N/A	644,573
	SF352-08	Fanless	N/A	532,704
	SF352-08P	Fanless	N/A	530,716
	SF352-08MP	Fanless	N/A	478,335
	SF350-24	Fanless	N/A	562,313
	SF350-24P	2	0°C - 25°C: 39.7dB 50°C: 52.2dB	293,029
	SF350-24MP	2	0°C - 25°C: 39.7dB 50°C: 52.2dB	272,127
	SF350-48	Fanless	N/A	277,653
	SF350-48P	3	0°C - 25°C: 42.5dB 50°C: 55.0dB	182,270
	SF350-48MP	4	0°C - 25°C: 42.0dB 50°C: 54.1dB	191,951
	SG350-8PD	Fanless	N/A	562,664
	SG350-10	Fanless	N/A	308,196
	SG350-10P	Fanless	N/A	205,647
	SG355-10P	Fanless	N/A	296,426
	SG350-10MP	Fanless	N/A	80,093
	SG350-10SFP	Fanless	N/A	851,827
	SG350-20	Fanless	N/A	1,400,007
	SG350-28	Fanless	N/A	367,209
	SG350-28P	2	0°C - 25°C: 37.2dB 50°C: 53.7dB	396,687
	SG350-28MP	2	0°C - 25°C: 37.2dB 50°C: 51.8dB	213,373
	SG350-28SFP	1	0°C - 30°C: 40.3dB 50°C: 43.6dB	101,523

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Feature	Description			
	SG350-52	1	0° C - 25° C: 36.6dB 50° C: 52.6dB	301,297
	SG350-52P	3	0° C - 25° C: 41.2dB 50° C: 54.2dB	195,746
	SG350-52MP	4	0° C - 25° C: 43.7dB 50° C: 55.5dB	163,704
Warranty	Limited lifetime with next business day advance replacement (where available)			
Package Contents				
• Cisco 350 Series Managed Switch • Power Cord (Power Adapter for select SKUs) • Mounting Kit • Console Cable • Quick Start Guide				
Minimum Requirements				
• Web browser: Chrome, Firefox, Edge, Safari • Category 5 Ethernet network cable • TCP/IP, network adapter, and network operating system (such as Microsoft Windows, Linux, or Mac OS X) installed on each computer in the network				

Ordering information

Table 2 provides ordering information for the Cisco 350 Series Switches. Table 3 gives region- and country-specific information, and Table 4 provides MGE transceiver ordering information.

Table 2. Cisco 350 Series Switches ordering information

Model Name	Order Product ID Number	Description
Fast Ethernet		
SF350-08	SF350-08-K9-xx	• 8 10/100 ports
SF352-08	SF352-08-K9-xx	• 8 10/100 ports • 2 Gigabit copper/SFP combo
SF352-08P	SF352-08P-K9-xx	• 8 10/100 PoE+ ports • 2 Gigabit copper/SFP combo • 62W PoE power budget
SF352-08MP	SF352-08MP-K9-xx	• 8 10/100 PoE+ ports • 2 Gigabit copper/SFP combo • 128W PoE power budget

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Model Name	Order Product ID Number	Description
SF350-24	SF350-24-K9-xx	• 24 10/100 ports • 2 Gigabit copper/SFP combo + 2 SFP ports
SF350-24P	SF350-24P-K9-xx	• 24 10/100 PoE+ ports (4 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 185W PoE power budget
SF350-24MP	SF350-24MP-K9-xx	• 24 10/100 PoE+ ports (4 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 375W PoE power budget
SF350-48	SF350-48-K9-xx	• 48 10/100 ports • 2 Gigabit copper/SFP combo + 2 SFP ports
SF350-48P	SF350-48P-K9-xx	• 48 10/100 PoE+ ports (8 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 382W PoE power budget
SF350-48MP	SF350-48MP-K9-xx	• 48 10/100 PoE+ ports (8 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 740W PoE power budget
Gigabit Ethernet		
SG350-10	SG350-10-K9-xx	• 8 10/100/1000 ports • 2 Gigabit copper/SFP combo
SG350-10P	SG350-10P-K9-xx	• 8 10/100/1000 PoE+ ports • 2 Gigabit copper/SFP combo • 62W PoE power budget
SG355-10P	SG355-10P-K9-xx	• 8 10/100/1000 PoE+ ports • 2 Gigabit copper/SFP combo • 62W PoE power budget
SG350-10MP	SG350-10MP-K9-xx	• 8 10/100/1000 PoE+ ports • 2 Gigabit copper/SFP combo • 124W PoE power budget
SG350-10SFP	SG350-10SFP-K9-xx	• 8 SFP Gigabit slots • 2 Gigabit copper/SFP combo
SG350-20	SG350-20-K9-xx	• 16 10/100/1000 ports • 2 Gigabit copper/SFP combo + 2 SFP ports
SG350-28	SG350-28-K9-xx	• 24 10/100/1000 ports • 2 Gigabit copper/SFP combo + 2 SFP ports
SG350-28P	SG350-28P-K9-xx	• 24 10/100/1000 PoE+ ports (4 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 195W PoE power budget
SG350-28MP	SG350-28MP-K9-xx	• 24 10/100/1000 PoE+ ports (4 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 382W PoE power budget

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Model Name	Order Product ID Number	Description
SG350-28SFP	SG350-28SFP-K9-xx	• 24 SFP Gigabit slots • 2 Gigabit copper/SFP combo + 2 SFP ports
SG350-52	SG350-52-K9-xx	• 48 10/100/1000 ports • 2 Gigabit copper/SFP combo + 2 SFP ports
SG350-52P	SG350-52P-K9-xx	• 48 10/100/1000 PoE+ ports (8 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 375W PoE power budget
SG350-52MP	SG350-52MP-K9-xx	• 48 10/100/1000 PoE+ ports (8 support 60W PoE) • 2 Gigabit copper/SFP combo + 2 SFP ports • 740W PoE power budget
Multi-Gigabit Ethernet		
SG350-8PD	SG350-8PD-K9-xx	• 6 10/100/1000 PoE+ ports • 2 2.5G PoE+ ports • 2 Multigigabit/SFP+ combo • 124W PoE power budget

* Each combo port has one 10/100/1000 Ethernet port and one SFP Gigabit Ethernet slot, with one port active at a time.

The -xx in the Product Order ID Number is a country-/region-specific suffix. For example, the complete PID of SG350-28P for the United States is SG350-28P-K9-NA. Please refer to Table 3 for the correct suffix to use for your country/region.

Table 3. Country/region suffix for product order ID number

Suffix	Country/Region
-NA	USA, Canada, Mexico, Colombia, Chile and rest of Latin America
-BR	Brazil
-AR	Argentina
-EU	EU, Russia, Ukraine, Israel, United Arab Emirates, Turkey, Egypt, South Africa, Indonesia, Philippines, Vietnam, Thailand, Korea
-UK	United Kingdom, Saudi Arabia, Qatar, Kuwait, Singapore, Hong Kong, Malaysia
-AU	Australia, New Zealand
-CN	China
-IN	India
-JP	Japan
-KR	Korea

The products may also be available in a country/region not listed in Table 3. Not all product models are offered in all countries/regions. For Korea, either -EU or -KR suffix will be used depending on product models. Please consult with your local Cisco sales representative or Cisco partners for more details.

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Table 4. MGE transceiver ordering information

MGE Transceivers	
MGBSX1	1000BASE-SX SFP transceiver, for multimode fiber, 850 nm wavelength, support up to 500 m
MGBLX1	1000BASE-LX SFP transceiver for single-mode fiber, 1310 nm wavelength, supports up to 10 km
MGBLH1	1000BASE-LH SFP transceiver, for single-mode fiber, 1310 nm wavelength, support up to 40 km
MGBT1	1000BASE-T SFP transceiver for Category 5 copper wire, supports up to 100 m

A powerful, affordable foundation for your small business network

As you strive to make your employees as productive and effective as possible, your business applications and information and the network that delivers them become ever more vital parts of your business. You need a technology foundation that can meet your business's needs today and in the future and that delivers the right feature set at the right price. The Cisco 350 Series portfolio of managed switches provides the reliability, performance, security, and capabilities you need to power your business.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

For more information

To find out more about the Cisco 350 Series, visit https://www.cisco.com/go/350switches.

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C1800FDi DSP power amplifier 2x950W, install



- Installation DSP amplifier, Euroblock connectors
- Fully integrated professional speaker processing with FIR Drive technology
- Market leading acoustic performance and rock solid reliability
- Low Z and 70/100V operation and power saving standby mode
- Intuitive system control software, makes setup and control easy

Technical specifications

Load Impedance	2 Ω	2.6 Ω	4 Ω	8 Ω
Maximum Output Power, Single Channel	1600 W	1300 W	950 W	480 W
Maximum Output Power, Dual Channel	1400 W	1200 W	850 W	450 W
Maximum Output Power, Bridged	-	-	2800 W	1700 W
Direct Drive Load Capability Dual Channel Bridged	**70 V Operation** 2 x 1250 W (-1.5 dB) Not recommended[1]		**100 V Operation** Not available[2] 1 x 1250 W (-1.5 dB)	
Maximum RMS Voltage Swing THD = 1%, 1 kHz	65.1 V			
Voltage Gain Ref.1 kHz	32.0 dB			

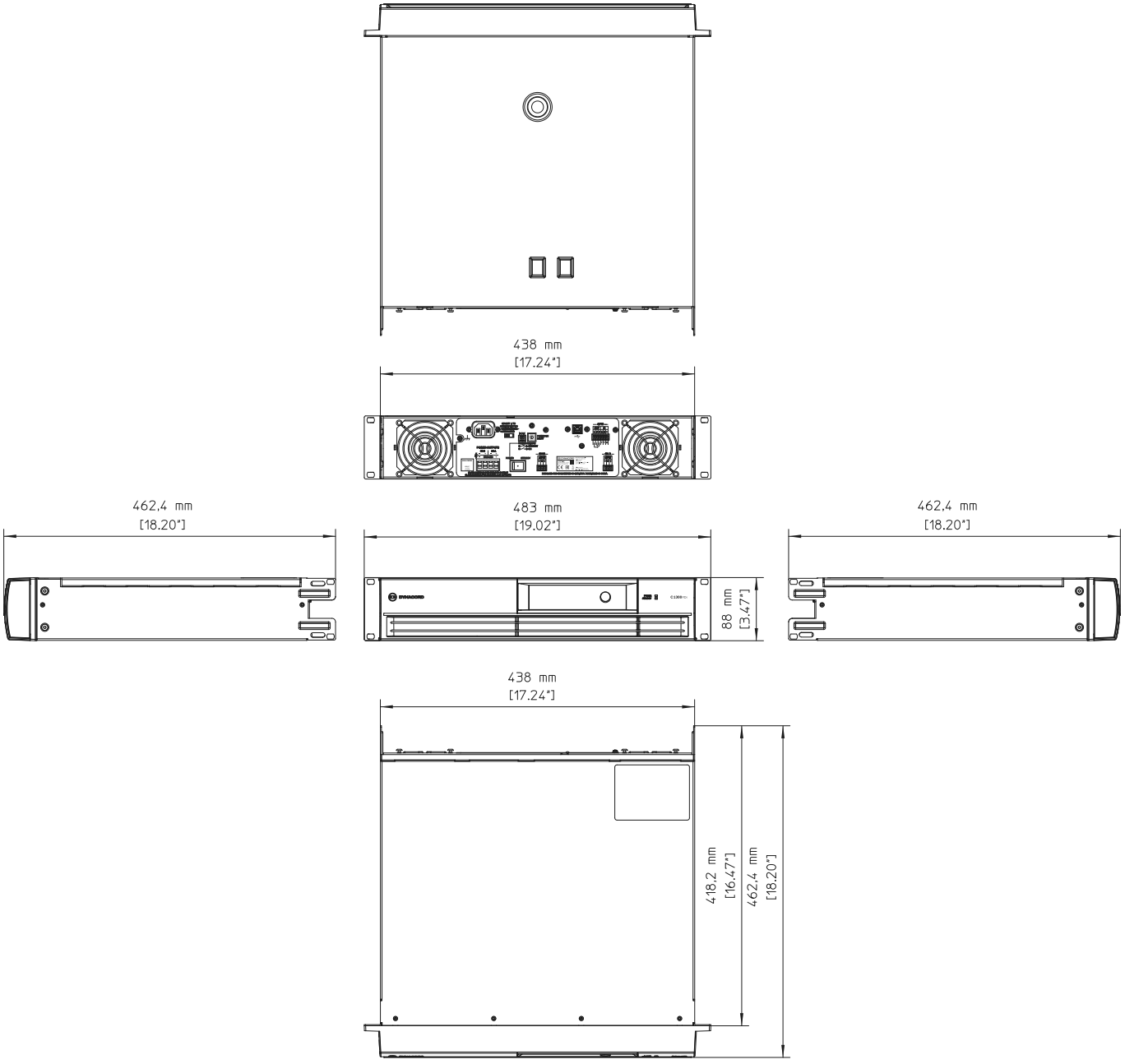
THD at 600 W/4 Ω MBW = 80 kHz, 1 kHz	< 0.05%
IMD-SMPTE, 60 Hz, 7 kHz	< 0.1%
DIM30, 3.15 kHz, 15 kHz	< 0.05%
Maximum Input Level	+21 dBu
Crosstalk ref. 1 kHz, at 100 W/4 Ω	< -80 dB
Frequency Response, ref. 1 kHz	10 Hz to 21 kHz (±1 dB)
Input Impedance, Active Balanced	20 k Ω
Signal to Noise Ratio Amplifier, A-weighted, ref to Max. Output Power @ 8 Ω	>105 dB

Output Noise, A-weighted	< -68 dBu
Output Stage Topology	Class AB
Power Requirements	240 V, 230 V, 120 V or 100 V; 50 Hz to 60 Hz (factory configured)
Power Consumption 1/8 Maximum Output Power @ 4 Ω	700 W
Mains Fuse	240 V/230 V: T12AH; 120 V/100 V: T25AH
Protection	Audio limiters, high temperature, DC, HF, Back-EMF, Peak current limiters, Inrush current limiters, Turn on delay
Cooling	Front-to-rear, 3-stage-fans
Ambient Temperature Limits	+5°C to +40°C (40°F to +105°F)
Safety Class	I
Color	Black
Dimensions (W x H x D), mm	483 x 88 x 462.4
Weight	15.2 kg (33.5 lb)

Remote Power ON/GPIO	Power remote via switch, delay time selectable Floating relay contacts (show protect mode) Inputs for preset selection
Signal Processing	FIR Filters, Audio Limiters Output delay per channel, 31 band GEQ per channel, PEQ per channel, Load impedance
Accessories	RMK15 (rear rack mount kit), Multi Amplifier Remote Control (MARC) software

Test signal for max. output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz/20 ms on/480 ms off/low level -20 dBu).

Direct drive load capability
The direct drive load capability is a measure for the total wattage that can be driven in 70 V/100 V operation mode. A load capability value of 1250 watts means that this amplifier can drive e.g. 50 loudspeakers at a voltage tab of 25 watts. The dB value in parentheses indicates the delta to maximum modulation. In cases where the maximum modulation is not required you can use the smaller amplifier model.
[1]This operation mode is not recommended due to the efficiency reasons. Please use the next smaller amplifier for this mode.
[2]Direct drive mode not available for this configuration.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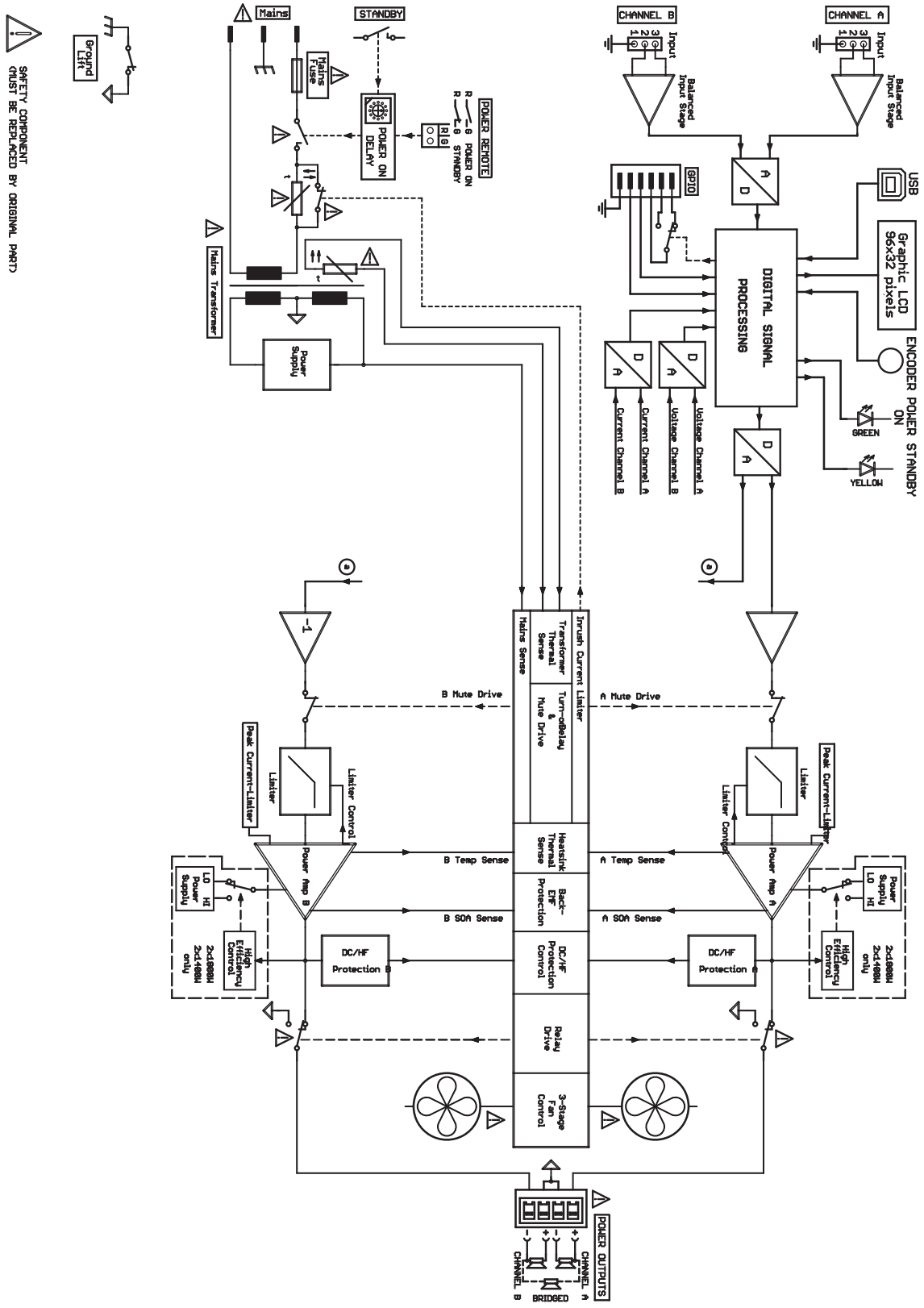
Dimensions



Block diagram

Ordering information

C1800FDI-AU DSP power amplifier 2x950W, install AU
DSP power amplifier 2 x 950W @ 4 ohms with FIR Drive, 70V/100V output, GPI remote power, black, Australian region
Order number **C1800FDI-AU**

C1800FDI-CN DSP power amplifier 2x950W, install CN
DSP power amplifier 2 x 950W @ 4 ohms with FIR Drive, 70V/100V output, GPI remote power, black, Chinese region
Order number **C1800FDI-CN**

C1800FDI-EU DSP power amplifier 2x950W, install EU
DSP power amplifier 2 x 950W @ 4 ohms with FIR Drive, 70V/100V output, GPI remote power, black, European region
Order number **C1800FDI-EU**

C1800FDI-UK DSP power amplifier 2x950W, install UK
DSP power amplifier 2 x 950W @ 4 ohms with FIR Drive, 70V/100V output, GPI remote power, black, UK region
Order number **C1800FDI-UK**

C1800FDI-JP DSP power amplifier 2x950W, install JP
DSP power amplifier 2 x 950W @ 4 ohms with FIR Drive, 70V/100V output, GPI remote power, black, Japanese region
Order number **C1800FDI-JP**

C1800FDI-US DSP power amplifier 2x950W, install US
DSP power amplifier 2 x 950W @ 4 ohms with FIR Drive, 70V/100V output, GPI remote power, black, North American region
Order number **C1800FDI-US**

DC-RMK15 RMK-15
Rack Mount Kit for amplifiers, Length 15,5“; 1L/1R
Order number **DC-RMK15**

Germany:
Bosch Sicherheitssysteme GmbH
Robert-Bosch-Ring 5
85630 Grasbrunn
Germany

Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, NY 14450
USA

www.dynacord.com

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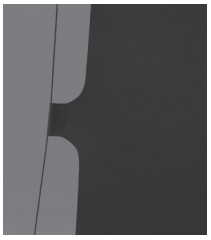
Document Number | Vs3 | 06. Mar 2018

ELECTRIC Paragon V

TAB-TENSIONED, CEILING- OR WALL-MOUNTED







Paragon V electric projection screen the largest tab-tensioned screen Draper® offers. Its size makes it ideal for auditoriums or lecture halls. Tab-tensioned screens provide a perfectly flat viewing surface with better image quality. RF welded tabs create a more durable seal that eliminates separation and stickiness. This heavy-duty screen provides smooth, quiet, and reliable operation.

THIS SCREEN IS TAB-TENSIONED
RF welded tabs eliminate stickiness and tab separation. Tabs warranted against separation for five years. Tab-tensioned screens provide a perfectly flat viewing surface with better image quality.

FEATURES

- Image area fully framed with black. Standard 12" (30 cm) black drop at top of viewing area.
- Includes extruded aluminum case with white finish.
- Bottom closure panel provides easy access for service or maintenance.
- Rear projection surfaces available.
- Includes a 110V, 3-position switch (standard).

WARRANTY

draperinc.com/warranty.aspx

OPTIONS

- **Viewing Surfaces:** TecVision®, OptiFlex™ (tensioned), CineFlex™ (rear projection), and ClearSound families.
- Optional wall-mounting brackets and ceiling trim flange kit.
- Low-voltage modules and controls or 220V options are available.

SIZES

- **Case dimensions** 13¼" high x 12" deep (34 cm x 30 cm). Optional extra drop may increase case length.
- **Maximum image width** up to 24' (732 cm) wide, depending on surface.
- 16:10 FORMAT: 234" to 335" (850 to 594 cm) diagonal.
- 16:9 HDTV FORMAT: 227"to 324" (576 to 822 cm) diagonal.
- 4:3 NTSC/PAL FORMAT: 250" to 30' (635 to 914 cm) diagonal.
- AV FORMAT: from 13' 6" x 18' (411 cm x 549 cm) to 18' x 24' (549 cm x 732 cm) viewing area.
- Custom sizes available.

SUPPORTING DOCUMENTS

All instructions, technical drawings and other supporting documents are located at: *draperinc.com/documents.aspx*

For more information on this product visit: *draperinc.com/projectionscreens/electricscreens.aspx*

DRAPER

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Panasonic

SPEC FILE

Product Number : PT-**RZ21K**

Product Name : 3-Chip DLP™ Projector

Specifications

Main unit

Power supply		AC 200V-240V, 7.7A, 50/60Hz The light output will decrease to approximately 1/2 when using the projector with AC 100V to AC 120V [9.6A].
Power consumption		1,510 W (1,525 VA [AC200V]) (0.3 W with Standby Mode set to Eco*1, 4 W with Standby Mode set to Normal) 1,217W (Normal Mode), 972 W (Eco Mode) Operating Temperature: 25 °C (77 °F), Altitude: 700m (2,297ft), IEC627087: 2008 Broadcast contents, Picture mode: Standard, Dynamic contrast [2]
BTU value		Max 5,159 BTU
DLP™ chip	Panel size	24.4 mm (0.96 inches) diagonal (16:10 aspect ratio)
	Display method	DLP™ chip × 3, DLP™ projection system
	Pixels	6,912,000 (1920 x 1200 x 3) pixels
Refresh rate		120 Hz*2
Lens		Optional (no lens included with this model), powered zoom, powered focus lens
Light source		Laser Diode (Laser class: Class 1)*Class 3R for North America.
Illumination life of set		Varies depending on operation mode setting. 20,000 hours at half luminance (Normal) 24,000 hours at half luminance (Eco) * IEC62087: 2008 Broadcast contents, Dynamic contrast [3] (NORMAL/ECO Temperature: 30°C (86°F), Altitude 700m (2,297 ft),Dynamic Contrast [3] Under conditions of 0.15 mg/m^3 of particulate matter
Screen size (diagonal)		1.78–25.4 m (70–1,000 in) with 16:10 aspect ratio 1.78–15.24 m (70–600 in) with the ET-D75LE8, 16:10 aspect ratio 3.05–15.24 m (120–600 in) with the ET-D75LE95, 16:10 aspect ratio
Brightness		21,000 lm (Center)*3*5 / 20,000 lm (Normal)*4*5
Center-to-corner uniformity		90 %
Contrast*3		20,000:1 (Full On/Full Off, Dynamic Contrast Mode: 3)
Resolution		1920 x 1200 pixels
Scanning frequency	Video/YC	fH:15.73KHz fV:59.94Hz, fH:15.63KHz fV:50Hz
	RGB	• Resolution: 640 x 400 pixels to 1920 x 1200 pixels • Dot clock frequency: 162MHz or less • PIAS (Panasonic Intelligent Auto Scanning)
	YPBPR(YCBCR)	• Resolution: 480i/576i to 1920 x 1080 pixels • Dot clock frequency: 148.5MHz or less • The SYNC/HD and VD terminals do not support 3 value SYNC.
	DVI	• Moving image signal resolution: 480i*6/576i*6 to 1920x1080 Still image signal resolution: 640 x 400 to 1920 x 1200 (non-interlace) • Dot clock frequency: 25 MHz to 162 MHz
	HDMI/DIGITAL LINK	• Moving image signal resolution: 480i*6/576i*6 to 1920x1080 Still image signal resolution: 640 x 400 to 1920 x 1200 (non-interlace) • Dot clock frequency: 25 MHz to 162 MHz
	SDI	SD-SDI signal HD-SDI signal 3G-SDI signal
Optical axis shift		Vertical (from center of screen) ±55 % (±44 % with ET-D75LE6, +68 % – +78 % with ET-D75LE95) (powered) Horizontal (from center of screen) ±20 % (±15 % with ET-D75LE6, ±12 % with ET-D75LE95) (powered)

NOTE: Optical axis shift function cannot be operated when used with the ET-D75LE50.

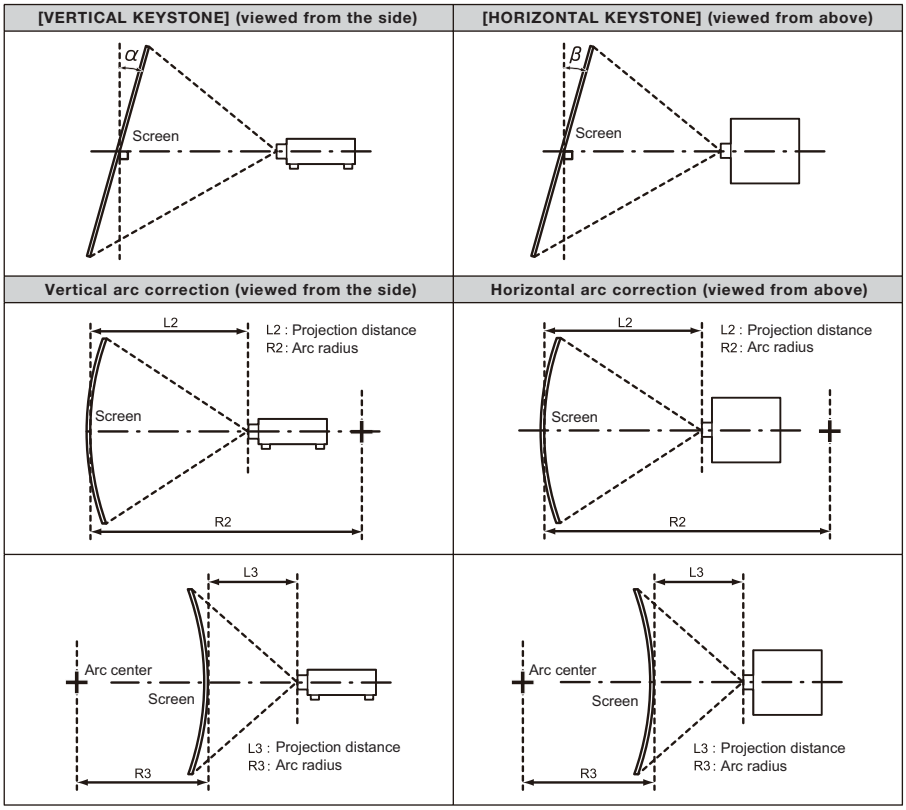
Keystone correction range

Projection lens Model No.	Only [KEYSTONE] used		[KEYSTONE] and [CURVED] used together				Only [CURVED] used	
	Vertical keystone correction angle α (°)	Horizontal keystone correction angle β (°)	Vertical keystone correction angle α (°)	Horizontal keystone correction angle β (°)	Min. value of R2/L2	Min. value of 3/L3	Min. value of R2/L2	Min. value of R3/L3
ET-D75LE6	± 28	± 15	± 10	± 10	1.6	3.9	0.9	2.3
ET-D75LE8	± 40	± 15	± 20	± 15	0.2	0.4	0.2	0.3
ET-D75LE10	± 40	± 15	± 20	± 15	1.1	2.6	0.6	1.5
ET-D75LE20	± 40	± 15	± 20	± 15	0.9	1.7	0.5	1.0
ET-D75LE30	± 40	± 15	± 20	± 15	0.6	1.2	0.4	0.7
ET-D75LE40	± 40	± 15	± 20	± 15	0.4	0.7	0.2	0.4
ET-D75LE50	± 22	± 15	± 8	± 8	2.0	4.9	1.2	2.9
ET-D75LE95*7	+5 / -0	0	-	-	-	-	-	-

When using the optional Upgrade Kit (Model No.: ET-UK20)

Projection lens Model No.	Only [KEYSTONE] used*8		[KEYSTONE] and [CURVED] used together*8				Only [CURVED] used	
	Vertical keystone correction angle α (°)	Horizontal keystone correction angle β (°)	Vertical keystone correction angle α (°)	Horizontal keystone correction angle β (°)	Min. value of R2/L2	Min. value of 3/L3	Min. value of R2/L2	Min. value of R3/L3
ET-D75LE6	± 28	± 15	± 10	± 10	1.2	3.0	0.7	1.7
ET-D75LE8	± 45	± 40	± 20	± 15	0.2	0.3	0.1	0.2
ET-D75LE10	± 40	± 40	± 20	± 15	0.9	2.0	0.5	1.1
ET-D75LE20	± 40	± 40	± 20	± 15	0.7	1.3	0.4	0.7
ET-D75LE30	± 45	± 40	± 20	± 15	0.5	0.9	0.3	0.5
ET-D75LE40	± 45	± 40	± 20	± 15	0.3	0.5	0.2	0.3
ET-D75LE50	± 22	± 15	± 8	± 8	1.5	3.7	0.9	2.2
ET-D75LE95*7	+5 / -0	0	-	-	-	-	-	-

Keystone correction range



Installation		Ceiling/floor, front /rear, free 360-degree installation
Terminals	RGB1 IN	BNC × 5
	R,G,B	R: 0.7 Vp-p, 75 ohms, G: 0.7 Vp-p (G: 1.0 Vp-p for sync on G), 75 ohms, B: 0.7 Vp-p, 75 ohms HD, VD/SYNC: TTL, high impedance, positive/negative automatic
	Y, P_B, P_R (Y, C_B, C_R)	Y: 1.0 Vp-p (including sync signal), PB/PR (CB/CR): 0.7 Vp-p, 75 ohms
	Y/C	Y: 1.0 Vp-p (including sync signal), C: 0.286 Vp-p, 75 ohms
	VIDEO IN	BNC × 1, 1.0 Vp-p, 75 ohms
	RGB2 IN	D-sub HD 15-pin (female) × 1
	R,G,B	R: 0.7 Vp-p, 75 ohms, G: 0.7 Vp-p (G: 1.0 Vp-p for sync on G), 75 ohms, B: 0.7 Vp-p, 75 ohms HD, VD/SYNC: TTL, high impedance, positive/negative automatic
	Y, P_B, P_R (Y, C_B, C_R)	Y: 1.0 Vp-p (including sync signal), PB/PR (CB/CR): 0.7 Vp-p, 75 ohms
	DVI-D IN	DVI-D 24-pin ×1 Single link, DVI 1.0 compliant, HDCP compatible
	HDMI IN	HDMI 19-pin x1 HDCP compatible, Deep Color compatible
	SDI IN 1	BNC × 1 SD-SDI signal SMPTE ST 259 compliant HD-SDI signal SMPTE ST 292 compliant 3G-SDI signal SMPTE ST 424, 425-2 compliant Dual link HD-SDI (LINK A) signal SMPTE ST 372 compliant Dual link 3G-SDI (Link 1) signal SMPTE ST 425-3 compliant
	SDI IN 2	BNC × 1 SD-SDI signal SMPTE ST 259 compliant HD-SDI signal SMPTE ST 292 compliant 3G-SDI signal SMPTE ST 424, 425-2 compliant Dual link HD-SDI (LINK B) signal SMPTE ST 372 compliant Dual link 3G-SDI (Link 2) signal SMPTE ST 425-3 compliant

Terminals	DIGITAL LINK	RJ-45 HDBaseT™ compliant, HDCP compatible, Deep Color compatible
	3D SYNC1 IN/OUT / MULTI PROJECTOR SYNC IN	BNC × 1, IN : TTL Hi-z OUT : TTL max10mA
	3D SYNC2 OUT / MULTI PROJECTOR SYNC OUT	BNC × 1, TTL max10mA
	SERIAL IN	D-sub 9-pin × 1 for external control (RS-232C compliant)
	SERIAL OUT	D-sub 9-pin × 1 for link control
	REMOTE 1 IN	M3 jack × 1 for wired remote control
	REMOTE 1 OUT	M3 jack × 1 for link control
	REMOTE 2 IN	D-sub 9-pin × 1 for external control (parallel)
	DIGITAL LINK/LAN	RJ-45 × 1 for network connection, 100Base-TX PJLink™ (class 2) compatible, Art-Net compatible
	DC OUT 5V	USB connector (type A) x 2 for power supply only (DC 5V, Max 2A)
Power cord length	3.0 m(9 ft 10 in)	
Cabinet materials	Molded plastic	
Dimensions (W × H × D)	598 × 270 × 725 mm (23 17/32″ x 10 5/8″ x 28 17/32″) (not including protruding parts)	
Weight*9	Approximately 49kg (108 lbs) (not including lens)	
Operation noise*3	46dB	
Laser Classification	Laser Class	USA and Canada: Class 3R (IEC 60825-1:2007) Other countries or regions: Class 1 (IEC/EN 60825-1:2014)
	Risk Group	Risk Group 3 (IEC 62471-5:2015)
Operating environment	Operating temperature: 0–50 °C (32–122 °F)*10; Operating humidity: 10–80 % (no condensation)	

Remote control unit

Power supply	DC 3 V (AAA/R03/LR03 battery × 2)
Operation range	Approx. 30 m (98 ft 5 in) when operated from directly in front of the signal receptor
Dimensions (W × H × D)	47.5 x 181.5 x 27.5 mm (1-7/8" x 7-5/32" x 1-3/32")
Weight	Approx. 150g (5.3 ozs.) (including batteries)

Supplied accessories

Power cord with secure lock (×2) Wireless/wired remote control unit (×1)
Batteries for remote control (AA/R6 type ×2) Lens hole cover (× 1) Lens drop-prevention screw (× 1)

Optional accessories

Fixed-focus lens (0.364:1)	ET-D75LE95	Fixed-focus lens (0.370:1)	ET-D3LEU100*12
Fixed-focus lens (0.694:1)	ET-D75LE50/ET-D3LEW50	Zoom lens (0.645-0.850:1)	ET-D3LEW200*12
Zoom lens (0.924-1.10:1)	ET-D75LE6/ET-D3LEW60	Zoom lens (1.30-1.67:1)	ET-D75LE10
Zoom lens (1.26-1.72:1)	ET-D3LEW10	Zoom lens (1.67-2.41:1)	ET-D75LE20/ET-D3LES20
Zoom lens (2.40-4.66:1)	ET-D75LE30	Zoom lens (2.40-4.66:1)	ET-D3LET30*12
Zoom lens (4.62-7.38:1)	ET-D75LE40	Zoom lens (4.61-7.41:1)	ET-D3LET40*12
Zoom lens (7.34-13.8:1)	ET-D75LE8/ET-D3LET80*12	Optional Fisheye Lens	ET-D3LEF70*12
Stepping Motor Kit	ET-D75MKS10*13	Lens Fixed Attachment	ET-PLF10
DIGITAL LINK Switcher	ET-YFB200G	Digital Interface Box	ET-YFB100G
Ceiling Mount Bracket (for High Ceilings)	ET-PKD520H	Ceiling Mount Bracket (for Low Ceilings)	ET-PKD520S
Ceiling Mount Bracket (Projector Mount Bracket)	ET-PKD520B	Frame	ET-PFD510
Geometry Manager Pro Software Upgrade Kit	ET-UK20	Auto Screen Adjustment Upgrade Kit	ET-CUK10
Auto Screen Adjustment Upgrade Kit (PC)	ET-CUK10P		

Early Warning Software (ET-SWA100*) *The symbol at the end of the part number will vary depending on the type of license.

Compatible Software

Logo Transfer Software Smart Projector Control (iOS/android) Multi Monitoring and Control Software

***1 When Standby Mode is set to ECO, network functions such as power on over LAN will not operate. Additionally, only certain commands can be received for external control using the serial terminal.**
***2 Refresh rate varies depending on scanning frequency.**
***3 Measurement, measuring conditions, and method of notation all comply with ISO 21118 international standards.**
***4 The value of the light output at the center region of the projected image is extracted based on the light output measurement method defined by the ISO/IEC 21118:2012 international standards.**
***5 In AC200V, When using a projection lens other than ET-D75LE95.**
***6 Pixel-Repetition signal(dot clock frequency 27.0MHz) only**
***7 Only the vertical keystone correction angle can be corrected in the direction in which the projector body moves away from the screen.**
***8 When [VERTICAL KEYSTONE] and [HORIZONTAL KEYSTONE] are used simultaneously, correction cannot be made exceeding total of 55°.**
***9 Average value. May differ depending on the actual unit.**
***10 Operating temperature is 0–45 °C (32–113 °F) when used in locations from 1,400 m to 4,200 m (4,593 ft to 13,779 ft) above sea level. When the [PROJECTOR SETUP] menu → [OPERATION SETTING] → [OPERATING MODE] is set to [NORMAL], and the operating environment temperature exceeds the following value, the light output may be reduced to protect the projector.**
•When using the projector at an altitude lower than 2,700m (8,858') above sea level: 35°C (95°F)
•When using the projector at an altitude between 2,700m (8,858') and 4,200m (13,780') above sea level: 25°C (77°F)
***11 For details, see the Spec File of the individual lens.**
***12 Please update to the latest firmware.**

Panasonic
BUSINESS

AW-UE150W [White Model]
AW-UE150K [Black Model]
4K Integrated Camera

AW-RP150GJ
Remote Camera Controller

Panasonic's 4K 60p/50p*1 12G-SDI Supported PTZ Camera the Industry's First*2



*1: Actual output format is UHD (3840 x 2160) 59.94p/50p. *2: Internal investigation, Oct. 2018.

AW-UE150

4K 60p/50p*1 Output, High-Magnification Zoom and Wide-Angle Shooting for Flexible Video Production



AW-UE150W
4K Integrated Camera
[White Model]



AW-UE150K
4K Integrated Camera
[Black Model]

• Power supply not included. An AC adaptor or PoE++ HUB is required.

The next-generation PTZ camera supports high-quality video production in stadium, lecture halls, churches and other venues. Smooth and high-quality 4K 60p/50p*1, high-magnification zoom and a wide shooting angle expand the range of the PTZ camera's applications. The camera is equipped with a variety of interfaces and supports simultaneous 4K/HD operation which allows for versatility in current and future production systems.

High-Quality 4K 60p/50p*1 Shooting

3840 x 2160 4K output and 59.94p/50p*1 shooting achieve extremely smooth video, even in live sports and other environments containing rapid movement.

■ Output format

4K	2160/59.94p, 2160/50p, 2160/29.97p*2, 2160/25p*2, 2160/24p*2, 2160/23.98p*2
HD	1080/59.94p, 1080/50p, 1080/29.97p*2, 1080/29.97PsF, 1080/25p*2, 1080/25PsF, 1080/23.98p*3, 1080/24p*2, 1080/23.98p*2, 1080/23.98PsF, 1080/59.94i, 1080/50i
	720/59.94p, 720/50p

1.0-type MOS Sensor Mounted

The large 1.0-type MOS sensor enables high sensitivity shooting with low noise. The sensor boasts a light-capturing area that is approximately four times larger than that of the 1/2.3-type sensor to guarantee a wide dynamic range.

Optical 20x Zoom / Industry's First* 75.1° Horizontal Wide-Angle Shooting

Adding "i zoom" to our optical 20x zoom, maintains high resolution while enabling ultra-high resolution 32x zoom in HD mode and 24x zoom in 4K mode. This enables distant subjects to be captured clearly. Furthermore, 75.1° horizontal wide-angle shooting enables capture of the entire area, even when installation space is limited.

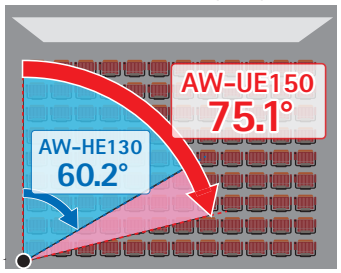
* Internal investigation, Nov. 2018.

■ Optical 20x Zoom Image Quality



* Images are simulated.

■ Horizontal 75.1° Shooting Range





HDR (HLG) Support*4

The camera supports HDR (High Dynamic Range) to prevent blown-out highlights and blocked-up shadows and enable picture quality close to that of the naked eye. Conforms to BT.2020.



HDR Mode OFF



HDR Mode ON

* Images are simulated.

Optical Image Stabilizer (OIS) Loaded

Vibrations of the mounted surface caused by doors opening and closing, audio systems and other installed equipment are automatically corrected to ensure stable shooting.

Night Mode Support

Equipped with Night Mode for infrared shooting. The use of IR rays in low-light situations enables shooting in situations that would normally be difficult, such as when capturing wildlife (image output is black and white).



* Images are simulated.

Incredible Pan and Tilt Performance

Pan and tilt operate from a minimum speed of 0.08°/s to a maximum of 180°/s in high-speed mode. This is approximately 3 times the speed of our current product*5 for rapid capture of the intended target. Furthermore, a low noise level of NC35 or less has been ensured when operating in normal mode, which is perfect for shooting in quiet environments*6.

■Comparative Pan / Tilt Speeds

Approx. 3 times the conventional speed

Our current product*5 — Maximum speed of 60°/s

AW-UE150W/K — Maximum speed of 180°/s (in high-speed operation mode)

Cropping Function

Images shot in 4K can be output in their entirety while simultaneously cropping parts of those images. The cropping position can be specified from a maximum of 3 locations to enable simple operation from the Remote Camera Controller AW-RP150GJ, a web browser or other operations screen.



* Images are simulated.

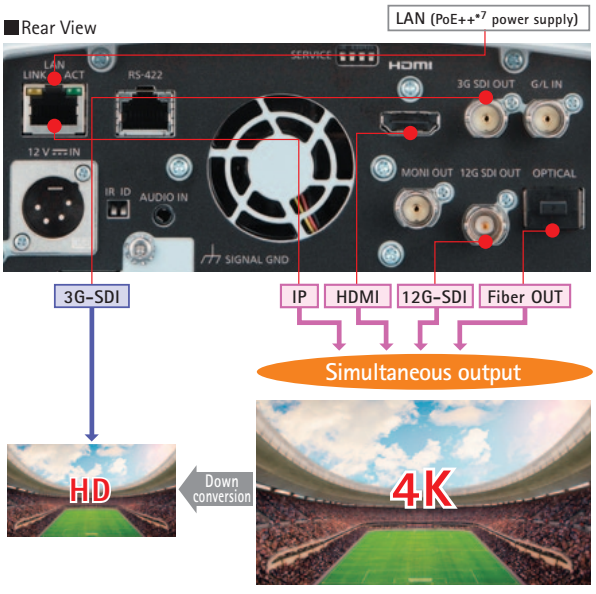


Equipped with a large Tally Lamp that is easy to see from a distance

Multiple Interfaces Supported

A wide range of outputs are supported: 12G-SDI, 3G-SDI, HDMI, IP and even Optical Fiber output. The addition of 4K/HD simultaneous output guarantees the right output for the operation at hand. 4K video can be down converted to HD directly within the camera.

■Rear View



* Images are simulated.

*1: Actual output format is UHD (3840 x 2160) 59.94p/50p.
*2: Native output.
*3: It denotes "1080/23.98p over 59.94i".
*4: The display color space does not completely comply with BT.2020. The color balance is shifted to display according to the BT.2020 color gamut.
*5: Comparison with our current product, AW-HE130W/K.
*6: Quietness, stationary accuracy, etc., in high-speed mode may vary from normal mode.
*7: Abbreviation of Power over Ethernet Plus Plus. Conforms to IEEE802.3bt.

Adaptive Matrix prevents color overloaded from blue LEDs*

Equipped with an Adaptive Matrix function that automatically controls matrix calculation coefficients. This enables shooting while preventing color overloaded, even during live events and on stages with strong blue LED lights.

*Use may require a software version update.

WEB UI Improved

Camera IP image output, settings and control can be performed using a web browser on a computer connected via an IP network. In addition to PCs and Macs, iPads, iPhones*, Androids and other mobile devices can be used for operation, and this pursuit of easy-to-use interfaces has enabled smooth camera control from remote locations.

*Use may require a software version update.

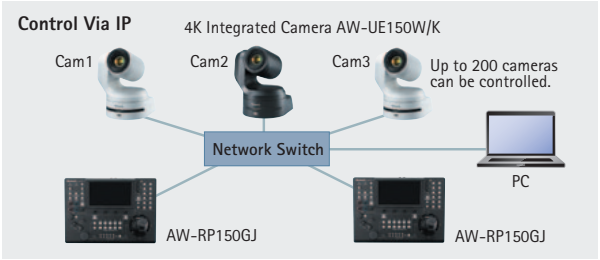
Camera control screen (Windows operation depicted.)



• For supported browsers, see specifications on page 10.

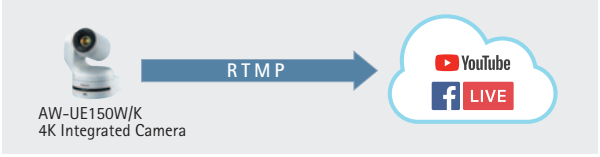
AW-RP150GJ Connection for Large-Scale Production Systems

IP connection from the Remote Camera Controller AW-RP150GJ through a HUB (switching hub) enables control of up to 200 AW-UE150W/K units. Furthermore, a single AW-UE150W/K unit can be controlled from up to 5 AW-RP150GJ units.



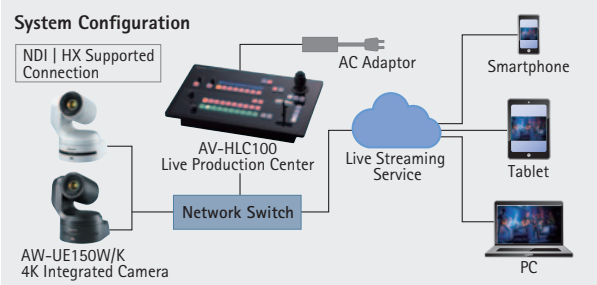
Direct Broadcast via RTMP (Real-Time Messaging Protocol)

RTMP (Real-Time Messaging Protocol) is supported to enable direct upload of video to live-streaming services such as YouTube Live and Facebook Live. This means a live stream can be broadcast directly from the camera.



NDI | HX Compatibility for Excellent Video Streaming Quality

The AW-UE150W/K can be upgraded to an NDI | HX compatible model if purchasing a license. Highly efficient NDI | HX compatibility enables high-quality video to be encoded and transmitted in real-time and input signals to be directly sent to a switcher (AV-HLC100) without the need for an IP decoder.



* 4K image output not supported in NDI|HX mode.
* Contact your local Panasonic reseller for further information.
• NDI|HX, a technology of NewTek, Inc.

JPEG Image Saving Function Equipped*

Up to 100 still images can be captured and saved as JPEG files to the built-in camera memory.

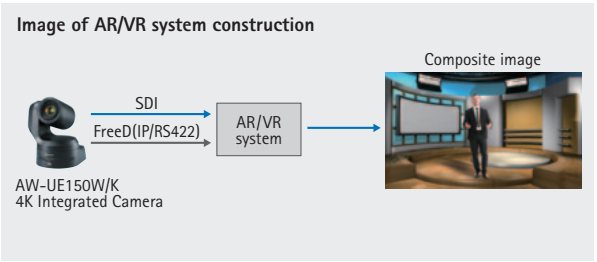
*Use may require a software version update.

FreeD Support for Construction of AR/VR Systems*

Connection with AR/VR systems has been enabled via FreeD-compliant command output. Camera tracking information (pan/tilt/zoom/focus/iris) is output according to a synchronizing signal to facilitate construction of virtual systems without an encoder.

AR: Augmented Reality
VR: Virtual Reality

*Use may require a software version update.



* Images are simulated.

SR Series

WALL MOUNT RACKS

The SR Series Wall Mount Racks address the increased need for space-saving solutions. They are not only ideal for smaller installations or to house system distribution points, but can be deployed in many more spaces within a facility. The innovative design allows the rack to pivot open 90° on a floor base to provide quick and convenient access to rear equipment connections without needing to leave an aisle behind the solution.





FEATURES

- Pivots 90º on floor base to easily access rear equipment connections for more overall space savings than a full height, floor standing enclosure
- Installation ease with the patented Tool Free Quick-Mount™ system for center section mounting to the backpan
- "Bonus" 4 rackspaces in base for mounting a UPS or other equipment
- Additional 3 rackspaces at the top for patching and other small equipment mounting
- Industry's first seismic rated wall rack series, delivering tip and/or vibration resistance when its desired or required

- Standard, adjustable front 10-32 threaded rackrail with numbered spaces for built-in cable management
- Flexible cable entry access at the top, bottom and sides of the rack with additional knockouts for electrical box and fans
- Sub plate allows mounting of 89D blocks and other connectivity accessories
- Options available to meet the needs of your installation requirements:
  - Corner mounting or side-by-side rack installation capability with the optional zero clearance latch
  - Choices of plexi, solid, or vented doors available depending upon desired level of visibility and need for additional airflow
- Up to 500 lb. UL load capacity rating and a 335 lb. Seismic load capacity rating

Wide SR Series

WALL MOUNT RACKS

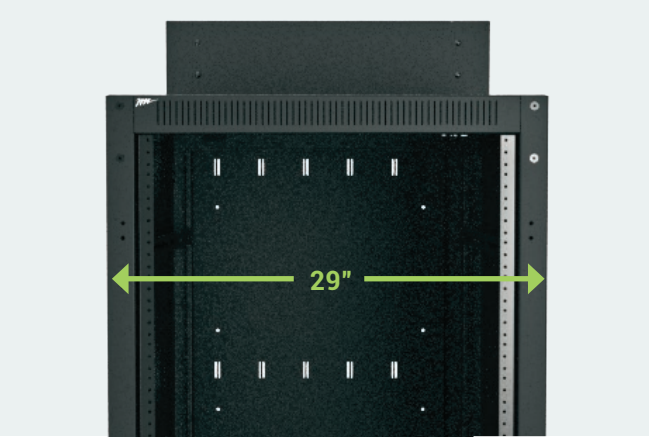
Enhancing the SR Series Wall Rack portfolio, the new, wider models provide ample room on either side of the cabinet for proper dressing, organization and management of high density cabling, improving cable integrity, thermal management and the overall aesthetics in the rack. The Wide SR Series Pivoting Wall Rack not only boasts a neat, organized look but maintains the same benefits of the existing line—high capacity for rackspace availability and weight of equipment much like a floor standing rack, but with the space saving benefits of wall mounted cabinets.

The innovative design allows the rack to pivot open 90° on a floor base to provide quick and convenient access to rear equipment connections without needing to leave an aisle behind the solution. Ideal for when that easy access is essential and for heavier installations that will connect to on-wall cabling or pull boxes, the Wide SR Series Wall Rack is a multi-application cabinet that allows mounting of AV, security, broadcast and data equipment in the same space for endless flexibility.



FEATURES

- Additional width allows ample room for high density cabling—providing neat aesthetics, improved thermal management, and greater signal integrity
- Pivots 90º on floor base to easily access rear equipment connections for more overall space savings than a full height, floor standing enclosure
- Installation ease with the patented Tool Free Quick-Mount™ system for center section mounting to the backpan
- "Bonus" 4 rackspaces in base for mounting a UPS or other equipment
- Options available to meet the needs of your installation requirements
- Industry's first seismic rated wall rack series, delivering tip and/or vibration resistance when its desired or required





- Standard, adjustable front 10-32 threaded rackrail with numbered spaces for built-in cable management
- 4" plastic fingers available to help route your cables and reduce cable strain
- Flexible cable entry access at the top, bottom and sides of the rack with additional knockouts for electrical box and fans
- Sub plate allows mounting of 89D blocks and other connectivity accessories
- Standard options available to meet the needs of your installation requirements:
  - Corner mounting or side-by-side rack installation capability with the optional zero clearance latch
  - Choices of plexi, solid, or vented doors available depending upon desired level of visibility and need for additional airflow
- Up to 500 lb. UL load capacity rating and a 335 lb. Seismic load capacity rating

SR Series

WALL MOUNT RACKS





SR-24-32

WIDER



SR28-40-32



SR-46-28

Part #	Description	Dimensions
SR-24-28	Standard SR Large Pivoting Wall Rack	28 3/8" D X 62 3/4" H X 23 1/2" W
SR-24-32	Standard SR Large Pivoting Wall Rack	32 3/8" D X 62 3/4" H X 23 1/2" W
SR-40-22	Standard SR Large Pivoting Wall Rack	22 3/8" D X 90 3/4" H X 23 1/2" W
SR-40-28	Standard SR Large Pivoting Wall Rack	28 3/8" D X 90 3/4" H X 23 1/2" W
SR-40-32	Standard SR Large Pivoting Wall Rack	32 3/8" D X 90 3/4" H X 23 1/2" W
SR-46-28	Standard SR Large Pivoting Wall Rack	28 3/8" D X 101 1/4" H X 23 1/2" W
SR28-24-32	Wide SR Large Pivoting Wall Rack	32 3/8" D X 62 3/4" H X 29" W
SR28-40-32	Wide SR Large Pivoting Wall Rack	32 3/8" D X 90 3/4" H X 29" W
SR28-46-32	Wide SR Large Pivoting Wall Rack	32 3/8" D X 101 1/4" H X 29" W

COMPLEMENTARY PRODUCTS



Fan Kit



Vented Front Door



Solid Front Door



Plexi Front Door



Rackrail Kit*



Plastic Fingers**



Vertical Power Distribution



Horizontal Power Distribution



Power Distribution with RackLink™



UPS Backup Systems



Rackshelves & Storage

*Comes standard & additional rear rackrail is available as options.
** Only applicable with Wide SR Racks. Comes standard & additional plastic fingers are available as options.

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DATA SHEET

MT-702 7" Modero G5 Tabletop Touch Panel



MT-702 (FG5969-53) Tabletop Touch Panel

Overview

The MT-702 / 7" Modero G5 Tabletop Touch Panel is a premium user interface that includes the G5 graphics engine and delivers superior performance. Designed specifically for dedicated room control, this elegantly-styled touch panel provides fast and smooth animations and transitions, along with a quad-core processor that provides more than enough processing power to run the most demanding applications today and in the future. The MT-702 also includes a built-in web browser and document viewers, enabling users to access real-time information during meetings or lectures.

The MT-702 is built for usability, offering edge-to-edge capacitive touch glass with multi-touch capabilities. The distinctive, low-profile design is engineered to sit perfectly on a table without obstructing views, and comes with a variety of mounting options for added security and convenience.

Common Applications

- The MT-702 is ideal for boardrooms, conference rooms or auditoriums where a premium control surface is needed to provide access to multiple functions simultaneously while remaining elegantly unobtrusive.
- In Higher Education, the MT-702 is ideal for lecture halls, auditoriums, performing arts theaters and boardrooms that require extensive control capabilities.
- In residences, it is perfect for kitchens, bedrooms or home offices where it can be used to manage systems throughout the home.

Features

- **G5 Graphics Engine and Quad Core Processing** – The most powerful processing in the industry delivers smooth gesturing, swiping, dynamic reordering, enhanced animation with transitions all at higher speeds for an experience any user will enjoy.
- **Simplified Enterprise Touch Panel and Firmware Updates** – Deploy and update touch panel files and firmware files from a network URL for simplified company-wide updates.
- **Built-in Web Browser and Content Viewers** – Conveniently simplifies accessing and presenting real-time content and documents during meetings. Simply preview files accessed via the native web browser, USB, or cloud storage apps. Easily update or disable apps using the onboard G5 App Update Manager.

- **Adjustable Security Modes** – With the ability to select from high security or custom modes, administrators can customize the panel's security levels for access, networking and communication.
- **Perfect From Any Angle** – Includes In-Plane Switching (IPS), which delivers the widest viewing angles and the most accurate color reproduction on the market.
- **Enhanced User Experience** – The Modero Series features intuitive UI functionality including: gesturing, swiping, dynamic reordering and enhanced animation capabilities.
- **View and Select Dynamic Data with Listview Buttons** – Display a listing of entries generated by a dynamic data source (e.g. phonebook contacts, call logs, RSS feed or other real time data sources) enabling the user to scroll or search to make a selection. Demos are available in the UI Resource Center.

Specifications

TOUCH SCREEN DISPLAY	
Display Type	TFT Active Matrix Color LCD
Display Size (WH)	Landscape: 6.4" x 4.0" (162mm x 103mm) 7.5" (192mm) diagonal
Viewable Area (WH)	Landscape: 5.9" x 3.7" (151mm x 94mm) 7.0" (178mm) diagonal
Resolution (WH)	Landscape: 1280x800
Aspect Ratio (WH)	Landscape: 16:9
Brightness	330 cd/m2
Contrast Ratio	800:1
Color Depth	16.7M colors
Illumination	LED
Touch Overlay	Projected Capacitive, multi-touch support, 3 simultaneous max
Viewing Angle	Vertical ± 89°, Horizontal ± 89°

MEMORY	
SDRAM	2 GB
Flash	16 GB
Maximum Project Size	12 GB flash, available for apps and touch panel files

COMMUNICATIONS	
Ethernet	10/100 Auto MDI-X port, RJ-45 connector. Supported IP and IP-Based Protocols: UCP, TCP, ICMP, ICSP, IGMP, DHCP, SSH, FTP, DNS, RFB (for VNC), HTTP
USB	(1) USB host 2.0, Type A ports (1 with limited physical access requiring right angle connection): Firmware upgrade, touch panel file transfer, document and image viewing, HID peripherals
Bluetooth	Mouse/Keyboard: HID Profile v1.1 (requires external USB-BT adapter)

VIDEO	
Supported Video Codecs	MPEG-2-TS: MPEG-2 Main Profile @ High Level up to 720p at 25 fps (decode only) MPEG-2-TS: H.264 High Profile @ Layer 4, AAC-LC up to 720p at 25 fps (decode) MJPEG up to 720p at 25 fps (decode only)
Supported Video Transport Streams	MPEG-TS for MPEG-2 and H.264; HTTP for MJPEG
Max Number of Active Video Streams	Two decode

AUDIO	
Speakers	4 ohm, 2 Watt, 300 Hz cutoff frequency
Supported Audio Codecs	MP2 Layer I and II, MP3 (8 kHz, 11.025 kHz, 12 kHz, 16 kHz, 22.05 kHz, 24 kHz, 32 kHz, 44.1 kHz, 48 kHz) AAC-LC (8 kHz, 96 kHz) G.711 with µLaw (VoIP encode/decode at 8 kHz)
File Formats	WAV, MP3 (as part of touch panel file only - no USB storage)

GRAPHICS ENGINE	
AMX G5	G5 enhanced feature set supporting multi-touch and gestures, scrolling, transitions, applications - See TPD5 Operations Guide for more information

EMBEDDED APPLICATIONS	
Viewer Applications	PDF, JPEG, BMP, PNG, TIFF, GIF, PowerPoint, .doc, .docx, .xls, .xlsx, .ppt, .pptx
Remote Management	VNC Server
Video Conferencing	Skype, the MT-702 receives audio/video and returns audio

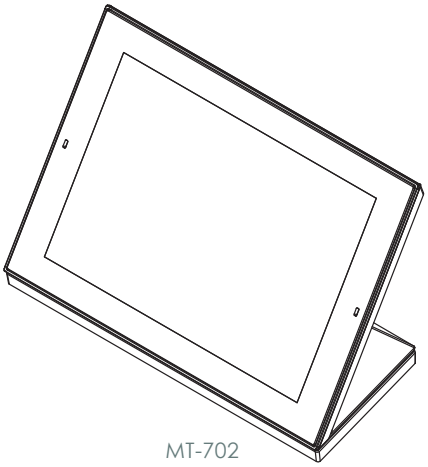
FRONT PANEL COMPONENTS	
Sleep Button	Sleep button to activate sleep mode and powering off. Also provides access to setup pages (can be disabled)

CONNECTIONS	
Ethernet	10/100 Auto MDI-X port, RJ-45 connector through cable extension
USB	(1) USB host 2.0, Type A ports
Power	PoE (Power over Ethernet), 802.3af, class 3

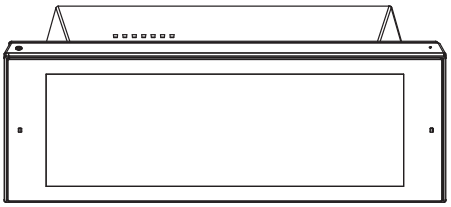
ENVIRONMENTAL	
Temperature (Operating)	32° F to 104° F (0° C to 40° C)
Temperature (Storage)	4° F to 140° F (-20° C to 60° C)
Humidity (Operating)	20% to 85% RH
Humidity (Storage)	5% to 85% RH
Power ("Heat") Dissipation	On: 39.2 BTU/hr Standby: 19.8 BTU/hr

GENERAL	
Dimensions (HWD)	4.52" x 7.36" x 3.34" (115mm x 187mm x 85mm)
Weight	1.6 lbs (0.73 Kg)
Power Consumption	Full-On: 11.5 W maximum Standby: 5.8 W Shutdown: 1 W
Start-Up Inrush Current	Not applicable due to PoE standard
External Power Supply Required	AMX recommends using one of these AMX approved PoE power supplies (not included): • PS-POE-AF-TC, PoE Injector, 802.3AF Compliant (FG423-83) • NXA-ENET8-POE+, Gigabit PoE Ethernet Switch (FG2178-64)
Regulatory Compliance	FCC Part 15 Class B C-Tick CISPR 22 Class B CE EN 55022 Class B and EN 55024 CB Scheme IEC 60950-1 IC IEC/EN-60950 UL 60950-1 RoHS/WEEE compliant
Included Accessories	• MXA-USB-C, USB Port Cover Kit, Modero X/S Series Touch Panel (FG5968-18) • HPG-10, 3/4" Mini-Grommet (FG570-01-10K) • MXA-CLK, Modero X/S Series Cleaning Kit (FG5968-16)
Optional Accessories	MOUNT • MSA-STMK-07, Secure Table Mount Kit, for Modero 7" Tabletop Touch Panel (FG2265-17) VIDEO • MXA-MPL, Modero Multi Preview Live (FG5968-10)

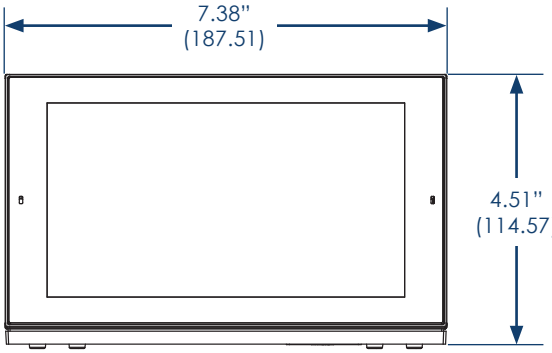
For more detailed pictorial drawings please visit: https://www.amx.com/en-US/products/mt-702



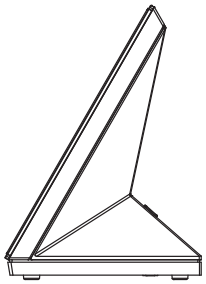
MT-702
(Isometric View)



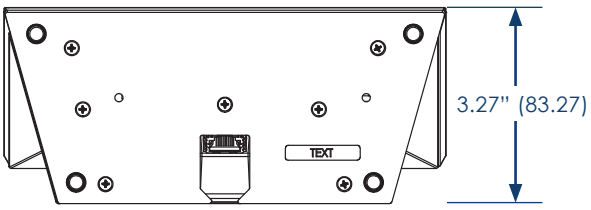
MT-702
(Top View)



MT-702
(Front View)



MT-702
(Right View)



MT-702
(Bottom View)

LAST REVISED: 10/09/2018

About AMX by HARMAN
Founded in 1982 and acquired by HARMAN in 2014, AMX® is dedicated to providing AV solutions for an IT World. AMX solves the complexity of managing technology with reliable, consistent and scalable systems comprising control, video switching and distribution, digital signage and technology management. AMX systems are deployed worldwide in conference rooms, classrooms, network operation/command centers, homes, hotels, entertainment venues and broadcast facilities, among others. AMX is part of the HARMAN Professional Group, the only total audio, video, lighting, and control vendor in the professional AV market. HARMAN designs, manufactures and markets premier audio, video, infotainment and integrated control solutions for the automotive, consumer and professional markets.
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www.amx.com | +1.469.624.7400 | 800.222.0193

ULX-D® DIGITAL WIRELESS SYSTEMS

SPECIFICATIONS (SUBJECT TO CHANGE)

RF Carrier Range	174–216 MHz, 470–865 MHz, 1492–1525 MHz, 1785–1805 MHz Note: Varies by region (See Frequency Range and Ouput Power table)
Working Range	100 m (328 ft) Note: Actual range depends on RF signal absorption, reflection and interference.
RF Tuning Step Size	25 kHz, varies by region
Image Rejection	>70 dB, typical
RF Sensitivity	-98dBm at 10^{-5} BER
Latency	<2.9 ms
Audio Frequency Response	ULXD1: 20 Hz – 20 kHz (±1 dB) ULXD2: 30 Hz – 20 kHz (±1 dB) Note: Dependent on microphone type
Audio Dynamic Range System Gain @ +10	XLR Analog Output: >120 dB, A-weighted Dante Digital Output (Dual and Quad receivers): 130 dB (typical), A-weighted
Total Harmonic Distortion –12 dBFS input, System Gain @ +10	<0.1%
System Audio Polarity	Positive pressure on microphone diaphragm produces positive voltage on pin 2 (with respect to pin 3 of XLR output) and the tip of the 6.35 mm (1/4-inch) output.
Operating Temperature Range	–18 °C (0 °F) to 50 °C (122 °F) Note: Battery characteristics may limit this range.
Storage Temperature Range	–29°C (–20°F) to 74°C (165°F) Note: Battery characteristics may limit this range.

FREQUENCY RANGE

Band	Range (MHz)	Transmitter Output (mW)
V50	174 to 216	1/10/20
V51	174 to 216	1/10/20
G50	470 to 534	1/10/20
G51	470 to 534	1/10/20
G52	479 to 534	1/10
H50	534 to 598	1/10/20
H51	534 to 598	1/10/20
H52	534 to 565	1/10
J50	572 to 636	1/10/20
K51	606 to 670	1/10
L50	632 to 696	1/10/20
L51	632 to 696	1/10/20
P51	710 to 782	1/10/20
R51	800 to 810	1/10/20
JB (Tx only)	806 to 810	1/10
AB (Rx and Tx)	770 to 810	"A" band (770.250-805.750): 1/10/20 "B" band (806.125-809.750): 1/10
Q51	794 to 806	1/10/20
X52	902 to 928	1/10/20
X50	925 to 932	1/10
X51	925 to 937.5	1/10
X52	902 to 928	0.25/10/20
X53	902 to 907.5; 915 to 928	0.25/10/20
X54	915 to 928	0.25/10/20
Z16	1240 to 1260	1/10/20

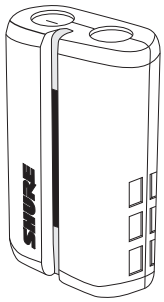
*Note: Not all frequencies available in all regions. Contact your authorized Shure dealer for availability.

NOTE:

This Radio equipment is intended for use in musical professional entertainment and similar applications. This Radio apparatus may be capable of operating on some frequencies not authorized in your region. Please contact your national authority to obtain information on authorized frequencies and RF power levels for wireless microphone products.

RECHARGEABLE POWER MANAGEMENT (sold separately)

SB900A RECHARGEABLE BATTERY



ULX-D transmitters are compatible with the SB900A lithium-ion rechargeable battery, which provides over 9 hours of continuous use and precise tracking of remaining life and charge cycle details.

SBC200 DUAL DOCKING RECHARGING STATION

This compact and portable unit charges batteries while in transmitters or out. Up to 4 SBC200's can be chained toget.her to run off one power supply.

SBC220 2-BAY NETWORKED CHARGING STATION

Enables docked charging and storage for any combination of two SB900A batteries or ULXD1, ULXD2 wireless transmitters. When connected to a network, the charging status of each transmitter can be viewed remotely. Up to four SBC220 units can be linked together to share power and network connectivity.

SBC800 EIGHT BATTERY RECHARGING STATION

This compact and portable unit charges up to 8 SB900A batteries to full capacity within 3 hours, with status LEDs to indicate power levels. SB900A batteries fit securely in the charger for easy, efficient storage and transport.

BATTERY RUNTIMES

(Note: Frequency Band Dependent)

BATTERY TYPE	1 MW	10 MW	20 MW
SB900A	> 9 hours	> 9 hours	> 7 hours
Alkaline	> 8 hours	> 8 hours	< 6 hours
NiMH	> 8 hours	> 8 hours	< 6 hours
Li-primary	10-16 hours	10-16 hours	7-9 hours

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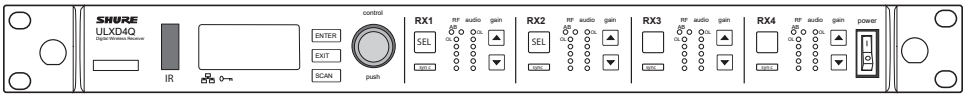
COMPONENT SPECIFICATIONS
ULXD4Q QUAD CHANNEL DIGITAL WIRELESS RECEIVER

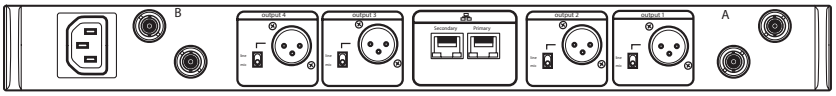
OVERVIEW

The Shure ULXD4Q Quad Channel Digital Wireless Receiver offers four channels of uncompromising audio quality, RF signal stability, and advanced setup features in a space-efficient single rack unit. Digital wireless processing delivers premium 24-bit/48 kHz audio and RF spectrum efficiencies that dramatically increase the number of available compatible channels. With an expansive set of enhanced features including AES 256-bit encryption for security and Dante™ digital networking for audio over Ethernet, the ULXD4D delivers the most wireless performance per square inch.

- Four receivers in a rugged 1RU metal chassis with internal power supply
- Individual gain controls, LED meters, and XLR outputs for each channel
- Up to 64 MHz tuning range (region dependent)
- Digital predictive switching diversity
- High Density mode optimizes ULX-D systems to simultaneously operate significantly more channels in applications up to 30 meters
- RF cascade ports allow distribution of RF signal to another unit
- Optimized scanning automatically finds, prioritizes, and deploys the cleanest frequencies to transmitters over IR sync
- Bodypack Frequency Diversity ensures uninterrupted audio for mission-critical applications
- AES 256-bit encryption-enabled for secure transmission
- Audio summing routes two or more audio channels to combinations of receiver outputs. Use each channel's gain adjustment to reach the desired mix.
- Dante Domain Manager compatible
- Two receivers in a rugged 1RU metal chassis with internal power supply
- Individual gain controls, LED meters, and XLR outputs for each channel
- Ethernet networking for streamlined frequency coordination and deployment across multiple receivers
- Interference detection and alerts provided on both the receiver and WWB6
- Up to 60 dB independently adjustable gain for each channel
- Wireless Workbench® 6 software integration for advanced coordination, monitoring, and control AMX/Crestron control
- Compatible with the AXT600 Axient™ Spectrum Manager
- Intuitive front panel LCD menu and controls with lockout feature
- Upgraded LCD with adjustable contrast and brightness
- Audio and RF LED meters with peak indicator
- Switchable mic/line output level
- Remoteable ½ wave antennas



ULXD4Q
Front Panel



ULXD4Q
Back Panel

SPECIFICATIONS

(SUBJECT TO CHANGE)

Dimensions	44 mm x 482 mm x 274 mm (1.73 in. x 18.97 in. x 10.79 in.), H x W x D
Weight	3.45 Kg (7.6 lbs), without antennas
Housing	Steel; Extruded Aluminum
Power Requirements	100 to 240 V AC, 50–60 Hz, 0.32 A max.

RF OUTPUT

Spurious Rejection	>80 dB, typical
Connector Type	BNC
Impedance	50 Ω
Bias Voltage	12 - 13 V DC, 150 mA maximum, per antenna

AUDIO INPUT

Gain Adjustment Range	–18 to +42 dB in 1 dB steps (plus Mute setting)
Configuration	XLR: Balanced (1=ground, 2=audio +, 3=audio –)
Impedance	100 Ω
Full Scale Output	LINE setting= +18 dBV, MIC setting= –12 dBV
Mic/Line Switch	30 dB pad
Phantom Power Protection	Yes

CASCADE OUTPUT

Connector Type	BNC: For connection of 1 additional receiver
Configuration	Unbalanced, passive
Impedance	50 Ω
Insertion Loss	0 dB

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COMPONENT SPECIFICATIONS
ULXD2 WIRELESS HANDHELD TRANSMITTER

OVERVIEW

The Shure ULXD2 is a handheld wireless transmitter compatible with ULX-D® Digital Wireless Systems. Offering premium 20 Hz – 20 kHz audio quality, advanced rechargeability options, and a wide selection of interchangeable Shure microphone heads, the ULXD2 delivers uncompromising wireless performance for professional sound reinforcement applications. The ULXD2 is offered with SM58®, SM86, SM87A, Beta 58A®, Beta 87A, and Beta 87C.

- 20 Hz to 20 kHz range with flat frequency response (actual response is microphone dependent)
- AES 256-bit encryption-enabled for applications where secure transmission is needed
- >120 dB dynamic range
- 1, 10, and 20 mW selectable RF output power
- 5 segment battery fuel gauge
- Shure lithium-ion rechargeable battery pack provides up to 9 hours of battery life, precision metering, and zero memory effect
- Up to 8 hours continuous use with 2 x AA batteries
- Backlit LCD with easy to navigate menu and controls
- Available with TA4M and LEMO3 input connectors
- 100 meter (300 ft) operating range
- Rugged metal construction
- Frequency and power lockout



ULXD2
Wireless Handheld Transmitter

SPECIFICATIONS (SUBJECT TO CHANGE)

Gain Offset Range	0 to 21 dB (in 3 dB steps)
Battery Type	Shure SB900A Rechargeable Li-Ion or LR6 AA batteries 1.5 V
Battery Runtime @ 10 mW	Shure SB900A: up to 9 Alkaline: 8 hours See Battery Runtime Chart
Dimensions	256 mm × 51 mm (10.1 in. × 2.0 in.) L × Dia. V50, V51 Bands: 278 mm × 51 mm (10.9 in. × 2.0 in.) L × Dia.
Weight	340 g (12.0 oz.), without batteries V50, V51 Bands: 348 g (12.3 oz.), without batteries
Housing	Machined aluminum

AUDIO INPUT

Configuration	Unbalanced
Maximum Input Level 1 kHz at 1% THD	145 dB SPL (SM58), typical Note: Dependent on microphone type
Preamplifier Equivalent Input Noise (EIN) System Gain Setting ≥ +20	120 dBV, A-weighted, typical

RF OUTPUT

Antenna Type	Integrated Single Band Helical
Occupied Bandwidth	<200 kHz
Modulation Type	Shure Proprietary Digital
Power	1 mW, 10 mW, 20 mW See Frequency Range and Ouput Power table, varies by region

MICROPHONE OPTIONS
(See shure.com for more)

WL93	WL93 condenser capsule, omnidirectional lavalier mic
WL183	WL183 condenser capsule, omnidirectional lavalier mic
WL184	WL184 condenser capsule, supercardioid lavalier mic
WL185	WL185 condenser capsule, cardioid lavalier mic
WL50	WL50 condenser capsule, omnidirectional lavalier mic
WL51	WL51 condenser capsule, cardioid lavalier mic
SM31FH	SM31FH condenser capsule, moisture repellant cardioid headset mic
SM35	SM35 condenser capsule, cardioid headset mic
WCM16	WCM16 condenser capsule, hypercardioid headworn mic
WBH53	WBH53 condenser capsule, omnidirectional headworn mic
WBH54	WBH54 condenser capsule, supercardioid headworn mic
WB98H/C	WB98H/C condenser capsule, cardioid instrument clip mic

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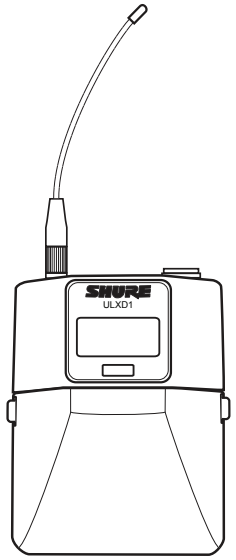
COMPONENT SPECIFICATIONS
ULXD1 WIRELESS BODYPACK TRANSMITER

OVERVIEW

The ULXD1 is a wireless bodypack transmitter compatible with ULX-D® Digital Systems. With a rugged yet lightweight aluminum case, the ULXD1 delivers uncompromising audio quality and RF performance, AES 256-bit encryption for secure transmission, and advanced rechargeability options for professional sound reinforcement applications.

- 20 Hz to 20 kHz range with flat frequency response (actual response is microphone dependent)
- AES 256-bit encryption-enabled for applications where secure transmission is needed
- >120 dB dynamic range
- 1, 10, and 20 mW selectable RF output power
- 5 segment battery fuel gauge
- Shure lithium-ion rechargeable battery pack provides up to 9 hours of battery life, precision metering, and zero memory effect
- Up to 8 hours continuous use with 2 x AA batteries
- Backlit LCD with easy to navigate menu and controls
- Available with TA4M and LEMO3 input connectors
- 100 meter (300 ft) operating range
- Rugged metal construction
- Frequency and power lockout



ULXD1
Wireless Bodypack Transmitter

SPECIFICATIONS (SUBJECT TO CHANGE)

Gain Offset Range	0 to 21 dB (in 3 dB steps)
Battery Type	Shure SB900A Rechargeable Li-Ion or AA batteries
Battery Runtime @ 10 mW	Shure SB900A: up to 9 Alkaline: 8 hours See Battery Runtime Chart
Dimensions	86 mm × 66 mm × 23 mm (3.4 in. × 2.6 in. × 0.9 in.) H × W × D
Weight	142 g (5.0 oz.), without batteries
Housing	Cast aluminum

AUDIO INPUT

Connector	4-Pin male mini connector (TA4M) LEMO3 connector
Configuration	Unbalanced
Impedance	1 MΩ
Maximum Input Level 1 kHz at 1% THD	Pad Off: 8.5 dBV (7.5 Vpp) Pad On: 20.5 dBV (30 Vpp)
Preamplifier Equivalent Input Noise (EIN) System Gain Setting › +20	120 dBV, A-weighted, typical

RF OUTPUT

Connector	SMA
Antenna Type	1/4 wave
Impedance	50 Ω
Occupied Bandwidth	<200 kHz
Modulation Type	Shure Proprietary Digital
Power	1 mW, 10 mW, 20 mW See Frequency Range and Ouput Power table, varies by region

MICROPHONE OPTIONS
(See shure.com for more)

WL93	WL93 condenser capsule, omnidirectional lavalier mic
WL183	WL183 condenser capsule, omnidirectional lavalier mic
WL184	WL184 condenser capsule, supercardioid lavalier mic
WL185	WL185 condenser capsule, cardioid lavalier mic
WL50	WL50 condenser capsule, omnidirectional lavalier mic
WL51	WL51 condenser capsule, cardioid lavalier mic
SM31FH	SM31FH condenser capsule, moisture repellant cardioid headset mic
SM35	SM35 condenser capsule, cardioid headset mic
WCM16	WCM16 condenser capsule, hypercardioid headworn mic
WBH53	WBH53 condenser capsule, omnidirectional headworn mic
WBH54	WBH54 condenser capsule, supercardioid headworn mic
WB98H/C	WB98H/C condenser capsule, cardioid instrument clip mic

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ETC®

Element 2 Console

Eos® Series

100V 115/120V 230/240V



GENERAL INFORMATION

Designed for venues using primarily conventional lighting, the Element 2 control console provides the powerful features of the Eos system in an economical and simplified package. In addition to keypad commands, True LTP Channel Faders provide hands-on control of intensity and can be used to set manual levels and edit recorded cues and submasters. Moving Light Controls are available to facilitate the use of conventional accessories like moving mirror heads, color scrollers or gobo rotators, or to make controlling small numbers of moving lights simple and direct. Element 2 can be backed up by another Element 2, ETCnomad™ 6144 or ETCnomad Puck™ 6144 mini-computer.

FEATURES

- 1,024 or 6,144 outputs
- 32,768 control channels (any number from 1 - 99,999)
- Up to 99 discrete users
- Partitioned control
- Master playback pair with 100mm faders
- 40 45mm faders x 100 pages for configurable faders, for channel, submaster and palette/preset, timing and effect master playback control
- User-definable direct selects
- Four discrete palette types (IFCB)
- Presets function as “all palette”
- Effects provide dynamic relational and absolute progressive behavior
- Central information area (CIA) accesses the browser and other controls
- Configurable high-density channel display, with format and flexi-channel modes
- Up to six abstract color spaces, tinting, spectrum and fade path tools.
- User configurable, interactive Magic Sheets
- ETCNet2™ and Net3™ (powered by ACN), ArtNet and Avab® UDP network output protocols
- Show import from Obsession, Express™, Expression®, Emphasis®, Congo®, Cobalt®, Grand MA1, Grand MA2, Safari and Strand 500/300 Series
- Two individually configurable Ethernet ports
- Multiple MIDI and/or SMPTE TimeCode Inputs, Analog/Serial Inputs, OSC transmit/recieve
- Virtual Media Server function for pixel mapped effects, images, animations
- Support for multiple languages, including English, German, Spanish, French, Italian, Japanese, Korean, Russian and Chinese (Simplified and Traditional)

ORDERING INFORMATION

Element 2

MODEL	DESCRIPTION
Element 2 - 1K	Element 2, 1,024 outputs (minimum)
Element 2 - 6K	Element 2, 6,144 outputs (maximum)
Element 2 - 5K Up	After-sale 5K upgrade
ETCnomad 512	Client for Mac/PC

Output protocols are distributed using ETCNet2 DMX Nodes or Net3 DMX/RDM Gateways. I/O Gateways and Show Control Gateways provide switch closure functionality, MIDI and SMPTE TimeCode.

Element 2 Accessories

MODEL	DESCRIPTION
Net3 RVI3	Net3 Remote Video Interface
ETCpad	ETC Portable Access Device
Element 2 - FC	Element 2 Flightcase

Eos Family Offline Editor software for Mac and PC platforms is called ETCnomad and is available for download from www.etcconnect.com

Element 2 requires Windows 7 compatible external monitors, 1280x1024 minimum resolution, standard, touch or multi-touch

SHIPS WITH:

- Dust cover
- One Littlite
- Mouse and mousepad
- Two active display-port to DVI adapters
- One locking IEC power cord

SPECIFICATIONS

SYSTEM CAPACITY

- 1,024 or 6,144 Outputs
- 32,768 Control Channels (devices)
- 10,000 Cues
- One Cue List
- 999 Submasters
- 100 Fader Pages
- 4 x 1,000 Palettes (Intensity, Focus, Color, Beam)
- 1,000 Presets (all palette)
- 1,000 Groups
- 1,000 Effects (relative, absolute or step)
- 99,999 Macros
- 1,000 Snapshots
- 1,000 Curves
- 1,000 Color Paths
- Supports two external display-port monitors at 1280x1024 minimum resolution, with optional touch or multi-touch control
- Solid-state hard drive
- Five USB ports for flashdrives, pointing devices, keyboards

DISPLAY FUNCTIONS

- All show data may be viewed on a single external monitor. External views may be posted separately or expanded across a maximum of two monitors. Three user-configurable workspaces per display, with split-screen/sizing controls.
- The Central Information Area accesses:
  - Browser
  - File Management
  - System Defaults
  - Show Defaults
  - Desk Defaults
  - Partition Definitions
  - Network Configuration
  - Show Data Utilities
  - Print to PDF
  - Record Target Lists
  - Patch functions
  - Help
  - Electronic alpha-numeric keyboard
  - Command Line
  - Selected Cue
  - Error messages
  - Context-Sensitive Control
  - Parameter Categories and individual parameters
  - Filters
- Channel Displays
  - Live channel or table view
  - Blind cue, palette, preset and group views, in list, channel, table and spreadsheet formats
  - User-configurable to show required parameters and/or parameter categories (IFCB)
  - Flexi-channel to determine which channels to display
  - Zoom allows user to define how many channels are viewed
  - Color-coded intensity levels indicate direction of move

SPECIFICATIONS

  - Color-coded non-intensity levels indicate change from previous state
  - Graphic differentiation of moving lights, single parameter devices and unpatched channels
- Magic Sheets
  - User-defined interactive display layouts
  - Objects and images may be imported
- Patch Views
  - Patch by channel
  - Patch by address
  - Patch by Device List (RDM)
  - Assign proportional patch value, curve and, preheat value for intensity
  - Swap pan and tilt
  - Invert pan and tilt
  - Custom fixture editor
  - User configurable shutter order
- Playback Status Display
  - Accesses status of 100 fader pages
  - Expanded cue list for selected cue, optional dynamic countdown of active cues
- Cue List Index
- Effect Editor
- Group Editor
- Park Display
- Dimmer Monitoring
- Submaster List
- Fader Config Display

PLAYBACK CONTROLS

- Master Playback crossfade pair with two 100mm potentiometers, Go and Stop/Back
- 100 pages of 40 45mm faders, each configurable as:
  - IFCB Palette/Preset Lists or single instances
  - Configurable Grand Master with Blackout
  - Additive or Inhibitive Submaster, with user-configurable button/slider behavior
  - Channel faders
  - Filtered Manual Timing Master
- Rate Controller
- Playback fader controls include:
  - Load to assign content
  - Timing Disable
  - Release
  - Freeze
  - Manual Override
  - Rate
  - Background Enable/Disable
  - 10 Priority States
  - 10 Background Priority States
  - Parameter and channel filters
- Macros
  - May be set to play background or foreground
  - Startup and Shutdown Macros
  - Disconnect Macros

SPECIFICATIONS

MANUAL CONTROL

- Channel selection from keypad and/or multi-touch direct selects
- Lists constructed with +, -, thru
- Intensity set with level wheel, keypad, level button, full and out
- Select Last recalls last sequential channel selection set
- Select Manual selects all channels with manual values
- Select Active selects all channels with intensity above zero
- Ordered groups
- Offset; including even, odd, random and reverse
- Fan
- Sneak
- User-definable home
- Home by parameter, parameter category or all non-intensity parameters
- Capture
- Park at level
- Scaled park for temporary percentage adjustment
- Recall-from and Copy-to commands
- About provides detailed view of selected channels or record targets
- Undo
- Highlight and Lowlight, with optional user-definable Rem Dim
- Lamp controls to strike and douse arc sources, calibrate devices

PROGRAMMING FEATURES

- Channel Functions
  - Non-intensity parameters set via numeric entry or pageable encoders
  - Encoders support software-controlled tactile response
  - Local display of color and gobo images
  - Color matching to gel selector
  - Color Path, color tinting and color spectrum tools.
  - Apply discrete time and delay per channel parameter
- Palette and Preset Functions
  - Record and Update
  - Toggle display to absolute data
  - Up to 999 decimal values may be inserted between any two whole numbers
- Effects
  - Create live or blind
  - Pattern-based relative dynamic effects
  - Absolute effects
  - Step effects
  - Channel level overrides
  - Cue level overrides
  - Entry mode determines how parameters enter effects
  - Exit mode determines how parameters depart effects
- Cue Recording
  - Cue List HTP/LTP Intensity
  - Cue List Priority and Background Priority
  - Fader as progress controller, manual or intensity master
  - Record manual values or channels in use
  - Auto playback of recorded cues
  - Auto-mark instructions
  - Block at cue or parameter level

SPECIFICATIONS

  - Follow or hang times
  - Out of sequence link
  - Loop functions
  - Cue level parameter category timing
  - 20-part multi-part cues
  - Cue-level rate override
  - Up to 999 decimal cues between each two whole-numbered cues
  - Execute List
    - Triggers snapshot
    - Triggers macros
    - Show-control triggers
    - Analog triggers
  - Update and Update Trace functions
  - Undo record and delete
- Submaster Recording and Playback
  - 999 additive or inhibitive submasters
  - Bump button timing for fade up/dwell/fade out
  - Exclusive or Shielded Mode
  - Background enable/disable
  - Restore to background or minimum value
  - LTP/HTP intensity
  - Fader as progress controller or intensity master
  - Priority and Background Priority status
- Curves
  - Assignable in patch to modify dimmer output ramp
  - Assignable at cue or cue part level to modify intensity crossfade profile or non-intensity parameter ramping

MOVING LIGHT CONTROLS

- On-Demand Moving Light controls include labeling and current parameter value on connected display monitor
- Flip and Home functions
- Parameters selectable on screen for mouse-based or touchscreen control or command-line actions

INTERFACES

- Two individually configurable ethernet ports
- ETCNet2, Net3 (powered by ACN), ArtNet and Avab UDP output protocols
- Four DMX/RDM ports
- Contact-closure triggers via D-Sub connector
- Two video connectors support display-port external displays (1280x1024) with optional single-touch or multi-touch screen control
- USB multipurpose (five ports)
- OSC Transmit/Receive
- UDP Transmit/Receive
- MIDI TimeCode, MIDI Show Control through Gateway
- SMPTE TimeCode through Gateway
- Contact closure (12 analog inputs, 12 SPDT contact outputs, RS-232) through Gateway

ELECTRICAL

- AC input (100 - 240V at 50/60 Hz)
- Power consumption (less external monitors) approximately 1 amp at 120V or 230/240V

PHYSICAL

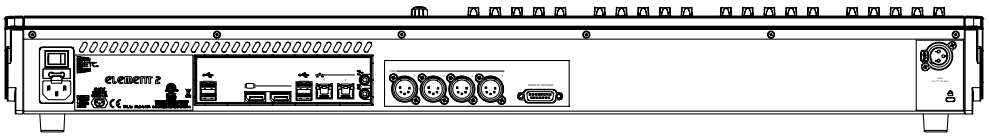
Element 2 Dimensions*

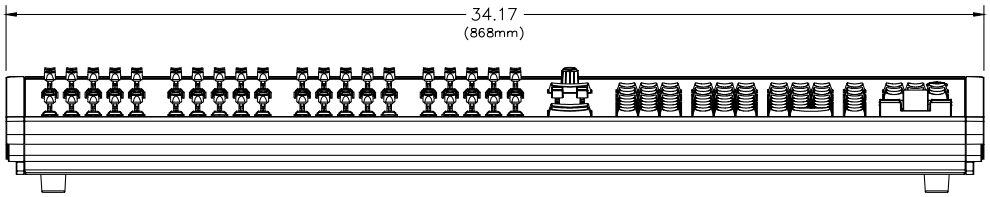
MODEL	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
Element 2	4.36	111	34.17	868	14.24	362
Element 2 in shipping container	9.50	241	40.25	1,022	19.50	495
Element 2 in roadcase	8.34	212	45.12	1,146	19.45	464

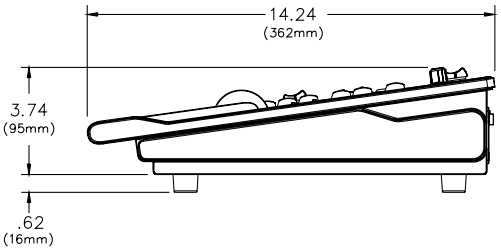
Element 2 Weights*

MODEL	WEIGHT	
	lb	kg
Element 2 console	16.00	7.26
Element 2 in shipping container	20.40	9.25
Element 2 in roadcase	41.75	18.94

*Weight and dimensions typical







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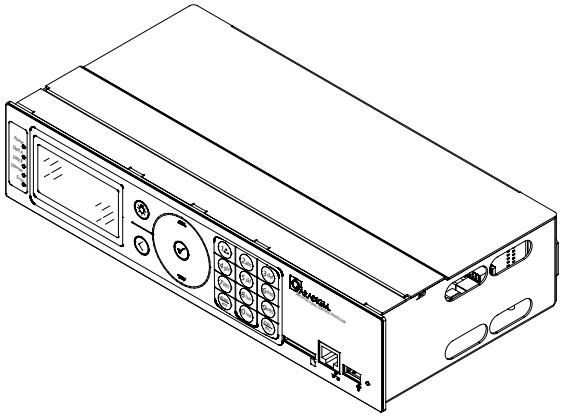
ETC Paradigm Architectural Control Processor

Unison Control Series



GENERAL INFORMATION

The Paradigm Architectural Control Processor is designed for easy interaction and rapid response. The Paradigm ACP's built-in memory and processing power works with vast amounts of lighting control data and is fast enough to process 1,024 simultaneous fades over any of its native protocols.

APPLICATIONS

- Houses of worship
- Schools
- Restaurants
- Hotels
- Museums
- Casinos
- Ballrooms

FEATURES

- Designed for use in Unison DRd and ERn enclosures
- Point of Control Interface: easy-to-read system display shows the user pertinent system information
- Supports Calculated Energy Reporting for configured loads when used in a Central Control Server System.
- LinkConnect: using Echelon® LonTalk® protocol with LinkPower, the two-wire topology-free system gives you the freedom to put stations where you need them
- NetConnect: Makes use of low-cost, easy-to-install Cat5/5e with PoE to connect touchscreen stations and other devices to a networked Paradigm System
- USBConnect: support for USB flashdrives for configuration upload and download
- QuickLoad: SD Media support for upload, and backup of configuration data
- LightDesigner Access: Web browser interface for easy modification, activation and monitoring of your system configuration and status
- LocalAccess: user control at the interface, including creation of timed events and editing of presets or sequences
- Secure-It Access Control: multiple levels of secure user access at the interface

REGULATORY AND COMPLIANCE

- cULus Listed
- CE Compliant

ORDERING INFORMATION

Paradigm Architectural Control Processor

MODEL	DESCRIPTION
P-ACP	Unison Paradigm Architectural Control Processor

Compatible Power and Control Enclosures

MODEL	DESCRIPTION
DRd	Unison Dimming Enclosure (12 and 24 circuits)
ERn	Unison External Control Enclosure

Unison Paradigm System Accessories

MODEL	DESCRIPTION
P-SPM-E	Unison Paradigm Station Power Module
P-REP	Unison Paradigm ERn Repeater Module
P-DREP	Unison Paradigm ERn Dual Repeater Module
P-REP-W	Unison Paradigm Wall-Mount Repeater
P-DREP-W	Unison Paradigm Wall-Mount Dual Repeater
P-REP-RM	Unison Paradigm Rack-Mount Repeater
P-DREP-RM	Unison Paradigm Rack-Mount Dual Repeater

SPECIFICATIONS

MECHANICAL

- Designed for use in the Unison DRd Rack Enclosure Series and Unison ERn Control Enclosure Series
- Microprocessor-based, solid-state technology to provide multi-scene lighting and building controls
- Fully-contained plug-in module with no discrete wire connections
- Tool-free installation
- Front-panel user interface with backlit LCD and alphanumeric button panel
- Support of RJ-45 Ethernet, Secure Digital (SD) and Universal Serial Bus (USB) media on the front panel

ELECTRICAL

- No discrete wiring connections required for use in a dimming or control enclosure
- Echelon® LinkPower® communications with remote devices, including button stations, button/fader stations, touchscreen stations, sensors, and third party LonMARK compliant products
- Hot swapable
- System configuration and programming information stored in flash memory
- Support of ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols
- Supports EIA-RS232 serial protocol for bi-directional command and communication with third-party equipment
- Two discrete ESTA DMX512A ports, configurable as input or output ports*
- Four dry-contact closure inputs
- Four contact-closure outputs, rated 1 A at30 VDC

*When used in a Dimming Enclosure, the second DMX port is always an output

THERMAL

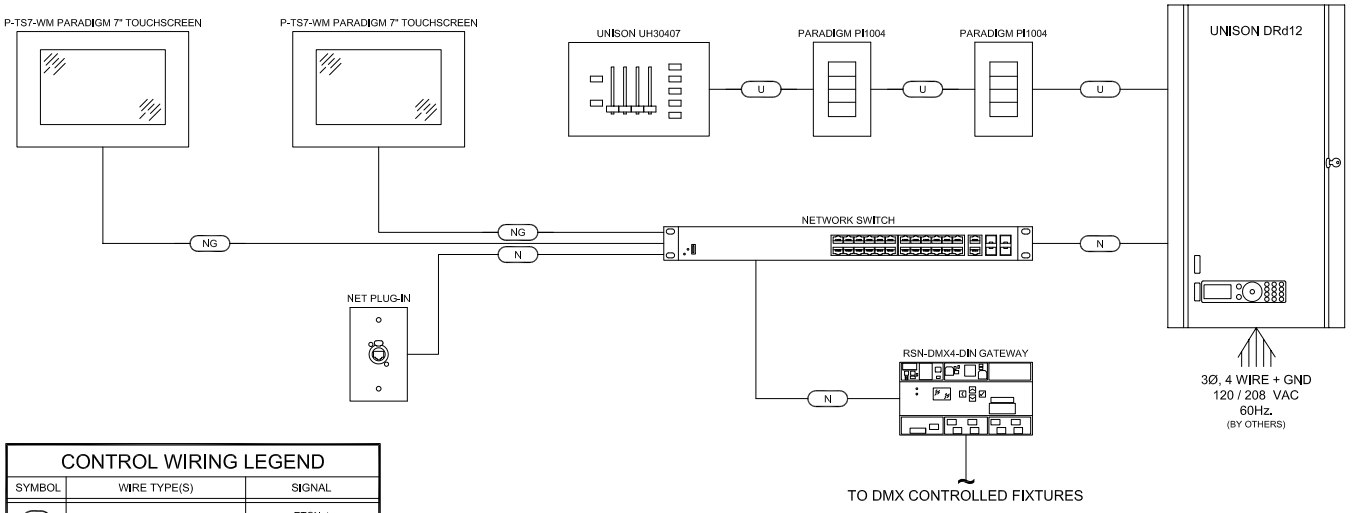
- Ambient room temperature: 0°–40° C / 32°–104° F
- Ambient humidity: 10–90% non-condensing

SPECIFICATIONS

FUNCTIONAL

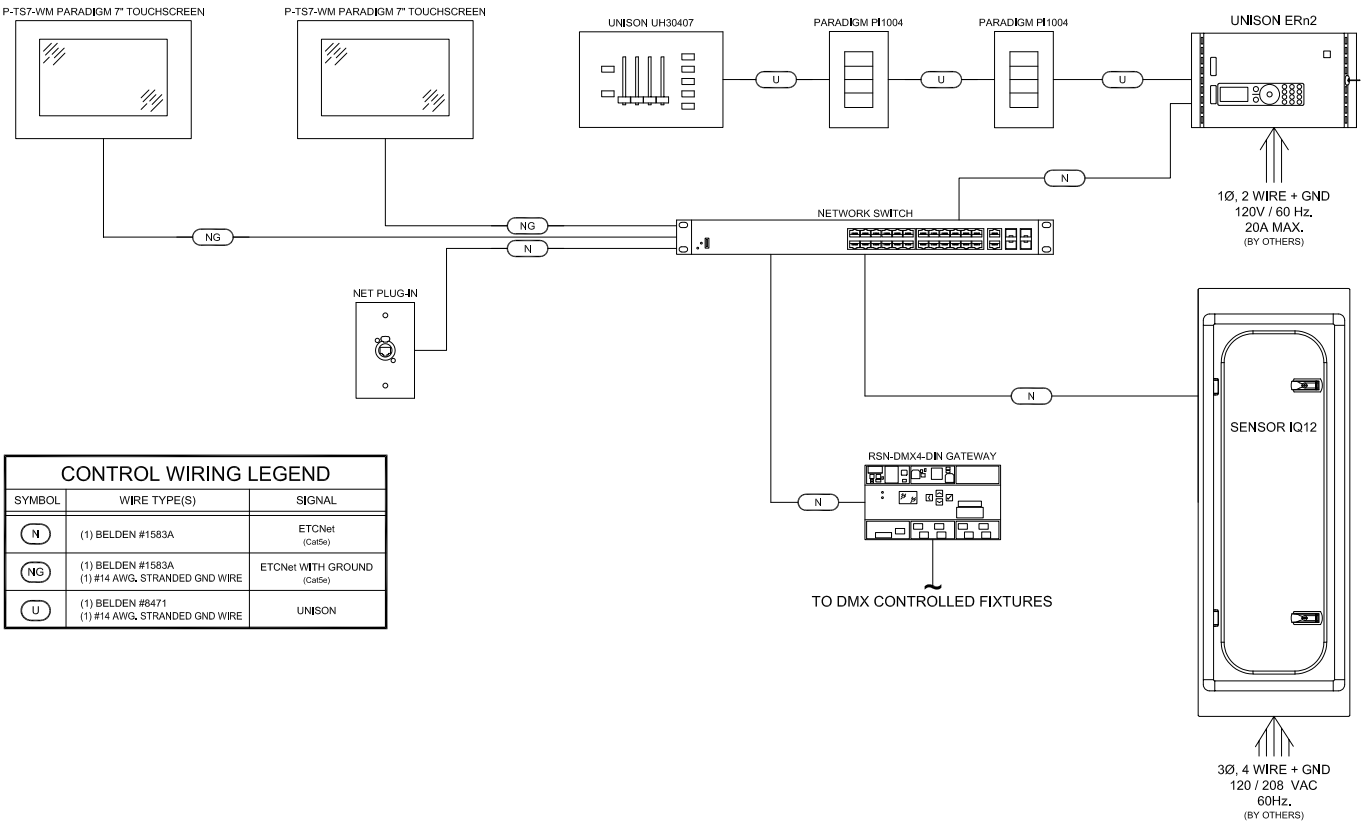
- Capacity
  - Supports 1,024 channels of control per control processor
  - Supports up to 63 stations per control processor
- System
  - Net3 system interoperability including sACN
  - Network Time Protocol for real-time clock synchronization supporting real and astronomical events
  - Supports two physical DMX ports, each configurable as an input or output
  - Provides configuration of DRd dimming operations
  - Up to 12 control processors per system
  - Addition of processors to a system proportionately increases the overall capacities
- Serial Input/Output
  - Eight-bit word length, parity selection and one or two stop bits
  - Fully customizable input and output messages
  - Bi-directional
- Configuration Data
  - Remote upload from a connected PC running LightDesigner or another connected Paradigm ACP
  - Stored in removable solid-state memory for easy transfer to another Paradigm ACP
- Local User Interface
  - Control functionality for control channels, zones, fixtures, groups, presets, macros, walls and sequences
  - Ability to schedule timed events (add/edit/delete)
  - Transfer of configuration using removable media
  - Transfer of configuration to and from touchscreen stations using removable media
- User Access Controls
  - Two user accounts – Administrator and User, local to each processor
- Web User Interface
  - Internal web server accessible via Ethernet port
  - Activate and deactivate presets
  - Schedule timed events (add/edit/delete)
  - Displays status information and log files
  - Configuration of processor settings
  - Supports configurable user login security options
- Diagnostics
  - Standard and Critical Event logging
- Stations
  - Connected to a Paradigm processor via topology-free LinkConnect, or star-topology NetConnect
  - Discovery and binding accomplished from the local user interface or LightDesigner
- Operation
  - Configurable DMX output refresh rate
  - Support for 16-bit DMX attributes
  - User configurable arbitration for multiple internal and external source data

TYPICAL SYSTEM RISER – DRd WITH PARADIGM CONTROL



CONTROL WIRING LEGEND		
SYMBOL	WIRE TYPE(S)	SIGNAL
N	(1) BELDEN #1583A	ETCNet (Cat5e)
NG	(1) BELDEN #1583A (1) #14 AWG. STRANDED GND WIRE	ETCNet WITH GROUND (Cat5e)
U	(1) BELDEN #8471 (1) #14 AWG. STRANDED GND WIRE	UNISON

TYPICAL SYSTEM RISER – ERn WITH PARADIGM CONTROL



CONTROL WIRING LEGEND		
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U	(1) BELDEN #8471 (1) #14 AWG. STRANDED GND WIRE	UNISON

ETC Paradigm Architectural Control Processor

Unison Control Series

PHYSICAL

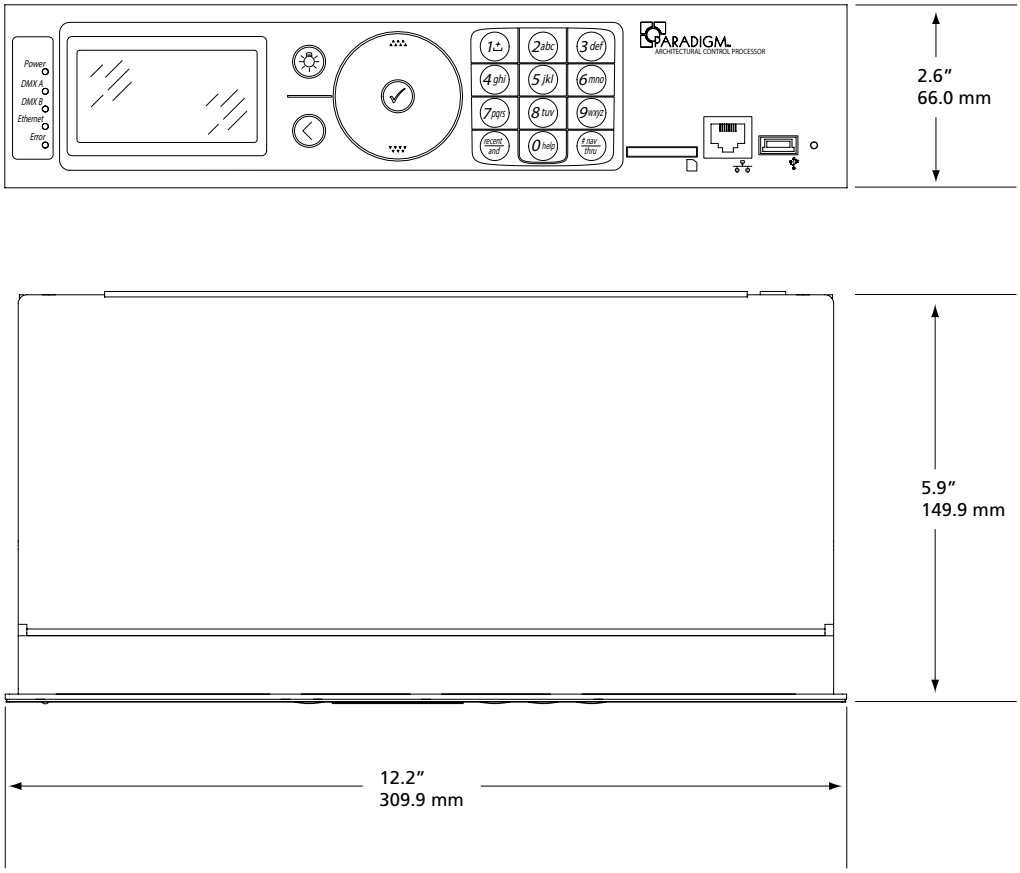
P-ACP Dimensions*

MODEL	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
P-ACP	2.6	66	12.2	310	6.0	150

P-ACP Weights*

MODEL	WEIGHT		SHIPPING WEIGHT	
	lb	kg	lb	kg
P-ACP	3.8	1.72	4.8	2.18

*Weights and dimensions typical



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ETC® Unison® Paradigm® Inspire® Control Stations

Paradigm Control Series



GENERAL INFORMATION

Sophisticated and stylish - with the control you need. These LinkConnect-powered stations are designed to initiate preset, zone, and space controls for your entire lighting system. They communicate efficiently with a single space or the rest of the Paradigm family of lighting controls to provide necessary control for any installation. Paradigm Inspire are an elegant way to add control to any facility.

APPLICATIONS

- Education
- Hospitality
- Healthcare facilities
- Office buildings
- Conference rooms
- Meeting rooms
- Retail

FEATURES

- LinkConnect: two-wire topology-free system gives you the freedom to easily place stations wherever they are needed
- Fastener-Free Faceplate System: no visible means of attachment
- Decorator style face plates available in one-, two-, three- and four-gang options
- Color control: the four button with fader station provides live feedback and control for:
  - Variable Color: Intensity, Saturation and Hue
  - Variable White: Intensity, Tint and Color Temperature
- Color condition: rear-illuminated indicators that reflect system status using RGB LEDs. Allowing for customized control indication on a per-button basis
- Laser engraved legend system with custom button labeling available

GENERAL

- UL and cUL LISTED
- CE marked
- CA Title 24 compliant

ORDERING INFORMATION

Paradigm Inspire Stations

MODEL	DESCRIPTION
PI1001-_	Inspire 1-Button Control Station
PI1002-_	Inspire 2-Button Control Station
PI1004-_	Inspire 4-Button Control Station
PI1006-_	Inspire 6-Button Control Station
PI1008-_	Inspire 8-Button Control Station
PI1104-_	Inspire 4-Button with Fader Control Station

Enter station color code in __ space provided:

1 = Cream (RAL 9001), 3= Grey (RAL 7001), 4 = Black (RAL 9004), 5 = Signal White (RAL 9003)

Stations flush-mount (F) in industry-standard gang boxes. (By others)

Surface mount boxes available from manufacture upon request.

Compatible Control Systems

MODEL	DESCRIPTION
P-ACP	Paradigm Architectural Control Processor

Note: A Paradigm Station Power Module (P-SPM) is required

SPECIFICATIONS

FUNCTIONAL

- Zone or preset control from any station
- RGB button illumination for activity status
- Button functions include: preset selection, record mode activation, station lockout, raise, lower, macro activation, zone on/off control, timed-event override and wall open/close or toggle
- Fader functions include: zone or group intensity, color control, variable white control
- Custom button functionality programmable via LightDesigner configuration software
- Programmable electronic lockout levels
  - Allows for programming of individual lockout levels

MECHANICAL

- 1, 2, 4, 6 and 8 buttons or 4 buttons with rotary fader
- Gangable for custom applications
- Enclosed electronics assembly
- Cantilevered switch arrays with replaceable button caps
- No visible means of attachment
- Flush-mount in industry standard backbox, RACO 690 or equivalent
- Surface-mount backboxes available from ETC upon request
- Constructed of injection-molded, ABS plastic in four RAL standard colors:
  - Cream (RAL 9001)
  - Grey (RAL 7001)
  - Black (RAL 9004)
  - White (RAL 9003)

ELECTRICAL

- Connect via LinkConnect two-wire control network utilizing low-voltage Class 2 wiring
  - Topology-free and polarity-independent wiring over Belden 8471 or equivalent and one #14 ESD drain wire
  - Wiring may be bus, loop, home run or any combination of these
- All station terminations utilize removable connectors
- UL and cUL LISTED, CE marked

THERMAL

- Ambient room temperature: 0-40°C / 32-104°F
- Ambient humidity: Maximum 90% non-condensing

PHYSICAL

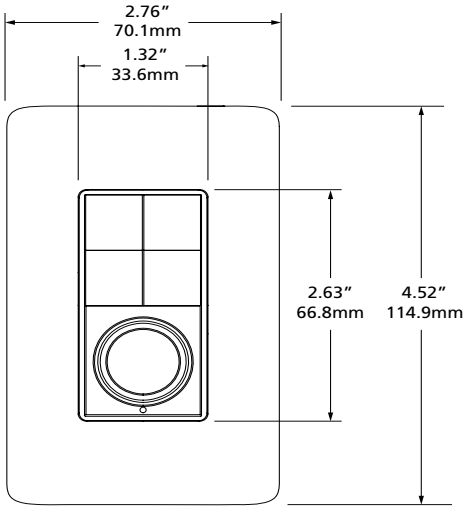
Station Dimensions*

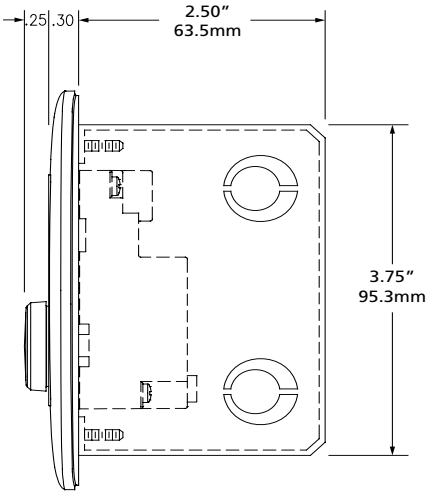
MODEL	HEIGHT		WIDTH		DEPTH	
	inches	mm	inches	mm	inches	mm
PI100X	4.52	115	2.76	71	0.30	8
PI1104	4.52	115	2.76	71	0.55	14

Station Weights*

MODEL	WEIGHT		SHIPPING WEIGHT	
	ounces	grams	ounces	grams
PI100X	3.68	105	7.49	213
PI1104	3.75	107	7.54	214

*Weights and dimensions typical





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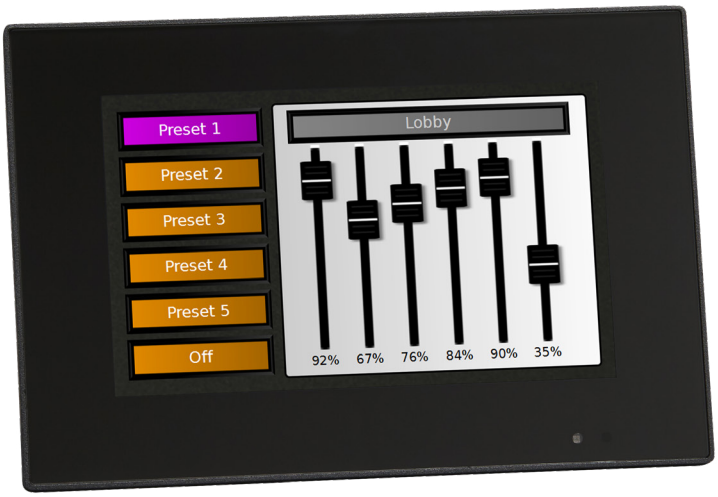
ETC

Unison Paradigm 7” Touchscreen

Unison Control Series



GENERAL INFORMATION

Paradigm Touchscreens use high-resolution, color displays that are bright and easy to read. The touch-sensitive panels provide audible and visual feedback that show when commands are fully registered. Designed to your specifications with ControlDesigner software, the Touchscreen’s intuitive graphics guide users quickly through lighting and control options.

APPLICATIONS

- Houses of worship
- Hotels
- Convention centers
- Meeting rooms
- Schools
- Restaurants

FEATURES

- 7” WVGA (800x480), 24-bit color LCD touchscreen
- ColorPicker – Support for HSB color picker for dynamic selection of color with LED and multiparameter fixtures
- Timed Event creation, edit, and override from setup menu
- Ready-When-You-Are – built in proximity and ambient light sensors make sure the station is ready to respond when you are about to use it
- Electronic Lockout - configurable, software based access level control with multiple levels of access utilizing numeric pass codes
- NetConnect – making use of low-cost, easy to install Cat5 with PoE to connect LCD stations to a networked Paradigm System
- LinkConnect – using Echelon® LonTalk® protocol with LinkPower, the two wire topology-free system gives you the freedom to put stations where you need them
- USBConnect – Support for USB flash drives for configuration upload and download
- QuickLoad – SD Media support for upload, and backup of configuration data
- Support of standard or custom graphical control pages

ORDERING INFORMATION

Paradigm 7” Touchscreen

MODEL	DESCRIPTION
P-TS7-_	Paradigm 7” Touchscreen

Insert station color selection in the __ space provided:

1 = Cream (RAL 9001)

2 = Ivory (RAL 1015)

3 = Gray (RAL 7001)

4 = Black (RAL 9004)

5 = Signal White (RAL 9003)

Paradigm 7” Touchscreen Mounting Options

MODEL	DESCRIPTION
P-LCD-FBB	7” Touchscreen Flush Back Box
P-LCD-SBB	7” Touchscreen Surface Back Box
P-LCD-SLBB	7” Touchscreen Surface Back Box - Locking Cover
P-TS7-RM	Paradigm 7” Touchscreen Rack Mount Kit

Paradigm 7” Touchscreen Locking Covers

MODEL	DESCRIPTION
P-LCD-LC-_	7” Touchscreen Hinged Locking Cover

Notes: Insert Locking Cover color selection in the __ space provided using the color chart above.

Note: Locking covers use the standard flush mount backbox for recesses mount applications

SPECIFICATIONS

FUNCTIONAL

- Built-in setup display, separate from user configured pages
- Configuration upload from the following sources:
  - LightDesigner software
  - Paradigm Architectural Control Processor
  - SD media, via built in SD card slot
  - USB Flash Drive, via built in USB port
- Ability to store multiple configurations on one touchscreen and select which configuration is active from an on-screen menu
- Allows 30 separate control pages
- Individual zone control
- Preset record and selection
- Room Combine Controls
- Preset, color, sequence, macro, and custom function activation
- Change, initiate, or override timed events
- Multi-level electronic lockout
- Custom controls configured from LightDesigner software
- Custom graphics from ControlDesigner software

MECHANICAL

- Color LCD display with projected capacitive touchscreen interface with LED backlight
- 178 degree horizontal and vertical viewing angle
- Low-profile aluminum bezel finished in a fine-texture powder coat paint
- No visible means of attachment
- Manufacturer provided back boxes for surface and flush mount applications
- Adjustable brightness and contrast for low light conditions
- 7” WVGA, display (800x480)

ELECTRICAL

- Connection to Paradigm Control System utilizes standard Ethernet (CAT5/ 5e)
  - Powered by Power over Ethernet, PoE Class 2 (6-watts)
  - Requires ground wire
- Optional connectivity using low voltage Class II LinkConnect wiring
  - Topology free and polarity independent wiring over Belden 8471 or equivalent plus two #16 for 24 VDC AuxPower
  - Requires ground wire
  - Wiring may be bus, loop, home-run or any combination of these
- Meets or exceeds EN60950-1, N55103-1, En55103-2 and IEC1000-4-2

THERMAL

- Ambient room temperature: 0°–40° C (32°–104° F)
- Ambient humidity: 10–90% non-condensing

REGULATORY AND COMPLIANCE

- cULus Listed
- CE Compliant
- RoHS compliance
- WEEE

PHYSICAL

P-TS7 Dimensions*

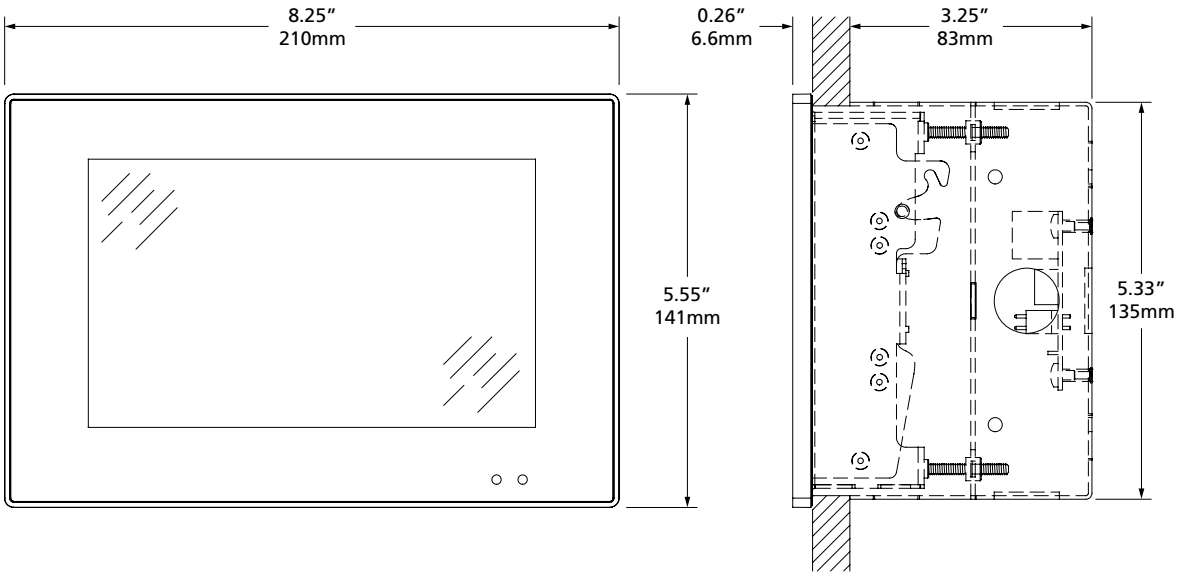
MODEL	HEIGHT		WIDTH	
	in	mm	in	mm
P-TS7-_	5.55	141	8.25	210
Locking Cover	6.70	170	10	254
P-TS7-RM	6.96	177	19	483

P-TS7 Weights*

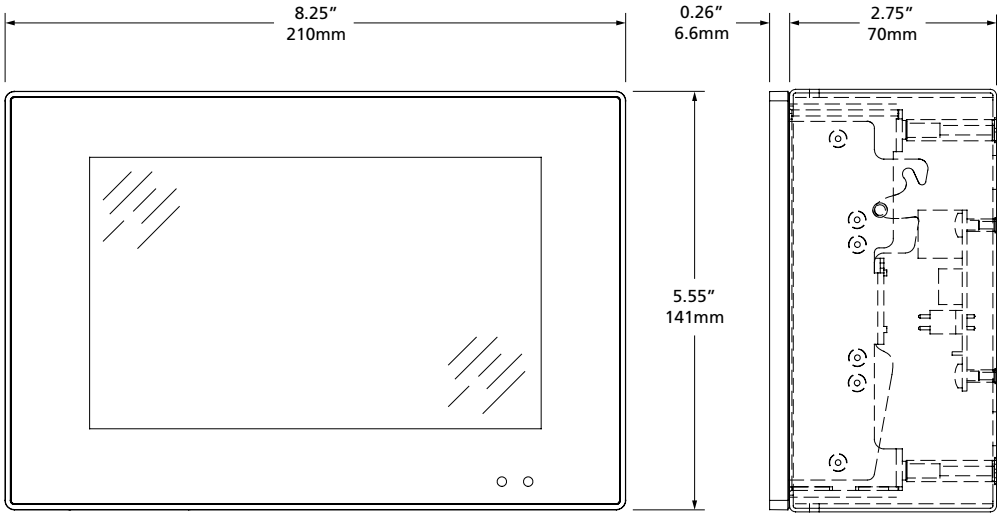
MODEL	WEIGHT		SHIPPING WEIGHT	
	lb	kg	lb	kg
P-TS7-_	2.5	1.13	3.2	1.45
P-TS7-RM	5.0	2.27	6.5	2.95

*Weights and dimensions typical

PARADIGM 7" TOUCHSCREEN FLUSH MOUNT

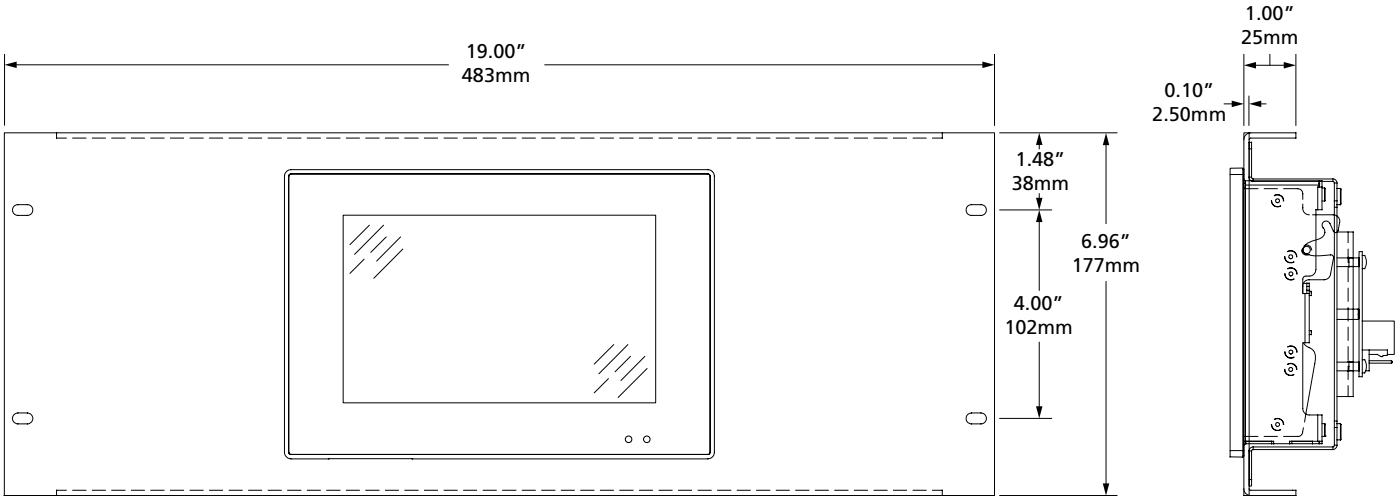


PARADIGM 7" TOUCHSCREEN SURFACE MOUNT

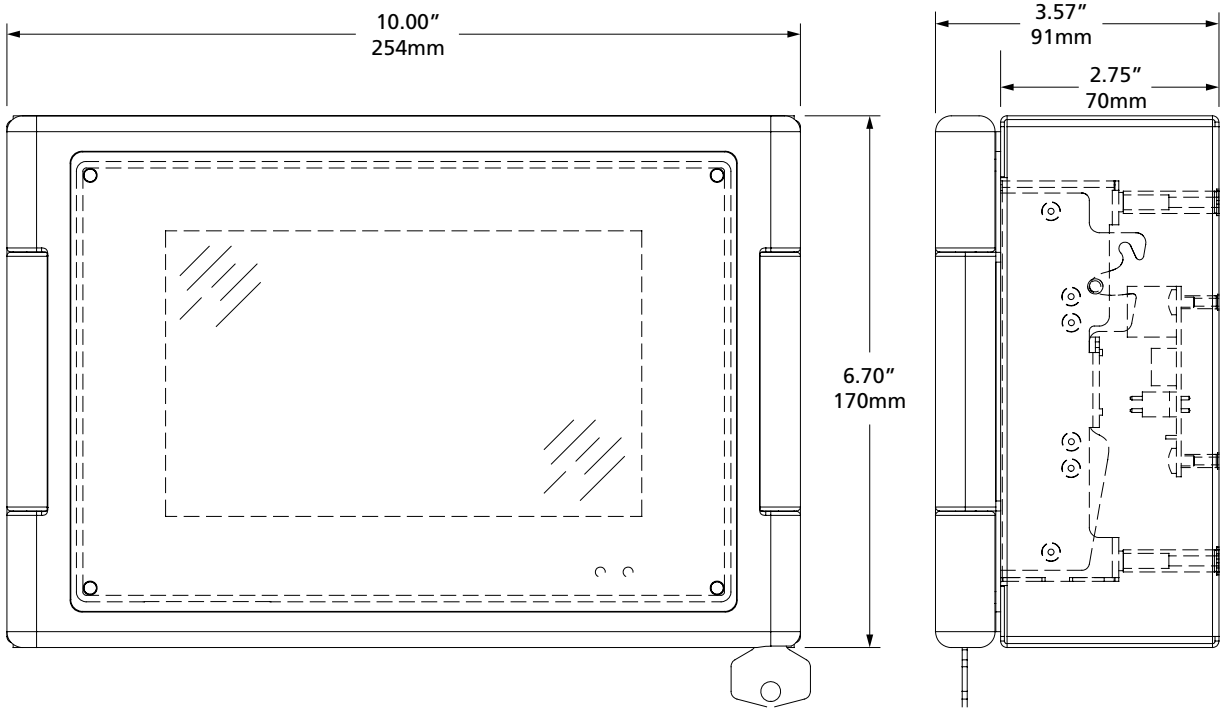


PHYSICAL

PARADIGM 7” TOUCHSCREEN RACK MOUNT

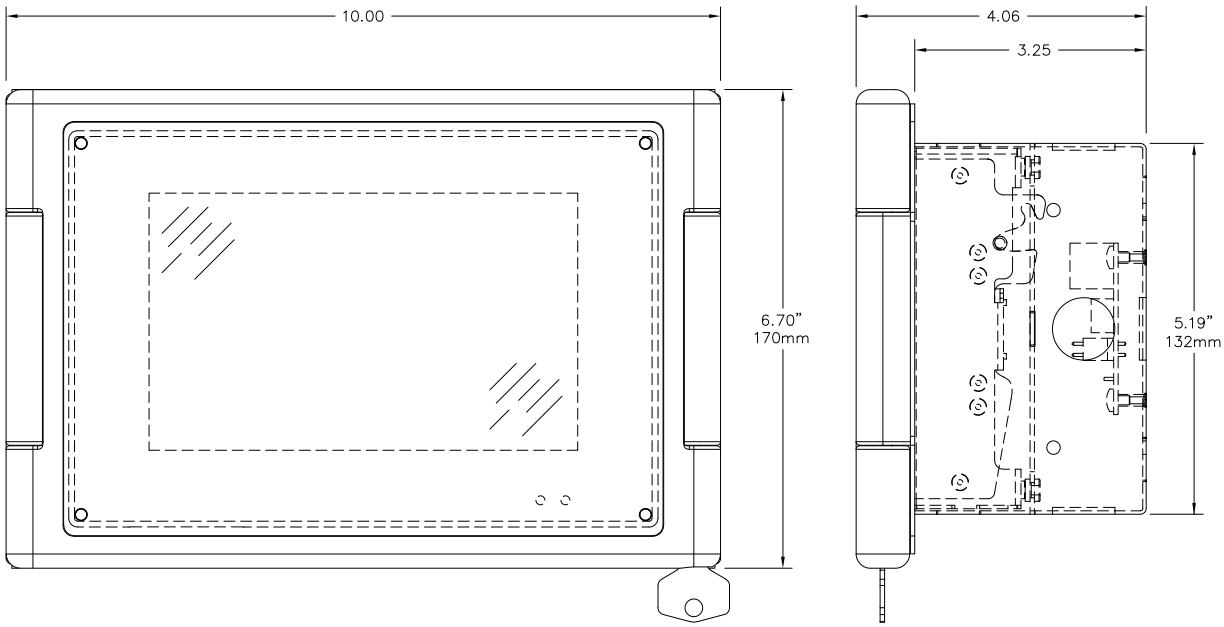


PARADIGM 7” TOUCHSCREEN LOCKING COVER SURFACE MOUNT



PHYSICAL

PARADIGM 7" TOUCHSCREEN LOCKING COVER FLUSH MOUNT



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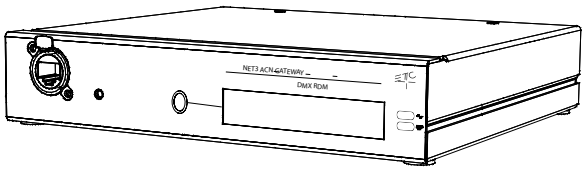
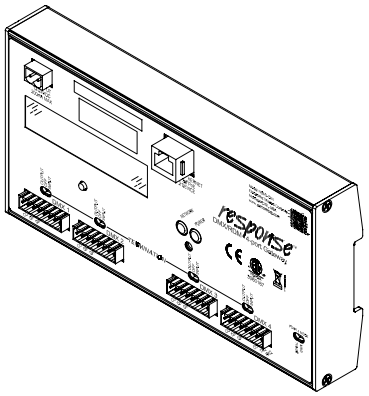
ETC®

DMX/RDM Four-Port Gateway

PoE 802.3af

Gateway Series





GENERAL INFORMATION

ETC's DMX/RDM Four-Port Gateway provides data distribution using the quality and reliability of ETC's network technology. Built for Net3 using industry-standard streaming ACN and sACN, the Four-Port Gateway unlocks the power of your networked system. The Four-Port Gateway also uses bidirectional Ethernet communication with other network devices to send or receive DMX512 and Remote Device Management (RDM) signals.

APPLICATIONS

- Roadhouses
- Touring
- University/professional theaters
- Convention halls
- Tech tables
- Stage manager panels
- System integration

FEATURES

- Distributes DMX and RDM data to any input/output device over Ethernet
- Supports Net3 protocol powered by ACN
- DMX/RDM Output/Input
- Simple configuration and service of each port
- LCD screen for labeling, status and configuration information
- Power and Network status indicators
- Power over Ethernet (PoE) or external DC power supply
- Configurable using Net3 Concert Software

ORDERING INFORMATION

Four-Port Gateways

MODEL	DESCRIPTION
N34G-4OUT	4-port DMX/RDM Gateway - 4 Output
N34G-4IN	4-port DMX/RDM Gateway - 4 Input
N34G-4TERM	4-port DMX/RDM Gateway - 4 Terminal Strip
N34G-4RJ	4-port DMX/RDM Gateway - 4 RJ45 Connectors
N34G-DIN	4-port DMX/RDM Gateway - DIN-rail Mount

Four-Port Gateway Components

MODEL	DESCRIPTION
N34G-FB	Gateway - includes 4 blank plates
N34G-MM	Input Module - Male 5-pin XLR
N34G-FM	Output Module - Female 5-pin XLR
N34G-TM	Terminal Strip Module - Input or Output
N34G-RJM	RJ45 Module - Input or Output
N34G-BM	Blank Module - For any unused port

Four-Port Gateway Accessories

MODEL	DESCRIPTION
N34G-FP4F	Gateway Front-Panel Kit - DMX 4 Out[1]
N34G-4P2M2F	Gateway Front-Panel Kit - DMX 2 In 2 Out[1]
PS-INTL	Gateway Universal Power Supply[2]
N3GA-RM	Gateway Rack-Mount Kit
N3GA-HBU	Gateway Hanging-Bracket Kit with U-Bolt

[1]Does not include required Rack-Mount kit

[2]PS-INTL includes plugs for United States/Japan, Europe, and Great Britain. Compatible with Four-Port, Two-Port, Show Control and I/O Gateways.

SPECIFICATIONS

FUNCTIONAL

- Supports Net3/ACN (ANSI E1.31 and E1.17)
- Supports RDM (ANSI E1.20)
- Supports USITT DMX512-A (ANSI E1.11)
- USITT DMX512 and ANSI E1.11 DMX512-A compliant
- Advanced Input Patch (AIP) allows any incoming address to be associated with any sACN address
- Flexible Output Patch (FOP) allows a 512-address universe to begin at any output address
- Support for per-address- or per-universe-level priority

MECHANICAL

- Menu button for backlight/paging control
- Backlit LCD display for identification and status reporting and basic configuraton.
- Rack-Mount/Portable/Touring
  - Fabricated from 16-gauge cold-rolled steel
  - Black, Fine-textured, powder-coat finish
  - C-clamp and U-bolt hardware available
  - Half 19" equipment rack width allows for up to eight DMX ports in 1U height
- DIN-rail
  - Extruded aluminium enclosure
  - Mounting complies with DIN43880 (35/7.5 rail)
  - DIN installation enclosure availabl
- Network, power and data activity LED indicators
  - Blue power indicator, green network activity indicator
  - Bi-color DMX activity indicator
- Front-panel RJ45 for connection to lighting network
- Reset button for hard reset or forced reboot

PROCESSOR

- Maximum delay time from input to output not greater than one packet time
- Selectable DMX refresh rate with a maximum at least 40Hz

ENVIRONMENTAL

- Ambient operating temperature: 0° to 40°C (32° to 104°F)
- Operating humidity: 5% - 95% non-condensing
- Storage temperature: -40° to 70°C (-40° to 158°F)

ELECTRICAL

- Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet
- Optional 8-28vDC power input for use with non-PoE systems
- Maximum five-watt current draw
- CE compliant and ETL listed

MODULAR DMX PORTS (NON DIN-RAIL MODELS)

- Supports up to four DMX ports independently configurable as inputs or outputs
- Module options include:
  - XLR 5-Pin Male DMX input connector
  - XLR 5-Pin Female DMX output connector
  - RJ45 DMX connector
  - Terminal strip connector
- Fully optically-isolated input from the Gateway electronics
- Withstands fault voltages of up to 250VAC
- Integrated DMX/RDM termination

SPECIFICATIONS

CONFIGURATION

- Configuration provided by Net3 Concert
  - Supports up to 512 DMX addresses per port
  - Supports up to 63,999 Streaming ACN universes
- Up to 2,048 channels in combination of data input or output
- DMX data input or output configurable by user
- Multiple outputs of a single DMX universe (DMX splitter) from a single Gateway
- Supports discrete DMX universe outputs per port
- Multiple sources may be combined to the network with each source or address allowed an independent priority
- Individual port start address and offset
- User-configurable labeling

ADDITIONAL INFORMATION

DMX512

Often shortened to DMX (Digital Multiplex), this communication protocol is used mainly to control dimmers and multi-parameter fixtures. A universe of DMX is defined as 512 channels. DMX sends a nearly continuous stream of level information for each control channel. It is a form of RS-485 digital serial communication.

RDM

Remote Device Management (ANSI E1.20) is a protocol enhancement to DMX512 that allows low-speed bidirectional communication between a system controller and attached RDM devices over a standard DMX line. This protocol will allow remote configuration, status monitoring, and management of devices.

sACN

Streaming ACN (ANSI E1.31), sends DMX-style control over TCP/IP networks. It provides a fast and efficient mechanism to transport the well-understood DMX protocol over Ethernet using an industry-standard protocol.

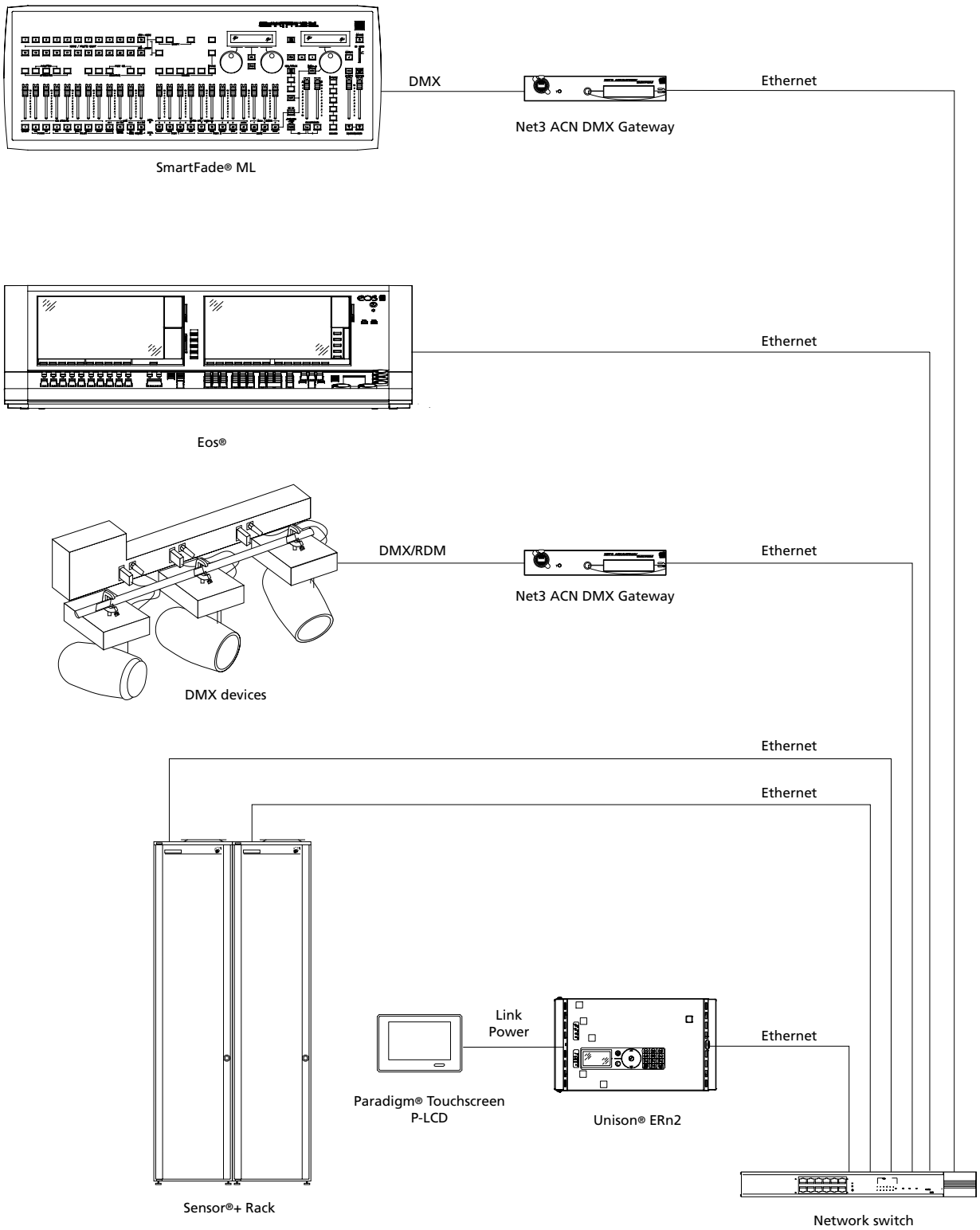
ACN

Architecture for Control Networks (ANSI E1.17) is a standard for high-speed bidirectional communication over TCP/IP on Ethernet network infrastructure. ACN is an open suite of protocols used between network devices for the purposes of greater and more adaptive control.

NET3

ETC's enhanced implementation of the standard ACN Protocol Suite (ANSI E1.17 and E1.31) including additional communication protocols for specialized applications and support of legacy systems.

TYPICAL SYSTEM RISER



PHYSICAL

Net3 Four-Port Gateway Dimensions

MODEL	HEIGHT		WIDTH		DEPTH	
	inches	mm	inches	mm	inches	mm
Gateway - Standard	1.71	44	8.5	216	8.2	208
Gateway - DIN-Rail Mount	4.13	105	8.03	204	1.61	41

Net3 Four-Port Gateways

MODEL	WEIGHT		SHIPPING WEIGHT	
	lbs	kgs	lbs	kgs
N34G-4OUT	6	2.7	8	3.6
N34G-4IN	6	2.7	8	3.6
N34G-4TERM	6	2.7	8	3.6
N34G-4RJ	5.5	2.5	8	3.6
N34G-DIN				

Bundles come complete with the Gateway, Modules, Rack-Mount Kit and Universal Power Supply.

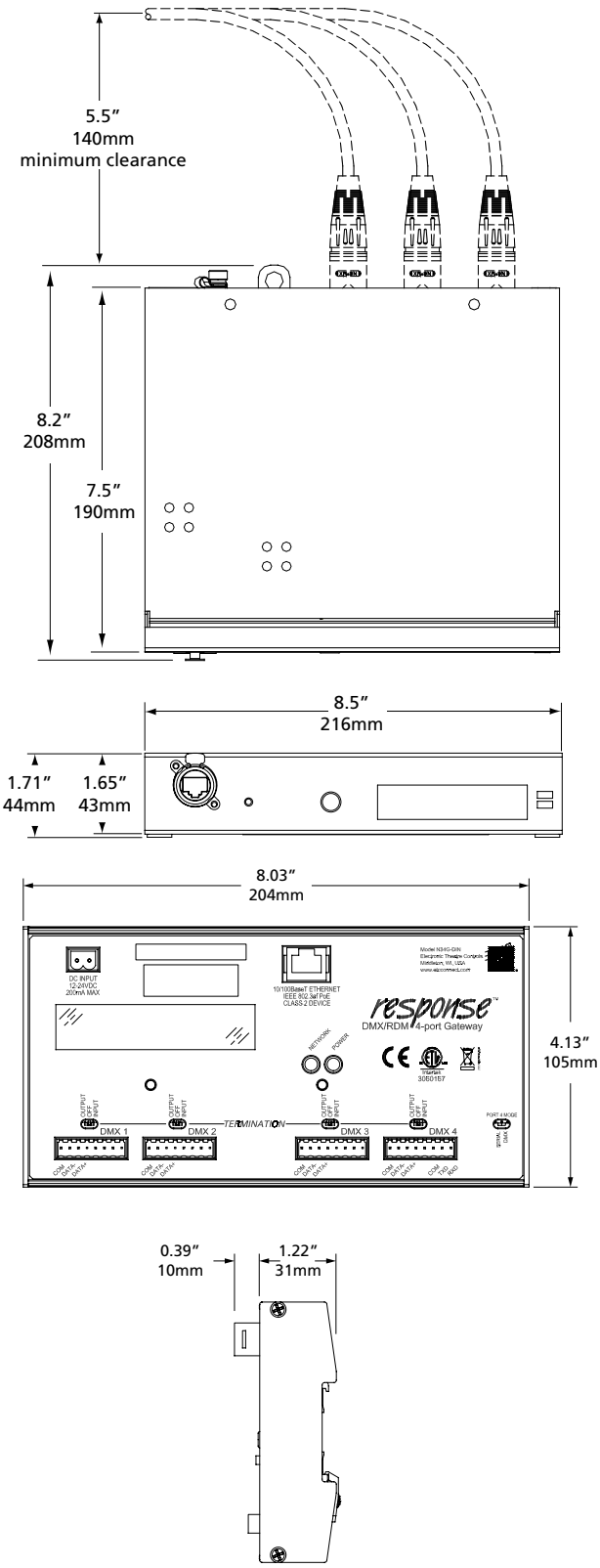
Net3 Four-Port Gateway Components

MODEL	WEIGHT		SHIPPING WEIGHT	
	lbs	kgs	lbs	kgs
N34G-4B	3	1.4	7	3.2
N34G-MM	0.3	0.1	1	0.5
N34G-FM	0.3	0.1	1	0.5
N34G-TM	0.4	0.2	1	0.5
N34G-RJM	0.4	0.2	1	0.5

Net3 Four-Port Gateway Accessories

MODEL	WEIGHT		SHIPPING WEIGHT	
	lbs	kgs	lbs	kgs
N34G-FP4F1[1]	1.1	0.5	2	0.9
N34G-FP2M2F[1]	1.1	0.5	2	0.9
N3GA-PS	0.5	0.2	1	0.5
N3GA-RM	1.5	0.7	2	0.9
N3GA-HBU	0.8	0.4	1	0.5

[1]Does not include required Rack-Mount Kit



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ETC 120 V Sensor IQ Intelligent Breaker System

Power Control Series



Type(s)

Project

Date

Notes

GENERAL INFORMATION

ETC's Sensor IQ Intelligent Breaker System provides mains-fed power distribution for up to 48 branch circuits in the industry's most compact footprint. Sensor IQ breakers combine high-inrush rated overcurrent protection, switched power control, and power usage/breaker status reporting in a single device. With built-in station, sensor, DMX and TimeClock controls and Ethernet connectivity, plus optional 0–10 V dimming, DALI output , contact inputs, and isolated ground bar for audio loads, the Sensor IQ integration opportunities are limitless.

APPLICATIONS

- Theaters
- Schools
- Houses of worship
- Conference centers
- Studios
- Arenas and stadiums

FEATURES

- Mains Feed: Three-phase 120 / 208 V four-wire plus ground or single (bi) phase 120 / 240 V three-wire plus ground
- 12-, 24- or 48-position breaker subpanel
- Breakers
  - Hydraulic magnetic breaker with high inrush trip curve
  - 22 kA SCCR (up to 65 kA series rated with main breaker)
  - Freely mix one-, two- and three-pole breakers up to 30 A
  - Integrated air-gap relay switching
  - Integrated on/off/tripped and connected load feedback
  - No power required for handle operation at the breaker
- Echo, sACN, DMX-512, TimeClock, or stand-alone control
- Built-in EchoConnect power supply for up to 6 Echo stations/sensors and 5 output products
- Built-in network interface provides:
  - Advanced control of relays over streaming ACN (sACN)
  - Measured energy usage reporting per branch circuit
  - Web UI for configuration
- Available 0–10 V, contact input or DALI control cards
- UL924 Listed emergency control bypass with load shedding

ORDERING INFORMATION

Panel Models

MODEL	DESCRIPTION
IQ12MLO	120 / 208 V 12-circuit breaker panel, main lug only
IQ12	120 / 208 V 12-circuit breaker panel, MCB optional
IQ24	120 / 208 V 24-circuit breaker panel, MCB optional
IQ48	120 / 208 V 48-circuit breaker panel, MCB optional
IQ12-1	120 / 240 V 12-circuit breaker panel, MCB optional
IQ24-1	120 / 240 V 24-circuit breaker panel, MCB optional
IQ48-1	120 / 240 V 48-circuit breaker panel, MCB optional

Note: Select surface or recess door below

Door Options

MODEL	DESCRIPTION
IQ DOOR 120-12MLR	Recess-mount door for IQ12MLO
IQ DOOR 120-12MLS	Surface-mount door for IQ12MLO
IQ DOOR 120-12R	Recess-mount door for IQ12/IQ12-1
IQ DOOR 120-12S	Surface-mount door for IQ12/IQ12-1
IQ DOOR 120-24R	Recess-mount door for IQ24/IQ24-1
IQ DOOR 120-24S	Surface-mount door for IQ24/IQ24-1
IQ DOOR 120-48R	Recess-mount door for IQ48/IQ48-1
IQ DOOR 120-48S	Surface-mount door for IQ48/IQ48-1

Optional Main Disconnects

MODEL	DESCRIPTION
IQ-MB100A22K*	Main Breaker: 120 / 208 V, 100 A, 22 kA SCCR
IQ-MB100A65K	Main Breaker: 120 / 208 V, 100 A, 65 kA SCCR
IQ-MB200A22K	Main Breaker: 120 / 208 V, 200 A, 22 kA SCCR
IQ-MB200A65K	Main Breaker: 120 / 208 V, 200 A, 65 kA SCCR
IQ-MB225A65K	Main Breaker: 120 / 208 V, 225 A, 65 kA SCCR
IQ-MB250A22K	Main Breaker: 120 / 208 V, 250 A, 22 kA SCCR
IQ-MB400A65K	Main Breaker: 120 / 208 V, 400 A, 65 kA SCCR
IQ1-MB100A22K*	Main Breaker: 120 / 240 V, 100 A, 22 kA SCCR
IQ1-MB200A22K	Main Breaker: 120 / 240 V, 200 A, 22 kA SCCR
IQ1-MB400A65K	Main Breaker: 120 / 240 V, 400 A, 65 kA SCCR
IQ-MF1003P	Main Fuse: 120 / 208 V, 100 A, 65 kA SCCR
IQ-MF2003P	Main Fuse: 120 / 208 V, 200 A, 65 kA SCCR
IQ1-MF1002P	Main Fuse: 120 / 240 V, 100 A, 65 kA SCCR
IQ1-MF2002P	Main Fuse: 120 / 240 V, 200 A, 65 kA SCCR

*100 A, 22 kA SCCR Main Breaker kits are not compatible with IQ48 panels.

NOTE: IQ panels with Main Fuse Kits to increase SCCR must be fed by an upstream breaker that is rated at the amperage of the fuse kit or greater.

Please see page 4 for Echo power requirement and supply information.

Please see page 5 for more accessory information.

SPECIFICATIONS

REGULATORY AND COMPLIANCE

- Breakers Listed to UL 489
- Enclosures listed to UL 67, UL 508, UL 924
- Complies with ANSI DMX512-A standard
- Complies with ANSI E1.31 streaming ACN standard

USER INTERFACE

- Graphical display
- Button interface
  - 0-9 number entry
  - Up, down and back-arrow navigation with enter
  - Test shortcut for local activation of preset, sequence and set level overrides
- USB interface for uploads of setup and software updates
- Onboard Web UI for simple configuration and management

BREAKER

- Hydraulic magnetic breaker maintains trip curve through entire thermal range, reducing nuisance tripping Bus connection type: Stab on
- One, two or three poles
- UL 489 Listed
- 15 A, 20 A or 30 A
- 50/60 hz frequency
- Inrush-pulse tolerance: 25 times rated current for half-cycle
- Integrated hall-effect sensors detect contact positions
- Integrated solenoid for remote operation
- Trips on overload even if handle is forcibly held in the "on" position
- Load lugs accept 14-6 AWG load wiring
- Multi-conductor rated output terminal
- Integral mechanically held air gap relay
- Integral current sensing
- Integral position and trip sensing
- Supports manual control of relay state using breaker handle without power
- Control and status provided by contact pads directly at bottom of the breaker case. No external wires or connections required for control or feedback
- Remote Feedback for breaker state, breaker type, current draw and phase voltage
- Visible state indication:

LED	HANDLE	INDICATION
LED on	Handle on	Output active
LED off	Handle on	Remotely controlled off
LED off	Handle off	Breaker tipped/Manually off

BREAKER CONTROL OPERATIONAL RATINGS

- No load-remote switching 1,000,000 cycles
- 24 A Resistive 100,000 cycles
- 15 A Electronic ballast (LED) 100,000 cycles
- Handle operations 10,000 cycles
- Duty cycle of 6 full cycles (12 operations) per minute
- Supports voltage isolation of 4000 V RMS
- Utilizes latching state relays
- Relays are mechanically held

SPECIFICATIONS

MECHANICAL

- Enclosure constructed of 16-gauge steel finished in black, fine-textured, scratch-resistant powder coat paint
- Removable outer panel includes integral locking door to limit access to electronics, breakers and local relay overrides
- Full front access with no side clearance required
- Removable covers for access to Class 1 and Class 2 wiring
- Complies with California building code - seismic zone four

ELECTRICAL

- Mains feed power input to support 120 / 208 V three-phase four-wire or 120 / 240 V bi-phase three-wire plus ground
- Max current input: 100 A at 12 circuits, 200 A at 24 circuits and 400 A at 48 circuits
- Quiescent draw: <10 W with relays at steady state
- Optional isolation between chassis and equipment grounding
- Short-circuit current rating: 22,000 A or 65,000 A symmetrical (see chart a right)
- Overloads occurs at 50 operations of 600% of rated current
- Integrated current transformer
- Current measurement range of 1–30 A. The maximum crest factor of primary current is 2.5
- Feeder entry supported at top or top side
  - Bottom or bottom side entry supported by rotating enclosure during installation
- Load wire entry supported on top, sides or bottom

SHORT-CIRCUIT CURRENT RATING AND LUG SIZING

TYPE	MAX RATING	SCCR RATING	INPUT LUG WIRE SIZE
Main Lug	100 A,200 A, 400 A	22 kA	2x6 AWG-250 kcmil (or 1x500 kcmil w/ kit for 48ckt panels), 1x6 AWG-350 kcmil neutral (dual lug on 48-channel panel), 1x14 AWG-2/0 ground (1x6 AWG-350 kcmil on 48 channel panel)
Main Breaker	100 A	22 kA	1x4 AWG-1 AWG
	100 A 200 A 225 A	65 kA 22 kA, 65 kA 65 kA	1x1AWG-300 kcmil
	250 A	22 kA	1x4 AWG-300 kcmil
	400 A	65 kA	2x3/0 AWG-250 kcmil
Main Fuse	100 A	65 kA	2x6 AWG-250 kcmil
	200 A	65 kA	2x6 AWG-250 kcmil
Branch Breaker	15 A, 20 A, 30 A	22 kA	6-18AWG solid or stranded class B, C, K; 10,12 or 14 AWG dual conductor
Branch GND/ Neutral	NA	NA	6-14 AWG

Note: Main feed lugs accept copper or aluminum wire; branch breakers accept copper wire only.

SPECIFICATIONS

ENVIRONMENTAL

- Thermal: 0°–40° C (32°–104° F) operating temperature
  - 24 A circuit (30 A breaker) - 1.4 W, 4.8 BTU/hr
  - 16 A circuit (20 A breaker) - 1 W, 3.4 BTU/hr
- Humidity; 5–95% non-condensing
- Complies with ESD immunity to IEC standard 1000-4-2

FUNCTIONAL

- **System-Wide control**
  - DMX input
    - Per-circuit patching
    - Per-circuit patch exclusions
    - Per-circuit threshold
    - 0-200 prioritization (matches sACN priorities)
  - Choice of DMX loss behavior: Hold last look or wait time
  - sACN input
    - Circuit-by-circuit patching
    - Circuit-by-circuit patch exclusions
    - 0-200 prioritization (matches sACN priorities)
  - Choice of sACN loss behavior: Hold last look or wait time
  - Global data loss behavior
  - UL 924 emergency lighting with load shedding
    - Load shedding requires a UPS Control Backup Wiring Kit (7131K1817) and Uninterruptable Power Supply (UPS) by others
    - UPS to supply 800 W–2400 W AC power to control processor
- **Application/Space segmented Control**
  - Space segmenting: up to 16 spaces per panel
  - Power sequencing
  - One 16-step sequence per space
  - Presets: up to 64 per space configurable via local UI or Echo Inspire control stations
    - Presets 1-16 can be configured remotely via Echo Access or integrated Web UI
  - Zone control: up to 16 zones per space
  - TimeClock (up to 50 events)
    - Event types: Preset and sequence activation, Flick warn
    - Timed hold (24 hours max.)
    - Auto-timed hold
    - Indefinite holds
    - Scheduled event overrides
    - Calendar and time of day based event scheduler
    - Holiday shut off
    - Astronomical time events: sunrise/sunset offsets
  - Integral station power supply (for up to six stations with up to six power panels connected)
- **Global monitoring**
  - Per circuit
    - Breaker-trip notification
    - Relay state
    - Current draw per circuit
    - Phase voltage
    - Energy usage
  - Per space
    - Active sequences
    - Active presets
    - Zone levels
    - Active-clock events

SPECIFICATIONS

OPTION CARDS AND ACCESSORIES

0-10 Dimming Option

- 24 outputs of 0–10 V sink dimming control rated for 400 mA per output

Contact Input Option

- 24 dry contact inputs which can be used to:
  - trigger presets and sequences, which will play at the priority configured for architectural sources, or;
  - directly control one or more outputs. The priority of these outputs is configurable. If nothing is configured, the last action takes precedence

DALI Control Option

- 24 control loops of broadcast DALI control
- Each loop supports up to 64 ballasts
- External DALI power supply required

Ride Thru Option

- Short-term power backup of control electronics
- Automatically engages when power is lost
- Recharges during normal power operation

UPS Backup Kit for Load Shedding

- Allows Power Control Processor to be powered via external UPS (by others)
- Required for load shedding applications
- UPS provides power to drive relays off when normal power is lost
- UPS for each Sensor IQ panel must by UL 924 Listed and rated for a minimum of 200 W peak load

Branch Circuit Fuse Kit

- Aids engineers in selective coordination* of emergency circuits

*Note: Selective coordination is a study on emergency systems that assures that an overcurrent on the output of any downstream branch circuit results in that branch tripping/clearing before the upstream mains breakers.

Echo Power Requirements

EchoConnect:	One unit of output power
Auxiliary Power:	Not required

Built-in EchoConnect Power Supply

EchoConnect:	Provides 6U of control power and an additional 5U of output power*
Auxiliary Power:	Not provided

*Note: Built in power supply can be disabled.

Echo Presets

Supports 64 Echo Presets per space; up to 16 Echo spaces

For more information, download the Echo Quick Guide.

SENSOR IQ BREAKERS

GENERAL INFORMATION

ETC's Sensor IQ breaker is a high-quality, UL 489 Listed circuit breaker which incorporates the ability to rapidly switch the load using an internal solenoid when the breaker is in the 'on' position. The IQ breaker is designed with a high-inrush trip curve to handle the demands of modern entertainment and architectural lighting fixtures. IQ's unique hydraulic-magnetic trip mechanism maintains this trip curve throughout the operating temperature of the breaker, giving you outstanding protection against nuisance tripping.

A variant of the breaker without switching is available for standard breaker applications.

Sensor IQ breakers are designed for use in Sensor IQ panels only.

Intelligent Breakers with Switching

MODEL	RATED CURRENT	POLES
IQ SM B15	15 A	1-Pole
IQ SM B20	20 A	1-Pole
IQ SM B30	30 A	1-Pole
IQ SM B152	15 A	2-Pole
IQ SM B202	20 A	2-Pole
IQ SM B302	30 A	2-Pole
IQ SM B153	15 A	3-Pole
IQ SM B203	20 A	3-Pole
IQ SM B303	30 A	3-Pole

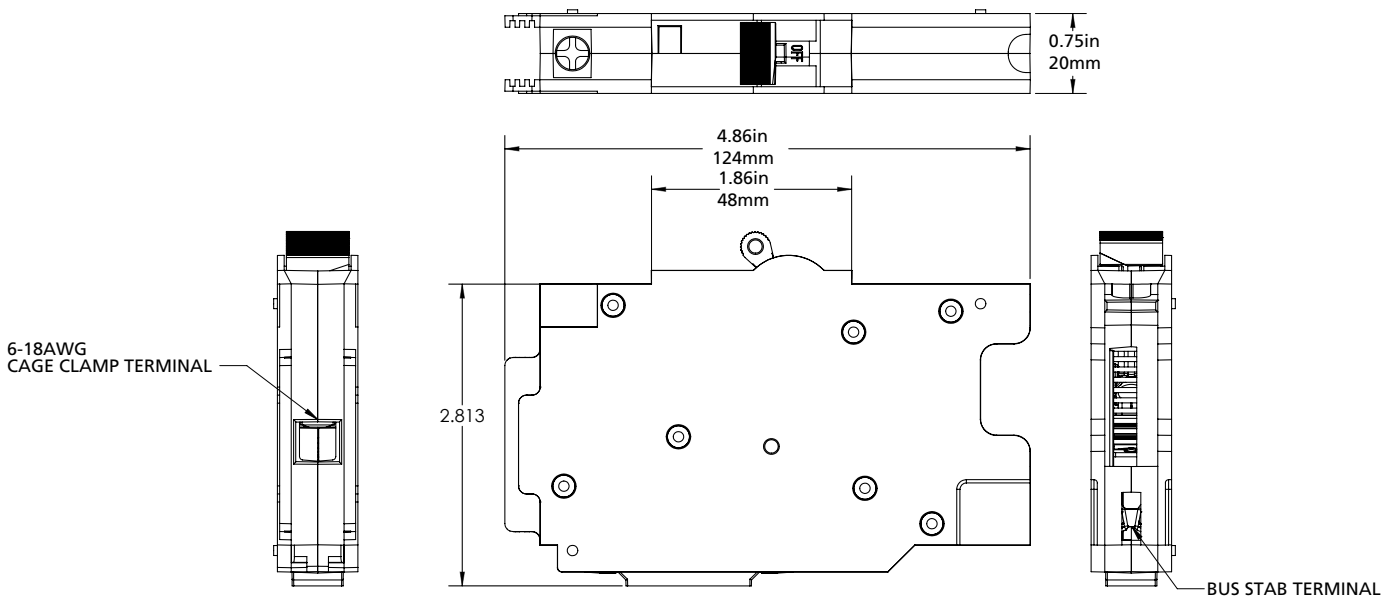
Standard Breakers without Switching

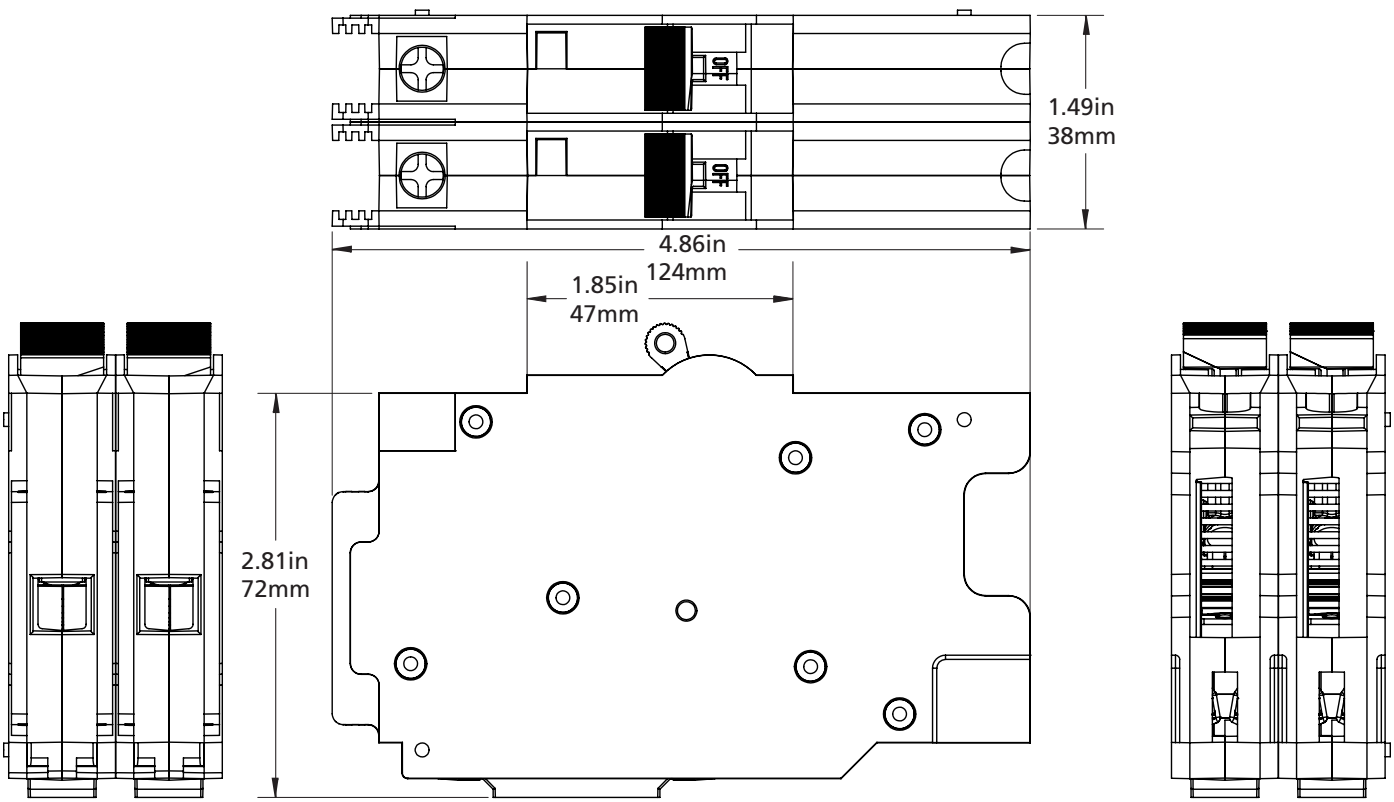
MODEL	RATED CURRENT	POLES
IQ B15	15 A	1-Pole
IQ B20	20 A	1-Pole
IQ B30	30 A	1-Pole
IQ B152	15 A	2-Pole
IQ B202	20 A	2-Pole
IQ B302	30 A	2-Pole
IQ B153	15 A	3-Pole
IQ B203	20 A	3-Pole
IQ B303	30 A	3-Pole

OPTION CARDS AND ACCESSORIES

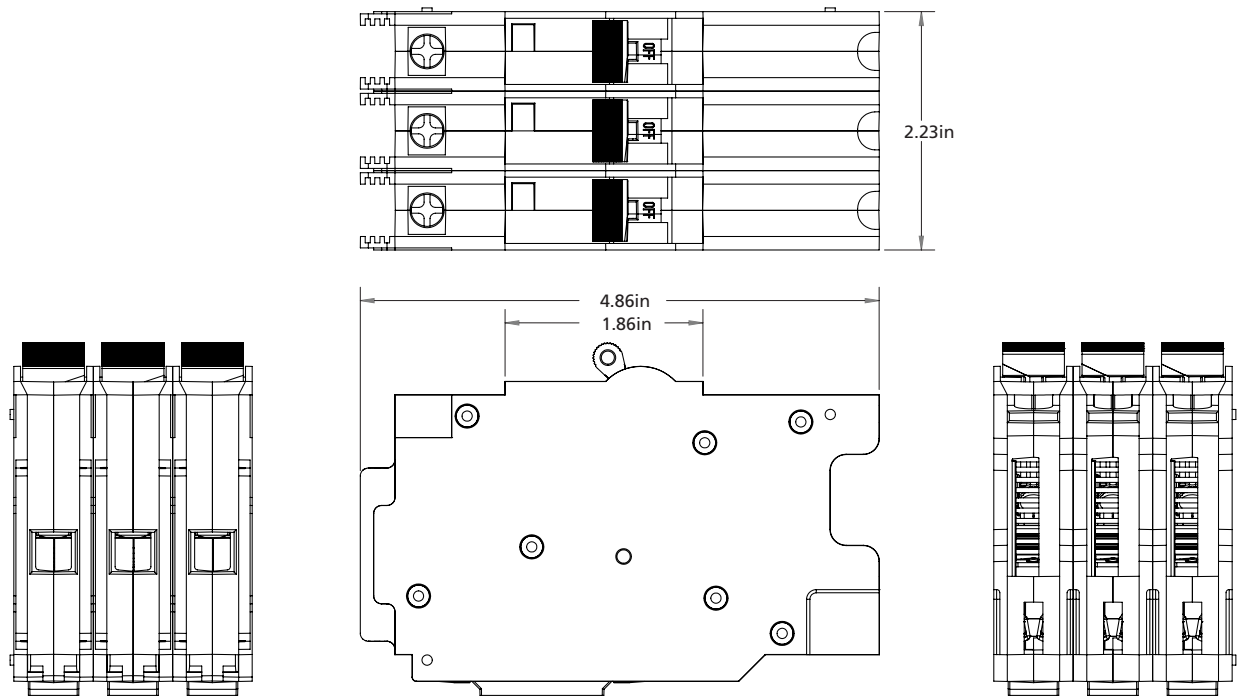
MODEL	DESCRIPTION
IQ-LVD	0–10 V Dimming Control Option
IQ-DALI	DALI Control Option
IQ-CI	Contact Input Option
IQ-RTO	RideThru Option
IQ-UPS-KIT	UPS Control Backup Wiring Kit - **required for shedding normal loads when the emergency state is active; a UL 924 Listed UPS (provided by others) with a minimum load rating of 200 W peak load is recommended for each Sensor IQ panel for load shedding applications**
IQ277-500KCMIL	IQ-48 500 kcmil feeder lug kit for support of 400 A feeders up to 500 kcmil
IQSC-6, -12, -24	Branch circuit fuse boxes that may be used for selective coordination of loads (see page 4 for details)
IQ12/24 ISO GND, IQ48 ISO GND	Isolating ground bar
IQ-TAP	Mains feed tap kit for normal sense circuits for emergency lighting control
Unison Echo Devices	Echo Sensors, Stations, Zone Controllers, Station Power Modules and Interfaces

SENSOR IQ BREAKER PHYSICAL SPECIFICATIONS

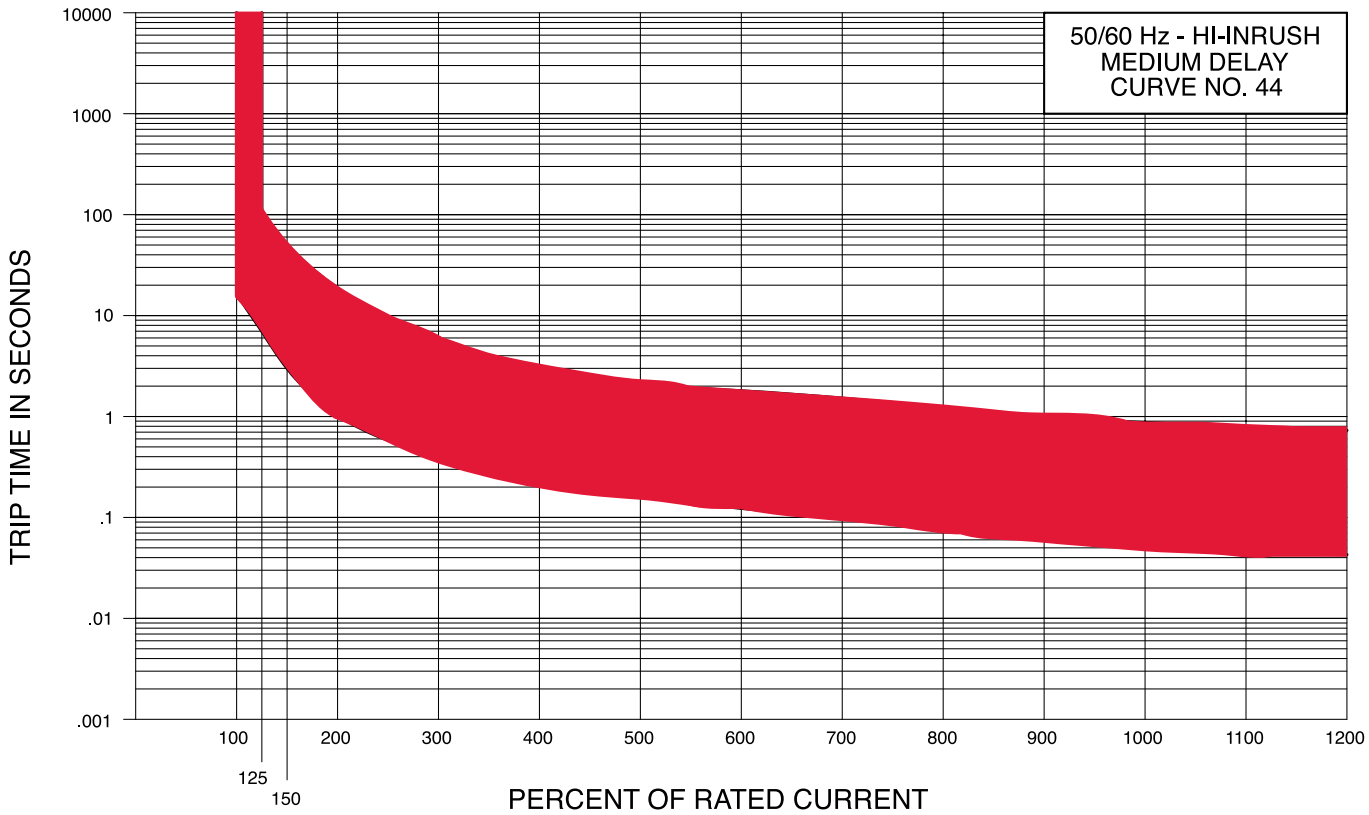


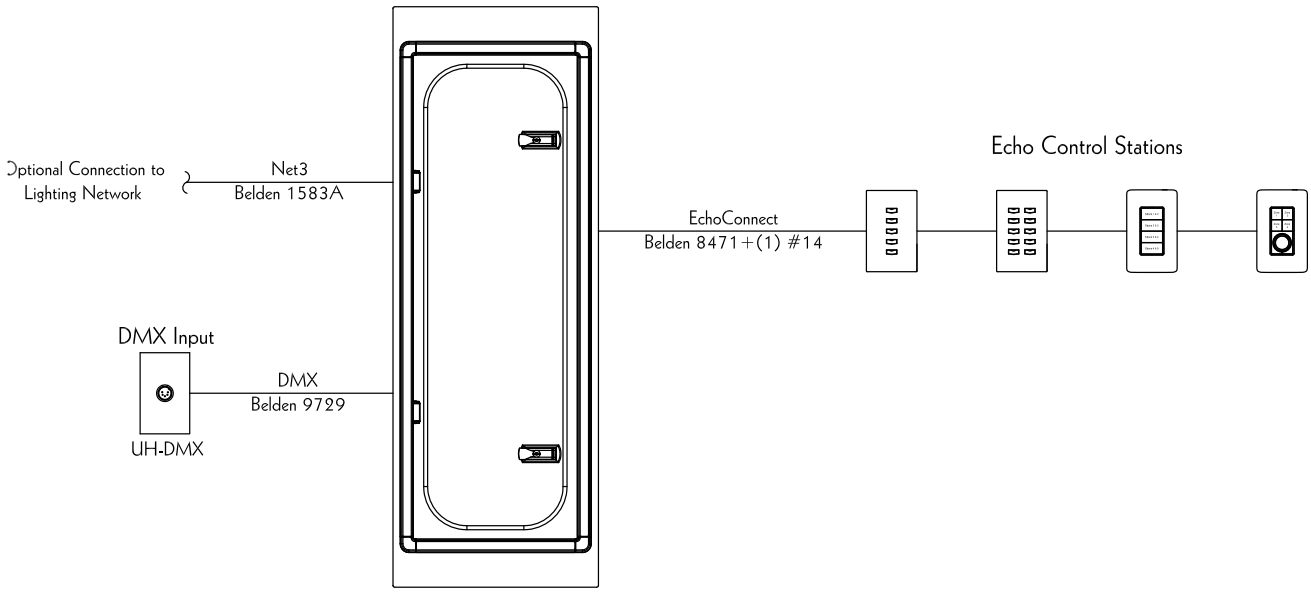


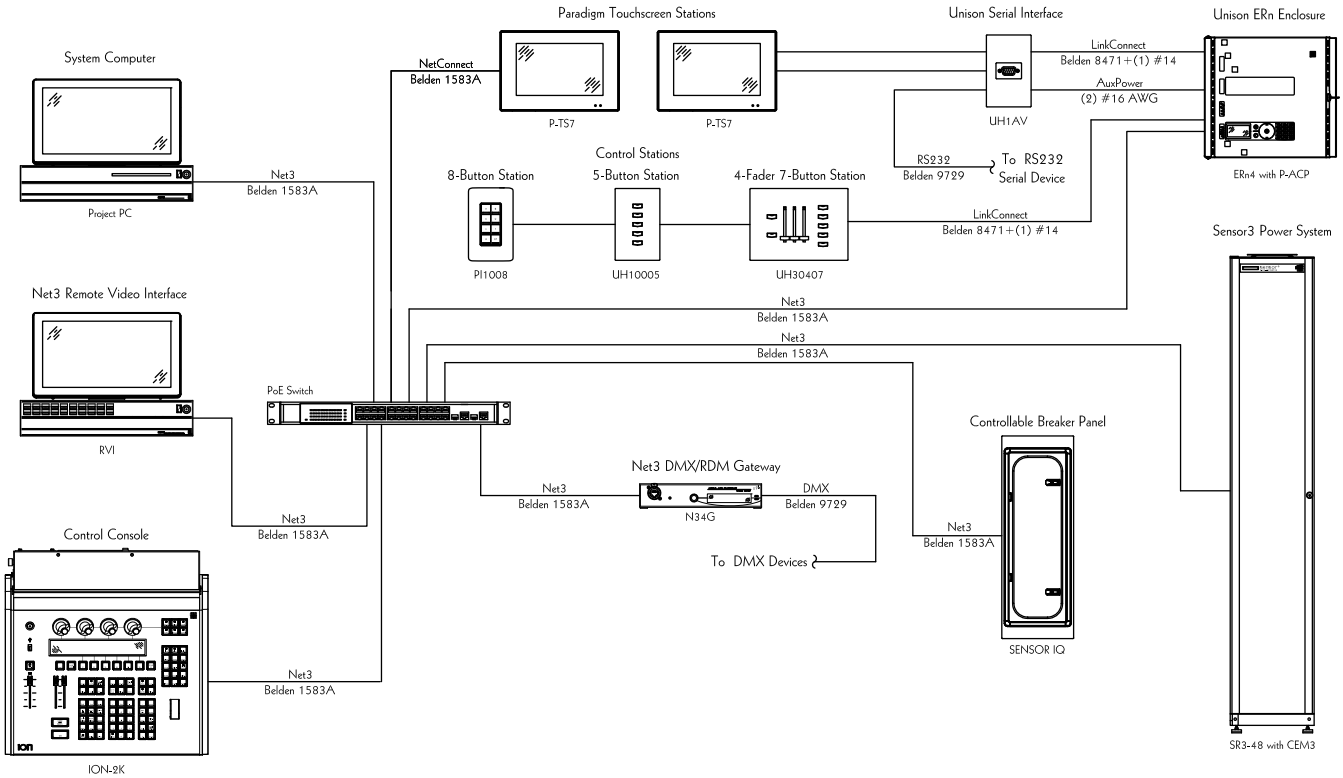
SENSOR IQ BREAKER PHYSICAL SPECIFICATIONS



TIME CURRENT CURVE




Optional Connection to Lighting Network
Net3
Belden 1583A
Echo Control Stations
EchoConnect
Belden 8471+(1) #14
DMX Input
DMX
Belden 9729
UH-DMX


Paradigm Touchscreen Stations
Unison Serial Interface
Unison ERn Enclosure
System Computer
NetConnect
Belden 1583A
P-TS7
P-TS7
UH1AV
LinkConnect
Belden 8471+(1) #14
AuxPower
(2) #16 AWG
ERn4 with P-ACP
Net3
Belden 1583A
Project PC
Control Stations
8-Button Station
5-Button Station
4-Fader 7-Button Station
RS232
Belden 9729
To RS232
Serial Device
LinkConnect
Belden 8471+(1) #14
PI1008
UH10005
UH30407
Sensor3 Power System
Net3 Remote Video Interface
Net3
Belden 1583A
Net3
Belden 1583A
PoE Switch
RVI
Controllable Breaker Panel
Net3 DMX/RDM Gateway
Net3
Belden 1583A
N34G
DMX
Belden 9729
Net3
Belden 1583A
Control Console
To DMX Devices
SENSOR IQ
Net3
Belden 1583A
ION-2K
SR3-48 with CEM3

PHYSICAL

Sensor IQ Dimensions

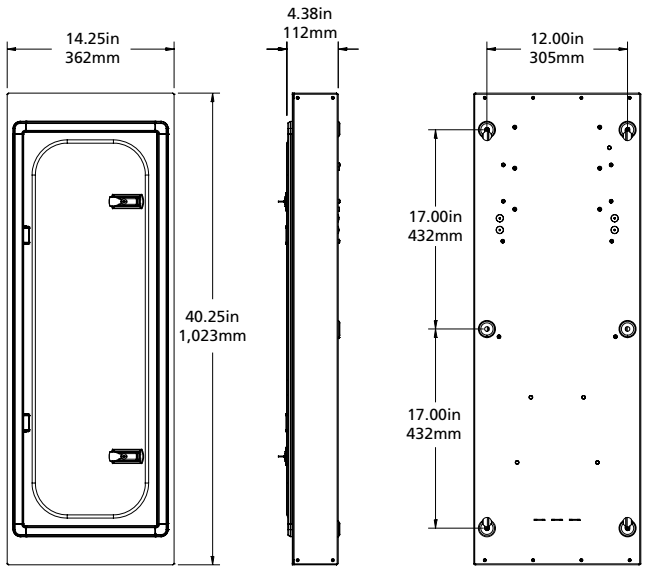
MODEL	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
IQ12	41.25	1,048	14.25	362	3.85	98
IQ12-ML	34.25	870	14.25	362	3.85	98
IQ24	50.25	1,277	14.25	362	3.85	98
IQ48	64	1,626	20	508	5.11	130

*Note: Depth is 4.075 in with door attached

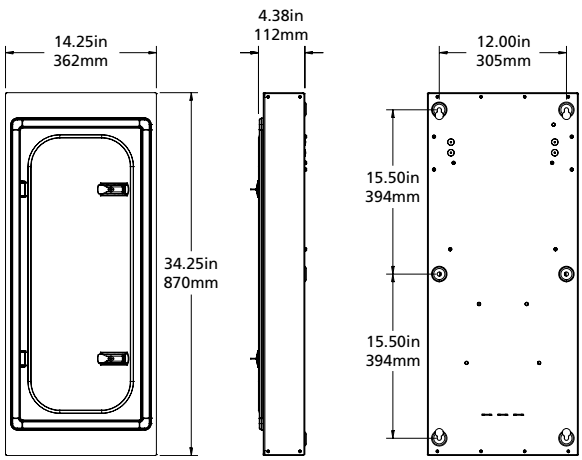
Sensor IQ Weights

MODEL	WEIGHT		SHIPPING WEIGHT	
	lb	kg	lb	kg
IQ12	40.0	18.2	44.6	20.3
IQ24	50.0	22.7	54.0	24.5
IQ48	86.0	39.0	91.3	41.4

IQ12



IQ12-ML

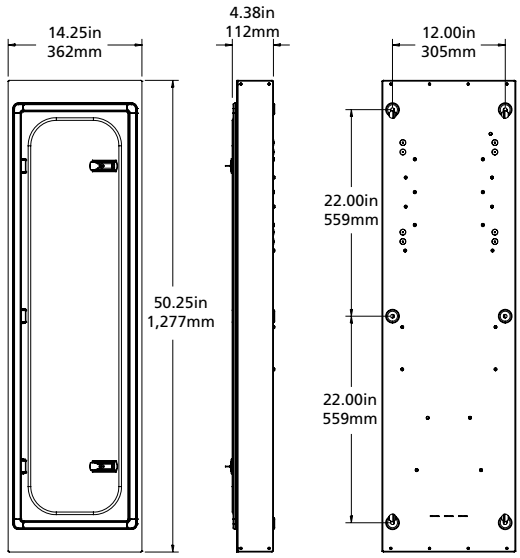


120 V Sensor IQ Intelligent Breaker System*

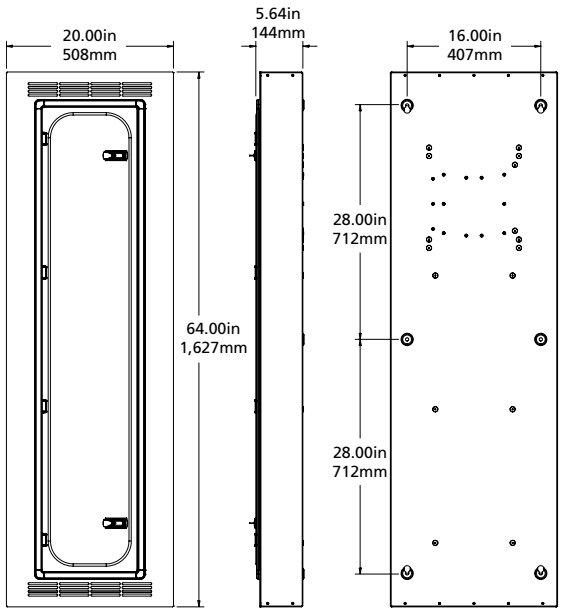
Power Control Series

PHYSICAL

IQ24



IQ48



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*Trademark and patent info: etcconnect.com/IP

etcconnect.com

ETC Sensor3 SR3 Installation Enclosures

Sensor3 120 V Series



Type(s)

Project

Date

Notes

GENERAL INFORMATION

Sensor3 power control systems provide high-density, professional features and exceptional reliability for lighting applications requiring top-of-the-line power control.

APPLICATIONS

- Professional and academic theatres
- Production studios
- Concert and performance halls
- Theme parks
- Themed retail and dining venues
- Hotels
- Multipurpose convention centers
- Arenas and stadiums
- Houses of worship

FEATURES

- Rugged industrial construction
- 100,000 A Short Circuit Current Rating (SCCR)
- Standard system monitoring with optional Advanced Features (AF) per-circuit reporting
- Adaptable modular design
- Up to 96 power control channels per enclosure
- Two 2.4 kW circuits or two 1 kW electronic low voltage circuits per module
- 6-, 12-, 24-, and 48- module enclosures available
- Direct Ethernet control-signal input (Net3, sACN)
- Advanced configuration editing over network
- Two DMX512-A inputs
- Built-in Echo power supply with direct support for
  - Up to six connected Echo sensors or stations
  - Up to five additional Echo power devices
- Uses up to 8 out of 255 assignable control spaces
  - Up to 16 zones per space
  - Up to 16 presets per space
  - 1 programmable sequence per space
- For more information on Echo control products visit etcconnect.com/Echo

SPECIFICATIONS

GENERAL

- Enclosures available in four sizes:
  - 6 modules, 12 circuits maximum
  - 12 modules, 24 circuits maximum
  - 24 modules, 48 circuits maximum
  - 48 modules, 96 circuits maximum
- Dual-density modules (two circuits per module)
- Operating temperature: 0°–40° C (32°–104° F)
  - Electrical room HVAC systems must maintain the specified ambient temperature at the enclosure at all times.
- Relative humidity: 10-90% non-condensing

MECHANICAL

- Rugged 16-gauge steel construction
- Fine-textured, scratch-resistant epoxy paint
- Top and bottom conduit access through removable panels (SR3-48) or knockouts (SR3-6, SR3-12, and SR3-24)
- Keyed module slots prevent insertion of incompatible module types
- Front access to all wiring and terminations
- Full-height locking door
- Electrostatic air filter easily removed from door for periodic cleaning
- High-efficiency cooling system with reporting
- High-visibility LED status beacon

ELECTRICAL

- SR3 enclosures accept the following feeds:
  - Three-phase 120 / 208 VAC
  - Single-phase 120 / 240 VAC
- Line feed frequencies from 47–63 Hz
- Line feed voltage range is 91–139 VAC
  - Max main transformer tap recommended is 135 V to allow for line fluctuation
- Short Circuit Current Rating: 100,000 A RMS symmetrical

CONTROL ELECTRONICS

- CEM3 Power Control Processor
- UL 924 Listed panic input for emergency lighting control
- Full number pad for fast access to dimmer override and setup
- Supports Dimmer Doubling
- System, enclosure, and diagnostic reporting standard
- Per-circuit reporting available with AF enclosures and modules

CONTROL POWER BACKUP OPTIONS

- Ride-thru Option (RTO):
  - Seamless transfer to backup power upon loss of incoming line power
  - Provides backup power for at least 6 seconds during power loss
  - Automatically recharges from power feed
- Battery Pack Option (BPO):
  - Seamless transfer to battery power upon loss of normal power
  - Provides backup power for 30 minutes during normal power loss
  - Automatically recharges from power feed during normal power conditions
  - Two hour recharge time from full discharge

REGULATORY AND COMPLIANCE

- All enclosures are cULus Listed

SR3 POWER ENCLOSURE CHART

Model Number Key (e.g. SR3AF-61P)

CEM Control Backplane - Identifies which control module the enclosure supports. Example: SR3 enclosures support the CEM3 module.

NOTE: All SR and SR+ series enclosures can be upgraded to support a CEM3 processor, which is required to support ThruPower modules.

AF - Indicates an enclosure with installed Advanced Features (AF) cards for per-circuit feedback. Requires AF power control modules for full advanced functionality.

NUMBER - Indicates the number of available module slots. See module datasheet for details on how many circuits each module provides per slot.

1P - Indicates a bi-phase 3-wire feed enclosure. Enclosures without a phase designation are three-phase, 4-wire feed.

6-Module (12 Channel) Enclosures

MODEL	POWER INPUT	FEED LUGS*	LOAD LUGS	MOUNTING	AF	ND	DUAL CEM
SR3-6	3P | 120 / 208 V | 100 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	N	N	N
SR3-61P	1P | 120 / 240 V | 100 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	N	N	N
SR3AF-6	3P | 120 / 208 V | 100 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	Y	N	N
SR3AF-61P	1P | 120 / 240 V | 100 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	Y	N	N

12-Module (24 Channel) Enclosures

MODEL	POWER INPUT	FEED LUGS*	LOAD LUGS	MOUNTING	AF	ND	DUAL CEM
SR3-12	3P | 120 / 208 V | 200 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	N	N	N
SR3-121P	1P | 120 / 240 V | 200 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	N	N	N
SR3AF-12	3P | 120 / 208 V | 200 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	Y	N	N
SR3AF-121P	1P | 120 / 240 V | 200 A MAX	Dual 120 mm^2 - 16 mm^2	25 mm^2 - 2.5 mm^2	Wall	Y	N	N

24-Module (48 Channel) Enclosures

MODEL	POWER INPUT	FEED LUGS*	LOAD LUGS	MOUNTING	AF	ND	DUAL CEM
SR3-24	3P | 120 / 208 V | 400 A MAX	Dual 175 mm^2 - 25 mm^2	25 mm^2 - 2.5 mm^2	Wall, Pedestal	N	N	N
SR3-241P	1P | 120 / 240 V | 400 A MAX	Dual 175 mm^2 - 25 mm^2	25 mm^2 - 2.5 mm^2	Wall, Pedestal	N	N	N
SR3AF-24	3P | 120 / 208 V | 400 A MAX	Dual 175 mm^2 - 25 mm^2	25 mm^2 - 2.5 mm^2	Wall, Pedestal	Y	N	N
SR3AF-241P	1P | 120 / 240 V | 400 A MAX	Dual 175 mm^2 - 25 mm^2	25 mm^2 - 2.5 mm^2	Wall, Pedestal	Y	N	N

48-Module (96 Channel) Enclosures

MODEL	POWER INPUT	FEED LUGS*	LOAD LUGS	MOUNTING	AF	ND	DUAL CEM
SR3-48	3P | 120 / 208 V | 800 A MAX**	Dual 300 mm^2 - 35 mm^2	25 mm^2 - 2.5 mm^2	Floor	N	N	N
SR3-481P	1P | 120 / 240 V | 800 A MAX**	Dual 300 mm^2 - 35 mm^2	25 mm^2 - 2.5 mm^2	Floor	N	N	N
SR3AF-48	3P | 120 / 208 V | 800 A MAX**	Dual 300 mm^2 - 35 mm^2	25 mm^2 - 2.5 mm^2	Floor	Y	N	N
SR3AF-481P	1P | 120 / 240 V | 800 A MAX**	Dual 300 mm^2 - 35 mm^2	25 mm^2 - 2.5 mm^2	Floor	Y	N	N
SR3AF-48-TERM***	3P | 120 / 208 V | 800 A MAX**	Dual 300 mm^2 - 35 mm^2	25 mm^2 - 2.5 mm^2	Floor	Y	N	N

*Note: Feed lugs are suitable for aluminum or copper wire. Aluminum feeds are limited to 600 A max.

**Note: Power feeds above 800 A up to 2,000 A require the addition of a 30" auxiliary enclosure.

***Note: This enclosure features an integrated aux bay with load lugs.

SR3 POWER ENCLOSURE CHART

Control Module

MODEL	DESCRIPTION
CEM3	Power Controller

Sensor Auxilliary Enclosure Options

MODEL	DESCRIPTION
AUX19-12	19" Auxiliary Enclosure(s) for 12-module enclosure
AUX19-24	19" Auxiliary Enclosure(s) for 24-module enclosure
AUX19-48	19" Auxiliary Enclosure(s) for 48-module enclosure
AUX30-48	30" Auxiliary Enclosure(s) for 48-module enclosure
AT12	Amp-Trap fuse option for 12-module enclosure
AT24	Amp-Trap fuse option for 24-module enclosure
AT48	Amp-Trap fuse option for 48-module enclosure
BK12	Bussing kit for two 12-module enclosure
BK24	Bussing kit for two 24-module enclosure
BK48	Bussing kit for two 48-module enclosure

Note: The following optional main circuit breakers are available for use in auxiliary enclosures - 100 A, 200 A, 225 A, 250 A, 300 A, 400 A, 600 A, 800 A, 1000 A, and 1200 A.

Sensor Installation Enclosure Accessories

MODEL	DESCRIPTION
SR3-RTO	RideThru Option Kit
SR3-BP	External BatteryPack Option (1 battery)
SR3-BP2	External BatteryPack Option (2 batteries)
SR3-TAP	Phase bar fuse tap kit (for 24- or 48-module racks only)
FVIP-RED	Floor mount vibration isolation pads
WVIP-BLACK	Wall mount vibration isolation pads
SSSH6-12	Sensor Sound Suppression Hood – small
SSSH24-48	Sensor Sound Suppression Hood – large
Pedestal	Floor pedestal for 24-module enclosure
SR3-DH	Document Holder

ADDITIONAL INFORMATION

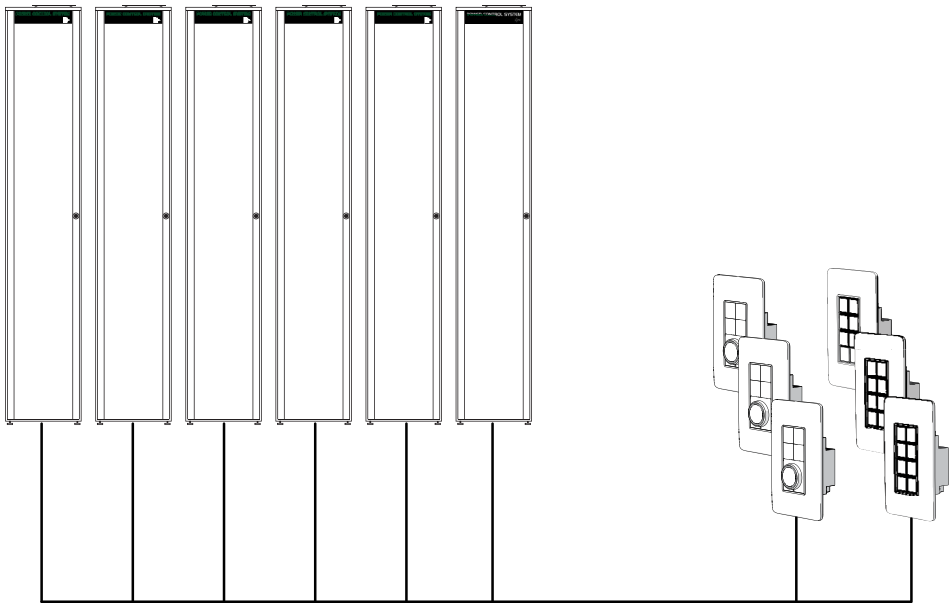
Sound Pressure Level (dBA)

MODEL	dBA*	
	WITHOUT SSSh**	WITH SSSh
SR3(AF)-48(1P)	49.0	47.7
SR3(AF)-24(1P)	52.0	51.5
SR3(AF)-12(1P)	53.3	53.2
SR3(AF)-6(1P)	41.0	38.9

*dBA values for each Sensor enclosure measured at one meter. Visit www.etcconnect.com for full spectrum dBA ratings.

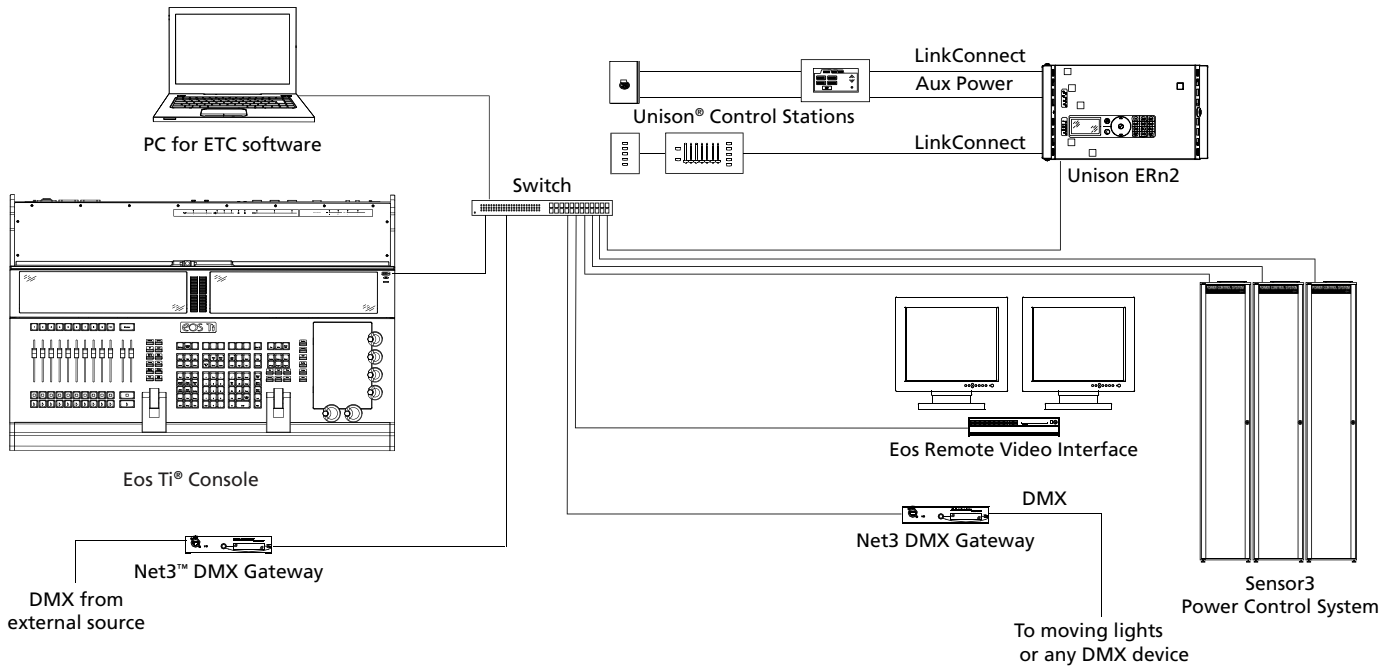
**Sensor Sound Suppression hood (SSSh)

SENSOR ENCLOSURES CONNECTED TO ECHO CONTROL STATIONS



EchoConnect - Belden 8471 + (1) 14 AWG ESD Ground Wire

TYPICAL SYSTEM RISER



Sensor3 SR3 Installation Enclosures

Sensor3 120 V Series

PHYSICAL

Empty Power Enclosure Weights

MODEL	WEIGHT	SHIPPING WEIGHT
SR3-48 w/ door*	100 kg	106 kg
SR3-48-TERM	143 kg	148 kg
SR3-24 w/ door	57 kg	62 kg
SR3-12 w/ door	26 kg	30 kg
SR3-6 w/ door	16 kg	21 kg

*Enclosure doors ship separately.

Power Enclosure Dimensions

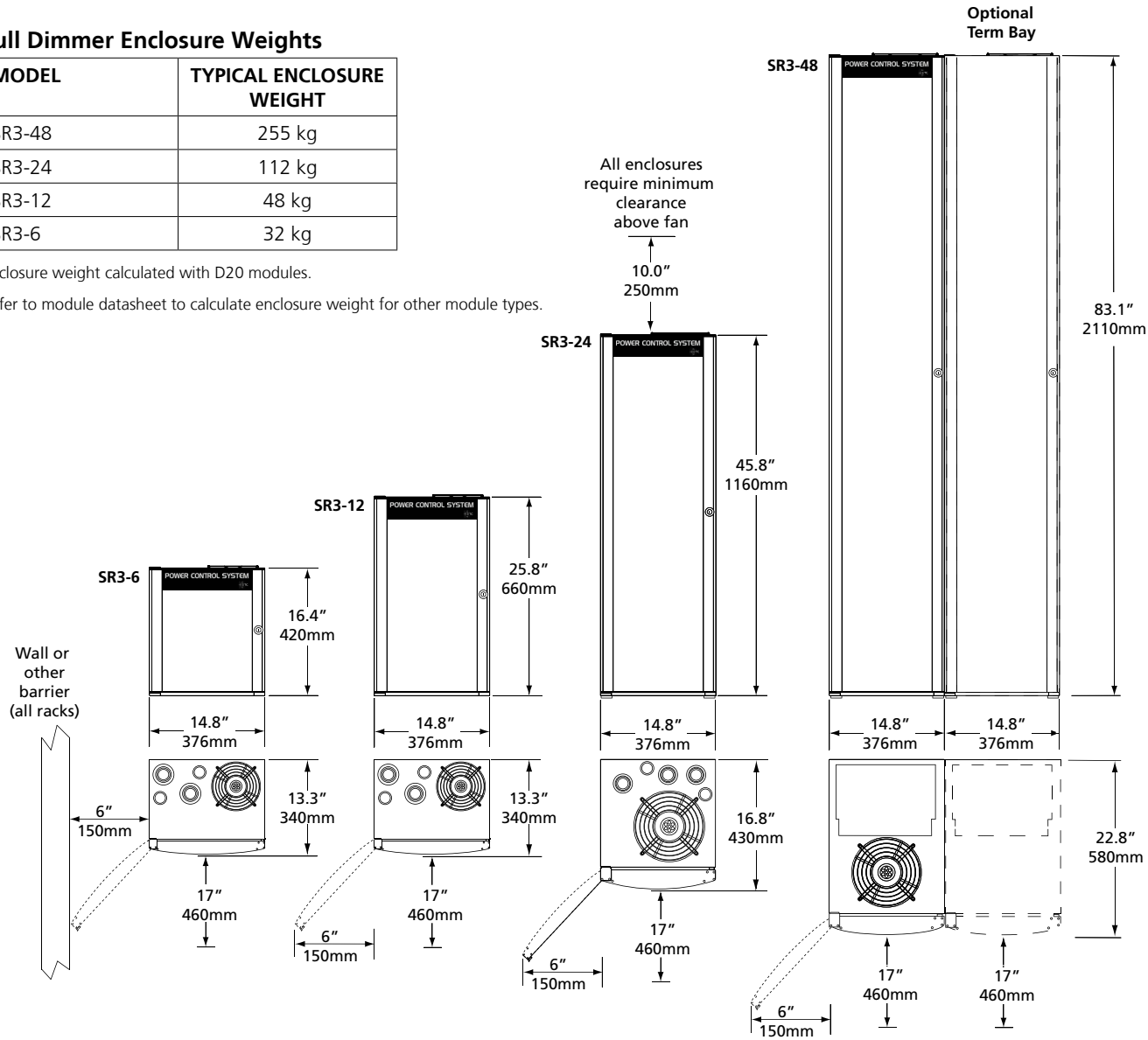
MODEL	HEIGHT	WIDTH	DEPTH
SR3-48	2,110 mm	370 mm	580 mm
SR3-48-TERM	2,110 mm	370 mm	580 mm
SR3-24	1,160 mm	370 mm	430 mm
SR3-12	660 mm	370 mm	340 mm
SR3-6	420 mm	370 mm	340 mm

Full Dimmer Enclosure Weights

MODEL	TYPICAL ENCLOSURE WEIGHT
SR3-48	255 kg
SR3-24	112 kg
SR3-12	48 kg
SR3-6	32 kg

Enclosure weight calculated with D20 modules.

Refer to module datasheet to calculate enclosure weight for other module types.



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Trademark and patent info: etcconnect.com/IP

etcconnect.com

ETC

Sensor Power Control Modules

Sensor 120 V Series



Type(s)

Project

Date

Notes

GENERAL INFORMATION

Sensor power control modules are designed for use in all SR3 modular enclosures. Whether you need forward-phase or reverse-phase SCR dimming, relay control, or the flexible control of our ThruPower modules, Sensor has you covered.

Most modules provides two circuits of control for a wide range of applications. Advanced Features (AF) modules enable dimmer-specific feedback of load circuit data in SensorAF enclosures. All modules feature modular installation and removal, fully magnetic circuit breakers, and rock-solid construction.

APPLICATIONS

- Tungsten lighting
- Low voltage lighting
- Non-dim loads
- Moving lights, fog machines, and powered effects
- Electronic transformers
- Electronic LED power supplies
- 2-wire Fluorescent ballast
- 2-wire Fluorescent ballast with integrated battery backup
- 3-wire Fluorescent ballast
- 4-wire Fluorescent ballast (requires ETC Response 0-10 V Gateway)
- Quartz lighting
- Neon lighting
- Cold Cathode lighting

FEATURES

- High-density modular assembly
- Die-cast aluminum chassis
- Fully magnetic circuit breakers
- Temperature sensors

ADVANCED FEATURES (AF)*

- Built-in per-circuit voltage and current sensing
- Advanced Features error messages:
  - Load dropped below recorded value
  - Load increased over recorded value
  - Circuit breaker tripped
  - Dimmer module removed
  - Dimmer load absent

*Access to AF features require an AF-equipped Sensor enclsoure or pack

REGULATORY AND COMPLIANCE

- cULus Listed for use in Sensor Dimming Enclosure

SPECIFICATIONS

GENERAL
- Rated for continuous duty at 100% of rated load
- 1.2 kW, 1.8 kW, 2.4 kW, 6 kW, and 12 kW circuits

PHYSICAL
- Modular plug-in assemblies
- Cast aluminum chassis, finished with textured epoxy paint
- Keyed to prevent insertion in inappropriately rated enclosure positions

CIRCUIT BREAKERS
- Fully magnetic to eliminate nuisance tripping
- 20x inrush current rating
  - (PhaseAdept and ELV modules rated at 10x inrush)
- 125%, 10–100 seconds, must-trip rating
- Rated for 100% switching duty applications

SHORT CIRCUIT RATINGS
- 100,000 A Short Circuit Current Rating (SCCR)
- Modules withstand hot-patching of cold loads up to full rating

POWER DEVICE
- Sealed, patented assembly
- Field-replaceable with screwdriver
  - Power devices on PhaseAdept and ELV modules are not field-replaceable
- Two back-to-back SCRs per circuit (D20 and TR20 modules)
- Per-circuit LED indicators
- Mechanical held air gap relay
- Integral bonded heatsink
- Integral temperature sensor

FILTERING
- High quality toroidal filters (see module chart for rise times)

DIMMING
- Dimming of 2 and 4-wire fluorescent ballast is dependent on lamp ballast combination. 4-wire fluorescent control requires Response 0-10 V Gateway. Contact ETC.
- Phase dimming performance for LED lamps varies considerably depending on the manufacturer and model. Visit http://www.etcconnect.com/compatibility/ for details on a variety of specific lamps and information on how to send samples to ETC for testing.
- PhaseAdept (LED) modules provide forward- or reverse-phase dimming and are compatible with any ETC Unison DR, Unison DRd or Sensor enclosure, including legacy products
- ELV modules provide forward- or reverse-phase dimming and are compatible with Sensor+ and Sensor3 enclosures

SR3 DIMMER MODULE CHART

Model Number Key

Module Type - Identifies the function of the module: TR (ThruPower), D (Dimmer), R (Relay), CC (Constant), LED (PhaseAdept), ELV (Electronic Low Voltage)

NUMBER - Identifies the rated max current per circuit within the module; for example, a D20 module provides dimming for two 20A circuits

AF - Module provides advanced features (AF) feedback per circuit; requires Sensor rack with AF cards for full functionality

HR - High rise time module, includes AF functionality

F - Three-wire fluorescent ballast dimming module

FB - Two-wire fluorescent ballast dimming module with non-dimmed circuit for integral emergency lighting battery packs

AFM - Module body without electronics for rack slots without branch circuits; ensures proper air flow and rack cooling

ThruPower Modules

MODEL	CURRENT/WATTAGE/ RISE TIME	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
TR20SAF	20 A / 2.4 kW / 350 µs	2	1	96.5%	290 BTU / 85 W	5.0 lb / 6.9 lb	38 mm x 300 mm x 172 mm
TR20AF	20 A / 2.4 kW / 500 µs	2	1	96.5%	290 BTU / 85 W	5.0 lb / 6.9 lb	38 mm x 300 mm x 172 mm

Dimmer Modules

MODEL	CURRENT/WATTAGE/ RISE TIME	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
D15	15 A / 1.8k W / 350 µs	2	1	96.9%	380 BTU / 112 W	5.0 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D15E	15 A / 1.8 kW / 500 µs	2	1	96.1%	474 BTU / 140 W	5.5 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D15AF	15 A / 1.8 kW / 500 µs	2	1	96.1%	474 BTU / 140 W	5.0 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D20	20 A / 2.4 kW / 350 µs	2	1	96.8%	522 BTU / 154 W	5.0 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D20E	20 A / 2.4 kW / 500 µs	2	1	95.0%	810 BTU / 238 W	5.5 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D20AF	20 A / 2.4 kW / 500 µs	2	1	95.0%	810 BTU / 238 W	5.0 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D20HR	20 A / 2.4 kW / 1000 µs	1	1	89.2%	259 BTU / 883 W	5.7 lb / 7.6 lb	38 mm x 300 mm x 127 mm
D20DHR	20 A / 2.4 kW / 1000 µs	2	1	95.8%	688 BTU / 200 W	5.5 lb / 6.9 lb	38 mm x 300 mm x 127 mm
D50AF	50 A / 6 kW / 500 µs	1	1	91.0%	808 BTU / 237 W	5.5 lb / 6.9l b	38 mm x 300 mm x 127 mm
D50HR	50 A / 6 kW / 800 µs	1	2	91.0%	1853 BTU / 543 W	7.7 lb / 9.6 lb	76 mm x 300 mm x 127 mm
D100AF	100 A / 12 kW / 500 µs	1	2	96.3%	1521 BTU / 446 W	7.7 lb / 9.6 lb	76 mm x 300 mm x 127 mm

Relay Modules

MODEL	CURRENT/WATTAGE	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
R15AF	15 A / 1.8 kW	2	1	>99.0%	<10 BTU / <4 W	2.6 lb / 3.5 lb	38 mm x 300 mm x 127 mm
R20AF	20 A / 2.4 kW	2	1	>99.0%	<10 BTU / <4 W	2.6 lb / 3.5 lb	38 mm x 300 mm x 127 mm

Sensor Power Control Modules

Sensor 120 V Series

Constant Modules

MODEL	CURRENT/WATTAGE	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
CC15	15 A / 1.8 kW	2	1	>99.0%	<10 BTU / <4 W	2.6 lb / 3.5 lb	38 mm x 300 mm x 127 mm
CC20	20 A / 2.4 kW	2	1	>99.0%	<10 BTU / <4 W	2.6 lb / 3.5 lb	38 mm x 300 mm x 127 mm

Low Voltage Line Dimming Modules

MODEL	CURRENT/WATTAGE	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
LED10	10 A / 1.2 kW	2	1	96.23%	163 BTU / 48 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 172 mm
ELV10-S	10 A / 1.2 kW	2	1	96.50%	119 BTU / 35 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 127 mm
ELV10AF	10 A / 1.2 kW	2	1	96.50%	119 BTU / 35 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 127 mm

Note: LED10 and ELV10 modules do not support use with magnetic transformers.

Fluorescent Dimming Modules

MODEL	CURRENT/WATTAGE	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
D15F	15 A / 1.8 kW	1	1	>99.0%	<10 BTU / <4 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 127 mm
D20F	20 A / 2.4 kW	1	1	>99.0%	<10 BTU / <4 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 127 mm
D15FB	15 A / 1.8 kW	1	1	>99.0%	<10 BTU / <4 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 127 mm
D20FB	20 A / 2.4 kW	1	1	>99.0%	<10 BTU / <4 W	2.4 lb / 3.3 lb	38 mm x 300 mm x 127 mm

Air Flow Modules

MODEL	CURRENT/WATTAGE	CIRCUITS	RACK SLOTS	EFFICIENCY	MAX BTU/ HR|WATTS/ CHANNEL	WT / SHIP WT	DIMENSIONS
AFM	-	0	1	-	-	1.5 lb / 2.4 lb	38 mm x 300 mm x 127 mm

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ETC®

CEM3 Power Controller

ETC Power Control Series

100V 115/120V 230/240V



GENERAL INFORMATION

The Sensor3™ Control Electronics Module (CEM3) is ETC's new platform for power control. CEM3 manages priority-based Ethernet, DMX and Preset control for ultra-smooth 16-bit dimming, fast activation of relays, and instant-on support for emergency-lighting systems. Energy usage, system status, and quick changes to circuit setup can be accessed at its intuitive facepanel or remotely at the lighting console.

APPLICATIONS

- Professional and educational theaters
- Production studios
- Performance halls
- Retail and dining
- Houses of worship
- High-density architectural dimming
- Touring and Portable dimming

FEATURES

- **Net3™ Uplink** - Connect to the Net3 lighting network using the ethernet jack on the front of the control module
- **USB QuickLoad** - Back up system settings and upgrade software
- **Point of Control Interface** - Easy-to-read systems display shows the user-pertinent system information
- **Live Control Override -** For presets, set level, and dimmer check
- **Local Menu** - Access to setup features and control directly at the control processor
- **Backup Looks** - 64 presets with programmable fade times and priority allows for take control, pile on, or live control failover sources to ensure that your show will never go black!
- **Connect to Console** - System and rack feedback to live control desks is standard
- **Quick Setup Wizard** - Builds a simple system in a single step
- **Advanced Features (AF)** - Adds dimmer-specific reporting
- **ETC Dimmer Doubling™** - Increase your individually controllable fixtures without adding extra circuits (supported only at 60hz)
- **RideThru** - Optional accessory that supports the processor electronics for a few seconds during a power outage
- **Battery Pack** - Optional accessory that supports the processor electronics for several minutes during a power outage

ORDERING INFORMATION

Control Module

MODEL	DESCRIPTION
CEM3	CEM3 Power Controller

Compatible Systems

MODEL	DESCRIPTION
SENSOR3 INSTALLATION RACKS	
SR3-48/SR3AF-48	Sensor3 48-module installation racks
SR3-24/SR3AF-24	Sensor3 24-module installation racks
SR3-12/SR3AF-12	Sensor3 12-module installation racks
SR3-6/SR3AF-6	Sensor3 6-module installation racks
HSR3/HSR3AF-	Sensor3 230V installation racks
SR3AFN	Sensor3 GFCI installation racks
ESR3AFN	Sensor3 CE installation racks
SENSOR3 TOURING RACKS	
SP3	Sensor3 small-frame touring rack
SP3	Sensor3 large-frame touring rack
SENSOR+ PORTABLE PACKS	
SP3-2420	Sensor3 12-module portable pack
SP3-1220	Sensor3 6-module portable pack

CEM3 Accessories

MODEL	DESCRIPTION
RK	Retrofit kit for Sensor standard and AF racks

SPECIFICATIONS

GENERAL

- Universal Control Electronics Module
- Direct Ethernet connectivity for dimmer levels, feedback and system control
- UL, cUL LISTED and CE Marked
- UL 924 LISTED for Emergency Lighting Control

PHYSICAL

- Formed-steel body
- Die-cast facepanel finished with textured epoxy paint
- Slide-in module installs and removes without tools
- Spring-loaded module release
- Airflow sensor to ensure adequate airflow

ELECTRICAL

- Accepts:
  - Single phase
  - Three phase WYE or Delta
- Universal Voltage range 91-139V and 181-259 VAC*
- Line-feed frequencies from 47-53Hz and 57-63Hz
- Automatic frequency-variation compensation
- Two configurable DMX512 inputs (2500V opto-isolated)

*Note: Suggested maximum main transformer tap 135V or 255V to allow for line fluxuation.

CONTROL FEATURES

- Eight-line by 20-character graphical LCD for system configuration, live control, and status display
- Full number pad for quick access to dimmers
- Shortcut buttons for Setup, About, and live control
- Five status LED indicators: Power, Network activity, DMX-A DMX-B, and Panic
- 64 user-programmable presets
- Single Panic circuit with flexible programming
- Replacement CEM3 automatically loads rack configuration
- Configuration backups saved on USB or network
- Dimmer outputs regulate to maintain constant power ±1V
- Individual output scale voltage settings for load-wiring compensation
- Selectable Firing Modes: Normal, Forward Phase, Reverse Phase, Dimmer Doubled, Sinewave, and Fluorescent
- Control Modes: Dimmed, Switched, Latch/lock, Always On, and Off
- Selectable Dimmer Output Curves: Linear, Modified Linear, Square, Modified Square, Sensor 2.0, and five custom curves
- 16-bit fade resolution (> 30,000-Step Resolution per 1/2 cycle)
- Selectable Data Loss Behavior

FEEDBACK

- All Sensor racks with CEM3 modules include basic system diagnostic reporting
- Standard rack feedback includes: DMX input status, rack power status, and rack temperature
- Advanced Features (AF) provides dimmer-specific status and load feedback (requires AF dimmer rack and AF dimmer modules)

LOCAL PROGRAMMING

LOCAL LIVE CONTROL

- Set Levels, Preset Activation, and Dimmer Check

STATUS (ABOUT)

- All modules: module type, mode, control source, module location, and overtemp
- AF modules: module removed, breaker trip, recorded and actual load
- Rack: temperature, rack type, Run Hours
- Network: IP address, SubNet mask, Gateway and active link
- Rack Data Ports: status for DMX A and B, and sACN
- About Rack Power: frequency, voltage per phase, and voltage headroom
- About Software: version number

SETUP

- Setup dimmer: Firing Mode, Curve, Scale Voltage and Name
- Patch
- Set rack priority per DMX port
- Data Loss Behavior: Hold last Look, Wait and Fade, Play Preset
- Name the rack (using ACN)
- Custom dimmer numbering
- Get Config and save Config to USB

PHYSICAL

CEM3 Dimensions

MODEL	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
CEM3	2.06	52	11.80	300	7.00	178

CEM3 Weight

MODEL	WEIGHT		SHIPPING WEIGHT	
	lb	kg	lb	kg
All CEM3	3.5	1.6	6.2	2.8

Maximum BTU Production per Module

MODEL	BTUS	WATTS	EFFICIENCY
All CEM3	<10	<4	N/A

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ETC

ColorSource Spot

ColorSource Series





Type(s)

Project

Date

Notes

GENERAL INFORMATION

The ETC ColorSource Spot brings together the affordability of a four-color light engine with the build-quality and support of an ETC product. Using a unique mix of red, green, blue and lime LED emitters, the ColorSource Spot offers an amazing range of color and depth, unlike other low-cost LED fixtures. Because it utilizes standard ETC optics, adapters and accessories, it is a versatile solution for any lighting need.

APPLICATIONS

- Theatres and performance spaces
- Houses of worship
- Universities and schools
- Hospitality
- Retail
- Exhibition centers
- Meeting rooms
- Clubs
- Cafetoriums

PRODUCT FEATURES

- ETC's RGB-L array (red, green, blue and lime)
  - Also available in Deep Blue, which replaces the blue LEDs with indigo for rich, saturated blues and magentas
- Simple user interface with seven-segment display
- powerCON® in and thru
- DMX/RDM in and thru (5-pin XLR)
- LED droop compensation
- Optically calibrated
- Tour-ready, aluminum housing
- Combine with available adapters to transform your fixture into a fully functional Fresnel or CYC light

ORDERING INFORMATION

ColorSource Spot Light Engine with Shutter Barrel

(For use with fixed-field lens tubes only)

MODEL	DESCRIPTION	ETL PART NUMBER	CE PART NUMBER	
CSSPOTS	ColorSource Spot with shutter barrel, black	7413A1001	7413A1201	
CSSPOTDBS	ColorSource Spot Deep Blue with shutter barrel, black	7413A1041	7413A1241	

ColorSource Spot Light Engine Body

(For use with zoom lens tubes and adapters and for retrofit of existing fixtures)

MODEL	DESCRIPTION	ETL PART NUMBER	CE PART NUMBER	
CSSPOT	ColorSource Spot, body only, black	7413A1000	7413A1200	
CSSPOTDB	ColorSource Spot Deep Blue, body only, black	7413A1040	7413A1240	

Color options: -1 = white, -5 = silver gray, -8 = custom colors.
Fixture ships with a soft-focus diffuser in a gobo holder, a c-clamp and a 1.5 m powerCON power-input cable with a connector of choice. See page six for connector options.
Please note: Lens tubes to be ordered separately. C-clamps included in NA regions only.

PRODUCT SPECIFICATIONS

Source

LED details	60 Lumileds LUXEON® Rebel LED
Max lumens	6,932
Lumens per watt	42.4
L70 rating (hours to 70% output)*	54,000 hours (both variants)

Color

Colors used	Spot: Red, green, blue, lime Spot DB: Red, green, indigo, lime
Color temperature range	Color mixing
Calibrated array	Yes
Red shift	No

Optical

Beam angle range	Swappable lens tubes between 5-90 degrees
Gate size	79-24 mm
Aperture size	6.25–14 in (depending on lens tube)
Pattern projection	Yes
Pattern size	A or B
Camera flicker control/Hz range	1,200 Hz (default) and 25,000 Hz (via RDM)
Notes	Can be used with LED CYC and Fresnel adapters

Control

Input method	DMX512 via 5-pin XLR connector
Protocols	DMX512/RDM
Modes (footprint)	4 modes, see page 7
RDM configuration	Yes
UI type	Seven-segment, three-button interface
Local control	Yes
Onboard presets	Yes (12)
Onboard sequences	Yes (5)
Onboard effects	No
FixtureLink	Yes
Notes	15-bit virtual dimming engine

Electrical

Voltage range	100–240 VAC 50/60 Hz
Input method	powerCON power in and thru
Inrush	28 A at 120 V (First half-cycle) 46 A at 240 V (First half-cycle)
Fixtures per circuit	9 fixtures (15 A power thru connector) or 10 fixtures (R20 module or similar)
Wattage typical/standby	168 W/1.19 W at 100 V 166 W/2.07 W at 120 V 166 W / 1.5 W at 240 V
Current draw typical/ standby	1.69 A/0.05 A at 100 V 1.39 A/0.05 A at 120 V 0.72 A/0.05 A at 240 V

Thermal

Ambient operating temp	0°–40° C (32°–104° F)
Fan (controllable)	Yes (no)
Droop compensation	Yes
dB range	21.2 dBA average at 1 m
BTUs/hour	504.78

Physical

Materials	Die-cast, all metal housing
Color options	Black, white, silver, or custom color
Mounting options	Yoke
IP rating	IP20
Weight	7.7 kg (17 lb) (without lens)
Included accessories	Hanging yoke, 1.5 m power cable, soft-focus diffuser in an A-size gobo holder
Notes	See page 6 for power cable options

Warranty

Fixture	5 years
LED array	10 years

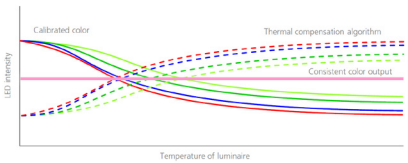
Regulatory and Compliance

Approved regulatory standards	cETLus Listed Conforms to UL 1573 Listed Conforms to UL 924 Listed Certified to CSA C22.2 No. 166 Listed Certified to CSA C22.2 No. 141 Listed CE Compliant EAC Compliant

***Note about LED luminaire lifetime:**
ETC utilizes a nationally recognized third-party lab for luminaire testing according to IES LM-84. See etcconnect.com/About/News/ETC-Fixture-Ratings-and-Warranties-Extended.aspx.

All LED sources experience some lessening of light output and some color shift over time. LED output will vary with thermal conditions. In individual situations, LEDs will be used for different durations and levels. This can eventually lead to minor alterations in color performance, necessitating slight adjustments to presets, cues or programs.

PRODUCT FEATURES



LED DROOP COMPENSATION
ETC's custom software adjusts for the changes that naturally occur as LEDs heat up and cool down so you never have to worry about color shift.



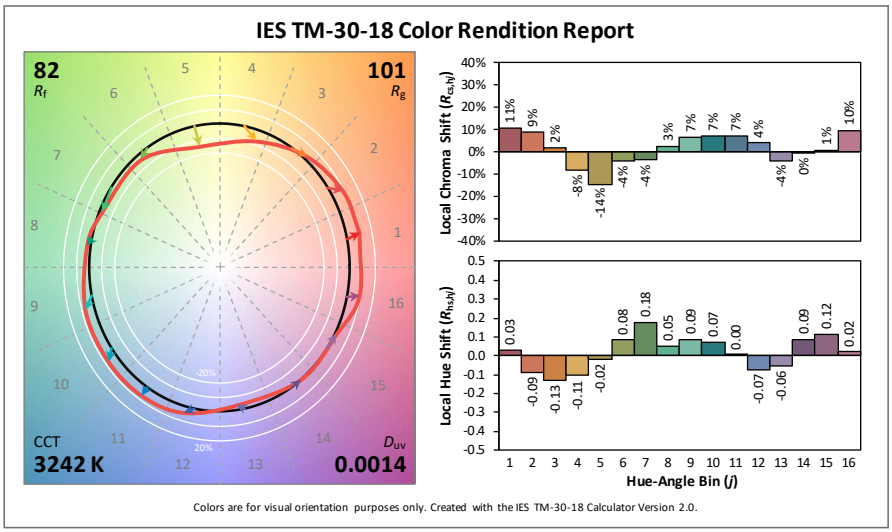
RGB-L ARRAY
The custom four-color blend of LEDs incorporates a hint of lime to increase spectral reach and color depth.



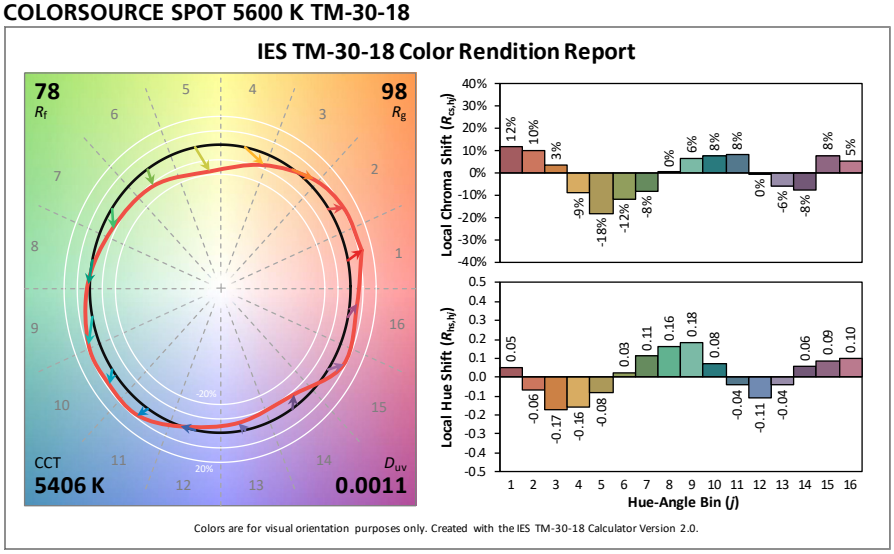
SIMPLE USER INTERFACE
The simple seven-segment display and navigation buttons enable quick setup and recall of built-in presets.

COLOR METRIC INFORMATION

COLORSOURCE SPOT 3200 K TM-30-18

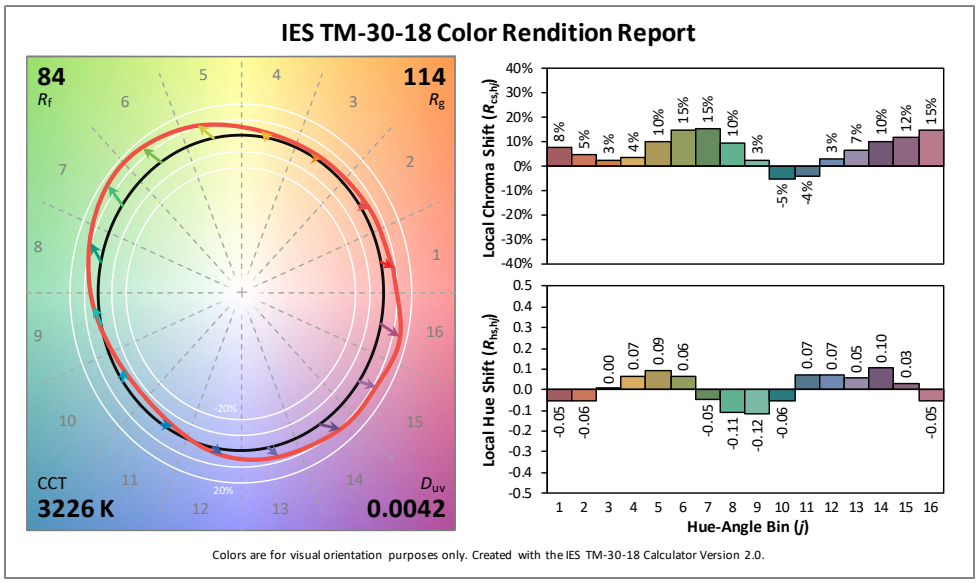


COLORSOURCE SPOT 5600 K TM-30-18

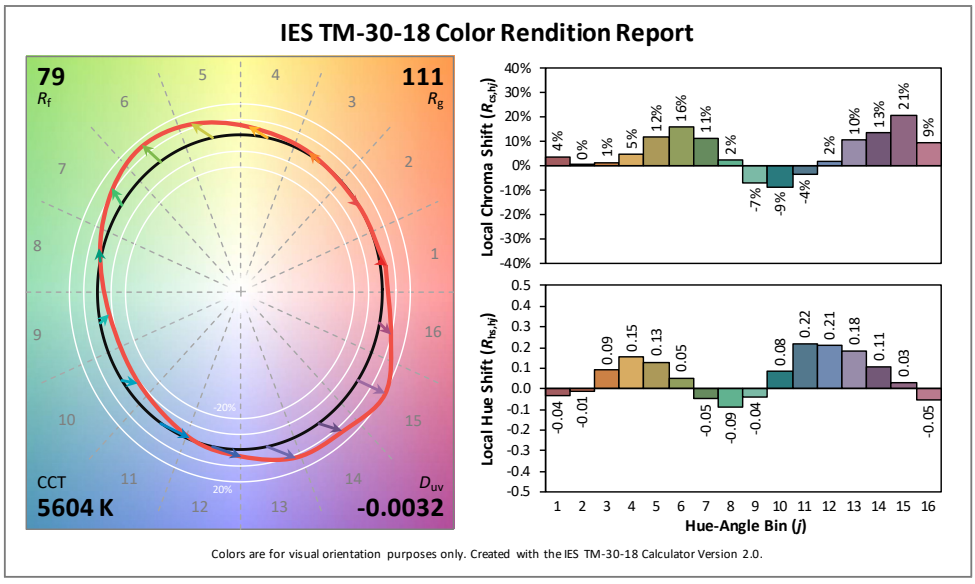


COLOR METRIC INFORMATION

COLORSOURCE SPOT DEEP BLUE 3200 K TM-30-18

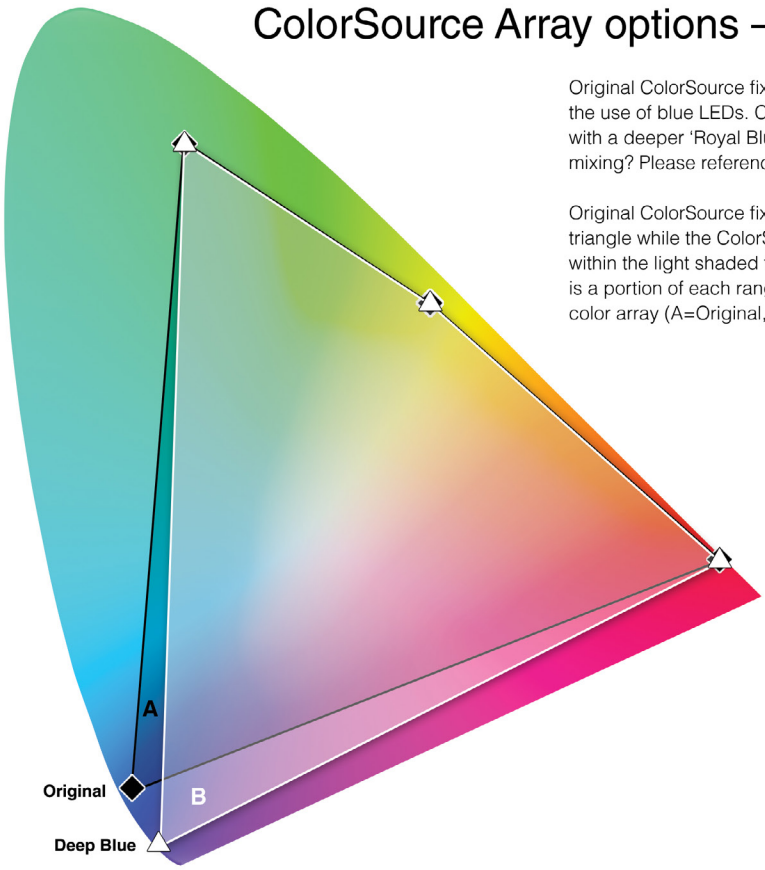


COLORSOURCE SPOT DEEP BLUE 5600 K TM-30-18



COLOR METRIC INFORMATION

ColorSource Array options – Original vs. Deep Blue



Original ColorSource fixtures use an RGB-L array where the 'B' represents the use of blue LEDs. ColorSource Deep Blue replaces those blue LEDs with a deeper 'Royal Blue' (indigo) LED. How does this impact your color mixing? Please reference the color chart.

Original ColorSource fixtures can reach any color within the dark shaded triangle while the ColorSource Deep Blue fixtures can reach any color within the light shaded triangle. While much of these areas overlap, there is a portion of each range that can only be reached by the respective color array (A=Original, B=Deep Blue).

Common gels found in original ColorSource
Roscolux 095, 075, 076
Lee 363, 119, 721, 722, 132, 141, 183, 172, 325

Common gels found in ColorSource Deep Blue
Roscolux 384, 385, 382, 059, 358, 347, 049, 349, 046, 124, 027, 120
Lee 126, 049, 798, 707, 181, 071, 120, 716

PHOTOMETRY INFORMATION

Degrees and Lumens

DEGREE	MAXIMUM OUTPUT FIELD LUMENS		DISTANCE TO ACHIEVE 50 FC	
	RGB-L	Deep Blue	RGBL	Deep Blue
5	5,020	4,682	89.0 ft / 27.2 m	89.0 ft / 27.2 m
10	5,429	5,063	70.0 ft / 21.4 m	69.5 ft / 21.2 m
14	6,173	5,757	49.0 ft / 15.0 m	49.0 ft / 15.0 m
19	5,426	5,061	40.0 ft / 12.2 m	40.0 ft / 12.2 m
19 EDLT	6,155	5,740	39.0 ft / 11.9 m	38.7 ft / 11.8 m
26	5,543	5,169	32.5 ft / 9.9 m	32.5 ft / 9.9 m
26 EDLT	6,932	6,494	32.3 ft / 9.9 m	32.3 ft / 9.9 m
36	6,680	6,230	23.8 ft / 7.3 m	23.6 ft / 7.2 m
36 EDLT	6,919	6,453	24.0 ft / 7.3 m	24.0 ft / 7.3 m
50	6,670	6,221	18.0 ft / 5.5 m	17.8 ft / 5.4 m
50 EDLT	7,074	6,598	17.0 ft / 5.2 m	16.9 ft / 5.2 m
70	7,474	6,971	13.4 ft / 4.1 m	13.4 ft / 4.1 m
90	6,952	6,483	11.8 ft / 3.6 m	11.7 ft / 3.6 m
15-30	6,464	6,029	33.0 ft / 10.1 m	33.0 ft / 10.1 m
25-50	6,974	6,505	23.2 ft / 7.1 m	23.2 ft / 7.1 m

See *ColorSource Spot Photometry Guide,* available at etcconnect.com for full photometry information.

ADDITIONAL ORDERING INFORMATION

Fixture Accessories

MODEL	DESCRIPTION	PART NUMBER	
400CC	C-clamp (not included with CE fixtures)	7060A2009 (not CE)	
400SC	Safety cable	7060A1022	
400PH-A	Pattern holder (A size) (included)	7060A1013	
400PH-B	Pattern holder (B size)	7060A1014	
400PH-G	Glass pattern holder	7060A1019	
400RS	Drop-In iris	7060A1012	
400CF	Color frame (6.25 in)	7060A3043	
407CF	Square color frame (7.50 in)	7061A3007	
400DN	Donut	7060A1015	
400TH	Top hat, 6.25 in/159 mm	PSF1021	
400PTH6	Top hat, 7.5 in/191 mm	PSF1023	
410TH	Top hat, 12 in/305 mm (for 10° lens tubes)	PSF1024	
405TH	Top hat, 14 in/356 mm (for 5° lens tubes)	PSF1025	
400HH	Half hat	PSF10216	
DPSJ-X	25 ft powerCON-to-Edison input power cable with inline switch	7400B7030 (not CE)	

Power Input Cables

Use information below to order 5 ft power input leads with factory-fitted connectors. CE fixtures ship with powerCON to bare end cables in the box.

MODEL	DESCRIPTION	PART NUMBER	
DPA-A	5 ft powerCON to parallel blade U-ground (Edison) connector	7410B7037-A (not CE)	
DPA-B	5 ft powerCON to 20 A two-pin and ground (stage pin) connector	7410B7037-B (not CE)	
DPA-C	5 ft powerCON to grounded 20 A twistlock connector	7410B7037-C (not CE)	
DPA-X	5 ft powerCON to bare-end power input lead	7410B7037-X (not CE)	

Power Thru Jumpers

Note: Power thru jumpers connect to a fixture's output (thru) connector to provide a link to successive fixtures.

MODEL	DESCRIPTION	PART NUMBER	
DPJ-5	5 ft powerCON-to-powerCON fixture-to-fixture jumper	7410B7020	
DPJ-10	10 ft powerCON-to-powerCON fixture-to-fixture jumper	7410B7010	

Diffusers

The Soft Focus Diffuser fits into a standard A-size pattern holder and delivers beautiful, homogenized light. You can also use the Soft Focus Diffuser with patterns for dappled and soft-edge projections.
The Smooth Wash Diffuser is used when extra-smooth blending of multiple ColorSource Spot luminaires is required. The smooth wash diffuser is placed into the gel-frame slot of the lens tube.

MODEL	DESCRIPTION	PART NUMBER	
S4LED-SFD	Soft Focus Diffuser (included)	7460A4019	
S4LED-SWD6	Smooth Wash Diffuser for 6.25 in gel frame slots	7460K1001	
S4LED-SWD7	Smooth Wash Diffuser for 7.5 in gel frame slots	7460K1002	
S4LED-SWD12	Smooth Wash Diffuser for 10° lens tubes	7460K1003	
S4LED-SWD14	Smooth Wash Diffuser for 5° lens tubes	7460K1004	

RJ45 to XLR Adapter Cables

MODEL	DESCRIPTION	PART NUMBER	
W6538	RJ45 to female 5-pin XLR adapter (6 ft)	W6538	
W6539	RJ45 to male 5-pin XLR adapter (6 ft)	W6539	

PREFERRED LENSING OPTIONS (Lenses sold separately)

Fixed Beam Lenses

MODEL	DESCRIPTION	PART NUMBER	
LED50LT	LED-specific 50° EDLT lens	7460A2008	
LED50LT-1	LED-specific 50° EDLT (white) lens	7460A2008-1	
436EDLT	36° EDLT lens	7060A2048	
436EDLT-1	36° EDLT (white) lens	7060A2048-1	
426EDLT	26° EDLT lens	7060A2047	
426EDLT-1	26° EDLT (white) lens	7060A2047-1	
419EDLT	19° EDLT lens	7060A2046	
419EDLT-1	19° EDLT (white) lens	7060A2046-1	
490LT	90° lens	7060A2052-K	
490LT-1	90° (white) lens	7060A2052-1K	
470LT	70° lens	7060A2051-K	
470LT-1	70° (white) lens	7060A2051-1K	
414LT	14° lens	7060A2050-K	
414LT-1	14° (white) lens	7060A2050-1K	
410LT	10° lens	7060A2001-K	
410LT-1	10° (white) lens	7060A2001-1K	
405LT	5° lens	7060A2000-K	
405LT-1	5° (white) lens	7060A2000-1K	

Zoom Lens Assemblies

Use with light-engine body models.

MODEL	DESCRIPTION	PART NUMBER	
41530LT	Source Four 15°–30° Zoom lens	7060A2030-K	
42550LT	Source Four 25°–50° Zoom lens	7060A2032-K	

LED Adapters

MODEL	DESCRIPTION	PART NUMBER	
S4LEDCYC	LED CYC adapter	7460A2011	
S4LEDFRES	LED Fresnel adapter	7460A2016	

CONTROL

DMX Input Channel Profiles

DMX PROFILE	DMX CHANNELS	CHANNEL ASSIGNMENTS	NOTES
5ch (Default)	5	1-Intensity 2-Red 3-Green 4-Blue 5-Strobe	Lime is mixed automatically.
RGB	3	1-Red 2-Green 3-Blue	
1ch	1	1-Intensity	This mode controls the intensity of Preset 1.
Dir	6	1-Intensity 2-Red 3-Green 4-Blue/Indigo* 5-Lime 6-Strobe	*Original ColorSource Spot fixture uses blue in channel 4; Deep Blue ColorSource Spot fixture uses indigo in channel 4.

PHYSICAL

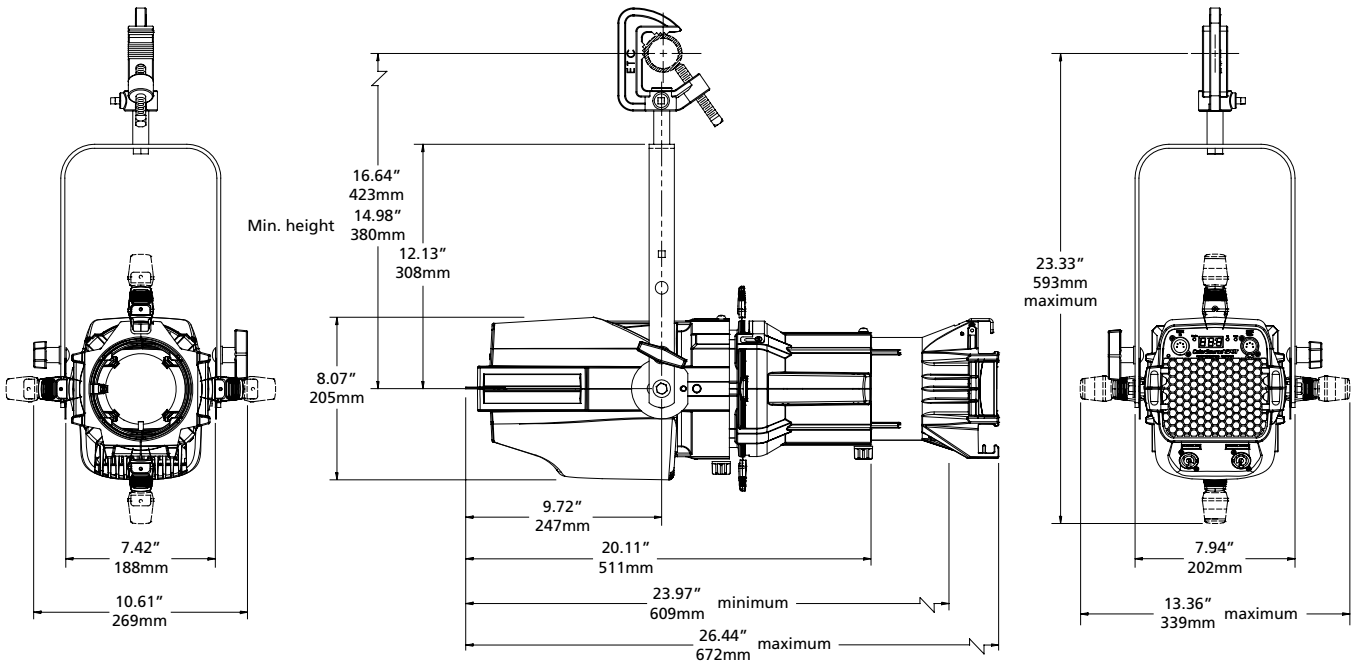
ColorSource Spot Weights

	WEIGHT*		SHIPPING WEIGHT	
	lb	kg	lb	kg
With Barrel	17.0	7.7	22.0	10.0
Without Barrel	13.0	5.9	16.3	7.4

* Does not include mounting hardware or lens tube

ColorSource Spot Dimensions

	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
ColorSource Spot	23.33	593	13.36	339	26.44	672



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etcconnect.com

ETC

ColorSource PAR

ColorSource Series





Type(s)

Project

Date

Notes

GENERAL INFORMATION

ColorSource PAR offers a quality of build and light that has never been seen in an affordable wash fixture. Using ETC's RGB-L color system, the ColorSource PAR provides a rich, bright light unlike any other LED wash light in its class.

APPLICATIONS

- Theatres and performance spaces
- Houses of worship
- Universities and schools
- Hospitality
- Retail
- Exhibition centers
- Meeting rooms
- Clubs
- Cafetoriums

PRODUCT FEATURES

- Three array options:
  - Original RGB-L (Red/Green/Blue/Lime)
  - Deep Blue RGI-L (Red/Green/Indigo/Lime)
  - Pearl (Warm and Cool White), see separate datasheet
- Homogenized optics
- Simple user interface with seven-segment display
- powerCON® in and thru
- 5-pin XLR
- LED droop compensation
- Optically calibrated
- Tour-ready, aluminum housing

ORDERING INFORMATION

ColorSource PAR

MODEL	DESCRIPTION	ETL PART NUMBER	CE PART NUMBER	
CSPAR	ColorSource PAR, black	7412A1005	7412A1205	
CSPARDB	ColorSource PAR Deep Blue, black	7412A1008	7412A1208	

Note: ColorSource PAR luminaires ship with a hanging yoke and a power cable with connector of choice. See page 6 for connector options. C-clamps are not included. For additional color options, please add the following: -1 for white, -5 for silver gray or -8 for custom color.

PRODUCT SPECIFICATIONS

Source

LED details	40 Lumileds LUXEON® Z LED
Max lumens	PAR: 3,039 PAR DB: 2,429
Lumens per watt	PAR: 28.1 PAR DB: 27.6
L70 rating (hours to 70% output)*	55,000 hours

Color

Colors used	PAR: red, green, blue, lime PAR Deep Blue: red, green, indigo, lime
Color temperature range	Color mixing
Calibrated array	Yes
Red shift	No

Optical

Beam angle range	14.5° (secondary lenses available for multiple beam-spread options)
Gate size	N/A
Aperture size	7.5 in / 190 mm
Pattern projection	No
Pattern size	N/A
Camera flicker control/Hz range	1,200 Hz (default) 25,000 Hz (via RDM)

Control

Input method	DMX512 via 5-pin XLR connector
Protocols	DMX512/RDM
Modes (footprint)	4 modes, see page 7
RDM configuration	Yes
UI type	Seven-segment, three-button interface
Local control	Yes
Onboard presets	Yes (12)
Onboard sequences	Yes (5)
Onboard effects	No
Fixture-to-fixture control	Yes
Notes	15-bit virtual dimming engine

***Note about LED luminaire lifetime:** ETC utilizes a nationally recognized third-party lab for luminaire testing according to IES LM-84. See etcconnect.com/About/News/ETC-Fixture-Ratings-and-Warranties-Extended.aspx.

All LED sources experience some lessening of light output and some color shift over time. LED output will vary with thermal conditions. In individual situations, LEDs will be used for different durations and levels. This can eventually lead to minor alterations in color performance, necessitating slight adjustments to presets, cues or programs.

Electrical

Voltage range	100–240 VAC 50/60 Hz
Input method	powerCON power in and thru
Inrush	35 A at 120 V (First half-cycle) 49 A at 240 V (First half-cycle)
Fixtures per circuit	9 (15 A power thru connector) 10 (R20 module or similar)
Wattage typical	90 W at 120 V 89 W at 240 V
Current draw	0.75 A at 120 V 0.40 A at 240 V

Thermal

Ambient operating temp	0°–40° C (32°–104° F)
Fan (controllable)	Yes (No)
Droop compensation	Yes
dB range	24.8 dBA average at 1 m
BTUs/hour (RGB-L / DB)	307 / 303

Physical

Materials	Die-cast, all metal housing
Color options	Black, white, silver, or custom color
Mounting options	Yoke, floor stand yoke (available as an accessory)
IP rating	IP20
Weight	3.77 kg (8.3 lb)
Included accessories	Hanging yoke, power cable
User interface	Seven-segment, three-button interface

Warranty

Fixture	5 years
LED array	10 years

Regulatory and Compliance

Approved regulatory standards	cETLus Listed Conforms to UL 1573 Listed Conforms to UL 924 Listed Certified to CSA C22.2 No. 166 Listed Certified to CSA C22.2 No. 141 Listed CE Compliant EAC Compliant

PRODUCT FEATURES



HOMOGENIZED OPTICS
The optics consist of a balanced mix of red, green, blue, and lime LEDs to give the best and brightest color mix possible.



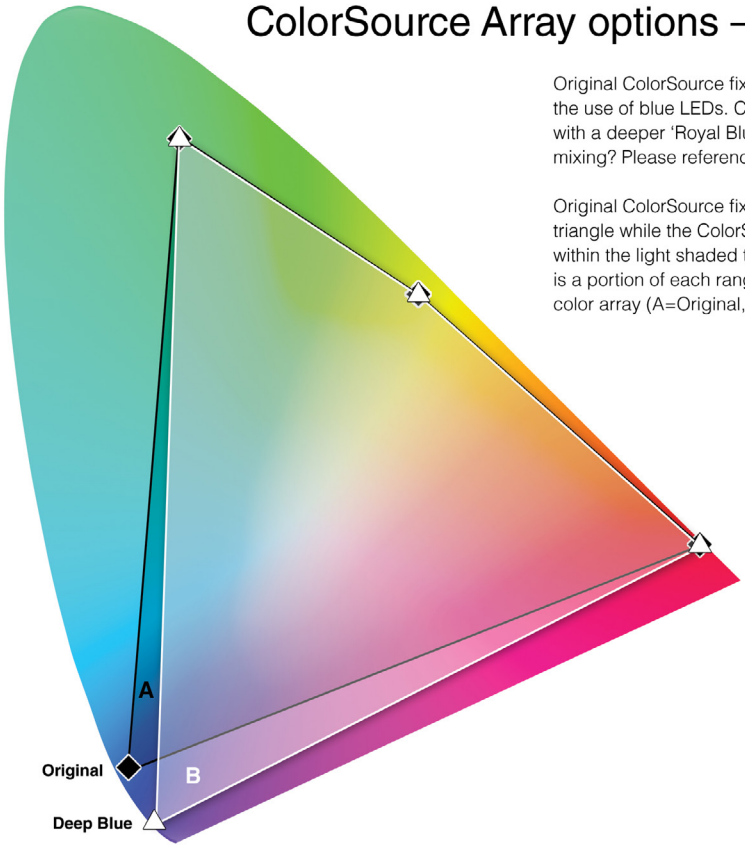
RGB-L ARRAY
The custom four-color blend of LEDs incorporates a hint of lime to increase spectral reach and color depth.



SIMPLE USER INTERFACE
The simple seven-segment display and navigation buttons enable quick setup and recall of built-in presets.

COLOR METRIC INFORMATION

ColorSource Array options – Original vs. Deep Blue



Original ColorSource fixtures use an RGB-L array where the 'B' represents the use of blue LEDs. ColorSource Deep Blue replaces those blue LEDs with a deeper 'Royal Blue' (indigo) LED. How does this impact your color mixing? Please reference the color chart.

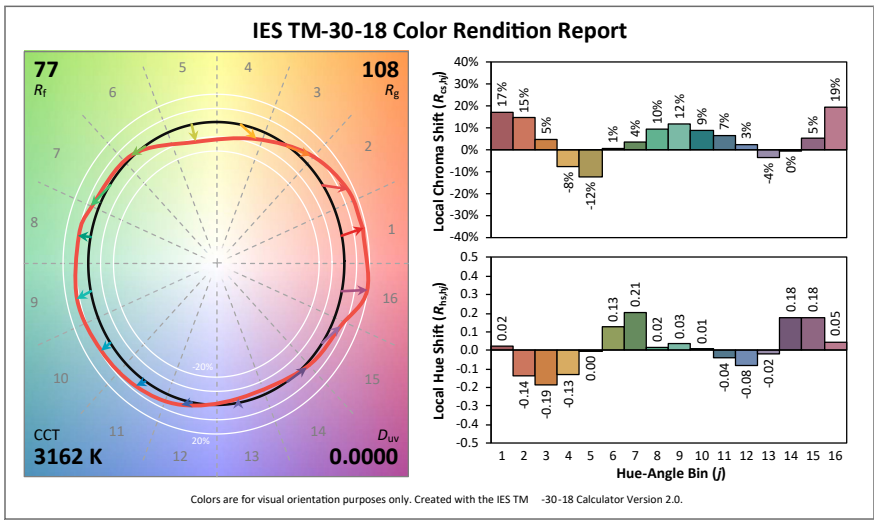
Original ColorSource fixtures can reach any color within the dark shaded triangle while the ColorSource Deep Blue fixtures can reach any color within the light shaded triangle. While much of these areas overlap, there is a portion of each range that can only be reached by the respective color array (A=Original, B=Deep Blue).

Common gels found in original ColorSource
Roscolux 095, 075, 076
Lee 363, 119, 721, 722, 132, 141, 183, 172, 325

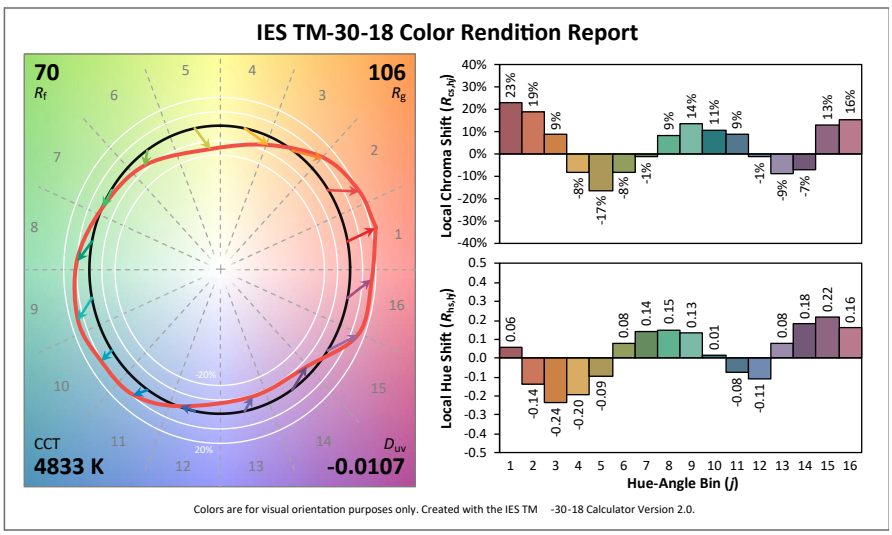
Common gels found in ColorSource Deep Blue
Roscolux 384, 385, 382, 059, 358, 347, 049, 349, 046, 124, 027, 120
Lee 126, 049, 798, 707, 181, 071, 120, 716

COLOR METRIC INFORMATION

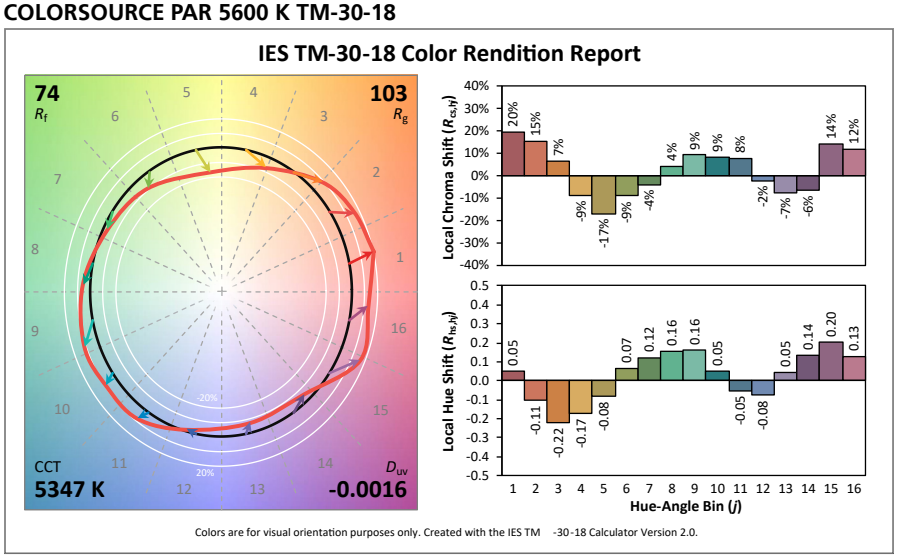
COLORSOURCE PAR 3200 K TM-30-18



COLORSOURCE PAR 4500 K TM-30-18



COLORSOURCE PAR 5600 K TM-30-18

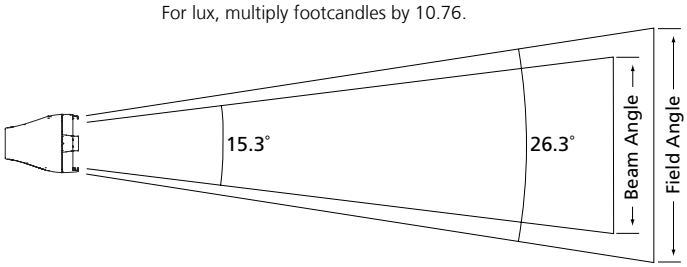


PHOTOMETRICS

ColorSource PAR

Mode	Degree	Candela	Field Lumens	Beam Lumens	Lumens Per Watt
Full ON - Direct	15.3	53,456	3,039	1,905	28.1
3200 K / RGB	15.3	41,323	2,380	1,494	32.9
5600 K / RGB	51,389	2,941	1,831	1,831	28.9

Metric conversions: For meters, multiply feet by 0.3048.
For lux, multiply footcandles by 10.76.



Throw Distance (d)	10 ft 3.0 m	15 ft 4.6 m	20 ft 6.1 m	25 ft 7.6 m	226.1 ft 68.9 m
Field Diameter	4.7 ft 1.4 m	7.0 ft 2.1 m	9.3 ft 2.8 m	11.7 ft 3.6 m	–
Illuminance (fc)	511	227	128	82	1
Illuminance (lux)	5,502	2,445	1,375	880	10.76

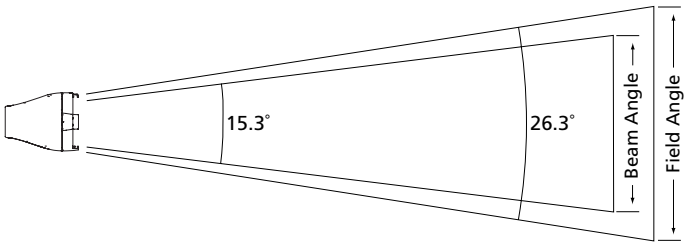
To determine center beam illumination in footcandles at any throw distance, divide candela by the throw distance squared.

For field diameter at any distance, multiply distance by 0.467.
For beam diameter at any distance, multiply by 0.269.

ColorSource PAR Deep Blue

Mode	Degree	Candela	Field Lumens	Beam Lumens	Lumens Per Watt
Full ON - Direct	15.3	50,156	2,978	1,874	27.6
3200 K / RGB	15.3	46,653	2,772	1,738	38.3
5600 K / RGB	15.3	46,273	2,723	1,706	26.8

Metric conversions: For meters, multiply feet by 0.3048.
For lux, multiply footcandles by 10.76.



Throw Distance (d)	10 ft 3.0 m	15 ft 4.6 m	20 ft 6.1 m	25 ft 7.6 m	226.0 ft 68.9 m
Field Diameter	4.7 ft 1.4 m	7.0 ft 2.1 m	9.3 ft 2.8 m	11.7 ft 3.6 m	–
Illuminance (fc)	511	227	128	82	1
Illuminance (lux)	5,500	2,444	1,375	880	10.76

To determine center beam illumination in footcandles at any throw distance, divide candela by the throw distance squared.

For field diameter at any distance, multiply distance by 0.467.
For beam diameter at any distance, multiply by 0.269.

LED Wash Lenses

Nominal									
D40	**No Lens**	**Very Narrow**	**Narrow**	**Medium**	**Wide**	**Extra Wide**	**Narrow Oval**	**Medium Oval**	**Wide Oval**
Lustr+	17	21	27	42	68	100	21x37	25x60	30x82
Vivid	18	22	27	42	69	104	20x37	25x60	30x82
Studio HD	18	23	28	42	69	104	21x29	25x61	30x82
Studio D	22	25	30	43	70	105	24x39	28x62	32x80
Studio T	23	25	30	43	70	105	24x39	28x62	32x80
ColorSource PAR	26	28	32	50	77	95	29x44	32x61	32x60

All values are in degrees.

ADDITIONAL ORDERING INFORMATION

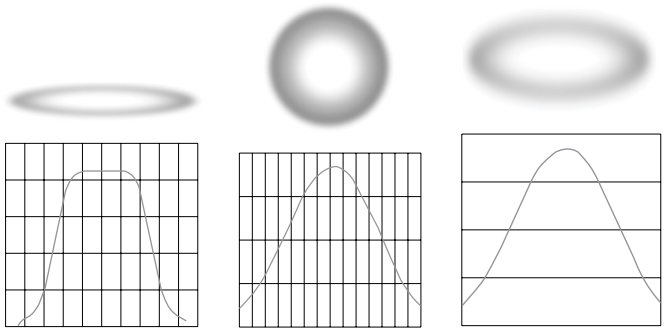
Secondary Lens Options

The following lenses are cut for ColorSource luminaires and create round, linear or oblong field patterns as described below. These lenses are not sized for use in Selador Classic fixtures. Linear lenses may be combined to create desired field size.

MODEL	DESCRIPTION	PART NUMBER	
Linear Field	Rigid polymer construction; does not require a media frame		
SELLN-7.5	7.5 in / 190 mm narrow lens	7410K1018	
SELLM-7.5	7.5 in / 190 mm medium lens	7410K1019	
SELLW-7.5	7.5 in / 190 mm wide lens	7410K1020	
SELLEW-7.5	7.5 in / 190 mm extra wide lens	7410K1021	
Round Field			
SELRN-7.5	7.5 in / 190 mm narrow lens	7410K1011	
SELRM-7.5	7.5 in / 190 mm medium lens	7410K1012	
SELRW-7.5	7.5 in / 190 mm wide lens	7410K1013	
SELRXW-7.5	7.5 in / 190 mm extra wide lens	7410K1039	
Oblong Field			
SELON-7.5	7.5 in / 190 mm narrow lens	7410K1014	
SELOM-7.5	7.5 in / 190 mm medium lens	7410K1015	
SELOW-7.5	7.5 in / 190 mm wide lens	7410K1016	

[Lenses compared to Source Four PAR EA]

Typical Lens Field Profiles



Narrow Linear Round Oblong

ADDITIONAL ORDERING INFORMATION

Power Input Cables

Use information below to order 5 ft power input leads with factory-fitted connectors. CE Fixtures ship with powerCON to bare end cables in the box.

MODEL	DESCRIPTION	PART NUMBER (NOT CE)	
DPA-A	5 ft / 1.5 m powerCON to parallel blade U-ground (Edison) connector	7410B7037-A	
DPA-B	5 ft / 1.5 m powerCON to 20 A two-pin and ground (stage-pin) connector	7410B7037-B	
DPA-C	5 ft / 1.5 m powerCON to grounded 20 A twistlock connector	7410B7037-C	
DPA-X	5 ft / 1.5 m powerCON to bare-end power input lead	7410B7037-X	

Power-Thru Jumpers

Note: Power-thru jumpers connect to luminaire's output (thru) connector to provide link to successive luminaires.

MODEL	DESCRIPTION	PART NUMBER	
DPJ-5	5 ft powerCON to powerCON fixture-to-fixture jumper	7410B7020	
DPJ-10	10 ft / 3.0 m powerCON to powerCON fixture-to-fixture jumper	7410B7010	

Luminaire Accessories

MODEL	DESCRIPTION	PART NUMBER	
CSPARFSY	Yoke with floor-stand attachment	7412K1000	
400BD	Barn door (use only as a flexible top hat for diminishing aperture glare, not for beam shaping)	PSF1019	
407CF	Color frame (use for round and oblong lenses)	7061A3007	
400L	Egg crate louver	PSF1028	
400PTH3	Top hat 3 in / 76 mm tube	PSF1022	
400PTH6	Top hat 6 in / 152 mm tube	PSF1023	
400PHH	Half hat 6 in tube	PSF1027	
400CC	C-Clamp (does not ship with fixture) (not CE)	7060A2009 (not CE)	
400SC	Safety cable (30 in / 762 mm)	7060A1022	
DPSJ-25	25 ft / 7.6 m powerCON-to-Edison input power cable with inline switch	7400B7030 (not CE)	

CONTROL

DMX Input Channel Profiles

DMX Profile	DMX Channels	Channel Assignments	Notes
5ch (Default)	5	1-Intensity 2-Red 3-Green 4-Blue 5-Strobe	Lime is mixed automatically.
RGB	3	1-Red 2-Green 3-Blue	
1ch	1	1-Intensity	This mode controls the intensity of Preset 1.
Dir	6	1-Intensity 2-Red 3-Green 4-Blue/Indigo* 5-Lime 6-Strobe	Original ColorSource PAR fixture uses blue in channel 4. Deep Blue ColorSource PAR fixture uses indigo in channel 4.

PHYSICAL

ColorSource PAR Dimensions*

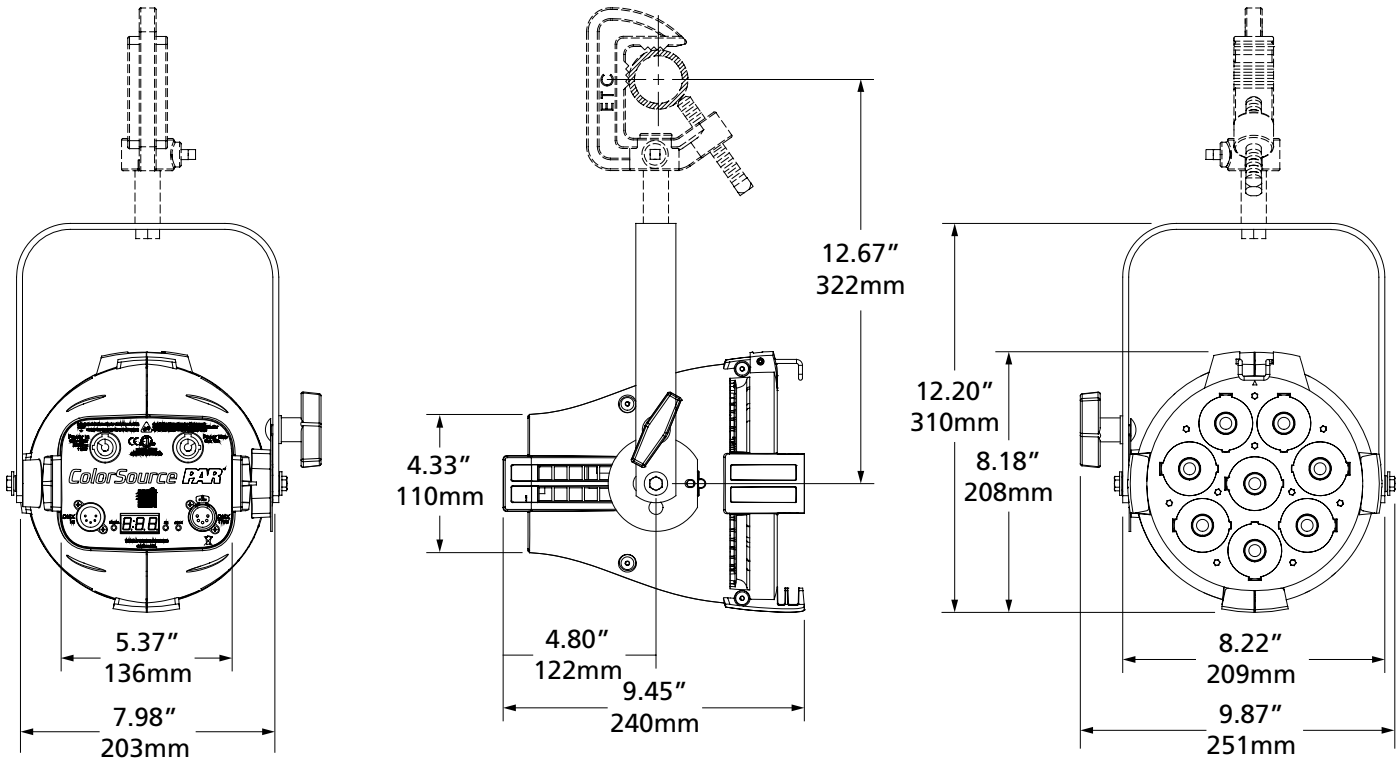
HEIGHT		WIDTH		DEPTH	
in	mm	in	mm	in	mm
12.20	310	7.98	203	9.45	240

* Does not include mounting hardware

ColorSource PAR Weights*

WEIGHT*		SHIPPING WEIGHT	
lb	kg	lb	kg
8.3	3.8	10.1	4.6

* Does not include mounting hardware



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ETC

ColorSource CYC

ColorSource Series





Type(s)	
Project	
Date	
Notes	

GENERAL INFORMATION

The ColorSource CYC is a dedicated cyclorama fixture designed with the sole purpose of creating beautiful, smooth washes of light on a cyclorama or wall. And it delivers! This is the first ETC fixture to use this innovative five-color mix of red, green, blue, lime, and indigo for expanded range and color control.

PRODUCT FEATURES

- All LED (RGBI-L)
- Rich, bright light
- Fanless operation
- Stand-alone presets and sequences
- Simple setup and user interface

ORDERING INFORMATION

ColorSource CYC

MODEL	DESCRIPTION	ETL PART NUMBER	CE PART NUMBER	
CSCYC	ColorSource CYC fixture, black	7415A1000	7415A1200	

Color Options: Fixture ships standard in black. For additional colors please use the below color code suffix:

Add -1 for white, -5 for silver or -8 for custom color.

Notes: C-clamp sold separately

COLORSOURCE CYC SHIPS WITH:

- Hanging yoke
- Power cable

PRODUCT SPECIFICATIONS

Source

LED details	42 Lumileds LUXEON® C LEDs
Max lumens	4,117
Lumens per watt	31
L70 rating (hours to 70% output)	50,000 hours (estimate pending LM84 test data)

Color

Colors used	Red, green, blue, indigo and lime
Color temperature range	Variable
Calibrated array	Yes
Red shift	No

Optical

Beam angle range	N/A (asymmetrical)
Gate size	N/A
Aperture size	N/A
Pattern projection	No
Pattern size	N/A
Camera flicker control/Hz range	1,200 Hz (default) and 25,000 Hz (via RDM)
Notes	The ColorSource CYC has a built in accessory for spill control

Control

Input method	DMX-512 via 5-pin XLR connector
Protocols	DMX
Modes (Footprint)	5 channel- IRGBS (5) Direct- IRGBILS (7) 1 channel- I (1) RGB- RGB (3)
RDM configuration	Yes
UI type	7-segment address display
Local control	Yes
Onboard presets	Yes (12)
Onboard sequences	Yes (5)
Onboard effects	No
Fixture-to-fixture control	Yes
Notes	Local level control via UI

Electrical

Voltage range	100–240 VAC, 50/60 Hz
Input method	powerCON in and thru
Inrush	39 A (first half-cycle) at 120 V 74 A (first half-cycle) at 240 V
Fixtures per circuit	9 using power thru connector (or 10 per 20 A switched circuit, R20 module or similar)
Wattage Typical/ Standby	133 W / 1.4 W at 120 V 116 W / 1.2 W at 240 V
Current draw	1.11 A at 120 V 1.11 A at 240 V

Thermal

Ambient operating temp	0°–40° C (32°–104° F)
Fan (controllable)	No (N/A)
Droop compensation	Yes
dB range	18.5 dBA average at 1 m
BTUs/hour	453

Physical

Materials	Die-cast aluminum and plastic
Color options	Black, white, silver or custom color
Mounting options	Yoke and floor
IP rating	IP20
Weight	10.3 lb (4.67 kg)
Included accessories	Hanging yoke, power cable
Notes	See accessories list for power cable options

Warranty

Fixture	5 years
LED array	10 years

Regulatory and Compliance

Approved regulatory standards	cETLus to UL 1573 CSA C22.2 No. 166 CE Compliant EAC Compliant

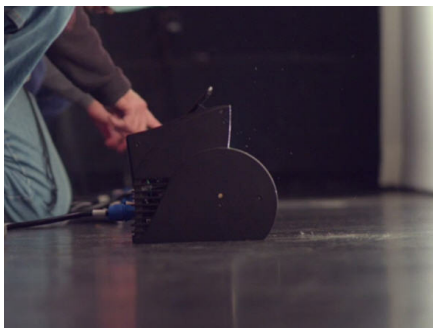
***Note about LED luminaire lifetime:**
ETC utilizes a nationally recognized third-party lab for luminaire testing according to IES LM-84. See etcconnect.com/About/News/ETC-Fixture-Ratings-and-Warranties-Extended.aspx.

All LED sources experience some lessening of light output and some color shift over time. LED output will vary with thermal conditions. In individual situations, LEDs will be used for different durations and levels. This can eventually lead to minor alterations in color performance, necessitating slight adjustments to presets, cues or programs.

PRODUCT FEATURES



UNIQUE 5-COLOR ARRAY
ColorSource CYC uses a unique blend of red, green, blue, indigo and lime LEDs.



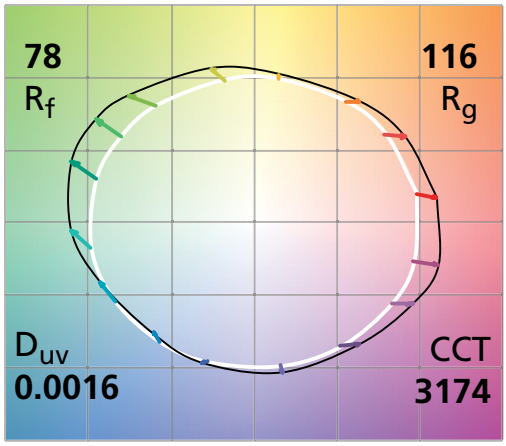
COMPACT DESIGN
The ColorSource CYC was designed to fit onto even the tightest of stages.

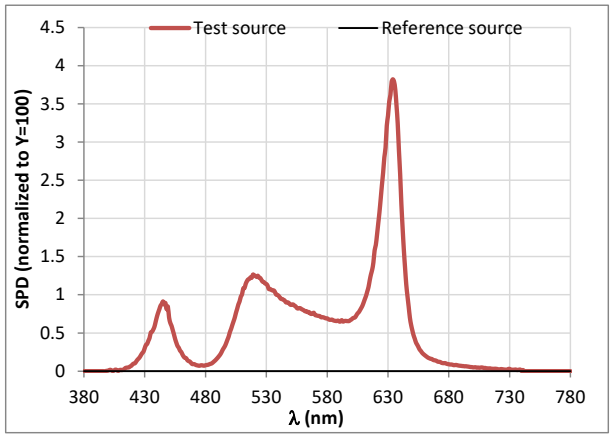


FAN-FREE
No fan means a quieter stage.

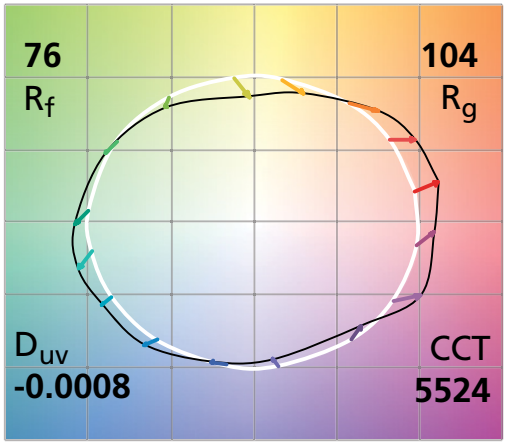
COLOR METRIC INFORMATION

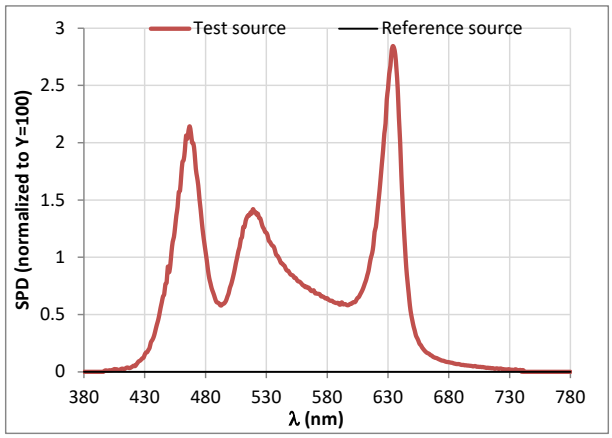
TM-30-15 3200 K - COLORSOURCE CYC





TM-30-15 5600 K - COLORSOURCE CYC





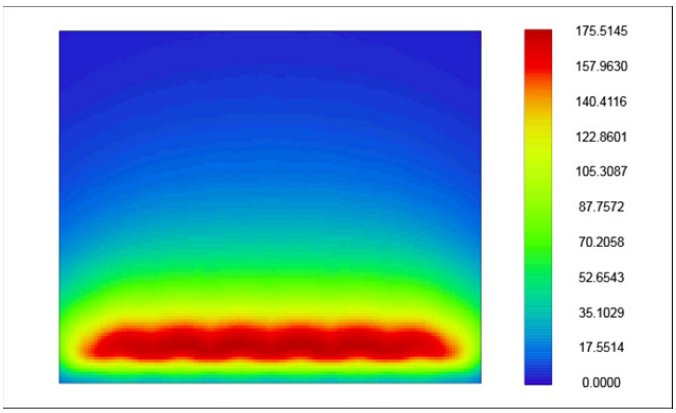
COLOR METRIC INFORMATION

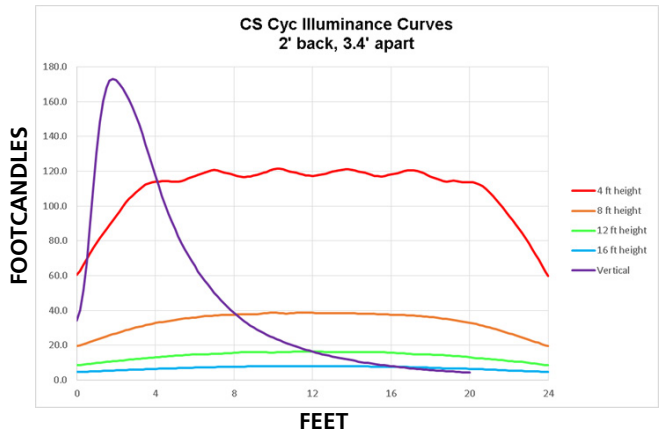
Additional Color Metrics

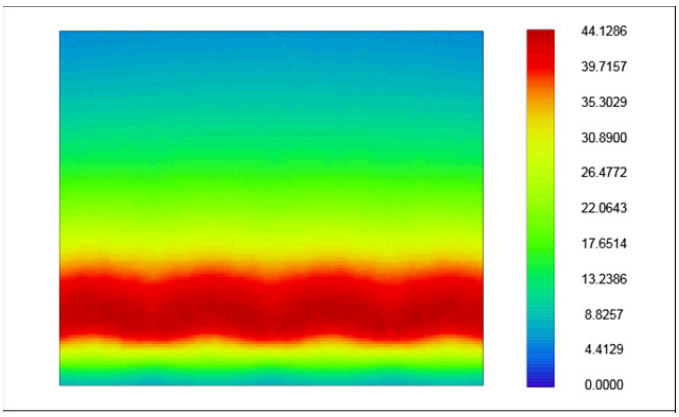
	CS CYC 3200 K	CS CYC 5600 K
CRI R_a (R_9)	72 (2)	72 (-42)
TLCI	52	68

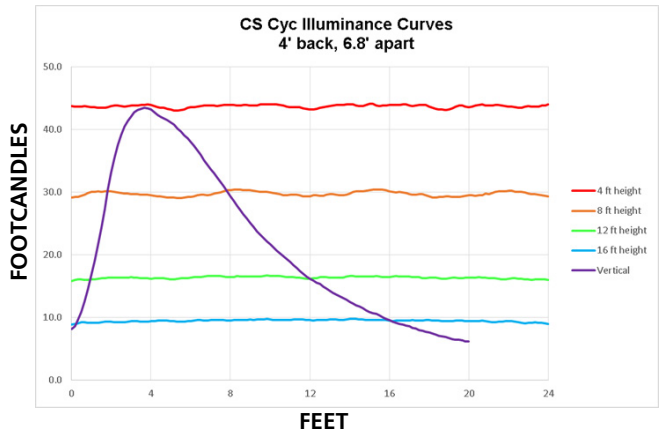
PHOTOMETRICS

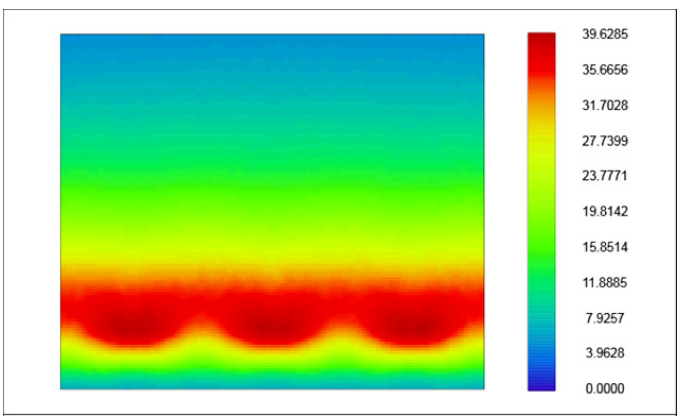
Numerical values represent footcandles.

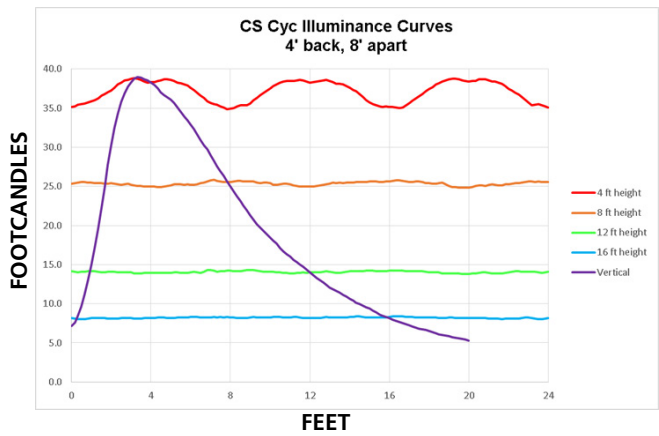












ADDITIONAL ORDERING INFORMATION

Accessories

MODEL	DESCRIPTION	PART NUMBER	
400SC	Safety cable	7060A1022	
400CC	C-Clamp	7060A2009 (not CE)	
DPA-A	1.5 m / 5 ft powerCON to parallel blade U-ground (Edison) connector	7410B7037-A (not CE)	
DPA-B	1.5 m / 5 ft powerCON to 20 A two-pin and ground (stage-pin) connector	7410B7037-B (not CE)	
DPA-C	1.5 m / 5 ft powerCON to grounded 20 A twistlock connector	7410B7037-C (not CE)	
DPA-X	1.5 m / 5 ft powerCON to bare-end power input lead	7410B7037-X (not CE)	
DPJ-5	1.5 m / 5 ft powerCON to powerCON fixture to fixture jumper	7410B7020	
DPJ-10	10 ft powerCON to powerCON fixture to fixture jumper	7410B7010	

PHYSICAL

ColorSource CYC Dimensions

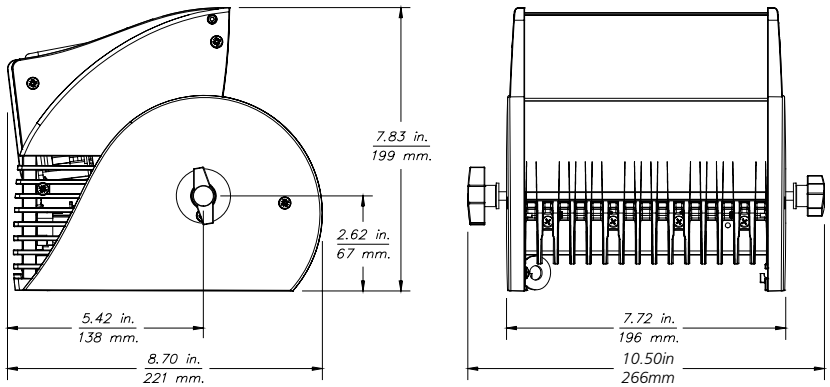
MODEL	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
ColorSource CYC (Floor)	7.83	199	10.5	266	8.70	221
ColorSource CYC (Hang)	11.97	304	10.5	266	8.70	221

ColorSource CYC Weights

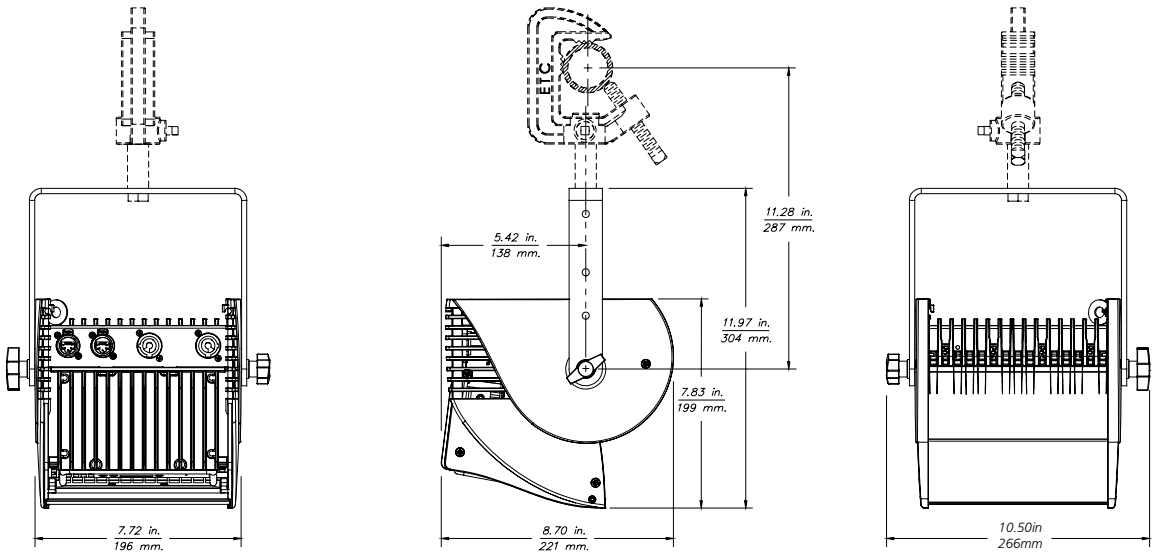
MODEL	WEIGHT*		SHIPPING WEIGHT	
	lb	kg	lb	kg
ColorSource CYC	10.3	4.67	12.9	5.85

*Without mounting hardware

FLOOR



HANG



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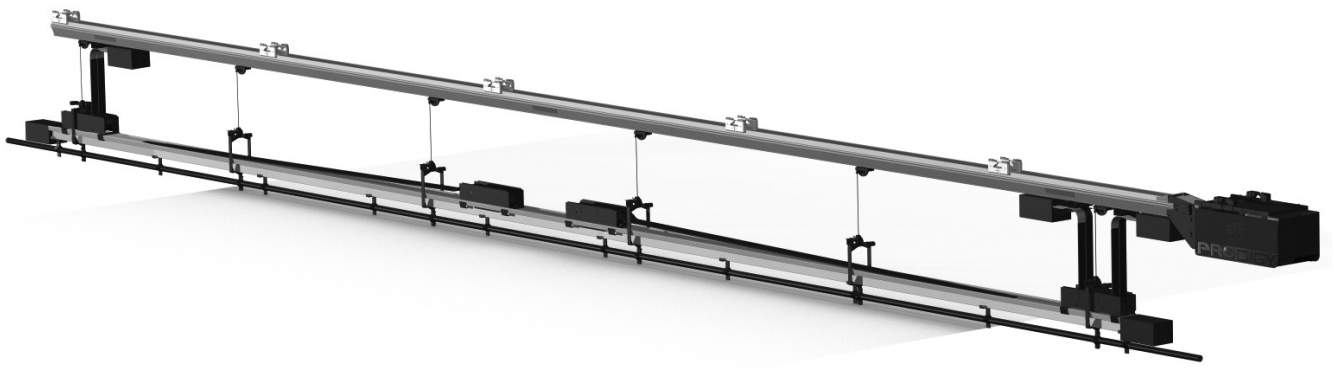
ETC® P1500E and P1500E/480 Fixed Speed Stage Electric

Prodigy® Low Profile Hoist Series



GENERAL INFORMATION

APPLICATIONS

Prodigy Low Profile Hoists provide a simple, low cost way to lift heavy lights for storage or for production. Prodigy P1500E is especially useful for the front of house where an extremely low profile allows the hoist and cable management system to disappear into the plenum in the smallest space requirement in the industry. Larger high schools and other facilities with wider proscenium openings can be equipped with front-of house-lighting or onstage lighting pipes without the added cost of catwalks.

These hoists resolve space and access challenges for schools, night clubs, houses of worship or other places where there is no means to access lighting above the stage or audience. With motorized hoists, it will not be necessary to climb ladders or scaffolds to install or service lighting. Instead, the motorized battens can be lowered to working level and allow workers to easily install and service equipment that can be raised to performance or storage positions high above the stage floor.

ETC Prodigy hoists are manufactured in a family of sizes from house light hoists up to machines designed to carry heavy loads.

FEATURES

- LIGHT WEIGHT: Powerhead weighs less than 580 pounds
- SMALL SIZE: Powerhead is only 17 3/8" high x 50 11/16" long x 17 13/16" wide
- COMPACT CABLE MANAGEMENT SYSTEM: Front of house and stage electrics hoists store in 30" of height yet feed up to 48 20 Amp circuits
- TRUE LIFTING CAPACITY: TRUE LIFTING CAPACITY: Hoists are rated by their working load limit (WLL), the amount of weight that can be suspended from the batten in a standard configuration. The total motor lifting capacity is shown in the "Total Lifting Capacity" area in the tables below
- UNIQUE PRODIGY HYBRID DRUM: Powerhead manages up to 7 liftlines plus one operating line for cable management in a machine 1/3 the size of other hoists
- FAIL-SAFE MOTOR BRAKE AND PRODIGY LOAD BRAKE: Two independent braking systems assure safe overhead lifting
- HIGHER DUTY CYCLES: Minimal braking pressure significantly reduces brake pad temperature and increases duty cycle of the hoist
- BUILT-IN LIMIT SWITCHES AND ENCODERS: With visual setting indicators for more efficient installation
- DMX or Ethernet data wiring available

GENERAL INFORMATION

- MID-TRAVEL PRESET POSITION: A third stop position that is re-settable by the user
- COMPRESSION TUBE: Channel snaps in place to interface with facility structure and neutralize additional horizontal loads on the building
- BUILT IN SLACK LINE DETECTOR: Standard on all hoists
- BUILT IN LOAD PROFILING: Standard on all hoists
- RIGHT ANGLE CABLE ADJUSTER (RACA): Unique trim clamp saves up to 14" of building height and allows greater batten travel. The RACA permits rapid trim adjustment even under load
- BUILT TO PLASA/ANSI STANDARDS: motorized hoist (draft) standards
- UL LISTED

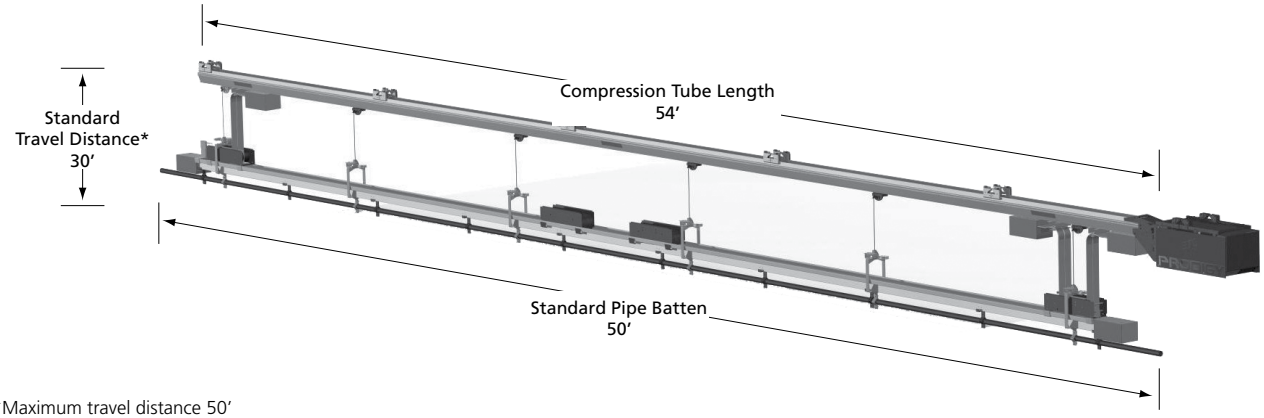
BENEFITS OF PRODIGY HOISTS

- Light weight – less load on the building and easier to install
- No additional lateral forces imposed on the building – lateral forces neutralized in the compression tube
- Anywhere-positioning of loft blocks along compression tube so lift line placement is not dependent on building structural layout
- May be attached to almost any structure that can support the weight of the hoist + lifted load such as bar joists
- Compatible with QuickTouch®, QuickTouch+® and Foundation® Control systems
- Easy limit switch adjustment with visible LED light indicators
- Low noise operation
- Prewired connector strip for up to 48 20 Amp circuits with up to 4 DMX and a CAT5 outlet
- Connector strip also works as a cable tray and roller guide system to manage flat feeder cable

ETC® P1500E and P1500E/480 Fixed Speed Stage Electric

Prodigy® Low Profile Hoist Series

HOIST STANDARD CONFIGURATION P1500E



*Maximum travel distance 50'

STANDARD SAFETY FEATURES

- Load Profiling – Senses load change variances
- Dual Braking System – A Primary Load Brake and a Motor Brake
- Limit Switches – 1 Top limit plus top overtravel limit switch
  1 Bottom limit plus bottom overtravel limit switch
- Slack Line Detection – Standard equipment. Slack line detection of lifting line will shut the system down should any line become slack
- Built-in Load cell – Standard equipment to provide continuous load profiling and monitoring

HOIST OPTIONS

P1500E STAGE ELECTRIC FIXED SPEED HOIST	
Batten length	Up to 76'
Travel distance	Up to 50'
Number of Circuits	Up to 48 20 Amp circuits
DMX Outlets	Up to (4) outlets
CAT 5E	Up to (4) outlets

STANDARD CONFIGURATION:

WEIGHT DATA			CIRCUIT INFORMATION			MOUNTING HARDWARE		
WLL	Total Lifting Cap	Dynamic Load	Circuits	Outlets	DMX/CAT5E	Cable Size	# Beam Clamps	# Lift Lines
*1500lbs	2000lbs	1.2G	36	36	1/1	3/16"	5	6+1 Cable

*Working Load Limits are based on standard configuration

COMPRESSION TUBE MOUNTING INFORMATION			
Beam Clamp Locations	Tube Weight	Min Qty of Beam Clamps Required	Standard Mounting Brackets Available for
Max spacing 14' O.C.	3.5lb /ft	1 at Powerhead + 1 @ 14 ' O.C. max spacing	W-, S-, or I-Beam / Bar Joist / Unistrut*

*Must be capable of supporting the load

LOADING INFORMATION (LIFT LINE PLACEMENT)						
Loading	Min Load Per Line	Max Load Per Line	Loft Block Locations			# of Lift lines Available
Distributed load over the length of the batten	25lbs per line	420lbs	4' minimum loft block spacing	4' min distance from the Powerhead or mule block with first lift line 1" from Powerhead nose	12' max spacing of loft blocks with 1.5" sch 40 pipe batten	7+1 cable management operating line

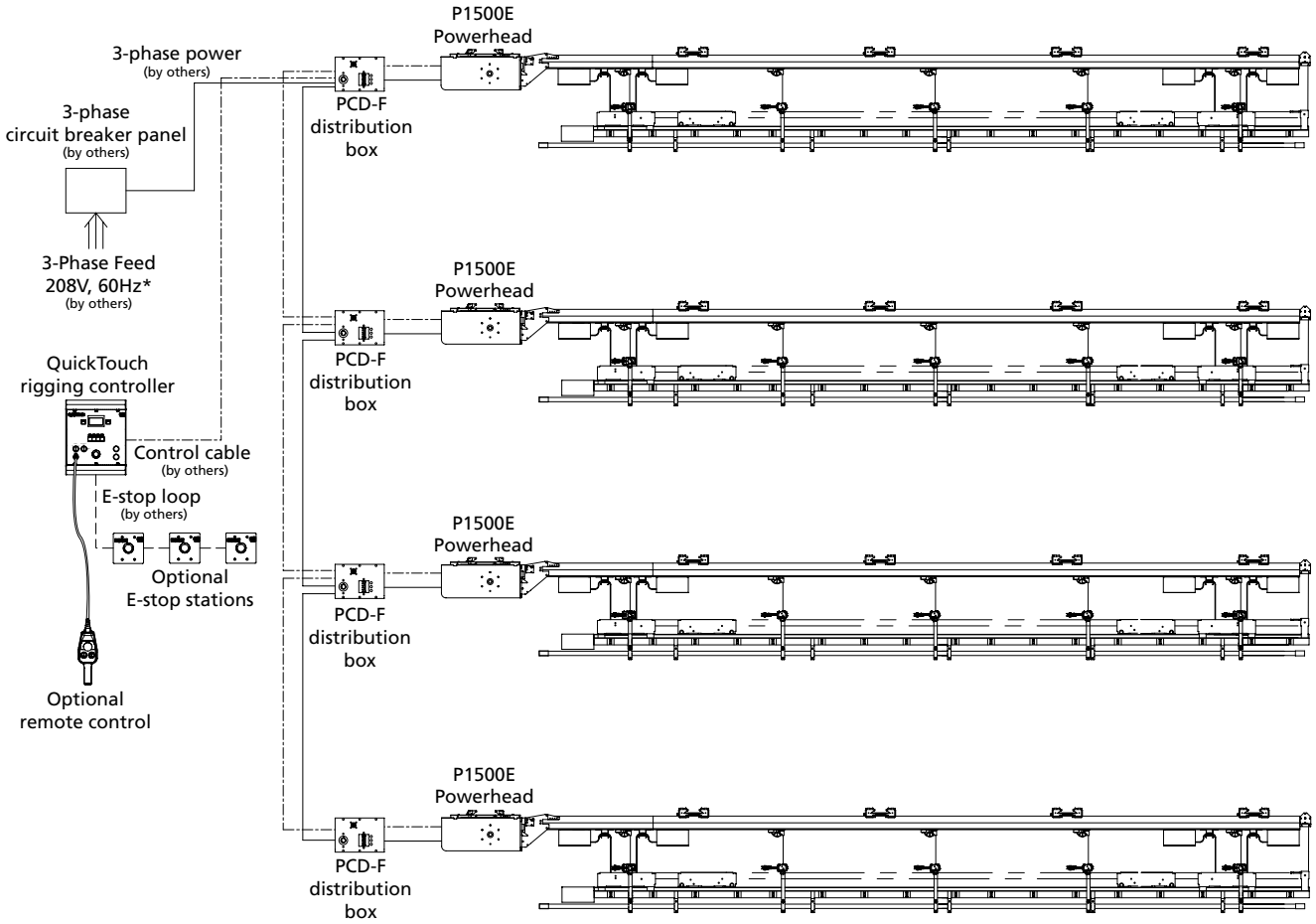
ETC® P1500E and P1500E/480 Fixed Speed Stage Electric

Prodigy® Low Profile Hoist Series

HOIST STANDARD CONFIGURTATION

ELECTRICAL INFORMATION						
Product	Speed	Line Voltage	Horse Power	Motor Inrush Current	Motor Operating Current	Motor Operating Temperature Range
P1500E	30fpm	3-phase, 208V / 60Hz	2.0HP	32.6 Amps	10.5 Amps	40˚F to 104˚F 4.5˚C to 40˚C
P1500E/480	30fpm	3-phase, 480V / 60Hz	2.0HP	16.5 Amps	5.25 Amps	40˚F to 104˚F 4.5˚C to 40˚C

PRODIGY SYSTEM RISER



* P1500E/480 requires 480V, 60Hz service

——— Power cable, 3-phase + ground

—·—·— Control cable, CAT5e or better

– – – – E-stop, CAT5e or better

Power cord from Powerhead to PCD – 8’0”

Data cord from Powerhead to PCD – 8’0”

Remote control device cord – 30’0”

ETC® P1500E and P1500E/480 Fixed Speed Stage Electric

Prodigy® Low Profile Hoist Series

PRODIGY FAMILY OF HOISTS

Model #	Speed	Working Load Limit (Standard configuration)	Total Lifting Cap	Batten length	Voltage	20 Amp Circuits
VARIABLE SPEED						
V1000S	0-180 FPM	1000lbs	1200lbs	Up to 76'	480V. 3ø	no circuits*
EXO V1200S	0-180 FPM		1200lbs	Up to 76'	480V. 3ø	no circuits*
ELECTRIC BATTENS						
P650E & P650E/480	30 FPM	650lbs	900lbs	Up to 76'	208V. 3ø & 480V. 3ø	Up to 48*
P1000E & P1000E/480	30 FPM	1000lbs	1400lbs	Up to 76'	208V. 3ø & 480V. 3ø	Up to 48*
P1500E & P1500E/480	30 FPM	1500lbs	2000lbs	Up to 76'	208V. 3ø & 480V. 3ø	Up to 48*
GENERAL PURPOSE						
P800G & P800G/480	30 FPM	800lbs	900lbs	Up to 76'	208V. 3ø & 480V. 3ø	no circuits*
P1300G & P1300G/480	30 FPM	1300lbs	1400lbs	Up to 76'	208V. 3ø & 480V. 3ø	no circuits*
P1900G & P1900G/480	30 FPM	1900lbs	2000lbs	Up to 76'	208V. 3ø & 480V. 3ø	no circuits*
EXO P900G & EXO P900G/480	30 FPM		900lbs	Up to 76'	208V. 3ø & 480V. 3ø	no circuits*
EXO P1400G & EXO P1400G/480	30 FPM		1400lbs	Up to 76'	208V. 3ø & 480V. 3ø	no circuits*
EXO P2000G & EXO P2000G/480	30 FPM		2000lbs	Up to 76'	208V. 3ø & 480V. 3ø	no circuits*

*See cable management and houselight distro on cable management datasheet.

RIGGING CONTROL

FOUNDATION FOR VARIABLE SPEED	
Foundation	Forty-eight channels
QUICKTOUCH+ FOR VARIABLE & FIXED SPEED	
QuickTouch+ 4	Four channels
QuickTouch+ 8	Eight channels
QuickTouch+ 12	Twelve channels
QuickTouch+ 24	Twenty-four channels
QUICKTOUCH FOR FIXED SPEED	
Quicktouch 1	Single channel
Quicktouch 4	Four channels
Quicktouch 8	Eight channels
Quicktouch 12	Twelve channels
Quicktouch 24	Twenty-four channels

WARNING

Only trained persons shall operate or maintain this equipment

Improper operation or maintenance may cause serious injury or death

Read and understand operations manual before use

Disconnect power before servicing this equipment

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DWR Series

wall mount rack

pivoting, sectional wall cabinet is ideal for larger systems in both secured and non-secured areas

features:

- Available in 17”, 22”, 26” and 32” overall depths with 15”, 20”, 24” and 30” of useable depth
- Tool-Free Quick-Mount™ system for easy, one-person mounting of the center section to the backpan on the jobsite
- Center section rear channel accommodates slim power to save space
- Optional minimum-clearance latch allows side-by-side or interior corner mounting
- Reversible padlockable center section is keyed differently from optional front door for security
- 2” knockouts, 4” knockouts for Wiremold 4000® Series raceways, and knockouts for UCP Series universal connector panels on side
- Grounding/bonding stud in top and bottom of center section and backpan facilitates proper grounding and bonding of electronic equipment, as per NEBS and NEC standards
- Finished in a durable black textured powder coat
- UL listed in the US and Canada



see inside for important information regarding useable depths

specifications:

EIA compliant 19” wall mount rack shall be Middle Atlantic Products model # DWR-__-__ (refer to chart). Overall dimensions shall be 23.4” W x __” H x __” D (refer to chart). Weight capacity shall be __ lbs. Tool-Free Quick-Mount™ system enables one-person installation. Useable depth shall be __” (refer to chart) and shall extend into the back pan 3.5”. Center section and back pan shall be steel, phosphate pre-treated and finished in a black textured powder coat. Adjustable rackrail shall be constructed of 11-gauge steel with tapped 10-32 mounting holes in universal EIA spacing with black e-coat finish and marked rack spaces. Rack shall be constructed to swing open for component cabling access, center section shall pivot for either left or right opening. Rack shall have a rear knockout panel with 1/2”, 3/4”, 1”, 1-1/2”, 2” and 3” electrical knockouts installed in base, and a rear knockout panel with 1/2”, 3/4”, 1”, 1-1/2”, 2” and 3” electrical knockouts, and BNC knockouts for UHF/VHF antennas installed in top. Large laser knockout on back pan shall have a 12-1/2” x 12-1/2” cutout for electrical pull-box. Fan knockouts on top and bottom shall allow for installation of up to four 4-1/2” fans. Rack shall have 2” knockouts, 4” knockouts for Wiremold 4000® Series raceways, and knockouts for UCP Series universal connector panels on the side. Top, bottom and sides shall feature vertical vent pattern. DWR Series enclosures shall satisfy the 2013 CBC; 2012 IBC & ASCE 7-10 (2010 Edition) for use in areas of high seismicity, using an assumed Site Class D soil condition with lateral force requirements for protecting 155 lbs. of essential equipment in locations with the highest level of seismicity and top floor or rooftop installations with an Importance factor (Ip) of 1.5 when used with DWRSR-ZL Latch. DWR Series shall be OSHPD approved for fixed equipment anchorage in California healthcare facilities. Rack shall be UL Listed in the US and Canada to the UL-2416 (NWIN) Category when used with optional bonding kit, model # PET-K-__. DWR Series shall meet all enclosure requirements towards PCI DSS (Payment Card Industry Data Security Standard) Compliance. Rack shall be GREENGUARD Gold Certified. Rack shall be manufactured by an ISO 9001 and ISO 14001 registered company. Rack shall be warrantied to be free from defects in materials or workmanship under normal use and conditions for the lifetime of the rack.

Customizable specification clips available at middleatlantic.com

c UL us LISTED

GREENGUARD GOLD

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

PCI COMPLIANT ENCLOSURE

PEP eco PASS PORT®

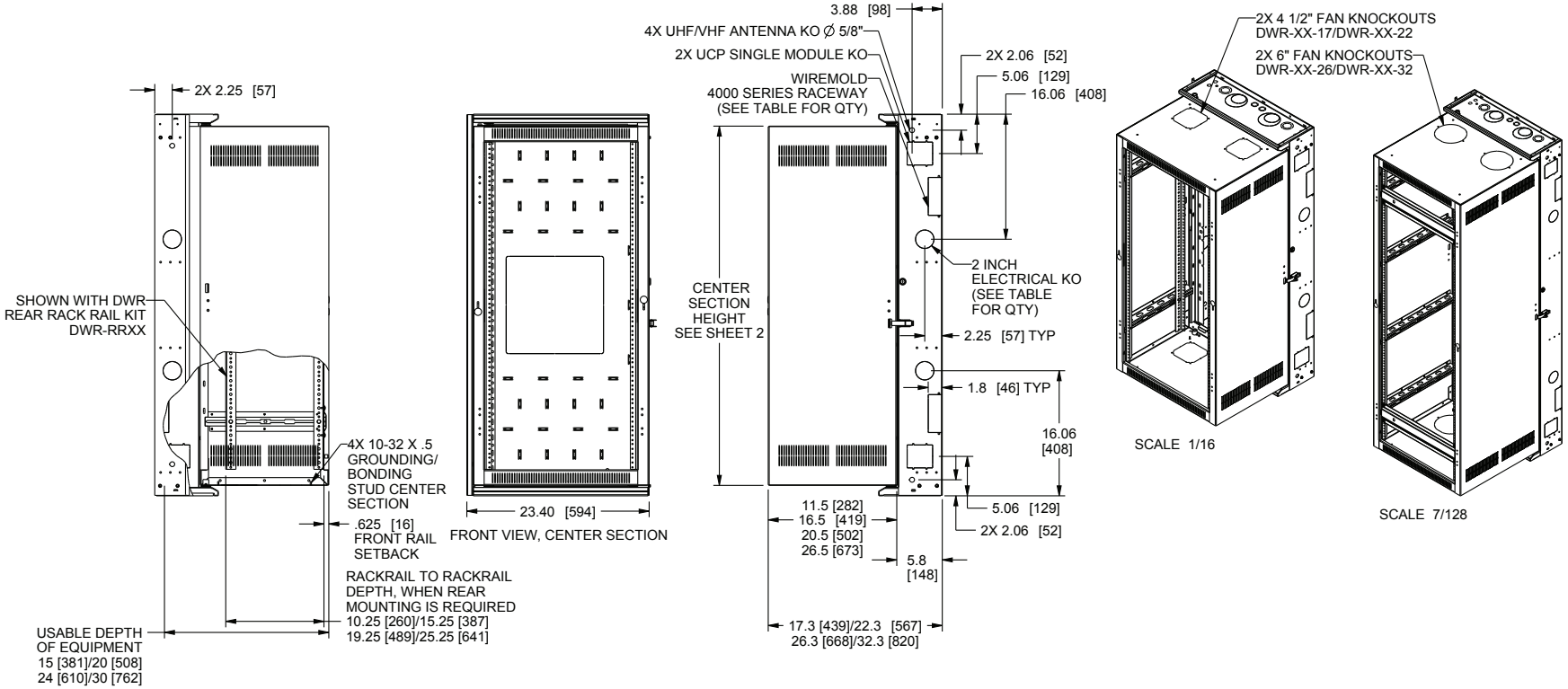
EIA/TIA COMPLIANT | US PATENT# 7, 278, 183 | SEISMIC CERTIFIED

options:

- Front doors shall be reinforced steel, model # FD-XX (solid), VFD-XX (vented, 25% open area), LVFD-XX (vented, 64% open area), PFD-XX (plexi), (XX= # of rackspaces of DWR rack)
- Keyless Latch replaces keylock, fits front & rear doors, shall be models # LATCH
- Rear rail kit 11-gauge, 10-32 threaded, sold in pairs, hardware included, shall be model # DWR-RRXX
- Fan kits with two 4-1/2” exhaust fans, fan guards and vent blockers shall be model # DWR-FK17 (fits DWR-xx-17), DWR-FK22 (fits DWR-xx-22), Fan kits with two 6” exhaust fans, fan guards and vent blockers shall be DWR-FK6-26 (fits DWR-xx-26), DWR-FK6-32 (fits DWR-xx-32)
- Vent Blockers used to promote active thermal management, shall be model # VBK-D17 (fits DWR-XX-17), VBK-SD22 (fits DWR-XX-22), VBK-E20 (fits DWR-XX-26)
- Optional cover plate / shelf kit shall be model # DWR-CVR
- Minimum-clearance latch shall allow side-by-side or corner mounting, shall be model # DWRSR-ZL
- Optional bonding kit for UL-2416 (NWIN) compliance shall be Middle Atlantic Products PET-K-D/EWR (for backpan to center section), PET-K-D/EWRD (for backpan to center section to front door), PET-K-FD (for front door to center section), PET-K-DWRFK (for fan kit to center section)

DWR Series
basic dimensions

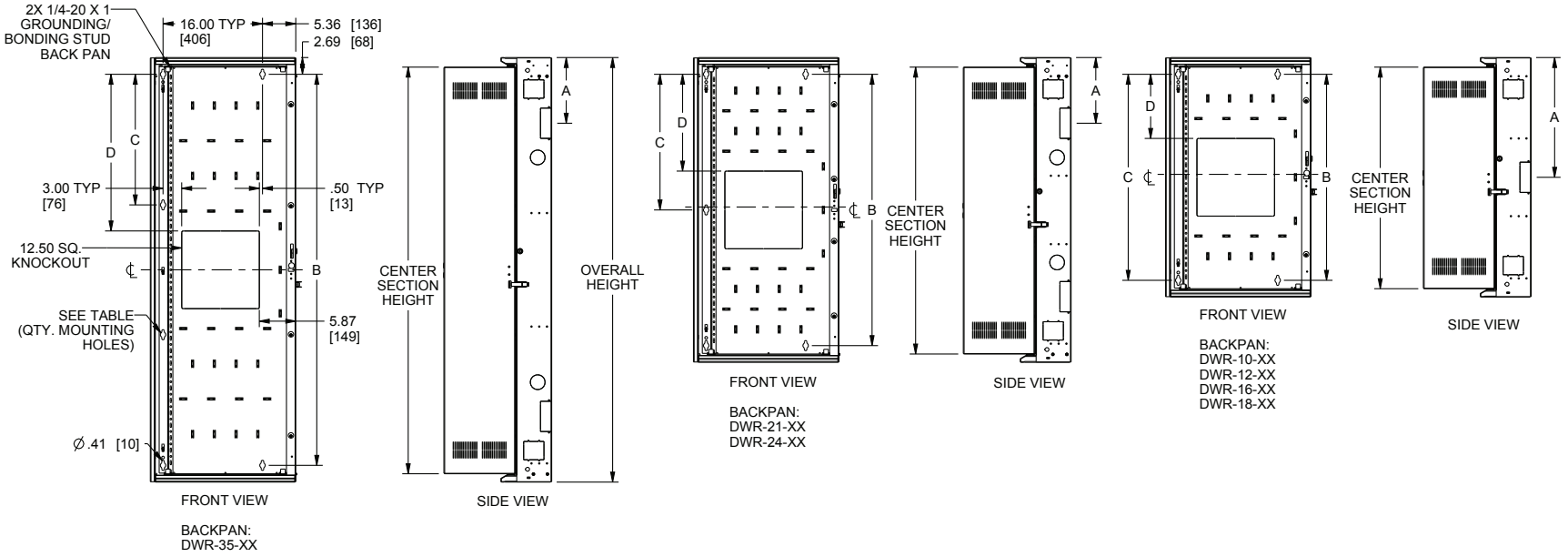
NOTE(S):
1) 17", 22", 26" AND 32" DEEP MODELS
ARE REPRESENTED IN THIS DRAWING
(DWR-XX-17)/(DWR-XX-22)/
(DWR-XX-26)/(DWR-XX-32)
2) DIMENSIONS ARE IN THE FORMAT IN [MM]



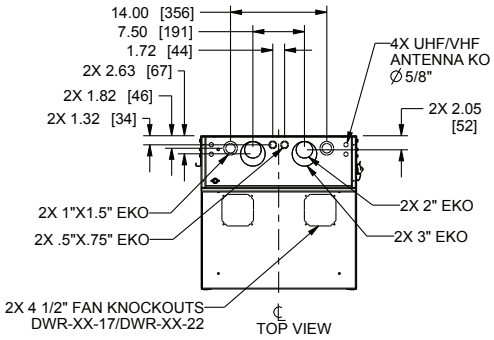
DWR Series
basic dimensions

NOTE(S):
1) 17", 22", 26" AND 32" DEEP MODELS ARE REPRESENTED IN THIS DRAWING (DWR-XX-17)/(DWR-XX-22)/ (DWR-XX-26)/(DWR-XX-32)
2) DIMENSIONS ARE IN THE FORMAT IN [MM]

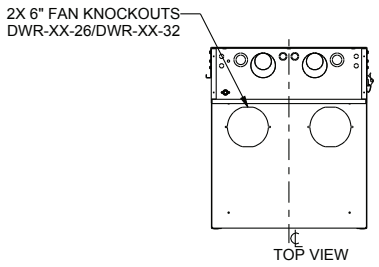
	OVERALL HEIGHT IN[MM]	CENTER SECTION HEIGHT IN[MM]	RACKING HEIGHT IN[MM]	RACK SPACES	WEIGHT CAPACITY	2" EKO BACK PAN	WIREMOLD 4000 SERIES	"A" WIREMOLD 4000 SERIES SPACING	"B" MOUNTING HOLE SPACING	"C" MOUNTING HOLE SPACING HINGE SIDE	"D" KNOCKOUT TOP TO MOUNTING HOLE SPACING	QUANTITY MOUNTING HOLES
DWR-10-17	24.50 [622]	21.63 [549]	17.50 [445]	10 SP	200 lbs	-	1	12.25 [311]	19.13[486]	19.13[486]	3.31[84]	4
DWR-10-22	24.50 [622]	21.63 [549]	17.50 [445]	10 SP	200 lbs	-	1	12.25 [311]	19.13[486]	19.13[486]	3.31[84]	4
DWR-12-17	28.00 [711]	25.13 [638]	21.00 [533]	12 SP	200 lbs	-	1	14.00 [356]	22.63[575]	22.63[575]	5.06[129]	4
DWR-12-22	28.00 [711]	25.13 [638]	21.00 [533]	12 SP	200 lbs	-	1	14.00 [356]	22.63[575]	22.63[575]	5.06[129]	4
DWR-12-26	28.00 [711]	25.13 [638]	21.00 [533]	12 SP	200 lbs	-	1	14.00 [356]	22.63[575]	22.63[575]	5.06[129]	4
DWR-12-32	28.00 [711]	25.13 [638]	21.00 [533]	12 SP	200 lbs	-	1	14.00 [356]	22.63[575]	22.63[575]	5.06[129]	4
DWR-16-17	35.00 [889]	32.13 [816]	28.00 [711]	16 SP	200 lbs	-	1	17.50 [445]	29.63[753]	29.63[753]	8.56[217]	4
DWR-16-22	35.00 [889]	32.13 [816]	28.00 [711]	16 SP	200 lbs	-	1	17.50 [445]	29.63[753]	29.63[753]	8.56[217]	4
DWR-18-17	38.50 [978]	35.63 [905]	31.50 [800]	18 SP	250 lbs	-	1	19.25 [489]	33.13[841]	33.13[841]	10.31[262]	4
DWR-18-22	38.50 [978]	35.63 [905]	31.50 [800]	18 SP	250 lbs	-	1	19.25 [489]	33.13[841]	33.13[841]	10.31[262]	4
DWR-18-26	38.50 [978]	35.63 [905]	31.50 [800]	18 SP	250 lbs	-	1	19.25 [489]	33.13[841]	33.13[841]	10.31[262]	4
DWR-18-32	38.50 [978]	35.63 [905]	31.50 [800]	18 SP	250 lbs	-	1	19.25 [489]	33.13[841]	33.13[841]	10.31[262]	4
DWR-21-17	43.75 [1111]	40.88 [1038]	36.75 [933]	21 SP	250 lbs	4	2	10.56 [268]	38.38[975]	19.19[487]	12.94[329]	5
DWR-21-22	43.75 [1111]	40.88 [1038]	36.75 [933]	21 SP	250 lbs	4	2	10.56 [268]	38.38[975]	19.19[487]	12.94[329]	5
DWR-24-17	49.00 [1245]	46.13 [1172]	42.00 [1067]	24 SP	300 lbs	4	2	10.56 [268]	43.63[1108]	21.81[554]	15.56[395]	5
DWR-24-22	49.00 [1245]	46.13 [1172]	42.00 [1067]	24 SP	300 lbs	4	2	10.56 [268]	43.63[1108]	21.81[554]	15.56[395]	5
DWR-24-26	49.00 [1245]	46.13 [1172]	42.00 [1067]	24 SP	300 lbs	4	2	10.56 [268]	43.63[1108]	21.81[554]	15.56[395]	5
DWR-24-32	49.00 [1245]	46.13 [1172]	42.00 [1067]	24 SP	300 lbs	4	2	10.56 [268]	43.63[1108]	21.81[554]	15.56[395]	5
DWR-35-17	68.25 [1734]	65.38 [1661]	61.25 [1558]	35 SP	300 lbs	4	2	10.56 [268]	62.88[1597]	21.00[533]	25.19[640]	6
DWR-35-22	68.25 [1734]	65.38 [1661]	61.25 [1558]	35 SP	300 lbs	4	2	10.56 [268]	62.88[1597]	21.00[533]	25.19[640]	6
DWR-35-26	68.25 [1734]	65.38 [1661]	61.25 [1558]	35 SP	300 lbs	4	2	10.56 [268]	62.88[1597]	21.00[533]	25.19[640]	6

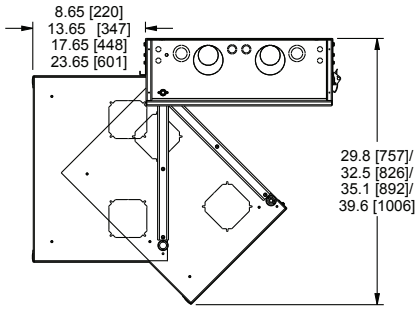


DWR Series
basic dimensions

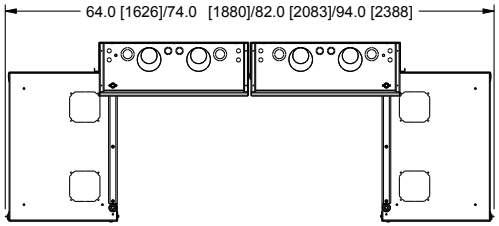


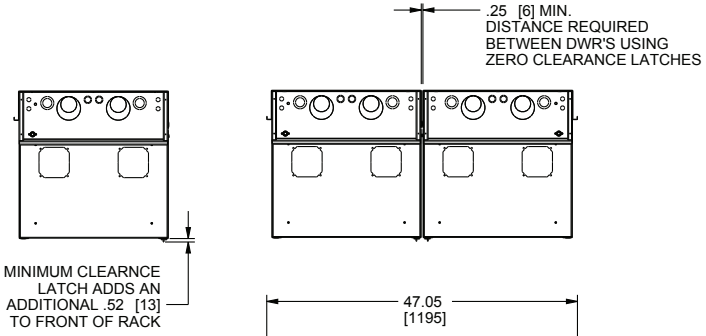
KNOCKOUTS PICTURED IN TOP VIEW ARE ALSO LOCATED ON THE BOTTOM VIEW



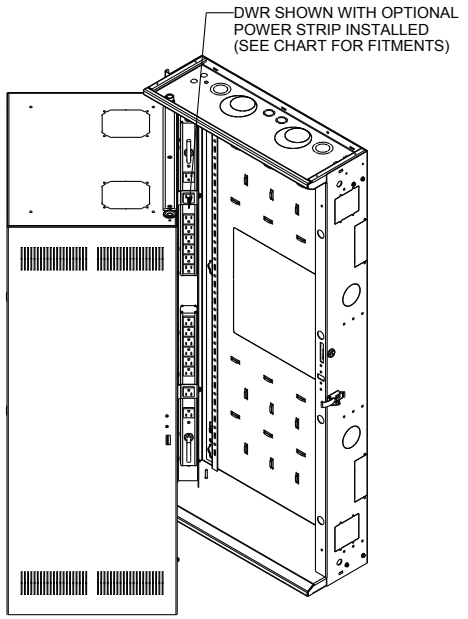


CENTER SECTION CLEARANCE





CENTER SECTION TRIM POWER		
	PD-815 SERIES (QTY)	PD-2415 SERIES (QTY)
DWR-10-xx	1	N/A
DWR-12-xx	1	N/A
DWR-16-xx	1	N/A
DWR-18-xx	1	N/A
DWR-21-xx	1 OR 2	N/A
DWR-24-xx	1 OR 2	N/A
DWR-35-xx	1 OR 2	1



NOTE(S):
1) DIMENSIONS ARE IN THE FORMAT IN [MM]

ROSE BRAND®

800-223-1624 | RoseBrand.com

Rose Brand Spec Sheet	**25oz. Charisma Velour, IFR**		
SKU #	VL250036 - VL250064		
Material Composition	100% Polyester		
Width	54 in	4.5 ft	137 cm
Weight	17 oz/sq yd	1.85 oz/sq ft	565 gr/sq mtr
Weight	25 oz/l yd	8.33 oz/l ft	775 gr/l mtr
Construction	Napped		
Woven or Knit	Woven		
Bale or Roll	Roll		
Bale/Roll Size in yard	Approximately 110 yds.		

ROSE BRAND®

800-223-1624 • 201-809-1730 | RoseBrand.com

Rose Brand Spec Sheet	**56” IFR Avora Lining, Black**		
SKU #	LINI0001		
Material Composition	100% Polyester		
Width	56 in	4’ 8”	142 cm
Weight	Approx. 6 oz/sq yd	Approx. 0.67 oz/sq ft	Approx. 203 gr/sq mtr
Weight	Approx. 9.3 oz/l yd	Approx. 3.1 oz/l ft	Approx. 290 gr/l mtr
Construction	Plain		
Woven or Knit	Woven		
FR Certifications/Compliances	Please see the FR certificates on our website for this product.		
Bale or Roll	Roll		
Bale/Roll Size in yard	Approx. 100		
Wash Fastness	Dry Clean Only		

Borders, Legs, Midstage Traveler, and Upstage Traveler

800-223-1624 | RoseBrand.com

Rose Brand Spec Sheet	**22 oz. Encore Velour, IFR**		
SKU #	VL220001 - VL220020		
Material Composition	100% Polyester		
Width	64 in	5.3 ft	163 cm
Weight	12 oz/sq yd	1.38 oz/sq ft	420 gr/sq mtr
Weight	22 oz/l yd	7.33 oz/l ft	681 gr/l mtr
Construction	Napped		
Woven or Knit	Knit		
Bale or Roll	Roll		
Bale/Roll Size in yard	Approximately 65 yds.		

Rose Brand

SHARKSTOOTH 8/2 SCRIM
(standard)

Fabric Specifications

Composition	100% cotton	
	8 twisted thread pairs/vertical inch 22 twisted threads/horizontal inch	
Finishing		
Color	available as natural (NFR), bleached white, standard colors (black, light blue, dark blue & grey), and custom colors	
Treatment	Vat immersion, centrifuge air dried	
Chemical	Flammentin AS	
Conformance	NFPA 701 (2004), test method #1 NFPA 701 (1989), small scale test California Reg. # F-545.07 NYC FD Reg. # 5149 Boston FD test IX-1 CAN ULC S109-03 BS 5438, Test 2, Part B DIN 4102 B1	
Harmonized Codes	Natural & white: Dyed:	6006.21.9080 6006.22.9080
Dimensions		
--Available widths	White & Black: 11', 15'-6", 19'-6", 25', 31', 35', 39' Light Blue: 15'-6", 19'-6", 31', 35' Dark Blue & Grey: 31' Natural (painter's): 36' and 39'	
--Unit weight	2.74 oz./yard^2	92.5 gms/m^2

Cyclorama

800-223-1624 • 201-809-1730 | RoseBrand.com

Rose Brand Spec Sheet	**32’ 9” IFR Extra Wide Trevira Muslin, White**		
SKU #	MUSP0020		
Material Composition	100% Trevira CS		
Width	393 in	32’ 9”	1000 cm
Weight	Approx. 5.9 oz/sq yd	Approx. 0.65 oz/sq ft	Approx. 200 gr/sq mtr
Weight	Approx. 64 oz/l yd	Approx. 21 oz/l ft	Approx. 2000 gr/l mtr
Construction	Plain		
Woven or Knit	Woven		
FR Certifications/Compliances	Please see the FR certificates on our website for this product.		
Bale or Roll	Bale		
Bale/Roll Size in yard	65.6		
Wash Fastness	Dry Clean Only		

ROSE BRAND®

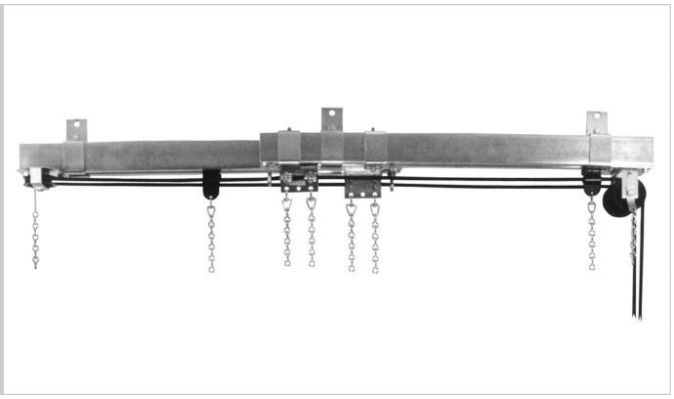
I am here:
ADC Silent Steel® 280 Series Track

WHAT'S RELATED

ALSO IN Curtain Track

- Request A Track Estimate
- ADC Besteel® 170 Series Track
- ADC Flex-I-Trac® 132 Series Track
- ADC Rig-I-Flex® 140 Series Track
- ADC Silent Steel® 280 Series Track
- ADC Specifine® 113 Series Track
- ADC Trak Eze® 220 Series Track
- ADC Tripl-I-Trac® 420/422 Series Track
- ADC T-Lift 2.0™
- ADC Patriarc® 500 Series Track
- Kirsch Ripplefold® Track
- Kirsch Series 9600 Track
- Motors
- Triple E 2WAY Track System
- Triple E ERAIL
- Triple E CHAINTRACK
- Triple-E CHAINBEAM
- Triple E CHAINRAIL
- Triple E UNIBEAM System
- Triple E UNITRACK System
- Accessories

ADC Silent Steel® 280 Series Track



Instructions for Hand Operated Models: 280, 281, 282, 280-A, 283-N, 283-R

Call 800-223-1624 or email for CWANA full system pricing.

Parts and track channel can be ordered below.

SILENT STEEL® is the most famous name in heavy-duty stage tracks. The model 280 steel series is used in the majority of stage installations with heavy weight curtains of any length, and is particularly quiet in operation. Models 281 and 282 are for use with especially heavy curtains. They are identical to Model 280 except neoprene-tired ball-bearing carriers are supplied with Model 281, while larger diameter floor and end pulleys and heavy duty nylon-tired ball-bearing carriers are furnished with Model 282.

Model 280 series tracks cannot be curved, and they use one carrier per foot of track.

Ordering a track system for drapery or scenery requires some expert advice. Get great advice and track system pricing quickly by submitting a request for a Custom Track System Quote online. Once your quote request is submitted, we'll contact you to validate information and guide you through the selection process. Don't worry if you don't have all answers upfront. We're here to help.

Show Comparison of Checked Items | Sort By | Search Within Results

Silent Steel® 280 Series Complete Track System (CWANA*)



The Model 280 steel series is used in the majority of stage installations with heavy weight curtains of any length.

Compare View Comparison

Price Ranges

2800 Silent Steel® Track Channel



14 gauge galvanized steel.

Compare View Comparison

Price Ranges

$270.06 - $662.88

2800A Silent Steel® Track Channel



12 gauge aluminum or supplied with a black anodized finish.

Compare View Comparison

Price Ranges

$385.98 - $716.82

1483INV Inverted Leg Wall Bracket



Allows the tracks to be mounted closer to the ceiling.

Compare View Comparison

Price Ranges

$62.07

1483UNI Universal Wall Bracket



Wall Bracket used with bi-parting or one way track systems. 280/170/140/132 series tracks.

Compare View Comparison

Price Ranges

$70.65

2801 Single Carrier



Block constructed of nylon material supported from ball-bearing with 2 heavy duty polyethylene wheels.

Compare View Comparison

Price Ranges

$13.47 - $14.70

2801A Single Carrier with Steel Block and Gate



Carrier block is constructed of plated steel and is supported from 2 heavy-duty polyethylene wheels mounted via a ball-bearing in the carrier body.

Compare View Comparison

Price Ranges

$35.40 - $40.63

2801B Single Carrier with Steel Block



Block constructed of nylon material supported from ball-bearing with 2 heavy duty polyethylene wheels and steel block.

Compare View Comparison

Price Ranges

$18.23 - $23.48

2802 Master Carrier



Block constructed of plated steel supported from 2 ball-bearings with 4 heavy duty polyethylene wheels and 2 cable clips.

Compare View Comparison

Price Ranges

$47.26 - $53.96

2802B Master Carrier with Brake



One foot in length and features nylon-tired, ball-bearing wheels.

Compare View Comparison

Price Ranges

$416.22

2802B4 Master Carrier with Brake



This custom unit is similar to the 2802B but is 4 feet in length and features nylon-tired, ball-bearing wheels.

Compare View Comparison

Price Ranges

$411.62

2803 Live End Pulley



Equipped with 2 oil-impregnated sleeve-bearing nylon wheels.

Compare View Comparison

Price Ranges

$111.32 - $134.63

2803-B Center Take-Off Pulley



This pulley is used when it is necessary to route the operating cables perpendicular to the track at track elevation.

Compare View Comparison

Price Ranges

$357.53

2803-F Flying Live End Pulley



This live-end pulley is only used with flying type curtain machines.

Compare View Comparison

Price Ranges

$385.25

2803-H Horizontal Live End Pulley



This pulley routes the operating lines horizontally and at a 90 degree angle relative to the track

Compare View Comparison

Price Ranges

$119.38

2804 Dead End Pulley



Equipped with 1 oil-impregnated sleeve-bearing nylon wheel.

Compare View Comparison

Price Ranges
$59.12 - $74.83

2805 Adjustable Floor Pulley



Steel side plates, equipped with 1 oil-impregnated sleeve-bearing nylon wheel.

Compare View Comparison

Price Ranges
$82.87 - $125.88

2806 Basic Floor Pulley for 280



Non-adjustable type with oil impregnated sleave bearing nylon wheel.

Compare View Comparison

Price Ranges
$73.05

2807 Lap Clamp



For attaching double-sectioned track at center overlap.

Compare View Comparison

Price Ranges
$13.18 - $27.90

2808 Hanging Clamp



Recommended spacing: 7 feet. Steel chain or cable suggested for track suspension.

Compare View Comparison

Price Ranges
$8.64 - $12.64

2808-ID Hanging Clamp with Cord Support



Used to support the operating cord/cable on track systems with large spans where the cord/cable may sag between the center overlap and the end pulleys.

Compare View Comparison

Price Ranges
$52.27

2809 End Stop



Prevents carriers from moving beyond selected position in track.

Compare View Comparison

Price Ranges
$8.51 - $12.66

2809 R End Stop 28 Rotodraper

Used with 28 or 28A Rotodraper

Compare View Comparison

Price Ranges
$10.15

2814 Pipe Clamp



For 1-1/4" I.D. Schedule 40 pipe.

Compare View Comparison

Price Ranges
$16.42 - $19.80

2815 Pipe Clamp



For 1-1/2" I.D. Schedule 40 pipe.

Compare View Comparison

Price Ranges
$16.95 - $21.04

2816 Pipe Clamp



For 2" I.D. Schedule 40 pipe.

Compare View Comparison

Price Ranges
$16.17 - $24.36

2821 Wall Bracket



4-1/2" long x 2" wide x 5-3/8" high

Compare View Comparison

Price Ranges
$27.06 - $31.50

2822 Pocket Bracket



1- 3/4" long x 2" wide x 5-5/8" high

Compare View Comparison

Price Ranges
$25.34 - $28.14

2823 Ceiling Bracket



Ceiling Bracket used when it is not possible to attach directly to ceiling.

Compare View Comparison

Price Ranges
$34.86 - $38.30

2824 Splice Clamps



Two piece 11 gauge clamp for joining and extending track sections.

Compare View Comparison

Price Ranges
$87.45 - $113.77

2824-A Ceiling Splicing Clamp



Two piece 11 gauge clamp for joining track sections.

Compare View Comparison

Price Ranges
$91.46 - $126.94

2825 Rubber Bumper



Attachment to 2801 Single Carriers. Function as noise reducer.

Compare View Comparison

Price Ranges
$0.20

2826 Rubber Spacer



For use with Back-Pack guides to provide quieter operation.

Compare View Comparison

Price Ranges
$0.28

2827 Rubber Spacer



For use with Back-Pack guides to provide quieter operation.

Compare View Comparison

Price Ranges
$0.47

2827A Rubber Spacer



For use with Back-Pack guides to provide quieter operation.

Compare View Comparison

Price Ranges
$0.60

2833 Back Pack Guide



Provides sliding door effect.

Compare View Comparison

Price Ranges
$7.31 - $10.41

2833-A Back Pack Guide



Used with Model 283-N and Model 283-R manually operated tracks.

Compare View Comparison

Price Ranges
$10.65 - $13.77

2834 Back Pack Guide



For machine operated tracks.

Compare View Comparison

Price Ranges
$7.29 - $10.29

2840 Masking Master Carrier



For moving panels or side masking curtains.

Compare View Comparison

Price Ranges
$267.15

2848 Space Saver



Used to reduce the amount of curtain stacking.

Compare View Comparison

Price Ranges
$9.27

Load Next 40 Search Results

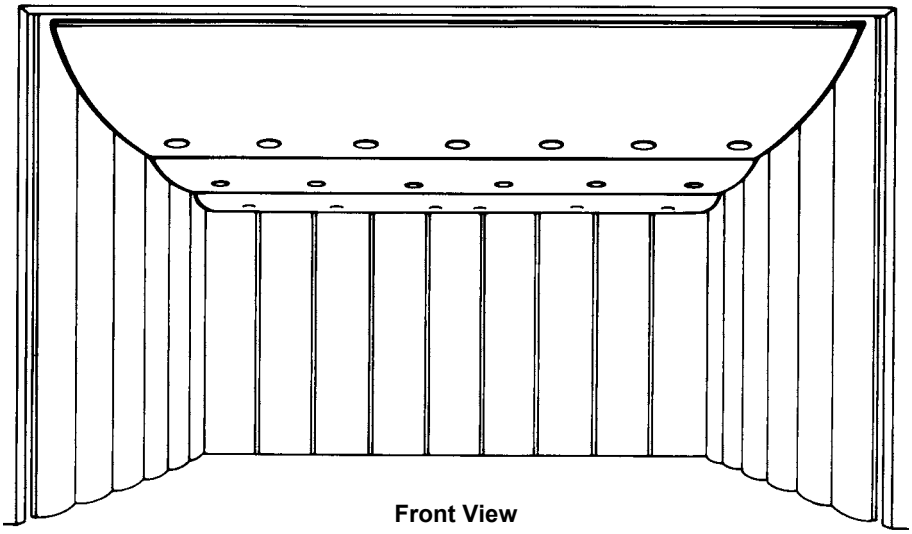
TECHNICAL SHEET

Diva® Acoustical Shell

General

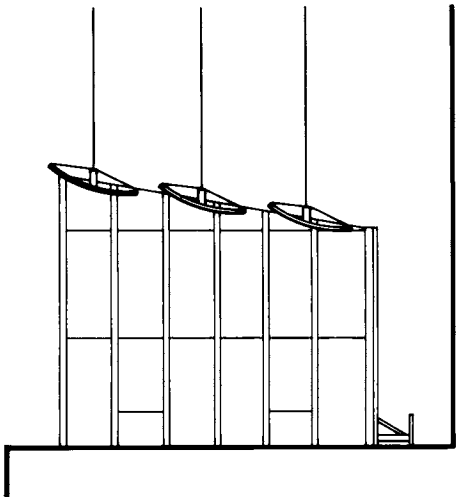
- Mobile towers and rows of ceiling panels form a full stage acoustic enclosure when placed together on stage
- Separate air transporter or wheeled mover easily lifts and moves the towers
- Towers nest for storage backstage, ceiling panels hang from rigging and are stored in fly-loft
- Towers and ceilings are constructed from composite, stressed skin panels
- Finishes available include:
  - Wilsonart® High Pressure Laminate
  - Hardwood Veneer stained and finished to match space requirements
  - Painted panels with Sherwin-Williams® Kem® Aqua painted finish
- Tower and ceiling panel framework is constructed of aluminum
- Door, wing and ceiling panel hinges feature self-lubricating bearings for continuously smooth and quiet operation
- Trim strips on towers prevent backstage light from shining between the panels and may be painted to complement the shell
- Patented designs
- Five-year warranty
- Environmental attributes and LEED compliance for these products can be found at www.wengercorp.com/GREEN or by contacting your Wenger representative

Because of the component nature of the Diva Acoustic Shell, different configurations may be created by using different numbers of towers and ceiling panels.
For instance, fewer towers and ceiling rows can be used to create a smaller shell for chamber music or choral performances.



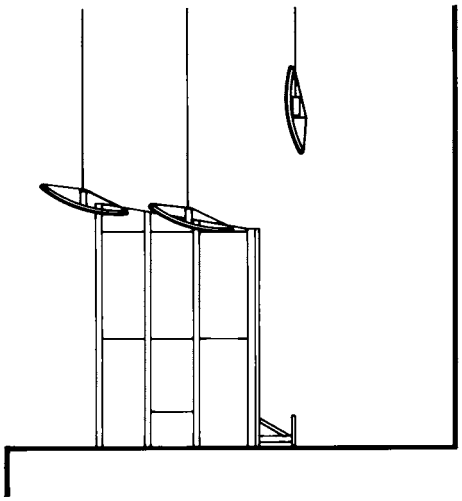
Front View

Performance position.



Side View

Full set of towers and ceiling panels used for a full ensemble.

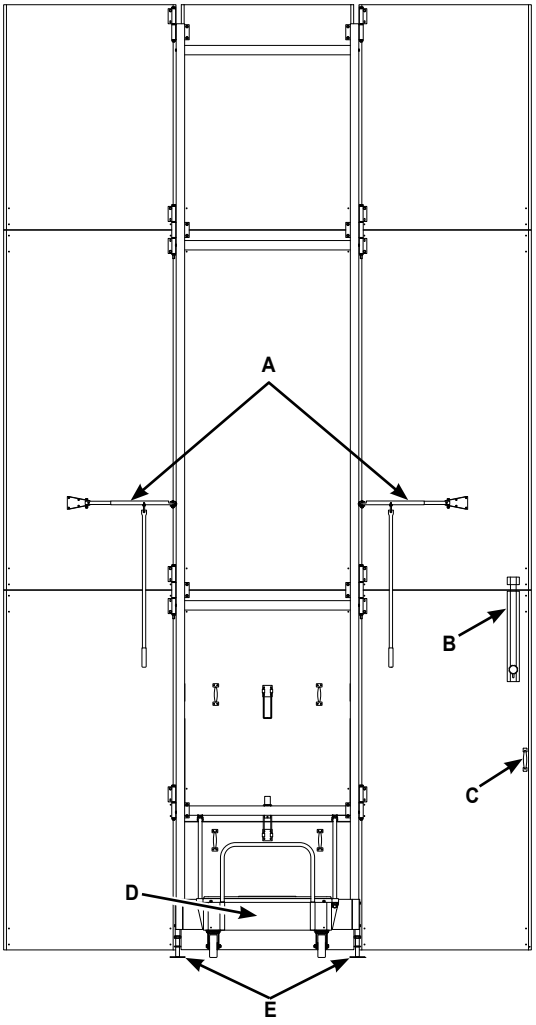


Side View

Fewer towers and ceiling panels used for a smaller ensemble.

Tower

- All towers feature panels with a 5' (1524 mm), 10' (3048 mm) or 20' (6096 mm) radius curve
- Each tower consists of one center panel and two adjustable wing panels
- Towers are available in heights from 16' (4877 mm) to 32' (9754 mm). Custom towers can be as high as 40' (12192 mm).
- Lower wing panels can be used as a door as required
- Double doors allow access of large equipment, including concert grand pianos
- Framework of towers and base are constructed of extruded aluminum and steel weldments
- Diagonal bracing between the tower frame and the base distributes weight over several areas of the tower assembly
- Each tower is equipped with a counterweighted base assembly for stability
- A telescoping wing-stay locks tower wings in performance or storage positions
- Extruded aluminum bearings incorporate bronze Oilite® bearings
- Each tower incorporates leveling adjustment mechanisms
- Towers nest one within another to minimize storage space
- The back side of towers are painted black
- Five-year warranty



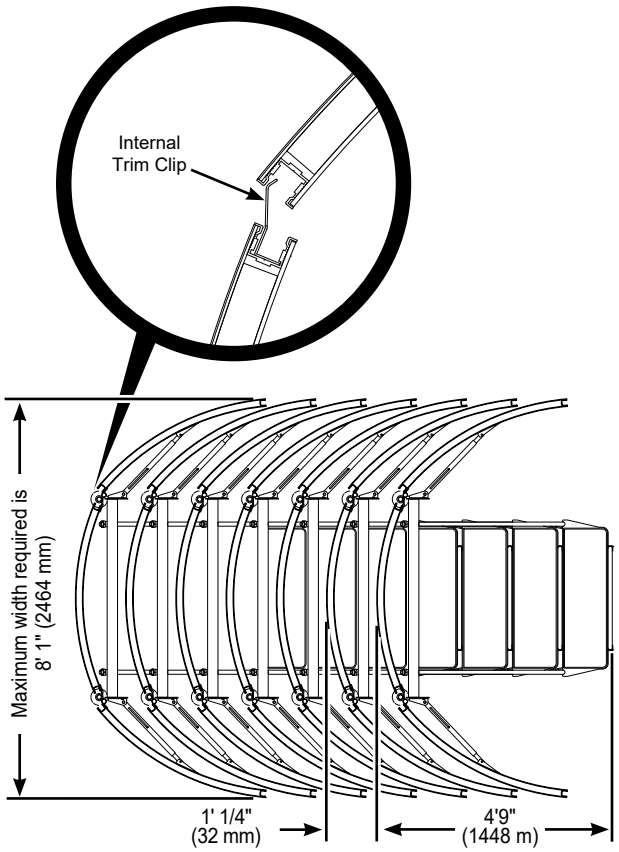
Back View

Telescoping wing-stays lock wings into performance and storage positions (A).

The door lock (B) and door handle (C).

The counterweighted base (D) provides shell stability when shell is stationary or being moved on stage.

The shell rests on leveling pads (E) for uniform set-up on uneven floors.



4' 9" (1448 mm) first tower, add 1' 1/4" (32 mm) each additional tower.

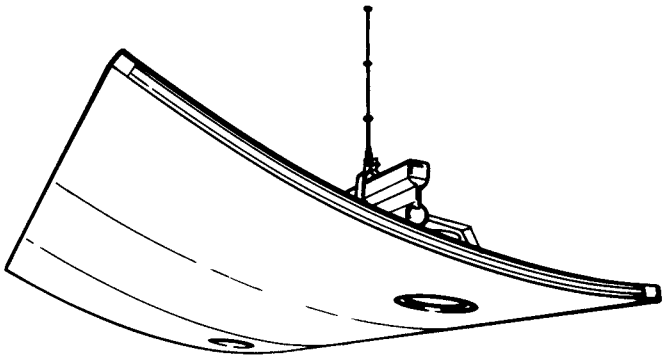
Top View

Showing how Diva Towers nest together in the storage position, minimizing required storage space.

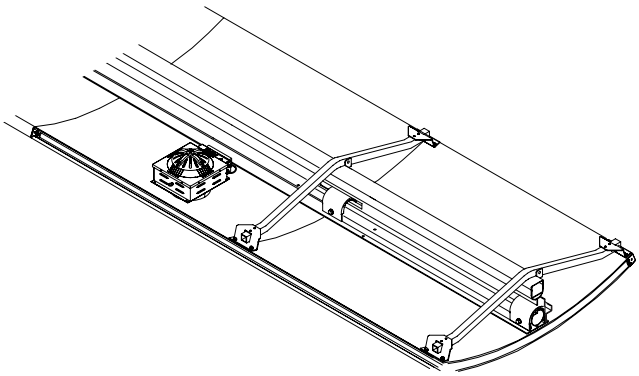
Shell Ceiling Panels

- Shell ceiling panels have either 5' (1524 mm), 10' (3048 mm) or 20' (6096 mm) radius curves and are available in various single or triple configurations
- Ceiling panels store in a vertical position, and rotate to pre-set, adjustable performance angles
- Ceiling panels are balanced so that each row requires no more than two people to deploy
- Shell ceiling panels feature an integral aluminum alloy truss and hang from stage rigging pipe battens
- Extruded aluminum hinges incorporate bronze low friction acetyl bearings
- Ceiling storage profile can be as little as 13-1/2 (343 mm)
- The back side of ceiling panels are painted black
- Optional integrated Wenger® Lieto™ LED light fixtures are available
- Ceiling panel truss features an ETL rated integral raceway so separate plug strips are not required
- Five-year warranty

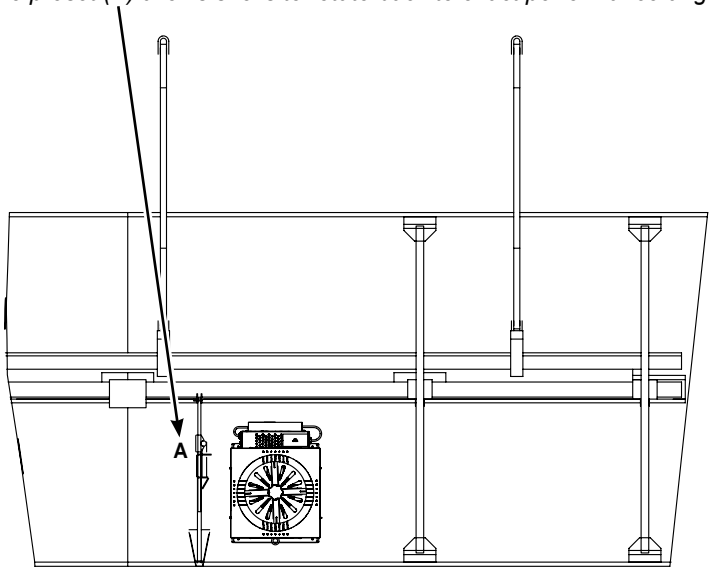
Ceiling panels with built-in truss hang from stage rigging.



Ceiling panels feature the option of integrated Wenger Lieto LED light fixtures.



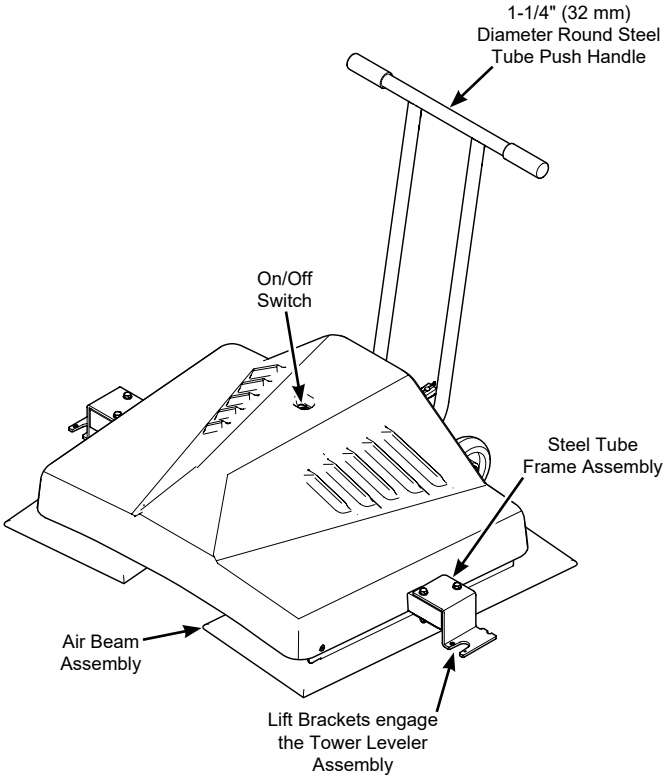
Ceiling panels easily tilt into storage position.
Adjustable preset (A) allows shells to rotate back to exact performance angle.



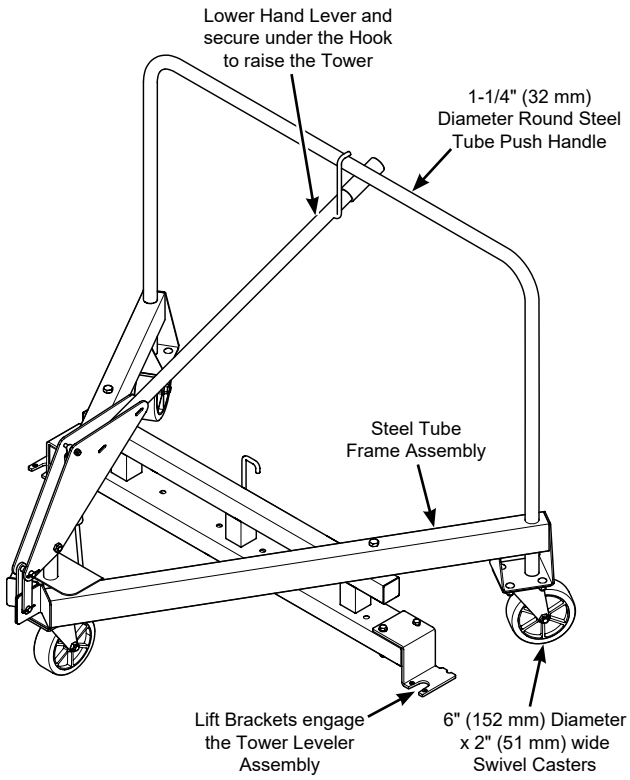
Rear View of a 10' (3048 mm) radius ceiling panel.

Tower Transporters

- A separate air transport unit makes lifting and transporting the towers an easy job
- A cushion of air carries most of the tower's weight, which prevents damage to stage floor
- Moves the tower easily in any direction, so it is easier to position
- Requires standard 110-volt 15 amp circuit
- A wheeled mover is also available
- Five-year warranty



Air Transporter



Wheeled Mover

The Air Transporter lifts majority of the tower weight and maneuvers shell in all directions for exact placements and easy mobility to and from storage.

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MUSIC EDUCATION AND PERFORMING ARTS
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Syracuse Office: Phone 800.836.1885 Worldwide +1.315.451.3440 | jrclancy.com | 7041 Interstate Island Road | Syracuse | NY 13209-9713
ATHLETICS Phone 800.493.6437 | email gearboss@wengercorp.com | gearboss.com | 555 Park Drive, PO Box 448 | Owatonna | MN 55060-0448



SSHS BUILDING FINISHES

FINISH MATERIAL SCHEDULE:

Classroom & Offices
Flooring: Armstrong Vinyl Composition Tile with Rubber Wall Base
Sealed Concrete (GCC Shops)
Walls: Paint
Ceiling:

Band, Choir & Dance Classrooms
Flooring: Harlequin Activity Black Vinyl Finish
Walls: Paint, Acoustical Wall Panels
Ceiling:

Library
Flooring: Roppe Rubber Tile Marbleized Colors
Walls: Paint, Acoustical Wall Panels
Ceiling:

Gymnasium
Flooring: Roppe Rubber Tile Marbleized Colors (Offices, Locker Rooms, Weight Room, etc)
Robbins Pulastic (Main Gymnasium Space)
Walls: Paint, Acoustical Wall Panels
Ceiling:

Cafeteria
Flooring: Roppe Rubber Tile Marbleized Colors
Daltile Quarry Tile (Kitchen Area)
Walls: Paint, Acoustical Wall Panels
Ceiling:

Retrooms
Flooring: Daltile Median
Walls: Daltile Median
Ceiling:

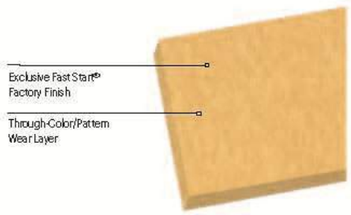
ArmstrongFlooring

VINYL COMPOSITION TILE (VCT) **Standard Excelon® Imperial® Texture**

Product Information

Construction - Vinyl Composition Tile
International Specifications - ASTM F1066 - Class 2 Through Pattern, ISO 10595, Type II
Overall/Wear Layer Thickness - 1/8 in. (3.2 mm), 3/32 in. (2.4 mm)
Factory Finish - Fast Start®
Installation - Adhesives: S-515, S-525
Maintenance Options - Polish

1/8" and 3/32" sizes are stocked for these colors: 51830, 51835, 51839, 51858, 51859. All other colors are stocked in 1/8" size; 3/32" is available on a special order basis, minimum order quantity of 45,000 sq ft² (4181 m²).



Packaging

Size	Tile per Carton/Coverage	Shipping Weight per Carton
12 in. x 12 in. (305 mm x 305 mm)	45 - 45 ft² (4.18 m²)	1/8 in. - 63 lbs./carton (28.6 kg) 3/32 in. - 48 lbs./carton (21.7 kg)

Testing

Performance	Test Method	Requirement	Performance vs. Requirement
ASTM F1066			
Thickness	ASTM F386	Nominal ± 0.005 in.	Meets
Size	ASTM F2055	± 0.016 in. per linear foot	Meets
Squareness	ASTM F2055	0.010 in. max.	Meets
Indentation - One Minute	ASTM F1914	≥ 0.006 in. to ≤ 0.015 in.	Meets
Indentation @ 115° F	ASTM F1914	< 0.032 in.	Meets
Impact	ASTM F1265	No cracks beyond limit	Meets
Deflection	ASTM F1304	1.0 in. minimum	Meets
Dimensional Stability	ASTM F2199	≤ 0.024 in. per linear foot	Meets
Chemical Resistance	ASTM F925	No more than slight change in surface dulling, attack or staining	Meets
Resistance to Heat	ASTM F1514	ΔE < 8.0	Meets
Additional Testing			
Static Load Resistance	ASTM F970*	< 0.005 in.	2000 psi
Fire Test Data - Flame Spread	ASTM E648	0.45 W/cm² or more Class 1	Meets
Fire Test Data - Smoke Evolution	ASTM E662	450 or less	Meets
Fire Test Data - Canada	CAN/ULC S102.2	Use dependent	Flame Spread - 0 Smoke Developed - 30
ADA Standards for Accessible Design	Chapter 3 Section 302.1	Floor surfaces shall be stable, firm and slip-resistant	Meets
Static Coefficient of Friction**	ASTM D 2047/UL 410	≥ 0.5	Meets

Maritime Usage

IMO Resolution A653 (16)	
Surface Flammability IMO MSC 61(67) Annex 1 Part 5 and Annex 2	Passes
Smoke and Toxicity IMO MSC 61(67) Annex 1 Part 2 and Annex 2	Passes
Safety Of Life at Sea (SOLAS)	Compliant
United States Coast Guard	Approved

ArmstrongFlooring

VINYL COMPOSITION TILE (VCT) **Standard Excelon® Imperial® Texture**

Sustainability

WELL v1 Feature		Imperial Texture	Contribution
Air	Feature 04 - VOC Reduction	✓	Tested and third party certified by FloorScore® as complying with CDPH v1.2
	Feature 11 - Fundamental Material Safety	✓	Product is free of asbestos and added lead (Part 1)
	Feature 25 - Toxic Material Reduction	✓	Free of flame retardants (Part 2)
Mind	Feature 97 - Material Transparency	✓	Readily available Health Product Declaration® (HPD) to 1000 ppm
	Feature 88 (Part 2) Biophilia I - Qualitative	✓	Products available that incorporate nature patterns
	Feature 99 - Beauty and Design II	✓	Patterns and colors to aid in wayfinding and spatial familiarity (Part 3)

WELL v2 Feature		Imperial Texture	Contribution
Air	Feature X12 - Short Term Emission Control	✓	Adhesives associated with product are tested and third party certified by FloorScore as complying with CDPH v1.2
	Feature X11 Long-Term Emission Control	✓	Flooring is tested and third party certified by FloorScore as complying with CDPH v1.2
	Feature X01 Fundamental Material Precautions	✓	Product is free of asbestos
Materials	Feature X10 Volatile Organic Compound	✓	Free of flame retardants (Part 2)
	Feature X14 Material Transparency	✓	Readily available Health Product Declaration® (HPD) to 1000 ppm
Mind	Feature M02 Access to Nature	✓	Products available that incorporate nature patterns
Community	Feature C13 (Part 2) Accessibility and Universal Design	✓	Patterns and colors to aid in wayfinding and spatial familiarity

LEED™ v4.1	Imperial Texture
BPDO - EPD	Product Specific certified by ASTM International
BPDO - Material Ingredient	HPD
BPDO - Sourcing	Recycled Content – 25% Total (5% Post-Consumer and 20% Pre-Consumer) Extended Producer Responsibility – On&On™ Recycling Program
Location of Manufacturer	USA
Low Emitting Flooring	Tested and third party certified by FloorScore as complying with CDPH v1.2
Low Emitting Adhesives	Tested and compliant to CDPH v1.2, Methylene Chloride and Perchloroethylene not intentionally added, FloorScore Certified
SCAQMD #1168 Compliant. Adhesives meet <50 g/L requirement.	S-515 – 0 g/L S-525 – 16 g/L

Carbon Footprint	Imperial Texture
Global Warming Potential, including Biogenic Carbon Raw Materials (A1) through Production (A3)	0.33 Kg CO^2 eq. / square foot (3.52 Kg CO^2 eq. / square meter)

Limited Warranty

5-year Commercial Warranty when installed in strict accordance with the detailed instructions.

Visit ArmstrongFlooring.com
for complete Product, Technical, Adhesives, Installation & Maintenance recommendations.

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The Health Product Declaration® is a registered trademark of HPD Collaborative.

*Testing at loads above 125 psi is outside the scope of the test method. Since testing is conducted on uninstalled flooring, results do not consider the performance of the adhesive, underlayment, or subfloor. These test results are not an indicator of the installed flooring system performance. **Using the James Machine as described in D2047 and as directed in UL 410 for floor covering materials (FCM) using a leather foot under dry conditions. The application of site-applied floor sealers, polishes and other types of finishes routinely used to maintain resilient flooring materials will change the walking surface and consequently the SCOF value.

Standard EXCELON® Imperial® Texture ■ MultiColor™



Standard EXCELON® Imperial® Texture ■ MultiColor™



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Smooth Rubber Tile, Marbleized M627 Mariner, M137 Cinnabar, M626 Tangerine, M198 Ivory



Red List Chemical Free

proudly made in the USA

rubber tile

- Free of Red List chemicals, PVC, phthalates and halogens. The ReNew palette is also cork-infused and contains 13% bio-based content from rapidly renewable resources.
- Made in the U.S.A. and meets GREENGUARD GOLD, FloorScore®, NSF332 Platinum and CHPS criteria. At end of life, this product can be recycled through the IMPACT take-back program.
- Designed for high durability and ease of maintenance throughout the product life cycle.
- Stands up well to constant traffic from wheelchairs, shopping carts, luggage carriers or dollies and resists scuffing, gouging, most chemicals and common substances.
- Provides underfoot comfort, reduced noise from foot traffic and has an inherent slip resistance.
- All colors available at a Single Price Point within your selected palette. ReNew palette is available in Smooth, Hammered and Textured profiles only. Fiesta® and Symmetry palettes are available in Dimensions profiles as a special order.

RAISED DESIGN, SMOOTH FINISH AND DIMENSIONS PROFILES

- Seven Raised Design profiles: Slate Design, Low Profile Raised Design, Textured Design, Raised Square Design, Raised Circular Vantage Profile, Hammered and Warning Tile Design – designed for high durability and ease of maintenance throughout the product life cycle. Most profiles available 19-11/16" x 19-11/16" tile sizes and 1/8" gauge.
- Smooth finish: Available in 19-11/16" x 19-11/16", 12" x 12" and 36" x 36" tile sizes and 1/8" and 3/16" gauges.
- Three Dimensions profiles: Cradle, Random and Stripe. Designed for high durability and ease of maintenance throughout the product life cycle. Available in 19-11/16" x 19-11/16" tiles and 1/8" gauge.



Health Product Declaration® is available at roppe.com



Environmental Product Declaration® is available at roppe.com

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MARBLEIZED COLORS
(For all rubber tile and tread profiles excluding Hammered R24.)

M100 black	M177 steel blue	M150 dark gray	M193 Black brown	M123 charcoal	M114 lunar dust	M129 dolphin	M178 pewter
M194 burnt umber	M148 steel gray	M175 slate	M174 smoke	M197 iceberg	M110 brown		
M147 light brown	M182 toffee	M623 nutmeg	M624 chameleon	M140 fawn	M191 camel	M125 fig	M171 sandstone
M130 buckskin	M198 ivory	M632 flax	M184 almond	M170 white	M131 bisque	M127 harvest yellow	M631 sahara
M639 beigewood	M640 creekbed	M122 natural	M195 light gray	M663 aged fern	M648 pear green	M647 spring dill	M646 gecko
M160 forest green	M649 sweet basil	M169 hunter green	M662 envy	M118 peacock	M187 blue	M139 deep navy	M627 mariner
M618 aubergine	M665 horizon	M664 blue jay	M656 bluebell	M654 lagoon	M638 cadet	M637 night mist	M655 peaceful blue
M657 sorbet	M658 berry ice	M621 merlin	M659 grape	M196 red	M137 cinnabar	M188 brick	M617 terracotta
M660 citrus	M661 marmalade	M643 mimosa	M644 sunbeam	M642 jonquil	M645 blonde	M641 moonrise	M161 snow

Robbins SPORTS SURFACES Classic 110

PULASTIC CLASSIC 110

A seamless multi-purpose sports floor that provides strength and performance for all levels of play and competition

25 YEAR WARRANTY!





PULASTIC® SPORTS FLOORING

- Pulastic Classic 110 is approved according to the EN 14904 Standard - Category P1
- Approved by FIBA and IHF
- Manufactured under ISO 9001, ISO 14001, and CSR Level 3 (ISO 26000)
- Good resiliency for comfort and injury prevention
- Seamless, non-porous and smooth surface for easy maintenance, repair and resurface options
- Excellent contact noise reduction for outstanding acoustic isolation
- Sustainability through high content of recycled and rapidly renewable raw materials
- Water based finish for very low odor during installation and maximum indoor clean air protection during use
- Outstanding mechanical strength and wear resistance for optimal life cycle cost and maximum usability

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Robbins SPORTS SURFACES Classic 110

INDOOR | MULTI- PURPOSE | BASKETBALL | VOLLEYBALL
AEROBICS | TRAINING FACILITY | COMPETITION LEVEL

Product Specifications

Nominal Thickness	11 mm	
Character	Point-Elastic	
Shock Absorption	28%	EN 14808
Vertical Deformation	1.4 mm	EN 14809
Ball Bounce	98%	EN 12235
Resistance to Rolling Load	≥ 1500 N	EN 1569
Resistance to Impact	≥ 800 gr @ 10˚C	EN 1517
	≥ 1200 gr @ 17˚C	EN 1517
Resistance to Indentation	0.35 mm @ 5 min	EN 1516
	0.15 mm @ 24 hrs	EN 1516
V.O.C. Content- Adhesive	Solvent Free	
V.O.C. Content- Finish	45 gr/lit	ASTM D 3960
Elongation at break- Structure	150%	DIN 53455
Tensile Strength- Structure	8 N/mm²	DIN 53455
Tear Strength- Structure	25 N/mm	DIN 53515
Warranty	25 YEAR manufacturer's warranty	

16 Classic Colors to Choose From



*Custom color options available. Due to printer variation, actual floor colors may be slightly different from colors above. Consult your dealer for color accuracy.

Classic 110 Meets the Following Organizational Approvals

robbinsfloor.com | 1.800.543.1913

Robbins, Inc. | 4777 Eastern Avenue | Cincinnati, OH 45226

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HARLEQUIN

Harlequin **Activity®**

Harlequin Activity is a permanently installed sprung floor system, based on the well-established 'triple-sandwich' construction originated by Harlequin over 30 years ago. It's a fully floating system with no fixings to the sub-floor and can be laid on any reasonably smooth and flat surface without prior preparation.

Harlequin Activity is shock-damped to avoid a 'trampoline' effect and provides area and point elasticity to offer identical characteristics across the whole floor. An 'industry standard' choice, when correctly reinforced, it can withstand heavy loading including retractable seating.

Harlequin Activity is only available for installation by our Contracts Division. Activity can be installed with a Harlequin vinyl performance surface for all types of dance. A hardwood surface is available for specifiers who need a surface for multi-purpose use, including traffic by the general public, full stage entertainment, ballroom dance, or when required to match existing décor.

Activity with Vinyl Surface



Activity with Hardwood Surface



Specification Guide

Installation	Permanent
Finish	Harlequin Vinyl Performance or Approved Hardwood Surface
Weight	37-40 lbs/yd² (vinyl surface) 47-50 lbs/yd² (hardwood surface)
Overall Thickness	2⅛" (2.125) nominal (vinyl surface) 2¼" (2.25) nominal (hardwood surface)
Testing Standards	DIN 18032-2
Average Shock Absorption (Min. 53%)	59.4%
Vertical Deformation (Min. 2.3mm)	3.8mm
Area Deflection (Max 15%)	7.2%
Rolling Load (Min. 1500N)	>1500 N

Harlequin Sprung Floor Application Guide

Along with Harlequin Activity, we offer additional sprung flooring options, which are listed below along with the recommended surface. These recommendations are based on experience and customer preference only. Please contact a Flooring Specialist to determine which option best suits your requirements.

✓ = We recommend.

	Allegro	Cascade	Fiesta	FreeStyle	Hardwood	Hi-Shine	Marine	Reversible	Reversible Pro	Standfast	Studio	Studio B
Activity		✓	✓	✓	✓		✓			✓	✓	✓
AeroDeck		✓	✓	✓		✓		✓	✓	✓	✓	✓
Flexity		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Liberty HD		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Liberty LatchLoc		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
WoodSpring		✓	✓	✓	✓		✓			✓	✓	✓

CALL 800-642-6440 or VISIT www.harlequinfloors.com

For samples or information on Harlequin Floors complete range of vinyl and sprung floors.

American Harlequin Corporation
1531 Glen Avenue
Moorestown, NJ 08057

(800) 642 6440
contact@harlequinfloors.com
harlequinfloors.com

The Company reserves the right to make any variation in design or construction of the material described.
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TOKYO

STONE LOOK

MEDIAN™

COLORBODY™ PORCELAIN

SIZES:

24 x 24 Floor Tile | 12 x 24 Floor Tile

FINISHES: MATTE | POLISHED | TEXTURED

COLOR PALETTE



WHITE | BEIGE | TAUPE | LIGHT GRAY | GRAY | CHARCOAL

FLOOR TILE



WHITE MN40 | BEIGE MN41 | TAUPE MN42

LIGHT GRAY MN43 | GRAY MN44 | CHARCOAL MN45

SLIP RESISTANT | WATERPROOF | STAINPROOF | DENTPROOF | SCRATCH-RESISTANT* | FIRE-RESISTANT | CLIMATEPRO™ | SIMPLICLEAN™

VISIT THE WHY TILE PAGE AT WWW.DALTILE.COM FOR A COMPLETE LIST OF QUALIFICATIONS AND EXCLUSIONS.

MEDIAN™

COLORBODY™ PORCELAIN

STONE LOOK

SIZES

		Thickness	Sq. Ft./ Carton	Pieces/ Carton
24 x 24 Floor Tile*	(23-5/8" x 23-5/8") (60.00 cm x 60.00 cm)	3/8"	15.50	4
12 x 24 Floor Tile	(11-3/4" x 23-5/8") (29.85 cm x 60.0 cm)	5/16"	13.45	7

* Textured finish available in 24 x 24 size only.

APPLICATIONS

	Target DCOF wet	Suitable
Dry & Level – Interior Floor	N/A	✔
Wet & Level – Interior Floor	≥ 0.42	✔*
Shower Floors (Residential or Light Commercial)	≥ 0.42	
Exterior Floor Applications (including patios, pool decking & other wet areas with minimal footwear)	≥ 0.60	✔**
Ramps & Inclines	≥ 0.65	
Walls/Backsplashes	N/A	✔
Countertops	N/A	✔
Pool Linings	N/A	

A DCOF value of ≥0.42 is the standard for tiles specified for level interior spaces expected to be walked upon when wet, as stated in ANSI A137.1-A326.3. For more information about DCOF and the DCOF AcuTest™, visit daltile.com/DCOF.

APPLICATION NOTES:

Suitable for exterior applications (provided it is noted as suitable in the applications chart above) in freezing and non-freezing climates, when proper installation methods are followed.

* Matte and Textured only.

** Textured only.

PERFORMANCE CHARACTERISTICS

	ASTM#	Textured Result	Matte Result	Polished Result
Water Absorption	C373	< 0.5%	< 0.5%	< 0.5%
Breaking Strength	C648	> 275 lbs	> 275 lbs	> 275 lbs
Scratch Hardness	MOHS	8.0	6.0	5.0
Chemical Resistance	C650	Resistant	Resistant	Resistant

For additional information on test results, visit us at: daltile.com/information/TestResults.

TRIM

	Type	Number	Size	Pieces/ Carton
	Floor Bullnose*	S44F9	4 x 24	12
	Cove Base◂	P36C9TB	6 x 12	22
	Cove Outcorner◂	PC36C9TB	1 x 6	15

Cove base trim is intended to coordinate with floor tile in the standard 90-degree installation position.

Cove base and cove corner trim are suitable for non-freezing climates only.

* Available in Matte and Polished finishes only.

◂ Available in Matte finish only.

INSTALLATION

Grout Joint Recommendation	Shade Variation
1/8" (3/16" when installing tile with a length 15" or greater in a staggered brick-joint pattern; overlap should not exceed 33%.)	Medium (V2)

DURABILITY

Floor Surface Wear Resistance

1 Residential Bathrooms | 2 All Residential Areas | 3 All Residential / Light Commercial* | 4 All Residential / Commercial*

* Polished finish only.
* Matte and Textured finishes only.

NOTES

Since there are variations in all fired ceramic and natural products, tile and trim supplied for your particular installation may not match samples. Final confirmation should be made from actual tiles and trim prior to installation. Manufactured in accordance with ANSI A137.1 standards.

Not for use on ramps. Water, oil, grease, improper drainage and certain footwear can create slippery conditions. Floor applications expected to be exposed to these conditions require extra caution in product selection.

For additional information refer to "Factors to Consider" at: daltile.com/Factors.

Special consideration needs to be given when installing tiles greater than 15 inches. Please refer to daltile.com/LargeTiles for more information.

Special care should be taken when grouting with dark pigmented colors. A grout release is recommended to prevent finely powdered pigments from lodging in the pores of the surface. Use of a latex modified thin-set is recommended for installation.

PRE-CONSUMER RECYCLED MATERIALS

All or select items within this series meet the requirements for these qualifications. For more information, visit daltile.com.

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CERTIFIED PORCELAIN TILE

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- ENCAUSTIC
- TERRAZZO
- PAVER
- CUSTOMIZE
- FLEXFIT™

LOW — HIGH

SEE CHARTS FOR FULL PRODUCT DETAILS

SIZES:
- 6 x 6 Floor Tile
- 4 x 8 Floor Tile

FINISHES: MATTE | TEXTURED

FLOOR TILE


RED BLAZE 0Q40 (1)


BLAZE FLASH 0Q41 (2)


ARID GRAY 0Q42 (2)


ARID FLASH 0Q48 (2)

NOTES:

(1) and (2) indicate price groups, (1) being the least expensive. All colors are available in abrasive surface in 6 x 6.
0Q40 and 0Q41 are available in abrasive in 6 x 6 and 4 x 8 field tile and bullnose; 0Q40 is also available in double abrasive in 6 x 6 only.
0Q42 and 0Q48 are available in abrasive in 6 x 6 field tile and bullnose.

SLIP RESISTANT · WATERPROOF · STAINPROOF · DENTPROOF · SCRATCH-RESISTANT* · FIRE-RESISTANT · CLIMATEPRO™ · SIMPLICLEAN™

*Scratch-resistant to pressure with Mohs and Taber Hardness

VISIT THE WHY TILE PAGE AT WWW.DALTILE.COM FOR A COMPLETE LIST OF QUALIFICATIONS AND EXCLUSIONS.

QUARRY

SIZES

		Thickness	Sq. Ft./ Carton	Pieces/ Carton
6 x 6 Floor Tile	(6" x 6") (15.20 cm x 15.20 cm)	1/2"	11.00	44
4 x 8 Floor Tile*	(4" x 8") (10.20 cm x 20.30 cm)	1/2"	10.76	50

* Available in Red Blaze 0Q40 and Red Blaze Flash 0Q41 only.

APPLICATIONS

	Target DCOF wet	Suitable
Dry & Level – Interior Floor	N/A	✔
Wet & Level – Interior Floor	≥ 0.42	✔
Shower Floors (Residential or Light Commercial)	≥ 0.42	✔**
Exterior Floor Applications (including pool decking & other wet areas with minimal footwear)	≥ 0.60	✔
Subject to Oils		✔
Ramps & Inclines	≥ 0.65	✔*
Walls/Backsplashes	N/A	✔
Countertops	N/A	✔
Pool Linings	N/A	✔**

A DCOF value of ≥0.42 is the standard for tiles specified for level interior spaces expected to be walked upon when wet, as stated in ANSI A137.1-A326.3. For more information about DCOF and the DCOF AcuTest™, visit daltile.com/DCOF.

APPLICATION NOTES:

Suitable for exterior applications in freezing and non-freezing climates, when proper installation methods are followed.

Suitable for industrial installation requiring high compressive strength.

Subject to Oils: Absorbs oils, grease and other liquids to keep floors slip-resistant, yet does not contaminate the surface.

* Abrasive surface only

** 6 x 6 only

INSTALLATION

Grout Joint Recommendation	Shade Variation
3/8"	High (V3) - non-Flash colors Random (V4) - Flash colors

PRE-CONSUMER RECYCLED MATERIALS

MADE IN THE U.S.A.

All or select items within this series meet the requirements for these qualifications. For more information, visit daltile.com.

ZEROTOX
Healthy Homes | Healthy Planet

QUARRY TILE™
QUARRY

TRIM

	Type	Number	Size	Pieces/ Carton
	Bullnose	Q-1485**	4 x 8	50
	Bullnose	Q-1665*	6 x 6	44
	Bullnose Corner	QCRL-1665	6 x 6	44
	Round Top Cove Base	Q-3565*	5 x 6	44
	Round Top Cove Base Corner Right	QCR-3565*	5 x 6	20
	Round Top Cove Base Corner Left	QCL-3565*	5 x 6	20
	Cove Base Inside Corner	QB-3565*	1 x 5	25

Bullnose, cove base and cove base corner trim are intended to coordinate with floor tile in the standard 90-degree installation position.

* Available with and without abrasive grain.

** Available in colors 0Q40 and 0Q41 only.

* Not available with abrasive surface or in Flash colors; use coordinating solid.

PERFORMANCE CHARACTERISTICS

	ASTM#	Result
Water Absorption	C373	< 3.0%
Breaking Strength	C648	> 350 lbs
Scratch Hardness	MOHS	7.0
Chemical Resistance	C650	Resistant

For additional information on test results, visit us at: daltile.com/information/TestResults.

DURABILITY

Floor Surface Wear Resistance

1	Residential Bathrooms	3	All Residential / Light Commercial
2	All Residential Areas	4	All Residential / Commercial

NOTES

Strong random shading enhances the natural beauty of this product. To achieve optimal results, tile should be selected from multiple cartons and shading arrangement planned prior to installation.

Since there are variations in all fired ceramic products, tile and trim supplied for your particular installation may not match these samples. Final color selection should be made from actual tiles and trim and not from tile samples or color reproductions. Manufactured in accordance with ANSI A137.1 standards.

Water, oil, grease, etc. create slippery conditions. Floor applications with exposure to these conditions require extra caution in product selection. Abrasive surface suitable for use on ramps.

For additional information refer to "Factors to Consider" at daltile.com/Factors.

Special care should be taken when grouting, a grout release is recommended to prevent finely powdered pigments from lodging in the pores of the tile surface.

It is necessary to follow the proper procedures and recommendations from the grout and maintenance products' manufacturers.

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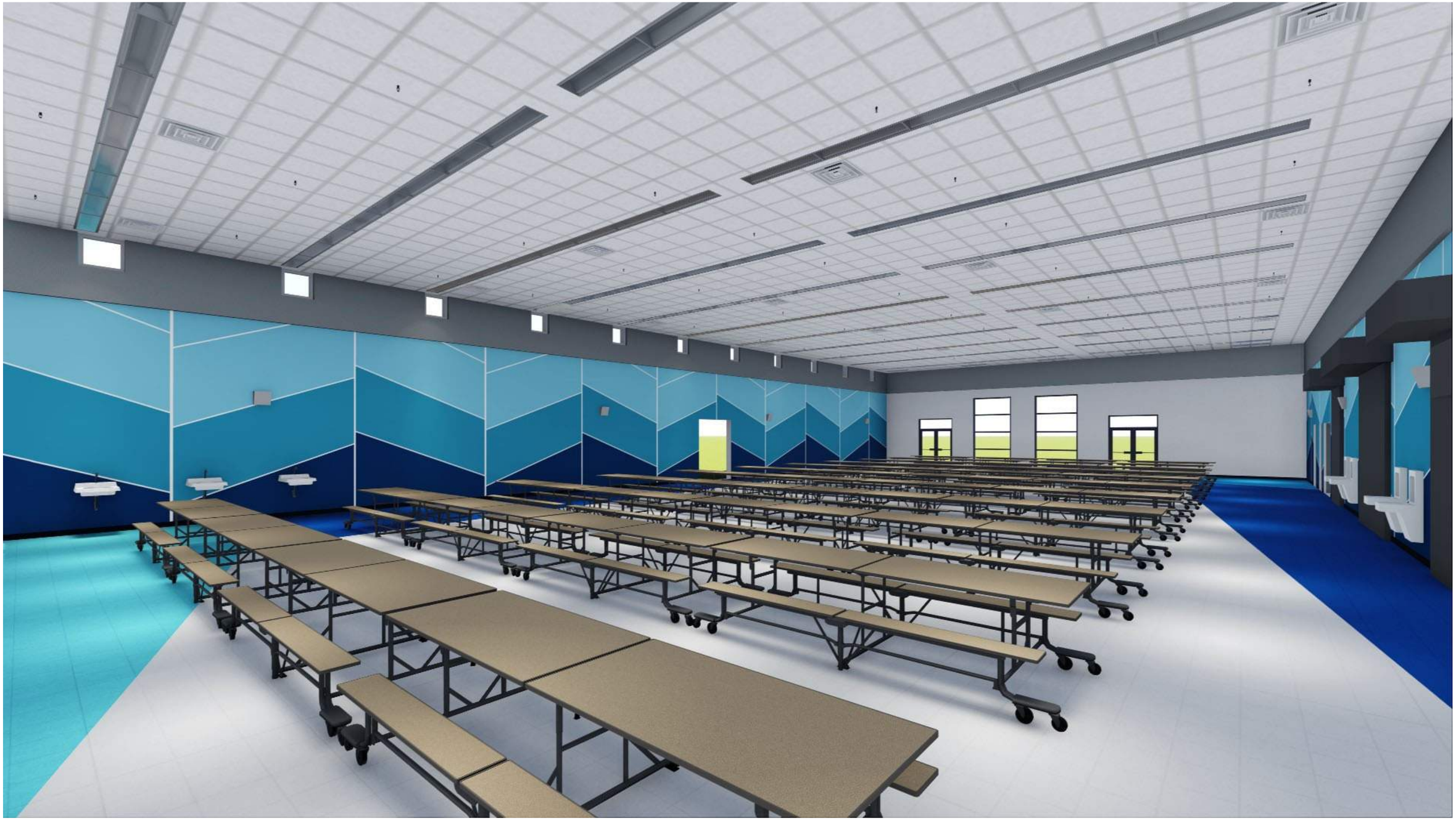






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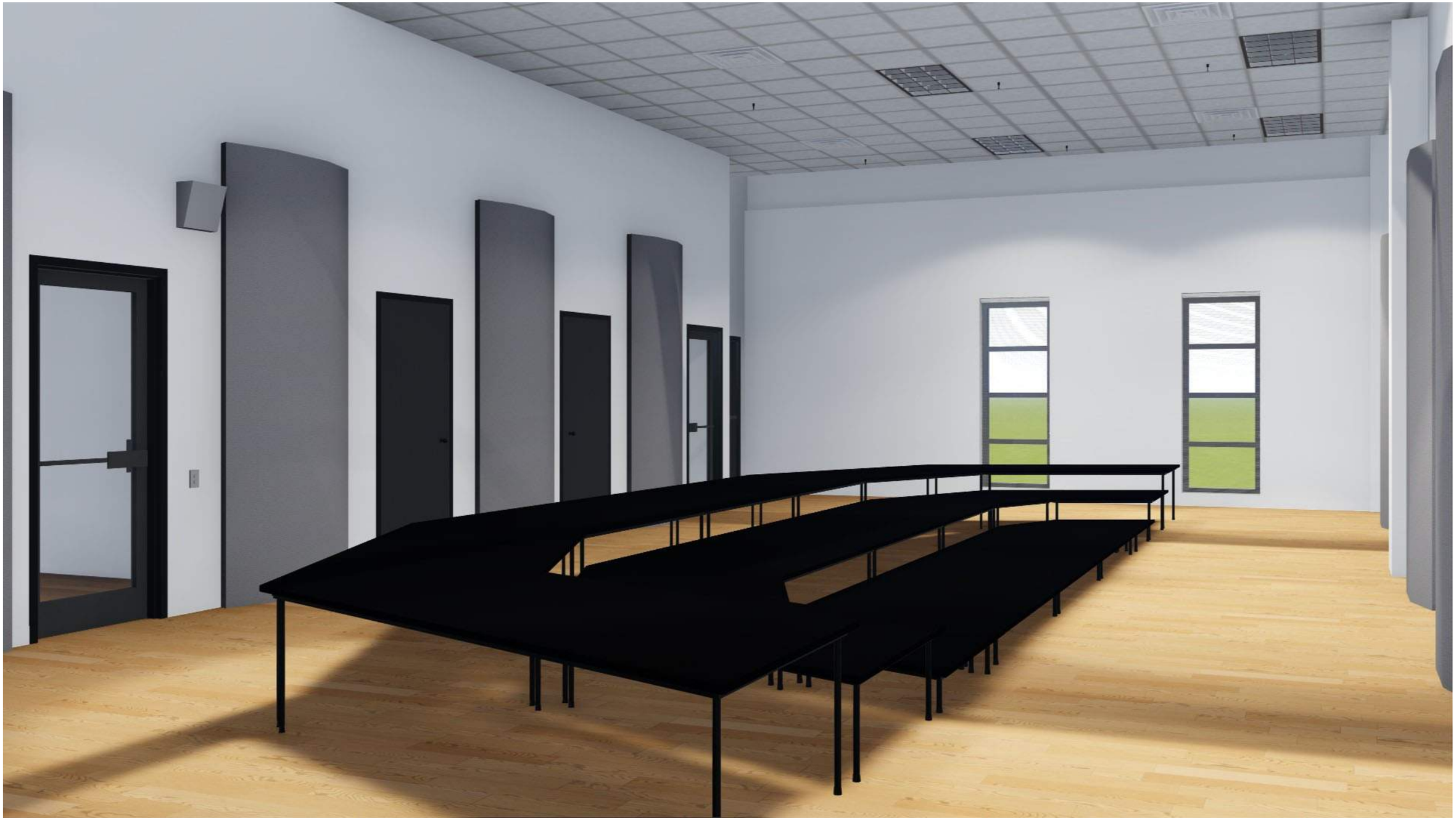









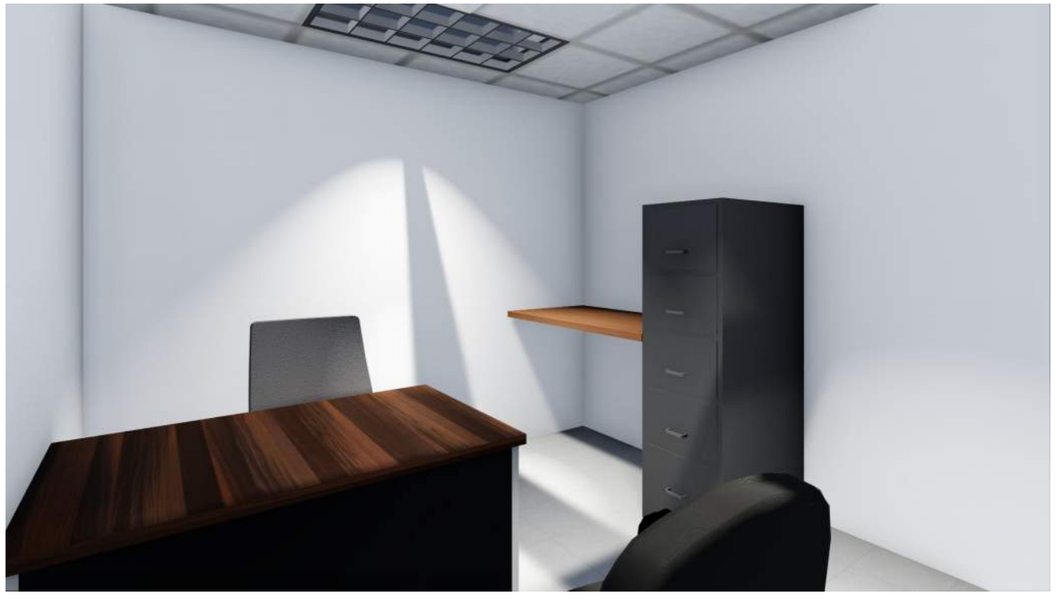















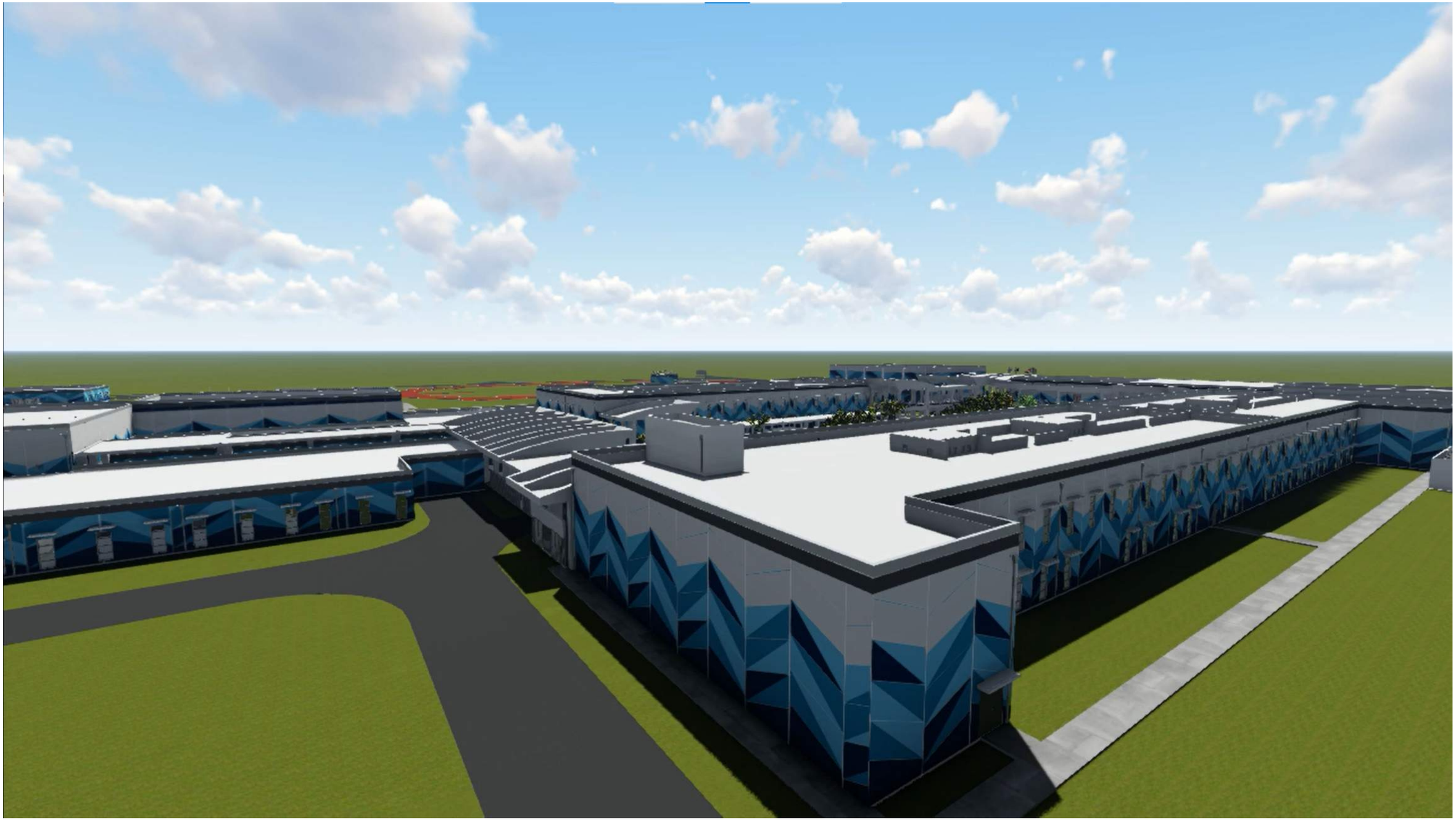





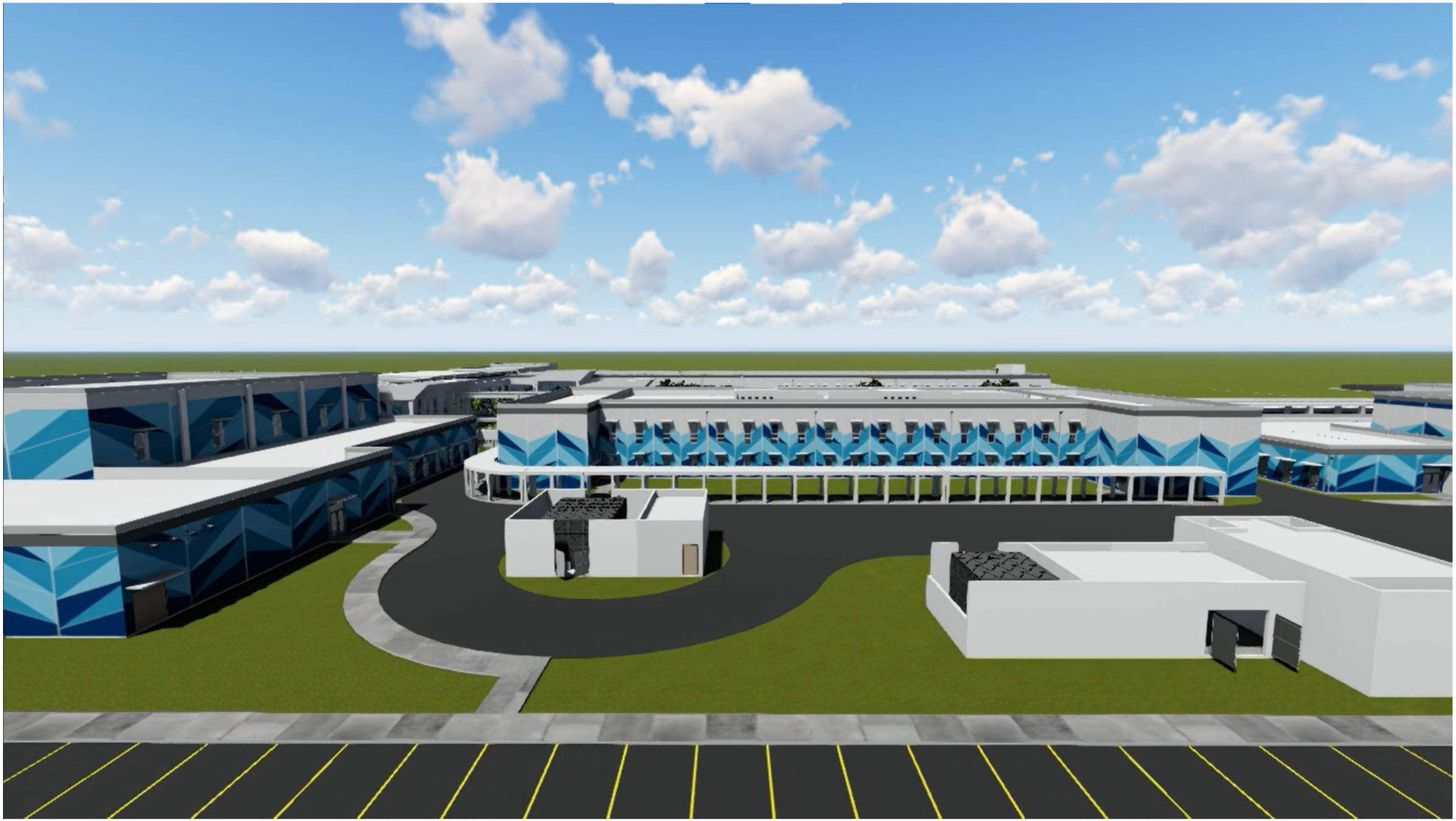





AUDITORIUM
OFFICE


OFFICE
CENTURY
XCELLENCE


EMPOWER STUDENTS TO BECOME PRODUCTIVE CITIZENS
OF THE 21ST CENTURY THROUGH A COMMITMENT TO
ACADEMIC EXCELLENCE CAREER PREPARATION
AND CIVIC ENGAGEMENT














JROTC




















A






GYM

SIMON SANCHEZ HIGH SCHOOL CIVIL NARRATIVE

1. Earthworks and Grading

Clear, grub, and grade the site as called for in the design. Site grading is based on the concept of providing a positive drainage flow that brings run offs away from buildings or structures. In general practice, cut and fill slopes should not be steeper than 2 horizontal to 1 vertical (2H:1V) in which vegetation or grass ground cover can be satisfactorily established and properly maintained. Areas disturbed by construction and grading activities will be fine graded and planted or seeded with grass for erosion control. In addition, careful consideration was used in locating drainage flow patterns to make sure the resulting gradient and related discharge velocities will not cause erosion.

2. Storm Sewer Management System

All storm runoff within the site will be contained and collected using area drains, catch basins, field inlets, and localized shallow depressions. They will be conveyed via underground drainage pipes or swales, whichever is appropriate, towards the proposed percolation basin.

Percolation Basin with a storage depth of deeper than 2 feet and are expected to hold water for more than 24 hours shall be provided with chain link fence around the basin's perimeter. The basin shall include a maintenance service access road and gate. Due to limited open space at the SSHS site, the percolation basin will be located on the south-west side of the FBLG property right west of the proposed multi-purpose fields. The percolation basin is also sized to accommodate stormwater flows from FBLG Middle School.

Location of the proposed percolation basin is located inside the 1,000 feet radius Wellhead Protection Zone (WPZ) from existing water production wells in the area. Stormwater runoffs from parking lots and roadways must be handled and treated as per requirements outlined in the CNMI and Guam Stormwater Management Manual and as approved by Guam EPA.

3. Sewer System

The sewer system for this project will be connected to the existing sewer located near the southwest property corner. The connection will involve installation of new sewer manhole on the existing sewerline. This existing sewerline, which also served the existing SSHS, is a 12-inch sewerline that connects to the 24-inch main sewerline on Marine Corps Drive (Route 1). The expected wastewater loads from the new SSHS is not expected to result in the overloading as the new school is a replacement of the old one.

The design of the sewer system in this project will be in accordance with the Guam Water Works Standards for Sewer and all any other applicable design manuals, technical

manuals, or other applicable technical reference. Flows and pipe capacities will be calculated using the Manning formula. Manholes will be provided at all change of directions and spaced not more than 400 feet apart. The minimum manhole diameter will be 48 inches and with a 30 inch diameter "Traffic Rated" manhole frame and cover. Sewer mains shall be a minimum of 8 inches diameter, building laterals shall be a minimum of 6 inches diameter. Curved sewer lines will not be allowed.

4. Water System

Water supply for this project will be connected to an existing 10-inch waterline that runs along Juan Jacinto Drive. This information is based on GWA Water System Map and the point of connection(s) is shown in the design drawings. An 8-inch looped system water line will be provided so that any single point of failure in the line, flows can still be supplied to the facility.

There are several existing fire hydrants located at the site. However, these will be impacted by the proposed new improvements and will be removed and replaced. Based on hydrant flow test conducted by WM Engineering Services, LLC, dated 04 November 2020, water system at or near the project site has static and residual pressures of 61 psi and 44 psi respectively.

Flow metering and backflow prevention device will be provided near the point of connection to the existing water main.

The project includes construction of a fire water storage tank and fire pumps room. Fire lines are supplied and pressurized by booster pumps.

5. Pavements

Flexible pavement structural sections shall be based on recommendations outlined in the Subsurface Soil Investigation Report for the New Simon Snachez High School, prepared by Geo-Engineering & Testing, Inc. dated 31 August 2022

6. Parking and Pedestrian Paving

Provide parking and pedestrian paving as shown in the Concept Drawings.

7. Barriers/Bollards

Provide barriers/bollards at corners of building or structure located near road edge and site fire hydrants.

8. Perimeter Fencing and Gates

Provide perimeter fencing and gates as shown in the Concept Drawings. Perimeter fencing and gates shall be chain link fence and minimum of 6 feet high.

9. Erosion and Sediment Controls

During construction, temporary erosion and sediment controls must be implemented in accordance with Guam EPA's Guam Soil and Sediment Control Regulations.

10. Turf Establishment

Newly graded areas and areas disturbed during construction, including Contractor's laydown/ staging area, shall be provided with 4 inches thick top soil and hydroseeded with Bermuda grass. Grass shall be maintained until a 95% ground cover is attained. Install on-grade temporary irrigation or other means for plant establishment and a 365-day landscape maintenance period.

LANDSCAPE ARCHITECTURE:

GENERAL PARAMETERS

- **Project Description**

  The scope of work includes, but is not limited to, the installation of new trees, shrubs, and lawn. Design also incorporates a main quad courtyard surrounded by the A and B-Wing, and GCC Classrooms, JROTC and Administration Building ring. The open space is programmed with learning zones based on the educational curriculum, a performance stage and open lawn for campus events, student gathering and covered study spaces, product and built-in seating opportunities, and planters to help create outdoor rooms accommodating groups of varied sizes and activities. The campus will be fitted with strategically located secured and anchored trash and recycling receptacles, bicycle racks. Special concrete pavement textural finishes from the campus main arrival are carried into the quad ring of buildings and central courtyard, highlighting the arrival sequence and celebrated areas.

  Primary and secondary pathway circulation from the parking areas to campus buildings and between building and sports facilities are provided connecting campus uses. Planter islands within and around the parking lots are utilized to capture and filter pavement runoff as a storm water management function. Hedge planting proposed to screen parking areas, and canopy trees are provided within and around parking lots to provide buffering and shade. Landscaping around the buildings is limited to grass, accent, and shade trees, and strategically located foundation shrubs and groundcover, with safety, security, and ease of maintenance in mind.

- **Existing Conditions**

  The existing building within a portion of the project site will be demolished following the completion of the new campus buildings. No existing trees or palms within the project site or existing campus will be salvaged or relocated into the new campus plan. A tree/palm protection plan could be developed as necessary for the material remaining. Consideration should be given to protect trees and palms that may be nesting sites for the Micronesian Starling. Large expanses of lawn protect the site from erosion and are healthy due to the frequent rains. A habitat of a native snail species was discovered along the southern edge of the site which is planned to be fenced and protected during construction with an additional setback boundary implemented prohibiting any disturbance or site work.

LANDSCAPE BASIS OF DESIGN

- **Key Issues or Requirements**
  - Low-maintenance plants, xeriscaping principles utilizing native plant species as well as adaptable plants for LID storm water management have been considered.
  - No non-native invasive plants or palm species known to be susceptible to invasive beetle species have been specified in the planting design.
  - Reference and strictly follow all requirements and procedures listed in the Coconut Rhinoceros Beetle (CRB) and Little Fire Ant (LFA) Management Procedures (Ver4. Revised 08.02.2021)

- A permanent automatic irrigation, with 'water-sense' rain and moisture sensors, has been designed to accommodate the planting areas around the main campus quad buildings and within the central courtyard space only. The water source is supplied by rainfall harvesting tanks and a filtration and pump system designed and provided by the project's design engineers.

- Lockable quick couplers or hose bibs on an irrigation mainline are strategically located through the areas without automatic irrigation convenient for seasonal and intermittent hand-watering of fields and maintenance washdown purposes.

- Stormwater management, water conveyance, and detention systems have been coordinated and implemented throughout the site with the civil engineers and may be highlighted as an educational component of Best Management Practices and consciousness of minimizing adverse impacts to the environment and resources.

- Provide positive surface drainage away from building and structures across pavement and planting areas to drainage swales, detention areas, and drain inlets.

- Provide a two-foot-wide gravel maintenance strip with poly containment edger around the buildings at areas adjacent to landscape planting areas.

- Guarantee landscaping for a period of one year starting after the completion of the landscape establishment and maintenance period. Provide a 365-day Landscape Establishment and Maintenance period. Landscaping Guarantee and Establishment and Maintenance periods must commence on the date that the inspection by the Contracting Officer shows that all landscaping under this contract has been satisfactorily installed.

- Provide 4" of topsoil for lawn areas and fine grade. All green waste generated from clearing and grubbing tasks and construction activities must be managed, processed, and reused on site.

- Contractor is required to prepare a green waste management plan that will be included in their overall waste management plan. Contractor is required to monitor green waste piles weekly for CRB infestation. If there is an infestation, the piles must go through a grinder/shredder prior to resuming compost activities.

- Prevent erosion from occurring by providing erosion control measures as required by Federal, Guam, and local regulatory requirements.

- Provide a planting soil mixture composed of a least 50 percent native soil blended with 50 percent amended topsoil or soil amendments based on a soil analysis test results with recommendations for all natural grass lawn areas and tree/palm planting pit backfill material. All newly created planting pits must be, at a minimum, twice as wide and equally as deep as the plant's root ball. Set tops of plant root balls even with adjacent finish grades. All trees must be provided with fertilizer tablets, quantity based on manufacturer's recommendations, and wood stakes with broad nylon fabric ties and expandable trunk guards. Provide an aluminum header (black) separating groundcover and lawn areas.

- Hydroseed areas to be turfed. Natural grass species in the hydroseed slurry must include a mixture of 50% Common Bermuda grass and 50% Centipede grass. Repair and restore all existing grass areas that are damaged by construction including access, storage and lay down areas. Restore by means of hydro-seeding and provide same guarantee and maintenance as for new landscape areas. Grass all graded areas, including areas that tie back into the existing site, outside of the landscape limit of work. Provide temporary irrigation system for establishment of lawn areas.

- **Planting**

The objective of the landscape design is to enhance the campus environment and the physical and psychological experience of the students, staff, and visitors. The landscape design has been created to provide comfort and natural greenery within the campus spaces. Layered planting compositions aim to soften and complement building forms and materials and provide a safe environment by allowing clear sightlines through and across student gathering areas. Canopy shade trees and foundation planting help the campus' facility of buildings to become more inviting, accessible, and tolerable within its surroundings and function as a daily institutional destination.

- **Site Trees**

Shade trees improve the environmental quality and help reduce energy consumption and disperse throughout the site's larger open spaces. Other smaller shade and accent trees help to enhance the site and "soften" and compliment the architecture and provide character. Tree placements create open spaces as well as provide privacy between the buildings. Cluster planting is intended to create a relaxed environment and is located to accommodate underground utilities.

Provide one(1) 25-gallon minimum size container canopy shade tree for every six parking stalls. Avoid conflicts with light pole fixtures, utilities, and utility lines. Provide a minimum of twenty-sq. ft. planting area for each tree root ball. Trees with large pods or seeds with dye color should not be used in parking areas.

- **Foundation Planting**

Foundation planting around the footprint of buildings and adjacent planter areas include shrubs, groundcover, and grass with small to medium accent site trees. The objective of foundation planting is to anchor the building with natural greenery, provide cooling and shade, soften structures and hardscape, and provide a visually approachable and pleasant environment for students, staff, visitors, and views from beyond the property edges. It is important that the placement of plants should provide visibility so as to not allow people or feral animals to easily hide unnoticed.

- **Screen Planting**
  - Wherever possible, shrubs are incorporated around utility and equipment (as allowed) to provide screening and softening.
  - Provide shrubs for screening of mechanical equipment/walls, dumpster enclosures, and other obstructions that do not present an aesthetic view from the street.

- **Educational Learning Gardens**

  These areas adjacent to A and B-Wings are deliberately left clear and open for academic programming, customized by teaching staff and or students. Landscape edging has been provided to separate ornamental planting from educational garden components. Electrical outlets have been provided in proximity to the convenience of any necessary lab equipment requiring power.

- **Bio-swales / Stormwater Retention (By Civil)**

  Grassed bio-swales capture and convey surface stormwater to open grassed retention basins which are depressions at the surrounding finished grade typically at the low points of the site. These features are intended to "clean" the impurities and materials and slowdown velocities and hold the water allowing natural percolation into the ground minimizing contaminates and excessive water volumes lessening inundation and impacts to inlets, storm drain systems, and waterways.

- **Hardscape**

The primary objective of the hardscape design is to provide safe and accessible circulation within the campus property for students, staff, and visitors. The hardscape design also helps to organize outdoor spaces of varied sizes, provides flexible open space for event gatherings, seating and studying, physical and passive activity, while providing a unique, vibrant, and expressive outdoor educational environment.

- **Walkway Circulation and Paving**

  Pedestrian pathways, beginning at the property limit access points are intended to be clearly defined and visible upon approach. Crosswalks are striped as per local code requirements as shown on the civil engineering drawings, fully accessible to wheelchairs and have tactile strips for the visually impaired. Planting adjacent to driveway crossings shall be void, minimal, or maintained so as to not obstruct visibility of drivers and pedestrians. Curb planter extensions are implemented to assist with wayfinding by providing clearly marked circulation points, shortening crosswalks, and discouraging crossing between vehicles. Materials and finishes are standard.

  Color and finish variation via integral and topically applied color, broom, stamped, and sandblasted concrete, are introduced to the walkways and pavement at the main frontage drop-off between the Administration Office and Gymnasium. Design articulation of the paving flatwork continues between the classroom building clusters and within the campus courtyard main quad. The layout of the walkways allows direct access for students, staff, and maintenance needs with primary and secondary routes. Contemporary forms provide flow, movement, avoid monolithic appearances, create spaces/outdoor rooms, and introduce visual interest from ground and the second level corridor views down into the courtyard.

  The planter area shapes, sizes, corner radii, and similarly the articulated pavement design around the planter areas may be simplified to three to four standard shapes rotated to still provide a varied appearance.

Proper lighting should also be provided for safety, security, and per code requirements in the parking areas and outdoor spaces of the campus. Campus events may extend or occur after daylight hours and are to be considered and coordinated, as necessary.

- **Performance Stage and Event Lawn**

  The area of the elevated performance and event stage is approximately 1,700 sq. ft. including steps and accessible ramp, with code compliant hand and guard railings (as required), sloped up to the stage level. This courtyard centerpiece also doubles as a student gathering flexible space during non-event times where furniture can be placed for an outdoor classroom and study or lounge area. Lighting and electrical points for the campus' audiovisual needs shall be provided and coordinated with the project's architects and engineers. A shade and weather structure over the stage is recommended as the budget allows.

- **Built-in Seating Walls**

  Cast in place or precast concrete seating walls are durable and long-lasting. The seat or bench walls are clean and simple in form, with no voids or crevasses throughout all surfaces and between seating wall sections where trash can collect, be hidden, or items can be stuffed into. Strategically located, the seating walls help guide circulation and minimize students cutting through planter areas, damaging plants, and irrigation equipment, compacting soil, impacting drainage, impeding plant growth and recovery.

  Planting soil can be bermed up against seat walls along planters, creating slight elevation change and dynamic visual interest in a flat space. As the wall structure is robust to incorporate power points with lockable covers in select locations for campus events. It's recommended that the top seating surface is very smooth or polished for ease of cleaning if marked or vandalized.

  The length and radii for the seat walls along the geometric shaped planters may be simplified yet should still provide a varied appearance, strategically placed barriers to minimize pathways cutting through planters, and provide vertical edges for varied size group gatherings.

- **Furniture Fixtures and Equipment (FF&E)**

  All furniture fixtures and equipment must be outdoor rated, sturdy. and robust. Construction should be simple with easily replaceable and readily available components if damage occurs. Consideration should be given to modular, footing anchors, lockability, and the weight of the furniture pieces to minimize or avoid unwanted movement.

  The appearance/form of furniture and fixtures is recommended to be inspiring and creative providing interest and color in the outdoor educational environment. Electrical points and lighting fixtures to be coordinated with the project's architect and engineers.

- **Installation and Maintenance**

  Equipment or personnel shall not move outside the designated construction zone. The Contractor will be responsible for all materials and labor for the repair of all unauthorized vegetation impacts. Damaged vegetation replacement will occur onsite and require

maintenance and monitoring comparable to the landscape requirements and will include appropriate native or acceptable species selection from the Plant Schedule or an approved list in the Guam Landscaping Guidelines.

The landscape design is intended to be simple with ease of maintenance in mind. The shrub locations and layout, groundcover beds, and edging of the lawn/turf area are convenient for access and mowing. The selection of the trees and shrubs, and the composition of groundcovers attempts to minimize water usage and maintenance efforts.

Provide complete landscape maintenance, including but not limited to, lawn mowing, edging, tree pruning, pest and disease inspection/treatment, debris removal, monitoring and adjusting of temporary irrigation system watering/schedule, natural grass area weed control, fertilizing, debris removal, dead planting replacement and tree stake and tie adjustments, throughout the 365-day landscape establishment and maintenance period. If landscape installation is done in phases, each phase shall have a 365-day landscape establishment and maintenance period once the premaintenance inspection for that phase is approved. At the completion of the landscape establishment and maintenance period the landscape subcontractor must install two double bag watering systems per tree and fill each watering bag with water. Each must be able to hold approx. twenty-gallons of water for a total of eighty-gallons of water per tree. One week prior to the completion of the landscape establishment and maintenance period and after the removal of the temporary irrigation system the landscape subcontractor must aerate all natural grass areas to a minimum depth of four-inches using a hollow tine aerator.

Maintenance after plant installation should be frequent and thorough for the successful establishment of the plants. The condition of new plantings should be checked regularly. Maintenance includes watering, weeding, cultivating, fertilizing, addressing disease and insect control, and employing selective pruning to remove dead, dying, or broken branches.

Root barriers along pavement edges to prevent tree roots from uplifting the paving are specified in strategic locations.

An electronic PDF copy of an ongoing landscape planting and irrigation operation and maintenance manual and schedule to be provided to the Owners for continuing reference including but not limited to mowing, trimming/pruning, fertilization, adding topsoil, aeration, green waste mitigation.

- **Irrigation (Outdoor Water Use for Planting)**

  During the landscape establishment and maintenance period, provide a temporary on-grade irrigation system utilizing water-conserving, highly efficient, automatic irrigation equipment with a reduced pressure backflow preventer, rain shut off device and controller to irrigate all landscaped areas with plantings.

  Where practical, provide a separate irrigation system for trees from other plant material (natural grass). At the completion of the landscape establishment and maintenance period, the temporary irrigation system will be removed.

  Any damage to the new landscape due to the presence and removal of the temporary irrigation system will be replanted at no cost to the Owner.

A temporary irrigation system shall be provided to support establishment for all new planting areas for the recommended duration of a one-year maintenance period. Although a permanent automatic irrigation system is designed for the main quad courtyard and areas adjacent to the building ring, a pressurized irrigation mainline system is strategically located within all remaining planted areas including all athletic fields for intermittent, seasonal, and spot treatment watering as needed during any dry periods, and for washdown maintenance of paved and hardscape areas. The mainline system will include quick coupler valves and or hose-bibs in sub-grade valve boxes and spaced at approximate 50-foot intervals.

A watering schedule will be required to be submitted for approval prior to the start of the landscape establishment and maintenance period indicating how watering will be scheduled, accounting for seasonal changes in rain amounts and air temperatures (provide rain gauge), to assist the newly installed plants to transition from everyday watering to no water by the end of the maintenance period. The intent is to assist the new plant material in acclimating to natural rain fall as a future source of water. The watering schedule will include infrequent deep watering periods to promote deep root structures to assist plant material through periods of drought.

The Main Quad Courtyard irrigation system incorporates rainwater catchment systems (designed by the project's civil engineer) for building re-use of roof runoff and greywater.

- **Plant Material List**

Botanical Name	Common Name
Small Tree	
Cordia subcordata	Niyoron
Jatropha integerrima	Jatropha
Medium Canopy Tree	
Aglaia mariannensis	Mapunao
Cassia fistula	Golden Shower Tree
Filicium decipiens	Fern Tree
Plumeria obtusa	Singapore Plumeria
Large Canopy Tree	
Barrington asiatica	Fish Kill Tree
Calophyllum inophyllum	Daok
Hernandia sonora	Nonak
Clumping Palm	
Ptychosperma macarthurii	Macarthur Palm
Shrubs	
Cordyline fruticosa 'Emerald Green'	Emerald Green Ti Plant
Cordyline fruticosa 'Red'	Red Ti Plant
Crinum asiaticum	Crinum Lily
Pseuderanthemum reticulatum	Golden 'El Dorado'

- **Ground Covers**

Cuphea hyssopifolia	False Heather
Dianella tasmanica 'Variegata'	Variegated Flax Lily
Ficus microcarpa 'Green Island'	Dwarf Wax Ficus
Microsorum scolopendria 'Lauae Iki'	Lauae Iki Fern
Monstera deliciosa	Monstera
Vitex roundifolia	Pohinahina

- **Lawn / Grass**

Cynodon dactylon	Bermuda Grass

- **STANDARDS AND REFERENCES (Include but not Limited to)**
  - Final Guam Landscaping Guidelines, NAVFAC PACIFIC, 2011
  - International Building Code, 2006
  - Coconut Rhinoceros Beetle (CRB) and Little Fire Ant (LFA) Management Procedures (Ver4. Revised 08.02.2021)
  - Final Guam landscaping guidelines_rev3
  - Final pesticide soils management plan for the Guam DPRI program
  - Tropical Landscaping and Plant Selection Guide for Hawai'i, Guam, and the Pacific Islands, 2003
  - City and County of Honolulu Land Use Ordinance
  - G20 SITE IMPROVEMENTS SYSTEM DESCRIPTION (Provide site improvements that support project sustainability goals of Part 2 Section 01 33 29.05 20, *Sustainability Reporting for Design Build)*

STRUCTURAL DESIGN NARRATIVE

GENERAL

CODES AND STANDARDS

Recommend utilizing the most current Building codes as follows:

- (IBC 2021) or the latest edition of the International Building Code (IBC) for the Design Build Contract.
- American Society of Civil Engineers (ASCE) 7-16, Minimum Design Loads for Buildings and Other Structures is still applicable.
- American Concrete Institute (ACI) 318-19, Building Code Requirements for Structural Concrete and Commentary
- American Institute of Steel Construction (AISC), Sixteenth Edition, Steel Construction Manual
- Steel Joist Institute (SJI), The 45th Edition
- American Society of Testing and Materials (ASTM)
- PCI Design Handbook, 7th Edition – American Concrete Institute

MATERIALS FOR CONSTRUCTION

Concrete

- All cast-in-place concrete will have a 28-day minimum compressive strength of 4,000 psi.
- All Pre-Cast Concrete will have a 28-day minimum compressive strength of 5,000 psi.

Reinforcing Steel

- Reinforcing steel shall comply with ASTM A706/ASTM A706M, Grade 60. ASTM A615/A615M Grade 60 shall be permitted if:
  - The actual yield strength based on mill tests does not exceed F_y by more than 18,000 psi; and
  - The ratio of the actual tensile strength to the actual yield strength is not less than 1.25.
  - The minimum elongation in 8 inches shall be at least 14 percent for bar sizes No. 3 through No. 6, at least 12 percent for bar sizes No. 7 through No. 11 and at least 10 percent for bar sizes No. 14 and No. 18.

Steel Joists/Joist Girders

- Steel joists shall conform to the latest standard specification for open web joists/joist girders of the (SJI) Steel Joist Institute.

STRUCTURAL SYSTEMS

The buildings listed below follow a typical structural system approach:

- Classroom Buildings
- Administration Building and Library
- Cafeteria
- Gymnasium
- Auditorium
- GCC Building
- JROTC Building and Firing Range
- Credit Recovery Building
- Press Box
- Generator Building
- Pump Buildings
- Canopies and Covered Walkway
- Miscellaneous Structures: Dug-Out, Bus-Stop, Guard-Post
- Sports Field Lighting

The typical structural systems follow:

Foundations – The building may be supported using conventional reinforced concrete continuous wall spread footings and individual column spread footings to support wall and column loads, respectively. Footings should bear on existing limestone subgrade or on a layer of well-compacted sand and gravel fill. The continuous footing would be able to span and bridge over potential soft soil pockets, if encountered. There may be a requirement for tie/grade beams on certain buildings. Foundation criteria and selection will depend on the soil investigation findings and recommendations from a Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022 are provided for reference.)

Ground Slab – Building floor slabs may be a reinforced concrete slab on grade. Large expansive areas will require construction and separation joints to control cracking.

Walls – The main support walls may be doubly, or singly special reinforced cast-in-place or precast concrete walls designed as vertical load-bearing shear walls. Precast/Prestressed concrete walls designed as vertical load-bearing shear walls may be considered.

Frames – Open-web steel joists/joist girders may support floor and roof loads. Conventional Cast-in-Place Reinforced Concrete Beam-Column Frames may be considered were appropriate to meet span requirements.

Floor & Roof Slab – Building elevated floor and roof slabs may consist of a composite metal deck with reinforced concrete topping supported by open-web steel joists. Precast/Prestressed Concrete Double Tees or Precast/Prestressed Concrete Planks with

reinforced concrete may be considered were appropriate to meet span requirements. The topping slabs provide a rigid diaphragm for the transfer of lateral loads to the seismic and lateral resisting elements of the structure. Chord steel is located at the slab perimeters where required. Conventional Cast-in-Place Reinforced Concrete Slabs may be used on shorter spans and where appropriate.

Seismic - Reinforced Concrete (Cast-in-Place or Precast/Prestressed) shear walls may provide lateral resistance to seismic loads. The reinforced concrete slabs and concrete toppings on elevated floor and roof slab diaphragms may be designed to distribute loads to shear walls.

Wind - The reinforced concrete (Cast-in-Place or Precast/Prestressed) walls will provide lateral wind load resistance for both in-plane and out-of-plane shear and bending, respectively.

DESIGN FLOOR LOADS

Live Loads (minimum):

- Classrooms – 40 psf
- Corridors above first floor – 80 psf
- 1st Floor Corridors – 100 psf
- Offices – 50 psf
- Cumulative folder file room – 150 psf
- Library Stack Rooms – 150 psf
- Lobbies and 1st Floor corridors – 100 psf
- Reading Rooms – 60 psf
- Assembly areas and Theatres – fixed seats – 60 psf
- Assembly areas and Theatres – stage floors – 150 psf

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pads, whichever is greater.
- Floor Finish Weight – Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.
- Solar Panels – Roof shall be designed to support the Solar panel system and associated framing.

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

STRUCTURAL BASIS OF DESIGN

GENERAL

CODES AND STANDARDS

- International Building Code (IBC), 2018 Edition
- American Society of Civil Engineers (ASCE) 7-16, Minimum Design Loads for Buildings and Other Structures
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- Press Box
- Generator Building
- Pump Buildings
- Canopies and Covered Walkway
- Miscellaneous Structures: Dug-Out, Bus-Stop, Guard-Post
- Sports Field Lighting

The typical structural systems follow:

Foundations – The building will be supported using conventional reinforced concrete continuous wall spread footings and individual column spread footings to support wall and column loads, respectively. Footings will bear on existing limestone subgrade or on a layer of well-compacted sand and gravel fill. The continuous footing would be able to span and bridge over potential soft soil pockets, if encountered. There may be a requirement for tie/grade beams on certain buildings. Foundation criteria and selection will depend on the soil investigation findings and recommendations from the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

Ground Slab – Building floor slabs will be a reinforced concrete slab on grade. Large expansive areas will require construction and separation joints to control cracking.

Walls – The main support walls will be doubly, or singly special reinforced cast-in-place or precast concrete walls designed as vertical load-bearing shear walls.

Frames – Open-web steel joists/joist girders will support floor and roof loads.

Floor & Roof Slab – Building elevated floor and roof slabs will consist of a composite metal deck with reinforced concrete topping supported by open-web steel joists. The topping slabs provide a rigid diaphragm for the transfer of lateral loads to the seismic and lateral resisting elements of the structure. Chord steel is located at the slab perimeters where required.

Seismic - Reinforced concrete shear walls will provide lateral resistance to seismic loads. The reinforced concrete topping elevated floor and roof slab diaphragms will be designed to distribute loads to shear walls.

Wind - The reinforced concrete walls will provide lateral wind load resistance for both in-plane and out-of-plane shear and bending, respectively.

CLASSROOM BUILDINGS:

Building Description

The new Classrooms will consist of two-story buildings measuring 255'-0" by 100'-0" for A Wing West, 195'-0" by 110'-0" for A Wing East, and 266'-0" by 110'-0" for B Wing. These classroom buildings are connected through corridors. The building structural system is a Special Reinforced Concrete Bearing and Shear Wall system with composite metal decks with reinforced concrete topping elevated floor and roof slabs supported by open-web steel joists. The building is supported on continuous wall spread footings and individual column spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- Classrooms – 40 psf
- Corridors above first floor – 80 psf
- 1st Floor Corridors – 100 psf

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pads, whichever is greater.
- Floor Finish Weight – Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.
- Solar Panels – Roof shall be designed to support the Solar panel system and associated framing.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

ADMINISTRATION BUILDING and LIBRARY:

Building Description

The new Administration and Library building will be a two-story building measuring 60'-0" by 159'-0". The Administration building has various spaces including offices, nurse's area, faculty lounge, conference rooms, storage rooms, cumulative folder file room, and common areas that will be located on the 1st Floor. The library contains a book stack and reading area, computer laboratory, storage rooms, and offices which are all located on the 2nd Floor. The building structural system is a Special Reinforced Concrete Shear Wall building frame system with a composite metal deck with reinforced concrete topping elevated floor and roof slabs supported by open-web steel joists and girders. The building is supported on continuous wall spread footings and individual column spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- Offices – 50 psf
- Cumulative folder file room – 150 psf
- Library Stack Rooms – 150 psf
- Lobbies and 1st Floor corridors – 100 psf
- Corridors above 1st Floor – 80 psf
- Reading Rooms – 60 psf

Dead Loads:

- Floor Finish Weight – Dictated by the selected Architectural finishes.
- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pads, whichever is greater.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.
- Solar Panels – The roof is designed to support the Solar panel system and associated framing.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

CAFETERIA:

Building Description

The new Cafeteria will be a single-story building measuring 120'-0" by 114'-0". Half of the building area will consist of dining rooms, while the remaining half will include the kitchen, storage rooms, serving station, pantry, walk-in refrigerator and freezer, and equipment room. The building structural system is a Special Reinforced Concrete Bearing and Shear Wall system with a composite metal deck with reinforced concrete topping roof slab supported by open-web steel joists. The building foundation system will consist of continuous wall spread footings with individual column spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

Dining Rooms – 100 psf

Dead Loads:

- Floor Finish Weight –Dictated by the selected Architectural finishes.
- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pad, whichever is greater.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

GYMNASIUM:

Building Description

The new Gymnasium will be a single-story building measuring 180' – 0" by 168' – 0", with various fitness and locker rooms located along the North and East sides of the main gymnasium respectively. The building structural system is a Special Reinforced Concrete Bearing and Shear Wall system with a composite metal deck with reinforced concrete topping roof slab supported by open-web steel joists. The building foundation system will consist of continuous spread footings to support walls or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- Gymnasiums – Main Floor and Balconies: 100 psf
- Bleachers – 100 psf
- Platforms (assembly) – Portable Stage – 100 psf

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pad, whichever is greater.
- Floor Finish Weight – Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.
- Solar Panels – The roof is designed to support the Solar panel system and associated framing.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

AUDITORIUM:

Building Description

The new Auditorium will be a one-story building measuring 59'-0" by 134'-0", with a stepped fixed seating area overlooking the stage. The Auditorium will consist of an elevator room, dressing rooms, storage area, lobby, office, and vestibules. The building system is a Special Reinforced Concrete Bearing and Shear Wall structural system with a composite metal deck with reinforced concrete topping elevated floor and roof slabs supported by open-web steel joists. The building is supported on continuous wall spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- Assembly areas and Theatres – fixed seats – 60 psf
- Assembly areas and Theatres – stage floors – 150 psf
- 1st Floor corridors – 100 psf

Dead Loads:

- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.
- Solar Panels – The roof is designed to support the Solar panel system and associated framing.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

GCC BUILDING:

BUILDING DESCRIPTION

The new GCC Building will be a one-story building measuring 260'-0" by 75'-0" east side and 248'-0" by 58'-0" west side. The building structural system is a Special Reinforced Concrete Bearing and Shear Wall system with a composite metal deck with reinforced concrete topping elevated floor and roof slabs supported by open-web steel joists. The building is supported on continuous wall spread footings and individual column spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- First-floor corridors – 100 psf
- Classrooms – 40 psf

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pad, whichever is greater.
- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

JROTC BUILDING:

Building Description

The new JROTC building will be a one-story building measuring 177' – 0" by 119' – 0", with various classrooms as well as an indoor firing range for airsoft guns and archery. The building structural system is a Special Reinforced Concrete Bearing and Shear Wall system with a composite metal deck with reinforced concrete topping elevated floor and roof slabs supported by open-web steel joists. The building is supported on continuous wall spread footings and individual column spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- Classrooms – 40 psf
  1st Floor corridors – 100 psf

Dead Loads:

- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support all HVAC equipment and be supported directly off the roof framing system.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

CREDIT RECOVERY BUILDING:

Building Description

The new Credit Recovery building is a one-story building measuring 80' – 0" by 96' – 0", with various classrooms, office, storage, telecom, and electrical room. The building structural system is a Special Reinforced Concrete Bearing and Shear Wall structural system with reinforced concrete topped composite metal deck elevated floor and roof slabs supported by open-web steel joists. The building is supported on continuous wall spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Live Loads (minimum):

- Classrooms – 40 psf
- 1st Floor Corridors – 100 psf

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pad, whichever is greater.
- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Dead Loads:

- HVAC Equipment Weight – The roof is designed to support 120 psf in isolated areas for the anticipated HVAC equipment and be supported directly off the roof framing system
- Solar Panels – The roof is designed with an additional 30 psf of superimposed dead load to support the Solar panel system and associated framing.

Dead Loads (for joist design):

- Metal Deck – 2.0 psf
- Membrane – 1.0 psf
- Insulation – 2.0 psf
- Mechanical + Electrical – 3.0 psf
- Fire Protection – 2.0 psf
- Misc. Dead – 10 psf

PRESS BOX:

Building Description

The new Press Box is a two-story building measuring 48' – 6" by 22' – 0". The building structural system is a Reinforced Concrete Bearing and Shear Wall system with a monolithic cast-in-place reinforced concrete roof slab. The building is supported on continuous spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pad, whichever is greater.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.
- Third-Floor roof was designed for 50 psf to account for roof-top recreational gathering.

PUMP & GENERATOR BUILDING:

Building Description

The new Pump and Generator building is a single-story Reinforced Concrete Bearing and Shear Wall structural systems with a monolithic cast-in-place reinforced concrete roof slab. The buildings are supported on continuous spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Dead Loads:

- Equipment Floor Load – 100 psf minimum or electrical equipment weight plus equipment pad, whichever is greater.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Miscellaneous Structures: Multi-Purpose Field "Dug Out"

Building Descriptions

The Multi-Purpose field "Dug-Out" is a 3-sided-wall structure with a 30' – 0" long wall, 8'-0" long walls on each side. The structural system is a Reinforced Concrete, Singly Reinforced Wall system with a monolithic cast-in-place reinforced concrete roof slab. The building is supported on continuous spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Dead Loads:

- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Wind Loads (minimum):

- 92 psf (uplift)

Canopies and Covered Walkways:

Building Descriptions

The Canopies and Covered Walkways are Reinforced Concrete framing systems with suspended roof slabs supported by reinforced concrete beams and columns. The structural system uses moment resisting frames, reinforced concrete columns and beams to support loads on the structure. The buildings are supported on individual spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.).

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Miscellaneous Structures: Bus-Stop

Building Descriptions

The Bus-Stop is a Reinforced Concrete framing system with 8'-4" cantilevered roof slab supported by reinforced concrete beams and columns. The structural system uses reinforced concrete columns and beams to support the governing uplift wind load on the structure. The building is supported on individual spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Dead Loads:

- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Wind Loads (minimum):

- 67 psf (uplift)

Miscellaneous Structures: Guard Post

Building Descriptions

The new Guard Post is a single-story building measuring 9'-4" by 9' – 4". The building structural system is a Reinforced Concrete Bearing and Shear Wall system with a monolithic cast-in-place reinforced concrete roof slab. The building is supported on continuous spread footings or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Floor Live Loads:

- Minimum 10psf to account for persons assigned to the structure

Dead Loads:

- Floor Finish Weight –Dictated by the selected Architectural finishes.

DESIGN ROOF LOADS

Live Loads (minimum):

- Minimum 20 psf.

Sports Field Lighting

Descriptions

The Sports Field Lighting are pre-engineered 90'-0" high Reinforced Concrete poles. The poles have a minimum embedment depth of 23'-0". The sports field lighting pole foundations are concrete drilled piers or other foundation types as recommended by the Geotechnical Engineer. (Preliminary Geotechnical Recommendations dated 22 June 2022.)

DESIGN FLOOR LOADS

Dead Loads:

- Weight of the lighting system, and poles

DESIGN ROOF LOADS

Wind Loads (minimum):

- 21.42 kips acting on the pole and light fixtures

Mechanical HVAC System

GENERAL MECHANICAL SCOPE OF WORK

The new Simon Sanchez High School Building will be provided with high efficiency Mechanical HVAC System. The work will include of Designing and providing construction documents for new air conditioning and ventilation systems.

This statement of work (SOW) documents will be used as a reference requirement for the DB Contractor to provide constructions documents complete with approved design and construction drawings, specifications, permit and clearances, equipment, materials, architectural/engineering design services, and other necessary documents to complete the project.

CRITERIA AND REFERENCE

Design shall be in accordance with the following codes, standards, and regulations. If dates are not given for reference standards or criteria, the latest edition is to be used. The more stringent shall govern where discrepancies occur.

- ASHRAE 15 Safety Standard for Refrigeration Systems, 2016
- ASHRAE 34 Designation and Safety Classification of Refrigerants, 2016
- ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality, 2016
- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings, 2016
- ASHRAE Handbook, Fundamentals, 2017
- ASHRAE Handbook, HVAC Applications, 2015
- IMC International Mechanical Code, 2009
- IPC International Plumbing Code, 2009
- IFC International Fire Protection Code, 2009
- IBC International Building Code, 2009
- NFPA Standards
- SMACNA HVAC Duct Construction Standards, Metal and Flexible, 2005
- SMACNA Round Industrial Duct Construction Standards, 2013
- Guam Tropical Energy Code, 2017 Edition

AIR CONDITIONING AND VENTILATION SYSTEM

Air conditioning and ventilation systems will be provided for the entire building in accordance with the requirements of Guam Local Codes and GDOE Specification dated July 04, 2017. Heat load calculation will be provided using computer programs in accordance with calculation procedures described in the ANSI/ASHRAE/ACCA standard 183.

Outside Conditions (Cooling 1.0%)

Summer	88	Degrees F dry bulb	Winter	N/A	Degrees F
	31	Degrees C dry bulb		N/A	Degrees C
	79	Degrees F wet bulb			
	26	Degrees C wet bulb			

Inside Conditions (Offices, Classroom, Gymnasium, Auditoriums, GCC)

Summer	72-78	Degrees F dry bulb	Winter	N/A	Degrees F
	26	Degrees C dry bulb		N/A	Degrees C
	50 to 60%	Percent RH			

Design calculations will be provided to size and select the air-conditioning and ventilation systems for the entire facilities to meet the system requirements from GDOE energy efficiency requirements of Guam Tropical Energy Code and Building Sustainability.

Ventilation rates will be calculated and provided with systems in accordance with ASHRAE Standard 62.1, *Ventilation for Acceptable Indoor Air Quality*.

Provide exhaust ventilation for the restroom, storage, and janitor closet. The make-up air for the bathroom will be supplied from the administration area air-conditioning system. Provide exhaust ventilation system for the laboratory fume hood and laboratory room in GCC Class.

Provide balancing dampers for all supply, return, exhaust and make-up air ductwork systems serving the building for air balancing and distribution. Provide smoke detectors in the air supply distribution system in reference to international code and standard.

Provide each zone with its own limited range of control, as allowed by the control system central workstation.

SPECIFIC BUILDING AIRCONDITIONING AND VENTILATION SYSTEM DESCRIPTION

Classrooms and GCC:

Provide Variable Refrigerant Flow (VRF) for all classrooms. The Fan Coil Unit will be constant volume ducted type with ducted return. The FCU will be located at the corridor closet that serve two classroom each FCU. The unit will be provided with UV Light to mitigate any molds and bacteria at the cooling coil. The classrooms will also be providing with Dedicated Fresh Air Unit that will be located at Mechanical room. The Dedicated Fresh Air Unit will be a modular ducted type Air Handling unit that will be designed to treat the outside air to be supplied inside the zone area. The DOAS will also be provided with reheat to provide comfort temperature and reduce humidity. Each floor will have its own Dedicated Fresh Air Unit and directly supplied at each classroom. The corridor will also be provided with an independent air-conditioning system. The corridor air-conditioning unit will be constant volume Floor mounted AHU. The Mechanical room will also be provided with air-conditioning supplying from corridor ac. The Air-cooled condensing unit (ACCU) will be located at the mechanical yard at the ground level provided with concrete breeze block for typhoon protection. The option if permitted by the GDOE is to locate the ACCU at the rooftop provided with access for maintenance. The restroom, storage and janitor closet will be provided with exhaust ventilation system. The exhaust fan will be ducted type and located on the roof.

Provide in-line exhaust ventilation systems to Marine Biology, Anatomy, Biology and Physics rooms which will most likely conduct science experiments and activities. Provide exhaust ventilation on the Chemistry Room and Science Preparation rooms. Provide fume hood with couple exhaust fan to extract fumes during testing and preparation activities in the chemistry room. Provide DOAS system serving the chemistry room for air pressurization and balancing. Provide rangehood to serve within the SPED Classroom during school activity.

The GCC Classrooms will be zone in accordance with specific classes. The air-conditioning system will be DX Ducted Constant Volume Split Type Floor Mounted Air-handling Unit. The fresh air will be supplied through Central Dedicated Outdoor Air Unit (DOAS). The GCC Building with Automotive class workshop will be provided with an Industrial exhaust ventilation system. Battery charging station will be provided with explosion proof motor and hydrogen sensor for exhaust ventilation. The carpentry shop will be provided with central dust control and exhaust ventilation system. The laboratory classrooms will also be provided with Fume Hood and exhaust ventilation. The compressor room will be provided with exhaust ventilation. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's

restroom, Staff restroom, Mock room & Compressor room. Provide roof exhaust ventilator for Automotive Room and Carpentry Workshop for ventilation. Provide ceiling/bathroom exhaust fan to serve the janitor closet. Provide Kitchen Ventilation to Prostart Kitchen room. Provide dryer exhaust duct to serve in the laundry area.

Administration Building

Provide Ducted Type Variable Volume Air Handling System with Dedicated Outside Air Unit at the first floor of the Administration Building. The air-conditioning system is direct expansion. Each room or zone will be provided with a Variable Air Volume Box (VAV) located inside ceiling and with zone control thermostat. The AHU unit will be Variable Air Volume and quantity to be determined.

Provide Package Type Ducted Roof Top Air Conditioning System directly coupled with Dedicated Outside Air Unit on the second floor of Administration building. The Package Roof Top (PCU) will be located on the roof provided with roof curb with stainless steel sheet metal flashing. The PCU unit will be Variable Air Volume and quantity to be determined.

Provide ducted exhaust ventilation systems and exhaust fans to serve the Men & Women restrooms, Lobby Toilet, Staff restrooms, Isolation toilet rooms, Bed Area and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Staff restroom on the second floor. Provide ceiling exhaust fan for the Men & Women restroom, Lobby Toilet, Isolation room, Bed Area, and Janitor Closet.

Main Entrance

Provide Variable Refrigerant Flow (VRF) Air conditioning system for Main Entrance Building. The Fan Coil Unit will be a wall mounted type with a room-controlled thermostat located in each room for HR, SRO, Storage, & Ticket Booth room. The ACCU unit will be located on the roof provided with roof curb, equipment concrete pad, vibration isolators, SSTL. – tie down, supports and other related accessories.

Gymnasium Building

Provide Package Type Ducted Roof Top Air Conditioning System directly coupled with Dedicated Outside Air Unit. The Package Roof Top (PCU) will be located on the roof provided with roof curb with stainless steel sheet metal flashing. The PCU unit will be Variable Air Volume and quantity to be determined. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's restroom and locker room, family restroom, staff restroom and janitor closet. Provide in-line dryer exhaust booster fan to serve in the laundry area. Provide sidewall exhaust fan for the Solar Water Heater Storage rooms. Provide occupancy

sensor control for the exhaust fans serving the family restrooms and staff rooms. Provide multi-speed exhaust fans serving the Men's & Women's restroom and Locker room.

Cafeteria Building

Provide Package Type Ducted Roof Top Air Conditioning System directly coupled with Dedicated Outside Air Unit. The Package Roof top (PCU) will be located on the roof provided with roof curb with stainless steel sheet metal flashing. The PCU unit will be Variable Volume and quantity to be determined. The main kitchen will be provided with Kitchen Exhaust Ventilation system. Provide air-curtains at the entrance of the dining area to separate the space from any odor, bacteria, or air particles, (vice versa) from the conditioned space to the outdoors. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's Employee and Customer's restroom and Staff restroom. Provide ceiling/bathroom exhaust fan to serve the janitor closet. Provide occupancy sensor control for the customer's men & women restroom and staff room.

Auditorium Building

Provide Package Type Ducted Roof Top Air Conditioning System directly coupled with Dedicated Outside Air Unit serving the Auditorium Seating and Stage Area. The Package Roof top (PCU) units will be located on the roof provided with roof curb with stainless steel sheet metal flashing. The PCU unit serving the Second Floor Common Area and Backstage will be single zone Variable Air Volume Air Conditioning system. The main auditorium seating area and stage area will be single zone Variable air volume provided with duct silencer. The HVAC system design for the auditorium shall be in compliance with the room's sound/acoustical requirements. The Ground Floor Common Area will be provided with Multi Zone Variable Air Volume Package Type Roof Top Air Conditioning System. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's restroom, Dressing room & Family restroom. Provide ceiling/bathroom exhaust fan to serve the janitor closet.

JROTC

Provide Package Type Ducted Roof Top Air Conditioning System with Dedicated Outside Air Unit serving the office and common space. The DOAS unit will supply conditioned outside air to the Packaged Roof Top unit and directly to the classrooms and common areas. Provide Variable Refrigerant Flow (VRF) system for the classrooms. The Fan Coil Unit will be constant volume ducted type with ducted return. The FCU will be located at the corridor closet that serves two classrooms with each FCU unit. The unit will be provided with UV Light to mitigate

any molds and bacteria at the cooling coil. The VRF outdoor unit will be located on the roof provided with equipment concrete pad, vibration isolators, SSTL. -tie down, supports and other related accessories. Provide Computer Room Air-Conditioning Unit (CRAC) to the ARMS Room. The CRAC Unit will be DX-Split System with the ACCU located on the roof provided with roof curb with equipment concrete pad, vibration isolators, SSTL. – t down, supports and other related accessories. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms, locker rooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's restroom, Men and Women's Locker room, and Staff restroom. Provide ceiling/bathroom exhaust fan to serve the janitor closet. Provide occupancy sensor control for the staff room.

Credit Recovery

Provide Package Type Ducted Roof Top Air Conditioning System with Dedicated Outside Air Unit serving the common space. The DOAS unit will supply conditioned outside air to the Packaged Roof Top unit and directly to the classrooms. Provide Variable Refrigerant Flow (VRF) system for the classrooms. The Fan Coil Unit will be constant volume ducted type with ducted return. The FCU will be located at the corridor closet that serves two classrooms with each FCU unit. The unit will be provided with UV Light to mitigate any molds and bacteria at the cooling coil. The VRF outdoor unit will be located on the roof provided with equipment concrete pad, vibration isolators, SSTL. -tie down, supports and other related accessories. The Package Roof top (PCU) will be located on the roof provided with roof curb with stainless steel sheet metal flashing. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's restroom. Provide ceiling/bathroom exhaust fan to serve the janitor closet.

Press Box

Provide Variable Refrigerant Flow (VRF) for Press Box Room and Electrical Room. The Fan Coil Unit will be a wall mounted type with a room-controlled thermostat. The Telecom Room within the Press Box Building will be provided with a Single DX-Split System, with a wall mounted type Fan Coil Unit with a room-controlled thermostat. Provide ducted exhaust ventilation systems and exhaust fans to serve the restrooms and janitor closet. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 for the Men's & Women's restroom. Provide ceiling/bathroom exhaust fan to serve the janitor closet.

AIRCONDITIONING AND VENTILATION SYSTEM SPECIFICATION

Provide minimum 6-inch-thick concrete housekeeping pads and vibration isolators under all floor-mounted equipment and Air-cooled condensing unit. Equipment for areas with acoustical requirements shall be provided with spring vibration isolators as required,

Provide the outdoor mechanical HVAC enclosure on the Leeward side of the building opposite of the prevailing or trade winds that carry salt-laden air that would speed up the corrosion process.

All outdoor mechanical equipment HVAC cooling and condenser coils must be provided with a manufacturer approved coating system. The heat transfer rating shall be as installed. For unitary air-conditioning equipment located outdoor including air-cooled condensing units and packaged units, provide a copper tube/aluminum fin condenser coil with a 10,000-hour salt spray test per ASTM B117 standard or better for both condenser coil, cabinet casings, chassis, and internal components and an ultraviolet (UV) topcoat on the coating to prevent UV degradation. Spray-on application is acceptable by a certified applicator for the coating product inside a shop in a controlled environment. No field or job site coating application allowed. Provide with stainless steel fasteners only.

Provide insulated galvanized steel ductwork constructed, braced, reinforced, installed, supported, and sealed in accordance with the IMC and Sheet Metal and Air-Conditioning Contractors' National Association (SMACNA) standards inside conditioned space. All ductwork exposed to outdoor condition or conveying untreated air shall be stainless steel.

Provide insulated, stainless-steel ductwork constructed, braced, reinforced, installed, supported, and sealed per SMACNA standards for outside air ductwork.

Ductwork shall be designed to the pressure class required for the pressure of the air-conditioning system provided. All supply return and outside air ducts shall be sealed to Seal Class A and leak tested if its pressure class is greater than 1-inches of water column.

Provide grilles, registers, and diffusers of aluminum construction. Exterior devices and ducts shall be stainless steel. Laboratory Exhaust ventilation system shall be stainless steel construction Devices shall include bird screens, louvers, dampers, and fasteners.

Provide stainless steel ductwork constructed, braced, reinforced, installed, supported, and sealed per the IMC and SMACNA standard for shower areas and ductwork connecting outside air louvers to Dedicated Outdoor Air or Air-conditioning and Ventilation system.
For equipment’s located on the roof, provide roof curb with stainless steel sheet metal flashing. Provide stainless steel fasteners, bolts & nuts, and stainless-steel tie-down. Provide equipment with vibration isolators, concrete pads (where applicable), supports and other related accessories.

Provide grilles, registers, and diffusers shall be aluminum with stainless steel screws and fasteners. Ceiling diffusers and registers shall be provided with anti-smudge devices. Diffusers, registers, and grilles shall be similar. Supply grilles shall be double deflection type. Provide opposed blade dampers as face of registers, diffusers, and grilles. Do not locate diffusers near operable windows or doors to the exterior to prevent humid air from coming into contact with the diffuser or register resulting in condensation. Where there is potential for outside air to come

into contact with supply terminal devices, use supply air registers or grills. Locate supply registers and diffusers to ensure proper air distribution throughout the entire conditioned space.

EXHAUST SYSTEMS

Provide stainless steel ductwork constructed, braced, reinforced, installed, supported, and sealed in accordance with the IMC and SMACNA standards

Provide ducted exhaust ventilation systems and exhaust fans to serve all ventilated zones of the facility. Provide in-line centrifugal exhaust fans that are certified to meet AMCA 210 and zoned for the building. Provide fans with non-spark construction in the Laboratory rooms, Science rooms, Chemistry rooms, Anatomy rooms, Biology rooms and other classrooms which will conduct testing and experimenting substances and other scientific laboratory activities per school educational program. Provide an in-line dryer booster fan for laundry areas including exhaust ductwork system to vent air to the exterior side of the building.

PACKAGE UNITS

The Dedicated Outside Air Unit (DOAS unit) shall be 100-percent Outside Air Makeup Air-Conditioning Unit to precondition outside air prior to distributing to zone area.

Provide high efficiency Direct Expansion Ducted Package Type Air-conditioning with hot gas by-pass for humidity control. The unit shall be mounted on concrete pad with vibration isolators, Stainless Steel tie-down, anchors, bolts & nuts and other accessories. The Ducted Type Package air-conditioning unit will have capability for humidity control between 50-60% RH.

DIRECT DIGITAL CONTROLS (DDC)

A Direct Digital Control (DDC) will be provided. The control will be following ASHRAE Standard 135 building controller as the main interface for the building control system.

PLUMBING BASIS OF DESIGN

GENERAL

CODES AND STANDARDS

- International Building Code (IBC), 2009 Edition
- International Plumbing Code (IPC), 2009 Edition
- ASHRAE Handbook – HVAC Applications, 2015
- ASPE Plumbing Engineering Design Handbook; Vol. 1 - Fundamentals of Plumbing Engineering 2013 and Vol. 2 - Plumbing Systems 2014
- Guam Tropical Energy Code, 2017 Edition
- Recommended Standards for Wastewater Facilities (Ten State Standards)
- Standard Construction Details – The City of Palm Coast, Florida.
- Manufacturers Brochures and Catalogs

MATERIALS FOR CONSTRUCTION

Domestic water piping, Treated Rainwater/Non-potable water piping

- Water distribution piping shall be Type K, hard drawn copper for underground installations.
- Water distribution piping shall be Type L, hard drawn copper for above ground installations.
- Fittings for copper tubing shall be cast bronze or wrought copper with soldered ends using tin-antimony solder.
- Mineral fiber insulation with vapor barrier shall be provided on domestic hot water supply piping throughout.

Sanitary waste and vent piping

- Underground piping shall be ABS pipes & fittings.
- Aboveground piping shall be hubless, cast iron with heavy duty couplings.
- Pipe insulation shall be provided on all drainage piping that may be subject to condensation.

Liquefied Petroleum Gas (LPG) piping

- Aboveground piping shall be galvanized steel pipe & fittings.
- Underground piping shall be polyethylene pipe.
- Control valves shall be listed for LPG service.

Compressed air piping

- Piping shall be schedule 40, steel, meeting the requirements of ASTM A53/A53M, black or hot-dip zinc coated with threaded fittings

Rainwater/ Storm drainage piping

- Underground piping shall be ABS plastic pipes & fittings.
- Aboveground piping shall be hubless, cast iron with heavy duty couplings.

PLUMBING SYSTEMS

The plumbing system in Simon Sanchez High School consists of all fixtures, potable cold and hot water piping and equipment, piping insulation, water heating equipment, sanitary waste and vent piping systems, and other specialty piping and equipment within 5 feet of the buildings.

The typical plumbing systems are as follow:

Fixtures, Faucets and Fixture Fittings

All plumbing fixtures shall be high efficiency low-flow type fixtures for water conservation. The toilets and shower rooms shall be provided with EPA Water Sense-labeled plumbing fixtures and faucets. ADA compliant fixtures shall be provided as shown in the architectural floor plans. Provide all fittings, connections and accessories required for a complete and usable system.

Gooseneck type lavatory faucets shall be provided in toilet and shower areas. Electric water coolers, refrigerated type with bottle filler, shall be provided in classroom buildings, Cafeteria and Gymnasium. Provide washing machine utility box for clothes washers.

Floor drains and shower drains shall be provided in toilets, kitchen, shops, laundry, science laboratories, shower rooms and cafeteria dining hall. Floor sinks shall be provided for mechanical and utility rooms. Stainless steel, NSF-listed trench drains, and floor sinks shall be provided in Cafeteria kitchen area. Funnel drains shall be provided in FCU rooms and Solar Water Heater rooms.

Utilities

Water supply shall be piped to the buildings from the GWA utility system. The record of Hydrant Flow Test as of November 4, 2020, have 61 psi static, 44 psi residual and 544 gpm flow rate.

The building drainpipe shall be connected to the main sewer line and will be coordinated with the civil engineer.

Domestic water distribution system

Cold water supply shall be provided to support the toilets, showers, kitchens, science laboratories, art rooms, GCC classroom/shops, break rooms, utility rooms, laundry and emergency fixtures.

The domestic water distribution system shall include pipes, fittings and accessories. Provide water hamme1r arrestors.

Provide shut-off valves on service lines entering the building in accessible locations. Provide isolation valves at supply to fixtures to provide ease of maintenance. Provide hose

bibbs with vacuum breaker along the exterior of buildings for general maintenance use and in roof decks for mechanical equipment cleaning. Provide hose bibbs with vacuum breaker in classroom and gymnasium public restrooms, and in cafeteria kitchen for maintenance.

Provide backflow preventers on make-up water supply for rainwater tanks. Locate backflow preventers in easily accessible location and near the tank's enclosure.

Provide piping supports in accordance with the IPC.

Test piping for leaks in accordance with the International Plumbing Code (IPC) installation requirements.

All potable water piping shall be chlorinated and disinfected in accordance with American Waterworks Association (AWWA) and EPA requirements and standards.

Hot water supply system

Hot water supply shall be provided in the kitchen areas, science laboratories, and showers. Provide water heaters complete with control system, gauges and ASME rated combination pressure and temperature relief valve. Electric tank type water heater shall be Energy Star certified. Tankless electric water heaters shall be multiple or point-of-use type.

Solar photovoltaic system shall have water heaters with two photovoltaic resistive heating elements each rated to 1000 watts. PV system shall generate electricity from PV modules and PV Inverters. The water heater backup electrical grid element rated 3380 watts will ensure hot water availability when solar heat is not available. The hot water system shall include vertical steel storage tank, hot water recirculating pump and thermal steel expansion tank.

Storage type water heating equipment shall be mounted on a concrete pad and secured to the building structure with strapping and fasteners. Provide service clearances in accordance with manufacturer's recommendations around all equipment.

Sanitary waste and vent system

Provide p-trap primer for floor drains that are not receiving condensate drains from the air-conditioning units. Provide cleanouts.

Provide single sump pump in pits below the lowest floor of Classroom A-Wing, B-Wing, and Auditorium. Complete system with controls, high-water level alarm actuator, and audible or visual alarm.

Utilize individual and common vent for vent systems where applicable. Design vent system per IPC. Vents thru the roof shall be terminated not less than 12 inches above the roof.

Roof drainage system

Provide roof drains that are compatible with the roofing system. Roof catchment areas shall collect rainwater for water closets and urinal flushing and for landscape irrigation.

Other roof drains not included in the roof catchment areas shall have drain system connected to the storm runoff by civil design.

Special plumbing systems where required are as follow:

Grease interceptors – Grease interceptors shall be provided in the kitchen areas.

Solid interceptors – Solids interceptors shall be provided in the Art room area.

Oil-water separator – Oil-water separator shall be provided in the Automotive workshop area.

Dilution tanks – Dilution tanks shall be provided in the Science Laboratory area.

Liquefied Petroleum Gas (LPG) Supply – LPG supply storage tanks and piping shall be provided for the kitchen area in Cafeteria, for the kitchen area in GCC ProStart/Kitchen room, and for science classrooms in A-Wing.

RAINWATER COLLECTION AND DISTRIBUTION SYSTEM

A rainwater catchment system shall be utilized for use in water closets and urinals in selected buildings to reduce water consumption and achieve sustainability goals.

A wet system plumbing configuration shall be utilized to transfer harvested rainwater from the roof, underground through pipes and up to the rainwater harvesting tank. Roof drains shall receive rain fall over the roof catchment areas. The network of downspout system shall collect the rainwater to an underground piping to the vortex type fine filter installed above the tank's full capacity water level. The vortex type fine filter shall remove debris to the rainwater before diverting to storage tanks and discharge drain to daylight or splash block. The underground piping shall have a drip type drain valve in a percolation chamber to drain the residual rainwater. Provide cleanout handholes for underground rainwater piping. The roof catchment area shall have secondary storm drain system connected directly to the storm runoff system by civil design.

Each system shall utilize 1-each above ground Fiberglass Reinforced Plastic (FRP) panel type storage tank assembly with associated pump enclosed in a dedicated pump house. The tank is sized for a 2 to 3-days drought period and shall include level controls, overflows, floating filters and vents. The tank's overflow pipe shall drain to daylight for excess rainwater during collection process. For tank's maintenance, a normally closed drain valve at the bottom of the tank shall drain to daylight. Municipal makeup tied into the storage tank shall ensure that adequate supply of water will always be available. Makeup domestic water supply from GWA meter shall have backflow preventer assembly.

The treatment and distribution system shall consist of packaged duplex booster pump assembly with pump control panel, hydropneumatic tank for pressure control, sediment and carbon filters to remove debris and prevent organic growth, water softener, UV light for disinfection, motorized valves interlock with pump control and other accessories. The treated rainwater shall supply the water closets and urinals across the school facility and shall supply for landscape irrigation during off-peak schedule.

Provide concrete pad and supports on all pump room equipment. Provide service clearances in accordance with manufacturer's recommendations around all equipment.

There shall be 4 separate Zones for rainwater harvesting and distribution: (1) for Administration, Auditorium, and A-Wing located at Lower East (2) for GCC located at Lower West, (3) for B-Wing and Gymnasium located at Upper East, and (4) for JROTC located at Upper West.

Rainwater collection system in Zone 3 (Upper East) shall be connected to emergency power service for typhoon shelter facility use in Gymnasium building.

PLUMBING REQUIREMENTS

CLASSROOM BUILDINGS:

CLASSROOM A-WING

A. Science Laboratories
Science Laboratories/classrooms will have 8 student-workstation sinks, a teacher demonstration table with sink, and OSHA compliant emergency shower and eye/face wash station in each laboratory. Sinks shall be provided with cold & hot water, gas assemblies for Bunsen burners, and sanitary sewer systems.

Science preparatory rooms will have prep sinks, mop sinks and OSHA compliant emergency shower and eye/face wash stations. Emergency shower and eye/face wash station in each science classrooms shall include flow activation alarms and shall be interlocked with the fire alarm system.

Hot water system shall utilize solar photovoltaic system complete with PV modules, PV Inverters, hot water storage tank, hot water recirculating pump and thermal expansion tank.

Point-of-use, in-floor application chemical dilution tanks with threaded lid shall be provided for each sink in science laboratories/classrooms and science prep room to collect and treat acid wastes before discharging to the sanitary drainage system.

A 2-each 125-gallon LPG supply storage tank and piping shall be provided for the Science Laboratories, supplying gas on each workstation. Clearly labeled manual control valve will be located in the Preparatory Rooms. Concrete enclosure with lockable gates shall be provided.

B. SPED Classrooms
SPED Basic Life Skills classrooms will have a kitchen sink, clothes washer and dryer, restroom and a shower. Cold and hot water and sanitary sewer system shall be provided.

A light-duty tank type electric water heater shall be provided for hot water supply.

C. Art Rooms
Energy star rated tankless electric water heater for multiple lavatories shall be provided.
Solids interceptors for on-floor installation shall be provided in each Art rooms.

D. Restrooms
The rainwater distribution system for fixture flushing of water closets and urinals in A-Wing restrooms shall share system with Administration and Auditorium Building. Rainwater tanks are located south of the A-Wing (East) building.

CLASSROOM B-WING

The rainwater catchment and distribution system for fixture flushing of water closets and urinals in B-Wing Building shall share system with Gymnasium. Rainwater tanks are located north of B-Wing building.

ADMINISTRATION BUILDING and LIBRARY:

Provide cold water connection to private restroom lavatories, electric water cooler and mop sink. Provide cold and hot water connections to lavatories in nurse's office, nurse room restroom, ante room and isolation room. Provide cold and hot water connection for pantry sink. Provide hose bibb with vacuum breaker and floor sinks in the mechanical room.

Energy star rated tankless electric water heater for multiple lavatories shall be provided in the Isolation and Ante area. A tankless electric water heater shall also be installed for shower and lavatory in the Nurse's restroom.

Energy star rated tankless electric water heater for single point-of-use under-the-counter shall be provided in the Faculty Lounge pantry sink.

The rainwater catchment and distribution system for fixture flushing of water closets and urinals in Administration Building shall share system with A-Wing and Auditorium. Rainwater tanks are located south of the A-Wing (East) building.

CAFETERIA:

A high-efficient heavy duty commercial use, tank type electric water heater complete with valves and piping shall be provided for the kitchen area to serve hot water supply on ware washing units and sinks.

A 1,000-gallon cast-in-place concrete grease interceptor shall be provided for kitchen waste.

A 500-gallon horizontal LPG supply storage tank and LPG distribution piping shall be provided for the cooking equipment in the kitchen area.

Provide hand sinks, drinking fountains and floor drains in dining hall. Domestic cold water shall be supplied to hand sinks and drinking fountains, and to plumbing fixtures in public restrooms.

Non-potable water from rainwater Zone-4 (Upper West) shall be utilized for hose bibbs on the exterior of the building.

GYMNASIUM:

Provide cold water connections for public lavatories and electric water coolers. Provide cold and hot water connections for private lavatories, showers, mop sink, laundry tub, washing machine utility box, and janitor sink. Provide high and low electric water coolers in locker room hallway. Provide hose bibbs with vacuum breaker in locker room restrooms. Provide linear floor drains for the Locker Room showers, floor drains in Restrooms and funnel drains in Solar Water Heater rooms.

Hot water supply shall utilize solar photovoltaic system complete with PV modules, PV Inverters, hot water storage tank, hot water recirculating pump and thermal expansion tank. There shall be a separate system for the men and women's locker rooms.

Rainwater catchment and distribution system for fixture flushing of water closets and urinals in Gymnasium shall share system with B-Wing Building. Rainwater tank and pump room are located north of B-Wing building.

AUDITORIUM:

Provide cold water connections for wall-mounted lavatories, mop sink, and hose bibb with vacuum breaker. Provide elevator sump pump complete with controls, accessories and force drainpipe to floor sink. Provide floor drains in restrooms.

The rainwater catchment and distribution system for fixture flushing of water closets and urinals in Auditorium shall share with the system for the Administration and A-Wing Building. Rainwater tank and pump room are located south of the A-Wing (East) building.

GCC BUILDING:

A. ProStart

A 2-each 125-gallon LPG supply storage tank and piping shall be provided for the kitchen area in the GCC ProStart room. Concrete enclosure with lockable gates shall be provided.

A grease interceptor shall be provided for kitchen waste treatment.

A heavy-duty tank-type electric water heater and hot water return pump shall be installed in the laundry area to serve clothes washer, kitchen sinks and dishwasher in ProStart Kitchen.

B. Carpentry and Automotive

Combination emergency shower and eye/face wash stations shall be provided in the Carpentry & Automotive shops. Emergency shower shall include flow activation alarms and will be interlocked with the fire alarm system.

Compressed air supply system shall be provided in the GCC Carpentry and Automotive shops. Packaged type air compressor with storage tank & controls, compressed air distribution piping, quick connect fittings and hose reels shall be provided in each shop.

Oil-water separator shall be provided in the Automotive workshop for waste treatment.

C. Marketing Store Lab

Provide cold water connections for wall-mounted handwashing station.

D. Hospitality & Tourism

Provide cold and hot water connections for fixtures in mock restroom.

E. ProStart Kitchen Lab

Provide cold and hot water connections for handwashing stations, kitchen sinks and dishwashing machine.

F. Electronics Workshop

Provide cold water connections for wall-mounted handwashing station.

G. Health Career Services

Provide cold water connections for wall-mounted handwashing station.

H. Restrooms

The rainwater catchment and distribution system for fixture flushing of water closets and urinals is located west of the GCC building.

JROTC BUILDING:

Provide cold water connections for public lavatories, ice maker and mop sink. Provide cold and hot water connections for showers and pantry sink. Provide hose bibb with vacuum breaker at exterior and at roof for maintenance use. Provide linear floor drains for the Locker Room showers, floor drains in Restrooms and funnel drains in FCU rooms.

Energy star rated tankless electric water heater for single point-of-use shall be provided for the shower in the Staff Restroom. Energy star rated tankless electric water heater for single point-of-use shall be provided for pantry sink in the Staff Collaboration room.

Hot water supply for showers in locker rooms shall utilize solar photovoltaic system complete with PV modules, PV Inverters, hot water storage tank, hot water recirculating pump and thermal expansion tank.

The rainwater catchment and distribution system for fixture flushing of water closets and urinals is located north of Cafeteria building.

CREDIT RECOVERY BUILDING:

Provide floor mounted, flush valve water closets. Provide wall-mounted urinals. Provide wall-mounted lavatories with lever handles for accessibility. Provide mop sink and floor drains. Provide hose bibb with vacuum breaker at exterior and at roof for maintenance use.

Domestic cold-water system shall be supplied in public restrooms.

PRESS BOX:

Provide floor mounted, flush valve water closets. Provide wall-mounted urinals. Provide wall-mounted lavatories with lever handles for accessibility. Provide mop sink and floor drains. Provide hose bibb with vacuum breaker at exterior and at roof for maintenance use.

Provide two outdoor shower and foot rinse stations with clearly labeled shut-off valves located inside. Provide floor drains at each outdoor shower and foot rinse station.

Domestic cold-water system shall be supplied in public restrooms.

PUMP & GENERATOR BUILDING:

PUMP ROOM

Provide floor sink for equipment drain and filter backwash and connect to sewer system.

GENERATOR BUILDING

Provide hose bibbs with vacuum breaker along the exterior of the building for general maintenance use. Provide OSHA compliant emergency shower and eye wash station for the generator room.

Fire Protection Basis of Design

CRITERIA AND REFERENCE

The design shall be in accordance with the following codes, standards, and regulations.

- New Simon Sanchez Specification dated July 04, 2017.
- IMC International Mechanical Code, 2009
- IPC International Plumbing Code, 2009
- IFC International Fire Protection Code, 2009
- IBC International Building Code, 2009
- NFPA Standards

FIRE PROTECTION SITE REQUIREMENTS:

Fire Access Road

Unimpeded access shall be provided to the site for fire department use. The road shall provide access to buildings, and the fire apparatus shall have access to within 150 feet of all portions of the exterior walls of the first story of the building measured by an approved route around the facility. (IFC 503) The 150 feet dimension can be increased if authorized by AHJ.

Fire apparatus access road shall have a minimum width of 20 feet. Dead-ends at the access roads in excess of 150 feet shall be provided with turnaround provision.

Fire-Flow Requirements (hydrant)

Fire flow requirements will be base on the largest building, which is the A-wing classroom building. The total floor area is around 38,000 sq. feet. Based on the IBC 2009 Appendix B (non-mandatory requirements), the recommended fire flow is 5,750 gpm with an allowable reduction of up to 75% when the building is protected with a fire sprinkler system. The final fire flow requirement is 1500 gpm at 20 psi (with allowed reduction).

Based on the hydrant flow test conducted, the available fire flow is 875 gpm at 20 psi. Though it may be below the recommended fire-flow, this is the prevailing situation in most areas on the island.

An Electric motor driven fire pump with 10,000 gals break tank shall be provided to serve all buildings in the facility.

BUILDING CODE & LIFE SAFETY REQUIREMENTS:

I. A - Wing, Auditorium and Admin Building

A. Occupancy Classification
Building Occupancy Classification: Mixed Use Occupancy, Separated. (IBC 508)
The North wing Building is composed of Classroom Building A-Wing, Auditoruim and Adminitration Building. The building will have Educational Group E (IBC 305), Assembly A-1 (IBC 303) and Busines Group B (IBC 304) occupancies. The provision of Separated Occupancies (IBC 508.4) shall be met.

IBC occupancies: Separated occupancies (IBC 508.3)

a. Assembly Group A-1
b. Educational Group E
c. Business Group B

B. Type of Construction
Noncombustible and limited combustible materials will be used for the proposed building elements to meet Type II-B construction.

C. Allowable Building Height (IBC Tables 503) (with the allowable increase for having sprinkler protection):

a. Assembly Group A-1 : 3 Stories / 75 feet.
b. Educational Group E : 4 Stories / 75 feet.
c. Business Group B : 4 Stories / 75 feet.

D. Allowable Building Area
The building allowable floor areas are as follows (with the allowable increase for having sprinkler protection):

a. Assembly Group A-3: 38,500 ft^2
b. Educational Group E: 43,500 ft^2
c. Business Group B: 92,000 ft^2

The allowable building areas for each separated occupancies will not be exceeded. In addition, sum of the ratios of the actual building areas of each occupancy shall not exceed 1.

E. Rating of Structural Components
The required fire-resistance ratings of the building elements for the proposed structure based on Type II-B construction are as follows:

Element	Material	Rating
Primary Structural Frame	Noncombustible	0 hr
Exterior Bearing Walls*	Non-combustible	0 hr*
Interior Bearing Walls	Non-combustible	0 hr
Exterior Nonbearing Walls*	Non-combustible	0 hr*
Interior Nonbearing Walls	Non-combustible	0 hr
Floor Construction	Noncombustible	0 hr
Roof Construction	Noncombustible	0 hr

* For the fire rating requirements of the exterior wall of see “Required Building Separation of Exposure Protection.”

F. Fire-Rated Walls and Partitions
Group A and Group E occupancies have similarities; both are people-intensive occupancies. No required separation between Group A and Group E per IBC Table 508.1 but must be separated from all other occupancies.Group B shall be separated from Group A and Group E occupancy.

Access corridors are not required to be fire-resistance rated per IBC Table 1018 since the building is protected by a fire sprinkler system.

G. Required Building Separation or Exposure Protection
Exposure wall protection shall be based on fire separation distance per IBC Table 602.

H. Means of Egress Requirements:
Egress requirements shall be based on the requirements of each separated occupancy. o. Means of egress components like corridors, stairways, and exteriors exit doors shall be sized to provide sufficient capacity.

The minimum number of exits shall be based on the calculated occupants and complies with the table below:

TABLE 1021.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

The means of egress shall be arranged to meet the common path and travel distance requirements.

Maximum Travel Distances: 250 feet
Maximum Dead-end corridor: 50 feet

Maximum Common Path: 30 feet (Group A), 75 feet (Group E)

I. Occupancy Load Calculation for Egress Requirements:
Occupant load calculation shall be based on the actual usage of the area as indicated on IBC Table 1004.1 as listed below:

Classroom areas: 20 ft^2/occupant (net)
Shops and other vocational areas: 50 ft^2/occupant (net)
Assembly with table and chairs: 15 ft^2/occupant (net)

G. Fire Suppression System
A fire sprinkler system is required for buildings with Group A-1 occupancies that exceed 12,000 ft^2 and Group E occupancies that exceed 12,000 ft^2. The fire sprinkler system shall be installed in accordance with NFPA 13.

H. Fire Alarm System
A Fire Alarm system shall be provided in accordance with IBC 907.5. The fire alarm system shall provide occupant notification. In Group A, occupancy with an occupant load of 1000 or more, the audible occupant notification shall be by voice alarm.

II. B- Wing Classroom Building

A. Occupancy Classification
Building Occupancy Classification:
The building will be classified as single occupancy, Educational Group E (IBC 305).

B. Type of Construction
Noncombustible and limited combustible materials will be used for the proposed building elements to meet Type II-B construction.

C. Allowable Building Height (IBC Tables 503) (with the allowable increase for having sprinkler protection):
   a. Educational Group E: 4 Stories / 75 feet.

D. Allowable Building Area
The building's allowable floor areas are as follows (with the allowable increase for having sprinkler protection):

   a. Educational Group E: 23,500 ft^2

The allowable building areas for Group E occupancy will not be exceeded.

E. Rating of Structural Components

The required fire-resistance ratings of the building elements for the proposed structure based on Type II-B construction are as follows:

Element	Material	Rating
Primary Structural Frame	Noncombustible	0 hr
Exterior Bearing Walls*	Non-combustible	0 hr*
Interior Bearing Walls	Non-combustible	0 hr
Exterior Nonbearing Walls*	Non-combustible	0 hr*
Interior Nonbearing Walls	Non-combustible	0 hr
Floor Construction	Noncombustible	0 hr
Roof Construction	Noncombustible	0 hr

* For the fire rating requirements of the exterior wall of see “Required Building Separation of Exposure Protection.”

F. Fire-Rated Walls and Partitions
Access corridors are not required to be fire-resistance rated per IBC Table 1018 since the building is protected by a fire sprinkler system.

G. Required Building Separation or Exposure Protection
Exposure wall protection shall be based on fire separation distance per IBC Table 602.

H. Means of Egress Requirements:
Egress requirements shall be based on the requirements of each separated occupancy. o. Means of egress components like corridors, stairways, and exteriors exit doors shall be sized to provide sufficient capacity.

The minimum number of exits shall be based on the calculated occupants and complies with the table below:

TABLE 1021.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

The means of egress shall be arranged to meet the common path and travel distance requirements.

Maximum Travel Distances: 250 feet
Maximum Dead-end corridor: 50 feet
Maximum Common Path: 75 feet

I. Occupancy Load Calculation for Egress Requirements:
Occupant load calculation shall be based on the actual usage of the area as indicated on IBC Table 1004.1 as listed below:

Classroom areas: 20 ft^2/occupant (net)
Shops and other vocational areas: 50 ft^2/occupant (net)
Assembly with table and chairs: 15 ft^2/occupant (net)

J. Fire Suppression System
A fire sprinkler system is required for buildings with Group E occupancies that exceed 12,000 ft^2. The fire sprinkler system shall be installed in accordance with NFPA 13. A fire pump with a break tank will be provided to serve all buildings in the facility.

K. Fire Alarm System
A Fire Alarm system shall be provided in accordance with IBC 907.5. The fire alarm system shall provide occupant notification during a fire alarm event.

L. Hazardous Materials
Hazardous materials stored or used in the building shall be limited to the quantities listed in IBC 2009 Table 307. When the maximum allowable amount is exceeded, the area will be classified as Group H occupancy and must be separated from the rest of the building using fire-rated construction.

III. Gymnasium

A. Occupancy Classification
Building Occupancy Classification: Assembly Occupancy A-1 and A-4
The building will have Assembly Group E (IBC 305) and Assembly A-5 (IBC 303) occupancies. The provision of Separated Occupancies (IBC 508.4) shall be met.

IBC occupancies: Separated occupancies (IBC 508.3)
   a. Assembly Group A-4 Gymnasium
   b. Educational Group E Classrooms

B. Type of Construction
Noncombustible and limited combustible materials will be used for the proposed building elements to meet Type II-A construction.

C. Allowable Building Height (IBC Tables 503) (with the allowable increase for having sprinkler protection):
   a. Assembly Group A-4 : 3 Stories / 75 feet.
   b. Educational Group E : 4 Stories / 75 feet.

D. Allowable Building Area
The building allowable floor areas are as follows (with the allowable increase for having sprinkler protection):
   a. Assembly Group A-4: 28,500 ft^2

b. Educational Group E: 43,500 ft^2

The allowable building areas for each separated occupancies will not be exceeded. In addition, sum of the ratios of the actual building areas of each occupancy shall not exceed 1

E. Rating of Structural Components
The required fire-resistance ratings of the building elements for the proposed structure based on Type II-A construction are as follows:

Element	**Material**	**Rating**
Primary Structural Frame	Noncombustible	1 hr
Exterior Bearing Walls*	Non-combustible	1 hr*
Interior Bearing Walls	Non-combustible	1 hr
Exterior Nonbearing Walls*	Non-combustible	0 hr*
Interior Nonbearing Walls	Non-combustible	0 hr
Floor Construction	Noncombustible	1 hr
Roof Construction	Noncombustible	1 hr

* For the fire rating requirements of the exterior wall of see “Required Building Separation of Exposure Protection.”

J. Fire-Rated Walls and Partitions
No fire-rated separation required between Group A-4, and Group E

Access corridors are not required to be fire-resistance rated per IBC Table 1018 since the building is protected by a fire sprinkler system.

K. Required Building Separation or Exposure Protection
Exposure wall protection shall be based on fire separation distance per IBC Table 602.

L. Means of Egress Requirements:
Egress requirements shall be based on the requirements of the most restrictive occupancy. Means of egress components like corridors, stairways, and exteriors exit doors shall be sized to provide sufficient capacity.

The minimum number of exits shall be based on the calculated occupants and complies with the table below:

TABLE 1021.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

The means of egress shall be arranged to meet the common path and travel distance requirements.

Maximum Travel Distances: 250 feet
Maximum Dead-end corridor: 50 feet
Maximum Common Path: 30 feet (Group A),

M. Occupancy Load Calculation for Egress Requirements:
Occupant load calculation shall be based on the actual usage of the area as indicated on IBC Table 1004.1 as listed below:

Assembly with table and chairs: 15 ft^2/occupant (net)
Assembly with fixed seating shall be based on the actual number of fixed seats. For seats without arm dividing arms, the occupant load shall be based on a seating length of 18 inches per person.

G. Fire Suppression System
A fire sprinkler system is required for buildings with Group A-1 and Group A-4 occupancies that exceed 12,000 ft^2. The fire sprinkler system shall be installed in accordance with NFPA 13. A fire pump with a break tank will be provided to serve all buildings in the facility.

H. Fire Alarm System
A Fire Alarm system shall be provided in accordance with IBC 907.5. The fire alarm system shall provide occupant notification. In Group A, occupancy with an occupant load of 1000 or more, the audible occupant notification shall be by voice alarm.

IV. GCC Building

Occupancy Classification
Building Occupancy Classification:
The building will be classified as single occupancy, Educational Group E (IBC 305).

A. Type of Construction
Noncombustible and limited combustible materials will be used for the proposed building elements to meet Type II-B construction.

B. Allowable Building Height (IBC Tables 503) (with the allowable increase for having sprinkler protection):
   a. Educational Group E: 4 Stories / 75 feet.

C. Allowable Building Area

The building allowable floor areas are as follows (with the allowable increase for having sprinkler protection):

a. Educational Group E: 43,500 ft^2

The allowable building areas for Group E occupancy will not be exceeded.

E. Rating of Structural Components

The required fire-resistance ratings of the building elements for the proposed structure based on Type II-B construction are as follows:

Element	**Material**	**Rating**
Primary Structural Frame	Noncombustible	0 hr
Exterior Bearing Walls*	Non-combustible	0 hr*
Interior Bearing Walls	Non-combustible	0 hr
Exterior Nonbearing Walls*	Non-combustible	0 hr*
Interior Nonbearing Walls	Non-combustible	0 hr
Floor Construction	Noncombustible	0 hr
Roof Construction	Noncombustible	0 hr

* For the fire rating requirements of the exterior wall of see “Required Building Separation of Exposure Protection.”

J. Fire-Rated Walls and Partitions

Access corridors are not required to be fire-resistance rated per IBC Table 1018 since the building is protected by a fire sprinkler system. Fire barrier between the JROTC and GCC building will be provided to have two separate fire areas.

K. Required Building Separation or Exposure Protection

Exposure wall protection shall be based on fire separation distance per IBC Table 602.

L. Means of Egress Requirements:

Egress requirements shall be based on the requirements of each separated occupancy. o. Means of egress components like corridors, stairways, and exteriors exit doors shall be sized to provide sufficient capacity.

The minimum number of exits shall be based on the calculated occupants and complies with the table below:

TABLE 1021.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

The means of egress shall be arranged to meet the common path and travel distance requirements.

Maximum Travel Distances: 250 feet
Maximum Dead-end corridor: 50 feet
Maximum Common Path: 75 feet

M. Occupancy Load Calculation for Egress Requirements:
Occupant load calculation shall be based on the actual usage of the area as indicated on IBC Table 1004.1 as listed below:

Classroom areas: 20 ft^2/occupant (net)
Shops and other vocational areas: 50 ft^2/occupant (net)
Assembly with table and chairs: 15 ft^2/occupant (net)

G. Fire Suppression System
A fire sprinkler system is required for buildings with Group E occupancies that exceed 12,000 ft^2. The fire sprinkler system shall be installed in accordance with NFPA 13. A fire pump with a break tank will be provided to serve all buildings in the facility.

H. Fire Alarm System
A Fire Alarm system shall be provided in accordance with IBC 907.5. The fire alarm system shall provide occupant notification during a fire alarm event.

I. Hazardous Materials
Hazardous materials stored or used in the building shall be limited to the quantities listed in IBC 2009 Table 307. When the maximum allowable amount is exceeded, the area will be classified as Group H occupancy and must be separated from the rest of the building using fire-rated construction.

V. JROTC Building

Building Code & Life Safety Requirements:

A. Occupancy Classification
Building Occupancy Classification:
The building will be classified as single occupancy, Educational Group E (IBC 305).

B. Type of Construction

Noncombustible and limited combustible materials will be used for the proposed building elements to meet Type II-B construction.

C. Allowable Building Height (IBC Tables 503) (Basic):
   a. Educational Group E: 3 Stories / 75 feet.

D. Allowable Building Area
The building allowable floor areas are as follows (with the allowable increase for having sprinkler protection):

   a. Educational Group E: 43,500 ft^2

Actual Building area
   a. Educational Group E JROTC Building: 17,680 ft^2

The allowable building areas for Group E occupancy will not be exceeded.

E. Rating of Structural Components
The required fire-resistance ratings of the building elements for the proposed structure based on Type II-B construction are as follows:

Element	**Material**	**Rating**
Primary Structural Frame	Noncombustible	0 hr
Exterior Bearing Walls*	Non-combustible	0 hr*
Interior Bearing Walls	Non-combustible	0 hr
Exterior Nonbearing Walls*	Non-combustible	0 hr*
Interior Nonbearing Walls	Non-combustible	0 hr
Floor Construction	Noncombustible	0 hr
Roof Construction	Noncombustible	0 hr

* For the fire rating requirements of the exterior wall of see “Required Building Separation of Exposure Protection.”

F. Fire-Rated Walls and Partitions
Access corridors are not required to be fire-resistance rated per IBC Table 1018 since the building is protected by a fire sprinkler system.

G. Required Building Separation or Exposure Protection
Exposure wall protection shall be based on fire separation distance per IBC Table 602.

H. Means of Egress Requirements:

Egress requirements shall be based on the requirements of each separated occupancy. o. Means of egress components like corridors, stairways, and exteriors exit doors shall be sized to provide sufficient capacity.

The minimum number of exits shall be based on the calculated occupants and complies with the table below:

TABLE 1021.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

The means of egress shall be arranged to meet the common path and travel distance requirements.

Maximum Travel Distances: 200 feet
Maximum Dead-end corridor: 20 feet
Maximum Common Path: 75 feet

I. Occupancy Load Calculation for Egress Requirements:
Occupant load calculation shall be based on the actual usage of the area as indicated on IBC Table 1004.1 as listed below:

Classroom areas: 20 ft^2/occupant (net)
Shops and other vocational areas: 50 ft^2/occupant (net)

G. Fire Suppression System
A fire sprinkler system is required for buildings with Group E occupancies that exceed 12,000 ft^2. A fire sprinkler system shall be installed in accordance with NFPA 13. A fire pump with a break tank will be provided to serve all buildings in the facility.

H. Fire Alarm System
A Fire Alarm system shall be provided in accordance with IBC 907.5. The fire alarm system shall provide occupant notification during a fire alarm event.

I. Hazardous Materials
Hazardous materials stored or used in the building shall be limited to the quantities listed in IBC 2009 Table 307. When the maximum allowable amount is exceeded, the area will be classified as Group H occupancy and requires to be separated from the rest of the building using fire rated construction

VI. Credit Recovery Building

A. Occupancy Classification
Building Occupancy Classification:
The building will be classified as single occupancy, Educational Group E (IBC 305).

B. Type of Construction
Noncombustible and limited combustible materials will be used for the proposed building elements to meet Type II-B construction.

C. Allowable Building Height (IBC Tables 503) (Basic):
   a. Educational Group E: 3 Stories / 75 feet.

D. Allowable Building Area
The building allowable floor areas are as follows (with the allowable increase for having sprinkler protection):

   a. Educational Group E: 43,500 ft^2

Actual Building area
   a. Educational Group E JROTC Building: 17,680 ft^2

The allowable building areas for Group E occupancy will not be exceeded.

E. Rating of Structural Components
The required fire-resistance ratings of the building elements for the proposed structure based on Type II-B construction are as follows:

Element	**Material**	**Rating**
Primary Structural Frame	Noncombustible	0 hr
Exterior Bearing Walls*	Non-combustible	0 hr*
Interior Bearing Walls	Non-combustible	0 hr
Exterior Nonbearing Walls*	Non-combustible	0 hr*
Interior Nonbearing Walls	Non-combustible	0 hr
Floor Construction	Noncombustible	0 hr
Roof Construction	Non-combustible	0 hr

* For the fire rating requirements of the exterior wall of see “Required Building Separation of Exposure Protection.”

J. Fire-Rated Walls and Partitions
Access corridors are not required to be fire-resistance rated per IBC Table 1018 since the building is protected by a fire sprinkler system.

K. Required Building Separation or Exposure Protection
Exposure wall protection shall be based on fire separation distance per IBC Table 602.

L. Means of Egress Requirements:
Egress requirements shall be based on the requirements of each separated occupancy. o. Means of egress components like corridors, stairways, and exteriors exit doors shall be sized to provide sufficient capacity.

The minimum number of exits shall be based on the calculated occupants and complies with the table below:

TABLE 1021.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

The means of egress shall be arranged to meet the common path and travel distance requirements.

Maximum Travel Distances: 200 feet
Maximum Dead-end corridor: 20 feet
Maximum Common Path: 75 feet

M. Occupancy Load Calculation for Egress Requirements:
Occupant load calculation shall be based on the actual usage of the area as indicated on IBC Table 1004.1 as listed below:

Classroom areas: 20 ft^2/occupant (net)
Shops and other vocational areas: 50 ft^2/occupant (net)

G. Fire Suppression System
A fire sprinkler system is required for buildings with Group E occupancies that exceed 12,000 ft^2. A fire sprinkler system shall be installed in accordance with NFPA 13. A fire pump with a break tank will be provided to serve all buildings in the facility.

H. Fire Alarm System
A Fire Alarm system shall be provided in accordance with IBC 907.5. The fire alarm system shall provide occupant notification during a fire alarm event.

I. Hazardous Materials
Hazardous materials stored or used in the building shall be limited to the quantities listed in IBC 2009 Table 307. When the maximum allowable amount is exceeded, the area will be classified as Group H occupancy and requires to be separated from the rest of the building using fire rated construction

ELECTRICAL

I. Electrical System Description

Provide an electrical system consisting of Service Entrance Wiring and Equipment, Switchboards, Distribution and Lighting Panelboards, Conduits, Feeder and Branch Circuits, Lighting and Branch Wiring, Emergency Generator, Provisions for Connection of Portable Generator, Transfer Switches, Metering, Emergency Lighting and Power, Grounding, Lightning Protection System, and Telecommunication system (outlets, cabling, pathways, cabinets, grounding, etc.) including accessories and devices as necessary and required for a complete and usable system.

Select electrical characteristics of the power system to provide a safe, efficient and economical distribution of power based upon the size and types of electrical loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served.

Provide a minimum of 15 percent spare circuit and load capacity at all levels of the power distribution system including any stand-by power systems.

Provide an interior distribution system consisting of insulated conductors in conduit.

Design and installation of the electrical system must be in accordance with NFPA and other Codes and Regulations, to include but not limited to the following:

- International Building Code (IBC), 2009
- NFPA 70 National Electrical Code, 2023
- NFPA 101 Life Safety Code, 2024
- NFPA 110, Standard for Emergency and Standby Power Systems, 2025
- Illuminating Engineering Society (IES) of North America
- IEEE C2 National Electricity Safety Code (NESC)
- BICSI Telecommunications Distribution Methods Manual
- ANSI/TIA Standards
- Guam Energy Tropical Code
- Guam Power Authority (GPA)
- Department of Public Works (DPW)
- Guam Fire Department (GFD)
- IES RP-3-20 Recommended Practice: Lighting Educational Facilities

II. General System Requirements

Provide an Electrical System complete in place, tested, and approved, as specified throughout this RFP, as needed for a complete, usable and proper installation. Install all equipment in accordance with the criteria, regulations, and the manufacturer's

recommendations. Where the word "should" is used in the manufacturer's recommendations, substitute the word "must".

Perform a short circuit and selective coordination study at the design stage to establish the basis for the system design and to enable completion of an initial arc flash analysis. Provide a final coordination study based on the as-built configuration of the system. Provide a complete coordination study that includes a system one-line diagram, short circuit and ground fault analysis, and protection coordination plots. Show on the one-line diagram all electrical equipment and wiring to be protected by the overcurrent devices including breakers and fuses. Prepare the coordination curves to determine the required settings of protective devices to assure selective coordination. Graphically illustrate on a log-log scale that adequate time separation exists between series devices, including the utility company upstream devices where applicable. Plot the specific time-current characteristics of each protective device in such a manner that all applicable upstream devices will be clearly shown on one sheet. Develop a table to summarize the settings, selected for each protective device. Complete an arc flash evaluation in accordance with NFPA 70E, IEEE Std 1584 (including Amendments 1 and 2), and IEEE Std 1584.1 to determine personal protective clothing (PPE) requirements for work on energized electrical equipment. Utilize computerized software and submit along with the printed report of the study, the editable electronic copy (model and database) used to perform the study.

Sustainability: Provide electrical systems and components that support project sustainability and energy goals.

Seismic Bracing: Bracing of electrical equipment to resist seismic events is required based on site seismic design criteria and building importance factor.

Electrical Testing: Test new electrical equipment in accordance with NETA acceptance testing specifications.

Corrosive Environment: All equipment installed at exterior or non-conditioned space (not provided with air-conditioning) must be provided in stainless steel enclosure(s). All equipment and enclosures installed outdoors must be Nema 4X rated. All associated fasteners, hardware, climbing rungs, metal boxes, framing, access covers, hinges, etc. must also be stainless steel.

III. Site Electrical

Connect to the existing GPA primary system, 13.8 kV, three phase, three wire, 60 Hertz electrical power system.

Locate equipment (transformers, switches, etc.) and underground structures (manholes and handholes) in locations accessible to GPA.

A. Underground Electric Conductors, Raceways, and Ductbanks: Provide a medium voltage and a 600 volt secondary underground electrical power distribution systems.

Underground electrical must be installed in concrete encased ductbank when under the following conditions.

a. Underground primary
b. Under paved road, sidewalk, and parking lot
c. Where subject to vehicular traffic, including non-paved areas that may encounter vehicular traffic

B. Manholes and Handholes: Manholes and handholes must be traffic rated where subject to vehicular traffic.

IV. Site and Area Lighting

Provide site and area lighting for exterior and security, including underground distribution, handholes, grounding, poles, fixtures, and controls as required for a complete and usable system. Provide site and area lighting consisting of pole mounted exterior lighting for the following:

1. Access roads and Parking lots
2. Vehicular gates
3. Pedestrian gates
4. Sports Fields
    a. Football Field
    b. Track & Field
    c. Softball Field
    d. Baseball Field
    e. Tennis Courts

Provide low-level exterior lighting at all pedestrian walkways. Provide building mounted exterior lighting throughout the building perimeter for general illumination.

A. Exterior Lighting Fixtures and Controls: Provide LED type lighting fixtures, complete with lamps. Coordinate color and finish of luminaire with the Government. All exterior luminaire housing must be stainless steel or aluminum. Provide high impact acrylic or high-performance glass lens. Polycarbonate lens must not be provided. All fasteners, connectors and internal metal parts of luminaires must be either aluminum or stainless steel.

   Except for sports lighting, provide an automatic lighting control system for exterior lighting fixtures utilizing lighting contactors, time switches, and photocell switches such that lighting will automatically turn "ON" and turn "OFF". Provide automatic controls with manual override (hand-off-auto) switches. Provide separate, dedicated HOA switches for each type and area (building, security, parking, etc.) to allow separate control of each type/area. For sports lighting, provide controls as indicated.

B. Lighting Poles: Except for sports lighting, provide tapered concrete poles complete with concrete foundations. At access roadway and parking lot lighting, include a 30”

high concrete pedestal. For high mast sports lighting, provide metal poles complete with concrete foundations.

Pole foundation anchor rods, bolts, nuts, and washers must be stainless steel.

Provide all exterior lighting mounted on poles with identification tags. Permanent, clearly visible, and unique identification tag must be installed or mounted securely on the pole.

C. Grounding System: Provide a ground rod at all light poles.

V. Electrical Service and Distribution

A. Perform electrical calculations to include but not limited to the following:

1. Load Analysis including Demand Load Calculations & Generator Sizing Calculations
2. Short Circuit Analysis including protective device interrupting rating
3. Protective device time-current coordination study
4. Arc Flash Analysis
5. Voltage Drop Calculations
6. Lighting Calculations

B. Service Entrance Equipment: Provide concrete encased underground service into the facility. Provide a main breaker at each service entrance.

C. Panelboards: Provide distribution and branch circuit panelboards to serve loads as required. Panelboards must be of sufficient ampacity to serve the designed loads plus a minimum of 15 percent additional ampacity to provide for future growth. Provide panels supplying sensitive electronic loads (i.e. server/LAN rooms, computer labs, telecom rooms, etc.) with Transient Voltage Surge Suppression. Provide separate dedicated panelboards at each Telecom Room. All panelboards must be bolt-on type with copper bus and separate ground bus.

D. Enclosed Circuit Breakers: Provide enclosed circuit breakers as required.

E. Other Service and Distribution: Provide transient voltage surge protective devices (SPD) at the following locations:

1. Service entrance
2. Panelboards serving the Telecom rooms
3. Panelboards serving the fire alarm/protection systems and emergency systems
4. Panelboards serving LED lighting
5. Panelboards serving HVAC systems
6. Panelboards serving electronic loads

Provide an interior distribution system consisting of insulated conductors in conduit so as to supply the required power to all lighting, convenience outlets, equipment connections and or special systems associated with the project. Provide connections for all equipment, plumbing systems, air conditioning and ventilation systems, fire alarm/protection systems, security systems, and other systems provided by other trades.

VI. Lighting and Branch Wiring

Provide electrical connections for all systems requiring electrical service/power.

Provide lighting and general-purpose receptacles throughout all spaces as required. All receptacles must be heavy duty type. Provide GFCI rated receptacles, weather resistant rated receptacles, and in-use type weatherproof receptacle covers as required by NEC.

Provide dedicated circuits and connections as required by Government/Users.

All receptacles, light switches, and equipment must be labeled to indicate the panelboard providing service. Identify each receptacle and light switch with panelboard identification and circuit number. Receptacles rated more than 120V must have voltage identified. Use hot, stamped or engraved machine printing with black-filled lettering on white field, self-adhesive nameplate attached to face of plate.

All lighting/devices and branch wiring installed at the exterior or non-conditioned space must be corrosion resistant.

A. Branch Wiring: Provide branch wiring consisting of insulated conductors in conduit. Provide minimum conduit size of ¾" diameter. Homeruns may have no more than three phase conductors.

B. Lighting Equipment: Provide a complete lighting system consisting of exit and emergency lighting and area lighting consisting of LED lighting including switches and automatic controls including occupancy sensors, vacancy sensors, automatic lighting shutoff systems, room controllers, and dimming systems.

   Generally, life safety illumination must be accomplished with integral battery backed-up fixtures. The emergency generator must not be used to comply with emergency lighting requirements.

   All luminaires installed at exterior or a non-conditioned space must include corrosion resistant enclosures. All exterior luminaire fixtures must have aluminum housing with stainless steel hardware and fasteners.

VII. Other Electrical Systems

Provide General Construction Items (Electrical) including, but not necessarily limited to,

all connections, fittings, boxes and associated equipment needed as required for a complete and usable system.

Conduits and pathways that penetrate fire-rated walls, fire-rated partitions, or fire-rated floors must be firestopped.

A. Emergency Lighting and Power: Provide power and wiring for emergency lights and exit lights throughout the facility. Use integral LED battery pack for emergency lighting. In non-finished spaces, use standalone emergency lighting units for emergency lighting. Provide emergency lighting units with self-testing and diagnostic control features.

B. Back-up Generator: Provide a permanent emergency generator system as indicated. The generator shall provide emergency power to the following loads within 10 seconds of normal power failure.

    1. Life Safety Panels
    2. Fire Alarm System
    3. PA/BGM
    4. Cafeteria Kitchen Refrigeration Equipment
    5. Computer Server Rooms
    6. Elevators
    7. Fire Pump
    8. Gymnasium
    9. Domestic Water Pump
    10. Gymnasium rainwater catchment pumps

    Provide a generator remote alarm annunciator powered by the engine starting battery system. The annunciator must have a lamp test switch and LED type indicating lamps. The annunciator must give visual and audible warnings for the following operating and alarm conditions:

    Provide lamps for the following operating conditions:
    1. Operating power source, normal or emergency
    2. Starting battery system trouble

    Provide lamps and an audible signal for the following alarm conditions:
    1. Low engine lubricating oil pressure
    2. Low engine coolant temperature
    3. High engine coolant temperature
    4. Low fuel
    5. Engine overcrank shutdown
    6. Engine overspeed shutdown

    Provide a remote manual stop station to allow the Users to shut down the prime mover (engine) of the emergency generator without the need to enter the generator room.

Provide a generator exerciser to allow the generator to be automatically tested. Include a programmable exerciser clock with integral battery backup to allow the generator and transfer equipment to be tested at programmed times (during least inconvenience and disruption to facility operations). Include “with or without load” selection.

The generator must be provided with an outdoor fuel tank and an indoor fuel day tank. Transfer of power must be achieved via automatic transfer switches (four pole) with bypass isolation switch. Generator set must be capable of providing full rated power within 10 seconds after failure of normal power. Generator set must be “tropicalized”.

Provide engine exhaust piping, exhaust silencer/muffler, and accessories.

C. Grounding Systems: Provide a complete grounding system for the facility electrical systems.

D. Building Photovoltaic System: Provide Photovoltaic (PV) System as indicated.

1. Provide required auxiliary equipment including disconnect switches, combiners, inverters, circuit breakers, and panelboards.
2. PV Modules must be mounted on the roof using manufacturer standard stainless steel channels. Panels must be oriented and tilted per the manufacturer’s recommendation. Installation must be rated to withstand the project’s windload requirement.
3. The PV system inverter output must connect to the building Electrical system. The power generated by the PV system must become available for utilization by the building load. The following must be provided with the PV system.
    a. Surge protection
    b. Integral ground fault protection
    c. Anti-islanding
    d. Over and under voltage trip function
    e. Over and under frequency trip function
    f. Voltage and frequency sensing and time delay functions per IEEE Std 929-2000
    g. A web box connection for remote monitoring.
    h. A kilo-watthour meter to track energy produced by the PV system.

TELECOMMUNICATIONS:

The telecommunications scope of work includes voice, data, commercial cable television, security, and other special communication systems to support the new Simon Sanchez High School, which consists of the main building, cafeteria, gymnasium, library, auditorium, GCC building, JROTC building, outdoor sports facilities, staff and student parking stalls, and a courtyard.

Criteria and reference

- SSHS Telecom v1.0
- ANSI/TIA Standards, Latest Edition as determined by the GDOE
- BICSI Outside Plant Design Reference Manual (OSPDRM); 6th Edition
- BICSI Telecommunications Distribution Methods Manual (TDMM), 14th Edition
- National Electrical Code (NEC), 2017 Edition

Site Design

Project will provide (4)-4" conduits from the nearest utility pole to the entrance facility in Main Quad Building. Utility connection point shall be determined by the commercial telecommunications service provider based on the configuration and orientation of the building. (4)-4" conduits will be provided between MDF and IDFs in Main Quad Building. Intrabuilding cables will consist of 12 strand single mode fiber optic cables, 25 pair copper cables, and 1 RG11 cable.

Main Quad building will be connected to other buildings within the campus via underground pathways and structures. A minimum of (3)-4" conduits will be provided between underground structures and building IDFs. Interbuilding cables will consist of 12 strand single mode fiber optic cables, 25 pair copper cables, and 1 RG11 cable.

Classroom Buildings

Classrooms shall have a minimum of three (3) CAT6A data jacks and one (1) CAT6A jack for voice (telephone). A minimum of three (3) Information Management Outlets (IMO) shall be installed in each classroom area. One of the IMO will be equipped with two (2) CAT6A RJ45 jacks for data and one (1) CAT6A RJ45 jack for voice (telephone) at the front of the classroom. The second IMO will be equipped with one (1) CAT6A RJ45 jacks for data at the rear of the room. The third IMO shall be equipped with one (1) CAT6A RJ45 data jack for a Wireless Access Point (WAP). In general, the IMO at the front of the room shall be located near the teacher's workstation and the IMO at rear of the classroom shall be located at the center. All IMOs with the exception of the WAP IMO shall be at least three (3) feet from an electrical outlet.

Cafeteria

Cafeteria shall have a minimum of five (5) CAT6A data jacks and two (2) CAT6A jack for voice. Two (2) IMOs shall be installed in the dining area and one (1) IMO in the Cafeteria's Manager Office. One (1) of the IMO will be equipped with three (3) CAT6A RJ45 jacks for data and one (1) CAT6A RJ45 jack for voice at the rear of the dining room or at a stage area (if applicable), and mounted no less than 18" above floor level, and at least three (3) feet from an electrical outlet. The second IMO shall be equipped with one (1) Cat 6A RJ45 jack for a WAP. The WAP IMO shall be located at the center of the dining area and mounted on a wall at least 18" below ceiling level. The third IMO equipped with one (1) CAT6A RJ45 jack for data and one (1) CAT6A RJ45 jack for voice shall be install in the Cafeteria's Manager Office. The third IMO shall be located next at a location suitable for an office workstation, and mounted no less than 18" above floor level and no more than three (3) from an electrical outlet. All data and voice cables shall be homerun back to the nearest network distribution frame (IDF or MDF). Note: Depending on size of the space, additional IMOs and cables may be required for additional wireless access points.

Gymnasium

Gym shall have a minimum of four (4) CAT6A data jacks and one (1) CAT6A jack for voice. Two (2) IMOs shall be installed in the Gym floor area. One (1) of the IMO shall be equipped with three (3) CAT6A RJ45 jacks for data and one (1) CAT6A RJ45 jack for voice at the front of the of the gym or at a stage area (if applicable), and mounted no less than 18" above floor level and at least three (3) feet from an electrical outlet. The second IMO shall be equipped with one (1) CAT6A RJ45 jack for WAP. The WAP IMO shall be located at the center of the gym area and mounted on a wall no more than 24" below the ceiling level. All data and voice cables shall be homerun back to the nearest network distribution frame (MDF or IDF). Note: Depending on size of the space, additional IMOs and cables may be required for additional wireless access points.

Auditorium

Auditorium shall have a minimum of four (4) CAT6A data jacks and one (1) CAT6A jack for voice. Two (2) IMO shall be installed in the auditorium area. One (1) IMO shall be installed at the front of the auditorium or stage area, and equipped with three (3) CAT6A RJ45 jack for data and one (1) CAT6A RJ45 jack for voice. The IMO shall be mounted no less than 18" above the floor level, and no more than three (3) feet from an electrical outlet. The second IMO shall be equipped with (1) CAT6A RJ45 jack for WAP. The WAP IMO shall be located at the center of the auditorium area and mounted on a wall at no more than 18" below the ceiling level. All data and voice cables shall be homerun back to the network distribution frame (MDF or IDF). Note:

Depending on size of the space, additional IMOs and cables may be required for additional wireless access points.

Library

Library shall have a minimum of twelve (12) CAT6A RJ-45 jacks for data and two (2) CAT6A RJ45 jack for voice. Three (3) IMOs shall be equipped with three (3) CAT6A RJ45 jacks for data. Two (2) IMO shall be equipped with one (1) CAT6A RJ45 for data and one (1) CAT6A RJ45 for voice. One (1) IMO equipped with one (1) data jack for the WAP. In general, the three (3) IMOs with three (3) CAT6A R45 jacks for data will be located next to the computer workstations for students as designated in the library's floor plan. One IMO with one (1) CAT6A RJ45 for data and one (1) CAT6A RJ45 for voice will be located near the librarian workstation. One (1) IMO with one (1) CAT6A RJ45 jack for date and one (1) CAT6A RJ45 jack for voice will be located near the library counter. And One (1) IMO with one (1) RJ45 jack for the WAP shall be located at the center of the Library's work area, and mounted on a wall no more than 18" below the ceiling level. All IMOs with the exception of the WAP IMO shall be located no more than three (3) from an electrical outlet. All data and voice cables shall be homerun back to the nearest network distribution frame (MDF or IDF). Note: Depending on size of the space, additional IMOs and cables may be required for additional wireless access points.

Computer lab

Computer lab shall have a minimum of twelve (12) CAT6A RJ-45 jacks for data and one (1) CAT6A RJ45 jack for voice. Three (3) IMOs shall be equipped with three (3) CAT6A RJ45 jacks for data. One (1) IMO shall be equipped with two (2) CAT6A RJ45 for data and one (1) CAT6A RJ45 for voice. One (1) IMO equipped with one (1) data jack for the WAP. In general, the three (3) IMOs with three (3) CAT6A data jacks will be located next to computer workstations as designated in the room's floor plan. One IMO with one (2) CAT6A RJ45 jack for date and one (1) CAT6A RJ45 jack for voice will be located at the front of the room near the teacher workstation. And One (1) IMO with one (1) RJ45 jack for WAP shall be located at the center of the room and mounted on a wall no more than 18" below ceiling level. All IMOs with the exception of the WAP IMO shall be located no more than three (3) feet from an electrical outlet. All data and voice cables shall be homerun back to the nearest network distribution frame (MDF or IDF). Note: Depending on size of the space, additional IMOs and cables may be required for additional wireless access points.

Office workstation

Office workstation shall have one (1) IMO with one (1) CAT6A RJ45 for data and one (1) CAT6A RJ45 jack for voice (telephone). The IMO shall be mounted no less than 18" above floor level and no more than 3 feet from an electrical outlet. The office workstations include but not

limited to workstations for Counselors, Nurse, CRT Office, Student Support Office, Main Offices for administrators and staff, PE Offices, Cafeteria Office, Main Office Counter, and other designated workstation(s) in the campus. All data and voice cables shall be homerun back to the designated MDF or IDF.

Main Office common area

Main Office common area shall have two (2) IMO equipped with one (1) CAT6A jack for data. One (1) IMO with one (1) CAT6A data jack is the WAP. The WAP IMO shall be located at the center of the common area and mounted on the wall no more than 18" below ceiling level. One (1) IMO with one (1) CAT6A data jack, if it is required, will be utilized for a time clock device connection, mounted at the designated area as indicated in the main office floor plan.

Teacher Lounge and school's conference rooms

Teacher Lounge and school's conference rooms shall be equipped with two (2) IMOs. One IMO shall have three (3) CAT6A RJ45 for data and one (1) CAT6A RJ45 for voice and shall be located next to a designated work area. This IMO shall be mounted no less than 18" above floor level and no more than 3 feet from an electrical outlet. The second IMO shall have one (1) CAT6A RJ45 jack for the WAP and shall be located at the center of the room and mounted on the wall no more than 18" below ceiling level. All data and voice cables shall be homerun back to the nearest network distribution frame (MDF or IDF).

Network copier

Network copier location shall be equipped with one (1) IMO equipped with one (1) CAT6A RJ45 jack for data, and located no less than 18" above floor level. The copier's IMO location shall be determined by the school's floor plan. The data cable shall be homerun back to the nearest distribution frame (MDF or IDF).

Network Rooms

Network rooms will be air conditioned and provided with fire suppression for electronics. A minimum of two (2) walls will be provided with fire-rated plywood backboards and cable ladders along with appropriate cable management will be provided in the rooms. An enclosed and lockable floor mounted enclosure rack with ventilated front and back door will be provided in the non-secured MDFs/IDFs to house all data and voice patch panels, fiber enclosure, and required network equipment. The 23.5"W x 42"D x 78"H rack enclosures shall include ventilated fans on top and bottom of the enclosed rack. Fans must be mounted on the relay rack within the lockable rack enclosure. A 23.5"W x 42"D x 78"H, four (4) post network rack will be provided in the secured MDFs/IDFs.

General

- The design and installation of conduits and pathway shall conform to TIA/EIA 569 pathway specifications.
- Pull string shall be provided in each conduit along with the cables.
- All intra-building data/voice cables shall be TIA/EIA Category 6A or better rated, TIA/EIA 568B, unshielded twist pair (UTP) cable, four (4) pair, UL approved, 24 AWG, solid copper. The cable jacket must state "(UL) Verified CAT".
- For data cabling, the cable length from IDF or MDF to IMO shall not exceed 290 feet.
- All cables installed shall have at least 8" of slack coiled in the box.
- Each cable shall be labelled, separately at both ends, within 6" of the termination ends.
- Typical outlet box for IMO shall consist of recessed double-gang,4-11/16" square by 2 1/8" deep, backbox with 2-gang mud ring and a blank faceplate in the up and down orientation.
- Provide a minimum of one (1) 1" conduit from each IMO to the nearest overhead distribution cable tray or homerun to the IDF. No-daisy-chaining.
- Fire stops will be used where applicable.
- Provide telecom handholes at strategic locations in the underground conduit system.

Commercial Cable Television (CATV)

A complete CATV system will be provided and coordinated with the local service provider to include all interior equipment required to provide high quality TV signals to all outlets with a return path for interactive television and cable modem access. System will include headend amplifier, amplifiers, splitters, combiners, line taps, cables, outlets, tilt compensators and all other parts, components, and equipment necessary to provide a complete and usable system.

Security (CCTV)

- An IP based security surveillance system will be provided with a network video recorder (14-day capacity).
- The system will be capable of providing motion detection and alerts.
- Indoor security cameras will be 4k and sound capable.
- Outdoor security cameras will be 4k, IP67-rated, tilt-pan capable.
- CCTV locations to be coordinated and determined by SSHS.

Public Address System (PA)

A complete PA system capable of multiple zone configurations will be provided throughout Simon Sanchez High School. PA speakers will be provided as required for adequate coverage.

The PA system equipment will be in the administration building with microphone connections at the location as determined by SSHS. The PA system shall have the capability to play prerecorded messages as well as manual messages from the microphone.

Intercom System

An intercom system will be provided at all exterior doors. Intercom system will provide two-way communication between the secured and non-secured side of the building. Entry into each building will be monitored.

Indoor Wireless Access Point

- Aruba Instant IAP-515 Wireless Access Point (US), Part Number Q9H63A, Indoor, dual radio, 5GHz 802.11ax 4x4 MIMO and 2.4GHz 802.11ax 2x2 MIMO, Supports 802.11b (DSSS) 802.11a/g/n/ac (OFDMA), 4 integrated dual-band downtilt omni-directional antennas, PoE supported or approved equivalent or better.
- Wireless Access Point Wall and Ceiling Mounting Kits

Outdoor Wireless Access Point

- Outdoor long arm bracket shall be securely mounted to the building's exterior structure. Outdoor WAP shall be mounted at the end of the arm bracket pointing or facing downwards.
- Mounted arm bracket shall house and support the Ethernet cable to outdoor access point. No cable to the WAP shall be exposed and shall be protected from weather elements.
- Outdoor wall mounting kit shall be included: AP-270-MNT-V1 AP-270 Series Outdoor Pole/Wall Long Mount Kit, Part Number JW052A.

Grounding and Bonding

- All grounding and bonding shall be done in accordance with TIA-607-C and NFPA 70
- Primary bonding busbar (PBB) shall be provided in the MDF and should be located adjacent to incoming service conduits. PBB shall be connected to the electrical building service ground with bonding conductor sized as required. Additional Secondary bonding busbar (SBB) shall be provided in each IDF with bonding conductor tied back to PBB.

PROCEDURES AND GUIDELINES HANDBOOK FOR ART IN PUBLIC BUILDINGS AND BUILDINGS SUPPORTED BY FEDERAL AND GOVERNMENT OF GUAM FUNDS IN THE TERRITORY OF GUAM AND THE PERCENT FOR THE ARTS ENHANCEMENT GRANT PROGRAM.

CHAPTER I. THE LAW

Public Law 20-27, Chapter 8 of Title 1 of the Guam Code Annotated, relative to "Arts in Public Buildings and Facilities" as amended by Public Law 31-118 amending subsections 850, 852 and 853 of the Guam Code Annotated.

CHAPTER II. PURPOSE

P.L. 31-118 Section 1 Subsection 850

The government of Guam recognizes its responsibility to foster culture and arts and the necessity for the development of the arts beginning with our young children and throughout the community. I Liheslatura (the legislature) declares it to be policy that a portion of appropriations for capital expenditures for public buildings be set aside either for the acquisition of works of art to be used in such buildings and in any buildings intended for use of the general public to the extent that the construction or improvement of such non-public buildings is supported by either federal or government of Guam tax incentives or other subsidy arrangement or the funds may be given to the Guam Council on the Arts and Humanities Agency for the purpose of fostering culture and the arts for the development of local artists, children and the community as a whole.

CHAPTER III. DEFINITIONS

A. Definitions as it applies to Art in Public Buildings and buildings supported by the Federal and Government of Guam Funds in the Territory of Guam.

1. "Art and Arts" means the graphic arts and other arts having aesthetic value that is to the public as defined by P.L. 20-27.

2. "Artist" means one who produces or aids in the production of art.

3. "Public Building" or "Public Facility": a building or facility owned by the government of Guam or any of its instrumentalities.

4. "Non-Public Buildings": Buildings that are supported by either government of Guam funds through tax abatements, rebates, loans, loan guarantee or bond financing or by Federal funds administered by the Government of Guam.

5. *"Department" means the Department of Public Works or that agency of the government which supervises the design of a public building or facility.*

6. "Public Area" means that part of a public building or facility to which the public is generally admitted during certain hours of the day. Public area does not include any office space to which the public generally has no access.

7. *"Local Artists" mean artists who are residents of Guam for at least 6 months and pay taxes on Guam.*

8. "Contracting Agency": The owner of the building identified including either governmental or non-governmental.

B. Definitions as it applies to the Percent for the Arts Enhancement Grant Program.

1. "Agency" means Guam Council on the Arts and Humanities Agency, government of Guam.

2. "Director" means Director of the Guam Council on the Arts and Humanities Agency.

3. "Board" means the council on the Arts and Humanities Agency Board, government of Guam.

4. "Fund" means the Percent for the Arts Enhancement Grant Fund.

5. "Grantee" means an applicant who is awarded a grant.

6. "Grant" means an approved award of funds from the Percent for the Arts Enhancement Grant Program.

7. "Government of Guam funds" means any funds received from a legislative appropriation, the Guam Visitors Bureau or from an autonomous agency.

8. "Government" means the government of Guam.

CHAPTER IV. HOW IT WORKS

A. Art in Public Buildings and buildings supported by the Federal and Government of Guam Funds. (P.L. 31-118 Section 2 subsection 852)

1. Plans for public buildings and buildings supported by federal or government of Guam subsidy which contain public areas, and plans for remodeling or renovation of public buildings or facilities where the total cost of construction, remodeling or renovation exceeds the sum of One Hundred Thousand Dollars ($100,000) shall contain provisions for the inclusion of works of art by local artists if available, including, but not limited to, sculptures, paintings, murals or objects relating to or consisting of native arts.

2. The owner of the building shall also have the option of allotting at least one percent (1%) of the overall construction, remodeling or renovation cost of a building to the Guam Council on the Arts and Humanities Agency (CAHA) in lieu of the inclusion of works of art.

3. If artwork plans are selected, however, a representation of the final selection shall be published in a newspaper of general circulation and/or the online version of the newspaper for public screening prior to implementation.

4. Before issuance of the occupancy permit for such construction, remodeling or reconstruction the owner of the building must obtain clearance from the Guam Council on the Arts and Humanities Agency that the provisions of this Chapter are being complied with.

5. At least one percent (1%) of the overall construction, remodeling or renovation cost of a building described in Subsection (a) of this Section shall be reserved for the purpose of the design, construction, mounting, maintenance and replacement and administration of works of art by CAHA in the public area of such a building or the owner shall give the amount to CAHA.

The Director of Public Works shall ensure that no construction, remodeling or renovating of a public building, or building supported by government of Guam funds, is granted an occupancy permit without this Chapter being complied with.

6. Such buildings with an overall construction cost of less than One Hundred Thousand Dollars ($100,000) are exempted from the requirements of this Chapter unless inclusion of works of art in their design and construction is specifically authorized by the owner.

7. The artist who creates these works of art shall be selected as provided in Subsection (f) of this section.

8. The Director of CAHA shall develop rules and regulations, pursuant to the Administrative Adjudication Law, for the selection of works of art under this Chapter and shall open competition for awarding any art contract under this Chapter by:

    a. Soliciting proposals from local artists by a project announcement published no less than three (3) times in a local publication or general circulation in print and online versions;

    b. Appointing a selection committee consisting of five (5) members to review all proposals and report to the Director the results of its deliberations regarding the proposed art contract. Such committee shall include a representative of the building' owner or of the agency or department involved, the project architect, the municipal mayor from the project site and at least two (2) practicing artists from Guam. The final decision regarding the use of art work and the selection committee's recommendations shall be by the Director of CAHA, who shall be the contracting officer for any art contract executed pursuant to this Chapter.

9. *The Director of CAHA shall include in the CAHA rules and regulations, pursuant to the Administrative Adjudication Law, procedures for the acceptance of funds as stated in this Section.*

a. *An account shall be established which shall be maintained separate and apart from other funds of the government of Guam, shall be kept in a separate bank account and shall not be subject to transfer authority of I Maga'alahen Guahan. Funds shall remain in such account and expended by CAHA for the purpose mandated in this Section. Said Fund shall be examined and reported upon as required by the law by the Director of CAHA who shall serve as the certifying officer of said Fund.*

b. *On the first (1st) day of each fiscal quarter, the CAHA Director shall provide to I Maga'Lahen Guahan and the Speaker of I Liheslaturan Guahan and post on the CAHA website, a detailed report of how funds were allocated and utilized.*

10. *Enforcement*

a. *CAHA shall identify public buildings in non-compliance with this Section and send written notices within ten (10) working days. Upon receipt of the notice, recipients have two (2) weeks (fourteen (14) calendar days) to acknowledge in writing, receipt. Recipients will be given up to one (1) fiscal year to comply with Section.*

b. *The Guam Economic Development Authority (GEDA) shall ensure that current Qualifying Certificate (QC) program beneficiaries are in compliance with this Section.*

c. *For monitoring purposes, GEDA shall provide to CAHA a list of past and current QC recipients. CAHA will determine whether former QC recipients complied with Subsections (a) and (c), and notify them in writing if non-compliance was determined. Upon receipt of the notice, recipients have two (2) weeks (fourteen (14) calendar days) to acknowledge, in writing, receipt. Recipients will be given up go one (1) fiscal year to comply with this section.*

d. *CAHA shall provide to the Department of Revenue and Taxation a list of QC recipients who fail to comply with this Section. The Department of Revenue and Taxation shall refuse to grant renewal of business license for current and past QC recipients in noncompliance, until the CAHA Director issues a written confirmation of compliance.*

11. *P.L. 31-118 Section 3 subsection 853 - Inclusion of Chamorro Artistry or Guam History Elements in Government Building: Government of Guam Buildings and Structures*

All government of Guam building and structures shall contain elements of either Guam History or of Chamorro artistry costing up to a maximum of three percent (3%) of the aggregate of the architectural and engineering , the construction or the renovation budgets therefore. Such elements may be made part of the internal or external physical structure of the building or structure and may be within the main

part of the building or structure or separated from the main part. In complying with the provision of this Section, a contractor for the government agency constructing the building or structure may consult with CAHA as to the various types of Chamorro or historic Guam artistic elements. The Department of Public Works (Department) shall monitor noncompliance with this Section during its plans approval process, unless such plans are exempted in accordance with Subsection (b) of this Section. If the Department determines that a non-exempted project does not comply with this Section, it shall refuse to issue either a building permit or an occupancy permit (as the case requires) for such project until compliance.

12. Exceptions to Applicability

Buildings and structures constructed for use as shelters for utility facilities or utility operations are not subject to Subsection (a) of this Section.

13. Compliance

Government of Guam agencies found in noncompliance of this Section shall be given up to one (1) fiscal year to comply. CAHA shall ensure compliance with this Section.

14. Government Lease Spaces

Government of Guam agencies leasing space are not exempt from this Section, and if found in noncompliance will be given up to one (1) fiscal year to comply. CAHA shall ensure compliance with this Section.

15. SELECTION COMMITTEE

The Selection Committee shall determine the scope, direction, and particular needs of each project. The Selection Committee shall include.

a. A representative of the building's owner or of the agency or department involved.

b. The project architect.

c. The Municipal Mayor from the project site.

d. At least two (2) practicing artists from Guam.

Voting: Each member of the selection committee will have one vote. The majority vote shall determine selection.

16. SELECTION PROCEDURE

The Selection Committee shall tour the site of the project and designate the various areas where artwork is to be placed. The Selection Committee shall then consider the

particular needs of the project including the budget, appropriate art forms, and the location and medium of the art form.

17. Selection Method

Open Competition: The Selection Committee shall solicit artwork samples from artists by a project announcement published no less than three (3) times in a local publication of general circulation.

The selection process may be in two stages whereby a limited number of finalists, selected from the competition will be asked to submit more detailed proposals. Each of the finalists will be paid a professional design fee.

18. Criteria for Selection

a. Style and Nature: Works of art that compliment the environment where the art work is to be displayed. The size of the artwork must also be compatible to the size of the location designated.
b. Quality: The inherent quality of the artwork is the most important criterion for selection.
c. Media: All visual art forms will be considered along with objects relating to or consisting of indigenous art. The artwork can be either portable or permanently fixed. If the artwork is to be permanently placed the Selection Committee will decide if the location identified is structurally capable of maintaining the artwork in terms of relative maintenance of repair costs.
d. Permanence: Due consideration will be given to structural and surface soundness and to permanence in terms of relative excessive maintenance or repair costs.
e. Method of Acquisition: Existing works of art specifically commissioned are eligible.

19. BUDGET

The selection Committee shall identify the funds available for the project and approve expenditures. The funds will be dispersed as specified by P.L. 31-118.

20. USE OF FUNDS

a. Funds identified may be used for:

1. For the purchase of existing artwork selected or commissioned by the Selection Committee.

2. Design: Artist's professional design fee.

3. Construction: The actual work and materials put into the creation of the artwork.

4. Mounting: Expenses for the purposes of affixing the artwork onto the location specified.

5. Maintenance: Expenses incurred towards the mechanical maintenance of the artwork for up to one year after installation.

6. Replacement: Artwork that are to be replaced due to irreparable damage.

7. Administration: Expenses to cover any administrative costs incurred by the Selection Committee of GCAHA in the selection of artwork. Those costs include but are not limited to hiring of contractual staff, advertisements, supplies and professional services. At least one percent (1%) of the identified funds will be awarded to the Guam Council on the Arts and Humanities Agency for the purposes of contracting administrative staff to coordinate and maintain the program.

8. Plaques and Labels identifying the art work.

9. Frames, mats and pedestals necessary for the presentation of the artwork.

10. Waterworks and electrical and mechanical devices, equipment and site work which are integral parts of the work of art.

11. Reproductions of up to 50 high quality limited edition prints, numbered and signed by the artist. Exclusively used for exhibition purposes and will not be for sale. (Subject to approval by the Selection Committee).

a. FUNDS IDENTIFIED MAY NOT BE USED FOR:

1. Reproductions, by mechanical or other means, of original works of art, unless mechanical means of reproductions are an integral part of the creative process. (Subject to approval by the selection Committee as mentioned on section (K) on USE ON FUND: Funds Identified May be used for)

2. Decorative, ornamental, or functional elements which are designed by the building architect or consultants engaged by the architect, as opposed to an artist commissioned for this purpose.

3. Those elements generally considered to be components of a landscape architectural design.

4. Art objects which are mass produced or of a standard commercial design, such as playground sculpture or fountains.

5. Directional, or other functional elements, such as super graphics, signage, color coding, maps, etc., except where these elements are an integral part of the original work of art.

6. Those items which are required to fulfill the basic purpose of the contracting agency. Examples would be works of art in the collection of a state museum, or works of art fulfilling an interpretive or educational role in a college or university art museum or gallery.

7. Preparation of the site necessary to receive the work of art.

8. Energy and water costs of operation of electrical and mechanical systems.

9. Art exhibitions and educational activities.

10. In connection with the works of art after delivery: registration, dedication, unveiling, insurance and security.

11. Architectural services.

12. Artistic staff salaries, equipment and supplies employed by the building owner.

21. WHO IS ELIGIBLE

Selection preference may be given to local artists who have resided in Guam for at least 6 months; who pay taxes in Guam; and are registered with CAHA. Selection preference may be given to local artists.

22. RESPONSIBILITES

a. Guam Council on the Arts and Humanities Agency in consultation with the various Government agencies and departments needed to comply with the law and the building owner shall:

1. Be responsible for the selection of the commissioning of artist for, reviewing the design, execution and placement of, and acceptance, of works of art in consultation with the selection committee.

2. Appoint the selection committee.

3. Assist the contracting agency in contract negotiation with the artists.

4. In consultation with the contracting agency, CAHA may transfer works of art between public buildings, whenever, in its judgment, the

transfer will be to the benefit of the citizens of Guam. This section only pertains to Government agencies and departments.

5. Handle public information aspects of the project. All expenses incurred will be the responsibility of the contracting agency.

6. Identify and carry necessary maintenance procedures (for up to one year after installation), and maintain accurate records of the collection in partnership with the contracting agency.

b. The Contracting Agency Shall:

1. Notify the Guam Council on the Arts and Humanities Agency upon Legislative approval of construction/renovation projects which costs over $100,000. If the contracting agency in this instance must notify GCAHA upon approval of support by either government of Guam funds through tax abatements, rebates, loans, loan guarantees or bonds financing or by Federal Funds administered by the government of Guam.

2. Notify the Guam Council on the Arts Humanities Agency of the Project details.

3. Consult with GCAHA and Selection committee on the determination of budget and selection procedures.

4. Contract with and pay for the architect for administrative and/or design services to be rendered in connection with the commissioning of works of art.

5. See that payment is made for all costs, professional fees, purchases and commissions in accordance with the Guam Law, these rules and GCAHA standards.

6. Provide project coordination to assure timelines of completion.

7. Be responsible for inventory and security of the work; and with advice and consent of the Guam Council on the Arts and Humanities Agency for maintenance and repair.

8. Assist GCAHA with public information aspects of the project, with assistance and approval from GCAHA.

9. The Guam Council on the Arts and Humanities Agency and the selection Committee must be informed of any changes in the proposed plans, costs, construction completion date or scope of the project before these changes are implemented.

c. The Architect Shall:

1. Recommend to the Guam Council on the Arts and Humanities Agency and the contracting agency specific sites for works of art and the scale and type of work thought to be most appropriate.

2. Act as a member of the selection committee.

3. Work closely with the artist where required, provide engineering and technical assistance to the artist if requested from the contracting agency.

4. Assure that all service requirements for the work of art met in the design documents and that the work may be installed with relative ease.

d. The Artist shall:

1. Be commissioned by the contracting agency (Defined as both governmental and private developments) with approval of the Director of the Guam Council on the Arts and Humanities Agency to execute and complete the work in a timely and professional manner. Be in close contact with the contracting agency before and during installation, and transfer title of an existing work of art to the agency for incorporation in its building inventory.

2. Deal personally with the other parties in all phases of the negotiations. However, the artist (s) may, at their option designates their dealers or agents to represent them in certain aspects of the project.

3. Copyright: The artist retains those rights concerning the reproduction and of the original artwork for commercial purposes unless specified in the original contract agreed upon by the artist and the contracting agency.

4. Maintain a close working relationship with the architect and contracting agency on commissioned pieces.

5. Upon completion of the work (s) or purchased, the artist shall submit to the Guam Council on the Arts and Humanities Agency a detailed description of the work (s) with instructions on its care and maintenance, high resolution digital files, scans and two 8 X 10 glossy photos. The description form shall be submitted concurrently with the final invoice.

6. All plans, drawings, and other materials related to a proposed work of art are the property of the Guam Council on the Arts and

Humanities Agency until the final work is installed, at which time such preparatory materials revert to the artist.

23. SCOPE AND NATURE EXPENDITURES

While no more than 1% can be dedicated from capital construction appropriations, it is possible that a dollar total greater than 1% can be expended for art in a project if funds are generated from other sources (i.e., governmental or private funds). The 1% figure is a minimum.

If 1% of total funds appropriated for a particular project is not required for that project, such un-required amounts can be: a) used to acquire art for existing government buildings; b) transferred to another construction project, or both, as determined by the Guam Council on the Arts and Humanities Agency, in consultation with the contracting agency. If the contracting agency is a non public building the contracting agency may use these funds to purchase art pieces that will be donated to the people of the territory of Guam, these funds can also be used to fund art related projects, although these expenditures must be approved by the Guam Council on the Arts and Humanities Agency.

Administrative costs of any particular project may be funded through the 1% appropriation and will be limited to the following area:

a. Supplies and services connected with public information, and artists' prospect for specific projects.

b. Selection committee per diem, and artist professional fees.

c. Contractual Services.

24. GENERAL PRINCIPLES AND PROCEDURES

Integration of Art and Architecture: So that artists and architects can gain from each others' design insights and, thereby produce a more integrated solution, all parties should strive for engagement of the artist as soon as possible after the approval of the architect's schematic design phase.

Freedom of Expression: Because of the bold attempt to meld together the imaginations and talents of so many individuals and groups, freedom to reach creative solutions must always be maintained. The artists, on their part, must be sensitive to the unique qualities of public art and the guidelines and parameters which, of necessity, may have been agreed upon.

Exhibitions and Educational Aspects: To serve the public more fully the contracting agencies should consider undertaking the following, funded with monies other than those made available under the Act:

a. Exhibition of sketches and scale models created in open competitions.

b. Involvement of students and art instructors in workshops with artists creating works.

c. Tours of those sites which exhibit many works, conducted by trained docents.

d. Use of State educational and other facilities by the artist in developing concepts and creating the work, so that the people of the territory of Guam can better understand the creative process. Such facilities might studio space, foundries, machine, welding and woodworking shops, printing and photographic facilities.

e. Filming or Videotaping the creation and installation of the work.

The Guam Council on the Arts and Humanities Agency is available to provide consultative assistance with these matters.

Accessibility of Information: All parties will strive to publicize widely all aspects of the program. All meetings of the Selection Committee are open to the public.

Community Support and advice: While firmly committed to the principle of selection of artists by the selection Committee, the Selection Committee welcomes advice from the interested public.

Conflict of Interest: All procedures will be conducted and all decisions will be made free of any conflict of interest. The Guam Council on the Arts and Humanities Agency will ensure that members of the Selection Committee and the Contracting Agency are not related in any way to the artists submitting portfolios either through kin and/or Business relations.

Dedication: If a dedication or "Unveiling" of work is desired, arrangements shall be the responsibility of the contracting agency in consultation with the Guam Council on the Arts and Humanities Agency.

25. DOCUMENTATION

Documentation:

A. Identification: The Guam Council on the Arts and Humanities Agency will assist the contracting agency with identification which will include plaques or labels identifying the work, which are securely affixed, unobtrusive, and well designed. Included should be the name of the artist; if any; medium; and year completed.

B. Registration: The Contracting agency shall maintain accurate inventory records. Copies will be filed with the Guam Council on the Arts and Humanities Agency.

C. Publications: As Collections grow, contracting agencies are encouraged to publish informative folders and booklets on works of art. The Guam Council

on the Arts and Humanities Agency is available to assist with editorial and technical assistance.

CHAPTER V. HOW IT WORKS – The Percent for the Arts Enhancement Grant Program. (P.L. 31-118 Section 2 subsection 852)

Public Law 31-118 establishes the fund. It mandates the Guam Council on the Arts and Humanities Agency to set up the eligibility requirements governing usage of the fund. The Director of CAHA shall include in CAHA rules and regulations, pursuant to the Administrative Adjudication Law, for the disposition of funds to meet the purpose of fostering culture and arts for the development of local artists, our children and the community as a whole.

CHAPTER VI. Purpose of Grants

Grants are available to enhance cultural and artistic learning opportunities for our youth and youth organizations. Funds of no more than $3,000 per project will be awarded to assist in areas of cultural and artistic development. These projects must demonstrate that they are vital to long term learning and development, and support the continued fostering of the arts and cultural education process for the youth.

CHAPTER VII. Eligibility

A. Organizations

1. If the applicant is an organization, it must be registered with the government of Guam as a nonprofit organization, or be a bona fide Guam school program, sanctioned by the school's principal and endorsed by the Director of Education, school master or Superintendant of Parochial schools.

2. Organizations that apply for a grant must be in compliance with all applicable laws and regulations.

B. Individuals

1. If the applicant is an individual, he or she must be a permanent resident of Guam.

2. If the applicant is an individual under the age of eighteen years of age, their parent or legal guardian will be able to apply on the minor's behalf.

CHAPTER VIII. Grant Criteria

Grants will be awarded only to individuals or organizations.

CHAPTER IX. Application Process

A. Step One: Submission.

1. To qualify for a grant, an application must be filled out and submitted to the Agency, along with the following information:

   A nonprofit organization requesting funds must provide a copy of its articles of incorporation of other proof of registration as a nonprofit organization with the government of Guam. A requesting school must submit a letter from the school's principal and the Director of Education, school master or Superintendent of Parochial Schools, endorsing the organization.

2. Grant applications which do not comply with the requirements of Step One shall not be considered complete and eligible for certification.

B. Step Two: Certification.

The Director will certify the grant application as to its completeness. If the application is not complete, the Agency will send a notification to the applicant either via email or by certified mail informing them of the application's status and that proper adjustment need to be made within 15 days of notification. The Director will certify the grant application as to its completeness. If the grant application is not complete, the Agency will mail a non-certification form to the grant applicant for proper adjustment.

C. Step Three: Consideration.

1. A certified grant application shall be submitted by the Director to the Board for consideration during the next grant review cycle for the program. Applications will be reviewed and considered by the Board on a biannual basis, every January and June of a calendar year.

2. The Board shall approve grant applications in accordance with the purposes stated in Chapter VI of these regulations.

3. The Board will not consider any grant application unless Steps One and Two have been completed.

CHAPTER X. Disbursement of Funds

A. The Director shall manage the Fund and the Agency's certifying officer shall be the Fund's certifying officer.

B. Upon Board approval of the application, the Agency shall process the necessary paperwork for the grant

C. Within thirty days after completion of project/program, the grantee shall provide the Director with a report and an accurate expenses report reflecting the expenditure of all government of Guam funds.

CHAPTER XI. Misuse of Funds

A. Any person who willfully misuses a grant received under these regulations shall be guilty of a petty misdemeanor and subject to a fine not to exceed $500.

B. If the grantee is delinquent in submitting the detailed narrative and expenditure report required by Chapter X, Section C, the Agency shall send a written notice, certified mail, return receipt requested, to the grantee giving the grantee fifteen days from the date of receipt of the notice to submit the report. Grantees failure to comply may be deemed a violation of said chapter.

CHAPTER XI. Grant Limitations

A. Only one grant from the Fund can be awarded per organization program or individual per year.

B. The maximum grant amount for each organization or individual cannot under any circumstances exceed $3,000.

C. All grants awarded through the Agency are contingent upon the availability of funds and final approval by the governor.

CHAPTER XII. Recording Requirements

Reporting Requirements – Art in Public Buildings and Buildings Supported by Federal and Government of Guam Funds in the Territory of Guam and the Percent for the Arts Enhancement Grants Program.

On the first (1st) day of each fiscal quarter the CAHA Director shall provide I Maga'lahen Guahan and the Speaker of I Liheslaturan Guahan and post on the CAHA website a detailed report of how the funds were allocated and utilized.

A. The quarterly report for the Art in Public Buildings and Buildings Supported by Federal and Government of Guam Funds in the Territory of Guam shall include the following information concerning the use of the Fund:

1. The number and names of projects.
2. The amount allocated towards the program per project.
3. Other pertinent data concerning management of the fund.

B. The quarterly report for the Percent for the Arts Grants Enhancement Program shall include the following information concerning the use of the Fund:

1. The number and names of applicants.
2. The number, names of grantees and amounts of grants awarded.
3. Other pertinent data concerning management of the fund.

Furthermore, the Guam Council on the Arts and Humanities Agency shall annually make a public report on all Art in Public Buildings and Buildings Projects Supported by Federal and Government of Guam Funds in the Territory of Guam and the Percent for the Arts Enhancement Grants Programs of the previous year.

CHAPTER XIII. SEVERABILITY P.L. 31-118 Section 4

If any provisions of this Law or its application to any person or circumstance is found to be invalid or contrary to law, such invalidity shall not affect other provision or applications of this Law which can be given effect without the invalid provision or applications and to this end the provisions of this Law are severable.

IN CONCLUSION

Guam's 1% Program is dedicated to placing visual art of the highest quality by contemporary and traditional artists where the people of the Territory of Guam can appreciate. In so doing, the Territory of Guam is building a significant art collection of historic value for its people. Furthermore, it will enrich the lives of our children, local artists and the community as a whole.

ATTACHMENT B-17

DPW Construction Management (CM) Requirements

1. DPW Construction Management Oversight & Reporting

1.1 Developer Reporting Obligations

- Submit **weekly and monthly progress reports** to the DPW Construction Manager (CM), including:
    - Work completed.
    - Upcoming activities and critical milestones.
    - Risks, mitigation strategies, and outstanding issues.

1.2 Daily Construction Reports (DCRs)

- Submit **Daily Construction Reports (DCRs)** to the DPW CM **by 9:00 AM the following workday**.
- Reports must include:
    - Work performed (by trade and location).
    - Manpower on-site (contractor, subcontractors, and suppliers).
    - Equipment on-site and in use.
    - Weather conditions and any weather-related delays.
    - Quality control activities and testing performed.
    - Safety incidents or near misses.
    - Potential delays or issues requiring resolution.
- Provide **daily progress photos** highlighting work performed and critical activities.

1.3 Meetings & Coordination

- Attend DPW CM **weekly coordination meetings** and provide real-time project updates.
- The DPW CM has authority to **issue directives, require additional reporting, and approve work schedules**.

---

2. Work Hours & Overtime

2.1 Regular Work Hours

- **Monday to Friday, 8:00 AM – 5:00 PM**.

2.2 Non-Standard Work & Overtime Approval

- Any work outside these hours **requires DPW CM approval**.
- If work outside normal hours is due to **contractor delays**, costs are **contractor's responsibility**.
- Submit **Overtime Work Requests at least 48 hours in advance**, including:
    - Scope of work.
    - Justification for overtime.
    - Requested work hours.
    - Estimated CM inspection costs (if applicable).

2.3 DPW CM Overtime Inspection Costs

- If the contractor elects to **work overtime, weekends, or holidays**, the contractor shall be responsible for all associated DPW **CM overtime inspection costs**.
- DPW CM overtime rates shall be determined based on **contract rates established for Construction Management oversight personnel**.

---

3. DPW CM Field Office

3.1 Developer-Provided Office for DPW CM

- Office space for at least **6 personnel**.
- Conference room for **weekly coordination meetings**.
- High-speed internet, printers, and workstations.
- Office furniture (desks, chairs, filing cabinets, etc.).

3.2 Utilities & Maintenance

- Developer responsible for **utilities, janitorial services, and routine upkeep**.

3.3 Restroom Facilities

- The **Developer-Provided Office for CM** shall include **restroom facilities** that meet the following requirements:
    - **Flush toilets** with **septic or sewer connections**, or portable toilets maintained per **OSHA 29 CFR 1926.51(c)**.
    - **Separate restrooms** for men and women, or gender-neutral accommodations as required by law.
    - **Handwashing stations with potable water, soap, and disposable towels** per **OSHA 29 CFR 1926.51(f)**.

- **Regular servicing and maintenance** to ensure cleanliness and sanitation

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4. Project Scheduling & Time Impact Analysis (TIA) Requirements

4.1 Baseline Schedule Submission – USACE UFGS 01 32 01.00 10

- Submit **Primavera P6 (or equivalent) schedule** within **30 days of NTP**.
- Schedule must include:
  - **Critical Path Method (CPM) analysis**.
  - **Work Breakdown Structure (WBS)**.
  - **Milestones, activity durations, and dependencies**.

4.2 Schedule Updates

- Monthly updates tracking **actual progress vs. baseline**.
- Identification of **schedule variances and recovery plans**.

4.3 Look-Ahead Schedules

- **Two-week and four-week look-ahead schedules** must be submitted weekly.

4.4 Recovery Schedule Requirement

- If progress falls **15 days or more behind schedule**, submit a **Recovery Schedule within 7 days**, including:
  - Revised sequencing and task prioritization.
  - Manpower and resource adjustments.
  - Acceleration strategies to mitigate delays.

4.5 Time Impact Analysis (TIA) – AACE 52R-06 & USACE UFGS 01 32 17.00 20

- Perform a **Time Impact Analysis (TIA)** whenever a delay event occurs.
- Analysis must use **contemporaneous schedule updates** and include:
  - **Event chronology** with documentation supporting delay claims.
  - **Fragnets (fragmentary networks)** inserted into the CPM schedule.
  - **Comparison of pre- and post-delay schedules**.
  - **Responsibility assignment** (contractor vs. excusable delays).

- The CM must **review and approve all TIA submissions** before any schedule extensions are considered.

---

5. Quality Control (QC) Program – Three-Phase Control System (Per USACE UFGS 01 45 00.00 10)

5.1 QC System Requirements

- The contractor shall establish and implement a **Three-Phase Control System** in compliance with **USACE UFGS 01 45 00.00 10**.
- The contractor's designated **Quality Control (QC) Manager** is responsible for enforcement.

5.2 Phase 1: Preparatory Phase (Before Work Begins)

- Conduct a **Preparatory Phase Meeting** for each major work feature.
- Review applicable contract requirements, specifications, and approved submittals.
- Verify materials, equipment, and workmanship standards before starting work.
- Establish initial testing and inspection procedures.

5.3 Phase 2: Initial Phase (Start of Work)

- Inspect the **first unit of work** performed for each construction activity.
- Confirm that proper methods, materials, and workmanship are used.
- Identify potential issues early and document any non-compliance.
- Validate that the workforce follows approved methods and safety procedures.

5.4 Phase 3: Follow-Up Phase (Ongoing Work)

- Perform **continuous inspections** to ensure that all work conforms to contract documents.
- Track and correct any deficiencies in real time.
- Document completed work for final inspections and turnover.
- Submit detailed **QC inspection reports** to the DPW CM weekly.

---

6. Submittals & Approval Process

6.1 General Requirements

- The developer shall submit **all required documents, drawings, and certifications** as per the submittal register and schedule utilizing the DPW CM document management system.

- All submittals must be **stamped for approval** by the Developer's **Design of Record (DOR) or Quality Control (QC) personnel** before submission.
- The DPW **CM must be copied on all submittals** for monitoring, record-keeping, and government oversight.

6.2 Submittal Classification & Approval Authority

1. Government-Approved Submittals (Through CM)

- Must be **formally reviewed and approved** by the government through the DPW CM:
    - Project Schedule (Baseline and Updates)
    - Quality Control Plan
    - Safety Plan
    - Environmental Protection Plan
    - Commissioning & Testing Reports
    - Warranty Documentation
    - Scope/Budget impacting changes
    - Any other submittal required by the DPW CM

2. Developer-Approved Submittals (DOR or QC Personnel)

- Approved by Developer's **DOR/QC**, but copies must be **sent to the DPW CM**:
    - Material & product data
    - Shop drawings
    - Construction methods & procedures
    - Testing & Inspection Reports (excluding final acceptance tests)
    - As-built drawings (before final approval)

3. Record-Only Submittals (For DPW CM Documentation)

- Provided for DPW CM records but **do not require approval**:
    - Daily reports
    - Weather logs
    - Field test results (non-critical)
    - Meeting minutes & progress photos

6.3 Submittal Format & Delivery

- All submittals must be **electronically submitted** via the designated **Document Control System** (Procore, SharePoint, etc.).
- Each submittal must include a **Transmittal Form**, indicating:
    - Submittal Type
    - Approval Authority (Government, DOR, or Record Only)
    - Submission Date & Required Review Duration
    - Contractor's Recommendation (Approval, Resubmission, or Information Only)

6.4 Submittal Review & Turnaround Times

- **Government-Approved Submittals:** Reviewed within **14 calendar days**.
- **Developer-Approved Submittals:** Reviewed internally within **7 calendar days**, with copies forwarded to CM.
- **Record-Only Submittals:** Must be submitted to the CM **within 48 hours**.

6.5 Non-Compliance & Re-Submittals

- **Unapproved or incomplete submittals** will be marked **"Rejected" or "Revise & Resubmit"** by DPW CM.
- The developer must **correct and resubmit** within the timeframe specified by the DPW CM.
- Any work performed with unapproved submittals is subject to **removal at the contractor's expense**.

---

7. Rain Days & Weather Delays

7.1 Definition of Weather Delay

- Delays are only excusable if **weather conditions exceed historical averages**, based on **10 years of NOAA data**.

7.2 Documentation Requirement

- Developer must submit **daily weather logs, site photos, and impact assessments** for CM approval.

7.3 Schedule Adjustments

- Approved **schedule extensions** shall be granted only for **actual lost workdays**.
- Developer must submit a **Recovery Plan** for any weather-related delays.

---

8. Personnel Requirements

8.1 General Personnel Requirements

- The contractor shall provide and maintain an adequate workforce of **qualified personnel** to perform and manage the work.
- The contractor shall designate specific **Key Personnel** to ensure compliance with **quality control, safety, and contract administration**.
- **Key Personnel shall be on-site full-time** whenever construction activities are being performed.

8.2 Required Key Personnel

Position	Minimum Qualifications	Primary Responsibilities
Quality Control (QC) Manager *(Per USACE UFGS 01 45 00.00 10)*	- Completed **USACE Construction Quality Management for Contractors (CQM-C)** course.- Minimum **5 years of construction quality control experience**.- Prior experience as a QC Manager on projects of similar size/scope.	- Implements and manages the **Three-Phase Control System**.- Ensures compliance with contract quality standards.- Reviews submittals, tests, and inspection results.- Maintains the Quality Control Program documentation.- Coordinates all QC inspections and corrective actions.
Site Safety and Health Officer (SSHO) *(Per OSHA Standards)*	- Completed **OSHA 30-Hour Construction Safety Training**.- Minimum **5 years of safety management experience**.- Certified in **First Aid and CPR**.- Previous SSHO experience on projects of similar scope.	- Oversees project safety program and compliance.- Conducts daily safety briefings and inspections.- Investigates and reports all safety incidents.- Ensures adherence to **OSHA 29 CFR 1926 safety requirements**.- Enforces contractor's **Accident Prevention Plan (APP)**.

REQUIRED FORMS

ATTACHMENTS 1-9

AFFIDAVIT OF DISCLOSING OWNERSHIPAND COMMISSIONS

CITY OF _____)
) ss.
ISLAND OF GUAM)

A. I, the undersigned, being first duly sworn, depose and say that I am an authorized representative of the Proposer and that [please check only one]:

[ ] The Proposer is an individual or sole proprietor and owns the entire (100%) interest in the offering business.

[ ] The Proposer is a corporation, partnership, joint venture, or association known as _____ [please state name of Proposer company], and the persons, companies, partners, or joint ventures who have held more than 10% of the shares or interest in the offering business during the 365 days immediately preceding the submission date of the proposal are as follows [if none, please so state]:

Name	**Address**	**% of Interest**

B. Further, I say that the persons who have received or are entitled to receive a commission, gratuity or other compensation for procuring or assisting in obtaining business related to the bid or proposal for which this affidavit is submitted are as follows [if none, please so state]:

Name	**Address**	**Compensation**

C. If the ownership of the offering business should change between the time this affidavit is made and the time an award is made or a contract is entered into, then I promise personally to update the disclosure required by 5 GCA §5233 by delivering another affidavit to the government.

_____
Signature of one of the following:
Proposer, if the Proposer is an individual;
Partner, if the Proposer is a partnership;
Officer, if the Proposer is a corporation.

Subscribed and sworn to before me

This ____ day of _____, 202__.

_____
NOTARY PUBLIC

My commission expires: _____

AFFIDAVIT OF NON-COLLUSION

CITY OF _____)
) ss.
ISLAND OF GUAM)

I, _____[state name of affiant signing below], being first duly sworn depose and say that:

1. The name of the offering company or individual is [state name of company] _____.

2. The proposal for the solicitation identified above is genuine and not collusive or a sham. The Proposer has not colluded, conspired, connived or agreed, directly or indirectly, with any other Proposer or person, to put in a sham proposal or to refrain from making an offer. The Proposer has not in any manner, directly or indirectly, sought by an agreement or collusion, or communication or conference, with any person to fix the proposal price of Proposer or of any other Proposer, or to fix any overhead, profit or cost element of said proposal price, or of that of any other Proposer, or to secure any advantage against the government of Guam or any other Proposer, or to secure any advantage against the government of Guam or any person interested in the proposed contract. All statements in this affidavit and in the proposal are true to the best of the knowledge of the undersigned. This statement is made in pursuant to 2 GAR Division 4 § 3126(b).

3. I make this statement on behalf of myself as a representative of the Proposer, and on behalf of the Proposer's officers, representatives, agents, subcontractors, and employees.

_____
Signature of one of the following:
Proposer, if the Proposer is an individual;
Partner, if the Proposer is a partnership;
Officer, if the Proposer is a corporation.

Subscribed and sworn to before me

This ____ day of _____, 202__.

_____
NOTARY PUBLIC

My commission expires: _____

AFFIDAVIT Re NO GRATUITIES or KICKBACKS

CITY OF _____)
) ss.
ISLAND OF GUAM)

I, _____ [state name of affiant signing below], being first duly sworn, deposes and says that:

1. The name of the offering firm or individual is [state name of Proposer Company] _____. Affiant is _____ [state one of the following: the Proposer, a partner of the Proposer, and officer of the Proposer] making the foregoing identified bid or proposal.

2. To the best of affiant's knowledge, neither affiant, nor any of the Proposer's officers, representatives, agents, subcontractors, or employees have violated, are violating the prohibition against gratuities and kickbacks set forth in 2 GAR Division 4 § 11107(e). Further, affiant promises, on behalf of Proposer, not to violate the prohibition against gratuities and kickbacks as set forth in 2 GAR Division 4§ 11107(e).

3. To the best of affiant's knowledge, neither affiant, nor any of the Proposer's offices, representatives, agents, subcontractors, or employees have offered, given or agreed to give, any government of Guam employee or former government employee, any payment, gift, kickback, gratuity or offer of employment in connection with the Proposer's proposal.

4. I make these statements on behalf of myself as a representative of the Proposer, and on behalf of the Proposer's officers, representatives, agents, subcontractors, and employees.

_____
Signature of one of the following:
Proposer, if the Proposer is an individual;
Partner, if the Proposer is a partnership;
Officer, if the Proposer is a corporation.

Subscribed and sworn to before me

This ____ day of _____, 202__.

_____
NOTARY PUBLIC

My commission expires: _____, _____.

AFFIDAVIT RE CONTINGENT FEES

CITY OF_____)
) ss.
ISLAND OF GUAM)

I, _____ [state name of affiant signing below], being first duly sworn, deposes and says that:

1. The name of the offering company or individual is [state name of company] _____.

2. As a part of the offering company's bid or proposal, to the best of my knowledge, the offering company has not retained any person or agency on a percentage, commission, or other contingent arrangement to secure this contract. This statement is made in pursuant to 2 GAR Division 4 11108(f).

3. As a part of the offering company's bid or proposal, to the best of my knowledge, the offering company has not retained a person to solicit or secure a contract with the government of Guam upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business. This statement is made pursuant to 2 GAR Division 4 11108(h).

4. I make these statements on behalf of myself as a representative of the Proposer, and on behalf of the Proposer's officers, representatives, agents, subcontractors, and employees.

_____
Signature of one of the following:
Proposer, if the Proposer is an individual;
Partner, if the Proposer is a partnership;
Officer, if the Proposer is a corporation.

Subscribed and sworn to before me

This ____ day of _____, 202__.

_____
NOTARY PUBLIC

My commission expires: _____.

AFFIDAVIT re ETHICAL STANDARDS

CITY OF _____ _____)
) ss.
ISLAND OF GUAM)

I, _____ [state name of affiant signing below], being first duly sworn, deposes and says that:

The affiant is _____ [state one of the following: the Proposer, a partner of the Proposer, an officer of the Proposer] making the foregoing identified bid or proposal. To the best of affiant's knowledge, neither affiant nor any officers, representatives, agents, subcontractors or employees of Proposer have knowingly influenced any government of Guam employee to breach any of the ethical standards set forth in 5 GCA Chapter 5, Article 11. Further, affiant promises that neither he or she, nor any officer, representative, agent, subcontractor, or employee of Proposer will knowingly influence any government of Guam employee to breach any ethical standards set forth in 5 GCA Chapter 5, Article 11. These statements are made pursuant to 2 GAR Division 4 § 11103(b).

_____
Signature of one of the following:
Proposer, if the Proposer is an individual;
Partner, if the Proposer is a partnership;
Officer, if the Proposer is a corporation.

Subscribed and sworn to before me

This ____ day of _____, 202__.

_____
NOTARY PUBLIC

My commission expires: _____.

FORM E

DECLARATION RE COMPLIANCE WITH U.S. DOL WAGE DETERMINATION

Procurement No. FY2023 RFP 730-5-1058-L-YIG

Name of Proposer Company: _____

I, _____ hereby certifies under penalty of perjury:

1) That I am _____ (the proposer, a partner of the proposer, an officer of the proposer) making the bid or proposal in the foregoing identified procurement;

2) That I have read and understand the provision of 5 GCA § 5801 and § 5802 which read:

§ 5801. Wage Determination Established.

In such cases where the government of Guam enters into contractual arrangement with a sole proprietorship, a partnership or a corporation ("contractor") for the provision of a services to the government of Guam, and in such cases where the contractor employs a person(s) whose purpose, in whole or in part, is the direct delivery of service contracted by the government of Guam, then the contractor shall pay such employee(s) in accordance with the Wage Determination for Guam and the Northern Mariana Islands issued and promulgated by the U.S. Department of Labor for such labor as is employed in the direct delivery of contracts deliverables to the government of Guam.

The Wage Determination most recently issued by the U.S. Department of Labor at the time a contract is awarded to a contractor by the government of Guam shall be used to determine wages, which shall be paid to employees pursuant to this Article. Should any contract contain a renewal clause, then at the time of renewal adjustments, there shall be made stipulations contained in that contract for applying the Wage Determination, as required by this Article, so that the Wage Determination promulgated by the U.S. Department of Labor on a date most recent to the renewal date shall apply.

§5802. Benefits.

In addition to the Wage Determination detailed in this Article, any contract to which this Article applies shall also contain provisions mandating health and similar benefits for employees covered by this Article, such benefits having minimum value as detailed in the Wage Determination issued and promulgated by the U.S. Department of Labor, and shall contain provisions guaranteeing a minimum of ten (10) paid holidays per annum per employee.

3) 3) That the proposer is in full compliance with 5 GCA § 5801 and §5802, as many be applicable to be procurement herein;

4) 4) That I have review the attached the most recent wage determination applicable to Guam issued by the U.S. Department of Labor. (INSTRUCTION – Please attach)

_____
Signature

THIS MUST BE COMPLETED AND RETURNED IN THE ENVELOPE CONTAINING THE PROPOSAL

ACKNOWLEDGEMENT OF RECEIPT FORM

DEPARTMENT OF PUBLIC WORKS

Please acknowledge receipt of

***Project No.* 730-5-1059-L-YIG**

Construction of Simon Sanchez High School

Name of Prospective Proposer _____

Name of person receiving RFP _____

Signature _____

Date _____

Time _____

Contact Person regarding RFP _____

Company/Firm _____

Title _____

E-mail Address _____

Contact Number _____

Fax Number _____

Address _____

_____

DPW CHECKLIST OF PROPOSAL RESPONSIVENESS

This checklist will determine if a Proposal is responsive. Proposers are reminded to read the Request for Proposal and to comply with the mandatory requirements listed below. Proposals not in compliance with the mandatory requirements below may be disqualified.

DPW Check-off

( ) **PROPOSAL PACKAGE**

- ☐ Package must be sealed, and the outside clearly marked with the Project Name, Project No. and the name of the Proposer
- ☐ One (1) original and six (6) copies of the Proposal enclosed
- ☐ Two (2) electronic copies of the Proposal on CD or USB portable storage device
- ☐ One (1) separate and sealed individual Term Sheet for financing and a separate individual Price Proposal & Addenda Acknowledgement of Receipt Form (Attachment 9)

( ) **EXECUTIVE SUMMARY (max. 1 page)**

( ) **TABLE OF CONTENTS**

( ) **COVER LETTER (max 1 page)**

- ☐ The name, phone number and email address of the Proposer's contact person relative to the proposal.
- ☐ The Proposer's principal place of business and the location of the office proposing/sponsoring the work relative to this proposal.
- ☐ Must also indicate whether operating as an individual proprietorship, partnership, corporation, or a joint venture.
- ☐ A brief statement acknowledging the firm's understanding of the scope of work.
- ☐ A positive commitment to perform the services described, with the personnel specified in the submission, within the budgetary parameters of the "MA KÅHAT ACT OF 2013" and any subsequent/ relevant public laws.
- ☐ An acknowledgement that all addenda were received (list each addendum number and date in the letter).

( ) **BODY OF THE PROPOSAL**

- ☐ Does not exceed forty (40), excluding front and back covers, Executive Summary, Table of Contents, Cover Letter, tabs, certificates of insurance, detailed scheduled charts, and required forms. Items that are not part of the forty (40) pages should be clearly tabbed and labeled accordingly.

- ☐ Single-spaced and pages are numbered consecutively on the bottom
- ☐ Subdivided into the sections identified in **Section VII. Instructions for Submitting a Proposal, Sections 1-7**
- ☐ Copy of Contractors License/s
- ☐ Name and license of Proposer's Architectural/Engineering Design Team

( ) **AFFIDAVIT OF DISCLOSING OWNERSHIP AND COMMISSIONS (Attachment 1)**

- ☐ The affidavit must be completed, notarized and dated

( ) **AFFIDAVIT OF NON-COLLUSION (Attachment 2)**

- ☐ The affidavit must be completed, notarized and dated

( ) **AFFIDAVIT re NO GRATUITIES OR KICKBACKS (Attachment 3)**

- ☐ The affidavit must be completed, notarized and dated

( ) **AFFIDAVIT re CONTINGENT FEES (Attachment 4)**

- ☐ The affidavit must be completed, notarized and dated

( ) **AFFIDAVIT re ETHICAL STANDARDS (Attachment 5)**

- ☐ The affidavit must be completed, notarized and dated

( ) **DECLARATION re COMPLIANCE WITH U.S DOL WAGE DETERMINATION (Attachment 6)**

- ☐ The declaration must be completed and signed

( ) **ACKNOWLEDGEMENT OF RECEIPT FORM (Attachment 7)**

- ☐ Must be complete and signed

( ) **DPW CHECKLIST OF RESPONSIVENESS (Attachment 8)**

- ☐ Must be completed

PRICE PROPOSAL & ADDENDA ACKNOWLEDGEMENT OF RECEIPT FORM

Date: _____

To: Director of Public Works
Government of Guam
542 North Marine Drive
Tamuning, GU 96913

Gentlemen:

The undersigned (hereafter called the Bidder),

_____
(Corporation, Partnership or Individual)

an organized and/or licensed to do business under the laws of Guam, hereby proposes and agrees to furnish all the necessary labor, materials, equipment, tools and services necessary for the **"New Simon Sanchez High School: FDDBLM, Project No. 730-5-1059-L-YIG"** all in accordance with the drawings, specifications and other RFP documents prepared by the Department of Public Works for the sum of:

_____
_____($ _____) plus any and all sums to be added and/or deducted resulting from all extra and/or omitted work in accordance with the unit and/or lump sum prices stated in the itemized price proposal form attached hereto exclusive to annual maintenance and insurance cost. The annual insurance and maintenance costs are excluded from this sum.

The undersigned has examined the location of the proposed work, the drawings, specifications and other contract documents and is familiar with the local conditions at the place where the work is to be performed.

The Proposal Guaranty attached, without endorsement, in the sum of not less than fifteen percent (15%) of the total amount of the price proposal but shall not exceed $3 million, is furnished to the Government as a guarantee that the contract will be executed and a performance and payment bond furnished within fifteen (15) calendar days after the acceptance of the price proposal of the undersigned. In the event that the undersigned Proposer shall fail to execute the contract and furnish a satisfactory performance and payment bond under the conditions and within the time specified in this price proposal, the Proposal Guaranty shall be forfeited as liquidated damages for the delay and additional work and costs caused thereby in obtaining another Proposer, said being beforehand determined as being reasonable and containing no penalties.

If written notice of the acceptance of this price proposal is mailed, telegraphed or delivered to the undersigned within sixty (60) days after the opening thereof, the undersigned agrees to execute the form of agreement included as one of the contract documents, and to furnish a performance and payment bond in an amount equal to one hundred percent (100%) of the contract amount within fifteen (15) calendar days after receipt of such notice.

Project Scope Construction Costs:

Item	**Cost**
General Requirements for Design and Construction	
Site Development and Sports Facilities	
Administration Building, Main Entrance, Covered Walkways, and Courtyard	
A-wing Classroom Building	
Gymnasium Building	
B-wing Classroom Building	
Cafeteria Building	
JROTC Classroom Building & Multipurpose Space	
C-wing Classroom Building	
FF&E (excluding Auditorium & Credit Recovery Buildings)	
Auditorium Building including FF&E, Audio Visual, and Theater Systems	
Photovoltaic System	
Rainwater Catchment System	
Landscaping Plants, Irrigation, and Site Furnishing	
Credit Recovery Building including FF&E	
TOTAL	$

Annual Insurance and Maintenance

Item	Cost
Annual Insurance Premium	
Annual Grounds and Custodial Costs	
Annual Maintenance Costs	
Annual Capital Maintenance Fund	

The undersigned hereby acknowledges receipt of the following addenda:

	ADDENDUM NO.	DATED
1	_____	_____
2	_____	_____
3.	_____	_____
4.	_____	_____

If awarded the contract, the undersigned shall be the authorized representative to bind into an agreement with the government and agrees to complete the work within the contract time stipulated in this project.

The undersigned understands that the Government reserves the right to reject any or all price proposals or to waive any informality or technicality in any price proposals in the interest of the Government.

RESPECTFULLY SUBMITTED BY:

_____
(CONTRACTOR)

_____
(BY) *(Name and Signature)*

_____
(TITLE)

_____
(BUSINESS ADDRESS)

END OF PRICE PROPOSAL FORM