

**Fort Bend County, Texas  
Request for Proposals**



**Construction of Community Center  
for Fort Bend County  
RFP 22-077**

**SUBMIT PROPOSALS TO:**

Fort Bend County  
Purchasing Department  
Travis Annex  
301 Jackson, Suite 201  
Richmond, TX 77469

**\*\*NOTE:**

All correspondence must include the term  
"Purchasing Department" in address to assist in  
proper delivery

**SUBMIT NO LATER THAN:**

Tuesday, June 7, 2022  
2:00 PM (Central)

**MARK ENVELOPE:**

RFP 22-077  
Community Center

***ALL SUBMITTALS MUST BE RECEIVED AND TIME/DATE STAMPED BY THE PURCHASING OFFICE  
OF FORT BEND COUNTY ON OR BEFORE THE SPECIFIED TIME/DATE STATED ABOVE.***

***SUBMITTALS RECEIVED AS REQUIRED WILL THEN BE OPENED AND THE NAMES PUBLICLY READ.***

***SUBMITTALS RECEIVED AFTER THE SPECIFIED TIME WILL BE RETURNED UNOPENED.***

Results will not be given by phone.  
Results will be provided to bidder in writing  
after Commissioners Court award.

Requests for information must be in  
writing and directed to:  
Jaime Kovar  
Purchasing Agent  
[Jaime.Kovar@fortbendcountytexas.gov](mailto:Jaime.Kovar@fortbendcountytexas.gov)

**Vendor Responsibilities:**

- Download and complete any addendums. (Addendums will be posted on the Fort Bend County website no later than 48 hours prior to bid opening)
- Submit response in accordance with requirements stated on the cover of this document.
- DO NOT submit responses via email or fax.



## COUNTY PURCHASING AGENT

Fort Bend County, Texas

### Vendor Information

Jaime Kovar  
Purchasing Agent

Office (281-341-8640)

Legal Company Name (top line of W9)														
Business Name (if different from legal name)														
Federal ID # or S.S. #			DUNS #											
Type of Business	<input type="checkbox"/> Corporation/LLC <input type="checkbox"/> Partnership <input type="checkbox"/> Sole Proprietor/Individual <input type="checkbox"/> Tax Exempt Organization		Age in Business?											
Publicly Traded Business	<input type="checkbox"/> No <input type="checkbox"/> Yes      Ticker Symbol _____													
Remittance Address														
City/State/Zip														
Physical Address														
City/State/Zip														
Phone/Fax Number	Phone: _____ Fax: _____													
Contact Person														
E-mail														
Check all that apply to the company listed above and provide certification number.	DBE-Disadvantaged Business Enterprise <input type="checkbox"/> SBE-Small Business Enterprise <input type="checkbox"/> HUB-Texas Historically Underutilized Business <input type="checkbox"/> WBE-Women's Business Enterprise <input type="checkbox"/>		Certification # _____ Certification # _____ Certification # _____ Certification # _____	<table border="1"><thead><tr><th>Cert Date</th><th>Exp Date</th></tr></thead><tbody><tr><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td></tr></tbody></table>	Cert Date	Exp Date	_____	_____	_____	_____	_____	_____	_____	_____
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Company's gross annual receipts	<table border="1"><tr><td>&lt;\$500,000 _____</td><td>\$500,000-\$4,999,999 _____</td></tr><tr><td>\$5,000,000-\$16,999,999 _____</td><td>\$17,000,000-\$22,399,999 _____</td></tr><tr><td>&gt;\$22,400,000 _____</td><td></td></tr></table>		<\$500,000 _____	\$500,000-\$4,999,999 _____	\$5,000,000-\$16,999,999 _____	\$17,000,000-\$22,399,999 _____	>\$22,400,000 _____							
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\$5,000,000-\$16,999,999 _____	\$17,000,000-\$22,399,999 _____													
>\$22,400,000 _____														
NAICs codes (Please enter all that apply)														
Signature of Authorized Representative														
Printed Name														
Title														
Date														

**THIS FORM MUST BE SUBMITTED WITH THE SOLICITATION RESPONSE**



## **1.0 SCOPE OF WORK:**

Fort Bend County, Texas (hereafter referred to as the “County”) seeks Proposals (“Proposals or RFP”) for selection of a Contractor (“Respondent”) to complete the construction of Community Center (“Project”), located at 1908 Avenue E, Rosenberg Texas.

Vendor to construct approximately 19,956 square foot, two-story, steel structure, masonry and metal panel exterior Community Center for youth programming. Community center to include gymnasium, classrooms, offices, and multi-purpose spaces.

## **2.0 GUIDELINES:**

By virtue of submitting a proposal, interested parties are acknowledging:

- 2.1 The County reserves the right to reject any or all proposals if it determines that select proposals are not responsive to the RFP. The County reserves the right to reconsider any proposal submitted at any phase of the procurement. It also reserves the right to meet with select Respondents at any time to gather additional information. Furthermore, the County reserves the right to delete or add scope up until the final contract signing.
- 2.2 All Respondents submitting proposals agree that their pricing is valid for a minimum of ninety (90) days after proposal submission to the County. Furthermore, the County is by statute exempt from the State Sales Tax and Federal Excise Tax; therefore, proposal prices shall not include taxes.
- 2.3 This Proposal does not commit the County to award nor does it constitute an offer of employment or a contract for services. Costs incurred in the submission of this proposal, or in making necessary studies or designs for the preparation thereof, are the sole responsibility of the Respondents. Further, no reimbursable cost may be incurred in the anticipation of award. Proposals containing elaborate artwork, expensive paper and binding and expensive visual or other presentations are neither necessary nor desired.
- 2.4 In an effort to maintain fairness in the process, all inquiries concerning this procurement are to be directed only to the County’s Purchasing Agent in writing. Attempts to contact any members of the County’s Commissioners’ Court or any other County employee to influence the procurement decision may lead to immediate elimination from further consideration.
- 2.5 When responding to this Proposal, follow all instructions carefully. Submit proposal contents according to the outline specified and submit all hard copy and electronic documents according to the instructions. Failure to follow these instructions may be considered a non-responsive proposal and may result in immediate elimination from further consideration.

### 3.0 PROPOSAL CONTACT:

This Proposal is being issued by the County Purchasing Agent on behalf of Fort Bend County, Texas. Thus, responses should be directed to the Purchasing Agent, as outlined below. **Respondents are specifically directed NOT to contact any County personnel for meetings, conferences or technical discussions that are related to this Proposal other than specified herein. Unauthorized contact of any County personnel will likely be cause for rejection of the Respondent's proposal. All communications regarding the Proposal shall be directed to the County's Proposal Contact.** Communication with the Proposal Contact is permitted via email, facsimile, or written correspondence.

#### PROPOSAL CONTACT:

Jaime Kovar  
Purchasing Agent  
Fort Bend County Travis Annex  
301 Jackson, Suite 201  
Richmond, Texas 77469  
[Jaime.Kovar@fortbendcountytexas.gov](mailto:Jaime.Kovar@fortbendcountytexas.gov)  
Phone: 281.344.3724

### 4.0 SUBMISSION REQUIREMENTS:

- 4.1 Submission requirements: one (1) original proposal is required by RFP opening time of 2:00 PM on Tuesday, June 7, 2022. Four (4) paper copies and one (1) electronic response on flash drive are required to be submitted to Purchasing by 9:00 AM on Wednesday, June 8, 2022. Flash drive must contain only one (1) file in PDF format and must match written response identically. Failure to provide proper flash drive is cause for disqualification. Proposal shall be submitted to the address shown below. Proposal shall be signed, in ink, by a person having the authority to bind the firm in a contract.

Fort Bend County	Proposal Number: R22-077
Purchasing Department	Due Date: June 7, 2022
301 Jackson, Suite 201	Time: 2:00 PM (CST)
Richmond, Texas 77469	For: Community Center

- 4.2 Respondents may submit their proposal any time prior to the Opening Date and time. The Respondent's name and address as well as a distinct reference to the Proposal number above shall be marked clearly on the submission. All proposals are time-stamped upon receipt and are securely kept, unopened, until the Opening Date. No responsibility will attach to the County, or any official or employee thereof, for the pre-opening of, post-opening of, or the failure to open a proposal not properly addressed and identified. No oral, telegraphic, telephonic, or facsimile proposals will be considered.

- 4.3 Proposals may be modified or withdrawn prior to the established opening date by delivering written notice to the proposal contact. Any alteration made prior to opening date and time shall be initialed by the signer of the proposal, guaranteeing authenticity.
- 4.4 Proposals time-stamped after the due date and time will not be considered and will be returned to the Respondent unopened. Regardless of the method used for delivery, respondents shall be wholly responsible for the timely delivery of submitted proposals.
- 4.5 The Respondent's name and address shall be clearly marked on all copies of the proposal.

## **5.0 INCURRED COSTS:**

Those submitting proposals do so entirely at their expense. There is no expressed or implied obligation by the County to reimburse any individual or firm for any costs incurred in preparing or submitting proposals, for providing additional information when requested by the County or for participating in any selection interviews, including discovery (pre-contract negotiations) and contract negotiations.

## **6.0 ACCEPTANCE:**

- 6.1 Submission of any proposal indicates a Respondent's acceptance of the conditions contained in this Proposal unless clearly and specifically noted otherwise in their proposal.
- 6.2 Furthermore, the County is not bound to accept a proposal on the basis of lowest price, and further, the County has the sole discretion and reserves the right to cancel this Proposal, to reject any and all proposals, to waive any and all informalities and or irregularities, or to re-advertise with either the identical or revised specifications, if it is deemed to be in the County's best interests. The County reserves the right to accept or reject any or all of the items in the proposal, and to award the contract in whole or in part and/or negotiate any or all items with individual Respondents if it is deemed in the County's best interest.
- 6.3 Although Fort Bend County desires to negotiate toward a contract with a selected Respondent, the Commissioners' Court may award the contract on the basis of the initial proposals received, without discussions. Therefore, each initial proposal should contain the Respondent's best terms.

## **7.0 INTERPRETATIONS, DISCREPANCIES, AND OMISSIONS:**

- 7.1 It is incumbent upon each potential Respondent to carefully examine these specifications, terms, and conditions. Should any potential Respondent find discrepancies, omissions or ambiguities in this Proposal, the Respondent shall at

once request in writing an interpretation from the County's Proposal Contact. Any inquiries, suggestions, or requests concerning interpretation, clarification or additional information shall be made in writing via e-mail only to the County's Proposal Contact, as specified in Section 3.0. Deadline for submission of questions and/or clarification is **Tuesday, April 19, 2022 at 10:00 AM. (CST)**. Requests received after the deadline will not be responded to due to the time constraints of this Proposal process.

- 7.2 The issuance of a written addendum is the only official method by which interpretation, clarification or additional information will be given by the County. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarification will be without legal effect. If it becomes necessary to revise or amend any part of this Proposal, notice will be given by the County Purchasing Agent to all prospective Respondents who were sent a Proposal. The Respondent in their proposal shall acknowledge receipts of amendments. Each Respondent shall ensure that they have received all addenda and amendments to this Proposal before submitting their proposals.

#### **8.0 TENTATIVE SCHEDULE:**

Release of RFP:	May 8, 2022
Pre-RFP conference:	May 17, 2022
Deadline for Questions:	May 25, 2022
Submission Due Date:	June 7, 2022
Evaluation of Submissions:	Week of June 12th
Commissioners Court Permission to Negotiate:	June 28, 2022
Negotiations:	Beginning June 29, 2022
Final Contract Approval Commissioners Court:	July 26, 2022

#### **9.0 PRE-RFP CONFERENCE:**

A Pre-RFP conference will be conducted on **Tuesday, May 17, 2022 at 9:00 AM** (central). The pre-RFP conference will be held at the Fort Bend County Purchasing Department located in the Travis Annex at 301 Jackson, Suite 201, Richmond, Texas 77469. All vendors are encouraged to attend. A site visit will be conducted after the conference, if necessary.

#### **10.0 RETENTION OF RESPONDENT'S MATERIAL:**

The County reserves the right to retain all proposals regardless of which response is selected. All proposals and accompanying documents become the property of the County.

#### **11.0 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION:**

By submission of a proposal, each Respondent certifies, that in connection with this procurement:

- 11.1 The prices in this proposal have been arrived at independently, without consultation, communication, or agreement with any other Respondent; with any competitor; or with any County employee(s) or consultant(s) for the purpose of restricting competition on any matter relating to this Proposal.
- 11.2 Unless otherwise required by law, the prices which have been quoted in this proposal have not been knowingly disclosed by the Respondent and will not knowingly be disclosed by the Respondent prior to award directly or indirectly to any other Respondent or to any competitor; and;
- 11.3 No attempt has been made or will be made by the Respondent to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

## **12.0 ASSIGNMENT:**

The Respondent may not sell, assign, transfer or convey the contract resulting from this Proposal, in whole or in part, without the prior written approval from Fort Bend County Commissioners' Court.

## **13.0 CONFIDENTIAL MATTERS:**

- 13.1 All data and information gathered by the Respondent and its agents, including this Proposal and all reports, recommendations, specifications, and data shall be treated by the Respondent and its agents as confidential. The Respondent and its agents shall not disclose or communicate the aforesaid matters to a third party or use them in advertising, publicity, propaganda, and/or in another job or jobs, unless written consent is obtained from the County.
- 13.2 Proposals will only be publicly received and acknowledged only so as to avoid disclosure of the contents to competing Respondents and kept secret during negotiation. However, all proposals shall be open for public inspection after the contract is awarded. Trade secrets and any material that is considered to be confidential information contained in the proposal and identified by Respondent as such will be treated as confidential to the extent allowable in the Open Records Act.

## **14.0 LIMITS OF SUBCONTRACTORS:**

- 14.1 The County has approval rights over the use and/or removal of all subcontractors and/or vendor(s). Subcontractors shall conform to all County policies.
- 14.2 Any dispute between the Respondent and subcontractors, including any payment dispute, will be promptly remedied by the Respondent. Failure to promptly remedy or to make prompt payment to subcontractor may result in the

withholding of funds from the Respondent by the County for any payments owed to the subcontractor.

**15.0 JURISDICTION, VENUE, CHOICE OF LAW:**

This Proposal and any contract resulting there from shall be governed by and construed according to the laws of the State of Texas. Should any portion of any contract be in conflict with the laws of the State of Texas, the State laws shall invalidate only that portion. The remaining portion of the contract(s) shall remain in effect. Any lawsuit shall be governed by Texas law and Fort Bend County, Texas shall be the venue for any action or proceeding that may be brought or arise out of, in connection with or by reason of this Proposal process and resulting Agreements.

**16.0 INDEPENDENT CONTRACTOR:**

The Respondent is an independent contractor and no employee or agent of the Respondent shall be deemed for any reason to be an employee or agent of the County.

**17.0 AMERICANS WITH DISABILITIES ACT (ADA)**

Proposals shall comply with all federal, state, county, and local laws concerning this type of products/service/equipment/project and the fulfillment of all ADA requirements.

**18.0 DRUG-FREE WORKPLACE:**

All Respondents shall provide any and all notices as may be required under the Drug-Free Workplace Act of 1988, 28 CFR Part 67, Subpart F, to their employees and all sub-contractors to insure that the County maintains a drug-free workplace.

**19.0 PERFORMANCE AND PAYMENT BOND:**

The Respondent shall post with Fort Bend County, not later than ten (10) days of the County's award of a contract, a performance and payment bond in the amount of one hundred percent (100%) of the total lump sum price in such form as is satisfactory by County. This bond shall be executed by a corporate surety company duly authorized and admitted to do business in the State of Texas and licensed to issue such a bond in the State of Texas. The Respondent shall notify its corporate surety of any contract changes.

**20.0 POWER OF ATTORNEY:**

An attorney-in-fact who signs a bid bond, performance bond or payment bond must file with each bond a certified and effectively dated copy of his or her power of attorney.

## **21.0 TEXAS ETHICS COMMISSION FORM 1295:**

21.1 Effective January 1, 2016 all contracts executed by Commissioners Court, regardless of the dollar amount, will require completion of Form 1295 "Certificate of Interested Parties", per the new Government Code Statute §2252.908. All firms submitting a response to a formal Bid, RFP, SOQ or any contracts, contract amendments, renewals or change orders are required to complete the Form 1295 online through the State of Texas Ethics Commission website. Please visit:

[https://www.ethics.state.tx.us/whatsnew/elf\\_info\\_form1295.htm](https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm).

21.2 On-line instructions:

21.2.1 Name of governmental entity is to read: Fort Bend County.

21.2.2 Identification number use: RFP 22-077

21.2.3 Description is: Community Center

21.3 Apparent low bidder(s) will be required to provide the Form 1295 within three (3) calendar days from notification; however, if your company is publicly traded you are not required to complete this form.

## **22.0 INSURANCE:**

22.1 All respondents shall submit, with RFP, a current certificate of insurance indicating coverage in the amounts stated below. In lieu of submitting a certificate of insurance, respondents may submit, with RFP, a notarized statement from an Insurance company, authorized to conduct business in the State of Texas, and acceptable to Fort Bend County, guaranteeing the issuance of an insurance policy, with the coverage stated below, to the firm named therein, if successful, upon award of this Contract.

22.2 At contract execution, contractor shall furnish County with properly executed certificates of insurance, which shall evidence all insurance required and provide that such insurance shall not be canceled, except on 30 days prior written notice to County. Contractor shall provide certified copies of insurance endorsements and/or policies if requested by County. Contractor shall maintain such insurance coverage from the time Services commence until Services are completed and provide replacement certificates, policies and/or endorsements for any such insurance expiring prior to completion of Services. Contractor shall obtain such insurance written on an Occurrence form (or a Claims Made form for Professional Liability insurance) from such companies having Best's rating of A/VII or better, licensed or approved to transact business in the State of Texas, and shall obtain such insurance of the following types and minimum limits:

- 22.2.1 Workers' Compensation insurance. Substitutes to genuine Workers' Compensation Insurance will not be allowed.
- 22.2.2 Employers' Liability insurance with limits of not less than \$1,000,000 per injury by accident, \$1,000,000 per injury by disease, and \$1,000,000 per bodily injury by disease.
- 22.2.3 Commercial general liability insurance with a limit of not less than \$1,000,000 each occurrence and \$2,000,000 in the annual aggregate. Policy shall cover liability for bodily injury, personal injury, and property damage and products/completed operations arising out of the business operations of the policyholder.
- 22.2.4 Business Automobile Liability coverage with a combined Bodily Injury/Property Damage limit of not less than \$1,000,000 each accident. The policy shall cover liability arising from the operation of licensed vehicles by policyholder.
- 22.3 County and the members of Commissioners Court shall be named as additional insured to all required coverage except for Workers' Compensation and Professional Liability (if required). All Liability policies including Workers' Compensation written on behalf of contractor, excluding Professional Liability, shall contain a waiver of subrogation in favor of County and members of Commissioners Court.
- 22.4 If required coverage is written on a claims-made basis, contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of the contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years beginning from the time that work under the agreement is completed.
- 22.5 Builder's Risk Insurance: Contractor is required to provide proof before a Purchase Order is issued for this project and keep in full force and effect until the Transfer Date, Builders Risk Insurance, subject to policy terms and conditions, of direct physical loss or damage to property, materials, equipment and supplies which are to become an integral part of the Project, whether owned by Contractor, or subcontractors of every tier, and in which one or more of same has an insurable interest, while in transit, while at the Construction Site awaiting construction, during construction, and until the Transfer Date. Such insurance shall be maintained to cover, as nearly as practicable, the insurable value of such property, materials, equipment and supplies at risk, and shall contain a waiver of subrogation in favor of Contractor, Architect, subcontractors of any tier and Owner for loss or damage occurring during the Work and shall name Contractor as the named insured and Owner as additional insureds. All Builder's Risk Insurance proceeds shall be paid directly to the Contractor.



## **23.0 INDEMNIFICATION:**

Respondent shall save harmless County from and against all claims, liability, and expenses, including reasonable attorney's fees, arising from activities of Respondent, its agents, servants or employees, performed under this agreement that result from the negligent act, error, or omission of Respondent or any of Respondent's agents, servants or employees.

- 23.1 Respondent shall timely report all such matters to Fort Bend County and shall, upon the receipt of any such claim, demand, suit, action, proceeding, lien or judgment, not later than the fifteenth day of each month; provide Fort Bend County with a written report on each such matter, setting forth the status of each matter, the schedule or planned proceedings with respect to each matter and the cooperation or assistance, if any, of Fort Bend County required by Respondent in the defense of each matter.
- 23.2 Respondent's duty to defend, indemnify and hold Fort Bend County harmless shall be absolute. It shall not abate or end by reason of the expiration or termination of any contract unless otherwise agreed by Fort Bend County in writing. The provisions of this section shall survive the termination of the contract and shall remain in full force and effect with respect to all such matters no matter when they arise.
- 23.3 In the event of any dispute between the parties as to whether a claim, demand, suit, action, proceeding, lien or judgment appears to have been caused by or appears to have arisen out of or in connection with acts or omissions of Respondent, Respondent shall never-the-less fully defend such claim, demand, suit, action, proceeding, lien or judgment until and unless there is a determination by a court of competent jurisdiction that the acts and omissions of Respondent are not at issue in the matter.
- 23.4 Respondent's indemnification shall cover, and Respondent agrees to indemnify Fort Bend County, in the event Fort Bend County is found to have been negligent for having selected Respondent to perform the work described in this request.
- 23.5 The provision by Respondent of insurance shall not limit the liability of Respondent under an agreement.
- 23.6 Respondent shall cause all trade contractors and any other contractor who may have a contract to perform construction or installation work in the area where work will be performed under this request, to agree to indemnify Fort Bend County and to hold it harmless from all claims for bodily injury and property damage that arise may from said Respondent's operations. Such provisions shall be in form satisfactory to Fort Bend County.
- 23.7 Loss Deduction Clause - Fort Bend County shall be exempt from, and in no way liable for, any sums of money which may represent a deductible in any insurance policy. The payment of deductibles shall be the sole responsibility of Respondent

and/or trade contractor providing such insurance.

## **24.0 PREVAILING WAGES:**

This project is subject to the prevailing wage rate requirements of Chapter 2258 of the Government Code. All persons employed by Contractor shall be compensated at not less than the rates shown below. Contractor shall keep detailed records of each of its workers and said records shall be made available to County for inspection at all reasonable times. The Contractor shall pay Fort Bend County sixty dollars (\$60.00) for each worker employed by the Contractor for the provision of services described herein for each calendar day or part of the day that the worker is paid less than the below stated rates. Contractors may also visit [www.wdol.gov/dba.aspx](http://www.wdol.gov/dba.aspx).

General Decision Number: TX20220247 04/22/2022

Superseded General Decision Number: TX20210247

State: Texas

Construction Type: Building

County: Fort Bend County in Texas.

**BUILDING CONSTRUCTION PROJECTS** (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022, Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022, Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/07/2022
1	01/21/2022
2	02/18/2022
3	02/25/2022
4	03/11/2022
5	04/22/2022

ASBE0022-009 06/01/2021

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation)	\$ 25.14	15.15
BOIL0074-003 01/01/2021		
BOILERMAKER	\$ 29.47	24.10
*CARP0551-008 04/01/2021		
CARPENTER (Excludes Acoustical Ceiling Installation, Drywall Hanging, Form Work and Metal Stud Installation)	\$ 25.86	9.08
ELEC0716-005 08/30/2021		
ELECTRICIAN (Excludes Low Voltage Wiring and Installation of Alarms)	\$ 33.20	10.37
ELEV0031-003 01/01/2022		
ELEVATOR MECHANIC	\$ 47.04	36.885+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; Christmas Day; and Veterans Day.

ENGI0450-002 04/01/2014

POWER EQUIPMENT OPERATOR

Cranes	\$ 34.85	9.85
IRON0084-002 06/01/2021		
IRONWORKER (ORNAMENTAL AND STRUCTURAL)	\$ 26.01	7.56
PLAS0783-001 04/01/2021		
PLASTERER	\$ 26.04	9.02
PLUM0068-002 10/01/2021		
PLUMBER	\$ 36.83	11.71
PLUM0211-010 10/01/2021		
PIPEFITTER (Including HVAC Pipe Installation)	\$ 37.03	12.56
SHEE0054-003 04/01/2020		
SHEET METAL WORKER (Excludes HVAC Duct and Unit Installation)	\$ 29.70	13.85
* SUTX2014-023 07/21/2014		
ACOUSTICAL CEILING MECHANIC	\$ 16.41	3.98
BRICKLAYER	\$ 19.86	0.00
CAULKER	\$ 15.36	0.00
CEMENT MASON/CONCRETE FINISHER	\$ 13.82**	0.00
DRYWALL FINISHER/TAPER	\$ 16.30	3.71
DRYWALL HANGER AND METAL STUD INSTALLER	\$ 17.45	3.96
ELECTRICIAN (Alarm Installation Only)	\$ 17.97	3.37
ELECTRICIAN (Low Voltage Wiring Only)	\$ 18.00	1.68
FLOOR LAYER: Carpet	\$ 20.00	0.00
FORM WORKER	\$ 11.87**	0.00
GLAZIER	\$ 19.12	4.41
INSULATOR – BATT	\$ 14.87**	0.73
IRONWORKER, REINFORCING	\$ 12.10**	0.00
LABORER: Common or General	\$ 10.79**	0.00
LABORER: Mason Tender – Brick	\$ 13.37**	0.00
LABORER: Mason Tender - Cement/Concrete	\$ 10.50**	0.00
LABORER: Pipelayer	\$ 12.94**	0.00
LABORER: Roof Tearoff	\$ 11.28**	0.00
LABORER: Landscape and Irrigation	\$ 9.49**	0.00
LATHER	\$ 19.73	0.00
OPERATOR: Backhoe/Excavator/Trackhoe	\$ 14.10**	0.00

OPERATOR: Bobcat/Skid Steer/Skid Loader	\$ 13.93**	0.00
OPERATOR: Bulldozer	\$ 20.77	0.00
OPERATOR: Drill	\$ 16.22	0.34
OPERATOR: Forklift	\$ 15.64	0.00
OPERATOR: Grader/Blade	\$ 13.37**	0.00
OPERATOR: Loader	\$ 13.55**	0.94
OPERATOR: Mechanic	\$ 17.52	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	\$ 16.03	0.00
OPERATOR: Roller	\$ 16.00	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping	\$ 16.77	4.51
ROOFER	\$ 15.40	0.00
SHEET METAL WORKER (HVAC Duct Installation Only)	\$ 17.81	2.64
SHEET METAL WORKER (HVAC Unit Installation Only)	\$ 16.00	1.61
SPRINKLER FITTER (Fire Sprinklers)	\$ 22.17	9.70
TILE FINISHER	\$ 12.00**	0.00
TILE SETTER	\$ 16.17	0.00
TRUCK DRIVER: 1/Single Axle Truck	\$ 14.95**	5.23
TRUCK DRIVER: Dump Truck	\$ 12.39**	1.18
TRUCK DRIVER: Flatbed Truck	\$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck	\$ 12.50**	0.00
TRUCK DRIVER: Water Truck	\$ 12.00**	4.11
WATERPROOFER	\$ 14.39**	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

\*\* Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$15.00) or 13658 (\$11.25). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/agencies/whd/government-contracts](http://www.dol.gov/agencies/whd/government-contracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

## WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

## **25.0 PERMITS:**

It shall be the sole responsibility of the successful Respondent to obtain any required permits in the name of Fort Bend County.

## **26.0 TAX EXEMPT:**

Fort Bend County is exempt from state and local sales and use taxes under Section 151.309 of the Texas Tax Code. This project will be deemed a separate project for Texas tax purposes, and as such, Fort Bend County hereby issues its Texas Exemption for the purchase of any items qualifying for exemption under this project. Respondent is to issue its Texas Resale Certificate to vendors and subcontractors for such items qualifying for this exemption, and further, Respondent should state these items at cost.

## **27.0 NAME BRANDS:**

Name Brands: Specifications may reference name brands and model numbers. It is not the intent of Fort Bend County to restrict these bids in such cases, but to establish a desired quality level of merchandise or to meet a pre-established standard due to like existing items. Bidders may offer items of equal stature and the burden of proof of such stature rests with them. Fort Bend County shall act as sole judge in determining equality and acceptability of products offered.

## **28.0 EVALUATION CRITERIA:**

In order to facilitate the analysis of responses to this Proposal, Respondents are required to prepare their proposals in accordance with the instructions outlined in this part. Proposals should be prepared as simply as possible and provide a straightforward, concise description of the Respondent's capabilities to satisfy the requirements of the Proposal. Emphasis should be concentrated on accuracy, completeness, and clarity of content. All parts, pages, figures, and tables should be numbered and clearly labeled.

- 28.1 Respondents are required to follow the outline below when preparing their proposals:

Tab	Title
	Title Page
	Letter of Transmittal
	Table of Contents
	Executive Summary
1	Cost
2	Understanding Scope of Work
3	Firm's Experience
4	Staff Experience
5	Proposed Schedule
6	Overall Completeness of Proposal



- 28.2 Any exceptions to the Proposal requirements shall be identified in the applicable section.
- 28.3 Executive Summary - This part of the response to the Proposal should be limited to a brief narrative highlighting the Respondent's proposal. This section should not include cost quotations. Note that the executive summary should identify the primary contacts for the Respondent.
- 28.4 Respondents will be evaluated utilizing the factors, as weighted below:

Tab 1

Cost (weight factor = 45%)

- Complete Exhibit I.

Tab 2

Understanding Scope of Work (weight factor = 15%)

- Respondents must express, in detail, their understanding of this specific project. In addition, describe how the project requested will be provided and managed. Describe the approach your firm will take to the required collaboration, scheduling and coordination required for this project.

Tab 3

Firm's Experience (weight factor = 15%)

- Firm Experience with Projects of Similar Size and Complexity: Such experience must be in the form of providing general contracting services for similar facilities. List a minimum of three (3) similar projects completed within the last ten (10) years; provide the name and location of each project, detailed description of project, completion date, final cost, the client, and a contact person and phone number.

Tab 4

Staff Experience (weight factor = 10%)

- Staff Experience with Projects of Similar Size and Complexity: Such experience must be in the form of providing project management and construction services for similar facilities. List a minimum of three (3) similar projects completed within the last ten (10) years; provide the name and location of each project, the client, and a contact person and phone number and completion date. In addition, provide resumes for project superintendent and project manager who will be assigned to this project.

Tab 5

Proposed Schedule (weight factor = 10%)

- Provide project schedule.

Tab 6

Overall Completeness of Proposal (weight factor = 5%)

- Required Proof of Insurance
- Completed Respondent forms
- Completed W9 form
- Completed debt form
- Completed Contractor Acknowledgement of Stormwater Management Program form

**29.0 AWARD:**

The County will select the respondent whose proposal is the highest evaluated and responsible for the County. Contractual commitments are contingent upon the availability of funds, as evidenced by the issuance of a purchase order. All contracts are subject to the approval of the County's legal counsel and Commissioners' Court, prior to execution. Once awarded, the contract will be the final expression of the agreement between the parties and may not be altered, changed, or amended except by mutual agreement, in writing.

**30.0 RETAINAGE:**

Within thirty (30) days after receipt of each uncontested Application for Payment together with the supporting materials required, County shall advance to Contractor the uncontested amount requested in such uncontested Application for Payment, except *five* percent (5%) of the amount requested (hereinafter "Retainage") in each Application for Payment by County. The Retainage withheld shall be released upon final completion of the entire Project and verification of satisfactory work performed, unless grounds exist for withholding payment on account of other defaults by Contractor, including services provided by its sub-contractors.

**31.0 LIQUIDATED DAMAGES:**

If the Services are not substantially completed within the time for performance or within such additional time as may be extended by County, County will deduct from the final payment as liquidated damages and not as a penalty the sum of two hundred and fifty (\$250.00) per calendar day that the Services are not substantially complete. Such sum is agreed upon as a reasonable and proper measure of the damages County will sustain.

### **32. STATE LAW REQUIREMENTS FOR CONTRACTS:**

The contents of this section are required by Texas Law and are included by County regardless of content.

- 32.1 Agreement to Not Boycott Israel Chapter 2271 Texas Government Code:  
Contractor verifies that if Contractor employs ten (10) or more full-time employees and this Agreement has a value of \$100,000 or more, Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement.
- 32.2 Texas Government Code Section 2251.152 Acknowledgment: By signature on vendor form, Contractor represents pursuant to Section 2252.152 of the Texas Government Code, that Contractor is not listed on the website of the Comptroller of the State of Texas concerning the listing of companies that are identified under Section 806.051, Section 807.051 or Section 2253.153.

### **33.0 HUMAN TRAFFICKING:**

By acceptance of this contract, Contractor acknowledges that Fort Bend County is opposed to human trafficking and that no County funds will be used in support of services or activities that violate human trafficking laws.

### **34.0 REQUIRED FORMS:**

All respondents submitting are required to complete the attached and return with submission:

- 34.1 Vendor Form
- 34.2 W9 Form
- 34.3 Tax Form/Debt/Residence Certification
- 34.4 Contractor Acknowledgement of Stormwater Management Program

### **35.0 EXHIBIT:**

- Exhibit I: Pricing
- Exhibit II: Project Manual
- Exhibit III: Geotechnical Report
- Exhibit IV: Plans

# Request for Taxpayer Identification Number and Certification

Give Form to the  
requester. Do not  
send to the IRS.

Print or type See Specific Instructions on page 2.	<b>1</b> Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.	
	<b>2</b> Business name/disregarded entity name, if different from above	
	<b>3</b> Check appropriate box for federal tax classification; check only <b>one</b> of the following seven boxes: <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <b>Note.</b> For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner. <input type="checkbox"/> Other (see instructions) ▶ _____	<b>4</b> Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ <i>(Applies to accounts maintained outside the U.S.)</i>
	<b>5</b> Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	<b>6</b> City, state, and ZIP code	
<b>7</b> List account number(s) here (optional)		

## Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

**Note.** If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

<b>Social security number</b>										
				-				-		
<b>or</b>										
<b>Employer identification number</b>										
					-					

## Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

<b>Sign Here</b>	Signature of U.S. person ▶	Date ▶
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## General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at [www.irs.gov/fw9](http://www.irs.gov/fw9).

## Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)

- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

*If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.*

By signing the filled-out form, you:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
- Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

**Note.** If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

**Definition of a U.S. person.** For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

**Special rules for partnerships.** Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

**Foreign person.** If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

**Nonresident alien who becomes a resident alien.** Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

**Example.** Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

## Backup Withholding

**What is backup withholding?** Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

**Payments you receive will be subject to backup withholding if:**

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

## What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

## Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

## Penalties

**Failure to furnish TIN.** If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

**Civil penalty for false information with respect to withholding.** If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

**Criminal penalty for falsifying information.** Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

**Misuse of TINs.** If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

## Specific Instructions

### Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

**Note. ITIN applicant:** Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

**Line 2**

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

**Line 3**

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

**Limited Liability Company (LLC).** If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

**Line 4, Exemptions**

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

**Exempt payee code.**

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 <sup>1</sup>	Generally, exempt payees 1 through 5 <sup>2</sup>
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

<sup>1</sup> See Form 1099-MISC, Miscellaneous Income, and its instructions.

<sup>2</sup> However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

**Exemption from FATCA reporting code.** The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

**Note.** You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

**Line 5**

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

**Line 6**

Enter your city, state, and ZIP code.

**Part I. Taxpayer Identification Number (TIN)**

**Enter your TIN in the appropriate box.** If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

**Note.** See the chart on page 4 for further clarification of name and TIN combinations.

**How to get a TIN.** If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at [www.ssa.gov](http://www.ssa.gov). You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at [www.irs.gov/businesses](http://www.irs.gov/businesses) and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting [IRS.gov](http://IRS.gov) or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

**Note.** Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

**Caution:** A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.



## Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

**Signature requirements.** Complete the certification as indicated in items 1 through 5 below.

**1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.** You must give your correct TIN, but you do not have to sign the certification.

**2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983.** You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

**3. Real estate transactions.** You must sign the certification. You may cross out item 2 of the certification.

**4. Other payments.** You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

**5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions.** You must give your correct TIN, but you do not have to sign the certification.

## What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account <sup>1</sup>
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor <sup>2</sup>
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee <sup>1</sup>  The actual owner <sup>1</sup>
5. Sole proprietorship or disregarded entity owned by an individual	The owner <sup>3</sup>
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor <sup>4</sup>
For this type of account:	Give name and EIN of:
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity <sup>4</sup>
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

<sup>1</sup> List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

<sup>2</sup> Circle the minor's name and furnish the minor's SSN.

<sup>3</sup> You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

<sup>4</sup> List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

**\*Note.** Grantor also must provide a Form W-9 to trustee of trust.

**Note.** If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

## Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

**Protect yourself from suspicious emails or phishing schemes.** Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to [phishing@irs.gov](mailto:phishing@irs.gov). You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: [spam@uce.gov](mailto:spam@uce.gov) or contact them at [www.ftc.gov/idtheft](http://www.ftc.gov/idtheft) or 1-877-IDTHEFT (1-877-438-4338).

Visit [IRS.gov](http://IRS.gov) to learn more about identity theft and how to reduce your risk.

## Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

Job No.: \_\_\_\_\_

**TAX FORM/DEBT/ RESIDENCE CERTIFICATION**  
**(for Advertised Projects)**

Taxpayer Identification Number (T.I.N.): \_\_\_\_\_

Company Name submitting Bid/Proposal: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Are you registered to do business in the State of Texas? ☐ Yes ☐ No

If you are an individual, list the names and addresses of any partnership of which you are a general partner or any assumed name(s) under which you operate your business

I. **Property:** List all taxable property in Fort Bend County owned by you or above partnerships as well as any d/b/a names. Include real and personal property as well as mineral interest accounts. (Use a second sheet of paper if necessary.)

Fort Bend County Tax Acct. No.\*

Property address or location\*\*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\* This is the property account identification number assigned by the Fort Bend County Appraisal District.

\*\* For real property, specify the property address or legal description. For business personal property, specify the address where the property is located. For example, office equipment will normally be at your office, but inventory may be stored at a warehouse or other location.

II. **Fort Bend County Debt** - Do you owe any debts to Fort Bend County (taxes on properties listed in I above, tickets, fines, tolls, court judgments, etc.)?

☐ Yes ☐ No

If yes, attach a separate page explaining the debt.

III. **Residence Certification** - Pursuant to Texas Government Code §2252.001 *et seq.*, as amended, Fort Bend County requests Residence Certification. §2252.001 *et seq.* of the Government Code provides some restrictions on the awarding of governmental contracts; pertinent provisions of §2252.001 are stated below:

(3) "Nonresident bidder" refers to a person who is not a resident.

(4) "Resident bidder" refers to a person whose principal place of business is in this state, including a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

☐ I certify that \_\_\_\_\_ is a Resident Bidder of Texas as defined in Government Code §2252.001.  
[Company Name]

☐ I certify that \_\_\_\_\_ is a Nonresident Bidder as defined in Government Code §2252.001 and our principal place of business is \_\_\_\_\_.

[City and State]



## Mandatory Form



### **Contractor Acknowledgement of Storm Water Management Program**

I hereby acknowledge that I am aware of the stormwater management program and standard operating procedures developed by Fort Bend County in compliance with the TPDES General Permit No. TXR040000. I agree to comply with all applicable best management practices and standard operating procedures while conducting my services for Fort Bend County. I agree to conduct all services in a manner that does not introduce illicit discharges of pollutants to streets, stormwater inlets, drainage ditches or any portion of the drainage system. The following materials and/or pollutant sources must not be discharged to the drainage system as a result of any services provided:

1. Grass clippings, leaves, mulch, rocks, sand, dirt or other waste materials resulting from landscaping activities, (except those materials resulting from ditch mowing or maintenance activities)
2. Herbicides, pesticides and/or fertilizers, (except those intended for aquatic use)
3. Detergents, fuels, solvents, oils and/or lubricants, other equipment and/or vehicle fluids,
4. Other hazardous materials including paints, thinners, chemicals or related waste materials,
5. Uncontrolled dewatering discharges, equipment and/or vehicle wash waters,
6. Sanitary waste, trash, debris, or other waste products
7. Wastewater from wet saw machinery,
8. Other pollutants that degrade water quality or pose a threat to human health or the environment.

Furthermore, I agree to notify Fort Bend County immediately of any issue caused by or identified by:

---

(Company/Contractor)

that is believed to be an immediate threat to human health or the environment.

---

Contractor Signature

---

Date

---

Printed Name

---

Title

**RFP 22-077**

**Exhibit I: Pricing**

Total Bid

\$\_\_\_\_\_

Calendar days for completion \_\_\_\_\_

Acknowledgement of Receipt of Addendum(s), if issued by Purchasing, to the Request for Proposal Document.

Addendum No 1 dated \_\_\_\_\_ Received \_\_\_\_\_

Addendum No 2 dated \_\_\_\_\_ Received \_\_\_\_\_

Addendum No 3 dated \_\_\_\_\_ Received \_\_\_\_\_

\_\_\_\_\_  
Name of Respondent

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Printed Name of Representative

# NEW COMMUNITY CENTER FOR

## FORT BEND COUNTY

AVENUE E and SECOND STREET  
ROSENBERG, TX 77471

### PROJECT MANUAL

MAY 2022



# BLUELINE

333 CYPRESS RUN, SUITE 350  
HOUSTON, TEXAS 77094

126 W. BRUCE STREET, SUITE 102  
HARRISONBURG, VIRGINIA 22801

**NEW COMMUNITY CENTER  
for  
FORT BEND COUNTY**

**AVENUE E and SECOND STREET  
ROSENBERG, TX 77471**

**PROJECT MANUAL**

May 2022

**OWNER**

**Fort Bend County**  
301 Jackson St. Suite 201  
Richmond, TX 77469  
Phone: 281.238.3095

**ARCHITECT**

**Blueline TD, LLC**  
333 Cypress Run, Suite 350  
Houston, TX 77094  
Phone: 281.497.1040

**CIVIL ENGINEER**

**ALJ Lindsey**  
5629 1960 West, Suite 314  
Houston, TX 77069  
Phone: 281.301.5955

**STRUCTURAL ENGINEER**

**SCA Consulting Engineers**  
12511 Emily Court  
Sugar Land, TX 77478  
Phone: 713.779.7252

**MEP ENGINEER**

**The Tower Company**  
5444 Westheimer, Suite 1680  
Houston, TX 77056  
Phone: 713.626.7600

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## SECTION 01100 – SUMMARY

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Work covered by the Contract Documents.
  - 2. Type of the Contract.
  - 3. Work excluded from Contract.
  - 4. Work phases.
  - 5. Use of premises.
  - 6. Owner's occupancy requirements.
  - 7. Work restrictions.

## 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: New Community Center, 06-21-011
  - 1. Project Location: Avenue E and Second Street, Rosenberg, TX 77471
- B. Owner: **Fort Bend County**  
**301 Jackson St. Suite 201**  
**Richmond, Texas 77469**  
**281.238.3095**
- C. Architect: **Blueline TD, LLC**  
**333 Cypress Run, Suite 350**  
**Houston, Texas 77094**  
**281.497.1040**
- D. The Work consists of the following:
  - 1. The Work includes a two story Community Center including a Multi-Purpose Gym and classrooms and associated site work.

## 1.4 TYPE OF CONTRACT

- A. Project will be constructed under a single contract between Owner and Contractor.



B. Contract will be:

1. Lump sum contract (AIA A101).

1.5 WORK EXCLUDED FROM CONTRACT

- ~~A. Performance with Payment bonds.~~
- ~~B. Commercial icemaker and residential refrigerator.~~
- ~~C. Conduit and pull string for all equipment shown on drawings T2.1 and T2.2.~~
- D. Food service equipment.
- E. Sound system, audio/visual system, telephone with intercom systems.
- F. Computer cabling.
- G. Security system.
- H. Furnishings.
- I. Landscaping and site irrigation.
- J. Window coverings.
- K. Hazardous materials detection and abatement, including asbestos and mold.
- L. Impact fees and assessments.
- M. Tap and connection fees and meter fees.

1.6 OWNER'S OCCUPANCY REQUIREMENTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits, unless otherwise indicated.
- B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1.7 WORK RESTRICTIONS

- A. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7:00 a.m. to 3:30 p.m., Monday through Friday, except as otherwise agreed upon with Owner.

- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless otherwise agreed upon by Owner.

## 1.8 MISCELLANEOUS PROVISIONS

### A. Fees paid by Owner

1. Assessment charges for storm sewer, sanitary sewer, and water service based on land development, if any, exclusive of permit fees.
2. Easement charges, if any
3. Texas Accessibility Standards approval fees.
4. Tap and connection fees and meter fees.

### B. Fees paid by Contractor

1. All building-permit costs, and new driveway approach inspection fees.
2. All other permits, governmental fees, licenses and inspections necessary for the proper execution of the Contract and which are legally required at the time the Contract is signed, and which are not paid by the Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

## SECTION 01210 - ALLOWANCES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Allowances.

#### 1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. Obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. After Architect's selection, promptly notify Architect of any reasonable objections against supplier.
- D. Purchase products and systems selected by Architect from the designated supplier.

#### 1.4 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

#### 1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

## 1.6 ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Show all allowance amounts on Contractor's Schedule of Values.

## 1.7 UNUSED MATERIALS

- A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Owner or Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed to do so, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

### 3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

### 3.3 SCHEDULE OF ALLOWANCES

- A. **Allowance No. 1:** For interior and exterior signage per Division 10 Section "Signage", an allowance of forty five thousand dollars (**\$45,000.00**).

END OF SECTION 01210

## SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Contract Modification Procedures.

#### 1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions" or similar form.

#### 1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 5 business days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect. Contractor shall provide detailed back-up information as requested by Owner or Architect.
- C. Proposal Request Form: Use AIA Document G709 or similar form for Proposal Requests.

#### 1.5 ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of

work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 15 business days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner may reject claims submitted later than 15 business days after such authorization.

#### 1.6 CHANGE ORDER PROCEDURES

- A. After Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701. Multiple Proposal Requests may be bundled into a single Change Order, in which case Contractor will be directed to proceed with work prior to execution of the Change Order.

#### 1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 or similar form. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. Documentation: Maintain detailed records where Construction Change Directive is done on a time and material basis. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01250

## SECTION 01290 - PAYMENT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Payment Procedures.

#### 1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Submit the Schedule of Values to Architect at earliest possible date but no later than **seven** days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values.
  - 1. Change Orders: Provide a separate line item in the Schedule of Values for each Change Order.
  - 2. Allowances: Provide a separate line item in the Schedule of Values for each allowance.

#### 1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
- B. Payment Application Times: Progress payments shall be submitted to Architect by the last of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
- C. Payment Application Forms: Use **AIA Document G702** and **AIA Document G703 Continuation Sheets** as form for Applications for Payment.
  - 1. **Only** the **AIA G702** form is acceptable. Architect's certification of Applications for Payment expressly assumes that all language, meanings, and intents on any application

for payment form submitted by Contractor are identical to those in the AIA G702. Should Contractor submit applications for payment on any form besides the AIA G702, Architect shall be entitled to consider the form submitted as being completely in conformance with AIA G702, notwithstanding any language, meanings, or intents that are at variance with AIA G702. Any variances from AIA G702 are not acknowledged.

- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect may return incomplete applications without action.
- E. Transmittal: Submit **4** signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
- F. Waivers of Mechanic's Lien: If required by Owner, with each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment. Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of Values.
  - 3. Contractor's Construction Schedule (preliminary if not final).
  - 4. Schedule of unit prices, if any.
  - 5. Certificates of insurance and insurance policies.
  - 6. Performance and payment bonds, if required by Owner.
- H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
- I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Evidence of completion of Project closeout requirements.
  - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  - 3. Updated final statement, accounting for final changes to the Contract Sum.
  - 4. Final Project accounting (Cost Plus projects only).
  - 5. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  - 6. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  - 7. AIA Document G707, "Consent of Surety to Final Payment."
  - 8. Evidence that claims have been settled.
  - 9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.



PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

## SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project:
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Project Management and Coordination.

#### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

#### 1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other key personnel in attendance at Project site. List telephone numbers.

#### 1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

#### 1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for requests for interpretations (RFIs).
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Preparation of Record Documents.
    - l. Use of the premises.
    - m. Work restrictions.
    - n. Owner's occupancy requirements.
    - o. Responsibility for temporary facilities and controls.
    - p. Construction waste management and recycling.
    - q. Parking availability.
    - r. Office, work, and storage areas.
    - s. Equipment deliveries and priorities.
    - t. Security.
    - u. Progress cleaning.
    - v. Working hours.
    - w. Construction progress meetings' time.
  2. Minutes: Record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction. Pertinent installers and manufacturers/fabricators shall attend. Advise Architect of scheduled meeting dates (Architect may attend some conferences). Distribute minutes of the meeting to each party present and to parties who should have been present.
- D. Progress and Coordination Meetings: Conduct progress meetings at regular intervals every other week, as required by Owner and Architect.
1. Agenda:
    - a. Contractor's Construction Schedule:
    - b. Review present and future activities and needs. This is to include the next scheduled meeting.
    - c. Review status of procedures:

- 1) Status of submittals.
  - 2) Field observations.
  - 3) Requests for interpretations (RFIs).
  - 4) Status of proposal requests.
  - 5) Pending changes.
  - 6) Status of Change Orders.
  - 7) Pending claims and disputes.
  - 8) Documentation of information for payment requests.
2. Minutes: Record and distribute the meeting minutes.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

## SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Construction Schedule.
  - 2. Submittals Schedule.
  - 3. Daily construction reports.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Construction Progress Documentation.

#### 1.3 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - 2. Specification Section number and title.
  - 3. Name of subcontractor.
  - 4. Description of the Work covered.
- B. Construction Schedule: Submit three opaque copies.

#### 1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

## PART 2 - PRODUCTS

### 2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by approximate dates of submittal to Architect. Plan for sufficient time for Architect's review to prevent any delays to construction.

### 2.2 CONSTRUCTION SCHEDULE

- A. Procedures: Comply generally with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.

### 2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording information concerning events at Project site.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, so every other construction progress meeting, update schedule to reflect actual construction progress and activities.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

END OF SECTION 01320

## SECTION 01330 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Submittal Procedures.

#### 1.3 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals, if requested.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- E. Identification: Place a permanent label or title block on each submittal for identification.
- F. Deviations: Highlight or otherwise specifically identify deviations from the Contract Documents on submittals.
- G. Contractor's Certification: All submittals shall bear a stamp, dated and initialed or signed by Contractor, that submittal has been reviewed by Contractor prior to submittal to Architect, and that submittal applies directly to Project.
- H. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

- I. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Transmit only to Architect (not to Architect's consultants) unless specifically authorized otherwise in advance. Architect will return submittals, without review, received from sources other than Contractor.
- J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- L. Use for Construction: Use only final submittals with mark indicating "Approved" or "Approved as Noted" taken by Architect.

#### 1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. General: It is the responsibility of the General Contractor and each sub-contractor requesting CAD files, to pay a fee of \$500 (payable to the architect (Blueline) for administrative services associated with preparing the CAD files. The fee must be paid prior to receipt of the CAD files. At Contractor's written request, copies of Architect's CAD files may be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
  - 1. CAD files may be provided, but only as a convenience to the Contractor. Contractor and Contractor's subcontractors, suppliers, or any other party ("Contractor") who accept receipt of the CAD files, assumes all responsibility for confirming the suitability and accuracy of any information that is incorporated into submittals from the CAD files. It shall be the duty *solely* of the Contractor to verify dimensions, materials, etc, in the field that are graphically indicated on the CAD files. Due to the possibility of damage or alteration of CAD files in transmission, copying, or adaptation to other programs, Architect makes no representation or warranties regarding the information contained in CAD files. It is left *solely* to the discretion of Contractor whether CAD files are suitable for use. **HOLD HARMLESS:** Contractor shall hold Architect and Architect's consultants harmless for any matters relating to usage of CAD files.
  - 2. Only CAD files of plans will be provided.

### PART 2 - PRODUCTS

#### 2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.



1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    - f. Shopwork manufacturing instructions.
    - g. Templates and patterns.
    - h. Schedules.
    - i. Design calculations.
    - j. Compliance with specified standards.
    - k. Notation of coordination requirements.
    - l. Notation of dimensions established by field measurement.
    - m. Relationship to adjoining construction clearly indicated.
    - n. Seal and signature of professional engineer if specified.
    - o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
  2. Number of Copies: Submit the number of copies needed by Contractor, plus one copy for Architect, plus one copy for Engineer if review by Engineer is likely. Submit two additional copies where copies are required for operation and maintenance manuals. Architect will retain one copy and Engineer one copy; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of appropriate Specification Section.
  2. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
  3. Samples for Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
  4. Number of Samples: Submit three samples.

## 2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
  2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Manufacturer's Instructions: Submit written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates.
  2. Required substrate tolerances.
  3. Sequence of installation or erection.
  4. Required installation tolerances.
  5. Required adjustments.
  6. Recommendations for cleaning and protection.
- C. Material Safety Data Sheets (MSDSs): Submit only if specifically requested by Owner, and submit information directly to Owner. **Do not submit to Architect.**

## 2.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents, and that design is in accordance with applicable codes. Include list of codes, loads, and other factors used in performing these services.

## PART 3 - EXECUTION

### 3.1 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Submittals not required by the Contract Documents may not be reviewed and may be discarded without notification to Contractor.

END OF SECTION 01330

## SECTION 01400 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
- C. Coordinate the requirements of this Section with those of other sections requiring coordination with Quality Requirements.

#### 1.3 SUBMITTALS

- A. Reports: Prepare and submit certified written reports that include the following:
  - 1. Identification of testing agency or inspector.
  - 2. Date of issue.
  - 3. Project title and number.
  - 4. Name, address, and telephone number of testing agency.
  - 5. Dates and locations of samples and tests or inspections.
  - 6. Names of individuals making tests and inspections.
  - 7. Description of the Work and test and inspection method.
  - 8. Identification of product and Specification Section.
  - 9. Complete test or inspection data.
  - 10. Test and inspection results and an interpretation of test results.
  - 11. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  - 12. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  - 13. Name and signature of laboratory inspector.

14. Recommendations on retesting and re-inspecting.

#### 1.4 QUALITY ASSURANCE

- A. Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, Engineer, Owner, and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

#### 1.5 QUALITY MONITORING

- A. Owner Responsibilities: Owner will engage a qualified testing agency to perform quality testing for the Owner.
  1. As a courtesy to the Contractor, copies of the testing agency reports will be provided to the Contractor.
  2. Owner will pay for services of testing agency.
  3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality monitoring services.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.

C. Contractor Responsibilities:

1. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not. Provide in accordance with other paragraphs of this specification.
2. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
3. Associated Services by Contractor: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - a. Access to the Work.
  - b. Incidental labor and facilities necessary to facilitate tests and inspections.
  - c. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - d. Facilities for storage and field curing of test samples.
  - e. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - f. Security and protection for samples and for testing and inspecting equipment at Project site.
4. Coordination by Contractor: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTS

A. SOIL TESTS

1. Soil Analysis: Perform one analysis for each type of soil used under structure and pavements. Perform separate analysis for limestone base under asphalt paving areas. Each analysis shall include:
  - a. Liquid Limit.
  - b. Plastic Limit.
  - c. Plasticity Index.
  - d. Maximum Laboratory Density (Proctor) Tests, ASTM Method D698 (latest revision), with optimum moisture controlled within -1 to +4 percent of optimum.

2. Field Density Tests: Perform no less than one test for each 5,000 sq.ft.; perform at least 3 tests per trip.

B. INSPECTIONS OF FOUNDATIONS

1. Field inspections of drilled footings and other excavations.
2. Inspections will check for stability of the excavation and presence of water.
3. Bottom elevations, bearing capacities, and lengths of drilled piers indicated have been estimated from available soil data. Actual elevations and drilled-pier lengths and bearing capacities will be determined by Owner's testing and inspecting agency.

C. TESTS FOR CONCRETE

1. Mix Design: In accord with ACI 613 and 318 and with PCA T-12, for proportions, water-cement ratio and slump, for proposed mixes.
2. Slump Tests: In accord with ASTM C143.
  - a. For structural concrete, take at the beginning of each day's pour, and whenever water adjustments or noticeable change of slump occur.
3. Sampling: In accord with ASTM C172.
  - a. For structural concrete, make four (4) standard test cylinders for each 100 yards or fraction thereof. Take additional samples at any noticeable change in the makeup of the concrete.
4. Curing: In accord with ASTM C31.
5. Testing: Compression tests in accord with ASTM C39. Test one cylinder of each set at 7 days and two cylinders at 28 days. One cylinder will be held for additional testing, if required.

D. INSPECTION AND TESTING OF STRUCTURAL STEEL

1. Inspect 25 percent of the field welds and 10 percent of the bolted connections, per building code and AISC requirements.
2. Test 25 percent of welds per Division 5 "Structural Steel" requirements.
3. Radiographic Testing shall be provided for all welds shown on the drawings as Full Penetration Welds. If welds are inaccessible to Radiograph, welds shall be testing using Ultrasonic Testing.

END OF SECTION 01400

## SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Temporary Facilities and Controls.

#### 1.3 DEFINITIONS

- A. Enclosure: Temporary roofing is to be weathertight; temporary exterior walls are to be weathertight; and all temporary openings are to be closed with permanent construction or substantial temporary closures that are weathertight.

#### 1.4 USE CHARGES

- A. General: Cost or use charges for temporary facilities, including those for sewer, water, and electric power, shall be included in the Contract Sum.

#### 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

#### 1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts.

### 2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated weather tight or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide watertight sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

### 2.3 EQUIPMENT

- A. As required by Contractor's safety program.
- B. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water system or to public water supply if there is no existing water system. Extend distribution to locations required, install proper valve and terminal fittings.



- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Pay electric bills.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, safety, security, and traffic conditions.
- H. Telephone Service: Provide temporary telephone or other appropriate electronic communications service in common-use facilities for use by all construction personnel. Pay costs.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings. Roads and paved areas may be in same locations as permanent roads and paved areas.
  - 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
- C. Parking: Provide temporary parking areas for construction personnel where designated by Owner.
- D. Dewatering: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water as necessary for construction operations. If necessary, provide adequate pumping equipment, with qualified personnel to operate.
  - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
- E. Project Identification and Temporary Signs: Provide Project identification sign and install on wood posts in location directed by Architect. Sign shall be 3 colors on 4' x 8' plywood,

professionally painted, design to be provided by Architect. Unauthorized signs are not permitted.

1. Provide temporary, directional signs for construction personnel and visitors.
  2. Maintain and touchup signs so they are legible at all times.
  3. Contractor may display his firm sign in appropriate location approved by Owner.
- F. Architect's Sign: In addition to Project identification sign, pick up Architect's sign at Architect's office. Install on wood posts in location approved by Owner and as directed by Architect. After Substantial Completion, carefully remove sign and return to Architect's office.
- G. Waste Disposal Facilities: Comply with requirements specified in Division 1 Section "Construction Waste Management."
- H. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Site Enclosure Fence: Furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

- H. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
- I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

END OF SECTION 01500

## SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

### 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 administrative and procedural requirements for the following:
  - 1. Disposing of nonhazardous demolition and construction waste.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Construction Waste Management.

#### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

#### 1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  - 2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

## 3.2 DISPOSAL OF WASTE

- A. General: Remove waste materials from Project site and legally dispose of them in a location and manner acceptable to authorities having jurisdiction.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01524

## SECTION 01600 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Product Requirements.

#### 1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

#### 1.4 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable and as may be requested by Architect:
  - a. Statement why specified material or product cannot be provided.
  - b. List of changes or modifications needed to other parts of the Work.
  - c. Comparison of qualities of proposed substitution with those of the Work specified.
  - d. Product Data.
  - e. Samples, where applicable or requested.
  - f. List of similar installations with addresses, and architect and owner references.
  - g. Available test reports indicating compliance with requirements indicated.
  - h. Reports evidencing compliance with building code in effect.
  - i. Effect on Contractor's Construction Schedule.
  - j. Cost information, including a proposal of change, if any, in the Contract Sum.
  - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
  - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- B. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

#### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

#### 1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
  - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  - 2. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
  - 1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
  - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
  - 3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  - 4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
  - 5. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
  - 6. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers, or if no other manufacturers are named, by a recognized manufacturer of comparable products. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

### 2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution or comparable product if received within 30 days after commencement of the Work by the Contractor. Requests received after that time may be considered or rejected at discretion of Architect.

### 2.3 COMPARABLE PRODUCTS

- A. Conditions: Architect will consider Contractor's request for comparable product when the following conditions are satisfied:



1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

## SECTION 01700 - EXECUTION REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. General installation of products.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Execution Requirements.

#### 1.3 SUBMITTALS

- A. Landfill Receipts: If applicable to requirements of Project, submit to Owner copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for any hazardous waste disposal.
- B. Final Property Survey: Submit 3 copies showing the Work performed and record survey data. Comply with requirements of jurisdiction that grants building permit or other approvals.

#### 1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems, underground and other utilities, and other construction affecting the Work.
- B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

- C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

### 3.4 FIELD ENGINEERING

- A. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey. Comply with requirements of jurisdiction that grants building permit or other approvals.

### 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces, if any.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces or FFE contractors/suppliers/vendors.

### 3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

### 3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
- B. Restore permanent facilities used during construction to their specified condition.
- C. Existing Conditions Restoration: Existing facilities, including landscaping and grass areas, that are affected by the construction Work shall be returned to their prior condition.
  - 1. Photographically document existing conditions at the start of the Work, and provide copies of photographs to Owner.
  - 2. In the absence of photographic documentation, the judgment of the Owner and/or Architect will prevail regarding the requirements for remedial work.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

## SECTION 01731 - CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Coordinate the requirements of this Section with those of others sections that require coordination with Cutting and Patching.

#### 1.3 DEFINITIONS

- A. Cutting: Removal of or damage to in-place construction necessary to permit installation or performance of the Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of the Work.

#### 1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching.

#### 1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties. Request existing warranty information from Owner prior to starting.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as



possible. Provide materials and comply with installation requirements specified in other Sections.

1. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
- E. Paving
1. Sawcut existing paving with mechanical means to produce smooth, straight, tie-ins to new work.
  2. Where asphalt paving is involved, use equipment necessary to remove existing asphalt wearing course and existing limestone base which will not damage existing paving areas to remain.
  3. Patch and replace any portion of existing pavement surface which is found to be damaged, discolored, or shows other imperfections, with matching material.
- F. Grass
1. Maintain existing grass areas to remain. Contractor to limit vehicular traffic to minimum required and to designated parking or storage areas.
  2. Re-sod areas where grass has been damaged.
- G. Existing Conditions Restoration: Existing facilities, including but not limited to structures, utilities, landscaping, and grass areas, that are affected by the construction Work shall be returned to their prior condition.
1. Photographically document existing conditions at the start of the Work, and provide copies of photographs to Owner.
  2. In the absence of adequate photographic documentation, the judgment of the Owner and/or Architect will prevail regarding the requirements for remedial work.

END OF SECTION 01731

## SECTION 01770 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Warranties.
  - 3. Final cleaning.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Closeout Procedures.

#### 1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list).
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 4. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 5. Complete startup testing of systems.
  - 6. Advise Owner of changeover in utilities.
  - 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- B. Inspection: Submit a written request for inspection for Substantial Completion (e-mail or fax are acceptable). On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

#### 1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  2. Submit copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list). The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
  5. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  6. Prepare and submit Project Record Documents, operation and maintenance manuals, **property surveys**, and similar final record information.
  7. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  9. Complete final cleaning requirements, include touchup painting.
  10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for final inspection for acceptance (e-mail or fax is acceptable). On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

#### 1.5 WARRANTIES

- A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- B. Provide additional copies of each warranty to include in operation and maintenance manuals.

#### 1.6 SUBMITTAL REQUIREMENTS

- A. Assemble warranties and bonds executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Number of original signed copies required: Two each.

- C. Table of Contents: neatly typed, in orderly sequence. Provide complete information for each item.
1. Product of work item.
  2. Firm, with name of principal, address, and telephone.
  3. Scope.
  4. Date of beginning of warranty, bond, guaranty and maintenance contract.
  5. Duration of warranty, bond, guaranty and maintenance contract.
  6. Provide information for Owner's personnel:
    - a. Proper procedure in case of failure.
    - b. Instances which might affect the validity of warranty, bond or guaranty.
  7. Contractor, name of responsible principal, address and telephone number.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Provide final cleaning using cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Remove labels that are not permanent.
  2. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

## SECTION 01781 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Project Record Documents.

#### 1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set of marked-up Record Prints and one set of like transparencies to the owner, along with an electronic copy (scanned PDFs on a disk are acceptable). Also, submit an electronic copy to the Architect.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications to the owner, along with an electronic copy (PDFs on a disk are acceptable). Also, submit an electronic copy to the Architect.
- C. Record Product Data: Submit one copy of each Product Data submittal to the owner, along with an electronic copy (PDFs on a disk are acceptable). Also, submit an electronic copy to the Architect.
  - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally.
  - 2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Significant dimensional changes to Drawings.
    - b. Significant revisions to details shown on Drawings.
    - c. Locations and depths of underground utilities.
    - d. Locations of concealed internal utilities, piping and conduits.
    - e. Changes made by Change Order or Construction Change Directive.
    - f. Changes made following Architect's written orders.
    - g. Details not on the original Contract Drawings.
- B. Record Transparencies: Immediately before inspection for Final Completion, review marked-up Record Prints and prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings (scanned PDFs on a disk are acceptable).
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

### 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies significantly from that indicated in Specifications, addenda, and contract modifications, and variance is not reflected in approved shop drawings or product data submittals.

### 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies significantly from that indicated in Product Data submittal.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

- B. Maintenance of Record Documents and Samples: Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 01781

## SECTION 01782 - OPERATION AND MAINTENANCE DATA

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Operation manuals for systems, subsystems, and equipment.
  - 3. Maintenance manuals for the care and maintenance of products, materials, and finishes and systems and equipment.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Operation and Maintenance Data.

#### 1.3 SUBMITTALS

- A. Final Submittal: Submit one copy of each manual in final form at least 10 days before final inspection. Correct or modify each manual to comply with Architect's or Owner's comments.

### PART 2 - PRODUCTS

#### 2.1 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system.
- B. Manual Contents: Organize into sets of manageable size. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
  - 1. Binders: Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
  - 2. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts. However, include these in same binder.



## 2.2 OPERATION AND MAINTENANCE MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards, procedures and logs.
  4. Wiring, control and piped system diagrams.
  5. Precautions against improper use.
  6. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name, manufacturer and model number.
  2. Equipment identification with serial number of each component.
  3. Equipment function and operating characteristics.
  4. Limiting conditions and performance curves.
  5. Engineering data and tests.
  6. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping and normal shutdown instructions.
  6. Seasonal and weekend operating instructions.
  7. Required sequences for electric or electronic systems.
  8. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

## 2.3 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard printed maintenance instructions and bulletins.
  2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  3. Identification and nomenclature of parts and components.
  4. List of items recommended to be stocked as spare parts.

- B. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.
  - 3. Precautions against improper maintenance.
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - 5. Aligning, adjusting, and checking instructions.
- C. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- D. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- E. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- F. Warranties and Bonds: Include copies of warranties and bonds. Include procedures to follow and required notifications for warranty claims.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- B. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- C. Drawings: Provide drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
- D. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01782

## SECTION 01820 - DEMONSTRATION AND TRAINING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Coordinate the requirements of this Section with those of other sections that require coordination with Demonstration and Training.

#### 1.3 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate content of training with content of approved emergency, operation, and maintenance manuals

### PART 2 - EXECUTION

#### 2.1 PREPARATION

- A. Assemble educational materials necessary for instruction. Use Operations and Maintenance Manuals.

#### 2.2 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- B. Scheduling: Provide instruction at mutually agreed on times.

END OF SECTION 01820

**SECTION 02080 - PIPED UTILITIES - BASIC 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 applies to site utilities (outside 5 feet from the building face), and includes the following:
  - 1. Piping materials and installation instructions common to most piping systems.
  - 2. Transition fittings.
  - 3. Dielectric fittings.
  - 4. Sleeves.
  - 5. Grout.
  - 6. Piped utility demolition.
  - 7. Equipment installation requirements common to equipment sections.
  - 8. Concrete bases.
  - 9. Supports and anchorages.
- B. Coordinate the requirements of this Section with those of other sections that interface with Piped Utilities.

**1.3 DEFINITIONS**

- A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.
- B. Concealed 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.
- C. The following are industry abbreviations for plastic materials:
  - 1. PE: Polyethylene plastic.
  - 2. PVC: Polyvinyl chloride plastic.

**1.4 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Dielectric fittings.

## 1.5 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
  - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
  - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Electrical Characteristics for Piped Utility Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with 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 to prevent entrance of dirt, debris, and moisture.
- B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

## 1.7 COORDINATION

- A. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- B. Coordinate installation of identifying devices after completing covering and painting if devices are applied to surfaces.

## PART 2 - PRODUCTS

### 2.1 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 2 piping Sections for pipe, tube, 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 2 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 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 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, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.
- 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 for Joining Plastic Piping:
  - 1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  - 2. PVC to ABS Piping Transition: ASTM D 3138.

## 2.3 TRANSITION FITTINGS

- A. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
  - 1. Underground Piping NPS 1-1/2 and Smaller: Manufactured fitting or coupling.
  - 2. Underground Piping NPS 2 and Larger: AWWA C219, metal sleeve-type coupling.
  - 3. Aboveground Pressure Piping: Pipe fitting.
- B. Plastic-to-Metal Transition Unions: MSS SP-107, **PVC** four-part union. Include brass end, solvent-cement-joint end, rubber O-ring, and union nut.
- C. Flexible Transition Couplings for Underground Nonpressure Drainage Piping: ASTM C 1173 with elastomeric sleeve, ends same size as piping to be joined, and corrosion-resistant metal band on each end. Not permitted under concrete.

## 2.4 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Steel piping and fittings materials shall be of domestic manufacture.
- D. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
- 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 Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
  - 1. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig minimum working pressure where 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.
- 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.

## 2.5 SLEEVES

- A. Mechanical sleeve seals for pipe penetrations are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- B. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- C. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- D. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- E. PVC Pipe: ASTM D 1785, Schedule 40.
- F. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

## 2.6 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

### PART 3 - EXECUTION

#### 3.1 PIPED UTILITY DEMOLITION

- A. Refer to Division 1 Sections for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove piped utility systems, equipment, and components indicated to be removed.
  1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
  2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
  3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
  4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make operational.
  5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

#### 3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the requirements of other Division 2 Sections specifying piping systems.
- B. 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 by Architect.
- C. Where “future” structures or built features such as pavement are indicated on drawings, rout piping around these to avoid conflicts in future.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.



- G. Install piping free of sags and bends. Anchor and support as required.
- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install sleeves for pipes passing through concrete and masonry walls 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 equipment areas or other wet areas 2 inches above finished floor level.
  - 2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
    - a. **PVC Pipe Sleeves:** For pipes smaller than NPS 6.
    - b. **Steel Sheet Sleeves:** For pipes NPS 6 and larger, penetrating gypsum-board partitions.
- K. Verify final equipment locations for roughing-in.
- L. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

### 3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 2 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. 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:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. 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.

- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
  - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
  - 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
  - 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
  - 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
- L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
  - 1. Plain-End Pipe and Fittings: Use butt fusion.
  - 2. Plain-End Pipe and Socket Fittings: Use socket fusion.

### 3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
  - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
  - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
  - 3. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

### 3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment level and plumb, unless otherwise indicated.
- B. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations. Extend grease fittings to an accessible location.
- C. Install equipment to allow right of way to piping systems installed at required slope.

### 3.6 PAINTING

- A. Painting of piped utility systems, equipment, and components is specified in Division 9 Section "Painting." Only exposed-to-view items require painting.
- B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

### 3.7 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions.
  - 1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
  - 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
  - 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
  - 4. Place and secure anchorage devices. Use supported equipment manufacturer's 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.
  - 6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
  - 7. Use **3000-psi**, 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."

### 3.8 GROUTING

- A. Mix and install grout for equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 02080

## SECTION 02210 – GEOTECHNICAL REPORT

## 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. The Owner commissioned **QC LABORATORIES, INC** to prepare a geotechnical study of the site for the proposed building(s) and site work. This report is being provided by the Owner for the Contractor's information and guidance.
  - 2. Report No. **19G17134**, dated **December 2019** ("Report") is **bound herein**.
- B. The purposes of the geotechnical study were to:
  - 1. Explore and evaluate subsurface stratigraphy at the proposed building site(s).
  - 2. Explore and evaluate groundwater conditions at the Project area.
  - 3. Provide specific geotechnical recommendations to guide design and construction of the building foundations and paving for the proposed Project.
- C. The logs of the borings are shown in the Report.
- D. Coordinate the requirements of this Section with those of other sections that interface matters dealt with in the Geotechnical Report.

## 1.3 QUALITY ASSURANCE

- A. Use of the Report
  - 1. The information in the Report was used in preparing the designs for the foundations of the building and the paving.
  - 2. Bidders (or proposers) are expected to examine the site and the Report to determine the character of materials to be encountered.
  - 3. Information in the report represents conditions at the points of boring only and is for general information only. Inapplicability of this data to other areas of the site shall not incur liability on the part of the Owner or Architect and Architect's consultants.
  - 4. **When there is a conflict between the requirements of the geotechnical report and those of the drawings and specifications, the requirements of the geotechnical report shall govern.**

- B. The logs of the borings represent conditions encountered at the exact boring locations only. Contractor shall make reasonable inferences regarding soils conditions on the site, based on the information provided in the geotechnical report.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**The Report (including drawing showing boring locations) follows.**

END OF SECTION 02210

## **GEOTECHNICAL ENGINEERING STUDY**

**Attack Poverty / Friends of North Rosenberg  
NWC of Walnut Avenue and 3rd Street  
Rosenberg, Texas**

*Reported to:*  
**Attack Poverty  
Stafford, Texas**

*Prepared by:*  
**QC Laboratories, Inc.  
10810 Northwest Freeway  
Houston, Texas 77092  
(713) 695-1133**

**PROJECT NO.: 19G17134  
December 2019**



**LABORATORIES, INC.**  
Engineering and Testing Services



December 23, 2019

Attack Poverty  
3727 Greenbriar Drive, Suite 100  
Stafford, Texas 77477

Attn: Mr. Richard Logan  
Founder / President & CEO

Re: Geotechnical Engineering Study  
Attack Poverty / Friends of North Rosenberg  
NWC of Walnut Avenue and 3rd Street - Rosenberg, Texas  
QCL Project No. 19G17134

Dear Mr. Logan:

We are pleased to submit our geotechnical engineering report for the above referenced project. This study was authorized by you, through signature of our "Agreement for Geotechnical and Geo-Environmental Services" on October 23, 2019 and performed in general accordance with QCL Proposal No. 40278B, dated October 10, 2019.

We appreciate the opportunity to be of service to you on this phase of the project. If we may be of additional assistance, please call us.

Sincerely,

**QC LABORATORIES, INC.**

(Texas Registered Engineering Firm F-3601)

Xiaoyu (Constance) Lin, P.E.  
Project Manager

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Senior Geotechnical Engineer

Copies Submitted: Addressee - (1) Electronic



12/23/2019



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## **1.0 INTRODUCTION**

### **1.1 Project Description**

We understand the project consists of a new single story building located at the northwest corner (NWC) of Walnut Avenue and 3<sup>rd</sup> Street in Rosenberg, Texas. A vicinity map of the project site is provided on Plate 1 in the Appendix of this report.

Based on information provided, we understand the building is planned to have a footprint area of 10,500 square feet and consist of steel frame with tilt-up wall or cement masonry units (CMU) construction. For structural loading conditions, we anticipate a maximum column load of 100 kips and a floor slab pressure no greater than 125 pounds per square feet. Adjacent reinforced concrete pavement areas are also planned for this site.

Finished floor information was not available at the time of this study. We anticipate the finished floor of the proposed buildings will be within 1 to 2 feet above existing grade of the general high ground.

### **1.2 Scope of Services**

Our scope of services included drilling and sampling soil borings, performing laboratory tests on selected soil samples, and providing a written report that presents the results of our engineering analyses and field and laboratory services. Our report provides geotechnical information and recommendations including:

- Site and subgrade preparation, excavation and fill placement.
- Building foundation design (feasible types and allowable bearing capacities) and construction.
- Reinforced concrete pavement design and construction guidelines.

## **2.0 INVESTIGATION TECHNIQUES**

### **2.1 Field Exploration**

The subsurface conditions at this site were evaluated by drilling and sampling three soil borings (Borings B-1 through B-3) to a depth of about 20 feet within the area of the proposed building and two soil borings (B-4 and B-5) to a depth of about 6 feet within the proposed pavement



areas. The boring locations are shown on the Plan of Borings, Plate 2, in the Appendix of this report.

The soil sample intervals are shown on the boring logs. Soil samples were obtained continuously to a depth of about 10 feet, and at 5-foot intervals thereafter to the termination depth of the borings. The soil sample intervals are shown on the boring logs.

Soil samples were generally obtained with a 3-inch diameter tube sampler. Pocket penetrometer tests were performed in the field on extruded tube samples to serve as a general measure of consistency.

One cohesionless soil sample (18 to 20 feet at Boring B-2) was sampled using a split-spoon sampler by means of the Standard Penetration Test (SPT). The SPT test consists of measuring the number of blows required for a 140-pound hammer (falling 30 inches) to drive the split-spoon sampler 12 inches into the subsurface soils, after being seated 6 inches.

Each soil sample was extruded from the sampler in the field, examined, and visually classified by experienced personnel. At the completion of drilling, the boreholes were backfilled with soil cuttings.

Following completion of our field services, the samples were transported to our laboratory in Houston. Samples not consumed by testing will be retained in our laboratory for at least 30 days and then discarded unless the Client requests otherwise.

## **2.2 Laboratory Tests**

In the laboratory, each sample was observed and classified by an engineer. Laboratory tests were performed on selected soil samples to evaluate the physical properties of the soils. The following laboratory tests were performed for this project:

- Moisture Content (ASTM D 2216);
- Atterberg Limits (ASTM D 4318 - Method B);
- Unconfined Compression (ASTM D 2166); and
- Percent Finer than No. 200 Sieve (ASTM D 1140).

Detailed soil descriptions and results of the tests are presented on the boring logs, Plates 3 through 7, in the Appendix of this report.



### **3.0 GENERAL SITE AND SUBSURFACE CONDITIONS**

#### **3.1 Site and Subsurface Conditions**

At the time of our field exploration, the site was covered with maintained grass and appeared to be relatively level.

Fill consisting of high plasticity fat clays (CH) were observed at Borings B-2 through B-5 within the upper 1 foot of existing grade (grade existing at the time of our field exploration). The native subsurface soil conditions observed at this site generally consisted of high plasticity fat clays (CH) to a depth of about 8 feet below the existing grade, underlain by a stratum of medium plasticity lean/sandy lean clays (CL) that generally extended to a depth of about 21 feet below existing grade, and followed by a stratum of high plasticity fat clays (CH) that extended to a depth of 25 feet, the termination depth of the deeper borings. At Boring B-1, a slickensided fat clay (CH) layer was found between depths of about 12 and 15 feet; at Boring B-2, a layer of silty sands (SM) was observed at depths between about 17 and 21 feet.

More detailed stratigraphic information is presented on the Logs of Borings attached to this report. The boring logs contains our field and laboratory test results, as well as our Field Technician's and Engineer's interpretation of conditions believed to exist between actual samples retrieved. Therefore, the boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are intended to group soils having similar engineering properties and characteristics. They should be considered approximate as the actual transition between soil types (strata) may be gradual. A key to the soil symbols and terms used on the boring logs is provided on Plate 8, in the Appendix of this report.

#### **3.2 Water Level Measurements**

The borings for this study were drilled using dry-auger techniques to their termination depth (approximately 6 to 25 feet) in an effort to evaluate groundwater conditions at this site. Groundwater was not observed at Borings B-1 through B-5 during or upon completion of drilling.

It should be noted the above groundwater observations were very short term in nature. Fluctuations in the groundwater levels may occur for longer term groundwater observations, and may be affected by variations in rainfall, surface water run-off, and/or nearby construction activities. The actual depth of groundwater should be evaluated prior to construction.



## **4.0 FINDINGS AND RECOMMENDATIONS**

The findings and recommendations contained in this report were prepared based on conditions encountered in the borings drilled at this site, our field and laboratory test results, and our experience with geotechnical conditions similar to those at this site. In the event that any changes in the nature, design, or location of the structures are made from those discussed herein, the conclusions and recommendations contained in this report shall not be considered valid until the changes are reviewed and the conclusions are verified in writing by QCL.

### **4.1 Geotechnical Considerations**

#### **4.1.1 Expansive Soils**

Atterberg limit tests indicate that the near surface soils present at this site exhibit very high potential for shrink/swell behavior with changes in moisture content. Potential vertical soil movements were estimated using TEX-124-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures. Based upon the subsurface soil conditions observed and using TEX-124-E, we estimate that the subgrade soils at this site exhibit a potential vertical rise (PVR) of about 4 inches.

The above estimate was based upon an assumed zone of seasonal moisture change varying between a "dry" condition and a "wet" condition. Movements greater than those predicted above could occur if the soils are exposed to extended wet or dry periods, positive drainage of surface water is not maintained or if soils are subject to an outside water source, such as leakage from a utility line or subsurface moisture migration from off-site locations.

This report provides recommendations to reduce the PVR to a more acceptable value (generally considered to be one inch or less by most structural engineers and/or owners) for the building planned at this site.

#### **4.1.2 Existing Undocumented Fill**

As stated previously, undocumented fill soils were observed within the upper 1 foot of existing grade at all boring locations except at Boring B-1. We anticipate that fill may be present at other locations and depths not explored during our field program. In our opinion, there is a risk associated with supporting the foundations on or above undocumented fill, especially if unknown buried debris is present. This risk cannot be fully eliminated without removing all fill.



Considering the extent and nature of the existing undocumented fill soils observed in the soil borings, and their impacts on the proposed building and pavements construction, we recommend that:

- The floor slab of the proposed building be supported on improved subgrade as recommended in **Sections 4.4 and 4.5** of this report.
- Within the proposed pavement areas, the existing fill may be evaluated through a proofroll inspection and compaction testing throughout its depth. See **Section 4.8** for pavement subgrade improvements recommendations.
- If other deep fill soils of poor quality are encountered at this site during construction, QCL should be contacted in order to evaluate the fill soils and revise our recommendations.

#### 4.2 Foundation Selection

Based upon the subsurface conditions observed during our investigation, the proposed building may be supported on a foundation system consisting of shallow strip/spread footings. Provided in the following sections are recommendations for this type of foundation system, along with other geotechnical considerations for this project.

#### 4.3 Design of Individual Spread Footings

Parameter	Recommendation	Comment
Bearing depth, feet	4 feet	Below the FFE
Bearing material	Compacted select fill	---
Net allowable bearing pressure, $q_{all}$		
Dead load plus sustained live load	2,000 psf	Includes a factor of safety (F.S.) of 3
Total load	3,000 psf	Includes F.S. of 2
Uplift resistance	Foundation weight (150 pcf) and Soil weight (120 pcf)	Resisted by the dead weight of the footings and supported structure plus the weight of a soil wedge (4 vertical to 1 horizontal) above the footing bottom
Allowable Passive Pressure	500 psf	Includes F.S. of 2 The upper 4 feet should be neglected due to surface effects and near-surface moisture changes



Parameter	Recommendation	Comment
Footing Sliding Resistance	The friction on the base of the footings may be computed using a frictional coefficient of 0.25 that includes a factor of safety of about 2 with respect to the computed ultimate coefficient. We recommend that the maximum friction be limited to 250 psf	Lateral loads transmitted to the footings will be resisted by a combination of soil-concrete friction on the base of the footings and passive pressure on the sides of the footings.
Spacing	At least twice the larger width of footings	Measured center-to-center
Minimum Reinforcement for potential expansion	Per applicable design specifications	Should extend to the full depth of the footings

Settlement of the footings will primarily occur due to elastic deformation in the soil. We anticipate that individual footings designed and constructed in accordance with the recommendations provided in this report will settle about one inch or less.

The minimum center-to-center spacing between adjacent footings should be twice the width of the larger of adjacent footings to develop the recommended bearing pressure and to control foundation settlements. If the minimum center-to-center spacing cannot be maintained, the allowable bearing capacity values provided above should be reduced by 20 percent for a clearance between  $1\frac{1}{2}$  and 2, measured center-to-center. A clearance of less than  $1\frac{1}{2}$  width, measured center-to-center, is not recommended.

#### 4.3.1 Shallow Footings Construction

The slab-on-grade and the individual spread footing foundation should be neatly excavated. Excavations should be accomplished with a smooth-mouth bucket. If a toothed bucket is used, excavation with this bucket should be stopped 6 inches above the foundation depth and the excavation completed with a smooth-mouthed bucket or by hand labor. Disturbance of the bearing area of the floor slab and grade beams should be minimized during the excavation operations. Any soft zones should be over excavated to firm soil and loose material in the trench bottom should be removed before placement of concrete.

Based on the subsurface soil conditions observed at this site, groundwater seepage into the foundation excavations is not anticipated. If seepage or surface water runoff should enter the



excavations, the water should be pumped out prior to concreting. A series of sumps and pumps can be used for this purpose.

Reinforcing steel should be clean and free of any bond-inhibiting coating or mud. Reinforcing steel should be properly positioned and supported to assure the design cover around the reinforcing steel is achieved. Steel should be placed and the foundation concreted the same day of excavation. Sloughed soils and other debris in the bottom of the excavation should be removed prior to steel placement.

If for some reason the footings cannot be poured the same day of excavation, a thin seal slab (2 to 4 inches thick) consisting of lean concrete should be placed to protect the exposed foundation soils.

**Construction Monitoring:** Depth of footings to competent bearing soils is based on soil conditions encountered at the boring locations; however, significant variations can occur across horizontal distances across the borings. Prior to placement of concrete, the footings should be observed to determine that the footing bears in the proper bearing strata at the depth recommended in this report. The footing is constructed to the proper dimensions and steel reinforcements are placed as shown on the structural drawings. Excessive cutting, build-up of cuttings, and any other soft compressible materials have been removed from the bottom of the excavations.

An experienced QCL soil technician should be present during foundation installation to verify that the proper bearing stratum has been reached, the footing dimensions are as designed, and that the excavations are clean and dry before placing reinforcing steel and concrete.

#### **4.4 Floor Slab**

As mentioned previously, the near surface soils at this site would be described as having a very high expansion potential. These soils have the potential to shrink and swell (heave) with changes in moisture content and can subject the floor slabs to significant movement and distress. Completely eliminating the risk of movement and distress to the structures may not be feasible, but it may be possible to further reduce the risk of movement if significantly more extensive measures are used, such as designing the floor slab system as a suspended structural slab. QCL would be pleased to discuss this foundation alternative with you upon request.



One of the most common methods to reduce the potential expansion of the subgrade would be to provide a pad of non-expansive select fill beneath the proposed building. Thus, to reduce the PVR to approximately one inch or less, a minimum 60 inches of compacted select fill and/or lime-stabilized on-site soils should be placed beneath the proposed building. The select fill and lime-stabilized building pads should extend horizontally at least 5 feet beyond the edge of the building and be sloped to provide positive drainage away from the structure. Select fill and/or lime-stabilized on-site soils should also be used for all grade adjustments within the building area.

Clean in-site fat clay soils may be used as fill within the proposed building provided they are treated with adequate amount of lime. On-site fat clay soils that have not been lime stabilized should not be utilized in the building pad. A sufficient quantity of lime should be used to reduce the plasticity index (PI) of the treated soils to 20 percent or less (or until the lime stabilized soils obtain a pH of about 12.4). For planning purposes, we estimate about 8 to 10 percent lime by dry weight will be required. Lime vs PI or pH series tests can be performed at the beginning of the construction to determine the optimum quantity of lime for stabilization. During building pad construction, if lime-treated clay soils are to be used in lieu of select fill, Atterberg Limit (PI) tests should be collected on representative clay soils to be treated to verify that the proper quantity of lime to be used; we recommend a frequency of one test for every 5,000 square feet of lime-stabilized material.

We recommend that the following additional features be included in the project design and specifications:

- (1) Discharge roof downspouts into storm sewers;
- (2) Keep vegetation at least 10-feet from the slab;
- (3) Keep trees a “drip line” distance from the slab;
- (4) Seal utility trenches at foundation exits;
- (5) Place sidewalks adjacent to the building;
- (6) Keep irrigation systems at least 5-feet away from the face of the building exterior;  
and
- (7) Maintain a positive slope away from the building.





Following the completion of the building slabs, the owner/operator must maintain the grounds and the area near the buildings (within 20 feet) so that the recommendations in this report are followed. Vegetation type and location will be critical to the proper slab performance and the recommendations in this report should be followed. Maintenance and consistency of the soil moisture near the slabs will be critical to foundation performance over the long term. Positive slopes, drain systems, and vegetation should be properly maintained. Pavement and sidewalk joints must all be maintained so that the joint material is pliable and helps shed water. The addition of decorative drainage material or flower beds that are bordered in such way as to obstruct the flow of water away from the slabs should not be installed without a discussion with the Geotechnical Engineer and a full understanding by the owner/operator of the effects of such features.

We recommend that the owner and facility operator be made aware of the long-term maintenance recommendations in this report. If they should have any questions, they should contact the Geotechnical Engineer.

#### **4.5 Earthwork**

In general, site preparation should consist of stripping vegetation, topsoil, and any other debris or unsuitable material within the construction areas.

After over-excavation of expansive soils within the proposed building pad area and prior to the placement of any fill and before paving subgrade stabilization, the exposed subgrade should be proof-rolled with a 20-ton pneumatic roller or equivalent equipment to detect soft or weak areas. Special care should be taken to proofroll areas containing existing fill soils to detect weak and/or soft soils. Weak areas detected as well as zones containing organics should be removed and replaced with soils exhibiting similar classification, moisture content, and density as the adjacent in-situ soils. Wet/weak soils observed should be addressed as outlined in **Section 4.5.1** of this report.

Subsequent to proofrolling, the exposed subgrade within the construction areas should be evaluated for moisture and density. The subgrade should be within 3 percent of the optimum moisture content, and have an in-place dry density of at least 95 percent of the standard proctor (ASTM D 698). If the moisture or density does not meet the above criteria, the subgrade should be scarified to a minimum depth of 8 inches; moisture adjusted to within 3 percent of the optimum moisture content and compacted to at least 95 percent of the standard proctor (ASTM D 698).



Select fill should consist of clean lean clay, sandy lean clay, and/or clayey sand soils with a Liquid Limit less than 40 and a Plasticity Index (PI) between 10 and 20. Select fill should be placed in loose lifts of approximately eight-inches in thickness and compacted to a minimum of 98 percent standard of the standard proctor (ASTM D 698) at moisture contents within 3 percent of the optimum moisture content.

As mentioned previously, on-site fat clay soils may be used as fill within the proposed building area provided they are lime stabilized as outlined in **Section 4.2.1** of this report. Lime stabilized soil should be placed in loose lifts of approximately eight-inches in thickness and compacted to a minimum of 95 percent standard proctor density (ASTM D 698) at moisture contents between optimum moisture content and +4 percent of the optimum moisture content.

Samples of the subgrade, select fill, and stabilized materials should be obtained prior to the compaction operations for laboratory moisture/density testing (Proctor tests). The tests will then provide a basis for evaluating the in-place density requirements during compaction operations. A qualified soil technician should perform sufficient in-place density tests during the filling operations to verify that proper levels of compaction are being attained.

#### **4.5.1 Wet Weather/Weak Subgrade Considerations**

During wet weather, or at a poorly drained site, the surficial soils may become wet and/or weak. This may result in difficult ground conditions for construction traffic and pumping action may occur during compaction, thus affecting the overall construction schedule and associated costs. Such weather and ground conditions will require special care. The following approaches should be considered:

- Promote good site drainage as discussed in **Section 4.6** to dry the site and the surface soils. It is of prime importance to provide a firm and stable platform to support the construction activities and traffic.
- Removal of unsuitable materials and replacement with select fill; and/or
- Chemical treatment of unsuitable materials with lime to dry and improve the stability of the subgrade.

If such conditions are encountered, QCL should be contacted to evaluate the actual site conditions in order to provide the necessary recommendations.



#### **4.6 Site Drainage**

We recommend that site drainage be well developed. Surface water should be directed away from the building foundations by using a minimum slope of 5 percent within 10 feet of the foundations. No ponding of surface water should be allowed near the structures.

#### **4.7 Vegetation Control**

We recommend that trees be planted no closer than about 20 feet from the building or approximately one-half of a canopy diameter of a mature tree. This will reduce possible foundation distress caused by the tree root system.

#### **4.8 Pavements**

We anticipate the paving subgrade will consist of on-site high plasticity clay soils. The pavement subgrade should be cleared and excavated to grade and prepared as recommended in **Section 4.3**. The subgrade soils will require chemical stabilization to allow for long-term pavement performance. Chemical stabilization will increase the supporting value of the subgrade and decrease the effect of moisture on subgrade soils. We recommend that the top 6 inches of the finished subgrade soils directly beneath the pavement be chemically stabilized.

The high plasticity clay soils should be chemically stabilized using lime in accordance with TxDOT 2014 Standard Specifications Item 260 For estimating purposes, we recommend 8 percent lime by dry weight be utilized. This percentage is typically equivalent to about 38 pounds per square yard of lime per 6-inch treated depth utilizing a dry unit weight of 105 pcf.

The exact percentage of lime should be determined after sampling the rough-graded site and running laboratory tests. The pulverization, mixing, and curing of the treated subgrade is critical to proper stabilization. The subgrade should be compacted to a minimum of 95 percent of the Standard Proctor (ASTM D 698) at a moisture content between optimum and 4 percent of optimum.

We recommend that chemical stabilization of the subgrade be extended at least 2 feet outside the limits of the pavement.

Traffic information was not available for the design of the pavements at this site. However, we assume traffic will consist primarily of passenger vehicles in parking areas with occasional delivery trucks in drive areas. The assumptions utilized in our pavement thickness analysis are summarized



in the table below. If the actual traffic conditions are different from that assumed, the client should contact QCL so that we can revise and provide appropriate recommendations.

Traffic Assumptions	
<b>Parking Lots</b>	Light traffic - Few vehicles heavier than cars. No regular use by heavily loaded trucks. (EAL = Less than 6)
<b>Driveways</b>	Light to Medium Duty - Maximum 50 loaded two axle trucks or lightly loaded larger vehicles per day. No regular use by heavily loaded trucks with three or more axles. (EAL = 6 to 20)
<b>Driveways and Truck Traffic Areas</b>	Medium Duty - Maximum 300 loaded two axle trucks or lightly loaded larger vehicles per day. No more than 30 heavily loaded trucks with more than three axles per day. (EAL = 21 to 75)
EAL = Equivalent daily 18-kip single-axle load.	

Outlined in the table below are the various pavement thicknesses for the rigid pavement planned at this site based on the traffic assumptions above.

Rigid Pavement			
Component	Parking Lots	Light to Medium-Duty Areas	Medium-Duty Areas
Reinforced Concrete	5"	6"	7"
Stabilized Subgrade	6"	6"	6"

Dumpster pads should consist of a minimum of 7 inches of reinforced concrete.

It is estimated that the service life for a properly constructed and maintained pavement will be on the order of about 20 years. Related civil design factors such as subgrade drainage, shoulder support, cross-sectional configurations, and surface elevations must be included in the preparation of the construction drawings/specifications. These pavements will require normal periodic maintenance.

Outlined below are the material requirements for the paving layers.

- (1) **Concrete:** The materials and properties of concrete shall meet the applicable requirements in the ACI Manual of Concrete Practice. The concrete shall have a minimum compressive strength of 3,500 psi.



(2) **Reinforcing Steel:**

Pavement Thickness (inches)	Bar Size	Bar Spacing (On-center and in both directions)
5	#3	18
6	#3	12
7	#4	18

(3) **Control (Contraction) Joint Spacing:**

Pavement Thickness (inches)	Maximum Spacing (feet)
5	12½
6	15
7	15

- (4) **Expansion Joint Spacing:** Regularly spaced expansion joints may be deleted from concrete pavements per ACI. Therefore, the installation of expansion joints is optional and should be evaluated by the design team.

(5) **Dowels at Expansion Joints:**

Pavement Thickness (inches)	Diameter (inches)	Length (inches)	Embedment (inches)
5	5/8	12	5
6	3/4	14	6
7	7/8	14	6

Note: Dowels should be spaced on 12-inch centers.

## 5.0 BASIS FOR RECOMMENDATIONS

The recommendations provided in this report are based on project information provided to us and only apply to the specific project and site discussed in this report. If the project information in this report contains incorrect information or if additional information is available, we should be contacted to review and/or revise our recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between boring will be different from those at specific boring locations and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, experienced QC geotechnical personnel should



observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team in a timely manner in order to solve the problems created.

We will be happy to discuss our recommendations with you and are prepared to provide any additional studies or services to complete this project. We look forward to serving as your geotechnical engineer and construction materials consultant for the remainder of this project as well as on future projects.

## **6.0 OBSERVATION DURING CONSTRUCTION**

The recommendations are based on the subsoil data in the field exploration and laboratory testing. Due to the geological deposition of the soils in the area, variances may occur between boring locations. Therefore, the excavations should be observed under the supervision of a QCL geotechnical engineer to confirm that the bearing soils are similar to those observed during our field exploration and that the footing areas have been properly prepared.

The QCL geotechnical engineer should be immediately notified should any subsoil conditions be uncovered that will alter the conclusions and recommendations contained in this report. Further investigation and supplemental recommendations may be required if such a condition is encountered.

### **6.1 Construction Materials Testing**

The recommendations provided in this geotechnical report were based on the assumption that QCL would be employed to monitor the installation of the building foundations and pavements and to provide Construction Material Testing (CMT) services during construction. It may be occasionally required that QCL provide addendums to the original geotechnical recommendations based on the CMT observations or CMT test results which uncover site conditions that were not known when the geotechnical report was originally issued. New or changed site information, which is not properly communicated to the Geotechnical Engineer of Record, may result in a foundation that does not perform as originally intended.

## **7.0 GENERAL COMMENTS**

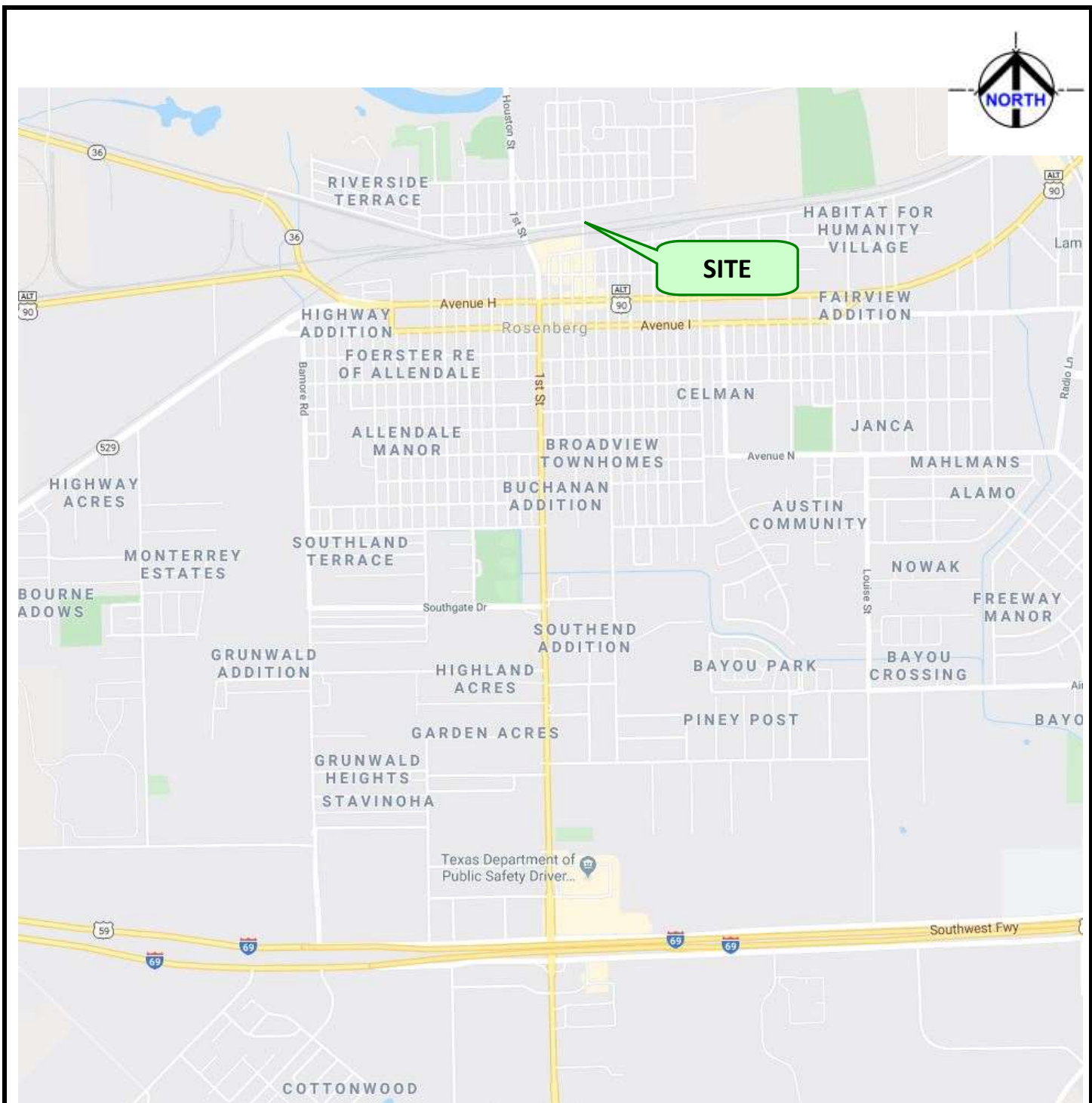


The information provided in this report is based on data obtained from the boring drilled at this site and project information provided to us. Regardless of the thoroughness of a Geotechnical exploration, there is always a possibility that conditions away from the boring will be different from those at the specific boring location. The nature and extent of such variations may not become evident unless further exploration is performed or until during or after construction. If conditions vary, we should be immediately notified so that further evaluation and supplemental information can be provided.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties (either express or implied) are intended or made.

# **APPENDIX**





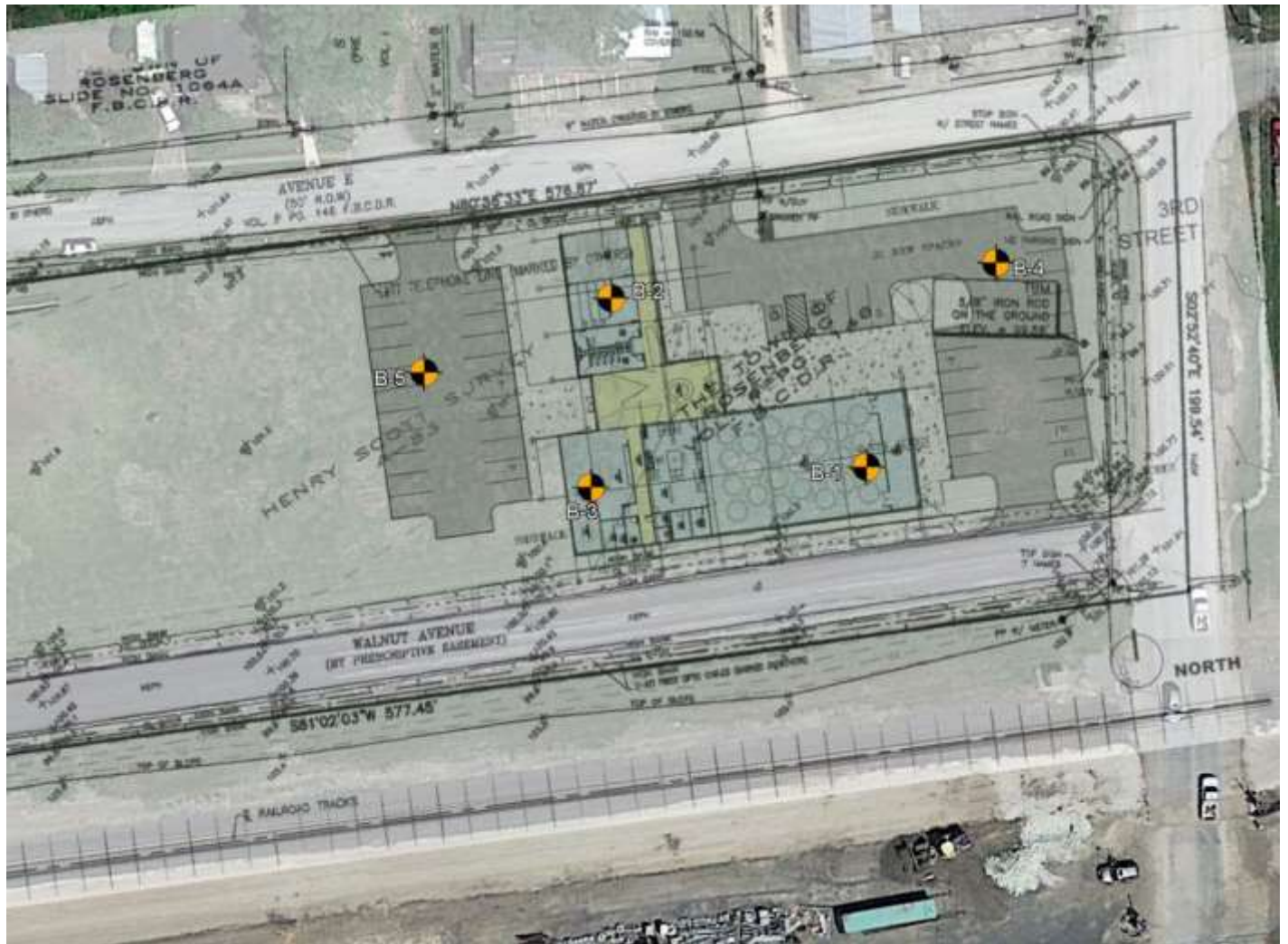
## VICINITY MAP



**Attack Poverty / Friends of North Rosenberg**  
**NWC of Walnut Avenue and 3<sup>rd</sup> Street**  
**Rosenberg, Texas**

**QCL PROJECT NO.**  
**19G17134**

**Plate 1**



## PLAN OF BORINGS



Attack Poverty / Friends of North Rosenberg  
NWC of Walnut Avenue and 3<sup>rd</sup> Street  
Rosenberg, Texas

QCL PROJECT NO.  
19G17134

Plate 2

## LOG OF BORING NO. B-1

Sheet 1 of 1


**LABORATORIES, INC.**  
 Geotechnical & Materials Engineers

 PROJECT: Attack Poverty / Friends of North Rosenberg  
 NWC of Walnut Ave & 3rd Street  
 Rosenberg, Texas

QCL NO.: 19G17134

DATE DRILLED: 11-1-19

ELEVATION, feet	DEPTH, feet	SYMBOL	DESCRIPTION	SAMPLES	HAND PENETROMETER (tsf)	SPT N-VALUE (bpf)	DRY UNIT WEIGHT (pcf)	NATURAL MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			PERCENT PASSING NO. 200 SIEVE	UNCONFINED COMPRESSION (tsf)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (psi)	TORVANE (tsf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX					
	0		SURFACE ELEVATION: Existing Grade													
			<b>FAT CLAY (CH)</b> stiff to very stiff, dark gray, with organics		1.0			26	70	18	52	91				
			- gray and tan 2 to 6 feet - with slickensides below 2 feet		1.0		94	26	81	18	63		1.1	5	0	
	5				1.0			29	84	18	66	88				
			- reddish brown below 6 feet		2.0											
	10		<b>LEAN CLAY (CL)</b> firm, reddish brown, with sand and silt seams		4.0		112	17				92	0.8	4	0	
	15		<b>FAT CLAY (CH)</b> soft, reddish brown, with slickensides and silt seams		4.5		92	31					0.4	3	0	
			<b>SANDY LEAN CLAY (CL)</b> very stiff, reddish brown, with interbedded soft clay and silt layers													
	20				0.5/4.5											
			<b>FAT CLAY (CH)</b> very stiff, light gray and tan													
					3.0											
	25		Boring Terminated at 25 feet													
	30															

WATER OBSERVATIONS: No free water observed during dry drilling

DRILLING METHOD: Dry augered to 25 feet.



LOG OF BORING NO. **B-2**

Sheet 1 of 1


**LABORATORIES, INC.**  
 Geotechnical & Materials Engineers

 PROJECT: Attack Poverty / Friends of North Rosenberg  
 NWC of Walnut Ave & 3rd Street  
 Rosenberg, Texas

QCL NO.: 19G17134

DATE DRILLED: 11-18-19

ELEVATION, feet	DEPTH, feet	SYMBOL	DESCRIPTION	SAMPLES	HAND PENETROMETER (tsf)	SPT N-VALUE (bpf)	DRY UNIT WEIGHT (pcf)	NATURAL MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			PERCENT PASSING NO. 200 SIEVE	UNCONFINED COMPRESSION (tsf)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (psi)	TORVANE (tsf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX					
	0		SURFACE ELEVATION: Existing Grade													
			<b>FILL: FAT CLAY w/ SAND (CH)</b> stiff, tan and gray, with organics		1.0			23	60	16	44	80				
			<b>FAT CLAY (CH)</b> stiff to very stiff, tan and gray													
			- dark gray 2 to 4 feet		2.0			23	65	16	49					
			- with ferrous nodules 4 to 6 feet													
	5		- reddish brown and with calcareous nodules below 6 feet		2.0	101		23					1.6	14	0	
					4.5			25	64	16	48	93				
			<b>SANDY LEAN CLAY (CL)</b> firm to stiff, reddish brown, with silt layers		4.0	114		13					1.6	4	0	
	10															
					1.0	102		23	34	18	16	70	0.5	4	0	
	15															
			<b>SILTY SAND (SM)</b> medium dense, reddish brown			11										
	20															
			<b>FAT CLAY (CH)</b> very stiff, reddish brown and light gray		4.0											
	25		Boring Terminated at 25 feet													
	30															

**WATER OBSERVATIONS:** No free water observed during dry drilling**DRILLING METHOD:** Dry augered to 25 feet.**SPT HAMMER:** Cat Head and Rope

LOG OF BORING NO. **B-3**

Sheet 1 of 1


**LABORATORIES, INC.**  
 Geotechnical & Materials Engineers

 PROJECT: Attack Poverty / Friends of North Rosenberg  
 NWC of Walnut Ave & 3rd Street  
 Rosenberg, Texas

QCL NO.: 19G17134

DATE DRILLED: 11-18-19

ELEVATION, feet	DEPTH, feet	SYMBOL	DESCRIPTION	SAMPLES	HAND PENETROMETER (tsf)	SPT N-VALUE (bpf)	DRY UNIT WEIGHT (pcf)	NATURAL MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			PERCENT PASSING NO. 200 SIEVE	UNCONFINED COMPRESSION (tsf)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (psi)	TORVANE (tsf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX					
	0		SURFACE ELEVATION: Existing Grade													
			<b>FILL: FAT CLAY w/ SAND (CH)</b> stiff, dark gray, with organics	1.0				24	55	15	40	87				
			<b>FAT CLAY (CH)</b> stiff to very stiff, tan and gray	3.0		100		24					1.5	6	0	
			- with ferrous nodules 4 to 6 feet	2.0				25	80	18	62	94				
			- reddish brown and with calcareous nodules below 6 feet	4.5		115		16					2.6	4	0	
			<b>LEAN CLAY w/ SAND (CL)</b> very stiff, reddish brown	3.0				15	29	14	15	75				
	10															
				4.5		112		19					3.0	6	0	
	15															
				2.0												
	20															
			<b>FAT CLAY (CH)</b> very stiff, reddish brown	3.0												
	25		Boring Terminated at 25 feet													
	30															

**WATER OBSERVATIONS:** No free water observed during dry drilling

**DRILLING METHOD:** Dry augered to 25 feet.


LOG OF BORING NO. **B-4**

Sheet 1 of 1


**LABORATORIES, INC.**  
 Geotechnical & Materials Engineers

 PROJECT: Attack Poverty / Friends of North Rosenberg  
 NWC of Walnut Ave & 3rd Street  
 Rosenberg, Texas

QCL NO.: 19G17134

DATE DRILLED: 11-18-19

ELEVATION, feet	DEPTH, feet	SYMBOL	DESCRIPTION	SAMPLES	HAND PENETROMETER (tsf)	SPT N-VALUE (bpf)	DRY UNIT WEIGHT (pcf)	NATURAL MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			PERCENT PASSING NO. 200 SIEVE	UNCONFINED COMPRESSION (tsf)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (psi)	TORVANE (tsf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX					
	0		SURFACE ELEVATION: Existing Grade													
			<b>FILL: FAT CLAY w/ SAND (CH)</b> stiff, dark gray, with organics		1.0			24	51	11	40	85				
			<b>FAT CLAY (CH)</b> stiff to very stiff, dark gray		1.5											
	5		- gray and tan below 4 feet		2.0											
			Boring Terminated at 6 feet													
	10															
	15															
	20															
	25															
	30															

**WATER OBSERVATIONS:** No free water observed during dry drilling

**DRILLING METHOD:** Dry augered to 6 feet.


LOG OF BORING NO. **B-5**






Sheet 1 of 1


**LABORATORIES, INC.**  
 Geotechnical & Materials Engineers

 PROJECT: Attack Poverty / Friends of North Rosenberg  
 NWC of Walnut Ave & 3rd Street  
 Rosenberg, Texas

QCL NO.: 19G17134

DATE DRILLED: 11-18-19

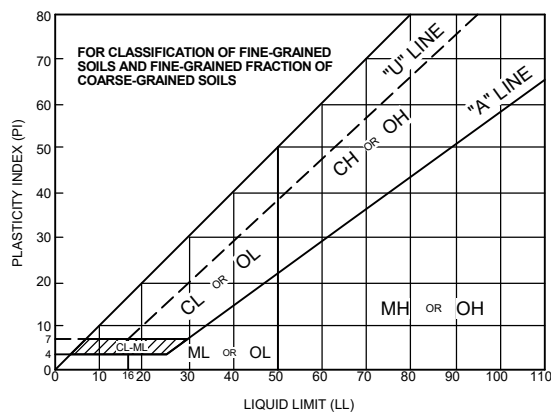
ELEVATION, feet	DEPTH, feet	SYMBOL	DESCRIPTION	SAMPLES	HAND PENETROMETER (tsf)	SPT N-VALUE (bpf)	DRY UNIT WEIGHT (pcf)	NATURAL MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			PERCENT PASSING NO. 200 SIEVE	UNCONFINED COMPRESSION (tsf)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (psi)	TORVANE (tsf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX					
	0		SURFACE ELEVATION: Existing Grade													
			<b>FILL: FAT CLAY (CH)</b> stiff, dark gray, with organics		1.0			31	76	18	58	92				
			<b>FAT CLAY (CH)</b> very stiff, gray and tan		3.0											
	5				2.0											
			Boring Terminated at 6 feet													
	10															
	15															
	20															
	25															
	30															
<b>WATER OBSERVATIONS:</b> No free water observed during dry drilling					<b>DRILLING METHOD:</b> Dry augered to 6 feet.											
																
																



# UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND	
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS  >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	$Cu \geq 4$ AND $1 \leq Cc \leq 3$	GW	WELL-GRADED GRAVEL	
			$Cu < 4$ AND/OR $1 > Cc > 3$	GP	POORLY-GRADED GRAVEL	
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR MH	GM	SILTY GRAVEL	
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL	
	SANDS  >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	$Cu \geq 6$ AND $1 \leq Cc \leq 3$	SW	WELL-GRADED SAND	
			$Cu < 6$ AND/OR $1 > Cc > 3$	SP	POORLY-GRADED SAND	
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR MH	SM	SILTY SAND	
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND	
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS  LIQUID LIMIT<50	INORGANIC	$PI > 7$ AND PLOTS $\geq$ "A" LINE	CL	LEAN CLAY	
			$PI < 4$ AND PLOTS < "A" LINE	ML	SILT	
		ORGANIC	LL (oven dried); LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT	
	SILTS AND CLAYS  LIQUID LIMIT>50	INORGANIC	$PI$ PLOTS $\geq$ "A" LINE	CH	FAT CLAY	
			$PI$ PLOTS < "A" LINE	MH	ELASTIC SILT	
		ORGANIC	LL (oven dried); LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT	
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT	

## PLASTICITY CHART



Equation of "A" Line  
Horizontal at  $PI=4$  to  $LL=25.5$ , then  $PI=0.73(LL-20)$

Equation of "U" Line  
Vertical at  $LL=16$  to  $PI=7$ , then  $PI=0.9(LL-8)$

PLASTICITY DESCRIPTION	
TERM	PLASTICITY INDEX
NON-PLASTIC	0
LOW	1 - 10
MEDIUM	11 - 30
HIGH	OVER 30

## SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System (as presented in ASTM D2487). Coarse-grained soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Coarse-grained soils are described on the basis of their in-place RELATIVE DENSITY.

Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are described as clays if they plot above the "A" line and silts if the plot below the "A" line; they are further described as low or high plasticity, depending upon their liquid limit (below or above 50). Clays are defined on the basis of their CONSISTENCY. Silts are defined on the basis of their in-place RELATIVE DENSITY.

RELATIVE DENSITY OF COARSE-GRAINED SOILS		CONSISTENCY OF FINE-GRAINED SOILS		
RELATIVE DENSITY	N-VALUE (BLOWS/FOOT*)	CONSISTENCY	BLOWS/FOOT*	COMPRESSIVE STRENGTH (TSF)
VERY LOOSE	0 - 3	VERY SOFT	WOH - 2	0 - 0.25
LOOSE	4 - 9	SOFT	2 - 4	0.25 - 0.50
MEDIUM DENSE	10 - 29	FIRM	4 - 8	0.50 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

\* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PEN. TEST).  
\* WOH = WEIGHT OF HAMMER

### SAMPLE TYPES

- Standard Penetration Test
- Shelby Tube

### OTHER MATERIAL SYMBOLS

- Asphalt
- Base Material
- Concrete
- Fill (Man Made)



## SECTION 02230 - SITE CLEARING

### 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. Protecting existing trees and other vegetation to remain.
  - 2. Removing existing trees and vegetation.
  - 3. Clearing and grubbing.
  - 4. Stripping and stockpiling topsoil.
  - 5. Removing above- and below-grade site improvements.
  - 6. Disconnecting, capping or sealing, and abandoning site utilities in place or removing site utilities.
  - 7. Temporary erosion and sedimentation control measures.
- B. Coordinate the requirements of this Section with those of other sections that interface with Site Clearing.

#### 1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

#### 1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

## 1.5 SUBMITTALS

- A. At his option, Contractor may, at commencement of the Work, submit photographs, videotape, or other sufficiently detailed documentation of existing conditions of trees and plantings, adjoining construction, and site improvements. Purpose of such documentation is to establish condition to which site and adjacent facilities must be returned after completion of construction.

## 1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.
- D. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."
  - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

### 3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### 3.3 TREE PROTECTION

- A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.
  1. Do not store construction materials, debris, or excavated material within fenced area.
  2. Do not permit vehicles, equipment, or foot traffic within fenced area.
  3. Maintain fenced area free of weeds and trash.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
  1. Employ an arborist or landscaper, licensed in jurisdiction where Project is located, to provide assistance regarding tree protection.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.
  1. Employ an arborist or landscaper, licensed in jurisdiction where Project is located, to provide assistance regarding repairs of damage to trees and shrubs.
  2. Replace trees that cannot be repaired and restored to full-growth status.

### 3.4 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
  1. Arrange with utility companies to shut off indicated utilities.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
  2. Do not proceed with utility interruptions without Owner's knowledge and permission.
- C. Excavate for and remove underground utilities indicated to be removed.

### 3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.
1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
  3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
  4. Use only hand methods for grubbing within tree protection zone.
  5. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

### 3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials. Dispose of all materials except remaining cleaned topsoil off-site.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile surplus topsoil to allow for resspreading on site.
  2. Dispose of topsoil off site.

### 3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as necessary and as may be indicated in order to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

### 3.8 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 02230

## SECTION 02300 - EARTHWORK

### 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. Preparing subgrades for slabs-on-grade, walks, pavements, and lawns and grasses.
  - 2. Excavating and backfilling.
- B. Coordinate the requirements of this Section with those of other sections that interface with Earthwork.

#### 1.3 DEFINITIONS

- A. Backfill: Material used to fill an excavation.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: placed over initial backfill to fill a trench.
- B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill, backfill, or select fill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- F. Fill: Soil materials used to raise existing grades.
- G. Select Fill: Course supporting a slab-on-grade or similar construction.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

- J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 SUBMITTALS

- A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
  - 1. Classification according to ASTM D 2487 of each soil material proposed for fill, backfill, and select fill.
- B. Preexcavation Photographs or Videotape: Contractor may, at his option, submit documentation that shows existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

#### 1.5 PROJECT CONDITIONS

- A. Sub-surface Investigation Data: See Section 02210 for Geotechnical Report.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted by Owner and then only after arranging to provide temporary utility services according to requirements indicated.
- C. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- D. Protection:
  - 1. Protect bench marks, existing fences, roads, walks, paving, curbs, and other constructed features from damage.
  - 2. Protect aerial, surface, and underground utility lines and appurtenances that are to remain.
  - 3. Reestablish bench marks, monuments, and reference points disturbed by damage; repair all other damage caused by construction Work.

### PART 2 - PRODUCTS

#### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations on the site.
- B. Subgrade Under Building Pad: **<per geotechnical report>**.
- C. Select Fill Under Building Slab: **<per geotechnical report>**.

- D. Subbase Material for Paving: **<per geotechnical report>.**
- E. Base Course for Paving: **<per geotechnical report>.**
- F. Bedding Course for Trenches: **<Bedding Course to be placed in accordance with the Geotechnical Report and Civil Plans.>.**
- G. Trench Backfill:
  - 1. Initial Backfill: **<Initial/Final Backfill to be placed in accordance with the Geotechnical Report and Civil Plans.>.**
  - 2. Final Backfill: **<Initial/Final Backfill to be placed in accordance with the Geotechnical Report and Civil Plans.>.**
- H. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand. Use only where specifically indicated.
- I. Cement-Stabilized Sand
  - 1. Cement sand meeting 100 psi within 48 hours, tested by ASTM C558.

## 2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
  - 1. Red: Electric.
  - 2. Yellow: Gas, oil, steam, and dangerous materials.
  - 3. Orange: Telephone and other communications.
  - 4. Blue: Water systems.
  - 5. Green: Sewer systems.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. All work shall be laid out by a competent surveyor, in accordance with Division 1. The Contractor shall be responsible for all elevations and dimensions and shall verify actual site conditions. Refer discrepancies to Architect for interpretation or modification before proceeding.
- B. Establish benchmark and maintain it until completion. Set floor level by instrument.
- C. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.



- D. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."
- E. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.

### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

### 3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
- B. Explosives: Do not use explosives.

### 3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch, or more if approved by the Architect. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
    - a. Should cave-ins occur or excavations be made over 2 inches beyond dimensions shown, increase excavation size to allow forming, and install wood forms.
  - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

### 3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### 3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide sufficient clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
- C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.

### 3.7 SUBGRADE INSPECTION

- A. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify any wet, soft, or pumping pockets.
- B. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

### 3.8 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength as indicated for footings may be used.

### 3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for Record Documents.
  - 3. Testing and inspecting underground utilities.
  - 4. Removing concrete formwork or temporary shoring, bracing or sheeting.
  - 5. Removing trash and debris.

### 3.10 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud or other deleterious conditions.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Backfill trenches excavated under footings and within 18 inches of bottom of footings with Select Fill.

- D. Initial Backfill: Place and compact initial backfill to a height of 12 inches over the utility pipe or conduit.
  - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Final Backfill: Place and compact final backfill to final subgrade elevation.
- F. Backfill voids with matching soil while installing and removing shoring and bracing.
- G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.11 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Building Elements: Place and compact fill material in layers to required elevations as follows:
  - 1. Under building slabs, use Select Fill in accordance with geotechnical report, to elevations required such that top of slab is at elevation indicated on Drawings.
  - 2. Under footings and foundations, use Select Fill in accordance with geotechnical report, to elevations required such that tops of footings and foundations are at elevations indicated on Drawings.
  - 3. Under walks and pavements, use soil material in accordance with geotechnical report, to underside of surfacing (allow for sand layer at walks, where indicated on Drawings).
  - 4. Under steps and ramps, use Select Fill in accordance with geotechnical report, to elevations required such that top of steps and ramps is at grades indicated on Drawings.
- C. Landscape Areas:
  - 1. Under grass areas, use satisfactory soil material to one inch below finish grades indicated on Drawings.
  - 2. Under planting areas, use satisfactory soil material to finish grades indicated on Drawings, allowing 3 inches for topsoil.

### 3.12 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction. Compact in accordance with geotechnical report.

### 3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry density according to ASTM D 698:
  - 1. Under structures, building slabs, steps, and pavements: 95 percent.
  - 2. Under walkways: 95 percent.
  - 3. Under lawn or unpaved areas: 95 percent.
  - 4. For utility trenches under building & paving: 95 percent.
  - 5. For utility trenches under lawn or unpaved areas: 95 percent.

### 3.14 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Lawn or Unpaved Areas: Plus or minus 1 inch.
  - 2. Walks: Plus or minus 1 inch.
  - 3. Pavements: Plus or minus ½ inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

### 3.15 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
  - 1. Place base course material over subbase course under hot-mix asphalt pavement.
  - 2. Shape subbase and base course to required crown elevations and cross-slope grades.
  - 3. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
  - 4. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 5. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry density for subgrade, and 95 percent for base course, according to ASTM D 698.
- C. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and

compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry density for subgrade, and 95 percent for base course, according to ASTM D 698.

### 3.16 SELECT FILL

- A. Place fill on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact fill under cast-in-place concrete slabs-on-grade as follows:
  - 1. Place select fill course 6 inches or less in compacted thickness in a single layer.
  - 2. Place select fill course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 3. Compact each layer of select fill to required cross sections and thicknesses to not less than 95 percent of maximum dry density according to ASTM D 698.

### 3.17 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

### 3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

### 3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.
- B. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
  - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

## SECTION 02361 - TERMITE CONTROL

### 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. Soil treatment with termiticide.
- B. Coordinate the requirements of this Section with those of other sections that interface with Termite Control.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Service Life of Soil Treatment: Soil treatment by use of a termiticide that is effective for not less than five years against infestation of subterranean termites.

#### 1.4 SUBMITTALS

- A. Product Data: For termiticide or borate.
  - 1. Include the EPA-Registered Label for termiticide and borate products.
- B. Product Certificates: For termite control products, signed by product manufacturer.
- C. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Brand name and manufacturer of termiticide.
  - 4. Quantity of undiluted termiticide used.
  - 5. Dilutions, methods, volumes, and rates of application used.
  - 6. Areas of application.
  - 7. Water source for application.
- D. Submit a diagram of the structure to be treated (Architect's plan may be used). Clearly mark areas to be treated, as well as measurements and calculations of materials to be used.
- E. Warranty: Special warranty specified in this Section.

## 1.5 QUALITY ASSURANCE

- A. **Installer Qualifications:** A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located, and who employs workers trained and approved to install manufacturer's products.
- B. **Regulatory Requirements:** Formulate and apply termiticides according to the EPA-Registered Label.

## 1.6 PROJECT CONDITIONS

- A. **Environmental Limitations:** To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.

## 1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.
- B. Apply borate treatment after framing, sheathing, and exterior weather protection is completed but before electrical and mechanical systems are installed.

## 1.8 WARRANTY

- A. **Special Warranty:** Manufacturer's standard form, signed by Applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
  - 1. **Warranty Period:** Five years from date of Substantial Completion.
  - 2. Applicator shall make annual inspections during life of warranty period. If evidence of termite activity is apparent during warranty period, promptly:
    - a. Re-treat soil to prevent subterranean termites from attacking the building or its contents, using means acceptable to Owner, at no cost to Owner, and;
    - b. Make good on all damage caused by subterranean termite activity, at no cost to Owner.

## 1.9 MAINTENANCE SERVICE

- A. **Continuing Service:** Beginning at Substantial Completion, provide 60 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, and terms for agreement period; and terms for future renewal options.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Termiticides:
    - a. Aventis Environmental Science USA LP; Termidor.
    - b. Bayer Corporation; Premise 75.
    - c. Dow AgroSciences LLC; Dursban TC.
    - d. Syngenta; ProBuild TC.
  2. Borates:
    - a. Nisus Corp.; Bora-Care, Jecta.
    - b. NovaGuard Technologies, Inc.; Armor-Guard, Shell-Guard.
    - c. U.S. Borax Inc.; Tim-Bor.

### 2.2 SOIL TREATMENT

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution (fuel oil or other petroleum products are not allowed to be used as diluent) formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

### 2.3 WOOD TREATMENT

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control.
1. Proceed with application only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparation before beginning application of termite control treatment. Remove all extraneous sources of wood cellulose and other edible materials



such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.

- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.

### 3.3 APPLICATION, GENERAL

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products. Comply with manufacturer's instructions.

### 3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.
  - 1. Slabs-on-Grade: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  - 2. Foundations: Adjacent soil including soil along the entire inside perimeter of foundation walls, around plumbing pipes and electric conduit penetrating the slab, and around interior column footers, piers, and similar elements; also along the entire outside perimeter, from grade to bottom of footing or grade beam. Avoid soil washout around footings.
  - 3. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

### 3.5 APPLYING BORATE TREATMENT

- A. Application: Mix wood treatment borate solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of borate, according to manufacturer's EPA-Registered Label, so that wood framing, sheathing, siding, and structural members subject to infestation receive treatment.
1. Framing and Sheathing: Apply borate solution by spray to bare wood for complete coverage.
  2. Wood Members Thicker Than 4 Inches: Inject borate gel solution under pressure into holes of size and spacing required by manufacturer for treatment.

END OF SECTION 02361

## SECTION 02466 - DRILLED PIERS

## 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. Dry-installed drilled piers.
- B. Coordinate the requirements of this Section with those of other sections that interface with Drilled Piers, in particular:
  - 1. Division 3 Section "Cast-in-Place Concrete."

## 1.3 SUBMITTALS

- A. Design Mixes: For each class of concrete. Include revised mix proportions when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

## 1.4 QUALITY ASSURANCE

- A. Drilled-Pier Standard: Comply with provisions in ACI 336.1, "Reference Specifications for the Construction of Drilled Piers," unless modified in this Section.
- B. Survey Work: Engage a qualified land surveyor or professional engineer to perform surveys, layouts, and measurements for drilled piers. Before excavating, lay out each drilled pier to lines and levels required.
- C. Record actual measurements of each drilled pier's location, shaft diameter, bottom and top elevations, deviations from specified tolerances, and other specified data. Provide a copy of the complete record to the Architect.
  - 1. Record and maintain information pertinent to each drilled pier and cooperate with Owner's testing and inspecting agency to provide data for required reports.
- D. Welding Standards: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1, "Structural Welding Code--Steel."
  - 2. AWS D1.4, "Structural Welding Code--Reinforcing Steel."

## 1.5 PROJECT CONDITIONS

- A. Existing Utilities: Locate existing underground utilities before excavating drilled piers. If utilities are to remain in place, provide protection from damage during drilled-pier operations.
  - 1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, adapt drilling procedure if necessary to prevent damage to utilities. Cooperate with Owner and utility companies in keeping services and facilities in operation without interruption. Repair damaged utilities to satisfaction of utility owner.
- B. Site Information: A geotechnical report has been prepared for this Project and is included elsewhere in the Project Manual for information only.

## PART 2 - PRODUCTS

### 2.1 STEEL REINFORCEMENT

- A. Reinforcement is specified in Division 3 section “Cast In Place Concrete.”

### 2.2 CONCRETE MATERIALS

- A. Concrete Materials are specified in Division 3 section “Cast In Place Concrete.”

### 2.3 CONCRETE MIX AND MIXING

- A. Concrete Mix and Mixing is specified in Division 3 section “Cast In Place Concrete.”
  - 1. Do not air entrain concrete for drilled piers.
- B. Concrete-mix design adjustments may be considered if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant. Resubmit and obtain approval of proposed changes to concrete-mix proportions.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, vibration, and other hazards created by drilled-pier operations.
- B. Before starting drilling operations, establish the location and extent of utilities in the work areas. Notify Architect of any potential conflicts prior to drilling. Notify utility companies prior to drilling if any utility lines appear to be in the way of construction.

### 3.2 EXCAVATION

- A. Unclassified Excavation: Excavation is unclassified and includes excavation to bearing elevations regardless of character of materials or obstructions encountered.
- B. Prevent surface water from entering excavated shafts. Conduct water to site drainage facilities.
- C. Excavate shafts for drilled piers to indicated dimensions and depths, in undisturbed virgin soil. Remove loose material from bottom of excavation.
  - 1. Excavate bottom of drilled piers to level plane within 1:12 tolerance. Clean bottom of pier holes free from rocks and soil lumps.
  - 2. Do not excavate shafts deeper than indicated, unless approved by Architect. If excavations are carried below required depths without authorization, fill excess excavation with concrete as specified for footings.
  - 3. Remove water from excavated shafts before concreting.
- D. Excavate shafts for closely spaced drilled piers and those occurring in fragile or sand strata, only after adjacent drilled piers are filled with concrete and allowed to set.
- E. Bells: Excavate bells for drilled piers to shape, base thickness, and slope angle indicated. Excavate bottom of bells to level plane and remove loose material before concrete is placed.
  - 1. Shore bells in unstable soil conditions to preclude cave-in during excavation, inspection, and concreting.
- F. Tolerances: Construct drilled piers to remain within ACI 336.1 tolerances.
  - 1. A tolerance of one inch off center from correct location, and up to three inches over in size, will be permitted.
  - 2. If location or out-of-plumb tolerances are exceeded, provide corrective construction. Submit design and construction proposals to Architect for review before proceeding.
- G. Notify and allow Owner's testing and inspecting agency to test and inspect bottom of excavation immediately prior to concrete placement. If unsuitable bearing stratum is encountered, make adjustments to drilled piers as determined by Architect.
  - 1. Each drilled pier must be inspected and tested by Owner's testing and inspecting agency before placing concrete.

### 3.3 STEEL REINFORCEMENT

- A. Comply with recommendations in CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy bond with concrete.
- C. Fabricate and install reinforcing cages symmetrically about axis of shafts in a single unit.

- D. Accurately position, support, and secure reinforcement against displacement during concreting. Maintain minimum cover to reinforcement.
- E. Use templates to set anchor bolts, leveling plates, and other accessories furnished in work of other Sections. Provide blocking and holding devices to maintain required position during final concrete placement.
- F. Protect exposed ends of extended reinforcement, dowels, or anchor bolts from mechanical damage and exposure to weather.

### 3.4 CONCRETE PLACEMENT

- A. Place concrete in continuous operation and without segregation, immediately after inspection and approval of shaft by Owner's independent testing and inspecting agency.
- B. Do not allow excavations to remain open and unprotected overnight.
- C. For piers that cannot be poured immediately, protect bearing surface to maintain natural moisture content. Cover surface to protect from drying; protect from water softening. Failure to protect bearing surface shall require removal of unsuitable bearing soil.
- D. Dry Method: Place concrete to fall vertically down the center of drilled pier without striking sides of shaft or steel reinforcement.
- E. Screed concrete at cutoff elevation level and apply scoured, rough finish. Where cutoff elevation is above the ground elevation, form top section above grade and extend shaft to required elevation.
- F. Protect concrete work, according to ACI 301, from frost, freezing, or low temperatures that could cause physical damage or reduced strength.
- G. When hot-weather conditions exist that would seriously impair quality and strength of concrete, place concrete according to ACI 301 to maintain delivered temperature of concrete at no greater than 90 deg F.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit reports during excavation and concrete placement for drilled piers.
  - 1. Refer to Division 1 section "Quality Requirements."

### 3.6 DISPOSAL OF MATERIALS

- A. Remove surplus materials and legally dispose of them off Owner's property.

END OF SECTION 02466

## SECTION 02510 - WATER DISTRIBUTION

### 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-distribution piping and related components outside the building for **[water service]** & **[fire-service mains]**.
- B. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

#### 1.3 DEFINITIONS

- A. EPDM: Ethylene propylene diene terpolymer rubber.
- B. LLDPE: Linear, low-density polyethylene plastic.
- C. PA: Polyamide (nylon) plastic.
- D. PE: Polyethylene plastic.
- E. PP: Polypropylene plastic.
- F. PVC: Polyvinyl chloride plastic.
- G. RTRF: Reinforced thermosetting resin (fiberglass) fittings.
- H. RTRP: Reinforced thermosetting resin (fiberglass) pipe.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components.
  - 1. Wiring Diagrams: Power, signal, and control wiring for alarms.

- C. Coordination Drawings: For piping and specialties including relation to other services in same area, drawn to scale. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.
- D. Field quality-control test reports.
- E. Operation and Maintenance Data: For water valves and specialties to include in emergency, operation, and maintenance manuals.

## 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
  - 2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
  - 3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- 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 ASTM F 645 for selection, design, and installation of thermoplastic water piping.
- E. Comply with FMG's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.
- F. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.
- G. NSF Compliance:
  - 1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
  - 2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
  - 1. Ensure that valves are dry and internally protected against rust and corrosion.
  - 2. Protect valves against damage to threaded ends and flange faces.
  - 3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:



1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

## 1.7 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:
1. Notify Architect and Owner no fewer than seven (7) days in advance of proposed interruption of service.
  2. Do not proceed with interruption of water-distribution service without Architect's and Owner's written permission.

## 1.8 COORDINATION

- A. Coordinate connection to water main with utility company.

## PART 2 - PRODUCTS

### 2.1 PVC PIPE AND FITTINGS

- A. PVC, Schedule 40 Pipe: ASTM D 1785.
1. PVC, Schedule 40 Socket Fittings: ASTM D 2466.
- B. PVC, Schedule 80 Pipe: ASTM D 1785.
1. PVC, Schedule 80 Socket Fittings: ASTM D 2467.
  2. PVC, Schedule 80 Threaded Fittings: ASTM D 2464.

- C. PVC, AWWA Pipe: AWWA C900, [Class 150] [and] [Class 200], with bell end with gasket, and with spigot end.
1. Comply with UL 1285 for fire-service mains if indicated.
  2. PVC Fabricated Fittings: AWWA C900, [Class 150] [and] [Class 200], with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
  3. PVC Molded Fittings: AWWA C907, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
  4. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Gaskets: AWWA C111, rubber.
  5. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

## 2.2 GATE VALVES

### A. AWWA, Cast-Iron Gate Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
3. Basis-of-Design Product: Subject to compliance with requirements, provide **[the product indicated on Drawings]** <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
  - a. American AVK Co.; Valves & Fittings Div.
  - b. American Cast Iron Pipe Co.; American Flow Control Div.
  - c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
  - d. Crane Co.; Crane Valve Group; Stockham Div.
  - e. East Jordan Iron Works, Inc.
  - f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
  - g. McWane, Inc.; Kennedy Valve Div.
  - h. McWane, Inc.; M & H Valve Company Div.
  - i. McWane, Inc.; Tyler Pipe Div.; Utilities Div.
  - j. Mueller Co.; Water Products Div.
  - k. NIBCO INC.
  - l. U.S. Pipe and Foundry Company.
  - m. Park Equipment.
4. Nonrising-Stem, Metal-Seated Gate Valves:
  - a. Description: Gray- or ductile-iron body and bonnet; with cast-iron or bronze double-disc gate, bronze gate rings, bronze stem, and stem nut.

- 1) Standard: AWWA C500.
  - 2) Minimum Pressure Rating: 200 psig.
  - 3) End Connections: Mechanical joint.
  - 4) Interior Coating: Complying with AWWA C550.
5. Nonrising-Stem, Resilient-Seated Gate Valves:
  - a. Description: Gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.
    - 1) Standard: AWWA C509.
    - 2) Minimum Pressure Rating: 200 psig.
    - 3) End Connections: Mechanical joint.
    - 4) Interior Coating: Complying with AWWA C550.
6. Nonrising-Stem, High-Pressure, Resilient-Seated Gate Valves:
  - a. Description: Ductile-iron body and bonnet; with bronze or ductile-iron gate, resilient seats, bronze stem, and stem nut.
    - 1) Standard: AWWA C509.
    - 2) Minimum Pressure Rating: 250 psig.
    - 3) End Connections: Push on or mechanical joint.
    - 4) Interior Coating: Complying with AWWA C550.
7. OS&Y, Rising-Stem, Metal-Seated Gate Valves:
  - a. Description: Cast- or ductile-iron body and bonnet, with cast-iron double disc, bronze disc and seat rings, and bronze stem.
    - 1) Standard: AWWA C500.
    - 2) Minimum Pressure Rating: 200 psig.
    - 3) End Connections: Flanged.
8. OS&Y, Rising-Stem, Resilient-Seated Gate Valves:
  - a. Description: Cast- or ductile-iron body and bonnet, with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.
    - 1) Standard: AWWA C509.
    - 2) Minimum Pressure Rating: 200 psig.
    - 3) End Connections: Flanged.
- B. UL/FMG, Cast-Iron Gate Valves:
  1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. American Cast Iron Pipe Co.; American Flow Control Div.
    - b. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.

- c. Crane Co.; Crane Valve Group; Stockham Div.
- d. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
- e. McWane, Inc.; Kennedy Valve Div.
- f. McWane, Inc.; M & H Valve Company Div.
- g. Mueller Co.; Water Products Div.
- h. NIBCO INC.
- i. U.S. Pipe and Foundry Company.
- j. Park Equipment.

2. UL/FMG, Nonrising-Stem Gate Valves:

- a. Description: Iron body and bonnet with flange for indicator post, bronze seating material, and inside screw.
  - 1) Standards: UL 262 and FMG approved.
  - 2) Minimum Pressure Rating: 175 psig.
  - 3) End Connections: Flanged.

3. OS&Y, Rising-Stem Gate Valves:

- a. Description: Iron body and bonnet and bronze seating material.
  - 1) Standards: UL 262 and FMG approved.
  - 2) Minimum Pressure Rating: 175 psig.
  - 3) End Connections: Flanged.

## 2.3 GATE VALVE ACCESSORIES AND SPECIALTIES

A. Tapping-Sleeve Assemblies:

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
  - b. East Jordan Iron Works, Inc.
  - c. Flowserve.
  - d. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
  - e. McWane, Inc.; Kennedy Valve Div.
  - f. McWane, Inc.; M & H Valve Company Div.
  - g. Mueller Co.; Water Products Div.
  - h. U.S. Pipe and Foundry Company.
  - i. Park Equipment.
- 2. Description: Sleeve and valve compatible with drilling machine.
  - a. Standard: MSS SP-60.
  - b. Tapping Sleeve: Cast- or ductile-iron or stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.

- c. Valve: AWWA, cast-iron, nonrising-stem, **[metal]** **[resilient]**-seated gate valve with one raised face flange mating tapping-sleeve flange.
- B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.
  - 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.
- C. Indicator Posts: UL 789, FMG-approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

## 2.4 DETECTOR CHECK VALVES

### A. Detector Check Valves:

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Badger Meter, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Globe Fire Sprinkler Corporation.
  - e. McWane, Inc.; Kennedy Valve Div.
  - f. Mueller Co.; Hersey Meters.
  - g. Victaulic Company of America.
  - h. Viking Corporation.
  - i. Watts Water Technologies, Inc.
  - j. Park Equipment.
- 2. Description: Galvanized cast-iron body, bolted cover with air-bleed device for access to internal parts, and flanged ends. Include one-piece bronze disc with bronze bushings, pivot, and replaceable seat. Include threaded bypass taps in inlet and outlet for bypass meter connection. Set valve to allow minimal water flow through bypass meter when major water flow is required.
  - a. Standards: UL 312 and FMG approved.
  - b. Pressure Rating: 175 psig.
  - c. Water Meter: AWWA C700, disc type, at least one-fourth size of detector check valve. Include meter, bypass piping, gate valves, check valve, and connections to detector check valve.
- 3. Description: Iron body, corrosion-resistant clapper ring and seat ring material, flanged ends, with connections for bypass and installation of water meter.
  - a. Standards: UL 312 and FMG approved.
  - b. Pressure Rating: 175 psig.

## 2.5 WATER METERS

- A. Water meters will be furnished by AHJ.

## 2.6 VACUUM BREAKERS

- A. Pressure Vacuum Breaker Assembly:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Flomatic Corporation.
  - e. Toro Co. (The); Irrigation Division.
  - f. Watts Water Technologies, Inc.
  - g. Wilkins; a Zurn company.
  - h. Park Equipment.
2. Standard: ASSE 1020.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: [5 psig] maximum, through middle 1/3 of flow range.
5. Size: <Insert NPS.>

## 2.7 BACKFLOW PREVENTERS

- A. Reduced-Pressure-Principle Backflow Preventers:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Flomatic Corporation.
  - e. Watts Water Technologies, Inc.
  - f. Wilkins; a Zurn company.
  - g. Park Equipment.
2. Standard: [ASSE 1013] [or] [AWWA C511].
3. Accessories:
  - a. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 and smaller; OS&Y gate type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.
  - b. Air-Gap Fitting: ASME A112.1.2, matching backflow preventer connection.

**B. Double-Check, Backflow-Prevention Assemblies:**

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Flomatic Corporation.
  - e. Watts Water Technologies, Inc.
  - f. Wilkins; a Zurn company.
  - g. Park Equipment.
2. Standard: **[AWWA C510]**.
3. Operation: Continuous-pressure applications, unless otherwise indicated.
4. Pressure Loss: [5 psig] maximum, through middle 1/3 of flow range.
5. Size: **<Insert NPS.>**

**C. Double-Check, Detector-Assembly Backflow Preventers:**

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Watts Water Technologies, Inc.
  - e. Wilkins; a Zurn company.
  - f. Park Equipment.
2. Standards: ASSE 1048 and UL listed or FMG approved.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: [5 psig] maximum, through middle 1/3 of flow range.
5. Accessories:
  - a. Valves: UL 262, FMG-approved, OS&Y gate type with flanged ends on inlet and outlet.
  - b. Bypass: With displacement-type water meter, shutoff valves, and reduced-pressure backflow preventer.

**D. Backflow Preventer Test Kits:**

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Conbraco Industries, Inc.
  - b. FEBCO; SPX Valves & Controls.
  - c. Flomatic Corporation.

- d. Watts Water Technologies, Inc.
  - e. Wilkins; a Zurn company.
2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

## 2.8 WATER METER BOXES

- A. Water meter boxes to meet AHJ requirements.

## 2.9 CONCRETE VAULTS

- A. Description: Precast, reinforced-concrete vault, designed for A-16 load designation according to ASTM C 857 and made according to ASTM C 858.
- 1. Ladder: ASTM A 36/A 36M, steel or polyethylene-encased steel steps.
  - 2. Manhole: ASTM A 48/A 48M Class No. 35A minimum tensile strength, gray-iron traffic frame and cover.
    - a. Dimension: 24-inch minimum diameter, unless otherwise indicated.
  - 3. Manhole: ASTM A 536, Grade 60-40-18, ductile-iron traffic frame and cover.
    - a. Dimension: 24-inch- minimum diameter, unless otherwise indicated.
  - 4. Drain: ASME A112.6.3, cast-iron floor drain with outlet of size indicated. Include body anchor flange, light-duty cast-iron grate, bottom outlet, and integral or field-installed bronze ball or clapper-type backwater valve.

## 2.10 PROTECTIVE ENCLOSURES

- A. Freeze-Protection Enclosures:
- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Aqua Shield.
    - b. BF Products, Inc.
    - c. DekoRRa Products.
    - d. Dunco Manufacturing, Inc.
    - e. G&C Enclosures.
    - f. Hot Box, Inc.
    - g. HydroCowl, Inc.
    - h. Watts Water Technologies, Inc.
  - 2. Description: Insulated enclosure designed to protect aboveground water piping, equipment, or specialties from freezing and damage, with heat source to maintain



minimum internal temperature of 40 deg F when external temperatures reach as low as minus 34 deg F.

- a. Standard: ASSE 1060.
- b. Class I: For equipment or devices other than pressure or atmospheric vacuum breakers.
- c. Class I-V: For pressure or atmospheric vacuum breaker equipment or devices. Include drain opening in housing.

1) Housing: Reinforced [-aluminum] [or] [-fiberglass] construction.

- a) Size: Of dimensions indicated, but not less than those required for access and service of protected unit.
- b) Drain opening for units with drain connection.
- c) Access doors with locking devices.
- d) Insulation inside housing.
- e) Anchoring devices for attaching housing to concrete base.

2) Electric heating cable or heater with self-limiting temperature control.

B. Weather-Resistant Enclosures:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Aqua Shield.
- b. BF Products, Inc.
- c. DekoRRa Products.
- d. Dunco Manufacturing, Inc.
- e. G&C Enclosures.
- f. Hot Box, Inc.
- g. HydroCowl, Inc.
- h. Watts Water Technologies, Inc.

2. Description: Uninsulated enclosure designed to protect aboveground water piping, equipment, or specialties from weather and damage.

- a. Standard: ASSE 1060.
- b. Class III: For equipment or devices other than pressure or atmospheric vacuum breakers.
- c. Class III-V: For pressure or atmospheric vacuum breaker equipment or devices. Include drain opening in housing.

1) Housing: Reinforced [-aluminum] [or] [-fiberglass] construction.

- a) Size: Of dimensions indicated, but not less than those required for access and service of protected unit.
- b) Drain opening for units with drain connection.
- c) Access doors with locking devices.
- d) Anchoring devices for attaching housing to concrete base.

C. Expanded-Metal Enclosures:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Backflow Prevention Device InnClosures, Inc.
  - b. BF Products, Inc.
  - c. Cross Brothers, Inc.
  - d. Le Meur Welding & Manufacturing Co.
2. Description: Enclosure designed to protect aboveground water piping, equipment, or specialties from damage.
  - a. Material: ASTM F 1267, expanded metal side and top panels, of weight and with reinforcement of same metal at edges as required for rigidity.
  - b. Type: Type [ **I, expanded**] [ **II, expanded and flattened**].
  - c. Class: Class [ **1, uncoated carbon steel**] [ **2, hot-dip, zinc-coated carbon steel**] [ **3, corrosion-resisting steel**].
  - d. Finish: Manufacturer's enamel paint.
  - e. Size: Of dimensions indicated, but not less than those required for access and service of protected unit.
  - f. Locking device.
  - g. Lugs or devices for securing enclosure to base.

D. Enclosure Bases:

1. Description: [4-inch-] [6-inch-] minimum thickness precast concrete, of dimensions required to extend at least 6 inches beyond edges of enclosure housings. Include openings for piping.

2.11 FIRE HYDRANTS

A. Dry-Barrel Fire Hydrants:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. American AVK Co.; Valves & Fittings Div.
  - b. American Cast Iron Pipe Co.; American Flow Control Div.
  - c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
  - d. American Foundry Group, Inc.
  - e. East Jordan Iron Works, Inc.
  - f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
  - g. McWane, Inc.; Kennedy Valve Div.
  - h. McWane, Inc.; M & H Valve Company Div.
  - i. Mueller Co.; Water Products Div.
  - j. Troy Valve; a division of Penn-Troy Manufacturing, Inc.
  - k. U.S. Pipe and Foundry Company.

2. Description: Freestanding, with one NPS 4-1/2 and two NPS 2-1/2 outlets, 5-1/4-inch main valve, drain valve, and NPS 6 mechanical-joint inlet. Include interior coating according to AWWA C550. Hydrant shall have cast-iron body, compression-type valve opening against pressure and closing with pressure.
  - a. Standard: AWWA C502.
  - b. Pressure Rating: [150 psig **minimum**] [250 psig].

## 2.12 FIRE DEPARTMENT CONNECTIONS

### A. Fire Department Connections:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Elkhart Brass Mfg. Co., Inc.
  - b. Fire End & Croker Corporation.
  - c. Guardian Fire Equipment, Inc.
  - d. Kidde Fire Fighting.
  - e. Potter Roemer.
  - f. Reliable Automatic Sprinkler Co., Inc.
  - g. Park Equipment.

## 2.13 ALARM DEVICES

- A. Alarm Devices, General: UL 753 and FMG approved, of types and sizes to mate and match piping and equipment.
- B. Water-Flow Indicators: Vane-type water-flow detector, rated for 250-psig working pressure; designed for horizontal or vertical installation; with 2 single-pole, double-throw circuit switches to provide isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal when cover is removed.
- C. Supervisory Switches: Single pole, double throw; designed to signal valve in other than fully open position.
- D. Pressure Switches: Single pole, double throw; designed to signal increase in pressure.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

### 3.2 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping.
- D. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground water-service piping [NPS 3/4 to NPS 3] shall be **[ any of ]** the following:
  - 1. Soft copper tube, [ASTM B 88, Type K] [ASTM B 88, Type L]; **[wrought-copper, solder-joint fittings; and brazed] [copper, pressure-seal fittings; and pressure-sealed]** joints.
- F. Underground water-service piping [NPS 4 to NPS 8] shall be **[ any of ]** the following:
  - 1. NPS 4 and NPS 6: NPS 6 PVC, AWWA Class 150 pipe; PVC, AWWA Class 150 **[fabricated] [or] [molded]** fittings; and gasketed joints.
  - 2. NPS 8: PVC, AWWA Class 200 pipe; **[PVC, AWWA Class 200 fabricated] [push-on-joint, ductile-iron] [mechanical-joint, ductile-iron]** fittings; and gasketed joints.
- G. Water Meter Box Water-Service Piping [NPS 3/4 to NPS 2] shall be same as underground water-service piping.
- H. Underground Fire-Service-Main Piping [NPS 4 to NPS 12] shall be **[ any of ]** the following:
  - 1. PVC, AWWA Class 150 pipe listed for fire-protection service; PVC Class 150 fabricated or molded fittings; and gasketed joints.
- I. Above-ground **[ and Vault ]** Combined Water Service and Fire-Service-Main Piping [NPS 6 to NPS 12] shall be ductile-iron, grooved-end pipe; ductile-iron-pipe appurtenances; and grooved joints.

### 3.3 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FMG, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, **[metal] [resilient]**-seated gate valves with valve box.
  - 2. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FMG, cast-iron, nonrising-stem gate valves with indicator post.

### 3.4 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. See Division 2 Section "Piped Utilities - Basic Materials and Methods" for piping-system common requirements.

### 3.5 PIPING INSTALLATION

- A. Water-Main Connection: Arrange with utility company for tap of size and in location indicated in water main.
- B. Water-Main Connection: Tap water main according to requirements of water utility company and of size and in location indicated.
- C. Make connections larger than NPS 2 with tapping machine according to the following:
  - 1. Install tapping sleeve and tapping valve according to MSS SP-60.
  - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
  - 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
  - 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
- D. Make connections NPS 2 and smaller with drilling machine according to the following:
  - 1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
  - 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
  - 3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
  - 4. Install corporation valves into service-saddle assemblies.
  - 5. Install manifold for multiple taps in water main.
  - 6. Install curb valve in water-service piping with head pointing up and with service box.
- E. Comply with NFPA 24 for fire-service-main piping materials and installation.
  - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
  - 2. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- F. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
  - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- G. Install PE pipe according to ASTM D 2774 and ASTM F 645.
- H. Install PVC, AWWA pipe according to ASTM F 645 and AWWA M23.
- I. Install fiberglass AWWA pipe according to AWWA M45.
- J. Bury piping with depth of cover over top at least [48 inches], with top at least [12 inches] below level of maximum frost penetration, and according to the following:

1. Under Driveways: With at least [48 inches] cover over top.
  2. Under Railroad Tracks: With at least [48 inches] cover over top.
  3. In Loose Gravelly Soil and Rock: With at least [12 inches] additional cover.
- K. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.
- L. Extend water-service piping and connect to water-supply source and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.
1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.
- M. Sleeves are specified in Division 15 Section "Sleeves and Sleeve Seals for Plumbing Piping."
- N. Mechanical sleeve seals are specified in Division 15 Section "Sleeves and Sleeve Seals for Plumbing Piping."
- O. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- P. See Division 13 Section "Fire-Suppression Piping" for fire-suppression-water piping inside the building.
- Q. See Division 15 Section "Domestic Water Piping" for potable-water piping inside the building.

### 3.6 JOINT CONSTRUCTION

- A. See Division 2 Section "Piped Utilities - Basic Materials and Methods" for basic piping joint construction.
- B. Make pipe joints according to the following:
1. Copper-Tubing, Pressure-Sealed Joints: Use proprietary crimping tool and procedure recommended by copper, pressure-seal-fitting manufacturer.
  2. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
  3. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
  4. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
  5. PE Piping Insert-Fitting Joints: Use plastic insert fittings and fasteners according to fitting manufacturer's written instructions.
  6. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
  7. Fiberglass Piping Bonded Joints: Use adhesive and procedure recommended by piping manufacturer.
  8. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

- a. Dielectric Fittings for [NPS 2] and Smaller: Use dielectric [**nipples**] [**unions**].
- b. Dielectric Fittings for [NPS 2-1/2 to NPS 4]: Use dielectric [**flanges**] [**flange kits**] [**nipples**].
- c. Dielectric Fittings for [NPS 5] and Larger: Use dielectric flange kits.

### 3.7 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
  - 1. Concrete thrust blocks.
  - 2. Locking mechanical joints.
  - 3. Set-screw mechanical retainer glands.
  - 4. Bolted flanged joints.
  - 5. Heat-fused joints.
  - 6. Pipe clamps and tie rods.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
  - 1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
  - 2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
  - 3. Bonded-Joint Fiberglass, Water-Service Piping: According to AWWA M45.
  - 4. Fire-Service-Main Piping: According to NFPA 24.
- C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

### 3.8 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.
- C. UL/FMG, Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.
- D. UL/FMG, Valves Other Than Gate Valves: Comply with NFPA 24.
- E. MSS Valves: Install as component of connected piping system.
- F. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.
- G. Pressure-Reducing Valves: Install in vault or aboveground between shutoff valves. [**Install full-size valved bypass.**]
- H. Relief Valves: Comply with AWWA C512. Install aboveground with shutoff valve on inlet.

### 3.9 DETECTOR-CHECK VALVE INSTALLATION

- A. Install in vault or aboveground.
- B. Install for proper direction of flow. Install bypass with water meter, gate valves on each side of meter, and check valve downstream from meter.
- C. Support detector check valves, meters, shutoff valves, and piping on brick or concrete piers.

### 3.10 WATER METER INSTALLATION

- A. Install water meters, piping, and specialties according to utility company's written instructions.
- B. Water Meters: Install [**displacement**] [**turbine**]-type water meters, NPS 2 and smaller, in meter boxes with shutoff valves on water meter inlets. Include valves on water meter outlets and valved bypass around meters unless prohibited by authorities having jurisdiction.
- C. Water Meters: Install [**compound**] [**turbine**]-type water meters, NPS 3 and larger, in meter vaults. Include shutoff valves on water meter inlets and outlets and valved bypass around meters. Support meters, valves, and piping on brick or concrete piers.
- D. Water Meters: Install detector-type water meters in meter vault according to AWWA M6. Include shutoff valves on water meter inlets and outlets and full-size valved bypass around meters. Support meters, valves, and piping on brick or concrete piers.

### 3.11 ROUGHING-IN FOR WATER METERS

- A. Rough-in piping and specialties for water meter installation according to utility company's written instructions.

### 3.12 VACUUM BREAKER ASSEMBLY INSTALLATION

- A. Install pressure vacuum breaker assemblies of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.
- B. Do not install pressure vacuum breaker assemblies in vault or other space subject to flooding.

### 3.13 BACKFLOW PREVENTER INSTALLATION

- A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.
- B. Do not install backflow preventers that have relief drain in vault or in other spaces subject to flooding.
- C. Do not install bypass piping around backflow preventers.



- D. Support NPS 2-1/2 and larger backflow preventers, valves, and piping near floor and on brick or concrete piers.

### 3.14 WATER METER BOX INSTALLATION

- A. Install water meter boxes in paved areas flush with surface.
- B. Install water meter boxes in grass or earth areas with top [2 inches] above surface.

### 3.15 CONCRETE VAULT INSTALLATION

- A. Install precast concrete vaults according to ASTM C 891.

### 3.16 PROTECTIVE ENCLOSURE INSTALLATION

- A. Install concrete base level and with top approximately [2 inches] above grade.
- B. Install protective enclosure over valves and equipment.
- C. Anchor protective enclosure to concrete base.

### 3.17 FIRE HYDRANT INSTALLATION

- A. General: Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints or thrust blocks, and support in upright position.
- B. Wet-Barrel Fire Hydrants: Install with valve below frost line. Provide for drainage.
- C. AWWA Fire Hydrants: Comply with AWWA M17.
- D. UL/FMG Fire Hydrants: Comply with NFPA 24.

### 3.18 FLUSHING HYDRANT INSTALLATION

- A. Install post-type flushing hydrants with valve below frost line and provide for drainage. Support in upright position. Include separate gate valve or curb valve and restrained joints in supply piping.
- B. Install ground-type flushing hydrants with valve below frost line and provide for drainage. Install hydrant box flush with grade. Include separate gate valve or curb valve and restrained joints in supply piping.
- C. Install sampling stations with valve below frost line and provide for drainage. Attach weather-resistant housing and support in upright position. Include separate curb valve in supply piping.

### 3.19 FIRE DEPARTMENT CONNECTION INSTALLATION

- A. Install ball drip valves at each check valve for fire department connection to mains.
- B. Install protective pipe bollards [**on two sides of**] [**on three sides of**] each fire department connection. Pipe bollards are specified in Division 5 Section "Metal Fabrications."

### 3.20 ALARM DEVICE INSTALLATION

- A. General: Comply with NFPA 24 for devices and methods of valve supervision. Underground valves with valve box do not require supervision.
- B. Supervisory Switches: Supervise valves in open position.
  - 1. Valves: Grind away portion of exposed valve stem. Bolt switch, with plunger in stem depression, to OS&Y gate-valve yoke.
  - 2. Indicator Posts: Drill and thread hole in upper-barrel section at target plate. Install switch, with toggle against target plate, on barrel of indicator post.
- C. Locking and Sealing: Secure unsupervised valves as follows:
  - 1. Valves: Install chain and padlock on open OS&Y gate valve.
  - 2. Post Indicators: Install padlock on wrench on indicator post.
- D. Pressure Switches: Drill and thread hole in exposed barrel of fire hydrant. Install switch.
- E. Water-Flow Indicators: Install in water-service piping in vault. Select indicator with saddle and vane matching pipe size. Drill hole in pipe, insert vane, and bolt saddle to pipe.
- F. Connect alarm devices to building fire alarm system. Wiring and fire-alarm devices are specified in Division 13 Section "Fire Alarm."

### 3.21 CONNECTIONS

- A. Piping installation requirements are specified in other Division 2 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. See Division 2 Section "Piped Utilities - Basic Materials and Methods" for piping connections to valves and equipment.
- C. Connect water-distribution piping to [**existing water main**]. Use [**tapping sleeve and tapping valve**] or [**service clamp and corporation valve**].
- D. Connect water-distribution piping to interior [**domestic water**] [**and**] [**fire-suppression**] piping.
- E. Ground equipment according to Division 16 Section "Grounding and Bonding."
- F. Connect wiring according to Division 16 Section "Conductors and Cables."

### 3.22 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.
  - 1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.
- C. Prepare reports of testing activities.

### 3.23 IDENTIFICATION

- A. Install continuous under-ground [**detectable**] warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Division 2 Section "Earthwork."
- B. Permanently attach equipment nameplate or marker indicating plastic water-service piping, on main electrical meter panel. See Division 2 Section "Piped Utilities - Basic Materials and Methods" for identifying devices.

### 3.24 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
  - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  - 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
  - 3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
    - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
    - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
    - c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
    - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 02510

## SECTION 02530 - SANITARY SEWERAGE

### 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. Section Includes:
  - 1. Pipe and fittings.
  - 2. Nonpressure and pressure couplings.
  - 3. Expansion joints and deflection fittings.
  - 4. Backwater valves.
  - 5. Cleanouts.
  - 6. Encasement for piping.
  - 7. Manholes.

#### 1.3 DEFINITIONS

- A. FRP: Fiberglass-reinforced plastic.

#### 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Expansion joints and deflection fittings.
  - 2. Backwater valves.
- B. Shop Drawings: For manholes. Include plans, elevations, sections, details, and frames and covers.
- C. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- D. Profile Drawings: Show system piping in elevation. Draw profiles to horizontal scale of not less than 1 inch equals 50 feet and to vertical scale of not less than 1 inch equals 5 feet. Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- E. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.

- F. Field quality-control reports.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.

#### 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
  - 1. Notify Architect and Owner no fewer than seven (7) days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without Architect's and Owner's written permission.
- B. PVC Type PSM Sewer Piping:
  - 1. Pipe: ASTM D 3034, [**SDR 35**], or SDR 26 PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
  - 2. Fittings: ASTM D 3034, PVC with bell ends.
  - 3. Gaskets: ASTM F 477, elastomeric seals.
- C. PVC Gravity Sewer Piping:
  - 1. Pipe and Fittings: ASTM F 679, [**T-1**] [**T-2**] wall thickness, PVC gravity sewer pipe with bell-and-spigot ends and with integral ASTM F 477, elastomeric seals for gasketed joints.
- D. PVC Pressure Piping:
  - 1. Pipe: AWWA C900, [**Class 150**] PVC pipe with bell-and-spigot ends for gasketed joints.
  - 2. Fittings: AWWA C900, [**Class 150**] PVC pipe with bell ends.
  - 3. Gaskets: ASTM F 477, elastomeric seals.

#### 1.7 CLEANOUTS

- A. Cast-Iron Cleanouts:
  - 1. 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]**:
    - a. Josam Company.

- b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
  3. Top-Loading Classification(s): **[Heavy Duty] [and] [Extra-Heavy Duty]**.
  4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

B. PVC Cleanouts:

1. 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]**:
  - a. Canplas LLC.
  - b. IPS Corporation.
  - c. NDS.
  - d. Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
  - e. Sioux Chief Manufacturing Company, Inc.
  - f. Zurn Light Commercial Products Operation; Zurn Plumbing Products Group.
2. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

1.8 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section; with separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, of length to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated; with top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: **[Individual FRP steps, FRP ladder, or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP]**; wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step.

Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than **[60 inches]**.

10. Adjusting Rings: Interlocking HDPE rings, with level or sloped edge in thickness and diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.
11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Designed Precast Concrete Manholes:

1. Description: ASTM C 913; designed according to ASTM C 890 for A-16 (ASSHTO HS20-44), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for sealant joints.
2. Ballast: Increase thickness of one or more precast concrete sections or add concrete to manhole as required to prevent flotation.
3. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
4. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
5. Steps: **[Individual FRP steps, FRP ladder, or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP]**; wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than **[60 inches]**.
6. Adjusting Rings: Interlocking HDPE rings, with level or sloped edge in thickness and diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.
7. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.

C. Fiberglass Manholes:

D. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch ID by 7- to 9-inch riser, with 4-inch- minimum-width flange and 26-inch- diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER."
2. To be installed per AHJ Requirements.

E. Manhole-Cover Inserts:

1. 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]**:
  - a. FRW Industries; a Syneco Systems, Inc. company.
  - b. Knutson Enterprises.



- c. L. F. Manufacturing, Inc.
  - d. Parson Environmental Products, Inc.
- 2. Description; Manufactured, plastic form, of size to fit between manhole frame and cover and designed to prevent stormwater inflow. Include handle for removal and gasket for gastight sealing.
  - 3. Type: [Per AHJ Requirements.].

## 1.9 CONCRETE

- A. General: Cast-in-place concrete complying with ACI 318, ACI 350/350R, and the following:
  - 1. Cement: ASTM C 150, Type II.
  - 2. Fine Aggregate: ASTM C 33, sand.
  - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
  - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
  - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: [1] percent through manhole.
  - 2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: [4] percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

## PART 2 - EXECUTION

### 2.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

## 2.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, nonpressure, drainage piping according to the following:
  - 1. Install piping pitched down in direction of flow, at slope shown on drawings.
  - 2. Install PVC Type PSM sewer piping according to ASTM D 2321 and ASTM F 1668.
  - 3. Install PVC gravity sewer piping according to ASTM D 2321 and ASTM F 1668.
- G. Install force-main, pressure piping according to the following:
  - 1. Install piping with restrained joints at tee fittings and at horizontal and vertical changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place-concrete supports or anchors.
  - 2. Install piping with **[48-inch]** minimum cover.
  - 3. Install PVC pressure piping according to AWWA M23 or to ASTM D 2774 and ASTM F 1668.
- H. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

## 2.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure, drainage piping according to the following:
  - 1. Join PVC Type PSM sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
  - 2. Join PVC gravity sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
- B. Join force-main, pressure piping according to the following:

1. Join ductile-iron pressure piping according to AWWA C600 or AWWA M41 for push-on joints.
2. Join ductile-iron special fittings according to AWWA C600 or AWWA M41 for push-on joints.
3. Join PVC pressure piping according to AWWA M23 for gasketed joints.
4. Join PVC water-service piping according to ASTM D 2855.
5. Join dissimilar pipe materials with pressure-type couplings.

## 2.4 MANHOLE INSTALLATION

- A. General: Install manholes complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Install FRP manholes according to manufacturer's written instructions.
- D. Form continuous concrete channels and benches between inlets and outlet.
- E. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops [**3 inches**] above finished surface elsewhere unless otherwise indicated.
- F. Install manhole-cover inserts in frame and immediately below cover.

## 2.5 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

## 2.6 BACKWATER VALVE INSTALLATION

- A. Install horizontal-type backwater valves in piping manholes or pits.
- B. Install combination horizontal and manual gate valves in piping and in manholes.
- C. Install terminal-type backwater valves on end of piping and in manholes. Secure units to sidewalls.

## 2.7 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
  1. Use Light-Duty, top-loading classification cleanouts in [**earth or unpaved foot-traffic**] areas.
  2. Use Medium-Duty, top-loading classification cleanouts in [**paved foot-traffic**] areas.
  3. Use Heavy-Duty, top-loading classification cleanouts in [**vehicle-traffic service**] areas.
  4. Use Extra-Heavy-Duty, top-loading classification cleanouts in [**roads**].

- B. Set cleanout frames and covers in earth in cast-in-place-concrete block, [**18 by 18 by 12 inches**] deep. Set with tops [3 **inches**] above surrounding grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

## 2.8 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Division 15 Section "Sanitary Waste and Vent Piping."
- B. Connect force-main piping to building's sanitary force mains specified in Division 15 Section "Sanitary Waste and Vent Piping." Terminate piping where indicated.
- C. Make connections to existing piping and underground manholes.
  - 1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  - 2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  - 3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes by cutting opening into existing unit large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe or manhole wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
    - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  - 4. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.
- D. Connect to [**grease**] [**oil**] [**and**] [**sand**] interceptors specified in Division 2 Section "Interceptors."

## 2.9 CLOSING ABANDONED SANITARY SEWER SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least **[8-inch-]** thick, brick masonry bulkheads.
  2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Manholes: Excavate around manhole as required and use either procedure below:
1. Remove manhole and close open ends of remaining piping.
  2. Remove top of manhole down to at least **[36 inches]** below final grade. Fill to within **[12 inches]** of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.
- C. Backfill to grade according to Division 2 Section "Earthwork."

## 2.10 IDENTIFICATION

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.
1. Use **[warning tape or]** detectable warning tape over ferrous piping.
  2. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

## 2.11 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
1. Submit separate report for each system inspection.
  2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to requirements of authorities having jurisdiction.
  3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

4. Submit separate report for each test.
  5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:
    - a. Fill sewer piping with water. Test with pressure of at least 10-foot head of water, and maintain such pressure without leakage for at least 15 minutes.
    - b. Close openings in system and fill with water.
    - c. Purge air and refill with water.
    - d. Disconnect water supply.
    - e. Test and inspect joints for leaks.
  6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
    - b. Option: Test concrete gravity sewer piping according to ASTM C 924.
  7. Force Main: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than **[150 psig]**.
    - a. Ductile-Iron Piping: Test according to AWWA C600, "Hydraulic Testing" Section.
    - b. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.
  8. Manholes: Perform hydraulic test according to ASTM C 969.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

## 2.12 CLEANING

- A. Clean dirt and superfluous material from interior of piping. **[Flush with potable water.]**

END OF SECTION 02530

## SECTION 02553 - NATURAL GAS DISTRIBUTION

## 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 natural gas distribution outside the building:
  - 1. Piping.
  - 2. Valves.
  - 3. Service regulators.
  - 4. Service meters.
  - 5. Concrete bases.
- B. Related Sections include the following:
  - 1. Division 15 Section "Fuel Gas Piping" for natural gas piping inside the building.

## 1.3 DEFINITIONS

- A. Gas Main: Utility's natural gas piping.
- B. Gas Distribution: Piping from gas main to individual service-meter assemblies.
- C. Service-Meter Assembly: Piping, valves, **[service regulator,]** **[service meter,]** and specialties.
- D. Point of Delivery: Piping outlet from service-meter assembly.
- E. Natural Gas Piping: Piping that conveys natural gas from point of delivery to natural gas utilization devices inside the building.
- F. PE: Polyethylene plastic.

## 1.4 PERFORMANCE REQUIREMENTS

- A. Minimum Working-Pressure Ratings:
  - 1. Piping and Valves: **[100 psig]** **<Insert other>** minimum, unless otherwise indicated.
  - 2. Service Regulators: **[65 psig]** **[100 psig]** **<Insert other>** minimum, unless otherwise indicated.

3. Service Meters: **[5 psig] [10 psig] [20 psig] [65 psig]** <Insert other> minimum, unless otherwise indicated.

## 1.5 SUBMITTALS

- A. Product Data: For the following:
  1. PE pipe and fittings.
  2. Valves.
  3. Service regulators. Indicate pressure ratings and capacities.
  4. Service meters. Indicate **[pressure ratings and]** capacities. Include **[bypass fittings] [bypass fittings and meter bars] [meter bars] [supports]**.
- B. Shop Drawings: For natural gas service piping and service meter assembly. Include plans, elevations, sections, details, and attachments to other work.
- C. Welding certificates.
- D. Field quality-control test reports.
- E. Operation and Maintenance Data: For the following natural gas distribution equipment and accessories to include in emergency, operation, and maintenance manuals.
  1. Service regulators.
  2. Service meters.
  3. Earthquake valves.

## 1.6 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of earthquake valves and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- B. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
- C. Comply with requirements of utility supplying natural gas and with authorities having jurisdiction for natural gas systems.
- D. Comply with **[ANSI Z223.1 or NFPA 54] [or] [AGA IFGC]** for materials, installation, testing, inspection, and purging.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handling Flammable Liquids: Remove and legally dispose of liquids from drips in existing gas piping. Handle liquids to avoid spillage and ignition. Notify gas supplier. Do not leave flammable liquids on premises overnight.
- B. Store PE pipes and valves protected from direct sunlight.



## 1.8 PROJECT CONDITIONS

- A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located.
- B. Interruption of Existing Natural Gas Service: Do not interrupt natural gas service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide purging and startup of gas supply according to requirements indicated:
  - 1. Notify **[Architect]** **[Construction Manager]** **[Owner]** no fewer than **[two]** **<Insert number>** days in advance of proposed interruption of natural gas service.
  - 2. Do not proceed with interruption of natural gas service without **[Architect's]** **[Construction Manager's]** **[Owner's]** written permission.

## 1.9 COORDINATION

- A. Coordinate connection to gas main with utility.
- B. Coordinate natural gas distribution with other utility Work.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.2 PIPES AND FITTINGS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.
- B. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B; Schedule 40, black.
  - 1. Malleable-Iron Fittings: ASME B16.3, Class 150, standard pattern, with threads complying with ASME B1.20.1.
  - 2. Steel Fittings: ASME B16.9, wrought-steel butt-welding type; and ASME B16.11, forged steel.
  - 3. Steel Flanges and Flanged Fittings: ASME B16.5.
  - 4. Unions: ASME B16.39, Class 150, black malleable iron; female pattern; brass-to-iron seat; ground joint.

C. PE Pipe: ASTM D 2513, SDR 11.

1. PE Fittings: ASTM D 2683, socket type or ASTM D 3261, butt type with dimensions matching ASTM D 2513, SDR 11, PE pipe.

D. Transition Fittings: Manufactured pipe fitting with one PE pipe end for **[heat-fusion]** **<Insert other>** connection to PE pipe and with one ASTM A 53/A 53M, Schedule 40, steel pipe end for threaded connection to steel pipe.

E. Service-Line Risers: Manufactured PE pipe fitting with PE pipe inlet for **[heat-fusion]** **<Insert other>** connection to underground PE pipe; PE pipe riser section with protective-coated, anodeless, steel casing and threaded outlet for threaded connection to aboveground steel piping.

## 2.3 JOINING MATERIALS

A. Components, Tapes, Gaskets, and Bolts and Nuts: Suitable for natural gas and as recommended by piping manufacturer.

## 2.4 SHUTOFF VALVES

A. Shutoff Valves, General: Manual operation, suitable for natural gas service, and with 100-psig **<Insert other>** minimum working-pressure rating.

B. Threaded Valves, NPS 1 and Smaller: Include listing by agency acceptable to authorities having jurisdiction.

C. Nonlubricated, Tapered Plug Valves: Brass or cast-iron body, with brass tapered plug; lever operation; and complying with ASME B16.33, MSS SP-78, UL 842[, **or CSA listing**]. Include lever[ **and locking device**].

1. **[Available]** Manufacturers:

- a. Essex Brass.
- b. Lyall, R. W. & Company, Inc.
- c. McDonald, A. Y. Mfg. Co.
- d. Mueller Company.
- e. **<Insert manufacturer's name.>**

D. Lubricated, Tapered Plug Valves: Cast-iron body, with lubricated, brass tapered plug; lever operation; and complying with ASME B16.33, MSS SP-78, UL 842[, **or CSA listing**]. Include lever[ **and locking device**].

1. **[Available]** Manufacturers:

- a. Mueller Company.
- b. National Meter.
- c. Nordstrom Valves, Inc.
- d. **<Insert manufacturer's name.>**

- E. Ball Valves: Bronze body, with chrome-plated brass ball; lever handle; and complying with ASME B16.33, MSS SP-110, UL 842[, **or CSA listing**].[ **Include locking device.**]
1. [Available ]Manufacturers:
- a. Conbraco Industries, Inc.
  - b. Hammond Valve.
  - c. Maxitrol Company.
  - d. Milwaukee Valve Company.
  - e. NIBCO.
  - f. Stockham.
  - g. Watts Industries, Inc.
  - h. <Insert manufacturer's name.>
- F. Lubricated Plug Valves: Cast-iron body, with lubricated, tapered, or cylindrical plug; lever operation; and complying with ASME B16.38, MSS SP-78, UL 842[, **or CSA listing**].[ **Include locking device.**]
1. [Available ]Manufacturers:
- a. Milliken Valve Co., Inc.
  - b. Nordstrom Valves, Inc.
  - c. Olson Technologies, Inc.; Homestead Valve Div.
  - d. R & M Energy Systems; Flow Control Div.
  - e. Walworth Company (The).
  - f. <Insert manufacturer's name.>
- G. Nonlubricated Plug Valves: Cast-iron body, with resilient-coated eccentric plug; lever operation; and complying with ASME B16.38, MSS SP-108, UL 842[, **or CSA listing**].[ **Include locking device.**]
1. [Available ]Manufacturers:
- a. Milliken Valve Co., Inc.
  - b. Olson Technologies, Inc.; Homestead Valve Div.
  - c. Pratt, Henry Co.
  - d. SPX Corporation; DeZURIK Unit.
  - e. <Insert manufacturer's name.>
- H. PE Valves: Made for gas distribution, with nut or flat head for key operation; and complying with ASME B16.40, UL 842[, **or CSA listing**].
1. [Available ]Manufacturers:
- a. Kerotest Manufacturing Corp.
  - b. Lyall, R. W. & Company, Inc.
  - c. Nordstrom Valves, Inc.
  - d. Perfection Corporation; Gas Products Div.
  - e. <Insert manufacturer's name.>

- I. Valve Boxes: Cast-iron, two-section box. Include top section with cover with "GAS" lettering, bottom section with base to fit over valve and barrel 5 inches in diameter, and adjustable cast-iron extension of length required for depth of bury. Include tee-handle, steel operating wrench with socket end fitting valve nut or flat head and with stem of length required to operate valve.

## 2.5 EARTHQUAKE VALVES

- A. Description: ASCE 25[ **or CSA listing**], mechanical-operation and automatic-shutoff type with operating-pressure rating at least as great as system pressure.
  1. Pipe Connections:
    - a. NPS 2 and Smaller: Threaded.
    - b. NPS 2-1/2 and Larger: Flanged.
  2. [**Available**]Manufacturers:
    - a. Pacific Seismic Products, Inc.
    - b. Quake Defense, Inc.; Emergency Fail-Safe Systems.
    - c. Safe T Quake.
    - d. Seismic Safety Products, Inc.
    - e. US QuakeKoso Canada, Inc.
    - f. **<Insert manufacturer's name.>**

## 2.6 SERVICE REGULATORS

- A. Description: Natural gas service regulator complying with ANSI B109.4 or DIR 006.3-listed for service regulators.
  1. Construction: Single-stage, steel-jacketed, corrosion-resistant diaphragm type. Include atmospheric vent and elevation compensator.
  2. Pipe Connections:
    - a. NPS 2 and Smaller: Threaded.
    - b. NPS 2-1/2 and Larger: Flanged.
  3. [**Available**]Manufacturers:
    - a. American Meter Co.
    - b. Fisher Controls International.
    - c. Invensys Energy Metering.
    - d. National Meter.
    - e. Schlumberger Limited.
    - f. **<Insert manufacturer's name.>**

## 2.7 SERVICE METERS

- A. Service Meters, General: Positive-displacement gas meter.

1. Construction: Metal case with temperature compensation, and corrosion-resistant internal components.
  2. Pipe Connections:
    - a. NPS 2 and Smaller: Threaded.
    - b. NPS 2-1/2 and Larger: Flanged.
- B. Small-Capacity Service Meters: ANSI B109.1, diaphragm type, with registration in cubic feet for meters with capacities of 500 cfh and less.
1. **[Available]** Manufacturers:
    - a. American Meter Co.
    - b. Fisher Controls International.
    - c. Invensys Energy Metering.
    - d. National Meter.
    - e. Schlumberger Limited.
    - f. **<Insert manufacturer's name.>**
- C. Large-Capacity Service Meters: ANSI B109.2, diaphragm type, with registration in cubic feet for meters with capacities of more than 500 cfh.
1. **[Available]** Manufacturers:
    - a. American Meter Co.
    - b. Invensys Energy Metering.
    - c. **<Insert manufacturer's name.>**
- D. Rotary Service Meters: ANSI B109.3, rotating-lobe type, with registration in cubic feet.
1. **[Available]** Manufacturers:
    - a. American Meter Co.
    - b. Schlumberger Limited.
    - c. **<Insert manufacturer's name.>**
- E. Service-Meter Bars: Malleable- or cast-iron frame for supporting service meter. Include offset swivel pipes, nuts with O-ring seal, factory- or field-installed dielectric unions, and threaded ends.
1. Exception: Omit offset swivel pipes if dimensions match meter connections.
  2. **[Available]** Manufacturers:
    - a. Fisher Controls International.
    - b. McDonald, A. Y. Mfg. Co.
    - c. Mueller Company.
    - d. National Meter.
    - e. Schlumberger Limited.
    - f. **<Insert manufacturer's name.>**

- F. Service-Meter, Bypass Fitting: Ferrous, tee pipe fitting with integral ball check valve and capped side inlet for temporary natural gas supply.

1. **[Available ]Manufacturers:**

- a. Lyall, R. W. & Company, Inc.
- b. Williamson, T. D., Inc.
- c. **<Insert manufacturer's name.>**

## 2.8 CONCRETE BASES

- A. Description: Precast concrete made of 3000-psi- minimum, 28-day compressive strength reinforced concrete; at least 4 inches thick and 4 inches larger in each dimension than supported item, unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

### 3.2 PREPARATION

- A. Close equipment shutoff valves before turning off gas to premises or piping section.
- B. Inspect natural gas piping according to fuel gas code to determine that natural gas utilization devices are turned off in piping section affected.
- C. Comply with fuel gas code requirements for prevention of accidental ignition.

### 3.3 PIPING APPLICATIONS

- A. Flanges, unions, and transition and special fittings with pressure ratings same as or higher than system pressure rating may be used, unless otherwise indicated.
- B. Aboveground Piping:
  1. NPS 2 and Smaller: Steel pipe, butt-welding-type fittings, and welded joints. Joints for connection to threaded service regulators, service meters, and valves may be threaded.
  2. NPS 2 and Smaller: Steel pipe, malleable-iron fittings, and threaded joints.
  3. NPS 2-1/2 and Larger: Steel pipe, butt-welding-type fittings, and welded joints. Joints for connection to service regulators, service meters, and valves with flanged connections may be flanged. Joints for connection to service regulators, service meters, and valves with threaded connections NPS 2-1/2 to NPS 4 may be threaded.
- C. Underground Piping: PE pipe, PE fittings, and heat-fusion joints.

- D. Protective Conduit for Underground Piping: Steel pipe and threaded- or welding-type fittings.
- E. Underground-to-Aboveground Piping Connections: Service-line riser.
- F. PE-to-Steel Piping Connections: Transition fitting.

### 3.4 VALVE APPLICATIONS

- A. Drawings indicate types of shutoff valves to be used. If specific types are not indicated, the following requirements apply:
  - 1. Connections to Existing Gas Piping: Use valve and fitting assemblies made for tapping gas mains.
  - 2. Underground: Use PE valves.
  - 3. Aboveground, NPS 2 and Smaller: **[Lubricated]** **[Nonlubricated]** tapered plug valves.
  - 4. Aboveground, NPS 2 and Smaller: Ball valves.
  - 5. Aboveground, NPS 2-1/2 and Larger: **[Lubricated]** **[Nonlubricated]** plug valves.

### 3.5 PIPING INSTALLATION

- A. Install underground, natural gas distribution piping buried at least **[36 inches]** **<Insert other>** below finished grade.
- B. Install underground, PE, natural gas distribution piping according to ASTM D 2774.
- C. Install underground, PE, natural gas distribution piping at entrance to and under part of building in steel piping protective conduit that is vented to outside.
- D. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate would be subject to freezing.
  - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- E. Terminate service-regulator horizontal vents or horizontal vent piping with reducing-elbow fittings with large end as outlet. Install fitting outlet turned down with corrosion-resistant insect screen in outlet.

### 3.6 SERVICE-METER ASSEMBLY INSTALLATION

- A. Install service-meter assemblies aboveground[, **on concrete bases**].
- B. Install metal shutoff valves upstream from service regulators. Shutoff valves are not required at second regulators if two regulators are installed in series.

- C. Install service regulators with vent outlet horizontal or facing down. Install screen in outlet if not integral with service regulator.
- D. Install metal shutoff valves upstream from service meters. Install dielectric fittings downstream from service meters. Refer to Division 2 Section "Piped Utilities -- Basic Materials and Methods" for dielectric fittings.
- E. Install service meters downstream from pressure regulators.
- F. Install pressure-relief or pressure-limiting devices so they can be readily operated to determine if devices are free of debris, tested to determine pressure at which they will operate, and examined for leakage if closed.
- G. Install at least **[two]** ~~<Insert other>~~ pipe bollards **[in front of]** **[as indicated around]** meter assemblies. Refer to Division 5 Section "Metal Fabrications" for pipe bollards.

### 3.7 VALVE INSTALLATION

- A. Install PE shutoff valves on branch connections to existing underground, natural gas distribution piping. Install valves with valve boxes.
- B. Install metal shutoff valves on aboveground, natural gas distribution piping.
- C. Install earthquake valves aboveground, outside building, and according to listing applications.

### 3.8 JOINT CONSTRUCTION

- A. Refer to Division 2 Section "Piped Utilities -- Basic Materials and Methods" for basic piping joint construction.

### 3.9 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect gas distribution piping to natural gas source and extend to service-meter assemblies and points indicated. Connect to building's natural gas piping if it is installed; otherwise, terminate piping with caps, plugs, or flanges, as required for piping material. Refer to Division 15 Section "Fuel Gas Piping" for natural gas piping inside the building.
- C. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment having threaded pipe connection.
- D. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
- E. Connect to utility gas main according to utility's procedures and requirements.
- F. Install aboveground, natural gas distribution piping upstream from equipment shutoff valves, electrically continuous, and bonded to grounding electrode according to NFPA 70.



- G. Do not use natural gas distribution piping as grounding electrode.

### 3.10 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on or near each service regulator, service meter, and earthquake valve.
  - 1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
- B. Refer to Division 2 Section "Piped Utilities -- Basic Materials and Methods" for equipment nameplates and signs.
- C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tape over natural gas distribution piping during backfilling of trenches for piping.
- D. Refer to Division 2 Section "Earthwork" for warning tapes.

### 3.11 PAINTING

- A. Refer to Division 2 Section "Piped Utilities -- Basic Materials and Methods" and Division 9 Section "[**Painting (Consumer Line Products)**] [**Painting (Professional Line Products)**] [**High-Performance Coatings**]" for field-applied finishes.
- B. Paint exposed metal piping, valves, service regulators, service meters and meter bars, earthquake valves, and piping specialties except units with factory-applied paint or protective coating.
- C. Damage and Touchup: Repair marred and damaged factory-applied finishes with materials and by procedures to match original factory finish.

### 3.12 FIELD QUALITY CONTROL

- A. Test, inspect, and purge natural gas distribution according to requirements of fuel gas code and utility.
- B. Repair leaks and defective valves and specialties and retest system until no leaks exist.
- C. Report results in writing.
- D. Verify correct pressure settings for service regulators.

### 3.13 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain earthquake valves. Refer to Division 1 Section "[**Closeout Procedures**] [**Demonstration and Training**]."

END OF SECTION 02553

## SECTION 02630 - STORM DRAINAGE

### 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. Section Includes:

1. Pipe and fittings.
2. Nonpressure transition couplings.
3. Pressure pipe couplings.
4. Expansion joints and deflection fittings.
5. Backwater valves.
6. Cleanouts.
7. Drains.
8. Encasement for piping.
9. Manholes.
10. Channel drainage systems.
11. Catch basins.
12. Stormwater inlets.
13. Stormwater detention structures.
14. Pipe outlets.
15. Dry wells.
16. Stormwater disposal systems.

#### 1.3 DEFINITIONS

- A. FRP: Fiberglass-reinforced plastic.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
  1. Manholes: Include plans, elevations, sections, details, frames, and covers.
  2. **[Catch basins] & [stormwater inlets]**. Include plans, elevations, sections, details, frames, covers, and grates.
  3. Stormwater Detention Structures: Include plans, elevations, sections, details, frames, covers, design calculations, and concrete design-mix reports.

- C. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- D. Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than 1 inch equals 50 feet and vertical scale of not less than 1 inch equals 5 feet. Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- E. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- F. Field quality-control reports.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.
- D. Handle [**catch basins**] [**and**] [**stormwater inlets**] according to manufacturer's written rigging instructions.

## 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
  - 1. Notify Architect and Owner no fewer than seven (7) days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without Architect's and Owner's written permission.

## PART 2 - PRODUCTS

### 2.1 PE PIPE AND FITTINGS

- A. Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth waterway for coupling joints.
  - 1. Silt-tight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
  - 2. Soil-tight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.
- B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints.

1. Silt-tight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
2. Soil-tight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

## 2.2 PVC PIPE AND FITTINGS

### A. PVC Cellular-Core Piping:

1. PVC Cellular-Core Pipe and Fittings: ASTM F 891, Sewer and Drain Series, PS 50 minimum stiffness, PVC cellular-core pipe with plain ends for solvent-cemented joints.
2. Fittings: ASTM D 3034, [**SDR 26**], PVC socket-type fittings.

### B. PVC Corrugated Sewer Piping:

1. Pipe: ASTM F 949, PVC, corrugated pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM F 949, PVC molded or fabricated, socket type.
3. Gaskets: ASTM F 477, elastomeric seals.

### C. PVC Profile Sewer Piping:

1. Pipe: ASTM F 794, PVC profile, gravity sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

### D. PVC Type PSM Sewer Piping:

1. Pipe: ASTM D 3034, [**SDR 35**], PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

### E. PVC Gravity Sewer Piping:

1. Pipe and Fittings: ASTM F 679, [**T-1**] [**T-2**] wall thickness, PVC gravity sewer pipe with bell-and-spigot ends and with integral ASTM F 477, elastomeric seals for gasketed joints.

## 2.3 CONCRETE PIPE AND FITTINGS

### A. Nonreinforced-Concrete Sewer Pipe and Fittings: ASTM C 14, [**Class 1**] [**Class 2**] [**Class 3**].

### B. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.

1. [**Bell-and-spigot**] [**or**] [**tongue-and-groove**] ends and [**gasketed joints with ASTM C 443, rubber gaskets**]

## 2.4 CLEANOUTS

### A. Cast-Iron Cleanouts:

1. 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]**:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Top-Loading Classification(s): **[Heavy Duty] [and] [Extra-Heavy Duty]**.
4. Sewer Pipe Fitting and Riser to Clean-out: ASTM A 74, Service class, cast-iron soil pipe and fittings.

### B. Plastic Cleanouts:

1. 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]**:
  - a. Canplas LLC.
  - b. IPS Corporation.
  - c. NDS Inc.
  - d. Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
  - e. Sioux Chief Manufacturing Company, Inc.
  - f. Zurn Light Commercial Products Operation; Zurn Plumbing Products Group.
2. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to clean-out of same material as sewer piping.

## 2.5 DRAINS

### A. Cast-Iron Area Drains:

1. 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]**:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.

- e. Watts Water Technologies, Inc.
    - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
  - 2. Description: ASME A112.6.3 gray-iron round body with anchor flange and round **[secured]** grate. Include bottom outlet with inside calk or spigot connection, of sizes indicated.
  - 3. Top-Loading Classification(s): **[Heavy Duty]**.
- B. Cast-Iron Trench Drains:
- 1. 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]**:
    - a. Josam Company.
    - b. MIFAB, Inc.
    - c. Smith, Jay R. Mfg. Co.
    - d. Tyler Pipe.
    - e. Watts Water Technologies, Inc.
    - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
  - 2. Description: ASME A112.6.3, 6-inch- wide top surface, rectangular body with anchor flange or other anchoring device, and rectangular **[secured]** grate. Include units of total length indicated and quantity of bottom outlets with inside calk or spigot connections, of sizes indicated.
  - 3. Top-Loading Classification(s): **[Heavy and Extra-Heavy Duty]**.
- C. Steel Trench Drains:
- 1. 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]**:
    - a. Rockford Sanitary Systems, Inc.
  - 2. Description: Factory fabricated from ASTM A 242/A 242M, welded steel plate, to form rectangular body with uniform bottom downward slope of 2 percent toward outlet, anchor flange, and grate. Include units of total length indicated, bottom outlet of size indicated, outlet strainer, acid-resistant enamel coating on inside and outside surfaces, and grate with openings of total free area at least two times cross-sectional area of outlet.
  - 3. Plate Thicknesses: **[1/4 inch]**.
  - 4. Overall Widths: **[7-1/2 inches and 12-1/3 inches]**.
    - a. Grate Openings: **[3/8-by-3-inch slots]**.

## 2.6 MANHOLES

- A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: [**Individual FRP steps; FRP ladder; or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP**], wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than [**60 inches**].
10. Adjusting Rings: Interlocking HDPE rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.
11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Designed Precast Concrete Manholes:

1. Description: ASTM C 913; designed according to ASTM C 890 for A-16 (AASHTO HS20-44), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for sealant joints.
2. Ballast: Increase thickness of one or more precast concrete sections or add concrete to manhole as required to prevent flotation.
3. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
4. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
5. Steps: [**Individual FRP steps; FRP ladder; or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP**], wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than [**60 inches**].
6. Adjusting Rings: Interlocking HDPE rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.

C. Manhole Frames and Covers:

1. Per AHJ requirements.



## 2.7 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R , and the following:
1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: [1] [2] percent through manhole.
  2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: [4] [8] percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

## 2.8 CATCH BASINS

- A. Standard Precast Concrete Catch Basins:
1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
  2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
  3. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
  4. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  5. Joint Sealant: ASTM C 990, bitumen or butyl rubber.

6. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
  7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and grate.
  8. Steps: [**Individual FRP steps; FRP ladder; or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP**], wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of catch basin to finished grade is less than [**60 inches**].
  9. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- B. Designed Precast Concrete Catch Basins: ASTM C 913, precast, reinforced concrete; designed according to ASTM C 890 for A-16 (ASSHTO HS20-44), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for joint sealants.
1. Joint Sealants: ASTM C 990, bitumen or butyl rubber.
  2. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
  3. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and grate.
  4. Steps: [**Individual FRP steps; FRP ladder; or ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP**], wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of catch basin to finished grade is less than [**60 inches**].
  5. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- C. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include flat grate with small square or short-slotted drainage openings.
1. Size: 24 by 24 inches minimum unless otherwise indicated.
  2. Grate Free Area: Approximately 50 percent unless otherwise indicated.
- D. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch- diameter flat grate with small square or short-slotted drainage openings.
1. Grate Free Area: Approximately 50 percent unless otherwise indicated.
- 2.9 STORMWATER INLETS
- A. Curb Inlets: Made with vertical curb opening [**, complying with AHJ requirements**].
- B. Gutter Inlets: Made with horizontal gutter opening [**, complying with AHJ requirements**]. Include heavy-duty frames and grates.

- C. Frames and Grates: Heavy duty [, **complying with AHJ requirements**].

## 2.10 PIPE OUTLETS

- A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.
- B. Riprap Basins: Broken, irregularly sized and shaped, graded stone according to NSSGA's "Quarried Stone for Erosion and Sediment Control."
  - 1. Average Size: NSSGA No. R-3, screen opening 2 inches.
  - 2. Average Size: NSSGA No. R-4, screen opening 3 inches.
  - 3. Average Size: NSSGA No. R-5, screen opening 5 inches.
- C. Filter Stone: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. FS-2, No. 4 screen opening, average-size graded stone.
- D. Energy Dissipaters: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. A-1, 3-ton average weight armor stone, unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Division 2 Section "Earthwork."

### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow.
2. Install piping [NPS 6] and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
3. Install piping with [36-inch] minimum cover.
4. Install ABS sewer piping according to ASTM D 2321 and ASTM F 1668.
5. Install PE corrugated sewer piping according to ASTM D 2321.
6. Install PVC cellular-core piping according to ASTM D 2321 and ASTM F 1668.
7. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
8. Install PVC profile gravity sewer piping according to ASTM D 2321 and ASTM F 1668.
9. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

### 3.3 PIPE JOINT CONSTRUCTION

#### A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join hub-and-spigot, cast-iron soil piping with gasketed joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
3. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.
4. Join ductile-iron culvert piping according to AWWA C600 for push-on joints.
5. Join ductile-iron piping and special fittings according to AWWA C600 or AWWA M41.
6. Join corrugated steel sewer piping according to ASTM A 798/A 798M.
7. Join corrugated aluminum sewer piping according to ASTM B 788/B 788M.
8. Join ABS sewer piping according to ASTM D 2321 and ASTM D 2751 for elastomeric-seal joints.
9. Join corrugated PE piping according to ASTM D 3212 for push-on joints.
10. Join PVC cellular-core piping according to ASTM D 2321 and ASTM F 891 for solvent-cemented joints.
11. Join PVC corrugated sewer piping according to ASTM D 2321 for elastomeric-seal joints.
12. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasketed joints.
13. Join PVC profile gravity sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.
14. Join fiberglass sewer piping according to ASTM D 3839 for elastomeric-seal joints.
15. Join nonreinforced-concrete sewer piping according to ASTM C 14 and ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
16. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
17. Join dissimilar pipe materials with nonpressure-type flexible couplings.

### 3.4 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
  - 1. Use Light-Duty, top-loading classification cleanouts in [**earth or unpaved foot-traffic**] areas.
  - 2. Use Medium-Duty, top-loading classification cleanouts in [**paved foot-traffic**] areas.
  - 3. Use Heavy-Duty, top-loading classification cleanouts in [**vehicle-traffic service**] areas.
  - 4. Use Extra-Heavy-Duty, top-loading classification cleanouts in [**roads**].
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, [**18 by 18 by 12 inches**] deep. Set with tops [**3 inch**] above surrounding earth grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

### 3.5 DRAIN INSTALLATION

- A. Install type of drains in locations indicated.
  - 1. Use Light-Duty, top-loading classification drains in [**earth or unpaved foot-traffic**] areas.
  - 2. Use Medium-Duty, top-loading classification drains in [**paved foot-traffic**] areas.
  - 3. Use Heavy-Duty, top-loading classification drains in [**vehicle-traffic service**] areas.
  - 4. Use Extra-Heavy-Duty, top-loading classification drains in [**roads**].
- B. Embed drains in 4-inch minimum concrete around bottom and sides.
- C. Fasten grates to drains if indicated.
- D. Set drain frames and covers with tops flush with pavement surface.
- E. Assemble trench sections with flanged joints.
- F. Embed trench sections in [**4-inch**] minimum concrete around bottom and sides.

### 3.6 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops [**3 inches**] above finished surface elsewhere unless otherwise indicated.

### 3.7 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### 3.8 STORMWATER INLET[ **AND OUTLET**] INSTALLATION

- A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
- B. Construct riprap of broken stone, as indicated.
- C. Install outlets that spill onto grade, anchored with concrete, where indicated.
- D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.
- E. Construct energy dissipaters at outlets, as indicated.

### 3.9 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

### 3.10 CHANNEL DRAINAGE SYSTEM INSTALLATION

- A. Install with top surfaces of components, except piping, flush with finished surface.
- B. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
- C. Embed channel sections and drainage specialties in [**4-inch**] minimum concrete around bottom and sides.
- D. Fasten grates to channel sections if indicated.
- E. Assemble channel sections with flanged or interlocking joints.
- F. Embed channel sections in [**4-inch**] minimum concrete around bottom and sides.

### 3.11 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Division 15 Section "Storm Drainage Piping."
- B. Connect force-main piping to building's storm drainage force mains specified in Division 15 Section "Storm Drainage Piping." Terminate piping where indicated.
- C. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
    - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.
- D. Connect to sediment interceptors specified in Division 2 Section "Interceptors."
- E. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
    - a. **[Unshielded]** **[Shielded]** flexible couplings for same or minor difference OD pipes.
    - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
  2. Use pressure-type pipe couplings for force-main joints.

### 3.12 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
1. Close open ends of piping with at least **[8-inch-]** thick, brick masonry bulkheads.

2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:
1. Remove manhole or structure and close open ends of remaining piping.
  2. Remove top of manhole or structure down to at least [**36 inches**] below final grade. Fill to within [**12 inches**] of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.
- C. Backfill to grade according to Division 2 Section "Earthwork."

### 3.13 IDENTIFICATION

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
1. Use [**warning tape or**] detectable warning tape over ferrous piping.
  2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.14 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
1. Submit separate reports for each system inspection.
  2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to requirements of authorities having jurisdiction.



3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate report for each test.
  5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
    - b. Option: Test plastic piping according to ASTM F 1417.
    - c. Option: Test concrete piping according to ASTM C 924.
  6. Force-Main Storm Drainage Piping: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than [**150 psig**].
    - a. Ductile-Iron Piping: Test according to AWWA C600, "Hydraulic Testing" Section.
    - b. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

### 3.15 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. [**Flush with potable water.**] [**Flush with water.**]

END OF SECTION 02630

## SECTION 02751 – EXTERIOR CONCRETE

### 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 exterior cement concrete pavement for the following:
  - 1. Driveways, roadways and parking lots.
  - 2. Curbs and gutters.
  - 3. Sidewalks.
  - 4. Unit paver base.
  - 5. Pavement markings.
- B. Coordinate the requirements of this Section with those of other sections that interface with Exterior Concrete, in particular:
  - 1. Division 2 Section "Earthwork" for subgrade preparation, grading, and subbase course.
  - 2. Division 2 Section "Pavement Joint Sealants" for joint sealants of joints in concrete pavement and at isolation joints of concrete pavement with adjacent construction.
  - 3. Division 2 Section "Stained Concrete" for surface-imprinted, stamped finished concrete pavement.

#### 1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
  - 1. Cementitious materials.
  - 2. Steel reinforcement and reinforcement accessories.

3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- C. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

## PART 2 - PRODUCTS

### 2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
  1. Use flexible or curved forms for curves with a radius 100 feet or less.
- B. 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.

### 2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.
- E. Plain Steel Wire: ASTM A 82, as drawn.
- F. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

- G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
  - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
- H. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

## 2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the same brand and type of cementitious materials, from the same manufacturer, throughout the Project:
  - 1. Portland Cement: ASTM C 150, Type I or II. Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class F or C.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Water: ASTM C 94/C 94M.
- C. Aggregates: ASTM C 33, Class 4M coarse aggregate, uniformly graded. Provide aggregates from a single source.
  - 1. Maximum Coarse-Aggregate Size: not to exceed one-third the depth or thickness of the concrete member or casting, but in no case more than 1-1/2 inches. Use materials that are free of substances that cause spalling.
  - 2. Fine Aggregate: Use materials that are free of substances that cause spalling, and that are free of materials with deleterious reactivity to alkali in cement.

## 2.4 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 3. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
  - 4. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

## 2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

## 2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

## 2.7 PAVEMENT MARKINGS

- A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type I or AASHTO M 248, Type N.
  - 1. Color: White except where indicated otherwise.

## 2.8 PREFABRICATED UNITS

- A. Splash Blocks: Precast concrete 12 inches wide x 4 inches high x 18 inches long formed splash blocks. Provide one for every downspout that is not connected into underground drainage piping.
- B. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 6 inches high by 9 inches wide by 72 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.
  - 1. Dowels: Galvanized steel, 3/4-inch diameter, 18-inch minimum length.

## 2.9 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.
  - 2. Do not use Owner's field quality-control testing agency as the independent testing agency.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
  - 1. Compressive Strength (28 Days): **3500** psi unless indicated otherwise on the Drawings.
  - 2. Slump Limit: 4 inches.

- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content of **3 to 6** percent.
- D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use accelerating admixtures in cold weather only with prior approval of the Architect. Do not use calcium chloride.
  - 2. Use set-retarding admixtures during hot weather only with prior approval of the Architect.
- E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements as follows:
  - 1. Fly Ash: 25 percent.
  - 2. Combined Fly Ash and Pozzolan: 25 percent.
  - 3. Ground Granulated Blast-Furnace Slag: 50 percent.
  - 4. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

## 2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface to identify soft pockets and areas of excess yielding, and to check for unstable conditions. Verify need for additional compaction.
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.
- D. Remove loose material from compacted subbase surface immediately before placing concrete.
- E. Sidewalks and Ramps: Place and level sand cushion over prepared sub-grade to a compacted depth of 2 inches. During concrete placement, keep sand cushion sufficiently moist to prevent excessive absorption of water from freshly placed concrete.

### 3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum 1-1/2 inch cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### 3.4 JOINTS AND EDGES

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
  - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Parking Lots, Driveways and Roadways:
  - 1. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
    - a. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
    - b. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
    - c. Provide tie bars at sides of pavement strips where indicated.
    - d. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
    - e. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat dowels, or use pre-coated dowels, over one-half of dowel length to prevent concrete bonding to one side of joint.
  - 2. Expansion and Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

- a. Locate expansion joints at intervals of no more than 50 feet, unless joint pattern with more dense spacing is indicated on the Drawings. Confirm joint spacing with Architect prior to installing joint forming materials.
  - b. Extend joint fillers full width and depth of joint.
  - c. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
  - d. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
  - e. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
  - f. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
  - g. Doweled Joints: Install dowel bars and support assemblies at joints. Lubricate or asphalt coat dowels, or use pre-coated dowels, over one-half of dowel length to prevent concrete bonding to one side of joint.
3. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
  - a. 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 developing random contraction cracks.
4. Edges: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/2-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

C. Sidewalks: Same as for Parking Lots, Driveways and Roadways, except:

1. Expansion and Isolation Joints: Place top of joint filler 1/2 inch below top of pavement, tooling edges on both sides to 1/2 inch radius. Locate expansion joints as indicated on Drawings; if not indicated on Drawings locate as follows:
  - a. Where no joint pattern is indicated on the Drawings, locate expansion joints a maximum of 20 feet in each direction.
  - b. Where a joint pattern is shown on the Drawings but expansion joints are not specifically indicated, locate expansion joints coincident on any of the joints shown so that spacing does not exceed 20 feet in each direction.
2. Contraction Joints: Tooled grooved joints, 1/8 inch wide and 1/4 inch deep, with tooled radius of 1/2 inch both sides.
3. Edges: Tool edges of sidewalks, including along expansion and contraction joints, to provide 4 inch wide smooth trowel finish each side of joint or along edge, unless indicated otherwise on the Drawings.



### 3.5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 304 R requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery, at Project site, or during placement.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete according to ACI 309 R by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
- H. Screed pavement surfaces with a straightedge and strike off.
- I. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- J. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- K. Cold-Weather Placement: Comply with ACI 306.1.
- L. Hot-Weather Placement: Comply with ACI 301.

### 3.6 FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Parking Lots, Driveways and Roadways: Use a Medium-to-Coarse-Textured Broom Finish. Provide finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
2. Curbs: Use a Steel Trowel finish. Sufficient cement and water may be added to the surface to obtain the smooth finish.
3. Sidewalks: Use a Medium-to-Fine-Textured Broom Finish, except for Smooth-Trowel Finish along edges and joints per “Joints and Edges” Article above. Draw a soft bristle broom across float-finished concrete surface in pattern shown to provide a uniform, fine-line texture. If no pattern is shown, draw broom perpendicular to line of traffic.
4. Other Surfaces: For other surfaces where finish may not be specifically indicated, use a Medium-to-Fine-Textured Broom Finish.

### 3.7 SPECIAL FINISHES

- A. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on pavement surface according to manufacturer's written instructions and as follows:
  1. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate over pavement surface in 2 applications. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
  2. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.
- B. Exposed-Aggregate Finish: Expose coarse aggregate in pavement surfaces as follows:
  1. Immediately after float finishing, spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.
  2. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
  3. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon-bristle broom.
  4. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.

### 3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to 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. Comply with ACI 305R.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
  - 1. 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.

### 3.9 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
  - 1. Elevation: 1/4 inch.
  - 2. Thickness: Plus or minus 3/8 inch.
  - 3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.

### 3.10 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow concrete pavement to cure for 28 days and be dry 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.

### 3.11 PREFABRICATED UNITS

- A. Splash Blocks: Place one splash block at the base of each downspout that does not connect into underground piping. Place splash block firmly on earth, directing the flow of water perpendicularly away from the face of the building.
- B. Wheel Stops: Securely attach wheel stops into pavement with not less than two galvanized steel dowels embedded in holes drilled or cast into wheel stops at one-quarter to one-third points. Firmly bond each dowel to wheel stop and to pavement. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop. Extend upper portion of dowel a minimum of 4 inches into wheel stop and lower portion a minimum of 5 inches into pavement, grouted firmly and securely in place.

### 3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- B. 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.
- C. 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.
- D. 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.
- E. Remove and replace concrete pavement where test results 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.

### 3.13 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

## SECTION 02764 - PAVEMENT JOINT SEALANTS

### 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. Expansion and contraction joints within cement concrete pavement.
  - 2. Joints between cement concrete and asphalt pavement.

#### 1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for any multicomponent materials.

### PART 2 - PRODUCTS

#### 2.1 JOINT SEALANT

- A. Pour grade elastomeric polymer.
  - 1. Sonneborn, Masterseal SL 2 BASF
  - 2. Or approved equal.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

#### 2.2 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

- B. Backer Strips for Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

## 2.3 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, Apply primer to comply with joint-sealant manufacturer's written instructions

### 3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Install sealant in paving and sidewalk expansion joints. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- D. When abutting buildings, provide continuous joint backer strips and sealant.
- E. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

### 3.3 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 02764

## SECTION 02823 - CHAIN-LINK FENCES AND GATES

### 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. Chain-Link Fences.
  - 2. Gates.
- B. Coordinate the requirements of this Section with those of other sections that interface with Chain Link Fences and Gates, in particular:
  - 1. Division 2 Section "Earthwork" for site excavation, fill, and backfill where chain-link fences and gates are located.
  - 2. Division 3 Section "Cast-in-Place Concrete."

#### 1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
  - 1. Fence and gate posts, rails, and fittings.
  - 2. Chain-link fabric, reinforcements, and attachments.
  - 3. Accessories.
  - 4. Gates and hardware.
- B. Manufacturer's Instructions: Provide manufacturer's installation instructions and procedures, including standard details for fences and gates.

#### 1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

## PART 2 - PRODUCTS

### 2.1 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:
1. Group: IA, round steel pipe, Schedule 40.
  2. Strength Requirement: Heavy industrial according to ASTM F 1043.
  3. Post Diameter and Thickness: According to ASTM F 1083.
    - a. Top Rail: 1.66 inches.
    - b. Line Post: 2.375 inches.
    - c. End, Corner and Pull Post: 2.875 inches.
    - d. Swing Gate Post: According to ASTM F 900.
      - 1) Leaf width up to 8 feet: 2-1/2 inch square, weight 3.76 lbs./ft.
      - 2) Leaf width 8'-1" to 12 feet: 3 inch square, weight 4.58 lbs./ft.
      - 3) Leaf width 12'-1" to 16 feet: 4 inch square, weight 9.42 lbs./ft.
      - 4) Leaf width 16'-1" to 24 feet: 6 inch square, weight 19.02 lbs./ft.
  4. Coating for Steel Framing:
    - a. Metallic Coating: Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123/A 123M.
- B. Height: Six feet.

### 2.2 TENSION WIRE

- A. General: Provide horizontal tension wire at the following locations:
1. Location: Extended along top of fence fabric where fence is indicated to be without top rail.
  2. Location: Extended along bottom of fence fabric.
- B. Metallic-Coated Steel Wire: 0.177-inch- diameter, marcelled tension wire complying with ASTM A 817, ASTM A 824, and the following:
1. Metallic Coating: Type II, zinc coated (galvanized) with the following minimum coating weight:
    - a. Class 1: Not less than 0.8 oz./sq. ft. of uncoated wire surface.

### 2.3 SWING GATES

- A. General: Comply with ASTM F 900.



1. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1043 and ASTM F 1083 for materials and protective coatings.
- B. Frames and Bracing: Fabricate members from square, galvanized steel tubing with outside dimension and weight according to ASTM F 900 and the following:
  1. Gate Fabric Height: same as adjacent fence height.
  2. Leaf Width: As indicated on Drawings.
  3. Frame Members: Tubular Steel 2 inches rectangular.
- C. Frame Corner Construction:
  1. Welded or assembled with corner fittings and 5/16-inch- diameter, adjustable truss rods for panels 5 feet wide or wider.
- D. Hardware: Latches permitting operation from both sides of gate, hinges, center gate stops for paired gates, and keepers for each gate leaf more than 5 feet wide. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.
  1. Coating for Steel Framing:
    - a. Metallic Coating: Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123/A 123M.

## 2.4 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Post and Line Caps: Provide for each post.
  1. Line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: Attach rails securely to each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
  1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
  2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line-to-line posts.
- E. Tension and Brace Bands: Pressed steel.
- F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
- H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames; Hot-Dip Galvanized Steel.

- I. Finish: Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. zinc.

## 2.5 CONCRETE, GROUT AND ANCHORING CEMENT

- A. Concrete for Footings: In accordance with Division 3 section “Cast-in-Place Concrete. 28 day compressive strength shall be 2500 psi.
- B. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- C. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

### 3.2 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

### 3.3 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
  1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete: Place concrete around posts to dimensions indicated below and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter. Expose concrete 2 inches above final grade; shape and smooth to shed water.
3. Footing sizes:

<b><u>Type Of Post</u></b>	<b><u>Fence Height</u></b>	<b><u>Hole Diameter</u></b>	<b><u>Hole Depth</u></b>	<b><u>Post Embedment</u></b>
Line	Less than 6 feet	8 inches	30 inches	27 inches
Line	6 feet to 16 feet	10 inches	38 inches	36 inches
End & corner	Less than 6 feet	10 inches	36 inches	34 inches
End & corner	6 feet to 16 feet	12 inches	38 inches	36 inches
Gate		6 x max. post dim.	42 inches	40 inches

- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts uniformly as shown on the Drawings. If not indicated on the Drawings, space equally at no more than 10 feet o.c.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts.
  1. Locate horizontal braces at midheight of fabric more than 6 feet tall, and at top rail of fence, and at 2/3 fabric height on fences where indicated to be without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric.
  1. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
  1. Provide top rail unless indicated otherwise on Drawings.
- H. Chain-Link Fabric: Apply fabric to inside (side of usage) of framework. Leave 2 inches between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
  1. Fabric to be continuous full height of fence unless otherwise indicated on Drawings.
  2. Stretch fabric continuous between terminal posts or at intervals of 100 foot maximum, whichever is the least dimension.

- I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.
- J. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at 1 end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
  - 1. Maximum Spacing: Tie fabric to line posts at 15 inches o.c. and to braces at 24 inches o.c.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
- L. Barbed Wire: Install barbed wire uniformly spaced, angled toward security side of fence or as indicated on Drawings. Pull wire taut and install securely to extension arms and secure to end post or terminal arms.

### 3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.
  - 1. Provide a minimum of three hinges per leaf, more if required by manufacturer or CLFMI.

### 3.5 GROUNDING AND BONDING

- A. Protection at Crossings of Overhead Electrical Power Lines: Ground fence in accordance with IEEE standards at location of crossing and at a maximum distance of 150 feet on each side of crossing.
- B. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2, unless otherwise indicated.

END OF SECTION 02821

#### 4SECTION 02920 – FINISH GRADING, LAWNS AND GRASSES

##### 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. Finish grading.
  - 2. Seeding including “hydroseed.”
  - 3. Sodding.
- B. Coordinate the requirements of this Section with those of other sections that interface with Finish Grading, Lawns, and Grasses, particularly:
  - 1. Division 2 Section "Site Clearing."
  - 2. Division 2 Section "Earthwork."

##### 1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

##### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding."

## 1.5 LAWN MAINTENANCE

- A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, until the latest of the following occurrences:
  - 1. Evidence that lawn is fully established, in a healthy, growing condition.
  - 2. 60 days from date of installation.
  - 3. Final acceptance by the Owner.
- B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, and replanting; by applying insecticides and fungicides; and by other operations, all as required to achieve a healthy growth. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.
  - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  - 2. Water lawn daily for the first ten days at a minimum, or until seed in the mulch or sod root structure has germinated and rooted in the soil.
- D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing at regular intervals to maintain 2 to 3 inch height without cutting more than 40 percent of grass height.
- E. Lawn Postfertilization: Apply fertilizer in accordance with manufacturer's recommendations after initial mowing and when grass is dry.

## PART 2 - PRODUCTS

### 2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species:
  - 1. Bermudagrass (*Cynodon dactylon*).
  - 2. Annual Ryegrass (*Lolium multiflorum*).

### 2.2 TURFGRASS SOD

- A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species: St. Augustine grass (*Stenotaphrum secundatum*).

## 2.3 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7.5, a minimum of 4 percent and a maximum of 25 percent organic material content; free of subsoil, roots, grass, and excessive amounts of weeds; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Reuse surface soil stockpiled on-site if conforming to requirements. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - 2. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient.

## 2.4 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character conforming to FS O-F-241, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: Indicated by triple-numeric designation such as “10-20-10” with first number specifying percentage of total nitrogen, second number specifying available phosphoric acid, and third number specifying water soluble potash.
  - 2. If no indication of composition is indicated, provide percentages as recommended in soil reports from a qualified soil-testing agency.

## 2.5 MULCHES

- A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

## 2.6 ACCESSORIES

- A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.
- B. Water: Clean, fresh and free of substances or matter that would inhibit vigorous growth of grass.
- C. Soil Additive: “Fertilaid Soil Activator” or equal product.

## 2.7 SEED MIX

- A. Hydroseed Mix: For application between April 1 and August 31:
  - 1. 50 lbs. Fiber Mulch.

2. 2-1/2 lbs. Bermudagrass seed (tagged and tested).
3. 20 lbs. Fertilizer (10-20-10).
4. 10 lbs. Soil Additive.
5. 150 gallons water.

B. Hydroseed Mix: For application between September 1 and March 31:

1. 50 lbs. Fiber Mulch.
2. 3 lbs. Bermudagrass seed (tagged and tested).
3. 1 lb. Annual ryegrass seed.
4. 20 lbs. Fertilizer (10-20-10).
5. 10 lbs. Soil Additive.
6. 150 gallons water.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
1. Protect adjacent and adjoining areas from hydroseeding overspray.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

#### 3.3 FINISH GRADING

- A. Limit finish grading to areas to be planted.
- B. Subgrade Preparation: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Spread topsoil to a depth of 3 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if topsoil or subgrade is frozen, muddy, or excessively wet.
1. Topsoil is to be used only in areas that will receive sod, as indicated on the Drawings.
  2. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of topsoil.
  3. Reduce elevation of planting soil to allow for soil thickness of sod.



- D. Finish Grading: Grade to a smooth, uniform surface plane with loose, uniformly fine texture. Finish grades shall be within 3/4 inch of indicated elevations or reasonably interpolated or extrapolated elevations. Adjust grades to allow for thickness of sod, where it occurs. Make changes between indicated grades smooth and gradual, and blend slopes into level areas. Roll and rake, remove ridges, and fill depressions to meet finish grades. Areas to be finish graded include:
1. All areas that receive topsoil or sod.
  2. All areas within 20 feet of sidewalks and buildings.
  3. All areas within 5 feet of parking lots and vehicular drives.
- E. Slope grade away from buildings at a rate of 6 inches down for every 10 feet horizontal, unless indicated otherwise on the Drawings.
- F. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- G. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

### 3.4 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, fiber mulch, and additives in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
1. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

### 3.5 SODDING

- A. Lay sod as soon as possible after delivery to prevent deterioration, but not more than 24 hours after harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface.
- C. Saturate sod with fine water spray within two hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

### 3.6 SATISFACTORY LAWNS

- A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities.

- B. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, well-rooted, even-colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.
- C. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

### 3.7 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.
- C. Remove erosion-control measures after grass establishment period.
- D. Remove surplus sub-soil and topsoil from site and dispose of legally off-site.

END OF SECTION 02920

## 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Footings and foundations.
  - 2. Slabs-on-grade.
  - 3. Floor and roof slabs in metal deck.
- B. Coordinate the requirements of this Section with those of other sections that interface with Cast-in-Place Concrete.
  - 1. Grouting at base plates is included in Division 5 section “Structural Steel.”
  - 2. Grouting at base plates is included in Division 13 section “Metal Buildings.”

#### 1.3 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. Waterstops and underslab Vapor Retarders:
  - 1. Samples for each product indicated.
  - 2. Submit manufacturer’s installation instructions including installation of boots around pipe and conduit penetrations.

- E. 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.

#### 1.4 QUALITY ASSURANCE

- A. 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.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specification for Structural Concrete."
  2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
  3. ACI 315.
  4. ACI 318.
  5. ACI 305.
  6. ACI 306.
  7. Other publications as may be referenced.

#### 1.5 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 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

## 2.2 FORM MATERIALS

- A. Smooth-Formed Finished Concrete: For concrete exposed to view, use form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  - 1. 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. Rough-Formed Finished Concrete: For concrete concealed in finish work, use 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 and Reveals: 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 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 staining or spalling of concrete on removal.
- J. Nails, Spikes, Lag Bolts, Through-Bolts, and Anchorages: Of sufficient size, strength, and character to maintain formwork in place while pouring concrete.

## 2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed, except no. 3 or no. 4 bars which are bent (stirrups, ties, and dowels) may be Grade 40.
- B.

## 2.4 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 supports contact forms, use CRSI Class 1 plastic-protected steel wire.
  - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
  - 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
- B. Tie Wire: Minimum 16 gauge annealed type, or patented system accepted by the Architect.
- C. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs. At expansion joint locations, provide with plastic dowel cover on one side of expansion joint.

## 2.5 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. Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class C or Class F.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4M coarse aggregate or better, graded. Provide aggregates from a single source.
  - 1. Maximum Coarse-Aggregate Size: not to exceed one-third the depth or thickness of the concrete member or casting, but in no case more than 1-1/2 inches.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Lightweight Aggregate: ASTM C 330, not to exceed one-third the depth or thickness of the concrete member or casting, but in no case more than 1 inch nominal maximum aggregate size.
- D. Water: ASTM C 94/C 94M and potable.

## 2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260. Use in concrete with exposure to the exterior, 5% plus-or-minus 1%.
- 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. 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, Type II.
- C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
1. Available Products:
    - a. Grace Construction Products, W. R. Grace & Co.; DCI.
    - b. Sika Corporation; Sika CNI.
    - c. Equal product by another manufacturer.
- D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
1. Available Products:
    - a. Grace Construction Products, W. R. Grace & Co.; DCI-S.
    - b. Sika Corporation; FerroGard-901.
    - c. Equal product by another manufacturer.

## 2.7 WATERSTOPS

- A. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
1. Acceptable Manufacturers:
    - a. Sika Greenstreak.
    - b. Progress Unlimited, Inc.
    - c. Williams Products, Inc.
  2. Profile: Ribbed with center bulb.
  3. Splices: Provide integral factory-made splice fittings.
  4. Dimensions: 6 inches by 3/8 inch thick; nontapered.
  5. Performance: Capable of withstanding 125 feet of head pressure.
  6. Use: As indicated on Drawings, and at all locations where floors meet walls or where floor plane changes, and finish floor is below finish grade.

## 2.8 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E 1745, Class A, not less than 15 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Acceptable Products:

- a. Stego Industries, LLC; Stego Wrap, 15 mils.
- b. Fortifiber Corporation; Moistop Ultra 15.
- c. Raven Industries Inc.; Vapor Block 15.
- d. Reef Industries, Inc.; Griffolyn Type-65G.

## 2.9 FLOOR AND SLAB TREATMENTS

- A. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.

1. Acceptable Products:

- a. Burke by Edoco; NonMetallic Floor Hardener.
- b. Euclid Chemical Company (The); Surfex.
- c. Scofield, L. M. Company; Lithochrome Color Hardener.
- d. Symons Corporation, a Dayton Superior Company; Hard Top.

- B. Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Acceptable Products:

- a. Burke by Edoco; NonMetallic Floor Hardener-Color.
- b. Euclid Chemical Company (The); Surfex.
- c. Scofield, L. M. Company; Lithochrome Color Hardener.
- d. Symons Corporation, a Dayton Superior Company; Color Hardener.

2. Color: As selected by Architect from manufacturer's full range.

- C. Metallic Dry-Shake Floor Hardener: Unpigmented, except where indicated as pigmented on the Drawings, factory-packaged, dry combination of portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.

1. Color: As selected by Architect from manufacturer's full range.

- D. Slip-Resistive Aluminum Granule Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of not less than 95 percent fused aluminum-oxide granules.

1. Acceptable Products:

- a. Anti-Hydro International, Inc.; A-H Alox.
- b. L&M Construction Chemicals, Inc.; Grip It AO.



- c. Sonneborn, Div. of ChemRex; Frictex NS.
- E. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
  - 1. Acceptable Products:
    - a. Burke by Edoco; Titan Hard.
    - b. Curecrete Distribution Inc.; Ashford Formula.
    - c. Euclid Chemical Company (The); Euco Diamond Hard.
    - d. Symons Corporation, a Dayton Superior Company; Buff Hard.

## 2.10 CURING MATERIALS

- A. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

## 2.11 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, per ASTM D 2240; as manufactured by Euclid or Metzger-McGuire or equal.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
  - 1. Types I and II, non-load bearing, or Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

## 2.12 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 1/8 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 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.

## 2.13 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.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Combined Fly Ash and Pozzolan: 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.05 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range 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.

## 2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Concrete strengths shall be as indicated on Drawings.
- B. Proportion concrete mixes in accordance with ACI 301, 3.8 and to meet strength requirements.
- C. Provide smaller aggregate mix for stair tread pans and landings, and equipment platforms.

## 2.15 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
- B. Locate reinforcing splices, where not indicated on Drawings, at points of minimum stress.
- C. Where indicated, weld reinforcing bars in accordance with AWS D12.1.

## 2.16 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.
  - 2. Delete references in ASTM C94 that allow additional water to be added to batch for material with insufficient slump. Do not add water to concrete mix after mixing.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
  - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## 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 347R as abrupt or gradual, Class A for smooth-formed surfaces and Class B for rough-formed 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.

- 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. Chamfer exterior corners and edges of permanently exposed concrete, except where may be indicated otherwise on the Drawings.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, 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.
  - 1. Do not apply form release agent where concrete surfaces will receive special finishes, applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.
- M. Obtain Architect's approval for use of earth forms. When using earth forms, hand-trim sides and bottoms, and remove loose dirt prior to placing concrete.
- N. Obtain Architect's approval before framing openings that are not indicated on Drawings in structural members.

### 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. Do not perform work unless specifically indicated on the Drawings or reviewed by Architect prior to installation.
  - 1. Provide formed openings where required for pipes, conduits, sleeves, and other work to be embedded in or passing through concrete members.
  - 2. Locate and set in place items that will be cast directly into concrete.
  - 3. Install concrete accessories in accordance with manufacturer's recommendations, straight, level and plumb.
- B. Place formed construction joints in slab. Set top screed to required elevations. Secure to resist movement of wet concrete.

- C. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings to allow flushing water to drain. Close temporary openings with tight-fitting panels, flush with inside of forms, neatly fitted so joints will not be apparent in exposed concrete surfaces.

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork removal shall be in accordance with ACI 318 and ACI 347.
- B. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after concrete has gained sufficient strength to carry its own weight as well as construction and design loads that are liable to be imposed on it.
  - 1. Remove formwork that does not directly support the weight of the concrete as soon as concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
- C. Formwork for Structural Elements:
  - 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 75 percent of its 28-day design compressive strength, provided construction is reshored.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
  - 3. Remove formwork progressively and in accordance with code requirements, and so that no shock loads or unbalanced loads are imposed on structure.
- D. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against concrete surfaces.
- E. 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.

### 3.4 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
  - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.
  - 2. Install boots around pipe and conduit penetrations per manufacturer's written instructions.

### 3.5 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.
  - 1. Maintain concrete cover around reinforcing as indicated on the Drawings.
- 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.

### 3.6 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.
  - 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.
- 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. Sawed Joints: Form contraction joints with power saws equipped with shatterproof “soffcut” 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. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.7 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.

### 3.8 CONCRETE PLACEMENT

- A. Maintain records of poured concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.
- B. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- 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.
- 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.
- F. Cold-Weather Placement: Comply with ACI 306.1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- G. Hot-Weather Placement: Comply with ACI 301.

### 3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

- B. 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 to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- C. 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 exposed to view or to be covered with resilient flooring, carpet, paint, or similar finishes.
  - 2. Finish surfaces to the tolerances specified in ACI 302.1R.
- D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated and where ceramic or quarry tile is to be installed. While concrete is still plastic, slightly scarify surface with a fine broom.
- E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps; to stair treads and landings; and elsewhere as indicated. Apply in accordance with patterns and in combination with other finishes as may be indicated on Drawings.

### 3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. 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.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

### 3.11 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. 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.
  - 2. 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.

### 3.12 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

### 3.13 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. Do not fill joints until construction traffic has permanently ceased.
  - 2. Eleven months after Substantial Completion, conduct an inspection and repair or replace all joint fillers that have lost bond with concrete on both sides of joint.
- 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.

### 3.14 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. 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. Compact mortar in place and strike off slightly higher than surrounding surface.
  - 2. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance; maintain required concrete coverages over reinforcing.
- 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. Correct 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.
- 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.

### 3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports. Tests that are to be conducted include, but may not be limited to, those described in Division 1 section "Quality Requirements."

END OF SECTION 03300

## SECTION 04810 - UNIT MASONRY ASSEMBLIES

### 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 unit masonry assemblies consisting of the following:
  - 1. Face brick.
  - 2. Tactile pavers.
  - 3. Mortar and grout.
  - 4. Reinforcing steel.
  - 5. Masonry joint reinforcement.
  - 6. Ties and anchors.
  - 7. Miscellaneous masonry accessories.
- B. Coordinate the requirements of this Section with those that interface with Unit Masonry, particularly the Division 7 specification sections related to flashing.
- C. Products installed, but not furnished, under this Section include the following:
  - 1. Cast-stone, furnished under Division 4 Section "Cast Stone."
  - 2. Steel lintels and/or shelf angles for unit masonry, furnished under Division 5 Section "Metal Fabrications."
  - 3. Manufactured reglets in masonry joints for metal flashing, furnished under Division 7 Section "Sheet Metal Flashing and Trim."
- D. Allowance for face brick: Brick shall be purchased by allowance, in accordance with Division 1 Section "Allowances":

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type and color of the following:
  - 1. Face brick.
  - 2. Mortar. Make Samples using same sand and mortar ingredients to be used on Project.
- C. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:

1. Masonry units.
2. Mortar mixes. Include description of type and proportions of ingredients.
3. Grout mixes. Include description of type and proportions of ingredients.
4. Reinforcing bars.
5. Joint reinforcement.
6. Anchors, ties, and metal accessories.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
- C. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.
- D. Mockup: Build mockup to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  1. Build mockup for typical exterior wall in size approximately 72 inches long by 48 inches high by full thickness, including face and backup wythes and accessories.
    - a. Include a sealant-filled joint at least 16 inches long in mockup.
    - b. Include all masonry types used on Project including brick, concrete masonry, and cast stone as directed by Architect.
  2. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units become wet, do not install until they are dry. Prevent staining and contamination.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix, if used, in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers in a dry location.

- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## 1.6 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, protect masonry units to prevent damage.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
- C. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. Maintain minimum temperature conditions of 50 degrees F prior to, during and for 48 hours after completion of masonry work.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

## PART 2 - PRODUCTS

### 2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

### 2.2 MASONRY LINTELS

- A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout. If precast, cure lintels before handling and installing. Temporarily support built-in-place lintels until cured.

### 2.3 BRICK

- A. General: Provide shapes indicated and as follows:
  - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs, and without belt marks, and with exposed surfaces finished.
  - 2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Face Brick: ASTM C216. The qualities below are minimum technical requirements for the brick.

1. Grade: SW.
2. Type: FBS.
3. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3000 psi.
4. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
6. Size: modular.
7. Application: Use where brick is exposed, unless otherwise indicated.
8. Products:

- a. As selected by allowance per Division 1 Section "Allowances."

C. Building (Common) Brick: ASTM C 62 Grade MW or SW.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2500 psi.
2. Size: Match size of face brick.
3. Application: Use where brick is indicated for concealed locations. Face brick complying with requirements for grade, compressive strength, and size indicated for building brick may be substituted for building brick.

## 2.4 MORTAR AND GROUT MATERIALS

A. Brands: All products used must be same brand throughout entire project.

B. Portland Cement: ASTM C 150 Type I.

C. Hydrated Lime: ASTM C 207, Type S.

D. Masonry Cement: ASTM C 91.

E. Water: Potable.

F. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.

G. Colored Cement Product: Packaged blend made from masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.

## 2.5 TIES AND ANCHORS FOR MASONRY VENEERS

A. Adjustable Masonry-Veneer Anchors

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall:
  - a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
2. Stud Wall Back-up Screw-Attached, Masonry-Veneer Anchors: Two-piece units consisting of a wire tie and a metal anchor section.
  - a. Anchor Section: Sheet metal plate, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom and with raised rib-stiffened strap, 5/8 inch wide by 3-5/8 inches long, stamped into center to provide a slot between strap and plate for inserting wire tie.
  - b. Fabricate sheet metal anchor sections and other sheet metal parts from 0.067-inch-thick, steel sheet, galvanized after fabrication.
  - c. Wire Ties: Triangular-shaped (“Vee”) wire ties fabricated from 0.188-inch-diameter, hot-dip galvanized steel wire.
  - d. Acceptable manufacturers:
    - 1) Dayton Superior Corporation, Dur-O-Wal Division.
    - 2) Heckmann Building Products Inc.
    - 3) Hohmann & Barnard, Inc.
    - 4) Wire-Bond.

## 2.6 EMBEDDED FLASHING MATERIALS

- A. Flexible Flashing: For flashing not exposed to the exterior, use flexible flashing.
  1. Refer to Division 7 specification “Self-Adhering Sheet Waterproofing and Flashing” for materials and installation requirements.
- B. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
  1. Refer to Division 7 specification “Sheet Metal Flashing and Trim” for materials and installation requirements.

## 2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
- B. Preformed Control-Joint Gaskets: Made from PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

- D. Weep/Vent Products: Use one of the following unless otherwise indicated:
1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
    - a. Products: Subject to compliance with requirements, provide one of the following or approved equal:
      - 1) Advanced Building Products Inc.; Mortar Maze weep vent.
      - 2) Blok-Lok Limited; Cell-Vent.
      - 3) Heckmann Building Products Inc.; No. 85 Cell Vent.
      - 4) Hohmann & Barnard, Inc.; Quadro-Vent.
      - 5) Wire-Bond; Cell Vent.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity. Use at window heads, full depth of cavity, 6 inches in height, and full width of window head.

## 2.8 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
- B. Do not use acid on cast stone.

## 2.9 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar.
  2. Limit cementitious materials in mortar to portland cement and mortar cement.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Type N (Same for cast stone).
- C. Pigmented Mortar: Use colored cement product.
1. Pigments shall not exceed 10 percent of portland cement by weight.
  2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
  3. Do not use carbon black.
  4. Mix to match Architect's sample.
- D. Provide minimum 750 psi mortar.



## 2.10 TACTILE PAVERS

- A. Tactile Pavers: Light-traffic paving brick, ASTM C 902 for sidewalk areas; or heavy vehicular paving brick, ASTM C 1272 where pavers cross vehicular traffic lanes or parking areas. Provide brick without frogs or cores in surfaces exposed to view in the completed Work.
  - 1. Size: 2-1/4 inches thick x 4 inches x 8 inches.
  - 2. Colors: As selected by Architect from manufacturer's full range available in size specified.
  - 3. Products: Tactile Pavers as manufactured by Pine Hall Brick, or equal if approved by Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- D. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
- E. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602.

### 3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry:
  - 1. Face Brick: Lay in **one-half running bond**.

- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners
- D. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- E. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
  - 1. Install compressible filler in joint between top of partition and underside of structure above.
  - 2. Fasten partition top anchors to structure above and build into top of partition.
  - 3. At fire-rated partitions, treat joint between top of partition and underside of structure above to achieve required fire rating.

### 3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick and concrete masonry units as follows:
  - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
  - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
  - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
  - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

### 3.5 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to stud wall backup with masonry-veneer anchors to comply with the following requirements:
  - 1. Use anchors indicated in Part 2 Article “Ties and Anchors.”
  - 2. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners.
  - 3. Embed tie sections in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
  - 4. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  - 5. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

### 3.6 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry per NCMA recommendations. If no expansion joints are indicated on drawings, provide spacing in accordance with NCMA recommendations.
- C. Form expansion joints in brick made from clay or shale per BIA recommendations. If no expansion joints are indicated on drawings, provide spacing in accordance with BIA recommendations.
  - 1. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants."

### 3.7 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

### 3.8 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at wall bases, shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
  - 1. Install flashing at masonry walls in accordance with Division 7 specification sections regarding flashing.
- B. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- C. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
  - 1. Use open head joints to form weep holes.
  - 2. Space weep holes no more than 30 inches o.c., unless otherwise indicated.
- D. Weeps shall not occur below final grade, nor below adjacent construction, such as where a masonry ledge abuts a concrete sidewalk. Provide solid grout at the masonry to raise the weeps above these types of conditions to allow for proper drainage. Slope the top of the grout to divert water out from the wall and away from the building. Flashing, dampproofing, and/or sheet waterproofing shall be provided both under and above the solid grout and installed in accordance with the specifications.
- E. Place cavity drainage material in cavities to comply with manufacturer's instructions. Install at each window head, full width of window head, full depth of cavity, and 6 inches high.

### 3.9 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Protect adjacent nonmasonry surfaces.
  - 2. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 3. Ensure that there is no efflorescence on brick or other materials.
  - 4. Inspect installation prior to expiration of one year warranty period. Clean off any efflorescence.
  - 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
  - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

### 3.10 TACTILE PAVERS INSTALLATION

- A. Pavers shall be installed over a concrete substrate, as indicated on the Drawings. If none is indicated on the Drawings, provide at a minimum a 4-1/2 inch thick concrete slab with #3 reinforcing bars at 16 inches on center each way. Concrete shall sit on 2 inch sand bed over properly compacted soil.
- B. Joint Pattern: As indicated on the Drawings. If no pattern is indicated, use a Herringbone pattern.
- C. On top of concrete substrate, place 1 to 1-1/2 inches of natural sand as leveling base, taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.
- D. Treat leveling base with soil sterilizer to inhibit growth of weeds and grass.
- E. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch, being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines.
- F. Tamp or vibrate pavers firmly into leveling course, if necessary using a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz.

- G. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.
- H. Do not allow traffic on installed pavers until sand has been vibrated into joints.

### 3.11 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated or requested by Owner, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04810

## SECTION 05121 - STRUCTURAL STEEL

### 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. Structural steel.
  - 2. Grout.
- B. Coordinate the requirements of this Section with those of other sections that interface with Structural Steel.

#### 1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.
  - 1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction.
  - 2. Engineering Responsibility: Fabricator's responsibilities include using a qualified professional engineer to prepare structural analysis data for structural-steel connections.

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
  - 1. **Provide one (1) complete package to submit for review. Partial submittal packages will not be accepted and will be returned "REJECTED".**
  - 2. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
  - 3. Include embedment drawings.

4. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
5. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
6. **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 certificates.

#### 1.6 QUALITY ASSURANCE

- A. Shop-Painting Applicators: Qualified according to SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
- C. Comply with applicable provisions of the following specifications and documents:
  1. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
  2. AISC's "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", latest edition.
  3. AISC's "Specification for the Design of Steel Hollow Structural Sections."
  4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

#### 1.7 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 erosion and deterioration.
  1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
  2. 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.

#### 1.8 COORDINATION

- A. Furnish 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. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles -Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500 structural tubing, Grade B.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
  - 1. Finish: Black, except where indicated to be galvanized.
- F. Medium-Strength Steel Castings: ASTM A 27/A 27M, Grade 65-35, carbon steel.
- G. High-Strength Steel Castings: ASTM A 148/A 148M, Grade 80-50, carbon or alloy steel.
- H. Welding Electrodes: Comply with AWS requirements.

### 2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1 or ASTM A 490, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
- B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
- C. Unheaded Anchor Rods, Headed Anchor Rods, and Threaded Rods: Refer to Structural Drawings.

### 2.3 PRIMER

- A. Primer: SSPC-Paint 25, Type I, iron oxide, zinc oxide, raw linseed oil, and alkyd. Use on any steel that is not located in air-conditioned space.
- B. Primer: SSPC-Paint 25 BCS, Type I, iron oxide, zinc oxide, raw linseed oil, and alkyd.
- C. Primer: SSPC-Paint 23, latex primer.
- D. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.



## 2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, 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."
  - 1. Camber structural-steel members where indicated.
  - 2. Mark and match-mark materials for field assembly.
  - 3. 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.
- 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 1, "Solvent Cleaning."
- F. 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 and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for passage of other work 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. Base-Plate 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: Refer to Structural Drawings.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for 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 of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
  - a. Grind butt welds flush.
  - b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

## 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.
  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.
  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 6/NACE No. 3, "Commercial Blast Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.0 mil. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

## 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 holes and grind smooth after galvanizing.
  2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls, either in masonry veneers, or where part will be exposed to view or the elements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- 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's "Code of Standard Practice for Steel Buildings and Bridges."
- B. Base Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base plates. Clean bottom surface of base plates.
  - 1. Set base plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of base plate.
  - 3. Tighten anchor rods per the Structural Drawings after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and base 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 forming 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 unless approved by Architect. If allowed, finish thermally cut sections within smoothness limits in AWS D1.1.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.

### 3.4 FIELD 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: Refer to Structural Drawings.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
  - 1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
  - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
  - 3. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 4. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
    - a. Grind butt welds flush.
    - b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

### 3.5 QUALITY CONTROL

- A. Owner will engage an independent testing and inspecting agency to perform tests and inspections and prepare test reports. Contractor shall correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- B. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: In addition to visual inspection, 25 percent of welded connections will be tested and inspected according to AWS D1.1 and the following or similar inspection procedures:
  - 1. Radiographic Inspection: ASTM E 94.

### 3.6 REPAIRS AND PROTECTION

- A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories and abutting structural steel.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
  - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- B. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 05120

## SECTION 05210 - STEEL JOISTS

### 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. Open-web steel joists.
  - 2. Joist girders.
  - 3. Joist accessories.
  - 4. Required anchorages, bridging, bearing plates & angles.
- B. Coordinate the requirements of this Section with those of other sections that interface with Steel Joists.
  - 1. Division 13 section "Metal Building Systems."

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide joists and connections capable of withstanding design loads within limits and under conditions indicated.
- B. Design joists to withstand design loads with total load deflections no greater than the following:
  - 1. Floor Joists: Vertical deflection of 1/360 of the span.
  - 2. Roof Joists: Vertical deflection of 1/360 of the span.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product indicated.
- B. Shop Drawings: Show layout, mark, number, type, location, and spacing of joists. Include joining and anchorage details, bracing, bridging, accessories; splice and connection locations and details; and attachments to other construction.
  - 1. Indicate locations and details of anchorage devices and bearing plates to be embedded in other construction.
  - 2. Comprehensive engineering analysis signed and sealed by the qualified professional engineer, registered in the State of Texas, responsible for its preparation.
  - 3. Indicate welded connections using standard AWS symbols. Indicate net weld lengths.

## 1.5 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** A firm experienced in manufacturing joists similar to those indicated for this Project and with a record of successful in-service performance.
  - 1. Manufacturer must be certified by SJI to manufacture joists complying with SJI standard specifications and load tables.
  - 2. Assumes responsibility for engineering special joists to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. **SJI Specifications:** Comply with SJI's "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders" (hereafter, "Specifications"), applicable to types of joists indicated.
- C. **Welding:** Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel"; and AWS D1.3 "Structural Welding Code--Sheet Steel."

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. **Steel:** Comply with SJI's "Specifications" for chord and web members.
- B. **Steel Bearing Plates:** ASTM A 36/A 36M.
- C. **Welding Electrodes:** Comply with AWS standards.
- D. **Galvanizing Repair Paint:** SSPC-Paint 20 or DOD-P-21035.

### 2.2 PRIMERS

- A. **Primer:** SSPC-Paint 15, Type I, red oxide; FS TT-P-636, red oxide; or manufacturer's standard shop primer complying with performance requirements of either of these red-oxide primers.

### 2.3 OPEN-WEB STEEL JOISTS

- A. **Manufacture steel joists** according to "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord; of joist type indicated.
- B. **Comply with AWS requirements and procedures** for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C. **Provide holes in chord members** for connecting and securing other construction to joists.
- D. **Top-Chord Extensions:** Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

- E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- F. Camber joists according to SJI's "Specifications" to accommodate for dead load deflection.
- G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

## 2.4 LONG-SPAN STEEL JOISTS

- A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series," in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as indicated.
- B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C. Provide holes in chord members for connecting and securing other construction to joists.
- D. Camber long-span steel joists according to SJI's "Specifications" or as indicated.
- E. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

## 2.5 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 indicated.
- B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C. Provide holes in chord members for connecting and securing other construction to joist girders.
- D. Camber joist girders according to SJI's "Specifications" or as indicated.
- E. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

## 2.6 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span.
- B. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Shop prime paint.



- C. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

## 2.7 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories to be primed by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Apply one shop coat of primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

## PART 3 - EXECUTION

### 3.1 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.
- C. Field weld joists to supporting steel bearing plates. 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. 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.

### 3.2 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds.
- B. Field welds will be visually inspected according to AWS D1.1.
- C. Correct deficiencies in Work that inspections have indicated are not in compliance with specified requirements.
- D. Additional inspections may be performed to determine compliance of corrected Work with specified requirements.

### 3.3 REPAIRS AND PROTECTION

- A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.

1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
  2. Apply a compatible primer of the same type as the shop primer used on adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 05210

## SECTION 05310 - STEEL DECK

### 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. Floor deck.
  - 2. Roof deck.
- B. Coordinate the requirements of this Section with those of other sections that interface with Steel Deck.
  - 1. Division 13 section "Metal Building Systems."

#### 1.3 SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, deck openings, special jointing, accessories, and attachments to other construction.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those steel deck units tested for fire resistance per ASTM E 119 by a testing and inspection agency acceptable to authorities having jurisdiction.
- D. AISI Specifications: Calculate structural characteristics of steel deck according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. BHP Steel Building Products USA Inc.
  2. Consolidated Systems, Inc.
  3. Epic Metals Corp.
  4. Marlyn Steel Products, Inc.
  5. Nucor Corp.; Vulcraft Div.
  6. Roof Deck, Inc.
  7. United Steel Deck, Inc.
  8. Verco Manufacturing Co.
  9. Wheeling Corrugating Co.; Div. of Wheeling-Pittsburgh Steel Corp.

### 2.2 FLOOR DECK

- A. Noncomposite Steel Form Deck: Fabricate ribbed steel sheet noncomposite form deck panels to comply with "SDI Specifications and Commentary for Noncomposite Steel Form Deck," in SDI Publication No. 29, and the following:
1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, zinc coating.
  2. Deck Profile: Reference Structural Documents.
  3. Profile Depth: Reference Structural Documents.
  4. Design Uncoated-Steel Thickness: Reference Structural Documents.
  5. Span Condition: As indicated.
  6. Side Laps: Reference Structural Documents.

### 2.3 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 29, and the following:
1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, zinc coating.
  2. Deck Profile: Reference Structural Documents.
  3. Profile Depth: Reference Structural Documents.
  4. Design Uncoated-Steel Thickness: Reference Structural Documents.
  5. Span Condition: As indicated.
  6. Side Laps: Reference Structural Documents.

## 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 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, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Steel Sheet Accessories: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- G. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 29 for overhang and slab depth.
- H. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- I. Shear Connectors: ASTM A 108, Grades 1010 through 1020 headed stud type, cold-finished carbon steel, AWS D1.1, Type B, with arc shields.
- J. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.
- K. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, and requirements in this Section.
- B. 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.
- C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

- D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking.
- E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.
- F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

### 3.2 FLOOR DECK INSTALLATION

- A. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.
- B. Floor Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of decking. Weld cover plates at changes in direction of floor deck panels, unless otherwise indicated.

### 3.3 ROOF DECK INSTALLATION

- A. Roof Sump Pans and Sump Plates: Install over openings provided in roof decking and weld flanges to top of deck. Space welds not more than 12 inches apart with at least 1 weld at each corner.
- B. Miscellaneous Roof Deck Accessories: Install ridge and valley plates, finish strips, cover plates, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
- C. 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 REPAIRS AND 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. 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 05400 - COLD-FORMED METAL FRAMING

### 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. Exterior non-load-bearing wall framing.
  - 2. Floor and ceiling joist framing.
- B. Coordinate the requirements of this Section with those of other sections that interface with Cold-Formed Metal Framing.
- C. For cold-formed roof purlins, see Division 13 section “Metal Building Systems.”

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: in accordance with the International Building Code, latest edition, and building codes in effect at the Project location.
- B. Design Responsibilities:
  - 1. Contractor’s Engineer is responsible for the designing member sizes, and locating bridging and bracing.
  - 2. Contractor’s engineer is responsible for designing connections between members, and anchorages of members to substrates.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Installation Instructions: Manufacturer’s printed instructions for installation of components.
- C. Shop Drawings: For special components and installations not fully dimensioned or detailed in manufacturer’s Product Data or Installation Instructions. Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing,

supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining Work.

1. Include structural analysis data signed and sealed by the qualified professional engineer registered in the State of Texas who is responsible for their preparation.

## 1.5 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- B. Fire-Test-Response Characteristics: Where metal framing is part of a fire-resistance-rated assembly, provide framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- C. AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" including:
  1. CCFSS Technical Bulletin: "AISI Specification Provisions for Screw Connections."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
  1. Delta Metal Products
  2. Dietrich Industries, Inc.
  3. Nucor Building Products
  4. Unimast, Inc.
  5. Wheeling Corrugating Co.

### 2.2 MATERIALS

- A. Steel Sheet: ASTM A 1101/A 1101M, hot rolled or ASTM A 108/ ASTM A 108M, cold rolled; cleaned, pretreated, and primed with manufacturer's baked-on, lead- and chromate-free, rust-inhibitive primer complying with performance requirements in FS TT-P-664, of grade as follows:
  1. Grade 33 or C, Type 1 or 2, for minimum uncoated steel thickness of 0.0428 inch and less
  2. Grade 40 or D, Type 1 or 2, for minimum uncoated steel thickness of 0.0538 inch and greater.
- B. Identify steel thickness on members by means of gauge designations painted on members, by or other identifying marks.



## 2.3 WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, complying with ASTM C 955. Provide in size and thickness as indicated. Flange width shall be manufacturer's standard to correspond with stud depths, but with a minimum of 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C 955. Thickness and depth to match studs, minimum flange width of 1-1/4 inches.
- C. Single Deflection Track: At Non-Load Bearing Walls, provide manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads. Thickness and depth to match studs, minimum flange width of 2 inches.

## 2.4 FLOOR AND CEILING JOIST FRAMING

- A. Steel Joists: Manufacturer's standard C-shaped steel joists, of web depths indicated, unpunched unless indicated otherwise, with stiffened flanges, complying with ASTM C 955. Provide in size and thickness as indicated. Flange width shall be a minimum of 1-5/8 inches.
- B. Steel Joist Track: Manufacturer's standard U-shaped steel joist track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C 955. Thickness and depth to match joists, minimum flange width of 1-5/8 inches.

## 2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi for members 0.0428 inch or less thickness, and 40,000 psi for members 0.0538 inch or greater thickness.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
  - 1. Supplementary framing.
  - 2. Bracing, bridging, and solid blocking.
  - 3. Web stiffeners.
  - 4. End clips.
  - 5. Foundation clips.
  - 6. Gusset plates.
  - 7. Stud kickers, knee braces, and girts.
  - 8. Joist hangers and end closures.
  - 9. Hole reinforcing plates.
  - 10. Backer plates.

## 2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

## 2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.
- B. Gypsum Sheathing: Comply with requirements in Division 9 Section "Gypsum Sheathing."

## 2.8 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
  - 1. Fabricate framing assemblies using jigs or templates.
  - 2. Cut framing members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.
- C. Grout bearing surfaces uniform and level to ensure full contact of bearing flanges or track webs on supporting concrete or masonry construction.

#### 3.3 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to ASTM C 1007, unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
  - 1. Cut framing members by sawing or shearing; do not torch cut.
  - 2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

- E. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- I. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

### 3.4 WALL FRAMING INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
  - 1. Anchor Spacing: As shown on Shop Drawings, but not greater than 24 inches o.c.
- B. Squarely seat studs against webs of top and bottom tracks. Fasten both flanges of studs to top and bottom tracks. Space studs as indicated on Drawings.
- C. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
  - 1. Install single deep-leg deflection tracks and anchor to building structure.
  - 2. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
    - a. Install solid blocking at every other stud.
- D. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- E. Align studs vertically where wall-framing continuity is interrupted by floor framing. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- F. Align floor and roof framing over studs. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- G. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure as indicated.

- H. Install headers over wall openings wider than stud spacing. Locate headers above openings as indicated. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
  - 1. Frame wall openings with not less than a double stud at each jamb of frame as indicated on Shop Drawings.
  - 2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- I. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
  - 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- J. Install horizontal bridging in stud system, spaced as indicated on Shop Drawings, but no greater than 54 inches o.c. apart. Fasten at each stud intersection.
  - 1. Bridging: Cold-rolled steel channel, welded to webs of studs.
- K. Install steel sheet diagonal bracing straps to both stud flanges, terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.
- L. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

### 3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05400

## 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Miscellaneous steel framing and supports.
  - 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
  - 3. Miscellaneous loose steel items and trim.
  - 4. Miscellaneous metal fabrications such as ladders and bollards.
- B. Products furnished, but not installed, under this Section include the following:
  - 1. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
- C. Coordinate the requirements of this Section with those of other sections that interface with Metal Fabrications.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Ladders: Provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
- B. Thermal Movements: Exterior metal fabrications 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 calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 100 deg F, ambient; 180 deg F, material surfaces.

#### 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Nonslip aggregates and nonslip-aggregate surface finishes.
  - 2. Paint products.

3. Grout.

B. 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.
2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer licensed in the State of Texas responsible for their preparation.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.3, "Structural Welding Code--Sheet Steel."

1.6 PROJECT CONDITIONS AND COORDINATION

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.
- B. Coordinate installation of anchorages for metal fabrications.

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.
- C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
- D. Cast Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.

## 2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners and anchors for exterior use and zinc-plated fasteners and anchors with coating complying with ASTM B 633, Class Fe/Zn 5 elsewhere.
- B. Steel Bolts, Nuts and Washers: ASTM A 307, as recommended for structural steel joints. Select fasteners for type, grade, and class required.

## 2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- 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 true to line and level with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously. At exposed connections, finish exposed welds and surfaces smooth.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, 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, coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

## 2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
- C. Galvanize miscellaneous framing and supports where indicated or if not indicated, at all conditions where moisture may be encountered or metal is in contact with concrete, grout, or masonry.

## 2.7 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize plates.

## 2.8 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.
- D. Prime interior miscellaneous steel trim, where indicated on drawings, with zinc-rich primer.

## 2.9 METAL LADDERS

- A. General:
  - 1. Comply with ANSI A14.3, unless otherwise indicated.
  - 2. Space siderails 18 inches apart, unless otherwise indicated.
  - 3. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted brackets, made from same metal as ladder.

B. Steel Ladders:

1. Siderails: Continuous, 3/8-by-2-1/2-inch steel flat bars, with eased edges.
2. Rungs: 3/4-inch diameter steel bars.
3. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
  - a. Provide nonslip surfaces on top of each rung
4. Galvanize exterior ladders, including brackets and fasteners.
5. Prime interior ladders, where indicated, including brackets and fasteners, with zinc-rich primer.

2.10 METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 40 steel pipe.
- B. Fabricate sleeves for bollard anchorage from steel pipe with 1/4-inch- thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than OD of bollard.

2.11 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.

2.12 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
  1. ASTM A 123/A 123M, for galvanizing steel and iron products.
  2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- B. Shop Priming: Prepare uncoated ferrous metal surfaces and apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

## 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. Fastening to In-Place Construction: Provide appropriate and secure anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. 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.
- B. Install pipe columns on concrete footings with grouted baseplates. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

### 3.3 INSTALLING PIPE BOLLARDS

- A. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with nonshrink, nonmetallic grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward bollard.
- B. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- C. Fill bollards solidly with concrete, mounding top surface to shed water.

### 3.4 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.
  - B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.
- END OF SECTION 05500

## SECTION 05511 - METAL STAIRS AND RAILINGS

### 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. Preassembled steel stairs with concrete-filled treads.
  - 2. Steel tube railings attached to metal stairs.
  - 3. Steel tube handrails attached to walls or structural steel.
- B. Coordinate the requirements of this Section with those of other sections that interface with Metal Stairs and Railings.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Stairs: Provide metal stairs capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Uniform Load: 100 lbf/sq. ft.
  - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
  - 3. Uniform and concentrated loads need not be assumed to act concurrently.
  - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
  - 5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.
- B. Structural Performance of Handrails and Railings: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Railings:
    - a. Uniform load of 50 lbf/ ft. applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.

#### 1.4 SUBMITTALS

- A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Provide templates for anchors and bolts specified for installation under other Sections.
2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer licensed in the State of Texas responsible for their preparation.

B. Welding certificates.

## 1.5 QUALITY ASSURANCE

- A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

1. Preassembled Stairs: Commercial class.

- B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.3, "Structural Welding Code--Sheet Steel."

## 1.6 COORDINATION

- A. Coordinate installation of anchorages for metal stairs. 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.
- B. Coordinate locations of hanger rods and struts with other work so that they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.

## PART 2 - PRODUCTS

### 2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For components 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) or ASTM A 513, Type 5 (mandrel drawn).
- C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D. Minimum yield point of 30 ksi.

- D. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, structural steel, Grade 25, unless another grade is required by design loads; exposed.

## 2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners and anchors for exterior use and zinc-plated fasteners and anchors with coating complying with ASTM B 633, Class Fe/Zn 5 elsewhere. Select fasteners for type, grade, and class required.
- B. Steel Bolts, Nuts and Washers: ASTM A 307, as recommended for structural steel joints. Select fasteners for type, grade, and class required.

## 2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
- C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
- D. Nonslip-Aggregate Concrete Finish: Factory-packaged abrasive aggregate made from fused, aluminum-oxide grits or crushed emery; rustproof and nonglazing; unaffected by freezing, moisture, or cleaning materials.
- E. Welded Wire Fabric: ASTM A 185, 6 by 6 inches--W1.4 by W1.4, unless otherwise indicated.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

## 2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  - 1. Join components by welding, unless otherwise indicated.
  - 2. Use connections that maintain structural value of joined pieces.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible.
- C. 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.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

- E. Form exposed work true to line and level with accurate angles and surfaces and straight edges.
- F. Weld connections to minimize distortion and develop strength and corrosion resistance of base metals. 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.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

## 2.6 STEEL-FRAMED STAIRS

### A. Stair Framing:

- 1. Fabricate stringers of steel channels, or of steel tubes where indicated on Drawings.
  - a. Provide closures for exposed ends of channel or tube stringers.
  - b. Run stringers continuous at platforms and landings, matching height to top of stringer to similar dimension above tread nosings.
- 2. Construct platforms of steel headers and miscellaneous framing members as needed to comply with performance requirements. Use channels or tubes to match stringers.
- 3. Weld stringers to headers; weld framing members to stringers and headers.
- 4. Where stairs are enclosed by gypsum board assemblies, provide hanger rods or struts to support landings from floor construction above or below. Locate hanger rods and struts where they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.

### B. Metal-Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.0677 inch.

- 1. Steel Sheet: Uncoated cold-rolled steel sheet; use in typical interior locations.
- 2. Steel Sheet: Galvanized steel sheet; use on exterior stairs and where indicated on Drawings.
- 3. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
- 4. Shape metal pans to include nosing integral with riser.

## 2.7 STEEL TUBE HANDRAILS AND RAILINGS

- ### A. General:
- Fabricate railings to comply with drawings and with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Accessibility Requirements: Fabricate railings to comply with requirements of the Americans With Disabilities Act (ADA) and the Texas Accessibility Standards (TAS), including but not limited to the following:
  - a. Size: **Minimum** dimension of **1-1/4 inches actual** (not nominal); and **maximum** dimension of **1-1/2 inches actual** (not nominal).
  - b. Clearance from walls: 1-1/2 inch clear, continuous.
2. Openings in railings shall be sized not to exceed four inches.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
- C. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- D. Close exposed ends of railing members with prefabricated end fittings.
- E. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- F. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
  1. Connect posts to stair framing by direct welding, unless otherwise indicated.
  2. **Fabricate posts to connect posts at floor directly to structural steel member, under floor slab, by direct welding; do NOT use base plates and bolts to anchor to concrete floor.**
  3. For galvanized railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
- G. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

## 2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
  1. ASTM A 123/A 123M, for galvanizing steel and iron products.
  2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.



3. Fill vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- C. Prepare surfaces and apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide appropriate and secure anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete, unless otherwise indicated.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. 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.
- F. Field Welding: Comply with requirements for fabrication.
- G. Place and finish concrete fill for treads and platforms to comply with Division 3 Section "Cast-in-Place Concrete."

### 3.2 INSTALLING STEEL TUBE RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
  1. **Anchor posts to steel by welding directly to steel supporting members. Do not bolt to concrete slabs.**
  2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
  3. Attach handrails securely to wall with wall brackets. Provide bracket with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

### 3.3 ADJUSTING AND CLEANING

- A. Touchup 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 to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05511

## SECTION 05515 – LADDER SAFETY POST

## I. PART ONE - GENERAL

## 1.01 SUMMARY

- A. Work included: Furnishing and installing factory fabricated ladder safety posts

## 1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM), 100 Bar Harbor Drive,  
West Conshocken, PA 19428-2959; (610) 832-9585, fax (610) 832-9555
  - 1. ASTM A 36-93a: Standard Specification for Structural Steel

## 1.03 SUBMITTALS

- A. Product Data: Provide manufacturer's product data for all materials in this specification.
- B. Shop Drawings: Show profiles, accessories, location, and dimensions.
- C. Samples: Manufacturer to provide upon request; sized to represent material adequately.
- D. Contract Closeout: Ladder Safety Post manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

## 1.04 PRODUCT HANDLING

- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

## 1.05 SUBSTITUTIONS

- A. Proposals for substitution products shall be accepted only from bidding contractors and not less than ten (10) working days before bid due date. Contractor guarantees that proposed substitution shall meet the performance and quality standards of this specification.

## 1.06 JOB CONDITIONS

- A. Verify that other trades with related work are complete before installing ladder safety post(s).
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.
- D. Observe all appropriate OSHA safety guidelines for this work.

## 1.07 WARRANTY/GUARANTEE

- A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

## II. PART TWO - PRODUCTS

### 2.01 MANUFACTURER

- A. The BILCO Company, P.O. Box 1203, New Haven, CT 06505; 1-203-934-6363, Fax: 1-203-933-8478  
Internet address: <http://www.bilco.com>  
For local representative, contact: Sweet's Buyline 1-800-892-1165 (#0032, #0034)

### 2.02 LADDER SAFETY POST

- A. Furnish and install where indicated on plans ladder safety post Model LU-1. The ladder safety post shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
  - 1. Tubular post shall lock automatically when fully extended.
  - 2. Safety post shall have controlled upward and downward movement.
  - 3. Release lever shall disengage the post to allow it to be returned to its lowered position.
  - 4. Post shall have adjustable mounting brackets to fit ladder rung spacing up to 14" on center and clamp brackets to accommodate ladder rungs up to 1-3/4" in diameter.
- C. Post: Shall be manufactured of high strength square tubing. A pull up loop shall be provided at the upper end of the post to facilitate raising the post.
- D. Material of construction: Shall be steel.
- E. Balancing spring: A stainless steel spring balancing mechanism shall be provided to provide smooth, easy, controlled operation when raising and lowering the safety post. [For installation in highly corrosive atmospheres, Model LU-3 incorporates a special alloy spring mechanism].
- F. Hardware: All mounting hardware shall be Type 316 stainless steel.
- G. Finishes: Factory finish shall be yellow powder coat steel.

## III. PART THREE - EXECUTION

### 3.01 INSPECTION

- A. Verify that ladder safety post installation will not disrupt other trades. Verify that the ladder rungs are dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

### 3.02 INSTALLATION

- A. Submit product design drawings for review and approval to the architect or specifier before fabrication.
- B. The installer shall check as-built conditions and verify the manufacturer's ladder safety post details for accuracy to fit the application prior to fabrication. The installer shall comply with the ladder safety post manufacturer's installation instructions.
- C. The manufacturer shall furnish fasteners necessary for installing ladder safety post on ladder.

END OF SECTION 05515

## SECTION 06100 - ROUGH CARPENTRY

### 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. Wood non-structural framing.
  - 2. Equipment bases and support curbs.
  - 3. Wood blocking, cants, and nailers.
  - 4. Utility shelving.
  - 5. Plywood nailers.
  - 6. Roof sheathing.
  - 7. Plywood backing panels.
- B. Coordinate the requirements of this Section with those of other sections that interface with Rough Carpentry.

#### 1.3 DEFINITIONS

- A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. NELMA - Northeastern Lumber Manufacturers Association.
  - 2. NLGA - National Lumber Grades Authority.
  - 3. RIS - Redwood Inspection Service.
  - 4. SPIB - Southern Pine Inspection Bureau.
  - 5. WCLIB - West Coast Lumber Inspection Bureau.
  - 6. WWPA - Western Wood Products Association.

#### 1.4 SUBMITTALS

- A. Product Data:
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
  - 2. Include data for fire retardant treatment, if required.

3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review. Provide grade stamps on all lumber if required by authorities.
  1. Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
- B. Wood Structural Panels:
  1. Plywood: DOC PS 1.
  2. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
  3. Factory mark panels according to indicated standard.

### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC2 (lumber) and AWPAC9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
  3. Wood floor plates that are installed over concrete slabs directly in contact with earth.

### 2.3 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated. Use Southern Yellow Pine No. 2 or Fir standard grade for concealed construction.

## 2.4 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including curbs, blocking, cants, nailers, furring, and grounds. Use Southern Yellow Pine #2 or Fir standard grade.
- B. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
  - 1. Mixed southern pine, No. 2 grade; SPIB.
  - 2. Spruce-pine-fir (south) or Spruce-pine-fir, Standard grade; NELMA, NLGA, WCLIB, or WWPA.
- C. For installing plywood behind wall pads, scoreboard, and shot clocks:
  - 1. Thickness: 5/8 inch-thick.
  - 2. Size: 48 by 96 inches, cut, for vertical installation.
- D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
  - 1. Product: Subject to compliance with requirements, provide "Dens-Glass Gold" by G-P Gypsum Corp.
  - 2. Type and Thickness: Regular, 1/2 inch thick.
  - 3. Size: 48 by 96 inches for vertical installation.
- E. Plywood Roof Sheathing: Exterior, Fire-Retardant Structural I sheathing.
  - 1. Thickness: Not less than 15/32 inch; 1/2 inch nominal.

## 2.5 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick.

## 2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, or at wall sheathing and roof decking, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.

- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1.
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- H. Expansion Anchors: Zinc-plated carbon steel anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete per ASTM E 488

## 2.7 METAL FRAMING ANCHORS

- A. General: Provide framing anchors made from metal indicated, of structural capacity, type, and size indicated on Drawings.
- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- C. Apply field treatment complying with AWP A M4 to cut surfaces of preservative-treated lumber and plywood.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

### 3.2 WOOD FRAMING INSTALLATION, GENERAL

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.



### 3.3 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
  - 1. Comply with "Code Plus" provisions in above-referenced guide.
- B. Subfloor-Underlayment:
  - 1. Glue T&G edges together, and glue and nail plywood to subfloor framing, in accordance with APA "Sturd-i-Floor" construction.
  - 2. Install Sound Barrier Board in accordance with manufacturer's printed instructions.

END OF SECTION 06100

## SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

### 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. Interior trim.
  - 2. Cabinetwork.
  - 3. Plastic-laminate work.
- B. Coordinate the requirements of this Section with those of other sections that interface with Interior Architectural Woodwork.

#### 1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items.

#### 1.4 SUBMITTALS

- A. Product Data: For any high-pressure decorative laminate, solid-surfacing material, fire-retardant-treated materials, cabinet hardware and accessories.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples for Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material indicated.

#### 1.5 QUALITY ASSURANCE

- A. Quality Standard: Unless otherwise indicated, comply with AWT's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork, construction, finishes, and other requirements.
  - 1. Premium Grade.

- B. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article. Protect items from weather while in transit.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings.

## 1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.
- B. Hardware Coordination: coordinate Shop Drawings and fabrication with hardware requirements.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated, 3/4" thickness for panel products unless otherwise indicated or required by AWI.
- B. Wood Products: Comply with the following:
  - 1. Hardboard: AHA A135.4.
  - 2. Particleboard: ANSI A208.1, Grade M-2 .
  - 3. Softwood Plywood: DOC PS 1, Medium Density Overlay.

4. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
  5. Hardwood Plywood and Face Veneers: HPVA HP-1.
- C. Thermoset Decorative Overlay (“melamine”): Particleboard complying with ANSI A208.1, Grade M-2, or medium-density fiberboard complying with ANSI A208.2, Grade MD, with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
    - a. Formica.
    - b. Micarta.
    - c. Nevamar.
    - d. Pionite.
    - e. Wilsonart.
- E. Adhesive for Bonding Plastic Laminate: FS MMM-A-130A and as recommended by mfr. Of plastic laminate for the particular condition of use. Verify VOC compliance.

## 2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where indicated, use materials impregnated with fire-retardant chemical formulations indicated by a pressure process or other means acceptable to authorities having jurisdiction to produce products with fire-test-response characteristics specified.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with AWPAC20 (lumber) and AWPAC27 (plywood), for woodwork items indicated as fire-retardant treated. Use the following treatment type:
1. Organic-resin-based formulation thermally set in wood by kiln-drying.
  2. Mill lumber before treatment and implement special procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork.
  3. Kiln-dry material before and after treatment to levels required for untreated material.
- C. Fire-Retardant Particleboard: Panels complying with the following requirements, made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread rating of 25 or less and smoke-developed rating of 25 or less per ASTM E 84.
1. For panels 3/4 inch thick and less, comply with ANSI A208.1 for Grade M-2.
  2. For panels 13/16 to 1-1/4 inches thick, comply with ANSI A208.1 for Grade M-1.
- D. Fire-Retardant Fiberboard: Medium-density fiberboard panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time

of panel manufacture to achieve flame-spread rating of 25 or less and smoke-developed rating of 200 or less per ASTM E 84.

## 2.3 CABINET HARDWARE AND ACCESSORIES

- A. Hardware Standard: Comply with BHMA A156.9.
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Wire Pulls: Back mounted, 4 inches long, 5/16 inches in diameter.
- E. Catches: Magnetic catches, BHMA A156.9, B03141.
- F. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081. K&V #255 standards and #256 clips or 5 mm hole & pin support system or approved equal.
- G. Drawer Slides: Side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings, BHMA A156.9, B05091, and rated for the following loads:
  - 1. File Drawer Slides: 100 lbf. Grant #529 or equal. Include rails for Pendaflex filing system (dual direction).
  - 2. Pencil Drawer Slides: 45 lbf Mepla SDS system.
  - 3. Keyboard Slide: 75 lbf.
- H. Locks:
  - 1. Door Locks: BHMA A156.11, E07121. Use at Reception Room 122.
  - 2. Drawer Locks: BHMA A156.11, E07041. Use at Reception Room 122.
- I. **Grommets** for Cable Passage through Countertops: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage. Color selection by Architect. Use at Reception Room 122.
- J. **Wire Manager** for Horizontally Managing Cables below Countertops: **WM22A J-shape manager, with inside dimensions of 2-9/16" by 1-3/32"**. Color selection by Architect. Use at Reception Room 122.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
  - 1. Satin Chromium Plated: . BHMA 626 for brass or bronze base; BHMA 652 for steel base.
- L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

## 2.4 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, or fire-retardant-treated softwood where required, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage.

## 2.5 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Provide Premium grade interior woodwork complying with the referenced quality standard.
- B. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to 1/16" radius.
- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site
- E. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

## 2.6 INTERIOR TRIM

- A. Quality Standard: Comply with AWI Section 300.
- B. Grade: Premium.
- C. For items with transparent finish that are wider than available lumber, use veneered construction. Do not glue for width.

## 2.7 PLASTIC-LAMINATE CABINETWORK

- A. Quality Standard: Comply with AWI Section 400 requirements for laminate cabinets.
- B. Grade: Premium.
- C. AWI Type of Cabinet Construction: As indicated.
- D. Core Material: ¾ inch Plywood or Particleboard; Core Material at lavatories and sinks to be exterior-grade plywood.
- E. Splashes: Coved base using postformable laminate cladding, except where otherwise shown on Drawings.
- F. Shelves: Grade B plywood.

- G. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
  - 1. Horizontal Surfaces including countertops: HGS.
  - 2. Postformed Surfaces: HGP.
  - 3. Vertical Surfaces: HGL.
  - 4. Countertop Edge Treatment: Same as laminate cladding on adjacent horizontal surfaces except where indicated otherwise.
  - 5. Shelf Edges:
    - a. Typical: PVC T-mold matching laminate in color, pattern, and finish.
    - b. For shelves inside cabinets: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.
- H. Materials for Semiexposed Surfaces: Match adjacent exposed surfaces.
- I. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
  - 1. Provide Architect's selections from laminate manufacturer's full range of colors and finishes.

## 2.8 SHOP FINISHING

- A. Quality Standard: Comply with AWI Section 1500, unless otherwise indicated.
- B. General: Finish architectural woodwork at fabrication shop much as possible.
- C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

### 3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700, Premium Grade.
- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims.
- C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.

- D. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with recommendations of chemical treatment manufacturer, including those for adhesives used to install woodwork.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Trim: Install with minimum number of joints possible, using full-length pieces to greatest extent possible. Scarf running joints and stagger in adjacent and related members.
  - 1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base, if finished.
- G. Cabinets: 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 installation of hardware and accessory items as indicated.
- H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
  - 1. Where applied backsplashes are shown on Drawings to be used, caulk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
- I. Refer to Division 9 Sections for final finishing of installed architectural woodwork that receives transparent or opaque finish.

### 3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semi exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06402



## SECTION 06615 - SIMULATED STONE COUNTERTOPS

## 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. Section Includes:

- 1. Quartz agglomerate countertops.

- B. Related Sections:

- 1. Division 6, Section "Interior Architectural Woodwork" for Cabinetwork and Plastic Laminate Work.

## 1.3 SUBMITTALS

- A. Product Data: For countertop materials.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
- C. Samples: For each type of material exposed to view.

## PART 2 - PRODUCTS

## 2.1 QUARTZ AGGLOMERATE COUNTERTOPS

- A. Countertops: **3/4-inch-thick**, quartz agglomerate **with front edge built up with same material**.
- B. Backsplashes and other vertical surfaces: **1/2-inch- thick**, quartz agglomerate.

## 2.2 COUNTERTOP MATERIALS

- A. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with the "Physical Characteristics of Materials" Article of ANSI SS1.

1. **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:**
  - a. Caesar Stone.
  - b. Cambria.
  - c. Cosentino USA.
  - d. E. I. du Pont de Nemours and Company.
  - e. LG Chemical, Ltd.
  - f. Meganite Inc.
  - g. Samsung Chemical USA, Inc.
  - h. Technistone USA, Inc.
  - i. Transolid, Inc.
2. **Colors and Patterns: As selected by Architect from manufacturer's full range.**

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

END OF SECTION 06615

**SECTION 07131 - SELF-ADHERING SHEET WATERPROOFING AND FLASHING****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. Flexible Flashing.
  - 2. Sheet waterproofing.
- B. Coordinate the requirements of this Section with those of other sections that interface with Self-Adhering Sheet Waterproofing and Flashing.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Provide waterproofing that prevents the passage of water.

**1.4 SUBMITTALS**

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
- B. Samples: For the following products:
  - 1. 12-by-12-inch square of waterproofing and flashing sheet.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store according to manufacturer's written instructions.
- B. Protect stored materials from direct sunlight.

**1.6 PROJECT CONDITIONS**

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

## PART 2 - PRODUCTS

### 2.1 FLEXIBLE FLASHING

- A. Use for flashing not exposed to the exterior.
- B. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch. Acceptable products:
  - 1. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Perm-A-Barrier Wall Flashing.
  - 2. Henry Company; Blueskin TWF.
  - 3. Equal product if approved by Architect.
- C. Locations:
  - 1. All base flashings.
  - 2. All lintel flashings.
  - 3. All shelf angle flashings.
  - 4. All ledge flashings.
  - 5. At all other obstructions to the downward flow of water in walls, and as otherwise indicated on the Drawings.

### 2.2 SHEET WATERPROOFING

- A. Use to cover back-up walls under the following building face materials:
  - 1. Brick masonry.
  - 2. Pre-finished metal panel.
- B. Self-Adhering, Polyethylene-Faced Sheet: ASTM D 1970, 40 mils thick minimum, consisting of slip-resisting polyethylene-film reinforcing and top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied, where indicated.
  - 1. Products:
    - a. Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; Dri-Start "A."
    - b. Grace Construction products; Grace Ice and Water Shield.
    - c. Henry Company; Blueskin PE200HT.
    - d. Johns Manville International, Inc.; Roof Defender.
    - e. NEI Advanced Composite Technology; AC Poly Ice and StormSeal.
    - f. Owens Corning; WeatherLock.
    - g. Polyguard Products, Inc.; Polyguard Deck Guard.
    - h. Protecto Wrap Company; Rainproof TM.

C. Locations:

1. All back-up walls to exterior veneers.
2. As underlayment over sheathing to which metal paneling is to be applied.

## 2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Primer: Liquid primer recommended for substrate by manufacturer of sheet waterproofing material.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by manufacturer of sheet waterproofing material.
- D. Sheet Strips: Self-adhering, rubberized-asphalt composite sheet strips of same material and thickness as sheet waterproofing.
- E. Substrate Patching Membrane: Low-viscosity, two-component, asphalt-modified coating.
- F. Mastic, Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates, including liquid mastic and adhesives, and adhesive tapes.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with curing, finish, and moisture requirements and other conditions affecting performance. Correct unsatisfactory conditions prior to installation.
- B. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

### 3.2 APPLICATION

- A. Install flexible flashing to provide continuous flashing membrane in locations indicated. Install product and auxiliary materials to tie into adjacent waterproofing.
- B. Install self-adhering product, including primer application, according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- C. Install flashing at masonry walls as follows, unless otherwise indicated:
  1. Seal all penetrations in flashing with adhesive, sealant or tape per flashing manufacturer's recommendations.

2. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 12 inches; with upper edge sealed to back-up.
  3. At lintels and shelf angles, if not indicated otherwise on drawings, extend flashing a minimum of 6 inches into masonry at each end of heads. At sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
  4. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- D. Repair tears, voids, and lapped seams in product not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheets extending 6 inches beyond repaired areas in all directions.
- E. Correct deficiencies in or remove product that does not comply with requirements, repair substrates, reapply waterproofing, and repair sheet flashings.

### 3.3 PROTECTION AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect from damage due to excess ultraviolet light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation will be subject to abuse and cannot be concealed and protected by permanent construction soon after installation.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- E. Trim exposed membranes neatly at edges of adjacent construction.

END OF SECTION 07131

## SECTION 07210 - BUILDING 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 the following:
  - 1. Concealed building insulation.
  - 2. Fire safing.
- B. Coordinate the requirements of this Section with those of other sections that interface with Building Insulation.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
  - 1. Surface-Burning Characteristics: ASTM E 84.
  - 2. Fire-Resistance Ratings: ASTM E 119.
  - 3. Combustion Characteristics (unfaced mineral-fiber insulation): ASTM E 136.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, sunlight, heat, ignition sources, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Polyisocyanurate Board Insulation:
    - a. Atlas Roofing Corporation.
    - b. Dow Chemical Company.
    - c. Rmax, Inc.
  - 2. Glass-Fiber Insulation:
    - a. CertainTeed Corporation.
    - b. Johns Manville Corporation.
    - c. Knauf Fiber Glass.
    - d. Owens Corning.

### 2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
  - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
  - 2. Typical minimum insulating values to be achieved:
    - a. R-19 at walls.
    - b. R-25 at roofs where polyiso board is used.
  - 3. All insulation units are to have insulating "R" values displayed in visible locations to meet requirements of authorities.
- B. Unfaced Mineral-Fiber Blanket (Batt) Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from glass; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
  - 1. Usage: typical wall, ceiling, and roof insulation, unless noted otherwise.
- C. Metal Building Insulation: ASTM C991, Type I, or NAIMA 202, glass-fiber-blanket (batt) insulation; 0.5-lb/cu. ft. (8-kg/cu. m) density; 2-inch- (50-mm-) wide.
  - 1. Usage: typical wall and roof insulation where pre-engineered metal building systems are used, unless noted otherwise.



- D. Foil-Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 1 or 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core on thicknesses up to 4 inches.

## 2.3 PERIMETER FIRE SAFING SYSTEMS

- A. Where gaps occur between the perimeter edge of fire-resistance-rated floor assemblies and non-fire-resistance-rated exterior walls, or at other locations indicated on the Drawings, provide a perimeter fire-containment system with fire-resistance rating equal to or greater than the floor-ceiling rating, as determined by testing identical systems per UBC Standard 26-9 and UL 2079 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

## 2.4 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

## 2.5 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:
  - 1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
  - 2. Spindle: Copper-coated, low carbon steel, fully annealed, 0.105 inch in diameter, length to suit depth of insulation indicated.
  - 3. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
  - 4. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.
- B. Poultry Mesh: Galvanized 20 gauge. Use 18 gauge annealed, galvanized steel wire to anchor poultry mesh to substrate.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled.

- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, stuff insulation around pipe to fully cover and encapsulate piping.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

### 3.2 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
  - 1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
  - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  - 3. For metal-framed wall cavities, support un-faced blankets mechanically with spindle-and-washer type anchors; additionally, use poultry mesh or wire strands if, in Architect's judgment, this is required to hold insulation firmly in place.
  - 4. At roofs, hold insulation in place with poultry mesh securely anchored to building structure with wire strands, providing complete coverage of the insulation.
- C. Stuff glass-fiber blanket insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

### 3.3 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210

## SECTION 07418 - METAL COMPOSITE WALL AND SOFFIT PANELS

### 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 metal composite wall and soffit panels and parapet caps.
- B. Related Sections:
  - 1. Division 05 Section "Cold-Formed Metal Framing" for cold-formed metal framing supporting metal composite wall panels.
  - 2. Division 07 Section "Sheet Metal Flashing and Trim" for field-formed flashings and other sheet metal work not part of metal composite wall panel assemblies.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal composite wall panel assemblies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Water Penetration: No water penetration.
- C. Structural Performance: Provide metal composite wall panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses.
  - 1. Wind Loads: Determine loads based on applicable building code or the International Building Code latest edition, whichever is more stringent.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- E. 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.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal composite wall panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal composite wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details. Distinguish among factory-, shop-, and field-assembled work.
  - 1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
    - a. Flashing and trim.
    - b. Anchorage systems.
- C. Samples: For each type of metal composite wall panel indicated with factory-applied color finishes.
- D. Warranties: Special warranties specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of metal composite wall panel from single source from single manufacturer.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal composite panels, and other manufactured items so as not to be damaged or deformed. Package metal composite panels for protection during transportation and handling.
- B. Unload, store, and erect metal composite panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal composite panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal composite panels to ensure dryness, with positive slope for drainage of water. Do not store metal composite panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal composite panels during installation.
- E. Retain strippable protective covering on metal composite wall panel for period of panel installation.

## 1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal composite panels to be performed according to manufacturers' written instructions and warranty requirements.

## 1.8 COORDINATION

- A. Coordinate metal composite panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite wall panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures, including rupturing, cracking, or puncturing.
    - b. Deterioration of metals and other materials beyond normal weathering.
  - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal composite panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 METAL COMPOSITE WALL AND SOFFIT PANELS

- A. General: Provide factory-formed and -assembled, metal composite wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assemblies' components, and accessories required for weathertight system.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Alcan Composites USA Inc.; Alucobond Plus.
    - b. ALPOLIC, Division of Mitsubishi Chemical America, Inc.; Alpolic/fr.
    - c. Arconic Architectural Products LLC; Reynobond FR.
    - d. Alucoil; Larson FR.
    - e. Citadel Architectural Products, Inc.; Envelope 2000 RR.
    - f. Protean Construction Products, Inc.; ACM 100 FR.

- B. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch- thick, coil-coated aluminum sheet facings.
  - 1. Panel Thickness: 4 mm.
  - 2. Core: Fire Retardant.
  - 3. Exterior Finish: Three-coat fluoropolymer.
    - a. Color: As selected by Architect from manufacturer's full range.
- C. Attachment Assembly Components: Formed from extruded aluminum.
- D. Attachment Assembly: Manufacturer's standard.

## 2.2 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite panels unless otherwise indicated.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal composite panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: ASTM C 920; as recommended in writing by metal composite panel manufacturer. Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

## 2.3 FABRICATION

- A. General: Fabricate and finish metal composite panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

- B. Fabricate metal composite panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
  - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
  - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
  - 4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
  - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
  - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
    - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

## 2.4 FINISHES

### A. Panels and Accessories:

- 1. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal composite panel supports, and other conditions affecting performance of the Work.
  - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal composite wall panel manufacturer.

2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal composite wall panel manufacturer.
  - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and assemblies penetrating metal composite panels to verify actual locations of penetrations relative to seam locations of metal composite panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal composite panel manufacturer's written recommendations.

### 3.3 METAL COMPOSITE PANEL INSTALLATION

- A. Attachment Assembly, General: Install attachment assembly required to support metal composite wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
  1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
- B. Installation: Attach metal composite wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.
  1. Wet Seal Systems: Seal horizontal and vertical joints between adjacent metal composite wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 07920 "Joint Sealants."
- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

### 3.4 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal composite panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On



completion of metal composite panel installation, clean finished surfaces as recommended by metal composite panel manufacturer. Maintain in a clean condition during construction.

- B. After metal composite panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal composite panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07418

**SECTION 07540 – THERMOPLASTIC MEMBRANE ROOFING****PART I GENERAL****1.01 SECTION INCLUDES**

- A. Roof Insulation, tapered and non-tapered roof insulation and cover board.
- B. TPO Membrane Roof System
- C. Engineering by roof system manufacturer to determine wind uplift pressures
- D. Manufacturer's 20 year warranty

**1.02 REFERENCES**

- A. Manufacturer's reference manual, most current edition.
- B. NRCA roofing and waterproofing manual.

**1.03 SYSTEM DESCRIPTION**

- A. Roof membrane, and insulation
  - 1. R-25 polyisocyanurate roof insulation board.
  - 2. Tapered and non-tapered polyisocyanurate roof insulation.
  - 3. 1/2" cover board.
  - 4. 80 mil TPO roof membrane, fully adhered to substrate.
  - 5. 80 mil TPO flashing, fully adhered to substrate, and all other accessories.

**1.04 SUBMITTALS**

- A. Submit certificates showing that the products delivered to the site comply with the standards set forth in the specifications. Include a certificate for bulk materials.
- B. Submit product data on any material substitutions.
- C. Submit the manufacturer's cut sheet on the system chosen.
- D. Submit a system description letter on the roof system manufacturer's letterhead that includes:
  - a. A description of the roof system to be installed.
  - b. Confirmation that the roofing contractor is certified by the roof manufacturer to install the roof system and provide the specified manufacturer's warranty.
  - c. Wind uplift pressures for all three zones on all roof levels and a roof plan denoting the width of the perimeter and corner wind uplift zones.
  - d. Plan view drawings of the insulation board, showing attachment requirements for a board in each of the three wind uplift zones. Attachment requirements are the locations and size of mechanical fasteners at metal roof decks.
  - e. A schedule of inspections to be performed by a technical representative of the roof system manufacturer during the installation of the roofing.

- E. Tapered and non-tapered roof insulation shop drawings including a roof plan and section details; minimum roof slope to drain shall be 1/4" per foot.
- F. Do not submit MSDS sheets to Architect. Submit MSDS sheets to General Contractor for all products used in the construction. Maintain one copy of each MSDS sheet on-site in construction area.

#### **1.05 QUALITY ASSURANCE**

- A. The installer of the roof system must have a minimum of five years experience installing this type of roofing on projects of this type and size.
- B. The installer must be approved by the manufacturer of the roofing materials.
- C. It is the intent to install all materials in accordance with the manufacturer's latest printed specifications. If there is a conflict between manufacturer's instructions and these specifications, notify the owner and the consultant. If there is a question of quantity in materials or application method, the more rigid specification shall apply.
- D. A pre-installation conference shall be convened prior to the beginning of this work. The conference should be used to clear up any questions or ambiguities about materials and methods of installation.
- E. Provide roof covering materials bearing U.L. Labels. The roof assembly shall have a Class A fire rating.
- F. A representative from the roofing system manufacturer must make a minimum of four site visits while the work is in progress. A report for each visit shall be supplied to the Contractor and the Owner. It shall show the status of the roof and list any deficiencies noted for correction.
- G. The roofing and sheet metal must be installed and warranted by the roofing contractor. If the sheet metal work is installed by a sub-contractor, that contractor must be employed by the roofing contractor.

#### **1.06 DELIVERING, STORAGE, AND HANDLING OF MATERIALS**

- A. Deliver materials to the site bearing manufacturers' labels, production dates, or product codes.
- B. Deliver material on pallets. Roll goods shall be stacked on end. Handle all goods to prevent damage.
- C. Store materials in dry protected areas. Use enclosed trailers when possible. Do not store roll goods or insulation materials in the PVC shipping wrappers. Use a waterproof tarpaulin to completely cover the materials. Protect materials from freezing.
- D. Keep lids on plastic cement, adhesive, primers, and other materials which are sensitive to evaporation.
- E. Do not thin primers, adhesives, or similar materials unless specified by the manufacturer.

- F. Remove any material from the job site which becomes wet or damaged.
- G. Comply with local fire codes and ordinances when flammable materials are to be stored.
- H. Do not load the roof deck or structure beyond its capacity.

#### **1.07 PROJECT SITE AND CONDITIONS**

- A. Do not install roofing products when moisture in any form is present (eg. rain, dew, frost, ice, or snow).
- B. Care must be taken when the mean temperature falls below 40 degrees F. Follow the manufacturer's instructions for cold weather application.

#### **1.08 WARRANTY**

- A. Before final payment, submit to the owner a warranty for a period of 2 years. The warranty shall cover all roofing, sheet metal, and related work called out in these documents. It shall cover defects in material and workmanship, as well as agreeing to make prompt repairs if notified of a leak. Provide a warranty inspection 1 year after the roof is installed, and 3 months prior to the expiration. Repair defects in materials or labor discovered at this time.
- B. Provide a maintenance schedule and maintenance information for the roof system installed.
- C. Provide a manufacturer's warranty on the roof system installed for a period of twenty years. The warranty shall cover material, and labor. It may not be limited by a penal sum.

#### **1.09 SEQUENCING AND SCHEDULING**

- A. Coordinate all roofing work with the general contractor.
- B. Coordinate intake air fan shut down prior to performing work which generates odors.
- C. Maintain maximum distance from intake air grills with products or equipment which generate odors.
- D. When applicable, keep all access doors from the penthouse or similar spaces to the roof closed at all times.
- E. All workers shall wear clean footwear covers to protect building finishes when while inside the building.
- F. Coordinate roofing work with inspections to be performed by a technical representative of the roof system manufacturer. Prior to the start of roofing work, schedule the inspections with the roof system manufacturer and submit a copy of the inspection schedule to the Architect.

**PART 2 PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Specification basis is GAF EverGuard 80 mil TPO, system T-FA-N-I-80. Other acceptable manufacturers are:
1. Carlisle Syntec
  2. Johns Manville
  3. Firestone

**2.02 ROOFING MEMBRANE AND INSULATION**

- A. Rigid roof insulation:
1. Roof Insulation: Polyisocyanurate, maximum board size shall be 48" x 96", minimum "R" value 31 complying with ASTM C 1289, Type II Class I, Atlas Roofing Corp. AC Foam II or equal.
  2. Tapered and Non-Tapered Insulation: polyisocyanurate, complying with ASTM C 1289, Type II Class I, Atlas Roofing Corp. AC Foam II or equal.
  3. Cover board: 1/2" Dens Deck Prime or equal as recommended by roof system manufacturer.
- B. Roof Membrane: A smooth type, polyester scrim reinforced thermoplastic polyolefin membrane with a nominal 0.080 inch (80 mil) thickness, for use as a single ply roofing membrane. Meets or exceeds the minimum requirements of ASTM D-6878. UL Listed, FM Approved. Membrane must be Energy Star Listed, CRRC Listed and Title 24 Compliant. Each full roll contains approximately 1000 sq.ft. of roofing material, 10' X 100', weighing 420 lbs.
- C. Wind Uplift Resistance: System shall be designed to resist uplift pressures calculated using ASCE 7-05.
- D. The roof membrane configuration shall be approved by FM for Class 1-SH (severe hail) exposure.

**2.03 INSULATION FASTENERS**

- A. Insulation mechanical fasteners for the metal decks shall be factory coated for corrosion resistance. The fastener shall conform to meet or exceed Factory Mutual Standard 4470.

**2.04 INSULATION ADHESIVE**

- A. Dual component polyurethane adhesive, tensile strength 35 psi per test method ASTM D-1623, OlyBond 500 or equal or as required by roof system manufacturer to resist the wind uplift forces on the roof.

**2.05 ROOF MEMBRANE ADHESIVE**

- A. Solvent-based Bonding Adhesive: Solvent based rubberized adhesive for use with TPO membranes, GAF EverGuard Bonding Adhesive.

**2.06 ROOF ACCESSORIES AND RELATED PRODUCTS**

- A. Protection Course: Manufacturer's standard product

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine surfaces to receive the new roof assembly, base flashing, and sheet metal. Report any conditions which may lead to defective installation or failure in workmanship or products. The products used should be suitable for the conditions present to produce a functional, leak free installation.
- B. Prior to beginning work, the Contractor shall inspect with a representative of the Owner and the Contractor shall document (with video tape or photographs) the condition of the staging area(s), building elevator(s) and access corridors/stairways to the roof levels that will be utilized by the Contractor in the performance with this work. Copies of the condition documentation shall be furnished to the Owner and Architect prior to beginning work. The Contractor will be responsible for repair or replacement for any damaged caused by the Contractor's operations.

**3.02 PREPARATION**

- A. Clean and prepare the deck to receive the new roof system, including the installation of primer as recommended by the adhesive manufacturer.
- B. Install treated wood nailers the same thickness as the insulation as required at roof perimeters, and openings.

**3.03 INSTALLATION OF ROOF INSULATION AND COVER BOARD**

- A. Install the rigid roof insulation over the metal deck using the mechanical fasteners, and discs. The insulation is to be installed to resist the specified wind uplift resistance. Attach the insulation using the number of fasteners required for each board in the field. Increase this number as required at the corners and perimeters. Fill all voids over 1/4" with additional insulation. Stagger joints between cover board and insulation a minimum of 6" and install the cover board in adhesive with ribbon spacing as required to resist the specified wind uplift resistance. Walk in each board to assure full adhesion. Do not force joints together. Install tapered edge strips and crickets as required for positive drainage.

**3.04 INSTALLATION OF THE ROOF MEMBRANE**

- A. Fully adhered TPO roof membrane over cover board:
  - 1. Place membrane so that wrinkles and buckles are not formed. Any wrinkles or buckles must be removed from the sheet prior to permanent attachment. Roof membrane shall be fully adhered immediately after it is rolled out, followed by welding to adjacent sheets.
  - 2. Overlap roof membrane a minimum of 3" for side laps and 3" for end laps.
  - 3. Install membrane so that the side laps run across the roof slope lapped towards drainage points.
  - 4. All exposed sheet corners shall be rounded a minimum of 1".

5. Use full width rolls in the field and perimeter regions of the roof.
6. Use appropriate bonding adhesive for substrate surface, applied with a solvent-resistant roller, brush or squeegee.
7. Fully adhere membrane sheets with bonding adhesive at a rate resulting in 60 square feet/gallon of finished roofing material for solvent-based bonding adhesives, and at a rate of 125 square feet/gallon of finished roofing material for water-borne bonding adhesive.
8. Apply bonding adhesive to both the underside of the membrane and the substrate surface at 120 square feet per gallon. A greater quantity of bonding adhesive may be required based upon the substrate surface condition.
9. Prevent seam contamination by keeping the adhesive application a few inches back from the seam area.
10. Adhere approximately one half of the membrane sheet at a time. One half of the sheet's length shall be folded back in turn to allow for adhesive application. Lay membrane into adhesive once the bonding adhesive is tacky to the touch.
11. Roll membrane with a weighted roller to ensure complete bonding between adhesive and membrane.
12. Membrane laps shall be heat-welded together. All welds shall be continuous, without voids or partial welds. Welds shall be free of burns and scorch marks.
13. Weld shall be a minimum of 1-1/2" in width for automatic machine welding and a minimum 2" in width for hand welding.
14. Supplemental membrane attachment is required at the base of all walls and curbs, and where the angle of the substrate changes by more than five (5) degrees (1" in 12"). Roofing membrane shall be secured to the structural wood deck with appropriate screws and plates spaced every 12" o.c. The screws and plates must be installed no less than 1/2" from the membrane edge. Alternatively, the roofing membrane may be turned up the vertical plane a minimum of 3" and secured with screws and termination bar. Fastener spacing is the same as is used for in-lap attachment. The termination bar must be installed within 1-1/2" to 2" of the plane of the roof membrane, with a minimum of 1" of membrane extending above the termination bar.
15. Supplemental membrane attachment to the structural wood deck is required at all penetrations unless the insulation substrate is fully adhered to the deck. Roofing membrane shall be secured to the deck with appropriate screws and plates.
16. Fasteners must be installed to achieve the proper embedment depth. Install fasteners without lean or tilt. Install fasteners so that the plate or termination bar is drawn down tightly to the membrane surface. Properly installed fasteners will not allow the plate or termination bar to move (underdriving), but will not cause wrinkling of the membrane (overdriving).

### **3.05 INSTALLATION OF FLASHINGS**

- A. Reinforced Flashings:
1. The thickness of the flashing membrane shall be the same as the same nominal 0.080 inch (80 mil) thickness of the roofing membrane.
  2. Membrane flashing shall be fully adhered to the substrate surface.
  3. Apply bonding adhesive at a rate resulting in 60 square feet/gallon of finished roofing material. Apply bonding adhesive to both the underside of the membrane and the substrate surface at 120 square feet per gallon. A greater quantity of bonding adhesive may be required based upon the substrate surface condition. The

bonding adhesive must be allowed to dry until tacky to the touch before flashing membrane application.

4. Apply the adhesive only when outside temperature is above 40°F. Recommended minimum application temperature is 50°F to allow for easier adhesive application.
5. The membrane flashing shall be carefully positioned prior to application to avoid wrinkles and buckles.

B. Eave and Gutter:

1. Flash eave and gutter with TPO membrane adhered to the substrate with bonding adhesive.
2. Secure membrane flashing at the top edge with a termination bar. Water Block shall be applied between the wall surface and membrane flashing underneath all exposed termination bars. Exposed termination bars shall be mechanically fastened 8" on center; termination bars that are counter flashed shall be fastened 12" on center.
3. Roof membrane must be mechanically attached along the base of walls with screws and plates or screws and inverted termination bar at 12" on center.
4. All coated metal wall flashings and loose applied membrane flashings must be provided with separate metal counterflashings, or metal copings.
5. Exposed termination bars must be sealed.

C. Parapet and Building Walls:

1. Flash walls with TPO membrane adhered to the substrate with bonding adhesive.
2. Secure membrane flashing at the top edge with a termination bar. Water Block shall be applied between the wall surface and membrane flashing underneath all exposed termination bars. Exposed termination bars shall be mechanically fastened 8" on center; termination bars that are counter flashed shall be fastened 12" on center.
3. Roof membrane must be mechanically attached along the base of walls with screws and plates or screws and inverted termination bar at 12" on center.
4. All coated metal wall flashings and loose applied membrane flashings must be provided with separate metal counterflashings, or metal copings.
5. Exposed termination bars must be sealed.
6. Flash wall scuppers with a coated metal insert that is mechanically attached to the wall and integrated as part of the wall flashing.

D. Roof Drains:

1. Roof drains must be fitted with compression type clamping rings and strainer baskets.
2. Roof drains must be provided with a minimum 36" x 36" sump. Slope of tapered insulation within the sump shall not exceed 4" in 12".
3. Extend the roofing membrane over the drain opening. Locate the drain and cut a hole in the roofing membrane directly over the drain opening. Provide a ½" of membrane flap extending past the drain flange into the drain opening. Punch holes through the roofing membrane at drain bolt locations.
4. For cast iron and aluminum drains, the roofing membrane must be set in a full bed of water block on the drain flange prior to securement with the compression clamping ring. Typical water block application is one 10.5 ounce cartridge per drain.
5. Lap seams shall not be located within the sump area. Where lap seams will be located within the sump area, a separate roof membrane drain flashing a minimum of 12" larger than the sump area must be installed. The roof membrane shall be mechanically attached 12" on center around the drain with screws and plates. The



separate roof drain flashing shall be heat welded to the roof membrane beyond the screws and plates, extended over the drain flange, and secured as above.

6. Tighten the drain compression ring in place.

D. Mechanical Equipment:

1. Include all skilled labor and materials for necessary mechanical and electrical disconnects. Include antennas when present. Coordinate the work with the owner.
2. Provide raised curb heights at fans and vents etc. of 8".

E. Pipes and conduits:

1. All pipes shall be set on new protection course and treated wood supports. A minimum of one 4" x 4" support shall be used for each 10' of pipe.
2. Include new pipe clamps as necessary. Oversize at large pipes to allow for movement.
3. Refer to the drawings for pipe and equipment supports.

F. Install roof protection course at the roof access areas, doors, at all sides of roof mounted mechanical equipment and where shown on the plans.

1. Invert the material after cutting.
2. Install in adhesive in maximum 6' lengths.
3. Allow space for drainage between units.

G. Coordinate all work in this section with sheet metal and related trades.

### **3.06 COORDINATION**

- A. Coordinate all work in this section with sheet metal, mechanical, and related trades.

### **3.07 QUALITY CONTROL**

- A. The owner may employ full or part time inspection services during the course of this project. Provide safe and adequate access to all parts of the work.

### **3.08 PROTECTION**

- A. Protect the roof membrane from damage until acceptance by the owner. Repair or replace damaged sections at no additional cost to the owner.
- B. Place temporary plywood panels or other protection over heavily trafficked areas.

END OF SECTION 07540

## SECTION 07620 - SHEET METAL FLASHING AND TRIM

### 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 sheet metal flashing and trim:
  - 1. Through-wall flashing.
  - 2. Manufactured reglets.
  - 3. Formed roof flashing and trim.
  - 4. Formed wall flashing and trim.
  - 5. Formed equipment support flashing.
  - 6. Formed overhead-piping safety pans.
- B. Coordinate the requirements of this Section with those of other sections that interface with Sheet Metal Flashing and Trim.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.
- D. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

#### 1.4 SUBMITTALS

- A. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
  - 1. Identify material, thickness, weight, and finish for each item and location in Project.
  - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
  - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
  - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- B. Samples: For sheet metal flashing and trim that is exposed to view. Submit manufacturer's standard color samples for factory-applied color finishes.
  - 1. Coping caps.

#### 1.5 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

#### 2.2 SHEET METALS

- A. Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
  - 2. Exposed Finishes: Apply the following coil coating:
    - a. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      - 1) Fluoropolymer 3-Coat System: Manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a minimum total dry film thickness of 1.5 mil;

complying with physical properties and coating performance requirements of AAMA 2605.

- 2) Color: As selected by Architect from manufacturer's full range.

B. Locations of Usage:

1. Roof Sheet Metal:

- a. As indicated on the Drawings for coping caps and other trim.
- b. At valleys, roof intersections at walls or parapets, and other similar conditions where different planes intersect.
- c. At roof penetrations and equipment supports.
- d. As otherwise indicated on the Drawings.

2. Flashings and Counter Flashings:

- a. At all locations where flashing of any type (through-wall, base, etc.) is exposed to the exterior or to view.
- b. As otherwise indicated on the Drawings.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhered Sheet Waterproofing: In accordance with Division 7 specification section "Self-Adhered Sheet Waterproofing and Flashing."

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
- C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- D. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

## 2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated.
1. Acceptable Manufacturers:
    - a. Cheney Flashing Company, Inc.
    - b. Fry Reglet Corporation.
    - c. Heckmann Building Products Inc.
    - d. Hickman, W. P. Company.
    - e. Keystone Flashing Company, Inc.
    - f. Sandell Manufacturing Company, Inc.
    - g. Equal if approved by Architect.
  2. Material: Stainless steel, 0.0187 inch thick.
  3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
  4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
  5. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
  6. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

## 2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
1. Seams: Fabricate nonmoving seams in accessories with flat-lock seams.
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

## 2.7 ROOF SHEET METAL FABRICATIONS

- A. Downspouts: Fabricate downspouts of shape shown (rectangular if none shown), complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
- B. Apron, Step, Cricket, and Backer Flashing: Fabricate from Prepainted, Metallic-Coated Steel 0.0217 inch thick.
- C. Valley Flashing: Fabricate from Prepainted, Metallic-Coated Steel 0.0276 inch thick.
- D. Drip Edges; Eave, Rake, Ridge and Hip Flashing: Fabricate from Prepainted, Metallic-Coated Steel 0.0217 inch thick.
- E. Base Flashing: Fabricate from Prepainted, Metallic-Coated Steel 0.0276 inch thick.
- F. Counterflashing: Fabricate from Prepainted, Metallic-Coated Steel 0.0217 inch thick.
- G. Flashing Receivers: Fabricate from Prepainted, Metallic-Coated Steel 0.0217 inch thick.
- H. Roof-Penetration Flashing: Fabricate from Lead 4.0 lb/sq. ft., hard tempered.

## 2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from Galvanized Steel 0.0276 inch thick.
- B. Overhead-Piping Safety Pans: Fabricate from Galvanized Steel 0.0396 inch thick.

## 2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Drawings may not show every condition or detail pertinent to sheet metal flashing. Contractor shall install sheet metal flashings, counterflashings, trim, and other components as required to provide a continuous and complete waterproof installation.
- B. Installation shall comply with recommendations in SMACNA's "Architectural Sheet Metal Manual."
- C. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
- D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
  - 1. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
  - 2. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- E. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- F. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and butyl sealant.
- G. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- H. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- I. Fasteners: Use stainless steel fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

- J. Seal joints with butyl sealant as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

### 3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.

### 3.4 ROOF FLASHING INSTALLATION

- A. General: Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for butyl sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
  - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
  - 2. Seal with butyl sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

### 3.5 MISCELLANEOUS FLASHING INSTALLATION

- A. Overhead-Piping Safety Pans: Suspend pans from pipe and install drain line to plumbing waste or drain line.
- B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Seal flashing with elastomeric sealant to equipment support member.

### 3.6 CLEANING AND PROTECTION

- A. Clean off excess solder and sealants.



- B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- C. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620

## SECTION 07720 – ROOF HATCH

### I. PART ONE - GENERAL

#### 1.01 SUMMARY

- A. Work included: Furnishing and installing factory fabricated roof hatches

#### 1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM), 100 Bar Harbor Drive,  
West Conshocken, PA 19428-2959; (610) 832-9585, fax (610) 832-9555
  - 1. ASTM A 36-93a: Standard Specification for Structural Steel

#### 1.03 SUBMITTALS

- A. Product Data: Provide manufacturer's product data for all materials in this specification.
- B. Shop Drawings: Show profiles, accessories, location, and dimensions.
- C. Samples: Manufacturer to provide upon request; sized to represent material adequately.
- D. Contract Closeout: Roof hatch manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

#### 1.04 PRODUCT HANDLING

- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

#### 1.05 SUBSTITUTIONS

- A. Proposals for substitution products shall be accepted only from bidding contractors and not less than ten (10) working days before bid due date. Contractor guarantees that proposed substitution shall meet the performance and quality standards of this specification.

#### 1.06 JOB CONDITIONS

- A. Verify that other trades with related work are complete before installing roof hatch(s).
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.
- D. Coordinate installation with roof membrane and roof insulation manufacturer's instructions before starting.
- E. Observe all appropriate OSHA safety guidelines for this work.

#### 1.07 WARRANTY/GUARANTEE

- A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function

in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products.

## II. PART TWO - PRODUCTS

### 2.01 MANUFACTURER

A. The BILCO Company, P.O. Box 1203, New Haven, CT 06505,  
1-203-934-6363, Fax: 1-203-933-8478, Web: [www.bilco.com](http://www.bilco.com)

### 2.02 ROOF HATCH

- A. Furnish and install where indicated on plans metal roof hatch Type S-50T, size width: 3'0" x length: 2'-6" Length denotes hinge side. The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
  - 1. Cover shall be reinforced to support a minimum live load of 40 psf with a maximum deflection of 1/150th of the span or a maximum design pressure of + or - 70 psf with a factor of safety of 2.
  - 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
  - 3. Operation of the cover shall not be affected by temperature.
  - 4. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.
- C. Cover: Shall be 11 gauge aluminum with a 4" beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
- D. Cover insulation: Shall be 2" thick polyisocyanurate with an R-value of 12, fully covered and protected by an 18 gauge aluminum liner.
- E. Curb: Shall be 12" in height and of 11 gauge aluminum. The curb shall be formed with a 4-1/2" flange with 7/16" holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6" on center, to be bent inward to hold single ply roofing membrane securely in place.
- F. Curb insulation: Shall be 2" thick polyisocyanurate with an R-value of 12.
- G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly
- H. Hardware
  - 1. Heavy pintle hinges shall be provided
  - 2. Cover shall be equipped with a spring latch with interior and exterior turn handles
  - 3. Roof hatch shall be equipped with interior and exterior padlock hasps.
  - 4. The latch strike shall be a stamped component bolted to the curb assembly.
  - 5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" diameter red vinyl grip handle to permit easy release for closing.
  - 6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed.

7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
- I. Finishes: Factory finish shall be mill finish aluminum.

### III. PART THREE - EXECUTION

#### 3.01 INSPECTION

- A. Verify that roof hatch installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

#### 3.02 INSTALLATION

- A. Submit product design drawings for review and approval to the architect or specifier before fabrication.
- B. The installer shall check as-built conditions and verify the manufacturer's roof hatch details for accuracy to fit the application prior to fabrication. The installer shall comply with the roof hatch Manufacturer's installation instructions.
- C. The installer shall furnish mechanical fasteners consistent with the roof requirements.

END OF SECTION 07720

## SECTION 07841 - THROUGH-PENETRATION FIRESTOP SYSTEMS

### 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 through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.
- B. Related Sections include the following:
  - 1. Division 7 Section "Fire-Resistive Joint Systems."
  - 2. Division 13 Sections specifying fire-suppression piping penetrations.
  - 3. Division 15 Sections specifying duct and piping penetrations.
  - 4. Division 16 Sections specifying cable and conduit penetrations.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
  - 1. Fire-resistance-rated walls including fire walls, fire partitions, fire barriers, and smoke barriers.
  - 2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.
- B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479 only where L-ratings are required:
  - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
  - 2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
    - a. Penetrations located outside wall cavities.
    - b. Penetrations located outside fire-resistance-rated shaft enclosures.

- C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
  - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
  - 2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
  - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
  - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
  - 1. Types of penetrating items.
  - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
  - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For Installer.
- E. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."

- B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- C. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
  - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
  - 2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:
    - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
    - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
      - 1) UL in its "Fire Resistance Directory."

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

#### 1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, through-penetration firestop systems that may be incorporated into the Work include, but are not limited to, those systems indicated that are produced by one of the following manufacturers:
- B. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:
  - 1. A/D Fire Protection Systems Inc.
  - 2. Grace, W. R. & Co. - Conn.
  - 3. Hilti, Inc.
  - 4. Johns Manville.
  - 5. Nelson Firestop Products.
  - 6. NUCO Inc.
  - 7. RectorSeal Corporation (The).
  - 8. Specified Technologies Inc.
  - 9. 3M; Fire Protection Products Division.
  - 10. Tremco; Sealant/Weatherproofing Division.
  - 11. USG Corporation.

### 2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
- B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
  - 1. Permanent forming/damming/backing materials, including the following:



- a. Slag-/rock-wool-fiber insulation.
  - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
  - c. Fire-rated form board.
  - d. Fillers for sealants.
2. Temporary forming materials.
  3. Substrate primers.
  4. Collars.
  5. Steel sleeves.

## 2.3 FILL MATERIALS

- A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.
- B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- E. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.
- F. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- H. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- I. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.
- J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

- K. **Silicone Sealants:** Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
1. **Grade for Horizontal Surfaces:** Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
  2. **Grade for Vertical Surfaces:** Nonsag formulation for openings in vertical and other surfaces.

## 2.4 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. **Surface Cleaning:** Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
  2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
  3. Remove laitance and form-release agents from concrete.
- B. **Priming:** Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. **Masking Tape:** Use masking tape where recommended in writing by through-penetration firestop system manufacturer to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears

from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

### 3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for firestop systems by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
  - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
  - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
  - 4. Date of installation.
  - 5. Through-penetration firestop system manufacturer's name.
  - 6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Building inspector from the authority having jurisdiction is to inspect through-penetration firestops and comply with ASTM E 2174 requirements.
- B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
- C. Proceed with enclosing through-penetration firestop systems with other construction only after building inspector verifies firestop installations comply with requirements.

### 3.6 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

### 3.7 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to alpha-alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. Firestop Systems with No Penetrating Items:
  - 1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [W-J-] [W-L-] <Insert one or more four-digit numbers> [0001-0999].
  - 2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type G.
  - 3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
  - 4. Type of Fill Materials: One or more of the following:
    - a. Latex sealant.
    - b. Silicone sealant.
    - c. Intumescent putty.
    - d. Mortar.
- C. Firestop Systems for Metallic Pipes, Conduit, or Tubing:
  - 1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [C-BK-] [F-A-] [F-B-] [F-C-] [W-J-] [W-K-] [W-L-] <Insert one or more four-digit numbers> [1001-1999].
  - 2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type A.
  - 3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>

4. Type of Fill Materials: One or more of the following:

- a. Latex sealant.
- b. Silicone sealant.
- c. Intumescent putty.
- d. Mortar.

D. Firestop Systems for Nonmetallic Pipe, Conduit, or Tubing:

- 1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [W-J-] [W-L-] <Insert one or more four-digit numbers> [2001-2999].
- 2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type B.
- 3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
- 4. Type of Fill Materials: One or more of the following:
  - a. Latex sealant.
  - b. Silicone sealant.
  - c. Intumescent putty.
  - d. Intumescent wrap strips.
  - e. Firestop device.

E. Firestop Systems for Electrical Cables:

- 1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [W-J-] [W-L-] <Insert one or more four-digit numbers> [3001-3999].
- 2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type D.
- 3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
  - a. Latex sealant.
  - b. Silicone sealant.
  - c. Intumescent putty.
  - d. Silicone foam.
  - e. Pillows/bags.

F. Firestop Systems for Cable Trays:

- 1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [W-J-] [W-K-] [W-L-] <Insert one or more four-digit numbers> [4001-4999].
- 2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type D.
- 3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
- 4. Type of Fill Materials: One or more of the following:
  - a. Latex sealant.
  - b. Intumescent putty.
  - c. Silicone foam.
  - d. Pillows/bags.
  - e. Mortar.

## G. Firestop Systems for Insulated Pipes:

1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-C-] [W-J-] [W-L-] <Insert one or more four-digit numbers> [5001-5999].
2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type C.
3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
4. Type of Fill Materials: One or more of the following:
  - a. Latex sealant.
  - b. Intumescent putty.
  - c. Silicone foam.
  - d. Intumescent wrap strips.

## H. Firestop Systems for Miscellaneous Electrical Penetrants:

1. [Available ]UL-Classified Systems: [C-AJ-] [F-A-] [W-L-] <Insert one or more four-digit numbers> [6001-6999].
2. [Available ]OPL-Classified Systems: FS <Insert one or more OPL design numbers> [F] [W], Penetrating Item Type E.
3. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
4. Type of Fill Materials: One or more of the following:
  - a. Latex sealant.
  - b. Intumescent putty.
  - c. Mortar.

## I. Firestop Systems for Miscellaneous Mechanical Penetrants:

1. [Available ]UL-Classified Systems: [C-AJ-] [F-C-] [W-J-] [W-L-] <Insert one or more four-digit numbers> [7001-7999].
2. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
3. Type of Fill Materials: One or both of the following:
  - a. Latex sealant.
  - b. Mortar.

## J. Firestop Systems for Groupings of Penetrants:

1. [Available ]UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-C-] [W-J-] [W-L-] <Insert one or more four-digit numbers> [8001-8999].
2. [Available ]ITS-Listed Systems: <Insert ITS design number(s).>
3. Type of Fill Materials: One or more of the following:
  - a. Latex sealant.
  - b. Mortar.
  - c. Intumescent wrap strips.
  - d. Firestop device.
  - e. Intumescent composite sheet.

END OF SECTION 07841

## SECTION 07842 - FIRE-RESISTIVE JOINT SYSTEMS

### 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 fire-resistive joint systems for the following:
  - 1. Floor-to-floor joints.
  - 2. Floor-to-wall joints.
  - 3. Head-of-wall joints.
  - 4. Wall-to-wall joints.
- B. Related Sections include the following:
  - 1. Division 7 Section "Through-Penetration Firestop Systems" for systems installed in openings in walls and floors with and without penetrating items.
  - 2. Division 7 Section "Joint Sealants" for non-fire-resistive joint sealants.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly in which fire-resistive joint systems are installed.
- B. For fire-resistive systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each fire-resistive joint system, show each kind of construction condition in which joints are installed; also show relationships to adjoining construction. Include fire-resistive joint system design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.
  - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each fire-resistive joint system configuration for construction and penetrating items.

- C. Product Certificates: For each type of fire-resistive joint system, signed by product manufacturer.
- D. Qualification Data: For Installer.
- E. Evaluation Reports: Evidence of fire-resistive joint systems' compliance with ICBO ES AC30, from the ICBO Evaluation Service.
- F. Research/Evaluation Reports: For each type of fire-resistive joint system.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."
- B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- C. Source Limitations: Obtain fire-resistive joint systems, for each kind of joint and construction condition indicated, through one source from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide fire-resistive joint systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
  - 1. Fire-resistance tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for fire-resistive joint systems acceptable to authorities having jurisdiction.
  - 2. Fire-resistive joint systems are identical to those tested per methods indicated in Part 1 "Performance Requirements" Article and comply with the following:
    - a. Fire-resistive joint system products bear classification marking of qualified testing and inspecting agency.
    - b. Fire-resistive joint systems correspond to those indicated by referencing system designations of the qualified testing and inspecting agency.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fire-resistive joint system products to Project site in original, unopened containers or packages with qualified testing and inspecting agency's classification marking applicable to Project and with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for fire-resistive joint systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.



## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate fire-resistive joint systems per manufacturer's written instructions by natural means or, if this is inadequate, forced-air circulation.

## 1.8 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify building inspector at least seven days in advance of fire-resistive joint system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up fire-resistive joint system installations that will become concealed behind other construction until building inspector or authorities having jurisdiction have examined each installation.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, fire-resistive joint systems that may be incorporated into the Work include, but are not limited to, those systems indicated in the Fire-Resistive Joint System Schedule at the end of Part 3.
- B. Products: Subject to compliance with requirements, provide one of the fire-resistive joint systems indicated for each application in the Fire-Resistive Joint System Schedule at the end of Part 3.

## 2.2 FIRE-RESISTIVE JOINT SYSTEMS

- A. Compatibility: Provide fire-resistive joint systems that are compatible with joint substrates, under conditions of service and application, as demonstrated by fire-resistive joint system manufacturer based on testing and field experience.
- B. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing and inspecting agency for systems indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of work.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
  - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
  - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from fire-resistive joint system materials. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates or damaging adjoining surfaces.

### 3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with Part 1 "Performance Requirements" Article and fire-resistive joint system manufacturer's written installation instructions for products and applications indicated.
- B. Install forming/packing/backing materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by openings and forming/packing/backing materials as required to achieve fire-resistance ratings indicated.
  - 2. Apply fill materials so they contact and adhere to substrates formed by joints.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 FIELD QUALITY CONTROL

- A. Inspecting of completed installations of fire-resistive joint systems shall take place in successive stages as installation of fire-resistive joint systems proceeds. Do not proceed with installation of joint systems for the next area until building inspector determines completed work shows compliance with requirements.
- B. Remove and replace fire-resistive joint systems where building inspector's inspections indicate that they do not comply with specified requirements.
- C. Additional inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and fire-resistive joint systems comply with requirements.

### 3.5 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

### 3.6 FIRE-RESISTIVE JOINT SYSTEM SCHEDULE

- A. Designation System for Joints in or between Fire-Resistance-Rated Constructions: Alphanumeric systems listed in UL's "Fire Resistance Directory" under Product Category XHBN.
- B. Floor-to-Floor Fire-Resistive Joint Systems:
  1. [Available ]UL-Classified Systems: FF-[D] [S]-<Insert separate four-digit number for each system selected to suit Project>.
  2. Assembly Rating: [1 hour] [2 hours] <Insert number of hours>.
  3. [Nominal ]Joint Width: [As indicated] <Insert dimension>.
  4. Movement Capabilities: Class [I] [II] [III] - <Insert number> percent [compression or extension] [compression, extension, or horizontal shear].
  5. L-Rating at Ambient: Less than <Insert number> cfm/lin. ft.
  6. L-Rating at 400 deg F: Less than <Insert number> cfm/lin. ft.
- C. Floor-to-Wall Fire-Resistive Joint Systems:

1. [Available ]UL-Classified Systems: FW-[D] [S]-<Insert separate four-digit number for each system selected to suit Project>.
2. Assembly Rating: [1 hour] [2 hours] <Insert number of hours>.
3. [Nominal ]Joint Width: [As indicated] <Insert dimension>.
4. Movement Capabilities: Class [I] [II] [III] - <Insert number> percent [compression or extension] [compression, extension, or horizontal shear].
5. L-Rating at Ambient: Less than <Insert number> cfm/lin. ft.
6. L-Rating at 400 deg F: Less than <Insert number> cfm/lin. ft.

D. Head-of-Wall Fire-Resistive Joint Systems:

1. [Available ]UL-Classified Systems: HW-[D] [S]-<Insert four-digit number for each system selected to suit Project>.
2. Assembly Rating: [1 hour] [2 hours] <Insert number of hours>.
3. [Nominal ]Joint Width: [As indicated] <Insert dimension>.
4. Movement Capabilities: Class [I] [II] [III] - <Insert number> percent[ compression or extension].
5. L-Rating at Ambient: Less than <Insert number> cfm/lin. ft.
6. L-Rating at 400 deg F: Less than <Insert number> cfm/lin. ft.

E. Wall-to-Wall Fire-Resistive Joint Systems:

1. [Available ]UL-Classified Systems: WW-[D] [S]-<Insert a four-digit number for each system selected to suit Project>.
2. Assembly Rating: [1 hour] [2 hours] <Insert number of hours>.
3. [Nominal ]Joint Width: [As indicated] <Insert dimension>.
4. Movement Capabilities: Class [I] [II] [III] - <Insert number> percent[ compression or extension].
5. L-Rating at Ambient: Less than <Insert number> cfm/lin. ft.
6. L-Rating at 400 deg F: Less than <Insert number> cfm/lin. ft.

END OF SECTION 07842

## SECTION 07920 - JOINT SEALANTS

### 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 joint sealants for the following applications:
  - 1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces as indicated.
  - 2. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated.
- B. Coordinate the requirements of this Section with those of other sections that interface with Joint Sealants.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for certain interior applications that establish and maintain water-resistant continuous joint seals without staining or deteriorating joint substrates.

#### 1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Warranties: Special warranties specified in this Section.
- D. Manufacturer's descriptive literature including surface preparation and installation instructions.

#### 1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
  - 2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. When contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## 1.6 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

### 2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range (more than one color may be required for each type of sealant).
- C. Elastomeric Joint Sealants: Comply with ASTM C 920. Where elastomeric sealants applied to porous substrates such as stone or masonry are specified to be nonstaining, provide products that have undergone testing according to ASTM C 1248 and have not stained substrates indicated for Project.

### 2.3 JOINT SEALANTS

- A. Single-Component, Ultra-Low Modulus Silicone Sealant:

1. Products:
  - a. Dowsil; 790.

- b. GE Silpruf SCS2000.
    - c. Equal if approved in advance by Architect.
  - 2. Usage: Brick and masonry expansion joints; concrete wall panel joints; plaster expansion joints.
- B. Single-Component, Medium Modulus Silicone Sealant:
  - 1. Products:
    - a. Dowsil; 795.
    - b. Equal if approved in advance by Architect.
  - 2. Usage: Joints between perimeter of metal window/door systems and adjacent materials. Joints between framing sections in storefront and curtainwall systems.
- C. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant:
  - 1. Products:
    - a. Pecora Corporation; 898.
    - b. Tremco; Tremsil 600 White.
    - c. Equal if approved in advance by Architect.
  - 2. Usage: Interior side of joints around perimeter of windows; “wet” interior areas such as toilet and bath rooms.
- D. Latex Sealant: Comply with ASTM C 834, Type OP, Grade NF.
  - 1. Usage: Interior “dry” uses other than those for which single-component mildew-resistant neutral-curing silicone is used. Provide at joints between countertops and backsplashes and backsplashes and wallboard, at joints between dissimilar finish materials such as gypsum board and concrete or concrete masonry, and at all other locations as required to provide a complete, finished look on the building interiors.
- E. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Flame-spread and smoke-developed indexes of less than 25 per ASTM E 84 where required by codes.
  - 1. Usage: Where indicated.

## 2.4 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings (“Backer Rod”): ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Oversize 30% to 50%.
- C. Bond-Breaker Tape: Polyethylene self-adhesive tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure.

## 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## 2.6 PENETRATING SEALER

- A. Clear, aqueous mixture of modified Silicates that does not alter bondability of concrete for application of all flooring materials and surface coatings.
- B. Products
  - 1. “Deep-Seal” as manufactured by VanHearron Inc., 410 South Coker Street, Greenwood, AR 72936. Phone: (479) 255-6101.
  - 2. Equal if approved in advance by Architect.
- C. Usage:
  - 1. Where storefront or curtainwall sill rests on floor slab, coat face of grade beam down 24 inches from sill, and coat slab in 12 inches from face of building. Extend coating full width of window and 12 inches beyond each jamb.
  - 2. On other concrete and masonry surfaces where indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.



- B. Joint Priming: Prime joint substrates. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

### 3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 07920

## SECTION 08111 - STANDARD STEEL DOORS AND FRAMES

### 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. Standard hollow-metal steel frames.
  - 2. Standard hollow-metal steel doors
- B. Coordinate the requirements of this Section with those of other sections that interface with Steel Doors & Frames.

#### 1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, fire-resistance rating, and finishes for each type of steel door and frame specified.
- B. Shop Drawings (manufacturer's published details will suffice in lieu of shop drawings, provided that the same information is shown): In addition to requirements below, provide a schedule of standard steel doors and frames using same reference numbers for details and openings as those on Drawings:
  - 1. Elevations of each door design.
  - 2. Details of doors, including vertical and horizontal edge details.
  - 3. Frame details for each frame type, including dimensioned profiles.
  - 4. Details and locations of reinforcement and preparations for hardware.
  - 5. Details of each different wall opening condition.
  - 6. Details of anchorages, accessories, joints, and connections.
  - 7. Details of glazing frames and stops showing glazing.
  - 8. Details of conduit and preparations for electrified door hardware and controls, if applicable.
- C. Product Test Reports: Based on evaluation of comprehensive fire tests performed by a qualified testing agency, for each type of standard steel door and frame.

#### 1.4 QUALITY ASSURANCE

- A. Fire-Rated Door Sidelight and/or Transom Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated.
- B. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.

#### 1.7 COORDINATION

- A. Coordinate installation of anchorages for standard steel frames. 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 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Amweld Building Products, LLC.
  - 2. Ceco Door Products; an ASSA ABLOY Group Company.
  - 3. Republic Builders Products Company.
  - 4. Steelcraft; an Ingersoll-Rand Company.

#### 2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 zinc-iron-alloy (galvannealed) coating designation.
- D. Electrolytic Zinc-Coated Steel Sheet (for supports and anchors of frames): ASTM A 591/A 591M, Commercial Steel (CS), Class B coating; mill phosphatized.
- E. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.
- F. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M.
- G. Grout: Comply with ASTM C 476, with a slump of 4 inches for standard steel door frames built into concrete or masonry, as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-developed indexes of 25 and 50 respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Division 8 Section "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.3 STANDARD STEEL (HOLLOW METAL) DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces, unless otherwise indicated. Comply with ANSI A250.8.
  - 1. Design: Flush panel.
  - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, mineral-board, or vertical steel-stiffener core that produces doors complying with ANSI A250.8.
    - a. Fire Door Core: As required to provide fire-protection ratings indicated.
    - b. Thermal-Rated (Insulated) Doors: On exterior doors, provide doors fabricated with thermal-resistance value (R-value) of not less than **2.2** when tested according to ASTM C 1363 (not less than **6** when tested according to ASTM C 518).
  - 3. Vertical Edges: Square edge unless beveled edge is indicated.
  - 4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick end closures or channels of same material as face sheets.
  - 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Interior Doors: Face sheets fabricated from cold-rolled steel sheet, unless otherwise indicated to comply with exterior door requirements. Provide doors complying with requirements indicated

below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:

1. Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush).
- C. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).
- D. Hardware Reinforcement: Fabricate reinforcement plates from same material as door face sheets. Coordinate with hardware supplier.
- E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

## 2.4 STANDARD STEEL (HOLLOW METAL) FRAMES

- A. General: Comply with ANSI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet, unless otherwise indicated to comply with exterior frame requirements.
1. Fabricate frames with mitered and welded face corners with exposed welds ground flush and smooth.
  2. Fabricate knocked-down frames with mitered or coped corners, for field assembly.
  3. Fabricate knocked-down, drywall slip-on frames for in-place gypsum board partitions.
  4. Frames for Level 2 Steel Doors: 0.053-inch- thick steel sheet.
  5. Frames for Wood Doors: 0.053-inch- thick steel sheet.
  6. Frames for Borrowed Lights: 0.042-inch- thick steel sheet, unless otherwise indicated or required for fire rating.
- C. Exterior Frames: Fabricated from metallic-coated steel sheet.
1. Fabricate frames with mitered and welded face corners with exposed welds ground flush and smooth.
  2. Frames for Level 3 Steel Doors: 0.067-inch- thick steel sheet.
- D. Hardware Reinforcement: Fabricate reinforcement plates from same material as frames. Coordinate with hardware provider.
- E. Supports and Anchors: Fabricated from electrolytic zinc-coated or metallic-coated steel sheet.
- F. Jamb Anchors:
1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
  2. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

3. Compression Type for Slip-on Frames: Adjustable compression anchors.
  4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- G. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
1. Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
- H. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.
- I. Plaster Guards: Formed from same material as frames, not less than 0.016-inch thick.

## 2.5 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.
- B. Fixed Frame Moldings: Formed integral with standard steel frames, minimum 5/8 inch high, unless otherwise indicated.
- C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.

## 2.6 FABRICATION

- A. General: Fabricate standard steel doors and frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Standard Steel Doors:
1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
  2. Glazed Lites: Factory cut openings in doors.
- C. Standard Steel Frames:
1. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners, unless otherwise indicated.

4. Plaster Guards: Weld guards to frame at back of hardware mortises in frames installed in concrete or masonry.
  5. Where installed in masonry, leave vertical mullions in frames open at top for grouting.
  6. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
  7. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches in height.
      - 2) Four anchors per jamb from 60 to 90 inches in height.
      - 3) Five anchors per jamb from 90 to 96 inches in height.
      - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 96 inches in height.
      - 5) Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
    - b. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Two anchors per jamb up to 60 inches in height.
      - 2) Three anchors per jamb from 60 to 90 inches in height.
      - 3) Four anchors per jamb from 90 to 120 inches in height.
      - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 120 inches in height.
    - c. Compression Type: Not less than two anchors in each jamb.
    - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
  8. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Provide plastic plugs to keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Hardware Preparation: Factory prepare standard steel doors and frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Division 8 Section "Door Hardware."
1. Reinforce doors and frames to receive nontemplated mortised and surface-mounted door hardware.
  2. Comply with applicable requirements in ANSI A250.6 and ANSI/DHI A115 Series specifications for door and frame preparation for hardware. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.
- E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of door or frame.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings such that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of doors and frames.
5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

## 2.7 STEEL FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  1. Finish standard steel door and frames after assembly.
- B. Metallic-Coated Steel Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
  1. Galvanizing Repair Paint: High-zinc-dust-content paint for reglazing welds in steel, complying with SSPC-Paint 20.
- C. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel; comply with SSPC-SP 3, "Power Tool Cleaning," or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.
  1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:



- B. Drill and tap doors and frames to receive nontemplated mortised and surface-mounted door hardware.

### 3.2 INSTALLATION

- A. General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install standard steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Standard Steel Frames: Install standard steel frames for doors, sidelights, transoms, borrowed lights and other openings, of size and profile indicated. Comply with SDI 105.
  - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - b. At fire-protection-rated openings, install frames according to NFPA 80.
    - c. Apply bituminous coating to backs of frames that are filled with mortar or grout.
  - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with postinstalled expansion anchors.
  - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  - 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar as specified in Division 4 Section "Unit Masonry Assemblies."
- C. Standard Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
  - 1. Non-Fire-Rated Standard Steel Doors:
    - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
    - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
  - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
  - 3. Smoke-Control Doors: Install doors according to NFPA 105.
- D. Glazing: Comply with installation requirements in Division 8 Section "Glazing" and with standard steel door and frame manufacturer's written instructions.
  - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c., and not more than 2 inches o.c. from each corner.

### 3.3 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including standard steel doors or frames that are warped, bowed, or otherwise unacceptable.
- B. Clean grout and other bonding material off standard steel doors and frames immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- D. Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08111

## SECTION 08125 - INTERIOR ALUMINUM FRAMES

### 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. Interior aluminum frames for doors.
- B. Coordinate the requirements of this Section with those of other sections that interface with Interior Aluminum Frames, especially:
  - 1. Division 8 Section "Flush Wood Doors" for wood doors installed in interior aluminum frames.
  - 2. Division 8 Section "Door Hardware" for door hardware.
  - 3. Division 8 Section "Glazing" for glass in interior aluminum frames.
  - 4. Division 9 Section "Gypsum Board Assemblies" for partitions.

#### 1.3 SUBMITTALS

- A. Samples: 6-inch- long framing member with factory-applied finish for each type of interior aluminum frame indicated.
- B. Maintenance Data: For interior aluminum frames to include in maintenance manuals.

#### 1.4 QUALITY ASSURANCE

- A. Fire-Rated Door-Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated on Drawings.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for interior aluminum frames is based on RACO products. Subject to compliance with requirements, provide the RACO product indicated or a comparable product by one of the following:

1. Versatrac Interior Frames.
2. Raco, Interior Products, Inc.
3. Frameworks Manufacturing.
4. Other approved equal.

## 2.2 COMPONENTS

- A. Aluminum Framing, General: ASTM B 221, Alloy 6063-T5 or alloy and temper required to suit structural and finish requirements, not less than 0.062 inch thick.
- B. Door Frames: Reinforced for hinges and strikes.
  1. Fabricate frame members for 90-minute fire-protection rating with interior cold-formed, primed, steel liner.
- C. Glazing Frames: For glazing thickness indicated.
- D. Ceiling Tracks: Extruded aluminum.
  1. Use exposed head tracks along ceiling that match other framing members in color and appearance.
- E. Trim: Extruded aluminum, not less than 0.062 inch thick, with removable snap-in casing trim, glazing stops, and door stops, all without exposed fasteners.
  1. Where partitions meet ceiling, use surfaced-applied exposed trim piece that matches adjacent framing members in color and appearance.

## 2.3 ACCESSORIES

- A. Fasteners: Aluminum, nonmagnetic stainless-steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.
- B. Sound Seals: Manufacturer's standard continuous mohair, wool pile, or vinyl seals.
- C. Smoke Seals for fire-rated assemblies: Intumescent strip or fire-rated gaskets.
- D. Glazing Gaskets: Manufacturer's standard extruded or molded plastic, to accommodate glazing thickness indicated.

## 2.4 FABRICATION

- A. Machine jambs and prepare for hardware, with concealed reinforcement plates, drilled and tapped as required, and fastened within frame with concealed screws.
- B. Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted or mitered connections.

- C. Fabricate frames for glazing with removable stops to allow glazing replacement without dismantling frame.
- D. Fabricate all components to allow secure installation without exposed fasteners.

## 2.5 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
  - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.0 mils, medium gloss.
  - 2. Color: As selected by Architect from manufacturer's full range.
- D. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
  - 1. Color: As selected by Architect from manufacturer's full range.
- E. Powder-Coated Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating). Apply thermosetting TGIC polyester, polyester urethane, or acrylic urethane powder coating with a cured film thickness of not less than 1.8 mils complying with coating and resin manufacturers' written instructions.
  - 1. Color: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine walls, floors, and ceilings, with Installer present, for conditions affecting performance of work.
  - 1. Verify that wall thickness does not exceed standard tolerances allowed by throat size indicated.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with frame manufacturer's written installation instructions.
- B. Install frames plumb and square, securely anchored to substrates. Eliminate wobble, rattle, and movement.
- C. Install frame components in the longest possible lengths; components must be 1 piece.
  - 1. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
  - 2. Secure clips to main structural extrusion components and not to snap-in or trim members.
  - 3. Do not leave screws or other fasteners exposed to view when installation is complete.
  - 4. When fastening to suspended ceiling grid, fasten on maximum 24-inch centers, using sheet metal screws or other fasteners approved by frame manufacturer.

### 3.3 CLEANING

- A. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended by frame manufacturer and according to AAMA 609 & 610.
- B. Touch up marred frame surfaces. Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

END OF SECTION 08125

## SECTION 08211 - FLUSH WOOD PLASTIC LAMINATE-VENEER DOORS

### 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. Solid-core doors with plastic-laminate faces.
- B. Coordinate the requirements of this Section with those that interface with Flush Wood Doors, particularly Division 8 Section "Glazing" for glass view panels in flush wood doors.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction, louvers where they might occur, and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
  - 1. Indicate dimensions and locations of mortises and holes for hardware.
  - 2. Indicate dimensions and locations of cutouts.
  - 3. Indicate fire ratings for fire doors.
- C. Samples for Selection: Color charts consisting of actual materials in small sections for the following:
  - 1. Plastic-Laminate Door Faces: Show the full range of colors, textures, and patterns available.

#### 1.4 QUALITY ASSURANCE

- A. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
- B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
  - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  - 2. Warranty shall be in effect for one year from date of Substantial Completion:

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Flush Wood Doors:
    - a. Algoma Hardwoods Inc.
    - b. Eggers Industries; Architectural Door Division.
    - c. VT Industries Inc.
    - d. Weyerhaeuser Company.

### 2.2 DOOR CONSTRUCTION, GENERAL

- A. Plastic-Laminate-Faced Doors:
  - 1. Grade: Premium.
  - 2. Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS.
  - 3. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of products.
  - 4. Stiles: Hardwood edges for painting.



## 2.3 SOLID-CORE DOORS

### A. Particleboard Cores: Comply with the following requirements:

1. Particleboard: ANSI A208.1, Grade LD-2.
2. Provide doors with either glued-block or structural composite lumber cores instead of particleboard cores at locations where exit devices are indicated.

### B. Interior Plastic-Laminate-Faced Doors:

1. Core: Particleboard.
2. Construction: Three plies with stiles and rails bonded to core, then entire unit abrasive planed before faces are applied.

### C. Fire-Rated Doors:

1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
2. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated as needed to eliminate through-bolting hardware.
3. Edge Construction: At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching face veneer.
4. Pairs: Furnish formed-steel edges and astragals with intumescent seals for pairs of fire-rated doors, unless otherwise indicated.

## 2.4 LIGHT FRAMES

### A. Wood Beads for Light Openings in Wood Doors:

1. Wood Species: Species compatible with door faces.
2. Profile: Manufacturer's standard shape.
3. Where 20-minute, fire-rated, wood-core doors occur, provide wood beads and metal glazing clips approved for such use.

### B. Metal Frames for Light Openings in Fire Doors: Manufacturer's standard frame formed of 0.0478-inch- thick, cold-rolled steel sheet; factory primed and approved for use in doors of fire rating indicated.

### C. Fire Door Louvers: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire rating of one and one-half hours and less.

1. Metal and Finish: Galvanized steel, 0.0396 inch thick, hot-dip zinc coated and factory primed for paint finish.

## 2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
  - 1. Comply with clearance requirements of Premium quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
- C. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
  - 1. Light Openings: Trim openings with moldings of material and profile indicated.
- D. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
  - 1. Fabricate door and transom panels with full-width, solid-lumber, rabbeted, meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
  - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.

- a. Comply with NFPA 80 for fire-rated doors.
  - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
  - 3. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
- D. Field-Finished Doors: Refer to Division 9 Section "Painting" for finishing requirements:

### 3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08211

## SECTION 08310 - FLOOR ACCESS DOORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Provide factory-fabricated floor access doors.

#### 1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data.
- B. Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.
- C. Warranty: Submit executed copy of manufacturer's standard warranty.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer: A minimum of 5 years experience manufacturing similar products.
- B. Installer: A minimum of 2 years experience installing similar products.
- C. Manufacturer's Quality System: Registered to ISO 9001 Quality Standards including in-house engineering for product design activities.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-ventilated area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

#### 1.5 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Basis-of-Design Manufacturer: Type SM Surface Mount with Angle Frame Floor Access Door by The BILCO Company, P.O. Box 1203, New Haven, CT 06505, 1-800-366-6530, Fax: 1-203-535-1582, Web: [www.bilco.com](http://www.bilco.com).

#### 2.2 ACCESS DOOR

- A. Furnish and install where indicated on plans vault access door Type SM, size: width 3'-0" x length 2'-6". Length denotes hinge side. The floor access door shall be single leaf and pre-assembled from the manufacturer.

## B. Performance characteristics:

1. Cover: Shall be reinforced to support a minimum live load of 105 psf.
2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
3. Operation of the cover shall not be affected by temperature.
4. Entire door, including all hardware components, shall be highly corrosion resistant. Please consult the manufacturer when doors are to be installed in unusually harsh environments or extremely corrosive conditions.

## C. Cover: Shall be 1/8" aluminum diamond pattern.

## D. Frame: Shall be 1/4" x 3" x 3" angle frame with internal mounting flange and 7/16" diameter anchor holes.

## E. Gasket: A heavy extruded EPDM rubber gasket shall be permanently adhered to the cover.

## F. Hinges: Shall be heavy duty Type 316 stainless steel pintle hinges with 3/8" Type 316 stainless steel hinge pins.

## G. Lifting Assistance: Manufacturer shall provide a gas strut lifting mechanism with a powder-coat finish to provide smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing.

## H. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover and the latch release shall be protected by a flush, gasketed, removable screw plug.

## I. Hardware:

1. Cover shall be equipped with an aluminum hold open arm that automatically locks the cover in the open position
2. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
3. Hardware: Gas strut has a powder coat finish. All other hardware is type 316 stainless steel unless otherwise specified.

## J. Finishes: Factory finish shall be mill finish aluminum.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
1. Test units for proper function and adjust until proper operation is achieved.
  2. Repair finishes damaged during installation.
  3. Restore finishes so no evidence remains of corrective work.

3.3 ADJUSTING AND CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION 08310

## SECTION 08332 – COILING COUNTER SHUTTERS

### 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 types of manually and electric-motor-operated coiling counter shutters:
  - 1. Counter shutters.
- B. Coordinate the requirements of this Section with those of other sections that interface with Coiling Counter Shutters.

#### 1.3 SUBMITTALS

- A. Product Data: For each type and size of coiling counter shutter and accessory. Include the following:
  - 1. Summary of forces and loads on walls and jambs.
- B. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's product data.
- C. Samples: Manufacturer's color charts showing full range of colors available.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain coiling counter shutters through one source from a single manufacturer.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

1. Overhead Door Company; basis-of-design model 650.
2. Atlas Door; Div. of Clopay Building Products Company, Inc.
3. Cornell Cookson, Inc.
4. Raynor.
5. Other manufacturer, but only with prior approval of the Architect.

## 2.2 SHUTTER CURTAIN MATERIALS AND CONSTRUCTION

- A. Shutter Curtains: Fabricate coiling counter shutter curtain of interlocking slats, in a continuous length for width of shutter without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by shutter manufacturer for performance, size, and type of shutter indicated, and as follows:
1. Stainless Steel Shutter Curtain Slats: Cold-rolled structural steel (SS) sheet.
    - a. Minimum Base-Metal (Uncoated) Thickness: 0.0209 inch.
    - b. Flat profile slats.
- B. Endlocks for Counter Shutters: Manufacturer's standard locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Counter Shutters: Manufacturer's standard continuous channel or tubular shape, to suit type of curtain slats, either aluminum extrusions or stainless steel where fire rating may be required.
1. Astragal: Provide a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene; for placement between angles or fitted to shape, as a cushion bumper for interior shutter.
- D. Curtain Jamb Guides for Counter Shutters: Fabricate curtain jamb guides of material and finish to match curtain slats, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise; with removable stops on guides to prevent overtravel of curtain.

## 2.3 HOODS AND ACCESSORIES

- A. Push/Pull Handles: For push-up-operated or emergency-operated shutters, provide galvanized steel lifting handles on each side of shutter.
1. Provide pull-down pole hooks for shutters more than 84 inches high.
- B. Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.
1. Locking Bars: Single-jamb side operable from inside only. Lock cylinder shall be keyed with hardware specified in Division 8 Section "Finish Hardware."



## 2.4 COUNTERBALANCING MECHANISM

- A. General: Counterbalance shutters by means of adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to shutter curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.
- C. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.
- D. Fabricate torsion rod for counterbalance shaft of cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Provide mounting brackets of manufacturer's standard design, either cast iron or cold-rolled steel plate.

## 2.5 MANUAL SHUTTER OPERATORS

- A. Provide manual operators unless electric shutter operators are indicated.
- B. Push-up Operation: Design counterbalance mechanism so required lift or pull for shutter operation does not exceed 25 lbf.

## 2.6 FINISHES, GENERAL

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install coiling shutters and operating equipment complete with necessary hardware, jamb and head molding strips, anchors, inserts, hangers, and equipment supports.

3.2 ADJUSTING

- A. Lubricate bearings and sliding parts; adjust shutters to operate easily, free of warp, twist, or distortion and with tight fit around entire perimeter.

3.3 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain coiling counter shutters.

END OF SECTION 08332

**SECTION 08411 - ALUMINUM-FRAMED ENTRANCES, STOREFRONTS AND WINDOWS****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. Exterior and interior aluminum-framed storefronts and windows.
    - a. Glazing is retained mechanically with gaskets on four sides.
  - 2. Exterior and interior manual-swing aluminum doors.
- B. Coordinate the requirements of this Section with those of other sections that interface with Aluminum Framed Entrances, Storefronts, and Windows.

**1.3 PERFORMANCE REQUIREMENTS**

- A. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
  - 1. Structural loads.
  - 2. Thermal movements.
  - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
  - 4. Dimensional tolerances of building frame and other adjacent construction.
  - 5. Wind loads per International Building Code, latest edition, including amendments adopted by local governing authorities, but no less than 20 lbs. per sq. ft.
- B. Deflection of Framing Members:
  - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches.
  - 2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.
- C. Structural-Test Performance: Provide aluminum-framed systems that conform to ASTM E 330 as follows:
  - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.

2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Durations: As required by design wind velocity but not less than 10 seconds.
- D. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- E. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 8.0 lbs/sq. ft.
- F. Water Penetration: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static or dynamic air-pressure difference of 8.0 lbs. per square foot.
- G. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45 tested according to AAMA 1503.

#### 1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- B. Certified Test Results: Provide certified test results from a nationally recognized testing agency that the system meets the Performance Requirements specified in Part 1 Article "Performance Requirements" above.
- C. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
1. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
  2. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
- D. Structural Analysis Data: Include structural analysis data and shop drawings related to system anchorage that are signed and sealed by the Professional Engineer registered in the state of Texas who is responsible for their preparation. Engineer shall also provide structural analysis data, signed and sealed, for system Performance Requirements that are not certified by manufacturer.
- E. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
- F. Warranties: Special warranties specified in this Section.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Capable of meeting requirements of this Section and who is acceptable to manufacturer.
- B. Accessible Entrances: Comply with Texas Accessibility Standards (“TAS”).

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings. Ensure adequacy of proper joint widths between system and adjoining building components.

## 1.7 WARRANTY

- A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Deterioration of metals and other materials beyond normal weathering.
    - c. Water leakage through fixed glazing and framing areas.
    - d. Failure of operating components.
  - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for aluminum-framed systems is based on the following system:
  - 1. Storefront:
    - a. Kawneer Tri-Fab 451 with High Performance sill flashing.
  - 2. Windows:

- a. Kawneer Tri-Fab 451 with High Performance sill flashing.
3. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - a. Atlas Industries.
  - b. Arch Aluminum & Glass, manufacturers of Amarlite
  - c. Oldcastle
  - d. Pittco Architectural Metals, Inc.
  - e. Tubelite, Inc.

**NOTE:** Products by U.S. Aluminum are **not permitted** on the Project.

**NOTE:** Products by YKK AP America Inc. are **not permitted** for the Project.

## 2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  1. Sheet and Plate: ASTM B 209.
  2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
  3. Extruded Structural Pipe and Tubes: ASTM B 429.
  4. Structural Profiles: ASTM B 308/B 308M.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard. Provide wherever required to meet Performance Standards cited above.
  1. Structural Shapes, Plates, and Bars: ASTM A 36.
  2. Cold-Rolled Sheet and Strip: ASTM A 1008.
  3. Hot-Rolled Sheet and Strip: ASTM A 1011.

## 2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
- D. Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed flashing from sheet aluminum finished to match framing. Use for end dams at sills.

- E. Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type.

## 2.4 GLAZING SYSTEMS

- A. Glazing: As specified in Division 8 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal, as specified in Division 8 Section "Glazing."
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

## 2.5 DOORS

- A. Doors: Manufacturer's standard glazed doors, for manual swing operation.
  - 1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie rods. Provide thermal separations as required.
  - 2. Door Design:
    - a. Wide stile; 5-inch nominal width.
    - b. Accessible Doors: Smooth surfaced for width of door in area within 10 inches above floor or ground plane.
  - 3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
- B. Door Hardware: As specified in Division 8 Section "Door Hardware."

## 2.6 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

## 2.7 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles which are sharp, straight, and free of defects or deformations.
  - 2. Accurately fitted hairline joints with ends coped or mitered.
  - 3. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
  - 4. Physical and thermal isolation of glazing from framing members.

5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  6. Provisions for field replacement of glazing from exterior.
  7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Door Frames: Reinforce as required to support loads imposed by door operation and for installing hardware.
- C. Doors: Reinforce doors as required for installing hardware.
- D. Hardware Installation: Factory installed hardware to the greatest extent possible.

## 2.8 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
1. Color: As selected by Architect from manufacturer's full range.
- C. High-Performance Organic Finish (3-Coat Fluoropolymer "Kynar"): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
1. Color and Gloss: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General:
1. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.
  2. Comply with manufacturer's written instructions.
  3. Do not install damaged components.
  4. Fit joints to produce hairline joints free of burrs and distortion.
  5. Rigidly secure nonmovement joints.



6. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
  7. Seal joints watertight, unless otherwise indicated.
- B. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:
1. Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
  2. Alignment:
    - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
    - b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
- C. Metal Protection:
1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
  2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- E. Install components plumb and true in alignment with established lines and grades, without warp or rack.
- F. Install glazing as specified in Division 8 Section "Glazing."
- G. Install perimeter joint sealants as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.
- H. Entrances: Install to produce smooth operation and tight fit at contact points.
1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
  2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- I. For all door thresholds with exterior exposure, install in continuous bed of non-curing butyl sealant to provide weathertight seal between floor slab and underside of threshold.

### 3.2 ADJUSTING

- A. Entrances: Adjust operating hardware for smooth operation according to hardware manufacturers' written instructions and the Texas Accessibility Standards (TAS).

END OF SECTION 08411

**SECTION 08711 - DOOR HARDWARE****PART 1 GENERAL****3.01 SECTION INCLUDES**

- A. Hardware for Wood, Hollow Metal and Aluminum doors.
- B. Hardware for fire-rated doors.
- C. Lock cylinders for doors with balance of hardware specified in other sections.
- D. Thresholds.
- E. Weatherstripping and gasketing.

**3.02 RELATED REQUIREMENTS**

- A. Section 062000 - Finish Carpentry: Wood door frames.
- B. Section 079200 - Joint Sealants: Sealants for setting exterior door thresholds.
- C. Section 080671 - Door Hardware Schedule: Schedule of door hardware sets.
- D. Section 081113 - Hollow Metal Doors and Frames.
- E. Section 081116 - Aluminum Doors and Frames.
- F. Section 081213 - Hollow Metal Frames.
- G. Section 081416 - Flush Wood Doors.
- H. Section 081433 - Stile and Rail Wood Doors.
- I. Section 084313 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.

**3.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2019.
- C. BHMA A156.1 - Standard for Butts and Hinges 2021.
- D. BHMA A156.3 - Exit Devices 2020.
- E. BHMA A156.4 - Door Controls - Closers 2019.
- F. BHMA A156.6 - Standard for Architectural Door Trim 2021.
- G. BHMA A156.7 - Template Hinge Dimensions 2016.
- H. BHMA A156.8 - Door Controls - Overhead Stops and Holders 2021.
- I. BHMA A156.13 - Mortise Locks & Latches Series 1000 2017.
- J. BHMA A156.15 - Release Devices - Closer Holder, Electromagnetic and Electromechanical 2021.
- K. BHMA A156.16 - Auxiliary Hardware 2018.
- L. BHMA A156.21 - Thresholds 2019.
- M. BHMA A156.22 - Standard for Gasketing 2021.
- N. BHMA A156.26 - Standard for Continuous Hinges 2021.
- O. BHMA A156.28 - Recommended Practices For Mechanical Keying Systems 2018.

- P. BHMA A156.30 - High Security Cylinders 2020.
- Q. BHMA A156.36 - Auxiliary Locks 2020.
- R. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames 2016.
- S. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames 2006.
- T. DHI (H&S) - Sequence and Format for the Hardware Schedule 2019.
- U. DHI (KSN) - Keying Systems and Nomenclature 2019.
- V. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames 2004.
- W. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors 1993; also, in WDHS-1/WDHS-5 Series, 1996.
- X. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- Y. ISO 9001 - Quality management systems -- Requirements 2015.
- Z. ITS (DIR) - Directory of Listed Products current edition.
- AA. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- BB. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- CC. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
- DD. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
- EE. UL (DIR) - Online Certifications Directory Current Edition.
- FF. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.
- GG. UL 437 - Standard for Key Locks Current Edition, Including All Revisions.
- HH. UL 1037 - Antitheft Alarms and Devices Current Edition, Including All Revisions.
- II. UL 1610 - Central-Station Burglar-Alarm Units Current Edition, Including All Revisions.
- JJ. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

### **3.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure facility services connections are achieved in an orderly and expeditious manner.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by affected installers and the following:
  - 1. Architect.
  - 2. Installer's Architectural Hardware Consultant (AHC).
  - 3. Hardware Installer.
  - 4. Owner's Security Consultant.
- D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- E. Keying Requirements Meeting:
  - 1. Schedule meeting at project site prior to Contractor occupancy.
  - 2. Architect will schedule meeting at project site prior to Contractor occupancy.
  - 3. Owner will schedule meeting at project site prior to Contractor occupancy.
  - 4. Attendance Required:

5. Agenda:
  - a. Establish keying requirements.
  - b. Verify locksets and locking hardware are functionally correct for project requirements.
  - c. Verify that keying and programming complies with project requirements.
  - d. Establish keying submittal schedule and update requirements.
6. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
7. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
8. Deliver established keying requirements to manufacturers.

### 3.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: A detailed listing that includes each item of hardware to be installed on each door.
  1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
  2. Comply with DHI (H&S) using door numbering scheme and hardware set numbers as indicated in Contract Documents.
    - a. Submit in vertical format.
  3. Include complete description for each door listed.
- D. Shop Drawings - Electrified Door Hardware: Include diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
  1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
  2. Elevations: Include front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
  3. Diagrams: Include point-to-point wiring diagrams that show each device in door opening system with related colored wire connections to each device.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Supplier's qualification statement.
- I. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- J. Keying Schedule:
  1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- K. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- L. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- M. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.

**3.06 QUALITY ASSURANCE**

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.
- D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) to assist in work of this section.
- E. Manufacturer Certifications: Provide products manufactured in facilities using quality management system certified for compliance with ISO 9001 and environmental management systems certified for compliance with ISO 14001.

**3.07 DELIVERY, STORAGE, AND HANDLING**

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

**3.08 WARRANTY**

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
  - 1. Closers: Five years, minimum.
  - 2. Exit Devices: Three years, minimum.
  - 3. Locksets and Cylinders: Three years, minimum.

**PART 2 PRODUCTS****5.01 GENERAL REQUIREMENTS**

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Locks: Provide a lock for each door, unless it's indicated that lock is not required.
  - 1. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's Series. As indicated in hardware sets.
    - a. Provide an office lockset for swinging doors for which a lock function is not indicated.
  - 2. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.
  - 3. Strikes:
    - a. Finish: To match lock or latch.
    - b. Curved-Lip Strikes: Provide as standard, with extended lip to protect frame, unless otherwise indicated.
    - c. Center Strike At Pairs of Doors: 7/8-inch (22.2 mm) lip.
- D. Closers:
  - 1. Provide door closer on each exterior door, unless otherwise indicated.
  - 2. Provide door closer on each fire-rated and smoke-rated door.
  - 3. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.

- E. Overhead Stops and Holders (Door Checks):
  - 1. Provide stop for every swinging door, unless otherwise indicated.
  - 2. Overhead Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop, unless otherwise indicated.
  - 3. Overhead stop is not required if a floor or wall stop has been specified for the door.
- F. Drip Guards: Provide at head of out swinging exterior doors unless protected by roof or canopy directly overhead.
- G. Weatherstripping and Gasketing:
  - 1. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
  - 2. Provide door bottom sweep on each exterior door, unless otherwise indicated.
  - 3. Fabricate as continuous gasketing, do not cut or notch gasketing material.
- H. Fasteners:
  - 1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
    - a. Aluminum fasteners are not permitted.
    - b. Provide Phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
  - 2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
    - a. Self-drilling (Tek) type screws are not permitted.
  - 3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
  - 4. Provide wall grip inserts for hollow wall construction.
  - 5. Fire-Resistance-Rated Applications: Comply with NFPA 80.
    - a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
    - b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

## 5.02 PERFORMANCE REQUIREMENTS

- A. Provide door hardware products that comply with the following requirements:
  - 1. Applicable provisions of federal, state, and local codes.
    - a. NFPA 101.
  - 2. Accessibility: ADA Standards and ICC A117.1.
  - 3. Fire-Resistance-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
  - 4. Hardware on Fire-Resistance-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), testing firm acceptable to authorities having jurisdiction, or [\_\_\_\_\_] as suitable for application indicated.
  - 5. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
  - 6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
  - 7. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
  - 8. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

## 5.03 HINGES

- A. Manufacturers: Conventional butt hinges.
  - 1. BEST; dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).

**B. Properties:**

1. Butt Hinges: As applicable to each item specified.
  - a. Standard Weight Hinges: Minimum of two (2) permanently lubricated non-detachable bearings.
  - b. Template screw hole locations.
  - c. Bearing assembly installed after plating.
  - d. Bearings: Concealed fully hardened bearings.
  - e. Bearing Shells: Shapes consistent with barrels.
  - f. Pins: Easily seated, non-rising pins.
    - 1) Fully plate hinge pins.
    - 2) Non-Removable Pins: Slotted stainless-steel screws.
  - g. UL 10C listed for fire-resistance-rated doors.
2. Continuous Hinges: As applicable to each item specified.
  - a. Geared Continuous Hinges: As applicable to each item specified.
    - 1) Non-handed.
    - 2) Anti-spinning through-fastener.
    - 3) UL 10C listed for fire-resistance-rated doors.
      - (a) Metal Door Installation: Rated up to 90 minutes.
      - (b) Wood Door Installation: Rated up to 60 minutes.
    - 4) Sufficient size to permit door to swing 180 degrees

**C. Sizes: See Door Hardware Schedule.**

1. Hinge Widths: As required to clear surrounding trim.
2. Sufficient size to allow 180-degree swing of door.

**D. Finishes: See Door Hardware Schedule.**

1. Fully polish hinges, front, back, and barrel.

**E. Grades:**

1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
2. Continuous Hinges: Comply with BHMA A156.26, Grade 1.

**F. Material: Base metal as indicated for each item by BHMA material and finish designation.****G. Types:**

1. Butt Hinges: Include full mortise hinges.
2. Continuous Hinges: Include geared hinges.

**H. Options: As applicable to each item specified.****I. Quantities:**

1. Butt Hinges: Three (3) hinges per leaves up to 90 inches (2286 mm) in height. Add one (1) for each additional 30 inches (762 mm) in height or fraction thereof.
  - a. Hinge weight and size unless otherwise indicated in hardware sets:
    - 1) For doors up to 36 inches (914 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.134 inch (3.4 mm) and a minimum of 4-1/2 inches (114 mm) in height.
    - 2) For doors from 36 inches (914 mm) wide up to 42 inches (1067 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.145 inch (3.7 mm) and a minimum of 4-1/2 inches (114 mm) in height.
    - 3) For doors from 42 inches (1067 mm) wide up to 48 inches (1219 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.180 inch (4.6 mm) and a minimum of 5 inches (127 mm) in height.
    - 4) For doors greater than 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.180 inch (4.6 mm) and a minimum of 5 inches (127 mm) in height.
2. Continuous Hinges: One per door leaf.

**J. Applications: At swinging doors.**

1. Provide non-removable pins at out-swinging doors with locking hardware and all exterior doors.
- K. Products:
  1. Butt Hinges:
    - a. Concealed bearing, five (5) knuckle.
  2. Continuous Hinges:
    - a. Aluminum geared hinges.

#### 5.04 BOLTS

- A. Manufacturers:
  1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
  2. Burns [www.burnsmfg.com](http://www.burnsmfg.com).
  3. DCI [www.doorcontrols.com](http://www.doorcontrols.com).
- B. Properties:
  1. Flush Bolts:
    - a. Manual Flush Bolts: Manually latching upon closing of door leaf.
      - 1) Bolt Throw: 3/4 inch (19 mm), minimum.
    - b. Automatic Flush Bolts: Automatically latching upon closing of door leaf.
      - 1) Bolt Throw: 3/4 inch (19 mm), minimum.
  2. Dustproof Strikes: For bolting into floor, provide except at metal thresholds.
- C. Options:
  1. Extension Bolts: In leading edge of door, one bolt into floor, one bolt into top of frame.
  2. Lever extensions: Provide for top bolt at oversized doors.
- D. Products:
  1. Manual flush bolts.
  2. Automatic flush bolts.

#### 5.05 EXIT DEVICES

- A. Manufacturers:
  1. dormakaba; dormakaba Group: [www.dormakaba.com/us-en/#sle](http://www.dormakaba.com/us-en/#sle).
  2. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  3. Substitutions: Not permitted.
- B. Properties:
  1. Actuation: Full-length touchpad.
  2. Chassis:
    - a. Construction: Investment cast steel, zinc dichromate plated.
    - b. Compatibility: Standard Stile and Narrow Stile doors.
  3. Touchpads: 'T' style metal touchpads and rail assemblies with matching chassis covers end caps.
  4. Latch Bolts: Stainless steel deadlocking with 3/4-inch (19 mm) projection using latch bolt.
  5. Lever Design: Match project standard lockset trims.
  6. Cylinder: Include where cylinder dogging or locking trim is indicated.
  7. Strike as recommended by manufacturer for application indicated.
  8. Sound dampening on touch bar.
  9. Dogging:
    - a. Non-Fire-Resistance-Rated Devices: Cylinder 1/4-inch (6 mm) hex key dogging.
    - b. Fire-Resistance-Rated Devices: Manual dogging not permitted.
  10. Touch bar assembly on wide style exit devices to have a 1/4-inch (6.3 mm) clearance to allow for vision frames.



11. All exposed exit device components to be of architectural metals and “true” architectural finishes.
  12. Handing: Field-reversible.
  13. Fasteners on Back Side of Device Channel: Concealed - exposed fasteners not allowed.
  14. Vertical Latch Assemblies' Operation: Gravity, without use of springs.
- C. Grades: Complying with BHMA A156.3, Grade 1.
1. Provide exit devices tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
- D. Products: 2000.

#### 5.06 REMOVABLE MULLIONS

- A. Manufacturers:
1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  2. Substitutions: Not permitted.
- B. Properties:
1. Rectangular shape 3 inches (76 mm) by 2 inches (51 mm) tubes with minimum 1/8-inch (3.2 mm) wall thickness.
  2. Furnished by the same manufacturer as exit devices.
  3. Pre-drilled holes for installation of exit device strikes.
  4. Spacers: Provide as required for proper installation, based on frame profile and dimensions.
- C. Grades: Complying with BHMA A156.3.
- D. Materials: Manufacturer's standard for items specified.
1. Top and Bottom Brackets: Investment-cast steel.
- E. Options:
1. Furnish Keyed Removable “KR” feature and corresponding cylinders as specified.
    - a. Mullions capable of being installed without physical key present.
    - b. Physical key required to operate.
- F. Applications: As indicated on drawings and in Door Hardware Schedule.
- G. Products:
1. 822 Series.

#### 5.07 LOCK CYLINDERS

- A. Manufacturers:
1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  2. Substitutions: Not permitted.
- B. Properties:
1. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
    - a. Provide cylinders from same manufacturer as locking device.
    - b. Provide cams and/or tailpieces as required for locking devices.
    - c. Provide cylinders with appropriate format interchangeable cores where indicated.
- C. Grades:
1. High Security Cylinders: Comply with BHMA A156.30 or UL 437.
- D. Material:
- E. Types: As applicable to each item specified.
1. High security type cylinders with seven-pin cores.
- F. Applications: At locations indicated in hardware sets, and as follows

1. As required for items with locking devices provided by other sections, including at elevator controls and cabinets.
  - a. When provisions for lock cylinders are referenced elsewhere in the Project Manual to this Section, provide compatible type of lock cylinder, keyed to building keying system, unless otherwise indicated.
- G. Products:
  1. Rim/mortise.

## 5.08 MORTISE LOCKS

- A. Manufacturers:
  1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  2. Substitutions: Not permitted.
- B. Properties:
  1. Mechanical Locks: Manufacturer's standard.
    - a. Fitting modified ANSI A115.1 door preparation.
    - b. Door Thickness Coordination Fitting 1-3/4 inch (44 mm) to 2-1/4 inch (57 mm) thick doors.
    - c. Latch: Solid, one-piece, anti-friction, self-lubricating stainless steel.
      - 1) Latchbolt Throw: 3/4 inch (19 mm), minimum.
    - d. Auxiliary Deadlatch: One-piece stainless steel, permanently lubricated.
    - e. Backset: 2-3/4 inch (70 mm).
    - f. Cylinders:
      - 1) Cylinder Security: Use concealed internal setscrew accessible only by removing the core with the control key from the cylinder body for securing the cylinder to the lockset.
      - 2) Cylinder Core Types: Locks capable of supporting manufacturers' cores, as applicable.
        - (a) 7-pin, removable.
        - (b) Small format interchangeable.
    - g. Lever Trim:
      - 1) Functionality: Allow the lever handle to move up to 45 degrees from horizontal position prior to engaging the latchbolt assembly.
      - 2) Strength: Locksets outside locked lever designed to withstand minimum 1,400 inch-lbs. (158.2 Nm) of torque. In excess of that, a replaceable part will shear. Key from outside and/or inside lever will still operate lockset.
      - 3) Spindle: Designed to prevent forced entry from attacking of lever.
      - 4) Independent spring mechanism for each lever.
        - (a) Trim to be self-aligning and thru-bolted.
      - 5) Handles: Made of forged or cast brass, bronze, or stainless-steel construction. Levers that contain a hollow cavity are not acceptable.
      - 6) Levers to operate a roller bearing spindle hub mechanism.
  - C. Finishes: See Door Hardware Schedule.
    1. Core Faces: Match finish of lockset.
  - D. Grades:
    1. Comply with BHMA A156.13, Grade 1, Security; Grade 2.
  - E. Options:
    1. Provide locksets made in a manufacturing facility to compliant with ISO 9001-Quality Management and ISO 14001-Environmental Management.
  - F. Products: Mortise locks, including standard and electrified types.
    1. 40H.

**5.09 AUXILIARY LOCKS (DEADLOCKS)**

- A. Manufacturers:
  - 1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  - 2. Substitutions: Not permitted.
- B. Properties:
  - 1. Backset: 2-3/4 inch (70 mm), unless otherwise indicated.
  - 2. Strike: Appropriate for door frame.
  - 3. Mortise Deadbolt: Manufacturer's standard, adjustable to accommodate range of door thickness indicated.
    - a. Door Thickness Fit: 1-3/4 inches (44 mm) to 3 inches (76 mm) thick doors.
    - b. Bolt Throw: 1 inch (25.4 mm) stainless steel.
    - c. UL listed for up to 3 hours.
- C. Grades:
  - 1. Mortise Deadbolts: Tested and approved by BHMA A156.36, Operational Grade 1.
  - 2. Cylindrical Deadbolts: Tested and approved by BHMA A156.36, Operational Grade 2.
- D. Products:
  - 1. 48/49H (Mortise).

**5.10 DOOR PULLS AND PUSH PLATES**

- A. Manufacturers:
  - 1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
  - 2. Burns [www.burnsmfg.com](http://www.burnsmfg.com).
  - 3. DonJo [www.donjo.com](http://www.donjo.com).
- B. Properties:
  - 1. Pull Type: Straight, unless otherwise indicated.
  - 2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
    - a. Edges: Beveled, unless otherwise indicated.
- C. Grades: Comply with BHMA A156.6.
- D. Material: Stainless steel, unless otherwise indicated.
- E. Products:
  - 1. Push-Pull Plates.

**5.11 DOOR PULLS AND PUSH BARS**

- A. Manufacturers:
  - 1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
- B. Properties:
  - 1. Bar Type: Bar set, unless otherwise indicated.
  - 2. Pulls and Handles:
    - a. Tubular Bars:
      - 1) Bar Diameter: 1-1/4 inches (32 mm).
      - 2) Pull Projection off Door Face: 3-11/32 inches (85 mm).
- C. Grades: Comply with BHMA A156.6.
- D. Material: Stainless steel, unless otherwise indicated.
- E. Products:
  - 1. AP Series Pulls.

**5.12 LADDER PULLS**

- A. Manufacturers:
  - 1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
- B. Properties:
  - 1. Proper number of support fixings to accommodate length of pull as recommended by the manufacturer.
  - 2. Flat tops at pulls projecting past support fittings.
- C. Types:
  - 1. Offset.
- D. Installation:
  - 1. Pull Handles Mounting Style: Use single-sided - SNG or back-to-back - B2B mounting methods, as appropriate for item specified and in coordination with door type and other hardware items.
- E. Products:
  - 1. AP400 Series.

**5.13 CLOSERS**

- A. Manufacturers:
  - 1. dormakaba; dormakaba Group: [www.dormakaba.com/us-en/#sle](http://www.dormakaba.com/us-en/#sle).
  - 2. Substitutions: Not permitted.
- B. Properties:
  - 1. Surface Mounted Closers: Manufacturer's standard.
    - a. Construction: R14 high silicon aluminum alloy.
    - b. Maximum Projection from Face of Door: 2-7/16 inches (62 mm).
    - c. Mechanism: Separate tamper-resistant adjusting valves for closing and latching speeds.
      - 1) Include advanced backcheck feature.
      - 2) Include delayed action feature.
    - d. Pinion: Stainless steel.
    - e. Hydraulic Fluid: All-weather type.
    - f. Arm Assembly: Standard for product specified.
      - 1) Material: Steel.
      - 2) Include hold-open, integral stop, or spring-loaded stop feature, as specified in Door Hardware Schedule.
      - 3) Parallel arm to be a heavy-duty rigid arm.
      - 4) Where "IS" or "S-IS" arms are specified in hardware sets, if manufacturer does not offer this arm provide a regular arm mount closer in conjunction with a heavy-duty overhead stop equal to a dormakaba 900 Series.
    - g. Covers:
      - 1) Type: Standard for product selected.
        - (a) Full.
      - 2) Material: Plastic.
      - 3) Finish: Painted.
- C. Grades:
  - 1. Closers: Comply with BHMA A156.4, Grade 1.
    - a. Underwriters Laboratories Compliance:
      - 1) Product Listing: UL (DIR) and ULC for use on fire-resistance-rated doors.
        - (a) UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
- D. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.

1. Devices listed with California Department of Forestry and Fire Protection, Office of the State Fire Marshal.
- E. Types:
  1. Rack-and-pinion, surface-mounted. 1-1/2 inches (38 mm) minimum bore.
- F. Options:
  1. Delayed action, adjustable with an independent valve.
- G. Installation:
  1. Mounting: Includes surface mounted installations.
  2. Mount closers on non-public side of door and stair side of stair doors unless otherwise noted in hardware sets.
  3. At out swinging exterior doors, mount closer on interior side of door.
  4. Provide adapter plates, shim spacers, and blade stop spacers as required by frame and door conditions.
  5. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
- H. Products:
  1. Surface Mounted:
    - a. 8900.

#### 5.14 OVERHEAD STOPS AND HOLDERS

- A. Manufacturers:
  1. dormakaba; dormakaba Group: [www.dormakaba.com/us-en/#sle](http://www.dormakaba.com/us-en/#sle).
  2. Architectural Builders Hardware Mfg. (ABH): [www.abhmfg.com/#sle](http://www.abhmfg.com/#sle).
- B. Properties:
  1. Stop Settings: At 100 degrees opening.
    - a. Adjustable friction tension.
  2. Hold-Open Settings: At 100 degrees opening.
    - a. Provide nylon composites for proven friction resistance and durability.
    - b. Provide built-in cushion stop.
- C. Sizes: Manufacturer's standard for the application.
- D. Finishes:
  1. Arms and Brackets: 26D.
- E. Grades: As applicable to item specified.
  1. Comply with BHMA A156.8, Grade 1.
- F. Material: Base metal as indicated for each item by BHMA material and finish designation.
  1. Track Channel: Extruded aluminum alloy.
  2. Slide Block: Machined from solid brass alloy.
- G. Types:
  1. Surface-applied.
- H. Products:
  1. Surface Overhead Stops and Holders:
    - a. 900 Heavy Duty.

#### 5.15 PROTECTION PLATES

- A. Manufacturers:
  1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
  2. Burns [www.burnsmfg.com](http://www.burnsmfg.com).
  3. DonJo [www.donjo.com](http://www.donjo.com).

- B. Properties:
  - 1. Plates:
    - a. Armor Plates: Provide on bottom half of push side of doors that require protection from objects moving through openings that may damage door surface.
      - 1) Size: 40 inches (1016 mm) high by 1-1/2-inch (38 mm) less door width (LDW) on pull side and 2-inch (51 mm) LDW on push side of door.
    - b. Kick Plates: Provide along bottom edge of push side of every wood door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
      - 1) Size: 10 inches (254 mm) high by 2 inch (51 mm) less door width (LDW) on push side of door.
    - c. Mop Plates: Provide along bottom edge of push side of doors to provide protection from cleaning liquids and equipment damage to door surface.
      - 1) Size: 6-inch (152 mm) high by 1-1/2-inch (38 mm) less door width (LDW) on pull side and 2-inch (51 mm) LDW on push side of door.
    - d. Edges: Beveled, on four (4) unless otherwise indicated.
  - C. Grades: Comply with BHMA A156.6.
  - D. Material: As indicated for each item by BHMA material and finish designation.
    - 1. Metal Properties: Stainless steel.
      - a. Metal, Standard Duty: Thickness 0.050 inch (1.27 mm), minimum.
  - E. Installation:
    - 1. Fasteners: Countersunk screw fasteners

## 5.16 STOPS AND HOLDERS

- A. Manufacturers:
  - 1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
  - 2. Burns [www.burnsmfg.com](http://www.burnsmfg.com).
  - 3. DonJo [www.donjo.com](http://www.donjo.com).
- B. General: Provide overhead stop/holder when wall or floor stop is not feasible.
- C. Grades:
  - 1. Door Holders, Wall Bumpers, and Floor Stops: Comply with BHMA A156.16 and Resilient Material Retention Test as described in this standard.
- D. Material: Base metal as indicated for each item by BHMA material and finish designation.
- E. Types:
  - 1. Door Holders: Lever with rubber bumper at bottom end.
  - 2. Wall Bumpers: Bumper, concave, wall stop.
  - 3. Floor Stops: Provide with bumper floor stop.
- F. Installation:
  - 1. Non-Masonry Walls: Confirm adequate wall reinforcement has been installed to allow lasting installation of wall bumpers.
- G. Products:
  - 1. Door Holders.
  - 2. Wall Bumpers.
  - 3. Floor Stops.

## 5.17 THRESHOLDS

- A. Manufacturers:
  - 1. National Guard Products, Inc: [www.ngpinc.com/#sle](http://www.ngpinc.com/#sle).
  - 2. Wooster [www.woosterproducts.com](http://www.woosterproducts.com).
- B. Properties:

1. Threshold Surface: Fluted horizontal grooves across full width.
- C. Grades: Thresholds: Comply with BHMA A156.21.
- D. Types: As applicable to project conditions. Provide barrier-free type at every location where specified.
  1. Saddle Thresholds: Without thermal break.

#### 5.18 WEATHERSTRIPPING AND GASKETING

- A. Manufacturers:
  1. National Guard Products, Inc: [www.ngpinc.com/#sle](http://www.ngpinc.com/#sle).
  2. Reese [www.reese.com](http://www.reese.com).
  3. Zero [www.allegion.com](http://www.allegion.com).
- B. Properties:
  1. Weatherstripping Air Leakage Performance: Not exceeding 0.3 cfm/sq ) of door opening at 0.3 inches of water pressure differential for single doors, and 0.5 cfm/sq ft l/sq m) of door area at 0.3 inches of water pressure differential for double doors for gasketing other than smoke control, as tested according to ASTM E283/E283M; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
  2. Rigid, Housed, Perimeter Gasketing: Sponge silicone gasket material held in place by aluminum housing; fastened to frame stop with screws.
- C. Grades: Comply with BHMA A156.22.

#### 5.19 MISCELLANEOUS ITEMS

- A. Manufacturers:
  1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
- B. Properties:
  1. Coat Hooks: Provide on room side of door, screw fastened.
    - a. Material: Brass.
  2. Padlocks: Solid extruded brass case with shackle that locks at heel and toe.
    - a. Shackle Height: 3/4 inch (19 mm), and width of opening is 7/8 inch (22.2 mm).
    - b. Shackle Material: Stainless steel.
    - c. Shackle Diameter: 5/16 inch (7.9 mm).
    - d. Finish: 626 - Satin Chrome.
    - e. Keying: 7-pin SFIC (Small Format Interchangeable Core).
    - f. Lock Functions:
      - 1) Frangible shackle (F3).
  3. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
    - a. Single Door: Provide three on strike jamb of frame.
    - b. Pair of Doors: Provide two on head of frame, one for each door at latch side.
    - c. Material: Rubber, gray color.
- C. Grades: As applicable to each item specified.
- D. Products:
  1. Padlocks:
    - a. 21B.

#### 5.20 KEYS AND CORES

- A. Manufacturers:
  1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).

2. Substitutions: Not permitted.
- B. Properties: Complying with guidelines of BHMA A156.28.
  1. Provide small format interchangeable core.
  2. Provide Patented CORMAX keys and cores.
  3. Provide keying information in compliance with DHI (KSN) standards.
  4. Keying Schedule: Arrange for a keying meeting, with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements.
  5. Keying: Master keyed.
  6. Include construction keying and control keying with removable core cylinders.
  7. Supply keys in following quantities:
    - a. Master Keys: 4 each.
    - b. Construction Master Keys: 6 each.
    - c. Construction Keys: 15 each.
    - d. Construction Control Keys: 2 each.
    - e. Control Keys if New System: 2 each.
  8. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
  9. Deliver keys with identifying tags to Owner by security shipment direct from manufacturer.
  10. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."
  11. Include installation of permanent cores and return construction cores to hardware supplier. Construction cores and keys to remain property of hardware supplier.
- C. Products:
  1. Patented:
    - a. CORMAX.

## 5.21 KEY CONTROL SYSTEMS

- A. Manufacturers:
  1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  2. Substitutions: Not permitted.
- B. Properties: Manufacturer's scalable system for keeping track of keys, users, and doors.
  1. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and snap catch.
  2. Password Policy for Logins: Configurable.
  3. User Interface: Tile icons and customizable dashboard.
  4. Importing and Appending Data: At any time.
  5. User Directory Synchronization: Active, reducing manual entry.
  6. Email Notifications: Configurable for keys and other items currently due back on a designated day, notifications when keys and items are issued, and notifications when keys and other items are returned.
  7. Global Search Functionality: Capable of listing cores and their location, building, and doors.
  8. Relational Database: Allowing cross-referencing of people to cores and keys, doors, and buildings they access.
  9. Reports: Customizable.
  10. Self-service Password retrieval functionality.
  11. Program Installation: Standalone.
  12. Software Access: Allowing authorized users secure access to the software from anywhere, provided user can access their organization's secure network.



13. Minimum Installation Requirements: As indicated in manufacturer's written installation instructions.

## **5.22 KEY CABINETS**

- A. Manufacturers:
  1. Lund Equipment Company, Inc: [www.lundkey.com/#sle](http://www.lundkey.com/#sle).
  2. Telkee: [www.telkee.com/#sle](http://www.telkee.com/#sle).
- B. Properties:
  1. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and snap catch.
  2. Security Key Tags: For each keyed lock on project, provide one set of matching key tags for permanent attachment to one key of each set.
  3. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
  4. Mounting: Wall surface mounted.
  5. Capacity: Actual quantity of keys, plus 25 percent additional capacity.
  6. Key cabinet lock to facility's keying system.
- C. Finishes: Baked enamel, manufacturer's standard color.
- D. Material: Sheet steel.
- E. Products:
  1. Lund.
  2. Telkee.

## **5.23 FIRE DEPARTMENT LOCK-BOXES**

- A. Manufacturers:
  1. Knox Company; Knox-Box Rapid Entry System]: [www.knoxbox.com/#sle](http://www.knoxbox.com/#sle).
  2. Substitutions: Not permitted.
- B. Properties:
  1. Heavy-duty, recessed, solid steel box with hinged door and interior gasket seal; single drill-resistant lock with dust covers and tamper alarm.
  2. Capacity: Holds 10 keys.
  3. Construction complying with UL 1037, UL 1610, and UL 437.
- C. Finishes: Manufacturer's standard coating.
  1. Color: Manufacturer's standard dark bronze.
- D. Options: As applicable to each item specified.

## **PART 3 EXECUTION**

### **7.01 EXAMINATION**

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Correct all defects prior to proceeding with installation.
- C. Verify that electric power is available to power operated devices and of correct characteristics.

### **7.02 INSTALLATION**

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install hardware using the manufacturer's fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

- C. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- D. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- E. Use templates provided by hardware item manufacturer.
- F. Do not install surface mounted items until application of finishes to substrate are fully completed.
- G. Wash down masonry walls and complete painting or staining of doors and frames.
- H. Complete finish flooring prior to installation of thresholds.
- I. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list, unless noted otherwise in Door Hardware Schedule or on drawings.
  - 1. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
  - 2. For Steel Doors and Frames: See Section 6549.
  - 3. For Steel Door Frames: See Section 081213.
  - 4. For Aluminum-Framed Storefront Doors and Frames: See Section 084313.
  - 5. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
  - 6. Flush Wood Doors: See Section 081416.
  - 7. Stile and Rail Wood Doors: See Section 081433.
  - 8. Mounting heights in compliance with ADA Standards:
    - a. Locksets: 40-5/16 inch (1024 mm).
    - b. Push Plates/Pull Bars: 42 inch (1067 mm).
    - c. Deadlocks (Deadbolts): 48 inch (1219 mm).
    - d. Exit Devices: 40-5/16 inch (1024 mm).
    - e. Door Viewer: 43 inch (1092 mm); standard height 60 inch (1524 mm).
- J. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal, anchor thresholds with stainless steel countersunk screws.
- K. Include in installation for existing doors and frames any necessary field modification and field preparation of doors and frames for new hardware. Provide necessary fillers, reinforcements, and fasteners for mounting new hardware and to cover existing door and frame preparations.

### 7.03 PROTECTION

- A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

#### Manufacturer List

BE	Best Access Systems
BY	By Related Section
DM	Dorma Door Controls
NA	National Guard
PR	BEST Precision Exit Devices
RW	Richard Wilcox
ST	BEST Hinges and Sliding
TR	Trimco

Option List

<b>Code</b>	<b>Description</b>
1/4-20-2" COMBO	1/4-20 X COMBO MS/ANCHOR (SS)
1-3/4"	1-3/4" Thick Doors
36"	36" Door Width
4	1-3/4" Door Thickness
7/8"LTC	7/8" Lip-To-Center Strike
B4E-HEAVY-KP	BEVELED 4 EDGES - KICK PLATES
CA-03	Cylinder Attachment Kit (Rim/SVR Device)
CD	CYLINDER DOGGING
CORMAX PATD	Cormax Patented Keying
CSK	COUNTER SINKING OF KICK and MOP PLATES
CSK-AP	COUNTER SINKING OF ARMOUR PLATES
Cut to Length	Cut to Length (Specify)
DA	ADJUSTABLE DELAYED ACTION
DD	Dutch Door Prep
FCSL	Full Plastic Slotted Cover
FL	Fire Exit Hardware
G	Back-to-Back Mounted
LBR	LESS BOTTOM ROD
LD	Less Dogging
M	Concealed Mounted
M5	GALVANIZED STEEL CHAIN
MCS	Mullion Cap Spacer (other Finishes)
N	Thru-Bolt w/ Flow-Thru
RP	RINGS-RIM CYLINDER
RP3	RINGS-7 PIN MORTISE
VIB	Double Visual Indicator Option
WC	PADLOCK WEATHER COVERS
XSPL	21B CUT RESISTANT

Finish List

<b>Code</b>	<b>Description</b>
26D	Satin Chrome
622	Flat Black Coated
626	Satin Chromium Plated
626W	Weatherized Satin Chrome
630	Satin Stainless Steel
689	Aluminum Painted
710CU	CuVerro Steralloy
AL	Aluminum
GREY	Grey

## Hardware Sets

**Set #1 - Admin, Gang Toilets**

Doors: 111, 112

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Deadlock	48H-7R PATD CORMAX PATD	626	BE
1	Pull Plate	1035-3	710CU	TR
1	Push Plate	1001-11	710CU	TR
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #2 - Serving**

Doors: 119B

1	Continuous Hinge	662HD UL 87" Cut to Length DD	AL	ST
1	Closer	8916 PH DA FCSL	689	DM
1	Semi-Auto Flushbolt	3825L	630	TR
1	Lockset	45H-7D14R PATD	626	BE
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
3	Silencer	1229A	GREY	TR
1	Astragal	139 SP 36"		NA
2	Wall Stop and Holder	1283-6S	626	TR

**Set #3 - Gym**

Doors: 101A

6	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
2	Back-To-Back Ladder Pull	AP423 18" 4 G	710CU	TR
2	Closer	8916 AF89 DA FCSL	689	DM
2	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
2	Kick Plate	KO050 10" x 1" Less Door Width x B4E x CSK	630	TR
2	Wall Stop and Holder	1283-6S	626	TR
2	Silencer	1229A	GREY	TR

**Set #4 - Staff Toilet**

Doors: 110

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7TD14R PATD CORMAX PATD VIB	626	BE
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
1	Coat Hook	3071	626	TR
3	Silencer	1229A	GREY	TR

**Set #4.1 - Private Toilets**

Doors: 203, 204

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Privacy Set	45H-0L14R VIB	626	BE
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
1	Coat Hook	3071	626	TR
3	Silencer	1229A	GREY	TR

**Set #5 - Offices**

Doors: 105, 123, 209

3	Butt Hinge	CB179 4.5" x 4.5"	26D	ST
1	Lockset	45H-7AT14R PATD	626	BE
1	Wall Bumper	1270CV	626	TR
1	Coat Hook	3071	626	TR
3	Silencer	1229A	GREY	TR

**Set #6 - Conference**

Doors: 207B

3	Butt Hinge	CB179 4.5" x 4.5"	26D	ST
1	Lockset	45H-7AT14R PATD	626	BE
1	Wall Bumper	1270CV	626	TR
1	Smoke Seal	5075 CL @ Head & Jambs		NA

**Set #7 - Conference**

Doors: 207A

3	Butt Hinge	CB179 4.5" x 4.5"	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 S-ISH DA FCSL	689	DM
1	Wall Bumper	1270CV	626	TR
1	Smoke Seal	5075 CL @ Head & Jambs		NA

**Set #8 - Meeting**

Doors: 115

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Wall Bumper	1270CV	626	TR
1	Smoke Seal	5075 CL @ Head & Jambs		NA

**Set #9 - Tech, Admin**

Doors: 202, 208

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #10 - Tech**

Doors: 113, 121

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 S-ISH DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #11 - Serving**

Doors: 119A

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 PH DA FCSL	689	DM
1	Armor Plate	KA050 40" x 34" B4E-HEAVY-KP CSK-AP	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #12 - Kids Cafe**

Doors: 118

3	Butt Hinge	CB168 4.5" x 4.5" NRP	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 SPAT DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #13 - Class, Vest.**

Doors: 114, 120

3	Butt Hinge	CB168 4.5" x 4.5" NRP	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 SPA DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #14 - Mechanical & Electrical**

Doors: 106A, 206

3	Butt Hinge	CB179 4.5" x 4.5"	26D	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Closer	8916 PH DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
1	Smoke Seal	5075 CL @ Head & Jambs		NA

**Set #15 - IT**

Doors: 213

3	Butt Hinge	CB179 4.5" x 4.5"	26D	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Closer	8916 PH DA FCSL	689	DM
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #16 - Storage**

Doors: 102, 104

3	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Armor Plate	KA050 40" x 34" B4E-HEAVY-KP CSK-AP	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #17 - Pantry**

Doors: 125

3	Butt Hinge	CB168 4.5" x 4.5" NRP	26D	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Armor Plate	KA050 40" x 34" B4E-HEAVY-KP CSK-AP	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Wall Stop and Holder	1283-6S	626	TR
3	Silencer	1229A	GREY	TR

**Set #18 – Janitor's Closet & Storage**

Doors: 107, 205

3	Butt Hinge	CB168 4.5" x 4.5" NRP	26D	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Overhead Holder	902 H	626	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Coat Hook	3071	626	TR
3	Silencer	1229A	GREY	TR

**Set #19 - Laundry**

Doors: 108

3	Butt	CB199 4.5" x 4.5"	626W	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Closer	8916 S-ISH DA FCSL	689	DM
1	Armor Plate	KA050 40" x 34" B4E-HEAVY-KP CSK-AP	630	TR
1	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
3	Silencer	1229A	GREY	TR

**Set #20 - Sprinklers**

Doors: 116

1	Continuous Hinge	662HD UL 83"	AL	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Overhead Holder	902 H	626	DM
1	Head Seal	700 SA FATT x Opening Width		NA
1	Pr. Jamb Seals	Pr. 137 SA x Opening Height		NA
1	Threshold	896 S 36" 1/4-20-2" COMBO	AL	NA
3	Silencer	1229A	GREY	TR

**Set #21 - Closets**

Doors: 117, 212

3	Butt Hinge	CB179 4.5" x 4.5" NRP	26D	ST
1	Lockset	45H-7D14R PATD	626	BE
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #22 - Gym Storage**

Doors: 103A, 103B

6	Butt Hinge	CB168 4.5" x 4.5" NRP	26D	ST
1	Semi-Auto Flushbolt	3825L	630	TR
1	Lockset	45H-7D14R PATD 7/8"LTC	626	BE
2	Overhead Holder	902 H	626	DM
2	Armor Plate	KA050 40" x 34" B4E-HEAVY-KP CSK-AP	630	TR
2	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Security Astragal	1390 SA x Net Door Hgt. Active Leaf Pull Side		NA
2	Silencer	1229A	GREY	TR

**Set #23 - Gym Exit**

Doors: 101B, 101C

1	Continuous Hinge	662HD UL 83"	AL	ST
1	Exit Device	2101 1-3/4" 36" LD	626W	PR
1	Rim Cylinder	12E-72 PATD CORMAX PATD RP	626	BE
1	Closer	8916 S-DST FC SL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Floor Stop	1209HOHA	630	TR
1	Drip Cap	16 A FATT 40"		NA
1	Weatherstrip	700 SA FATT 1 x 36" 2 x 84"		NA
1	Threshold	896 S 36" 1/4-20-2" COMBO	AL	NA
3	Silencer	1229A	GREY	TR



**Set #24 - Stair B Exit**

Doors: S-1

2	Continuous Hinge	662HD UL 83"	AL	ST
1	Removable Mullion	KR822 MCS	689	PR
2	Exit Device	2101 1-3/4" 36" LD	626W	PR
1	Rim Cylinder	12E-72 PATD CORMAX PATD RP	626	BE
2	Closer	8916 S-DST FCSL	689	DM
2	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
2	Drip Cap	16 A FATT 76"		NA
1	Head Seal	700 SA FATT x Opening Width		NA
1	Pr. Jamb Seals	Pr. 137 SA x Opening Height		NA
1	Mullion Seal	5100 S		NA
1	Threshold	896 S 72" 1/4-20-2" COMBO	AL	NA
2	Silencer	1229A	GREY	TR

**Set #25 - Joined Classrooms**

Doors: 210, 211

3	Butt Hinge	CB168 4.5" x 4.5" NRP	26D	ST
1	Exit Device	2108 X V4908D 1-3/4" 36" CA-03 CD	626W	PR
1	Rim Cylinder	12E-72 PATD CORMAX PATD RP	626	BE
1	Mortise Cylinder	1E-74 PATD CORMAX PATD RP3	626	BE
1	Closer	8916 SPAT DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #26 - Stair B**

Doors: S-2

3	Butt Hinge	CB179 4.5" x 4.5" NRP	26D	ST
1	Exit Device	FL 2114 X 4914D 1-3/4" 36"	626W	PR
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
1	Smoke Seal	5075 CL @ Head & Jambs		NA

**Set #27 - Stair B Vest.**

Doors: 124

6	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
2	Exit Device	FL 2214 X 4914D 1-3/4" 36" LBR	626W	PR
2	Closer	8916 AF89 DA FCSL	689	DM
2	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
2	Mop Plate	KM050 6" x 1" Less Door Width x B4E x CSK	630	TR
1	Smoke Seal	5075 CL @ Head & Jambs		NA
2	Magnetic Holder	EM 504-24120	689	DM
1	Smoke Seal	5070 B 84"		NA

NOTE: Doors normally held open. Fire alarm releases holders allowing doors to swing shut and latch.

**Set #28 - Electrical**

Doors: 126

2	Continuous Hinge	662HD UL 83"	AL	ST
1	Removable Mullion	KR822 MCS	689	PR
1	Exit Device	2101 1-3/4" 36" LD	626W	PR
1	Exit Device	2103 1-3/4" 36" CA-03 CD	626W	PR
1	Rim Cylinder	12E-72 PATD CORMAX PATD RP	626	BE
2	Mortise Cylinder	1E-74 PATD CORMAX PATD RP3	626	BE
1	Anti-Vandal Pull	1096HA-PHI	630	TR
2	Closer	8916 S-DST FCSL	689	DM
2	Kick Plate	KO050 10" x 1" Less Door Width x B4E x CSK	630	TR
1	Drip Cap	16 A FATT 76"		NA
1	Head Seal	700 SA FATT x Opening Width		NA
1	Pr. Jamb Seals	Pr. 137 SA x Opening Height		NA
1	Mullion Seal	5100 S		NA
1	Threshold	896 S 72" 1/4-20-2" COMBO	AL	NA
2	Silencer	1229A	GREY	TR

**Set #29 - Entry**

Doors: 100A

2	Continuous Hinge	661HD UL 83"	AL	ST
1	Exit Device	2601 36" CD	626W	PR
1	Exit Device	2603 36" CD	626W	PR
1	Rim Cylinder	12E-72 PATD CORMAX PATD RP	626	BE
2	Mortise Cylinder	1E-74 PATD CORMAX PATD RP3	626	BE
2	Door Pull	AP423 48" 4 M N	710CU	TR
2	Closer	8916 SPA FCSL	689	DM
2	Floor Stop	1209HOHA	630	TR
1	Drip Cap	16 A FATT 76"		NA
1	Door Weatherstrip	By Frame Mfg.		BY
1	Meeting Stile Seal	By Alum. Door Mfg.		BY
1	Threshold	896 S 72" 1/4-20-2" COMBO	AL	NA

**Set #30 - Shade Building Double Door C**

Doors: GATE(3)

4	Half Surface Strap Hinge	0434.00303 36	622	RW
1	Cane Bolt	05400021BZC 24"	622	RW
1	Slide Latch W/ Staple	0128.00011 X 0128.00014 12"	622	RW
2	Bow Handle	091.0001 14"	622	RW
1	Padlock	21B-720L PATD CORMAX PATD M5 WC XSPL	626	BE

**Set #31 - Admin**

4	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Lockset	45H-7R14R PATD	626	BE
1	Closer	8916 AF89 DA FCSL	689	DM
1	Kick Plate	KO050 10" x 2" Less Door Width x B4E x CSK	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #32 - Laundry Vestibule**

Doors: 109

4	Butt Hinge	CB168 4.5" x 4.5"	26D	ST
1	Deadlock	48H-7R PATD CORMAX PATD	626	BE
1	Closer	8916 SPA DA FCSL	689	DM
1	Armor Plate	KA050 40" x 34" B4E-HEAVY-KP CSK-AP	630	TR
1	Wall Bumper	1270CV	626	TR
3	Silencer	1229A	GREY	TR

**Set #33 - Single Gate**

Doors: SINGLE GATE

1	Half Surface Strap Hinge	0434.00303 36	622	RW
1	Slide Latch W/ Staple	0128.00011 X 0128.00014 12"	622	RW
1	Padlock	21B-720L PATD CORMAX PATD M5 WC XSPL	626	BE

Opening List

<b>Opening</b>	<b>Hdw Set</b>	<b>Opening Label</b>
100A	29	
101A	3	
101B	23	
101C	23	
102	16	
103A	22	
103B	22	
104	16	
105	5	
106A	14	
107	18	
108	19	
109	32	
110	4	
111	1	
112	1	
113	10	
114	13	
115	8	
116	20	
117	21	
118	12	
119A	11	
119B	2	
120	13	
121	10	
123	5	
124	27	
125	17	
126	28	
202	9	
203	4.1	
204	4.1	
205	18	
206	14	
207A	7	
207B	6	
208	9	
209	5	
210	25	
211	25	
212	21	
213	15	
S-1	24	
S-2	26	60
GATE/SINGLE	30/33	END OF DOOR HARDWARE

## SECTION 08800 - GLAZING

### 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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Windows.
  - 2. Glazed entrances and storefront.
  - 3. Doors.
  - 4. Interior lites.
- B. Coordinate the requirements of this Section with those of other sections that interface with Glazing.

#### 1.3 DEFINITIONS

- A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- D. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
- E. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- F. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining

and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: **Glass thickness designations indicated are minimums and are for detailing only.** Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed ASTM E 1300 and applicable building codes (if no building code is in force in the project jurisdiction, meet IBC, latest edition).
  - a. Maximum Lateral Deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch, whichever is less.
  - b. Minimum Glass Thickness for Exterior Lites: Not less than 1/4 inch.
  - c. Maximum deflection of glass supported on two sides: Thickness of glass.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data.

#### 1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- C. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
- D. Installation Instructions: For each type of glazing product including gaskets, provide manufacturer's printed instructions.

E. Samples: For the following products, in the form of 12-inch- square Samples for glass.

1. **Glass Type C.**

F. Warranties: Special warranties specified in this Section.

## 1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who is approved or licensed by the manufacturer.

B. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.

C. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.

D. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.

E. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.

F. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:

1. Insulating Glass Certification Council.
2. Associated Laboratories, Inc.

G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA Laminated Division's "Laminated Glass Design Guide" and GANA's "Glazing Manual."

## 1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

## 1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to Owner and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

- 1. Warranty Period: 10 years from date of Substantial Completion.

- B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form, made out to Owner and signed by laminated-glass manufacturer agreeing to replace laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

- 1. Warranty Period: Five years from date of Substantial Completion.

- C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

- 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Glass:
  - 1. AFG Industries
  - 2. Pilkington
  - 3. Guardian Industries
  - 4. PPG

### 2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036.



- B. Heat-Treated Float Glass: ASTM C 1048.
  - 1. Provide Kind FT (fully tempered) float glass where safety glass is indicated or required by code; or, should the Project be located in a jurisdiction with no applicable building code, provide Kind FT (fully tempered) float glass where safety glass would be required by the International Building Code, latest edition.
- C. Laminated Glass: ASTM C 1172, and complying with other requirements specified and with the following:
  - 1. Interlayer: Polyvinyl butyral of 0.090 thickness with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
    - a. For polyvinyl butyral interlayers, laminate lites in autoclave with heat plus pressure.
  - 2. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets.
- D. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.
  - 1. Provide Kind FT (fully tempered) glass lites where safety glass is indicated.
  - 2. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
  - 3. Sealing System: Dual seal, with primary and secondary sealants as follows:
    - a. Manufacturer's standard sealants.
  - 4. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
    - a. Spacer Material: Aluminum with clear anodic finish.
    - b. Desiccant: Molecular sieve or silica gel, or blend of both.
    - c. Corner Construction: Manufacturer's standard corner construction.

## 2.3 GLASS TYPES

- A. Solarban 60 (2) Solargrey + Clear: 1 inch insulating glass with the following characteristics:
  - a. 1/4" gray tinted Low-E fully tempered float safety glass
  - b. 1/4" clear fully tempered float safety glass
  - c. SHGC = 0.25 or less
  - d. U-Factor = 0.29 or less
- B. 1/4" clear fully tempered float safety glass

- C. Solarban 60 (2) Solargrey + Clear: 1 inch insulating glass with the following characteristics:
  - a. 1/4" gray tinted Low-E fully tempered float safety glass
  - b. 1/4" clear fully tempered float safety glass
  - c. Clear safety laminate on interior gym side
  - d. SHGC = 0.25 or less
  - e. U-Factor = 0.29 or less
- D. 1/4" clear, laminate on interior gym side, fully tempered float safety glass

## 2.4 GLAZING GASKETS

- A. Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene gaskets; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal.
  - 1. Use single piece gaskets all around window perimeters, with molded corners.

## 2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

## 2.6 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- C. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- D. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- E. Provide spacers for glass lites where length plus width is larger than 50 inches as follows:
1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- F. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- G. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

### 3.4 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

### 3.5 LOCK-STRIP GASKET GLAZING

- A. Comply with ASTM C 716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system, unless otherwise indicated.

### 3.6 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from any cause during construction period.

END OF SECTION 08800

## SECTION 08830 - MIRRORS

### 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 types of silvered flat glass mirrors.
  - 1. Annealed monolithic glass mirrors.

#### 1.3 DEFINITIONS

- A. Deterioration of Mirrors: Defects developed from normal use that are attributable to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning mirrors contrary to mirror manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Provide mirrors that will not fail under normal usage. Failure includes glass breakage and deterioration attributable to defective manufacture, fabrication, and installation.

#### 1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.
  - 2. Mirror mastic.
  - 3. Mirror hardware.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.
- C. Samples: For each type of mirror product required, in the form indicated below:
  - 1. Mirrors, 12 inches square, including edge treatment on 2 adjoining edges.
  - 2. Mirror clips.
  - 3. Mirror trim, 12 inches long.

- D. Product Certificates: For each type of mirror **and mirror mastic**, signed by product manufacturer.
- E. Mirror Mastic Compatibility Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing **paint** and substrates on which mirrors are installed.
- F. Warranty: Special warranty specified in this Section.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed mirror glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in mirror installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under NGA's Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- B. Source Limitations for Mirrors: Obtain mirrors from one source for each type of mirror indicated.
- C. Source Limitations for Mirror Glazing Accessories: Obtain mirror glazing accessories from one source for each type of accessory indicated.
- D. Glazing Publications: Comply with the following published recommendations:
  - 1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
  - 2. GANA Mirror Division's "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors, protected from moisture including condensation.

#### 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by mirror manufacturer agreeing to replace mirrors that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below:

1. Warranty Period: Ten years from date of **Substantial Completion**.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Glass Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering mirrors that may be incorporated into the Work include, but are not limited to, the following:
1. Arch Aluminum & Glass Co., Inc.
  2. Gardner Glass Products.
  3. Gilded Mirrors, Inc.
  4. Guardian Industries Corp.
  5. Independent Mirror Industries, Inc.
  6. Lenoir Mirror Company.
  7. Messer Industries, Inc.
  8. Stroupe Mirror Co., Inc.
  9. Sunshine Mirror.
  10. Virginia Mirror Company, Inc.
  11. VVP America, Inc.; Binswanger Mirror Products.
  12. Walker Glass Co., Ltd.

### 2.2 SILVERED FLAT GLASS MIRROR MATERIALS

- A. Clear Glass Mirrors: ASTM C 1503, Mirror **Select** Quality.
1. Nominal Thickness: **6.0 mm**.

### 2.3 MISCELLANEOUS MATERIALS

- A. Setting Blocks: Elastomeric material with a Type A Shore durometer hardness of 85, plus or minus 5.
- B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

- C. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

## 2.4 MIRROR HARDWARE

- A. Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.
- B. Top Channel/Cleat, Bottom and Side Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.
  - 1. Bottom and Side Trim: J-channels formed with front leg and back leg not less than 5/16 and 3/4 inch in height, respectively.
    - a. Product: Subject to compliance with requirements, provide D638 FHA Type "J" Channel by Laurence, C. R. Co., Inc. or approved equal.
  - 2. Top Trim: Formed with front leg with a height of 5/16 inch and back leg designed to fit into the pocket created by wall-mounted aluminum cleat.
    - a. Product: Subject to compliance with requirements, provide D 1638 Top Channel and D 1637M Mirror Mount System Cleat by Laurence, C. R. Co., Inc. or approved equal.
  - 3. Finish: **Clear** bright anodized.
- C. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
- D. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

## 2.5 FABRICATION

- A. Mirror Sizes: To suit Project conditions, cut mirrors to final sizes and shapes.
- B. Cutouts: Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- C. Mirror Edge Treatment: **Flat polished edge.**



1. Seal edges of mirrors after edge treatment to prevent chemical or atmospheric penetration of glass coating.
2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance.
  1. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.
  2. Proceed with mirror installation only after unsatisfactory conditions have been corrected and surfaces are dry.

#### 3.2 PREPARATION

- A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating surfaces with mastic manufacturer's special bond coating where applicable.

#### 3.3 INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- B. Provide a minimum air space of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.
- C. Wall-Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
  1. Top and Bottom Aluminum J-Channels: Provide setting blocks 1/8 inch thick by 4 inches long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch wide by 3/8 inch long at bottom channel.
  2. Top Channel/Cleat, Side and Bottom Aluminum J-Channels: Fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.
  3. Corners: **Mitered.**
  4. Install mastic as follows:
    - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.

- b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
- c. After mastic is applied, align mirrors and press into place while maintaining a minimum air space of 1/8 inch between back of mirrors and mounting surface.

### 3.4 CLEANING AND PROTECTION

- A. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- B. Do not permit edges of mirrors to be exposed to standing water.
- C. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

END OF SECTION 08830

## SECTION 09253 - GYPSUM SHEATHING

### 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. Paper-surfaced gypsum sheathing board.
- B. Coordinate the requirements of this Section with those of other sections that interface with Gypsum Sheathing.

#### 1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology Standard: Refer to ASTM C 11 for definitions of terms for gypsum sheathing board construction not defined in this Section or in other referenced standards.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For assemblies designated to have fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, or other causes. Stack sheathing flat on leveled supports off the ground, under cover, and fully protected from weather.

## PART 2 - PRODUCTS

### 2.1 GYPSUM SHEATHING

- A. Paper-Surfaced Gypsum Wall Sheathing: ASTM C 79/C 79M, with water-resistant material incorporated into the core and with water-repellent paper bonded to core's face, back, and long edges.
  - 1. Type and Thickness: Regular, 1/2 inch thick.
  - 2. Edge and End Configuration: tongue and groove.
  - 3. Size: 24 by 96 inches for horizontal, or 48 by 96 inches for vertical installation.

### 2.2 ACCESSORY MATERIALS

- A. Fasteners: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
  - 1. For steel framing less than 0.0329 inch thick, attach sheathing with steel drill screws complying with ASTM C 1002.
  - 2. For steel framing from 0.033 to 0.112 inch thick, attach sheathing with drill screws complying with ASTM C 954.

## PART 3 - EXECUTION

### 3.1 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and manufacturer's written instructions.
- B. Cut boards at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
  - 1. Install boards with a 3/8-inch setback where non-load-bearing construction abuts structural elements.
  - 2. Install boards with a 1/4-inch setback where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- C. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly.
- D. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.
- E. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.

- F. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of stud flanges, and stagger end joints of adjacent boards not less than one stud spacing. Screw-attach boards at perimeter and within field of board to each steel stud.
  - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
- G. Vertical Installation: Install board vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud.
  - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.

### 3.2 PROTECTION

- A. Protect sheathing that will be exposed to weather for more than 30 days (or 180 days if glass-mat sheathing) by covering exposed exterior surface of sheathing with a securely fastened weather-resistant barrier. Apply covering immediately after sheathing is installed.

END OF SECTION 09253

## SECTION 09260 - GYPSUM BOARD ASSEMBLIES

### 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. Interior gypsum wallboard.
  - 2. Tile backing panels.
  - 3. Non-load-bearing steel framing.
- B. Coordinate the requirements of this Section with those of other sections that interface with Gypsum Board Assemblies, in particular:
  - 1. Division 5 Section "Cold-Formed Metal Framing" for load-bearing steel framing.
  - 2. Division 6 Section "Rough Carpentry" for wood framing and furring.
  - 3. Division 9 Section "Gypsum Sheathing" for installations over steel framing.
  - 4. Division 9 Section "Gypsum Board Shaft-Wall Assemblies" for framing, gypsum panels, and other components of shaft wall assemblies.

#### 1.3 DEFINITIONS

- A. Gypsum Board Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

#### 1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory."
- B. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

## PART 2 - PRODUCTS

### 2.1 STEEL SUSPENDED CEILING AND SOFFIT FRAMING

- A. Components, General: Comply with GA-216 and ASTM C 754 for conditions indicated.
- B. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- diameter wire, or double strand of 0.0475-inch- diameter wire.
- C. Hangers: As follows:
  - 1. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter.
  - 2. Angle Hangers: ASTM A 653/A 653M, G60, hot-dip galvanized commercial-steel sheet.
    - a. Minimum Base Metal Thickness: 0.0179 inch.
    - b. Size: 7/8 by 1-3/8 inches.
- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base metal thickness of 0.0538 inch, a minimum 1/2-inch- wide flange, with manufacturer's standard corrosion-resistant zinc coating.
  - 1. Depth: 1-1/2 inches.
- E. Furring Channels (Furring Members): Commercial-steel sheet with manufacturer's standard corrosion-resistant zinc coating.
  - 1. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
    - a. Minimum Base Metal Thickness: 0.0179 inch.
  - 2. Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission, asymmetrical configuration, with face attached to single flange by a slotted leg (web).

- F. Grid Suspension System for Interior Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

## 2.2 STEEL PARTITION FRAMING

- A. Components, General: As follows:

- 1. Comply with GA-216 and ASTM C 754 for conditions indicated.
- 2. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with manufacturer's standard corrosion-resistant zinc coating.

- B. Steel Studs and Runners: ASTM C 645.

- 1. Minimum Base Metal Thickness: 0.0179 inch, and 0.0312 inch at fire-rated door frames.
- 2. Depth: As indicated.

- C. Deep-Leg Deflection Track: ASTM C 645 top runner with 2-inch- deep flanges, use in the following locations:

- 1. Wherever partition head is anchored directly to steel, concrete or wood structural members.
- 2. Wherever “slip joint” is called for on Drawings.

- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width as required to securely anchor the fixtures indicated.

- 1. Minimum Base Metal Thickness: 0.0179 inch.

- E. Cold-Rolled Channel Bridging: 0.0538-inch bare steel thickness, with minimum 1/2-inch- wide flange.

- 1. Depth: 1-1/2 inches.
- 2. Clip Angle: 1-1/2 by 1-1/2 inch, 0.068-inch- thick, galvanized steel.

- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

- 1. Minimum Base Metal Thickness: 0.0179 inch.
- 2. Depth: 7/8 inch or as otherwise indicated.

- G. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.

- 1. Configuration: Asymmetrical, with face attached to single flange by a slotted leg (web).

- H. Cold-Rolled Furring Channels: 0.0538-inch bare steel thickness, with minimum 1/2-inch- wide flange.

- 1. Depth: 3/4 inch.
- 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch.



3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch-diameter wire, or double strand of 0.0475-inch-diameter wire.
- I. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.
- J. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

## 2.3 GYPSUM WALLBOARD PRODUCTS

- A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Gypsum Wallboard: GA-216 and ASTM C 1396.
  1. Regular Type:
    - a. Thickness: 5/8 inch, unless otherwise indicated.
    - b. Long Edges: Tapered.
  2. Type X:
    - a. Thickness: 5/8 inch.
    - b. Long Edges: Tapered.
    - c. Location: As indicated, and where required for fire-resistance-rated assembly.
- C. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396 M.
  1. Core: 5/8 inch, Type X.
  2. Locations
    - a. All walls on which plumbing fixtures are located.
    - b. All walls with tile finish.
    - c. All walls in spaces with high moisture content in the air, including shower rooms, laundry rooms, and spaces with exterior exposure.
    - d. Water-Resistant Gypsum Backing Board shall extend full height of wall.
- D. Cementitious Backer Units: ANSI A118.9.
  1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include the following:
    - a. Custom Building Products; Wonderboard.
    - b. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
    - c. United States Gypsum Co.; DUROCK Cement Board.
  2. Thickness: 1/2 inch.

3. Location: Exterior soffits, and elsewhere as indicated.
- E. Abuse-Resistant Gypsum Wallboard: ASTM C 1396, manufactured to produce greater resistance to surface indentation and through-penetration than standard gypsum panels.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. National Gypsum Company; Gold Bond Hi-Abuse Wallboard.
    - b. United States Gypsum Co.; SHEETROCK Brand Abuse-Resistant Gypsum Panels.
  2. Core: 5/8 inch, Type X.
  3. Long Edges: Tapered.
  4. Location: 8'-0" high at all Gym 101 walls, and 4'-0" high at all vestibules, lounges, corridors, and stairs, as indicated in the drawings.

## 2.4 TRIM ACCESSORIES

- A. Interior Trim: GA-216 and ASTM C 1047.
1. Material: Paper-faced composite sheet.
  2. Shapes:
    - a. Cornerbead: Use at outside corners.
    - b. LC-Bead: J-shaped; exposed long flange receives joint compound; use at exposed panel edges.
    - c. U-Bead: J-shaped; exposed short flange does not receive joint compound; use where indicated.
    - d. Bullnose Bead: Use where indicated.
    - e. L-Bead: L-shaped; exposed long leg receives joint compound; use where indicated.
    - f. Expansion (Control) Reveal Joint: Use Fry Reglet, or approved equal, U-shaped model number DRM-25-25, as required by **ASTM C 840** and in specific locations indicated on the Drawings.
    - g. Curved-Edge Cornerbead: With notched or flexible flanges; use at curved openings.
- B. Exterior Trim: ASTM C 1047.
1. Material: Hot-dip galvanized steel sheet or rolled zinc.
  2. Shapes:
    - a. Cornerbead: Use at outside corners.
    - b. LC-Bead: J-shaped; exposed long flange receives joint compound; use at exposed panel edges.
    - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening. Use where required and in specific locations indicated on the Drawings.
- C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Fry Reglet Corp.
  - b. Gordon, Inc.
  - c. MM Systems Corporation.
  - d. Pittcon Industries.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, alloy 6063-T5.
3. Finish: Baked enamel, color as selected by Architect from manufacturer's full range.

## 2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with GA-216 and ASTM C 475.
- B. Joint Tape:
  1. Interior Gypsum Wallboard: Paper.
  2. Exterior Gypsum Soffit Board: Paper.
  3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
  4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
  2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
  3. Fill Coat: For second coat, use setting-type, sandable topping compound.
  4. Finish Coat: For third coat, use setting-type, sandable topping compound.
  5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
- D. Joint Compound for Exterior Applications: As recommended by manufacturer at Cementitious Backer Units.
- E. Joint Compound for Tile Backing Panels:
  1. Water-Resistant Gypsum Backing Board: Use setting-type taping and setting-type, sandable topping compounds.
  2. Cementitious Backer Units: As recommended by manufacturer.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Isolation Strip at Exterior Walls:
  - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
  - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLING STEEL FRAMING, GENERAL

- A. Install control joints above door frames on both sides and left and right (example: 4 locations at each interior door).
- B. Installation Standards: GA-216, ASTM C 754, and **ASTM C 840** requirements that apply to framing installation. The following are some of the excerpted requirements for installing control joints in gypsum board assemblies:
  - 1. Section 20.3.1 (GA 4.7.3.1) – A control joint shall be installed where a partition, wall, or ceiling traverses a construction joint (expansion, seismic or building control element) in the base building structure.
  - 2. Section 20.3.2 (GA 4.7.3.2) – Control joints shall be installed where a wall or partition runs in an uninterrupted straight plane exceeding 30 linear feet (9100 mm)
  - 3. Section 20.3.3 (GA 4.7.3.3) – Control joints in interior ceilings with perimeter relief shall be installed so that linear dimensions between control joints do not exceed 50 ft (15000 mm) and total area between control joints does not exceed 2500 sq ft (230 m<sup>2</sup>)
  - 4. Section 20.3.4 (GA 4.7.3.4) – Control joints in interior ceilings without perimeter relief shall be installed so that linear dimensions between control joints do not exceed 30 ft (9100 mm) and total area between control joints does not exceed 900 sq ft (84 m<sup>2</sup>)
  - 5. Section 20.3.5 (GA 4.7.3.5) – Control joints in exterior ceilings and soffits shall be installed so that linear dimensions between control joints do not exceed 30 ft (9100 mm) and total area between control joints does not exceed 900 sq ft (84 m<sup>2</sup>)
  - 6. Section 20.3.6 (GA 4.7.3.6) – A control joint or intermediate blocking shall be installed where ceiling framing members change direction Install supplementary framing,

blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."

- C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement.
  - 1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
  - 2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.
- D. **Do not bridge building control and expansion joints with steel framing or furring members. Frame both sides of joints independently.**

### 3.3 INSTALLING STEEL SUSPENDED CEILING AND SOFFIT FRAMING

- A. Suspend ceiling hangers from building structure as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
  - 3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
  - 4. Secure rod, flat, or angle hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
  - 5. Attach hangers to structural members only.
- B. Installation Tolerances: Install steel framing components for suspended ceilings so members for panel attachment are level to within 1/8 inch in 12 feet measured lengthwise on each member and transversely between parallel members.
- C. For exterior soffits, install cross bracing and framing to resist wind uplift.
- D. Wire-tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

- E. Install suspended steel framing components in sizes and spacings indicated, but not less than that required by the referenced steel framing and installation standards.
  - 1. Hangers: 48 inches o.c.
  - 2. Carrying Channels (Main Runners): 48 inches o.c.
  - 3. Furring Channels (Furring Members): 16 inches o.c.
- F. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

### 3.4 INSTALLING STEEL PARTITION AND SOFFIT FRAMING

- A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.
- B. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch from the plane formed by the faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
  - 1. Cut studs 1/2 inch short of full height to provide perimeter relief. Do not fasten studs to top track to allow independent movement of studs and track.
  - 2. For fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid-structure surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure.
- D. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.
- E. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
  - 1. Install two studs at each jamb, unless otherwise indicated.
- F. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- G. Z-Furring Members:
  - 1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches o.c.

2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

### 3.5 APPLYING AND FINISHING PANELS, GENERAL

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216.
- B. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- C. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- F. Attach gypsum panels to framing provided at openings and cutouts.
- G. Form control and expansion joints with space between edges of adjoining gypsum panels.
- H. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  2. Fit gypsum panels around ducts, pipes, and conduits.
  3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- I. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4- 1/2-inch wide spaces at these locations, and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- J. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing

off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

- K. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
- L. Space fasteners in panels that are tile substrates a maximum of 8 inches o.c.
- M. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

### 3.6 PANEL APPLICATION METHODS

#### A. Single-Layer Application:

- 1. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
  - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
  - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
- 2. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
- 3. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.

#### B. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

- 1. Z-Furring Members: Apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

#### C. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.

#### D. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws where required for fire-rating; otherwise fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.

#### E. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum



board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

F. Tile Backing Panels:

1. Water-Resistant Gypsum Backing Board: Install at showers, tubs, and where indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.
2. Cementitious Backer Units: ANSI A108.11, at showers, tubs, locations to receive tile, and where indicated.
3. Areas Not Subject to Wetting: Install standard gypsum wallboard panels to produce a flat surface except at showers, tubs, and other locations indicated to receive water-resistant panels.
4. Where tile backing panels abut other types of panels in the same plane, shim surfaces to produce a uniform plane across panel surfaces.

### 3.7 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations indicated on the Drawings.

### 3.8 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
  1. Embed tape at joints in ceiling plenum areas and in other similarly and completely concealed-from-view areas.
  2. Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where panels are substrate for tile.
  3. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view and covered with wallcovering or flat or semi-gloss paint finish.
  4. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface at panel surfaces to receive gloss paint finish.
- E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

END OF SECTION 09260

## SECTION 09265 - GYPSUM BOARD SHAFT-WALL ASSEMBLIES

### 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. Shaft enclosures for elevators.
  - 2. Stair enclosures.
  - 3. Chase enclosures.
- B. Coordinate the requirements of this Section with those of sections that interface with Gypsum Board Shaft-Wall Assemblies.

#### 1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board construction not defined in this Section or in other referenced standards.

#### 1.4 SUBMITTALS

- A. Product Data: For each gypsum board shaft-wall assembly indicated.
- B. Fire-Test-Response Reports: From a qualified independent testing and inspecting agency substantiating each gypsum board shaft-wall assembly's required fire-resistance rating.
- C. Research/Evaluation Reports: Evidence of compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction that substantiate required fire-resistance rating for each gypsum board shaft-wall assembly.

#### 1.5 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory."

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat on leveled supports off the ground to prevent sagging.

## 1.7 PROJECT CONDITIONS

- A. Comply with requirements for environmental conditions, room temperatures, and ventilation specified in Division 9 Section "Gypsum Board Assemblies."

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for gypsum board shaft-wall assemblies is based on products named in Part 2 "Gypsum Board Shaft Wall" Article. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. American Gypsum Co.
  - 2. G-P Gypsum Corp.
  - 3. National Gypsum Company.
  - 4. United States Gypsum Co.

## 2.2 ASSEMBLY MATERIALS

- A. General: Provide materials and components complying with requirements of fire-resistance-rated assemblies indicated.
- B. Provide auxiliary materials complying with gypsum board shaft-wall assembly manufacturer's written recommendations.
- C. Steel Framing: ASTM C 645.
  - 1. Protective Coating: Manufacturer's standard corrosion-resistant zinc coating.
- D. Gypsum Liner Panels: Manufacturer's proprietary liner panels in 1-inch thickness and with moisture-resistant paper faces.
- E. Gypsum Wallboard: ASTM C 1396, core type as required by fire-resistance-rated assembly indicated.
  - 1. Edges: Tapered.

- F. Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Division 9 Section "Gypsum Board Assemblies" that comply with gypsum board shaft-wall assembly manufacturer's written recommendations for application indicated.
- G. Gypsum Wallboard Joint-Treatment Materials: ASTM C 475 and as specified in Division 9 Section "Gypsum Board Assemblies."
- H. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- I. Track (Runner) Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
  - 1. Powder-Actuated Fasteners: Provide powder-actuated fasteners with capability to sustain, without failure, a load equal to 10 times that imposed by shaft-wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 1190.
- J. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."
- K. Sound Attenuation Blankets: ASTM C 665 for Type I, unfaced mineral-fiber-blanket insulation produced by combining thermosetting resins with mineral fibers manufactured from slag or rock wool. Locate in all elevator shaft-walls, and wherever else indicated on Drawings.

## 2.3 GYPSUM BOARD SHAFT WALL

- A. Basis-of-Design Product: As indicated on Drawings by design designation of a qualified testing and inspecting agency.
- B. Studs: Manufacturer's standard profile for repetitive members and corner and end members and for fire-resistance-rated assembly indicated.
  - 1. Depth: As indicated.
  - 2. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth and fire rating indicated.
- C. Track (Runner): Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches, in depth matching studs.
- D. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches, in depth matching studs, and not less than 0.0329 thick.
- E. Cavity Insulation: Sound attenuation blankets.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates to which gypsum board shaft-wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
  - 1. ASTM C 754 for installing steel framing.
  - 2. Division 9 Section "Gypsum Board Assemblies" for applying and finishing panels.
- B. Do not bridge building expansion joints with shaft-wall assemblies; frame both sides of joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
  - 1. At elevator hoistway door frames, provide jamb struts on each side of door frame.
  - 2. Where handrails directly attach to gypsum board shaft-wall assemblies, provide galvanized steel reinforcing strip with 0.0312-inch minimum thickness of base (uncoated) metal, accurately positioned and secured behind at least 1 face-layer panel.
- D. Integrate stair hanger rods with gypsum board shaft-wall assemblies by locating cavity of assemblies where required to enclose rods.
- E. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- F. Isolate gypsum finish panels from building structure to prevent cracking of finish panels while maintaining continuity of fire-rated construction.
- G. Install control joints to maintain fire-resistance rating of assemblies.
- H. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Provide continuous beads at all intersections between gypsum board assemblies and floor slabs and underside of ceiling structures, to form continuous seal between shaft and occupied spaces. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain

an airtight and smoke-tight seal; and comply with manufacturer's written instructions or ASTM C 919, whichever is more stringent.

- I. In elevator shafts where gypsum board shaft-wall assemblies cannot be positioned within 2 inches of the shaft face of structural beams, floor edges, and similar projections into shaft, install 1/2- or 5/8-inch- thick, gypsum board cants covering tops of projections.
  1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches o.c. with screws fastened to shaft-wall framing.
  2. Where steel framing is required to support gypsum board cants, install framing at 24 inches o.c. and extend studs from the projection to the shaft-wall framing.

END OF SECTION 09265

## SECTION 09310 - PORCELAIN TILE

### 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. Porcelain floor and wall tile.
  - 2. Quarry tile.
  - 3. Crack-suppression membrane.
  - 4. Epoxy grout.
  - 5. Metal edge strips installed as part of floor and wall tile installations.
- B. Coordinate the requirements of this Section with those of other sections that interface with Porcelain Tile.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with values in conformance with the Americans with Disabilities Act and the Texas Accessibility Standards, as determined by testing identical products per ASTM C 1028.
- B. Dynamic Coefficient of Friction: For tile installed on walkway surfaces, provide products with values per ANSI A137.1 of 0.42 or greater.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- C. Samples for Verification:
  - 1. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work.
- D. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

- E. Product Certificates: For each type of product, signed by product manufacturer.
- F. Material Test Reports: For each tile-setting and -grouting product.

## 1.5 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tile of same type from one source or producer.
  - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- C. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
  - 1. Build mockup of each type of floor tile installation.
  - 2. Build mockup of each type of wall tile installation.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI and Tile Council of America (TCNA) standards referenced below.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials as selected by Architect from manufacturer's full range.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.



- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.

## 2.2 TILE PRODUCTS

### A. Acceptable Manufacturers:

1. Daltile; Div. of Dal-Tile International Inc.
2. Lone Star Ceramics Company.
3. Summitville Tiles, Inc.
4. Texaramic, Inc.
5. Other, with prior approval of Architect.

### B. Tile Type 1 & 2:

1. Basis-of-Design Product: Daltile Ambassador – Stone Attaché or a comparable product made by one of the acceptable manufacturers.
2. Application and Location: As indicated on Drawings.
3. Pattern and colors: Pattern is to be determined and incorporating up to three colors.
4. Size: 12 inch by 24 inch.

## 2.3 CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

### A. General: Manufacturer's standard product that complies with ANSI A118.10.

### B. Acceptable Products:

1. Hydro-Rite, by Tex-Rite.
2. DalSeal (or NobleSeal), by Noble Co.

## 2.4 SETTING AND EPOXY GROUTING MATERIALS

### A. Acceptable Manufacturers:

1. C-Cure.
2. Custom Building Products.
3. LATICRETE International Inc.

### B. Latex-Modified Portland Cement Mortar (Thin Set): ANSI A118.4 and TCNA F113, consisting of the following:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
  - a. For wall applications, provide nonsagging mortar that complies with ANSI A118.4 Paragraph F-4.6.1, and with TCNA W202.
2. Applications: Floors and Concrete Masonry walls.

- C. Organic Adhesive: ANSI A136.1, Type I and TCNA W223.
  - 1. Applications: Gypsum Board walls.
- D. Latex-Modified Tile Epoxy Grout: ANSI A118.3, color as indicated.
  - 1. Unsanded grout mixture for joints 1/8 inch and narrower.
  - 2. Sanded grout mixture for joints 1/8 inch and wider.

## 2.5 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- C. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.
  - 1. Acceptable Products:
    - a. C-Cure; Penetrating Sealer 978.
    - b. Jamo Inc.; Penetrating Sealer.
    - c. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
    - d. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
    - e. TEC Specialty Products Inc.; TA-256 Penetrating Silicone Grout Sealer.
    - f. Equal, with prior approval of Architect.
- D. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for floor and wall applications, exposed-edge material.
  - 1. Basis-of-Design Product at floor: Schluter Systems, **Schiene**, or approved equal.
  - 2. Basis-of-Design Product at wall: Schluter Systems, **Quadec**, or approved equal.
  - 3. Material: **Satin anodized aluminum**.

## 2.6 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.

- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Ensure that surfaces are flat and level, within tolerances required by ANSI A108, with maximum variation of 1/8 inch in 10 feet.
    - a. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
    - b. Remove protrusions, bumps, and ridges by sanding or grinding.
  - 2. Ensure that substrates for setting tile are firm; dry; clean; free of oil, waxy films, curing compounds, and other materials that are incompatible with tile-setting materials.

### 3.2 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCNA Installation Guidelines: TCNA's "Handbook for Ceramic Tile Installation." Comply with TCNA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
  - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

- F. Expansion Joints: Locate sealant-filled expansion joints where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

- 1. Locate Expansion Joints in tile surfaces directly above any expansion, control, contraction or isolation joints in concrete substrates, even if joints in substrate are not indicated on the Drawings.

- G. Grout tile to comply with requirements of ANSI A108.10 and, where applicable, ANSI A108.6.

### 3.3 CRACK-SUPPRESSION MEMBRANE INSTALLATION

- A. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
- B. At all tile Expansion Joints, install membrane a width of 3 times the tile size, or a minimum of 24 inches.
  - 1. At expansion joints in substrate, cut membrane along center of joint before installing tile. Leave joint in tile free of grout to allow sealant application.

### 3.4 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCNA installation methods and ANSI A108 Series of tile installation standards.
- A. Joint Widths: Install tile on floors with joint widths per the manufacturer's recommendation.
- B. Expansion Joints: In lieu of grout, install joint sealant in accordance with Division 7 section "Joint Sealers" at joints that align over expansion joints.
- C. Grout Sealer: Apply grout sealer to grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

### 3.5 WALL TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCNA installation methods and ANSI setting-bed standards.
- A. Joint Widths: Install tile on walls with joint widths per the manufacturer's recommendation.

### 3.6 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all exposed tile surfaces so they are free of foreign matter.

1. Remove all grout residue from tile as soon as possible.
  2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09310

## SECTION 09511 - ACOUSTICAL PANEL CEILINGS

### 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 acoustical panels and exposed suspension systems for ceilings.
- B. Coordinate the requirements of this Section with those of other sections that interface with Acoustical Panel Ceilings.

#### 1.3 DEFINITIONS

- A. LR: Light Reflectance coefficient.
- B. NRC: Noise Reduction Coefficient.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
  - 1. Acoustical Panel: Set of 12-inch- square Samples of each type, color, pattern, and texture.
  - 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.
- C. Maintenance Data: For finishes to include in maintenance manuals.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations:
  - 1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
  - 2. Suspension System: Obtain each type through one source from a single manufacturer.

- B. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
  - 1. Surface-Burning Characteristics: Provide acoustical panels with surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
  - 2. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
    - a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
    - b. Identify materials with appropriate markings of applicable testing and inspecting agency.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.
  - 2. Maintain uniform minimum temperature of 61 degrees F and maintain humidity of 55% to 60% prior to, during and after installation.

## 1.8 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

## PART 2 - PRODUCTS

### 2.1 ACOUSTICAL PANELS, GENERAL

- A. Acceptable Manufacturers:
  - 1. Armstrong World Industries
  - 2. CertainTeed
  - 3. Conwed Corporation
  - 4. Johns-Manville
  - 5. United States Gypsum
- B. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
- C. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
- D. Fire Resistance Rating: Provide panels to achieve required ratings.
- E. Coating-Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273.

### 2.2 ACOUSTICAL PANEL TYPES

- A. At Ceiling Type 1:
  - 1. Products:
    - a. Armstrong Cirrus 574, HumiGuard Plus, or equal product in performance and appearance by one of the Acceptable Manufacturers.
    - b. Locations: Typical, unless indicated otherwise on the Drawings.
    - c. Size per Drawings.
    - d. Square Edge.
    - e. Provide Humidity-Resistant panels.
    - f. NRC of 0.70 or greater
    - g. Antimicrobial Treatment: Coating or Panel based.
- B. At Ceiling Type 2:
  - 1. Products:
    - a. Armstrong Clean RoomVL (vinyl-faced) HumiGuard Plus, or equal product in performance and appearance by one of the Acceptable Manufacturers.
    - b. Locations: Serving and laundry rooms.
    - c. Size per Drawings.
    - d. Provide Humidity-Resistant panels.
    - e. Antimicrobial Treatment: Coating or Panel based.



## 2.3 METAL SUSPENSION SYSTEMS, GENERAL

### A. Acceptable Manufacturers:

1. Armstrong World Industries.
2. CertainTeed.
3. Chicago Metallic Corporation.
4. USG Donn Brand

### B. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

1. Provide "Intermediate Duty" structural class system.

### C. Fire Resistance Rating: Provide system to achieve ratings indicated.

### D. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

### E. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.

### F. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire for interior applications and 0.135-inch- diameter wire for exterior applications.

### G. Hold-Down Clips: Provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees in the following locations:

1. Where required to achieve fire ratings.
2. All exterior locations.

## 2.4 METAL SUSPENSION SYSTEM TYPES

### A. At Ceiling Type 1:

1. Products:
  - a. Armstrong Prelude XL 15/16 exposed tee, or equal product in performance and appearance by one of the Acceptable Manufacturers.
  - b. Locations: Typical, unless indicated otherwise on the Drawings.

- c. End Condition of Cross Runners: Override (stepped) type.
- d. Face Design: Flat, flush.
- e. Cap Material: Steel or aluminum cold-rolled sheet.
- f. Cap Finish: Painted in color as selected from manufacturer's full range.

B. At Ceiling Type 2: Same Product as at Type 1.

## 2.5 METAL EDGE MOLDINGS AND TRIM

- A. Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
- 1. For lay-in panels with **reveal edge** details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
  - 2. For **circular penetrations** of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
  - 3. For **narrow-face suspension systems**, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

### 3.3 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Install ceiling systems in a manner capable of supporting superimposed loads, with maximum permissible deflection of 1/360 of span and maximum surface deviation of 1/8 inch in 10 ft.

C. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers' plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not attach hangers to steel deck tabs.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated, and at splices in main runners; provide hangers not more than 8 inches from ends of each member, and 2 feet o.c. around air duct outlets.
8. All lighting fixtures shall be supported by fixture support system rods or wires, **independent of the ceiling suspension devices**, for each fixture, and **at all four corners**. Locate support not more than 6 inches from the lighting fixture corners.

D. Center ceiling systems on room axes leaving equal border pieces, not less than one-half tile width, unless otherwise indicated on Drawings.

E. Install lay-in panels level, in uniform plane and free from twist, warp and dents.

F. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Do not use exposed fasteners, including pop rivets, on moldings and trim.

1. Install edge moldings at intersection of ceiling and vertical surfaces, using maximum lengths, straight, true to line and level. Miter corners. Provide edge moldings at junctions with other ceiling finishes.

G. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

H. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, for fire-resistance ratings, and to achieve UL listings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.
2. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 ADJUSTMENT AND CLEANING

A. Adjust any sags or twists which develop in the ceiling system(s) and replace any part which is damaged or faulty.

B. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09511

## SECTION 09651 - RESILIENT TILE FLOORING

### 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. Luxury Vinyl Tile (LVT).
  - 2. Rubber floor tile.
  - 3. Vinyl composition floor tile.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
  - 1. Show details of special patterns.
- C. Samples: Full-size units of each color and pattern of floor tile required.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated (LVT Resilient).
  - 1. Engage an installer who employs workers for this Project who are trained for installation techniques required.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups for floor tile including resilient base, feature strips, and accessories.
  - a. Size: Minimum 100 sq. ft. for each type, color, and pattern in locations directed by Architect.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 68 deg F or more than 72 deg F for a minimum period of 24-48 hours or until individual temperatures are met. Store floor tiles on flat surfaces.

#### 1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 68 deg F or more than 72 deg F, in spaces to receive floor tile during the following time periods:
  1. 48 hours before installation.
  2. During installation.
  3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 58 deg F or more than 72 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to heavy traffic for 48 hours after floor tile installation and to light foot traffic for 24 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, dry wall, etc., have been completed.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

- B. Warranty: 20 year commercial limited warranty.
- C. Wear: 30 mil commercial wear layer or greater.
- D. Slip Resistance: ADA compliant for slip resistance.

## 2.2 LUXURY VINYL FLOOR TILE LVT-1

- A. Basis-of-Design Product: Subject to compliance with requirements, provide one of the following:
  - 1. AB; American Biltrite.
  - 2. Altro Group.
  - 3. Amtico International Inc.
  - 4. Armstrong World Industries, Inc.
  - 5. Burke Mercer Flooring Products, Division of Burke Industries Inc.
  - 6. Centiva
  - 7. Flexco, Inc.
  - 8. Gerflor.
  - 9. Johnsonite; A Tarkett Company.
  - 10. Polyflor, Ltd.
  - 11. Roppe Corporation, USA.
  - 12. TOLI International.
  - 13. <Insert manufacturer's name>.
- B. Tile Standard: ASTM F 1700.
  - 1. Class: [Class I, monolithic vinyl tile] [Class III, printed film vinyl tile].
  - 2. Type: A, smooth surface.
- C. Nominal Thickness: 0.125 inch.
- D. Size: [9 by 9 inches] [12 by 12 inches] [12 by 18 inches] [12 by 36 inches] [18 by 18 inches] [36 by 36 inches] [3 by 36 inches] [4 by 36 inches] [6 by 36 inches] [7.2 by 48 inches].
- E. Colors and Patterns: As selected by Architect from full range of industry colors.

## 2.3 RUBBER FLOOR TILE (LANDINGS AND TREADS) RB-1

- A. Comply with ASTM F 1344.
- B. Stair Landings:
  - 1. Manufacturer: Roppe
  - 2. Style: SafeTCork Slip Resistant
  - 3. Surface DesignP: 991 Slate
  - 4. Thickness: 3/16 inch.

5. Usage: typical on stair landings unless a different flooring material is specifically called for on the Drawings.
6. Fire-Test-Response Characteristics:
  - a. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

## 2.4 VINYL COMPOSITION FLOOR TILE VCT-1

### A. Acceptable Manufacturers:

1. American Biltrite (Canada) Ltd.
2. Armstrong World Industries, Inc.
3. Azrock Commercial Flooring, DOMCO.
4. Congoleum Corporation.
5. Johnsonite.
6. Mannington Mills, Inc.
7. Tarkett Inc.

### B. Comply with ASTM F 1066.

### C. Vinyl Composition Tile (VCT) Type 1:

1. Class: 2 (through-pattern tile).
2. Wearing Surface: Smooth.
3. Thickness: 0.125 inch.
4. Size: 12 by 12 inches.
5. Usage: where indicated on the Drawings.
6. Fire-Test-Response Characteristics:
  - a. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

## 2.5 INSTALLATION MATERIALS

- A. Trowelable Cementitious Leveling and Patching Compounds: Latex-modified, portland cement based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than [9] [10] <Insert number> pH.
  - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
    - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 6 lb of water/1000 sq. ft. in 24 hours.
    - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 or lower percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable cementitious leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
  - 2. Room should be controlled by HVAC at a temperature of between 68 degrees F and 72 degrees F.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.



### 3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - 1. Lay tiles [square with room axis] [at a 45-degree angle with room axis] [in pattern indicated] [per installation instructions] <Insert requirements>.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles carefully, noting directional arrows on the back of tiles when present, [with grain running in one direction] [with grain direction alternating in adjacent tiles (basket-weave pattern)] [in pattern of colors and sizes indicated].
  - 2. Some pre-blending may be required depending on color or shade variation.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

### 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
  - 1. Remove wet adhesive and other blemishes from exposed surfaces with a damp cloth.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil after 48 hours.

- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Remove soil, adhesive, and blemishes from floor tile surfaces.
  - 1. Not less than 48 hours after installation, clean floor with a neutral liquid cleaner, followed by Floor Polish (sealer / finish coats).
- E. Cover floor tile until Substantial Completion if foot traffic is required immediately.

END OF SECTION 09651

**SECTION 09656 – INDOOR RESILIENT ATHLETIC SURFACING****PART 1 – GENERAL****1.1 SECTION INCLUDES**

- A. Supply and installation of the indoor resilient multipurpose surfacing
- B. Application of the game lines
- C. References for the correct construction and preparation of concrete slabs to receive resilient flooring.

**1.2 SUBMITTALS**

- A. Product Data:
  - 1. Manufacturer's promotional brochures, specifications and installation instructions
- B. Manufacturer Certifications:
  - 1. Provide certification that accurately identifies the Original Equipment Manufacturer (OEM) of flooring furnished for this project including manufacturer's name, address and factory location.
  - 2. Suppliers of private label flooring for this project must identify themselves as such and fully disclose the OEM information listed above.
  - 3. All "manufacturer" requirements in these specifications must be complied with by the OEM, including warranties, certifications, qualifications, product data, test results, environmental requirements, performance data, etc.
- C. Samples:
  - 1. Submit for selection and approval three (3) sets of the indoor resilient multipurpose surfacing, manufacturer's brochures, samples or sample boards of all of the available colors, textures and styles.
  - 2. Submit color samples of all the available game line paint colors for selection and approval.
- D. Closeout Submittals:
  - 1. Submit three (3) copies of the indoor resilient multipurpose surfacing and manufacturer's maintenance instructions.
  - 2. Submit three (3) copies of the material and installation warranties as specified.

**1.3 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. The indoor resilient multipurpose surfacing shall have been actively marketed for a minimum of ten (10) years.
  - 2. The indoor resilient multipurpose surfacing shall be manufactured in an ISO 9001 certified plant.
  - 3. The indoor resilient multipurpose surfacing shall be manufactured in an ISO 14001 certified plant.
  - 4. The indoor resilient multipurpose surfacing supplier shall be an established firm, experienced in the field, and competent in the techniques required by the manufacturer.
  - 5. The installer of the indoor resilient multipurpose surfacing shall have a minimum of five (5) years of experience in the field installing indoor resilient multipurpose surfacing and have worked on at least five (5) projects of similar size, type and complexity.

## B. Certifications:

1. Installer to submit the indoor resilient athletic surfacing manufacturer's or distributor's certification attesting that they are an approved installer of the indoor resilient multipurpose surfacing.
2. The indoor resilient multipurpose surfacing manufacturer to submit official ISO 9001 certification for the facility in which the indoor resilient multipurpose surfacing is manufactured.

## C. Testing:

Tests shall be relative for multi-purpose use with certificates from independent testing resources to be made available upon request. Test results shall be performed according to ASTM standard testing procedures including ASTM F2772 "Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems".

## 1.4 DELIVERY, STORAGE AND HANDLING

## A. Delivery:

Material shall not be delivered until all related work is in place and finished and/or proper storage facilities and conditions can be provided and guaranteed stable according to FieldTurf USA, Inc. recommendations.

## B. Storage:

1. Store the material in a secure, clean and dry location.
2. Maintain temperature between 55° and 85° Fahrenheit.
3. Store the indoor resilient athletic surfacing rolls in an upright position on a smooth flat surface immediately upon delivery to jobsite.
4. Rolls shipped in rigid protective cardboard containers can be laid horizontally prior to unpacking and installation.

## 1.5 PROJECT/SITE CONDITIONS

- A. It is the responsibility of the general contractor/construction manager to maintain project/site conditions acceptable for the installation of the indoor resilient multipurpose flooring.
- B. The area in which the indoor resilient multipurpose surfacing will be installed shall be dry and weather tight. Permanent heat, light and ventilation shall be installed and operable.
- C. All other trades shall have completed their work prior to the installation of the resilient athletic flooring. The general contractor or construction manager shall maintain a secure and clean working environment before, during and after the installation.
- D. Maintain a stable room temperature of at least 65°F for a minimum of one (1) week prior to, during and thereafter installation.
- E. An effective low-permeance vapor barrier is placed directly beneath the concrete subfloor. For "on" or "below grade" installations, it is recommended to provide a permanent vapor barrier resistant to long term hydrostatic pressure/moisture exposure. Protrusions should be sealed to prevent moisture migration into the slab. Moisture should not be allowed to enter the slab after the completed construction.
- F. Concrete subfloor surface pH level within the 7 to 11 range dependent upon installation type.

- G. Concrete subfloor should be no greater than 1/8" within a 10 ft diameter. This tolerance can be measured in accordance with ASTM E1155. A specified ( $F_F$ ) of 50 and an ( $F_L$ ) of 30 should reach this degree of floor flatness and floor level. There is no numerical correlation between F numbers and the deviation from the straight edge. However, the above specified numbers should achieve a flat floor with minimal deviation in the slab. Reference ACI 117 and ACI 302.1R. The general contractor should provide a certificate of compliance with the above recommendations.
- H. Concrete subfloor must be clean and free of all foreign materials or objects including, but not limited to, curing compounds and sealers.
- I. Fill cracks, grooves, voids, depressions, and other minor imperfections. Follow the manufacturer's directions. Moveable joints must be treated utilizing specific transition joint devices depending upon the architect's recommendations. Follow current ASTM F710 guidelines for the preparation of concrete slabs to receive resilient flooring.
- J. Refer to ACI 302.2R "Guidelines for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials" for concrete design and construction.
- K. Concrete slab shall be fortified with continual steel reinforcement. Fiber reinforcement alone shall not be considered adequate fortification.

#### 1.6 WARRANTY

- A. Special Limited Warranty:
  - 1. Manufacturer's standard form in which manufacturer agrees to repair or replace sports flooring including labor that fails within specified warranty period.
- B. Material warranty must be direct from the product manufacturer.
  - 1. Material warranties must come from original manufacturer or division thereof. Private label warranties from distributors or brokers are not valid. Supply original point of manufacturing upon request.
- C. Failures include, but are not limited to, the following:
  - 1. Material manufacturing defects.
  - 2. Surface wear and deterioration to the point of wear-through of wear layer per ASTM F410/ASTM F1303.
- D. Warranty Period:
  - 1. For material defects and surface wear-through: **25** years from date of substantial completion.
  - 2. For moisture vapor tolerance: **25** years from date of substantial completion.
- E. Installer's Limited Warranty:
  - 1. Installer's standard form in which installer agrees to repair or replace sports flooring that fails due to poor workmanship or faulty installation within the specified warranty period.
  - 2. Warranty Period: 2 years from date of substantial completion.

#### 1.7 ADDITIONAL MATERIALS

- A. Furnish to the owner additional materials containing a total of at least 1% of each different color or design of the indoor resilient athletic surfacing used on the project.

#### 1.8 LEED™ CERTIFICATION

- A. The indoor resilient athletic surfacing should be able to help this facility to achieve points towards *LEED™ certification*. Flooring system must be certified by FloorScore.
- B. LEED categories positively affected by the indoor resilient athletic surfacing:

LEED™ V4 Credit		Contribution
Materials & Resources: Building Product Disclosure & Optimization (BPDO)		
MRc3: Sourcing of Raw Materials	Options 1 & 2	2 Points
MRc4: Material Ingredients	Option 1	1 Point
MRc5: Construction and Demolition Management	Reclamation and Recycling	ReStart® Program
Indoor Environmental Quality		
EQc2: Low-Emitting Materials	TVOC: 0.5 mg/m <sup>3</sup> or less	FloorScore®

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The basis of the design for the indoor resilient multipurpose surfacing is Omnisports Multi-Use as manufactured by Tarkett.
- B. All other installation accessories and related components must be either made or approved by the indoor resilient athletic surfacing manufacturer.
- C. Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions.
- D. Test reports confirming compliance from an independent sports laboratory must be provided along with samples, technical data, installation, maintenance, and warranty prior to acceptance as an alternative product.

### 2.2 MATERIALS

- A. Omnisports Multi-Use - Prefabricated sport surface 6.2 mm (0.14") with wood flooring design, single surface embossing and Extreme Three (3) Layers technology (X3LT) as supplied by Tarkett.
  1. Embossing of wood design and solid colors must be the same; varying embossing or surface textures will not be allowed.
  2. Printing of wood design shall closely resemble standard wood strip flooring in size, color, board length, and grain appearance.
  3. Surface embossing combined with TopClean XP must offer proper balance of surface friction per the ASTM F2772.
  4. Surface embossing combined with TopClean XP must provide resistance to stains and scratches. Surface profile must not incorporate linear embossing.
  5. The wood design shall be protected by a clear layer of pure PVC (Polyvinyl Chloride) and TopClean XP, a factory-applied UV cured urethane treatment.
  6. Extreme Three (3) Layers technology (X3LT) includes Omnisports XCS cushion, glass veil and calendared sheet must offer improved shock absorbing comfort while providing better indentation recovery
  7. The XCS cushion force reduction layer shall be high-density closed cell PVC foam with honeycomb embossing, and is applied in one continuous manufacturing process.
  8. Laminated or adhered foam layers will not be allowed.
  9. Field constructed products will not be accepted.

- A. Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:

Width	—	6' 6" (2 m)
Length	—	85' (25.9m) approx.
Wear Layer	—	2 mm
Total Thickness	—	6.2 mm
Wear Layer	Type 1– Grade 1	ASTM F1303/F410
Vertical Deformation	PASSED	ASTM F2772
Rolling Load	PASSED	≤0.50 mm (EN 1569 {11/1999})
Surface Finish Effect	PASSED	ASTM F2772 (80 – 110)
Chemical Resistance	Excellent	ASTM F925
Impact Resistance	PASSED	EN 1717
Abrasion Resistance	PASSED	0.10 (EN ISO 5470-1 {06/1999})
Static Load Limit	PASSED	ASTM F970- Load 175 Lbs.
Sound Insulation	Excellent	+/- 19 dB (ISO 717/2)
In-Room Sound Insulation	Excellent	65dB (NF S31-074)
Ball Rebound	PASSED	ASTM F2772 > 90%
Force Reduction	PASSED	ASTM F2772 Class 2
Fire Rating	PASSED	ASTM E648 Class 1
Microbial Assays Test	No Growth	G21 ASTM - Backing
Asthma and Allergy Friendly™	ASP: 05-01/101	Certified Compliant
VOC	<10µg/m <sup>3</sup>	ASTM D5116 (small chamber)
Phthalate-free technology	—	YES
REACH Compliant	—	YES
Heavy Metals	—	NO
ISO 9001	—	YES
ISO 14001	—	YES

1. Color: As available from the indoor resilient athletic surfacing manufacturer's standard range.
2. Hardwood Design Series: High definition printing for a realistic wood surface appearance as available from the indoor resilient athletic surfacing manufacturer's standard range.
3. Texture: Texture to remain consistent between solid colors and wood design when blending colors.

- C. Tarkolay – A high quality low permeance slip sheet vapor retarder designed to separate the installed system from the substrate below.
1. Tarkolay as manufactured by Tarkett can be used below, on, or above grade substrates that experience elevated moisture conditions.
  2. Moisture tolerances shall have no limitation per ASTM F2170. Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:

Width	—	6' 6" (2 m)
Length	—	147'7" (45 m) approx.
Total Thickness	—	1.3 mm
Dimensional Stability	PASSED	.01% (EN 1434)
Permeance	Excellent	<0.20 (ASTM E96)

- D. Welding Rod: As supplied by the indoor resilient athletic surfacing manufacturer or supplier.
  - 1. Color to blend with the indoor resilient athletic surfacing color or design.
  - 2. All seams shall be welded to create a monolithic and impermeable surface.
- E. Adhesive: As approved by the indoor resilient athletic surfacing manufacturer.
- F. Game Line Paint and Primer: As approved by the indoor resilient athletic surfacing manufacturer.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. It is the responsibility of the general contractor/construction manager to ensure that project/site conditions are acceptable for the installation of the indoor resilient athletic flooring.
- B. Verify that the area in which the indoor resilient athletic surfacing will be installed is dry and weather tight. Verify that permanent heat, light and ventilation are installed and operable.
- C. Verify that all other work that could cause damage, dirt and dust or interrupt the normal pace of the indoor resilient athletic flooring installation is completed or suspended.
- D. Verify that there is a stable room temperature of at least 65°F.
- E. Verify that there are no foreign materials or objects on the subfloor and that the subfloor is clean and ready for installation.
- F. Installation with Tarkolay to Concrete Subfloor : moisture content no limitation when tested per ASTM F2170.
- G. Follow FieldTurf USA, Inc. installation recommendations.
- H. Do not average the results of the tests. Report all field test results in writing to the General Contractor, Architect, and End User prior to installation.
- I. Verify that the concrete subfloor surface pH level is within the 7 - 11 range.
- J. Document the results confirming the slab is within manufacturer's tolerances for slab deviation.

#### 3.2 PREPARATION OF SURFACES

- A. Sand the entire surface of the concrete slab.
- B. Sweep the concrete slab so as to remove all dirt and dust. If a sweeping compound is to be used it must be a sweeping compound that does not contain oil or other items that may inhibit the adhesive bond.
- C. Slab must be dust free. In the event that dust impairs adhesive bond, priming the slab prior to application of adhesive may be necessary. Follow installation guidelines.
- D. Follow OSHA guidelines.



### 3.3 INSTALLATION

- A. The installation area shall be closed to all traffic and activity for a period to be set by the indoor resilient athletic surfacing installer. The indoor resilient athletic surfacing installation shall not begin until the installer is familiar with the existing conditions.
- B. All necessary precautions should be taken to minimize noise, smell, dust, the use of hazardous materials and any other items that may inconvenience others.
- C. Install the indoor resilient athletic surfacing in strict accordance with the indoor resilient athletic surfacing manufacturer's written instructions.
- D. Install the indoor resilient athletic surfacing minimizing cross seams. Provide a seam diagram during the submittal process for approval prior to installation. Vinyl Sheet Flooring Seams: Comply with ASTM F 1516. Rout joints and heat weld to permanently, and seamlessly, fuse sections together.
- E. Paint game lines using approved game line paint primer and game line paint in strict accordance with the game line paint manufacturer's instructions.
- F. Install appropriate threshold plates or transition strips where necessary.

### 3.5 CLEANING

- A. Remove all unused materials, tools, and equipment and dispose of any debris properly. Clean the indoor resilient athletic surfacing in accordance with the manufacturer's instructions.

### 3.6 PROTECTION

- A. If required, protect the indoor resilient athletic surfacing from damage using coverings approved by the manufacturer until acceptance of work by the customer or their authorized representative.

### 3.7 RELATED STANDARDS AND GUIDELINES

- A. ASTM F2170 "Standard Test Method for Determining Relative Humidity In Concrete Floor Slabs Using In-Situ Probes"
- B. ASTM F710 "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring"
- C. ACI 302.2R-06 "Guideline for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials"
- D. ASTM F2772-11 "Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems"

END OF INDOOR RESILIENT ATHLETIC FLOORING

## SECTION 09681 – CARPET TILE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes modular, tufted carpet tile.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate required.
- B. Shop Drawings: Show the following:
  - 1. Carpet tile type, color, and dye lot.
  - 2. Type of subfloor and type of adhesive.
  - 3. Pattern type, repeat size, location, direction, and starting point.
  - 4. Type, color, and location of edge, transition, and other accessory strips.
  - 5. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
  - 1. Carpet Tile: Full-size Sample.
  - 2. Exposed Edge Stripping and Accessory: 12-inch- long Samples.
  - 3. Carpet Seam: 6-inch Sample.
- D. Maintenance Data: For carpet to include in maintenance manuals specified in Division 1. Include the following:
  - 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
  - 2. Precautions for cleaning materials and methods that could be detrimental to carpet.

#### 1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

- C. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

- 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

#### 1.5 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - 1. Do not commence carpet work until painting and finishing work is complete, and ceilings and overhead work are tested, approved, and completed.
  - 2. Maintain room temperature at minimum 60 degrees F, and relative humidity at approximately final occupied conditions, for at least 24 hours prior to installation.
  - 3. Provide sufficient lighting.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

#### 1.6 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 concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, and runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 CARPET TILE

#### A. Carpet Tile Types:

1. Type 1: Mohawk Group – Hyper Earth.
2. Color: Up to three colors, and as selected by Architect from manufacturer's full range.

#### B. Performance Characteristics: As follows:

1. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria; not less than 1-mm halo of inhibition for gram-negative bacteria; no fungal growth; per AATCC-174.
2. AntiRaveling Backing: manufacturer's standard.
3. Dry Breaking Strength: Not less than 100 lbf per ASTM D 2646.
4. Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC-165.
5. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) per AATCC-16.
6. ADA compliant for minimum static coefficient of friction of 0.6 for accessible routes.

### 2.2 INSTALLATION ACCESSORIES

#### A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

#### B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

1. Adhesive: Lee's "Unibond" wet set adhesive or equal.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

#### A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Verify that substrates and conditions are satisfactory for carpet tile installation and comply with requirements specified.

#### B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Broom and vacuum clean substrates to be covered immediately before installing carpet tile. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.
- C. Comply with carpet tile manufacturer's written recommendations for seam locations and direction of carpet tile; maintain uniformity of carpet tile direction and lay of pile. At doorways, center seams under the door in closed position. Level adjoining border edges.
- D. Do not bridge building expansion joints with carpet tile.
- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
  - 1. Remove excess adhesive, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
  - 2. Remove yarns that protrude from carpet tile surface.
  - 3. Vacuum carpet tile using commercial machine with face-beater element.

- B. Protect installed carpet tile to comply with CRI 104, Section 15, "Protection of Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer.

END OF SECTION 09681

**SECTION 09772 – DECORATIVE FIBERGLASS REINFORCED WALL PANELS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished gypsum wallboard.
  - 1. PVC trim.
- B. Products Not Furnished or Installed under This Section:
  - 1. Gypsum substrate board.
  - 2. Resilient Base.

**1.2 RELATED SECTIONS**

- A. Division 9 Section “Gypsum Board Assemblies” for Gypsum substrate board.
- B. Division 5 Section “Cold-Formed Metal Framing” for Metal Stud Framing
- C. Division 9 Section “Painting”.
- D. Division 9 Section “Resilient Floor Tile” for Resilient Base.

**1.3 REFERENCES**

- A. American Society for Testing and Materials: Standard Specifications (ASTM)
  - 1. ASTM D 256 - Izod Impact Strengths (ft #/in)
  - 2. ASTM D 570 - Water Absorption (%)
  - 3. ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
  - 4. ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
  - 5. ASTM D 2583- Barcol Hardness
  - 6. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
  - 7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

**1.4 SUBMITTALS**

- A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.

- B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
- D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
  - 1. Submit complete with specified applied finish.
  - 2. For selected patterns show complete pattern repeat.
  - 3. Exposed Molding and Trim: Provide samples of each type, finish, and color.
- E. Do not submit Manufacturers Material Safety Data Sheets (MSDS) to Architect. Submit MSDS sheets to General Contractor for all products used in the construction.

#### 1.5 QUALITY ASSURANCE

- A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
  - 1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
    - a. Wall Required Rating – Class A.
- B. Sanitary Standards: System components and finishes to comply with:
  - 1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
  - 2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work
- B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
  - 1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

#### 1.8 WARRANTY

- A. Furnish one year guarantee against defects in material and workmanship.



## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURER

- A. Marlite, or approved equal. 1 Marlite Drive, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: [info@marlite.com](mailto:info@marlite.com) [www.marlite.com](http://www.marlite.com).
- B. Product:
  - 1. Standard FRP

### 2.2 PANELS

- A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
  - 1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
  - 2. Dimensions:
    - a. Thickness – 0.090” nominal
    - b. Width - 4'-0” nominal
    - c. Length – 8'-0” nominal
  - 3. Tolerance:
    - a. Length and Width: +/-1/8”
    - b. Square - Not to exceed 1/8”
- B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
  - 1. Flexural Strength -  $1.0 \times 10^4$  psi per ASTM D 790.
  - 2. Flexural Modulus -  $3.1 \times 10^5$  psi per ASTM D 790.
  - 3. Tensile Strength -  $7.0 \times 10^3$  psi per ASTM D 638.
  - 4. Tensile Modulus -  $1.6 \times 10^5$  psi per ASTM D 638.
  - 5. Water Absorption - 0.72% per ASTM D 570.
  - 6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
  - 7. Izod Impact Strength of 72 ft. lbs./in ASTM D 256.
- C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.
- D. Front Finish: Provide the following characteristics:
  - a. Color: White
  - b. Surface: Smooth
  - c. Fire Rating: Class A (I)
  - d. Size: 48” x 96” x 0.090” nominal

## 2.3 MOLDINGS

- A. PVC Trim: Thin-wall semi-rigid extruded PVC.
  - 1. Inside Corner
  - 2. Outside Corner
  - 3. Division
  - 4. Edge
  - 5. Color: White

## 2.4 ACCESSORIES

- A. Adhesive: Either of the following construction adhesives complying with ASTM C 557.
  - 1. Marlite C-551 FRP Adhesive - Water- resistant, non-flammable adhesive.
  - 2. Marlite C-915 Construction Adhesive - Flexible, water-resistant, solvent based adhesive, formulated for fast, easy application.
  - 3. Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.
  - 4. Approved Equal.
- B. Sealant:
  - 1. Marlite Brand MS-250 Clear Silicone Sealant.
  - 2. Marlite Brand MS-251 White Silicone Sealant.
  - 3. Marlite Brand - Color Match Sealant.
  - 4. Approved Equal.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
  - 1. Verify that stud spacing does not exceed 24” on-center.
- B. Repair defects prior to installation.
  - 1. Level wall surfaces to panel manufacturer’s requirements. Remove protrusions and fill indentations.

### 3.2 INSTALLATION

- A. Comply with manufacturer's recommended procedures and installation sequence.
- B. Cut sheets to meet supports allowing 1/8" clearance for every 8 foot of panel.
  - 1. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
  - 2. Pre-drill fastener holes 1/8" oversize with high speed drill bit.
    - a. Space at 8" maximum on center at perimeter, approximately 1" from panel edge.
    - b. Space at in field in rows 16' on center, with fasteners spaced at 12" maximum on center.
- C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
  - 1. Install panels with manufacturer's recommended gap for panel field and corner joints.
    - a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
    - b. Drive fasteners for snug fit. Do not over-tighten.
- D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
  - 1. All moldings must provide for a minimum 1/8" of panel expansion at joints and edges, to insure proper installation.
  - 2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

### 3.3 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 09772

## SECTION 09912 - PAINTING

### 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 surface preparation and field painting of exposed exterior and interior items and surfaces.
  - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item, or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
  - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
  - 2. Painting includes field painting of exposed sheet metal, louvers, trim, and similar items, unless prefinished with a color.
    - a. If such items have clear anodized aluminum finish, confirm color with Architect prior to beginning painting.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
  - 1. Inside of ductwork behind air supply or return grilles is *not* considered a concealed space; these shall be painted flat black far enough back so that interior of ductwork is not visible.
  - 2. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Coordinate the requirements of this Section with those of other sections that interface with Painting.

#### 1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

#### 1.4 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
  2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Initial Selection: For each type of finish-coat material indicated, submit color chips.
1. After color selection, Architect will furnish color chips for surfaces to be coated.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
  2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
  3. Provide Samples for Verification for the following locations:
    - a. Each paint color selection.
- D. On-Site Samples: For each color and material to be applied, provide large-sized (at least 4 feet square) installed samples on actual on-the-job substrate. Samples may be left in place as part of the finished Work, if approved by Architect.
1. Final approval of colors will be from On-Site Samples.
  2. Provide correct lighting conditions with light fixtures installed as specified per the contract documents.
- E. Qualification Data: For Applicator.

## 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance for a period not less than five years.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
  - 1. Product name and description.
  - 2. Contents by volume, for pigment and vehicle constituents.
  - 3. Thinning instructions.
  - 4. Application instructions.
  - 5. Color name and number.
  - 6. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
- C. Take precautionary measures to prevent fire hazards and spontaneous combustions.

## 1.7 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
  - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and maintained within temperature and humidity limits specified by manufacturer during application and drying periods.
- D. Do not work when dust or insects are present. Ensure that spaces are swept clean, and that no other work is in progress at time of painting.
- E. Provide a minimum of 15 fc of lighting on surfaces to be finished.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

#### A. Acceptable Manufacturers:

1. Benjamin Moore & Co. (Benjamin Moore).
2. Pratt & Lambert.
3. PPG.
4. Sherwin-Williams Co. (Sherwin-Williams). (Basis of Design)

#### B. Where a specific product is indicated below, provide that product or an equal product made by one of the Acceptable Manufacturers.

### 2.2 PAINT MATERIALS, GENERAL

#### A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

#### B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

#### C. Use only one brand of materials insofar as possible.

#### D. Colors: As selected by Architect from manufacturer's full range.

1. Each exterior material may have a different color.
2. There will be a total of **4** different interior colors, and each room may have **2** different paint colors.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

#### A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

#### B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates.

### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
  - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Interior Concrete to be Sealed: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Prepare in accordance with manufacturer's printed instructions.
  - 3. Steel and Iron (Ferrous Metals): Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
    - a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
    - b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
  - 4. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
  - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
  - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.



### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
  2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  3. Provide finish coats that are compatible with primers used.
  4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
  5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
  10. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
  2. Omit primer over metal surfaces that have been shop primed and touchup painted.
  3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
  2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required. Use spray equipment only with prior approval of Owner.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Interior Concrete to be Sealed. Apply sealer in accordance with manufacturer's printed instructions.
- F. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- G. Mechanical items to be painted include, but are not limited to, the following:
  1. Uninsulated metal and plastic piping.
  2. Pipe hangers and supports.
  3. Tanks that do not have factory-applied final finishes.
  4. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
  5. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
  6. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
- H. Electrical items to be painted include, but are not limited to, the following:
  1. Switchgear.
  2. Panelboards.
  3. Electrical equipment that is indicated to have a factory-primed finish for field painting.
  4. Other, as required to provide fully finished project.
- I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- K. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

### 3.4 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
  - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

### 3.5 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
  - 1. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted, particularly within storage and preparation area.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
  - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.
- C. Place cotton waste, cloths and materials that may constitute a fire hazard in closed metal containers and remove from site daily.

### 3.6 EXTERIOR PAINT SCHEDULE

- A. Steel and Iron (Ferrous Metal): Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.
  - 1. Full-Gloss Urethane Alkyd-Enamel Finish: Two finish coats over a rust-inhibitive primer.
    - a. Primer: SW Pro Industrial Pro-Cryl Universal Metal Primer, B66W310, at 2.0 – 4.0 mils dft.
    - b. Finish Coats: SW Pro Industrial Urethane Alkyd Enamel, B54W150, at 2.0 – 4.0 mils dft.
- B. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:
  - 1. Full-Gloss Urethane Alkyd-Enamel Finish: Two finish coats over a galvanized metal primer.
    - a. Primer: SW Pro Industrial Pro-Cryl Universal Metal Primer, B66W310, at 2.0 – 4.0 mils dft.

- b. Finish Coats: SW Pro Industrial Urethane Alkyd Enamel, B54W150, at 2.0 – 4.0 mils dft.
- C. Aluminum: Provide the following finish systems over exterior aluminum surfaces:
  - 1. Full-Gloss Urethane Alkyd-Enamel Finish: Two finish coats over a primer.
    - a. Primer: SW Pro Industrial Pro-Cryl Universal Metal Primer, B66W310, at 2.0 – 4.0 mils dft.
    - b. Finish Coats: SW Pro Industrial Urethane Alkyd Enamel, B54W150, at 2.0 – 4.0 mils dft.
- D. Parking Stripes:
  - 1. Provide two full coats SW Set Fast Solvent Based Acrylic on concrete.

### 3.7 INTERIOR PAINT SCHEDULE

- A. Concrete (Athletic Court Striping): Provide the following finish systems at Gym 101, GEN-U-LINE (Mr. Bob Adams, 1-866-335-9980) no exceptions:
  - 1. Polyurethane Finish: One finish coat over a primer.
    - a. Primer: GEN-U-LINE 4445 at 2.0 mils dft.
    - b. Finish Coats: GEN-U-LINE 4000 at 2.0 mils dft.
- B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
  - 1. Low-Luster Acrylic-Enamel (Eggshell) Finish: Two finish coats over a primer.
    - a. Primer: SW Pro Mar 200 Zero VOC Latex Primer, B28W2600.
    - b. Finish Coats: SW Pro Mar 200 Zero VOC Latex Eg-Shel, B20W2600.
- C. Steel and Iron (Ferrous Metal): Provide the following finish systems over ferrous metal:
  - 1. Semigloss Alkyd-Enamel Finish: Two finish coats over a primer.
    - a. Primer: SW Pro Industrial Pro-Cryl Universal Metal Primer, B66W310.
    - b. Finish Coats: SW Pro Industrial Zero VOC Acrylic Enamel Semi-Gloss.
- D. Zinc-Coated Metal: Provide the following finish systems over interior zinc-coated metal surfaces:
  - 1. Semigloss Alkyd-Enamel Finish: Two finish coats over a primer.
    - a. Primer: SW Pro Industrial Pro-Cryl Universal Metal Primer, B66W310.
    - b. Finish Coats: SW Pro Industrial Zero VOC Acrylic Enamel Semi-Gloss.

- E. All-Service Jacket over Insulation: Provide the following finish system on cotton or canvas insulation covering:
  - 1. Flat Acrylic Finish: Two finish coats. Add fungicidal agent to render fabric mildew-proof.
    - a. Finish Coats: SW Pro Mar 200 Zero VOC Flat Latex.

END OF SECTION 09912

#### 4SECTION 10155 - TOILET COMPARTMENTS

##### 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 **phenolic-core** units as follows:
  - 1. Toilet Enclosures: **Floor to Ceiling**.
  - 2. Urinal Screens: Wall Hung.
- B. Coordinate the requirements of this Section with those of other sections that interface with Toilet Compartments.

###### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: Of each type of color and finish required for units, prepared on 6-inch- square samples of same thickness and material indicated for Work.

###### 1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

##### PART 2 - PRODUCTS

###### 2.1 PHENOLIC-CORE UNITS – PLASTIC LAMINATE FACED

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ASI Accurate / Global Partitions.
  - 2. Sanymetal; a Crane Plumbing Company.
  - 3. Tex-Lam Manufacturing, Inc.

4. Equal, with approval of the Architect.
- B. Door, Panel and Pilaster Construction: Solid phenolic-core panel material with melamine facing on both sides fused to substrate during panel manufacture (not separately laminated), and with eased and polished edges. Provide minimum 3/4-inch- thick doors and pilasters and minimum 1/2-inch- thick panels.
  1. Facing Sheet Color: One color in each room as selected by Architect from manufacturer's full range of colors. **The full range is to include the entire Wilsonart and Formica plastic laminate line, not just the stock or standard colors.**
  2. Core Color: Manufacturer's standard dark color.
- C. Pilaster **Shoes and Sleeves (Caps)**: Stainless steel, ASTM A 666, Type 302 or 304, not less than 0.0312 inch specified thickness and 3 inches high, finished to match hardware.
- D. Brackets (Fittings):
  1. Stirrup Type: Ear or U-brackets, chrome-plated, nonferrous, cast zinc alloy (zamac) or clear anodized aluminum.
  2. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel or aluminum.

## 2.2 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
  1. Material: Chrome-plated, nonferrous, cast zinc alloy (zamac) or clear anodized aluminum.
- B. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

## 2.3 FABRICATION

- A. Floor to Ceiling Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor and ceiling conditions. Make provisions for setting and securing top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.
- B. Doors: Unless otherwise indicated, provide 24-inch- wide in-swinging doors for standard toilet compartments and 36-inch- wide out-swinging doors with a minimum 32-inch- wide clear opening for compartments indicated to be accessible to people with disabilities.
  1. Hinges: Manufacturer's standard self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees.

2. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities.
3. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
4. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
5. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with accessibility requirements of authorities having jurisdiction. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
  1. Maximum Clearances:
    - a. Pilasters and Panels: 1/2 inch.
    - b. Panels and Walls: 1 inch.
  2. Stirrup Brackets: Secure panels to walls and to pilasters with not less than three brackets attached at midpoint and near top and bottom of panel.
    - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
    - b. Align brackets at pilasters with brackets at walls.
- B. Ceiling-Braced Units: Secure pilasters to floor and ceiling and level, plumb, and tighten. Secure each pilaster with not less than two fasteners. Hang doors to align tops of doors with tops of panels and adjust so tops of doors are parallel when doors are in closed position.
- C. Wall-Hung Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb and to resist lateral impact.

#### 3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 10155



## SECTION 10200 - LOUVERS AND VENTS

### 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. Fixed, extruded-aluminum louvers.
  - 2. Wall vents (brick vents).
- B. Coordinate the requirements of this Section with those of other sections that interface with Louvers and Vents, in particular:
  - 1. Division 15 Sections for louvers that are a part of mechanical equipment.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide louvers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of louvers.
- B. Wind loads per International Building Code, latest edition, including amendments adopted by local governing authorities, but no less than 20 lbs. per sq. ft.
- C. Thermal Movements: Provide louvers that 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 calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Air-Performance, Water-Penetration, Air-Leakage, and Wind-Driven Rain Ratings: Provide louvers complying with performance requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, and spacing.
- C. Samples: For units with factory-applied color finishes.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers and vents through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
  - 1. AWS D1.2, "Structural Welding Code--Aluminum."
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Louvers:
    - a. Airolite Company (The).
    - b. Construction Specialties, Inc.
    - c. Industrial Louvers, Inc.
    - d. Louvers & Dampers, Inc.
    - e. Ruskin Company; Tomkins PLC.
    - f. Vent Products Company, Inc.
  - 2. Wall Vents (Brick Vents):

- a. Airolite Company (The).
- b. Construction Specialties, Inc.
- c. Industrial Louvers, Inc.
- d. Ruskin Company; Tomkins PLC.
- e. Sunvent Industries; Sylro Sales Corp.

## 2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, alloy 6063-T5 or T-52.
- B. Fasteners: Of same basic metal and alloy as fastened metal or 300 Series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials. Use types and sizes to suit unit installation conditions.
- C. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

## 2.3 FABRICATION, GENERAL

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
  - 1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern.
- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints of 3/8 inch.
  - 1. Frame Type: Channel, unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
  - 1. Semirecessed Mullions: Where indicated, provide mullions partly recessed behind louver blades so louver blades appear continuous. Where length of louver exceeds fabrication

- and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
  - 2. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.
  - 3. Exterior Corners: Prefabricated corner units with mitered and welded blades and with semirecessed mullions at corners.
- G. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer, concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.
- H. Where indicated, provide subsills made of same material as louvers for recessed louvers.

## 2.4 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal, Drainable-Blade Louver: Drainable-blade louver with mullions capable of collecting and draining water from blades.
- 1. Basis-of-Design Product: Airolite Model CB 6774 or equal product by an acceptable manufacturer. Use where Drawings indicate continuous horizontal louver blades with concealed mullions.
  - 2. Louver Depth: 4 inches.
  - 3. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements, but not less than 0.080 inch for blades and 0.080 inch for frames.
  - 4. Performance Requirements:
    - a. Free Area: Not less than 48%.
    - b. Point of Beginning Water Penetration: Not less than 1000 fpm.
    - c. Air Performance: Not more than 0.10-inch wg static pressure drop at 750-fpm free-area velocity.
  - 5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.5 LOUVER SCREENS

- A. General: Provide screen at each exterior louver, covering entire louver.
- 1. Screen Location for Fixed Louvers: Interior face.
  - 2. Screening Type: Insect screening:
    - a. For aluminum louvers, 18-by-16 aluminum mesh, 0.012-inch wire.
- B. Secure screens to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Rewirable frames with a driven spline or insert for securing screen mesh.

2.6 BLANK-OFF PANELS

A. General: Provide to seal louvers wherever opening is not required on back side for ductwork penetrations.

B. Uninsulated, Blank-off Panels:

1. Aluminum sheet for aluminum louvers, not less than 0.050-inch nominal thickness, unless otherwise indicated.
2. Galvanized steel sheet for steel louvers, not less than 0.040-inch nominal thickness, unless otherwise indicated.
3. Panel Finish: Same type of finish applied to louvers, but black color.
4. Attach blank-off panels to back of louver frames with stainless-steel, sheet metal screws.

2.7 WALL VENTS (BRICK VENTS)

A. Cast-Aluminum Wall Vents: One-piece, cast-aluminum louvers and frames; with 18-by-14-mesh, aluminum insect screening on inside face; incorporating integral waterstop on inside edge of sill; of load-bearing design and construction.

B. Size to fit within masonry module as shown on Drawings, allowing for full mortar or sealant joints around perimeter as indicated.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish louvers after assembly.

2.9 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.

B. High-Performance Organic-Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Fluoropolymer Three-Coat Coating System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.
  - a. Color and Gloss: As selected by Architect from manufacturer's full range.
- C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
  1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Secure louvers into openings with anchor bolts into sub-frame at head and jambs. Securing louvers at the sill is only acceptable where shown in drawings.
- D. Form closely fitted joints with exposed connections accurately located and secured.
- E. Provide perimeter reveals and openings of uniform 3/8 inch width for sealants and joint fillers, unless different joint width is indicated on Drawings.
- F. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- G. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- H. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants.

- I. Seal all concealed penetrations through subsills with non-curing sealant in compliance with Division 7 section “Joint Sealants.”

### 3.3 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
  1. Touch up minor abrasions in factory-applied finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating. Comply with manufacturer’s instructions regarding coating materials.

END OF SECTION 10200

## SECTION 10431 - SIGNAGE

### 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. Room signs.
  - 2. Dimensional characters (letters and numbers).
  - 3. Accessible parking signs.
  - 4. Signage accessories.
- B. Coordinate the requirements of this Section with those of other sections that interface with Signage.

#### 1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
  - 1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and braille layout.
    - a. For typical interior signage showing room name and numbers, it is acceptable to provide shop drawings illustrating typical signage details, accompanied by a list of all signs with accompanying text.
- C. Samples: For each type of sign material provide a full-size sample indicating:
  - 1. Type, style and color selection.
  - 2. Method of attachment.
  - 3. If approved by Architect and at Architect's discretion, sample may be incorporated in the final Work.
- D. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.



#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each sign type through one source from a single manufacturer.
- B. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA), the Texas Accessibility Standards, and with other code provisions as adopted by authorities having jurisdiction.
  - 1. Interior Code Signage: If required by authorities having jurisdiction, provide signage as required by accessibility and other regulations and requirements, including but not limited to the following:
    - a. Fire Doors.
    - b. Room Capacity.
    - c. Stairway Identification.
    - d. Signs for Accessible Spaces.

#### 1.5 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Furnish templates for installation of anchorage devices, if required.

#### 1.6 ALLOWANCE

- A. Materials specified under this Section shall be purchased under an Allowance in accordance with Division 1 Section "Allowances."

### PART 2 - PRODUCTS

#### 2.1 ROOM SIGNS

- A. General: Provide panel signs that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
- B. Materials:
  - 1. Cast-Acrylic Sheet: Manufacturer's standard. Color shall be clear, translucent or solid, as selected by Architect from manufacturer's full range.
  - 2. Plastic Laminate: Provide high-pressure laminate engraving stock with face and core plies in finishes and color combinations indicated, as selected by Architect from manufacturer's full range.
  - 3. PVC: Extruded, high-impact PVC plastic in color as selected by Architect.
- C. Fabrication:
  - 1. Unframed Signs: Fabricate signs with edges mechanically and smoothly finished to comply with the following requirements:

- a. Edge Condition: Square cut.
  - b. Corner Condition: Rounded to radius of approximately ½ inch.
2. Laminated Panels: Permanently laminate face panels to backing sheets of material; use manufacturer's standard process.

D. Graphic Content and Style:

1. Provide sign copy that complies with requirements of governing authorities and as may be indicated on the Drawings for size, style, spacing, content, mounting height and location, material, finishes, and colors of signage.
2. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be accompanied by Grade 2 braille. Produce precisely formed characters with square cut edges free from burrs and cut marks.
  - a. Material: Opaque acrylic sheet.
  - b. Raised-Copy Thickness: Not less than 1/32 inch above adjacent surfaces.

E. Room Signage Schedule:

1. Provide a sign for each space including room number and name.
2. Do not provide signs for lobbies, corridors, and hallways.

## 2.2 DIMENSIONAL CHARACTERS

- A. Stainless-Steel Plate, Sheet, and Strip: Provide stainless-steel plate, sheet, and strip, Type 302 or Type 304, complying with ASTM A 666.
- B. Fabricated Characters: Fabricate letters and numbers to required sizes and styles, using metals and thicknesses indicated. Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories. Comply with requirements indicated for finish, style, and size.
  1. Stainless-Steel Sheet: Not less than 0.050 inch thick for face and 0.031 inch thick for returns.

## 2.3 ACCESSIBLE PARKING SIGNS

A. Accessible Parking Signs:

1. Material: 0.080-inch stainless steel, galvanized steel, or aluminum.
2. Background Color: Blue.
3. Copy Material: Reflective vinyl.

- B. Symbols of Accessibility: Provide 6-inch- high symbol fabricated from opaque nonreflective vinyl film, 0.0035-inch nominal thickness, with pressure-sensitive adhesive backing suitable for both exterior and interior applications.

- C. Mounting: Flush mounted to building with fasteners to suit building substrate, or to pole as indicated on Drawings.

## 2.4 ACCESSORIES

- A. Mounting Methods: Use concealed fasteners fabricated from materials that are not corrosive to sign material and mounting surface.
- B. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

## 2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

## 2.6 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- B. Finish:
  - 1. Bright, Directional Polish: No. 4 finish.
- C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

- B. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
  - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
  - 2. Provide shims or other fixed and firmly placed means as necessary to ensure that signs are plumb and surfaces in plane. If required, at Architect's discretion, provide matching trim or other measures acceptable to Architect around signs to hide irregularities in distance between substrate and sign edges.
  - 3. Interior Wall Signs: Install signs on walls adjacent to latch side of door. Where not possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Room Signs: Attach panel signs to wall surfaces using methods recommended by manufacturer.
  - 1. Where panel signs are scheduled or indicated to be mounted on glass, provide matching plate on opposite side of glass to conceal mounting materials.
- C. Dimensional Characters: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
  - 1. Flush Mounting: Mount characters with backs in contact with wall surface.
  - 2. Projected Mounting: Mount characters at projection distance from wall surface indicated.
- D. Accessible Parking Signs: Mount in accordance with manufacturer's instructions.

### 3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10431

## SECTION 10521 – FIRE EXTINGUISHERS AND CABINETS

### 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. Portable fire extinguishers.
  - 2. Fire-protection cabinets for portable fire extinguishers.
- B. Coordinate the requirements of this Section with those of other sections that interface with Fire Extinguishers and Cabinets.

#### 1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection cabinets.
  - 1. Fire Extinguishers: Include rating and classification.
  - 2. Fire-Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
- B. Samples for Verification: For each type of exposed factory-applied color finish required for fire-protection cabinets, prepared on Samples of size indicated below. Provide only if requested by Architect.
  - 1. Size: 6 by 6 inches square.
- C. Maintenance Data: To include in maintenance manuals.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers and fire-protection cabinets through one source from a single manufacturer. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

- C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
- D. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Fire End & Croker Corporation.
- B. General Fire Extinguisher Corporation.
- C. JL Industries, Inc.
- D. Kidde Fyrnetics.
- E. Larsen's Manufacturing Company.
- F. Modern Metal Products; Div. of Technico.
- G. Moon American.
- H. Potter Roemer; Div. of Smith Industries, Inc.
- I. Watrous; Div. of American Specialties, Inc.

### 2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Tempered Break Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 1.5 mm thick.

### 2.3 PORTABLE FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet indicated.
  - 1. Valves: Manufacturer's standard.
  - 2. Handles and Levers: Manufacturer's standard.
  - 3. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
- B. Basis of Design Product: Provide JL Industries Model Cosmic 5E, or equal product made by one of the Acceptable Manufacturers.
- C. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 3-A:40-B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

### 2.4 FIRE-PROTECTION CABINET

- A. Basis-of-Design Product: JL Industries Ambassador No. **1017-F17**>, or a comparable product made by one of the Acceptable Manufacturers.

- B. Cabinet Construction: Fire rating shall match that of the wall or partition in which it is placed.
- C. Cabinet Material: Enameled-steel sheet.
- D. Semi-Recessed Cabinet: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.
  - 1. 3" Rolled Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (rolled) of 3 inches.
- E. Cabinet Trim Material: Same material and finish as door.
- F. Door Material: Steel sheet.
- G. Door Style: Glazed panel with frame.
- H. Door Glazing: Tempered float glass (clear).
- I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
  - 1. Provide pivot hinge permitting door to open 180 degrees.
- J. Accessories:
  - 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
  - 2. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.
  - 3. Door Lock: Cylinder lock, keyed alike to other cabinets.
  - 4. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
    - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
      - 1) Location: Applied to cabinet glazing.
      - 2) Application Process: Silk-screened.
      - 3) Lettering Color: Red.
      - 4) Orientation: Vertical.
- K. Finishes:
  - 1. Manufacturer's standard baked-enamel paint for the following:
    - a. Exterior of cabinet, door, and trim, except for those surfaces indicated to receive another finish.
    - b. Interior of cabinet and door.
  - 2. Steel: Baked enamel.

- a. Color and Texture: As selected by Architect from manufacturer's full range.

## 2.5 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
  - 1. Weld joints and grind smooth.
  - 2. Construct fire-rated cabinets with double walls fabricated from 0.0428-inch- thick, cold-rolled steel sheet lined with minimum 5/8-inch- thick, fire-barrier material.
    - a. Provide factory-drilled mounting holes.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
  - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
  - 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

## 2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in the same piece are not acceptable.

## 2.7 STEEL FINISHES

- A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond using manufacturer's standard methods.
- B. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.



## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where **recessed** cabinets will be installed.
- B. Examine fire extinguishers for proper charging and tagging.
  - 1. Remove and replace damaged, defective, or undercharged units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare recesses for recessed fire-protection cabinets as required by type and size of cabinet and trim style.

### 3.3 INSTALLATION

- A. General: Install fire-protection specialties in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
  - 1. Fire-Protection Cabinets: 54 inches above finished floor to top of cabinet.
  - 2. Mounting Brackets: 54 inches above finished floor to top of fire extinguisher.
- B. Fire-Protection Cabinets: Fasten fire-protection cabinets to structure, square and plumb.
  - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semi recessed fire-protection cabinets.
  - 2. Provide inside latch and lock for break-glass panels.
  - 3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

### 3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection specialties are installed, unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

- D. Touch up marred finishes or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet manufacturer.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10521

## SECTION 10532 – WALKWAY COVERS

### 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. Pre-engineered aluminum walkway cover system as shown on the drawings.
  - 2. Drainage system for walkway cover.
  - 3. Concrete foundations engineered by the canopy supplier.
- B. Coordinate the requirements of this Section with those of other sections that interface with Walkway Covers.

#### 1.3 SUBMITTALS

- A. Product Data:
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings:
  - 1. Furnish complete shop drawings for cover and foundations, showing installation details, layout, plans, sections, accessories, and anchorages.
  - 2. Shop drawings shall bear the seal of a Texas Registered Professional Engineer, certifying design compliance of cover and foundations with live and wind loads required by applicable building codes.
- C. Samples:
  - 1. For each type of exposed material and factory-applied finish.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Avadek Walkway Cover Systems and Canopies.

- B. Equal system by equal manufacturer may be acceptable, but only with prior approval of the Architect.

## 2.2 PRODUCTS

- A. All structural components shall be 6063-T6 alloy extruded aluminum.
- B. Columns, beams, and roof deck shall be sized as required to meet the engineering requirements of the Project.
- C. Provide all components and accessories necessary for concealed drainage system.
- D. Exposed surfaces shall be Kynar 500 in color selected by Architect from manufacturer's standard color selection.
- E. Provide neoprene shims to separate dissimilar metals (aluminum from steel).
- F. Provide bituminous coating for concealed metal surfaces in contact with concrete.

## 2.3 FASTENERS

- A. General: Provide fasteners of size and type recommended by manufacturer that comply with requirements specified in this Article for material, manufacture, and code requirements.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Install the canopy in strict accordance with the manufacturer's written instructions.
- B. Install columns and beams straight and true.

### 3.2 INSTALLATION

- A. Install raincaps over draining sections of the deck.
- B. Fill downspout columns with grout to the discharge level to prevent standing water. Deflectors shall be installed after grouting.
- C. Install flashing as required.
- D. Ensure that dissimilar metals are separated by neoprene shims or spacers. Ensure that metals are coated with bituminous coating in concealed locations to prevent contact with concrete.

3.3 CLEANING

- A. Thoroughly clean after installation, using cleanser and methods as recommended by manufacturer.

END OF SECTION 10532

## SECTION 10651 - OPERABLE PANEL PARTITIONS

### 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. Manually operated folding paired-panel partitions.
- B. Coordinate the requirements of this Section with those of other sections that interface with Operable Panel Partitions, particularly:
  - 1. Division 5 specification sections “Structural Steel” and “Metal Fabrications.”
  - 2. Division 6 section “Rough Carpentry.”
  - 3. Division 9 sections “Gypsum Wallboard Assemblies” and “Acoustical Ceilings.”

#### 1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
  - 1. Sound Transmission Requirements: Operable panel partition assembly tested according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC (Sound Transmission Class) indicated.
- B. Calculate requirements for supporting accordion folding partitions and verify capacity of carriers and track components to support loads.

#### 1.4 SUBMITTALS

- A. Product Data: Material descriptions, construction details, finishes, installation details, and operating instructions for each type of operable panel partition, component, and accessory specified. Include data on acoustical performance, surface-burning characteristics, and durability.
- B. Shop Drawings: Show location and extent of operable panel partitions. Include plans, elevations, sections, details, attachments to other construction, and accessories. Indicate dimensions; weights; conditions at openings and for storage; and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track, and direction of travel. Show blocking to be provided by others. Include the following:

1. Calculations: Calculate requirements for supporting operable panel partitions and verify capacity of carriers and track components to support loads; indicate deflection limits for partition and adjacent construction.
- C. Setting Drawings: For embedded items and cutouts required in other work, including support beam punching template.
- D. Samples for Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes. . If requested by Architect or Owner, also provide the following:
  1. Panel Face Material: Manufacturer's standard-size unit, not less than 6 inches square.
- E. Product Test Reports: From a qualified testing agency indicating that each operable panel partition complies with requirements, based on comprehensive testing of current products.
- F. Maintenance Data: For the following to include in maintenance manuals specified in Division 1:
  1. Panel face finishes and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
  2. Seals, hardware, track, carriers, and other operating components.

## 1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide operable panel partitions with the following fire-test-response characteristics, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
  1. Surface-Burning Characteristics: As follows, per ASTM E 84:
    - a. Flame Spread: 25 or less.
    - b. Smoke Developed: 450 or less.
  2. Fire Growth Contribution: Textile wall coverings complying with the acceptance criteria of UBC Standard 8-2.

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify operable panel partition openings and storage arrangements by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

## PART 2 - PRODUCTS

### 2.1 PRODUCTS AND MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Hufcor Inc.
  - 2. Modernfold, Inc.
  - 3. Moderco
  - 4. Panelfold, Inc.
  - 5. Other, with prior approval of Architect.

### 2.2 MATERIALS

- A. Steel Frame: Steel sheet, thickness as required for specified performance, for all horizontal and vertical framing elements.
- B. Gypsum Board: ASTM C 36, ½ inch tackable gypsum board, class A rated single material or composite layers continuously bonded to panel frame.
- C. Steel Face/Liner Sheets: Tension-leveled steel sheet, 21 gauge minimum.

### 2.3 OPERABLE PANEL PARTITIONS

- A. Panel Construction: Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- B. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.
- C. Trim: Manufacturer's standard aluminum trim, painted, as selected by Architect from manufacturer's full range.
- D. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

### 2.4 SEALS

- A. General: Provide types of acoustical seals indicated that produce operable panel partitions complying with acoustical performance requirements and the following:
  - 1. Seals made from materials and profiles that minimize sound leakage.



2. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended, closed, and in place.
- B. Vertical Seals: Deep-nesting, interlocking astragals mounted on each edge of panel, with continuous PVC acoustical seal.
- C. Horizontal Top Seals: Continuous-contact, extruded-PVC seal exerting uniform constant pressure on track when extended. Provide pairs of non-contacting vinyl fingers to prevent distortion.
- D. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.
  1. Automatically Operated: Extension and retraction of bottom seal automatically operated by movement of partition, with operating range not less than the 1-inch operating clearance between retracted seal and floor finish.

## 2.5 FINISH FACING

- A. General: Provide finish facings that comply with indicated fire-test-response characteristics; factory attached or applied to accordion folding partitions over acoustical core with appropriate backing, using concealed fasteners; designed to be field replaceable.
  1. Apply facings free from air bubbles, wrinkles, blisters, and other defects, with vertical invisible seams, and with no gaps or overlaps. Horizontal seams are not permitted. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
  2. Where facings have directional or repeating patterns or directional weave, mark facing top and attach facing in same direction.
  3. Color to be selected by Architect from manufacturer's full range.
- B. Vinyl-Coated Fabric Wall Covering: Manufacturer's standard mildew-resistant, washable, vinyl-coated fabric wall covering; complying with CFFA-W-101-B for Type indicated; Class A.
  1. Antimicrobial Treatment: Additives capable of inhibiting growth of microbes, including, but not limited to, *Staphylococcus aureus*, *Escherichia coli*, and *Aspergillus niger*.
- C. Fabric Wall Covering: Manufacturer's standard fabric, from same dye lot, treated to resist stains.

## 2.6 SUSPENSION SYSTEMS

- A. Suspension Tracks: Steel anchored directly to structural support, or with adjustable steel hanger rods for overhead support, designed for type of operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track

sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

1. Panel Guide (if required): Aluminum; finished with factory-applied, decorative, protective finish.
  2. Head Closure Trim: As required for acoustical performance; with factory-applied, decorative, protective finish.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Steel Finish: Factory-applied, corrosion-resistant, protective coating, unless otherwise indicated.
- D. Track Intersections, Switches, and Accessories: As required for type of operation, storage, track configuration, and layout indicated for operable panel partition, and compatible with partition assembly specified. Fabricate track intersections and switches from steel.

## 2.7 ACCESSORIES

- A. Work Surfaces: Quantities, placement, and size indicated. Surface color as selected by Architect from manufacturer's full range.
1. Surface:
    - a. Porcelain steel marker/projection surface.
    - b. Self-healing, tackable, vinyl-coated fabric wall covering, complying with CFFA-W-101-B, Type II and indicated fire-test-response characteristics; laminated to natural cork tackboard.
  2. Size: Full width and height of panel.
  3. Trim: Aluminum slip-on or snap-on trim with no visible screws or exposed joints; miter corners to a neat, hairline joint.
- B. Pass Doors: Fabricated to comply with recommendations of Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)" and Texas Accessibility Standards. Swinging door built into and matching panel materials, construction, acoustical qualities, finish and thickness, complete with frames and operating hardware. Hinges finished to match other exposed hardware.
1. Single Pass Door: 36 by 80 inches, with the following:
    - a. Door Seals: Sweep floor seals.
    - b. Panic hardware.
    - c. Concealed door closer.
    - d. Door Viewer: Installed with view in direction of swing.
    - e. Exit Sign: Recessed, self-illuminated.
    - f. Lock: Deadlock to receive cylinder, operable from both sides of door. Refer to Division 8 Section "Door Hardware" for lock cylinder and keying requirements.

- C. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.

- 1. Manufacturer's standard method to secure pocket door in closed position.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Comply with ASTM E 557, operable panel partition manufacturer's written installation instructions, Drawings, and approved Shop Drawings.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed.
- C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

### 3.3 ADJUSTING

- A. Adjust operable panel partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.
- B. Pass Doors or Pocket Doors: Adjust to operate smoothly and easily, without binding or warping. Check and readjust operating hardware. Confirm that latches and locks engage accurately and securely without forcing or binding.

### 3.4 CLEANING AND PROTECTION

- A. Clean soiled surfaces on completing installation of operable panel partitions, to remove dust, loose fibers, fingerprints, adhesives, and other foreign materials according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure operable panel partitions are without damage or deterioration at time of Substantial Completion.

- C. Replace panels that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

### 3.6 OPERABLE PANEL PARTITION SCHEDULE

- A. Operable Panel Partition. Comply with the following:

1. Product: Hufcor 632 or approved equal.
2. Partition Operation and Configuration:
  - a. Manually operated, paired panels.
3. Steel-Frame Panel Construction: Faced with gypsum board.
4. Panel Construction: Manufacturer's standard panel construction complying with requirements indicated.
5. Panel Weight: 13 lb/sq. ft. maximum.
6. Panel Thickness: Not less than 3 inches.
7. Edges: Trimless.
8. Initial Closure: Flexible, resilient PVC, bulb-shaped acoustical seal.
9. Final Closure: Flexible, resilient PVC, bulb-shaped acoustical seal.
10. STC: Not less than 52.
11. Finish Facing: Vinyl-coated fabric wall covering complying with CFFA-W-101-B, Type II.
  - a. Total Weight: 20 oz.
  - b. Color/Pattern: As selected by Architect from manufacturer's full range.
12. Finish Facing: Fabric wall covering.
  - a. Wall-Covering Standard: Provide mildew-resistant wall coverings that comply with ASTM F 793 for Category IV, Type I Commercial Serviceability products.
  - b. Colorfastness to Wet and Dry Crocking: Passes AATCC 8, Class 3, minimum.
  - c. Colorfastness to Light: Passes AATCC 16A or AATCC 16E, Class 4, minimum, at 40 hours.
  - d. Flame Spread: Class A in accordance with ASTM E-84.
  - e. Width: 54 inches.
  - f. Applied Backing Material: Acrylic latex with mildew inhibitor.
  - g. Stain-Resistant Coating: DuPont; Tedlar/Teflon TEF3.
  - h. Colors, Textures, and Patterns: As selected by Architect from manufacturer's full range.

END OF SECTION 10651

## SECTION 10801 - TOILET AND BATH 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. Washroom accessories and anchorage hardware.
  - 2. Grab bars.
  - 3. Mirrors.
- B. Coordinate the requirements of this Section with those of other sections that interface with Toilet and Bath Accessories.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
  - 1. Construction details and dimensions.
  - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
  - 3. Material and finish descriptions.
  - 4. Features that will be included for Project.
  - 5. Manufacturer's warranty.
- B. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Provide products of same manufacturer unless otherwise approved by Architect.

#### 1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

- B. Provide to general contractor requirements for blocking or reinforcement in walls and partitions for secure anchorage.

## 1.6 WARRANTY

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch minimum nominal thickness, unless otherwise indicated.
- B. Brass: ASTM B 19 flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359-inch minimum nominal thickness.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- E. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

### 2.2 MANUFACTURERS

- A. Basis-of-Design Product: The design for accessories is based on products indicated, as manufactured by **Bobrick Washroom Equipment, Inc.** Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. A & J Washroom Accessories, Inc.
  - 2. American Specialties, Inc.
  - 3. Bradley Corporation.
  - 4. General Accessory Manufacturing Co. (GAMCO).

- B. Where a manufacturer different from Bobrick or one of the other manufacturers listed above is called for, provide the product of that manufacturer as specified.

## 2.3 WASHROOM ACCESSORIES

A. **Toilet Tissue Dispenser:** B-4288.

1. Description: Double-roll dispenser.
2. Mounting: Surface mounted.
3. Operation: Noncontrol delivery with heavy duty spindle.
4. Capacity: Designed for 5-inch- diameter tissue rolls.
5. Material and Finish: Stainless steel, No. 4 finish (satin).
6. Lockset: Flush tumbler type.

B. **Towel Dispenser/Waste Receptacle:** B-43944.

1. Mounting: Recessed, designed for nominal 4-inch wall depth.
2. Minimum Towel-Dispenser Capacity: 600 C-fold or 800 multifold paper towels.
3. Minimum Waste-Receptacle Capacity: 16 gal.
4. Material and Finish: Stainless steel, No. 4 finish (satin).
5. Liner: Reusable, vinyl waste-receptacle liner.
6. Lockset: Tumbler type for towel-dispenser compartment.

C. **Towel Dispenser:** B-4262.

1. Mounting: Surface mounted.
2. Minimum Capacity: 400 C-fold or 525 multifold towels.
3. Material and Finish: Stainless steel, No. 4 finish (satin).
4. Lockset: Tumbler type.
5. Refill Indicators: Pierced slots at sides or front.

D. **Lavatory Soap Dispenser:** B-8226.

1. Description: Designed for dispensing soap in liquid or lotion form.
2. Mounting: Lavatory mounted.
3. Capacity: 34 oz..
4. Spout length: 6 inches.
5. Materials: Bright chrome spout, cover and escutcheon.

E. **Soap Dispenser:** B-4112.

1. Description: Designed for dispensing soap in liquid or lotion form.
2. Mounting: Surface mounted.
3. Capacity: 40 oz..
4. Materials: Stainless steel No. 4 (satin).
5. Lockset: Tumbler type.
6. Refill Indicator: Window type.

F. **Napkin Disposal:** B-270.

1. Mounting: Surface mounted.
2. Door or Cover: Self-closing disposal-opening cover.
3. Receptacle: Removable.

4. Material and Finish: Stainless steel, No. 4 finish (satin).

G. **36" Grab Bar:** B-6806x36

1. Configuration: As indicated on Drawings.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.
4. Finish: Smooth, No. 4, satin finish.
5. Outside Diameter: 1-1/2 inches maximum outside actual (not nominal) dimension.

H. **42" Grab Bar:** B-6806x42

1. Configuration: As indicated on Drawings.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.
4. Finish: Smooth, No. 4, satin finish.

I. Not Used

J. **Mirror:** Full Height.

1. Refer to specification 08830.

K. **Mirror:** B-165.

1. Size: As indicated on Drawings.
2. Frame: Stainless-steel channel with bright-polished finish.
3. Corners: Mitered and mechanically interlocked.
4. Hangers: Produce rigid, tamper- and theft-resistant installation. Use one-piece, galvanized steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.

## 2.4 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.



3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10801

## SECTION 11480 - ATHLETIC EQUIPMENT

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Basketball Equipment
  - 2. Volleyball Floor Inserts
  - 3. Scoreboard and Shot Clocks

#### 1.2 SUBMITTALS

- A. Submit product data in accordance with Section 01330
- B. Product Data: For each type of product.
- C. Shop Drawings: For gymnasium equipment.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
- D. Samples: For each exposed product and for each item and color specified.

#### 1.3 WARRANTIES

- A. Provide manufacturer's standard printed warranty.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. All other installation accessories and related components must be either made or approved by the interior athletic equipment manufacturer. Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions. Samples, technical data, installation, maintenance, and warranty information must be provided prior to acceptance as an alternative product.

#### 2.2 BASKETBALL EQUIPMENT

- A. Basis of Design: Porter Athletic rectangular glass backboards, Model No. 2097242 or approved equal. Two total; one at each court end.
  - 1. Include 233H00 Powr-Flex goals at each backstop. Comes with a nylon net.
  - 2. Include 00324672 backboard (lower edge) safety padding kits at each backstop.
  - 3. Include 00161000 heavy-duty chain nets at each backstop.
  - 4. Include 01218000 tamper-proof goal hardware at each backstop.
- B. Source limitation: All components including hoops, nets, and other accessories and installation hardware shall be products of a single manufacturer.

## 2.3 VOLLEYBALL FLOOR INSERTS

- A. Basis of Design: Volleyball floor sleeves with hinged access cover floor plates by Senoh #KA25 or approved equal.

## 2.4 SCOREBOARD AND SHOT CLOCKS

- A. Basis of Design: Varsity 8'-0" wide wall-mounted Scoreboard with accompanying Wireless Controller, Model No. 2246, and two Varsity Shot Clock pair, Model No. 2210.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. It is the responsibility of the general contractor/construction manager to ensure that project/site conditions are acceptable for the installation of the interior athletic equipment.
- B. Install interior athletic equipment in strict accordance with manufacturer's written installation instructions. Complete equipment field assembly where required.
- C. Permanently Placed Gymnasium Equipment and Components: Install rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated; in proper relation to adjacent construction; and aligned with court layout.
- D. Install backstops to be stable and secure in their operation.
- E. Volleyball sleeves to extend approximately 10 inches below finish floor into concrete slab. Concrete must be thickened at sleeve locations. Coordinate with structure to avoid conflicts during installation.
- F. Install volleyball sleeves to be rigid and secure in place and with the floor plates flush and smooth; anchor into floor slab in locations shown.
- G. Verify exact scoreboard and control center quantities and junction box locations with Architect.
- H. Coordinate scoreboard electrical requirements to ensure proper power source, conduit, wiring, and boxes are provided. Prior to installation, verify type and location of power supply.
- I. Coordinate requirements for electrical power, wall blocking, auxiliary framing and supports, suspension cables, and other components to be provided under other Specification Sections to ensure adequate provisions are made for complete, functional installation of interior athletic equipment.
- J. Before installation, field test interior athletic equipment and accessories for operating functions. Ensure that interior athletic equipment accurately perform all operations. Correct deficiencies.
- K. Rigidly mount interior athletic equipment and accessories level and plumb with brackets and fasteners.
- L. Protect interior athletic equipment and finishes from other construction operations.
- M. Clean exposed surfaces of interior athletic equipment.

3.2 DEMONSTRATING AND TRAINING

- A. In accordance with Section 01700 – Execution Requirements, provide demonstration and training session for Owner's representative covering operation and maintenance of interior athletic equipment.

END OF SECTION 11480

## SECTION 13125 - METAL BUILDING SYSTEMS

### 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. The metal building provider shall design, engineer, and provide all above-ground systems made of steel, except as may be specifically excluded below.
- B. This Section includes:
  - 1. **NOTE:** The metal building provider shall design, engineer and provide all above-ground systems including those indicated below, unless specifically excluded:
    - a. Metal building systems that consist of integrated sets of mutually dependent components including structural framing, roof decking, roof panels, gutters and downspouts, and accessories.
    - b. Anchor bolts for embedment into concrete foundation for attachment of steel frame.
    - c. Grout.
    - d. Intermediate floor or mezzanine framing, excluding cold-formed members and non-metallic decking.
    - e. Relieving angles, loose lintels, and similar framing to support openings in masonry or other veneers.
  - 2. Exclusions from the metal building provider's responsibilities:
    - a. Cold-formed metal studs in exterior walls and interior partitions, unless required for structural performance of the metal building system.
    - b. Items specifically indicated on the Drawings as being of another trade.
- C. Coordinate the requirements of this Section with those of other sections that interface with Metal Building Systems.
  - 1. Metal building system will also include floor joists. Refer to Division 5 Section "Steel Joists" for requirements.
  - 2. Metal building system will also include floor deck. Refer to Division 5 Section "Steel Deck" for requirements.

### 1.3 DEFINITIONS

- A. Refer to MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction.

### 1.4 SYSTEM DESCRIPTION

- A. General: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include primary and secondary framing, metal roof panels, metal wall panels, soffit panels, and accessories complying with requirements indicated.
- B. Primary Frame Type:
  - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
- C. Secondary Frame Type: Manufacturer's standard purlins and joists and girts.
- D. End-Wall Framing: Engineer end walls to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.
- E. Roof System: standing-seam metal roof panels with concealed anchorage assembly, and accessory components.
- F. Exterior Wall System: Manufacturer's standard metal wall panels with concealed anchorage assembly, and accessory components.

### 1.5 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal building systems capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Engineer metal building systems according to procedures in MBMA's "Metal Building Systems Manual."
  - 2. Engineer metal building systems to comply with the requirements of the applicable building codes, including but not limited to:
    - a. Live loads. Include vertical loads induced by the building occupancy indicated on Drawings. Include loads induced by maintenance workers, materials, and equipment for roof live loads.
    - b. Wind loads: Include horizontal loads induced by a basic wind speed corresponding to a 10-year, mean-recurrence interval at Project site of **139** mph.
    - c. Collateral Loads: Include additional dead loads other than the weight of metal building system for permanent items such as sprinklers, mechanical systems, electrical systems, and ceilings.

- d. Load Combinations: Design metal building systems to withstand the most critical effects of load factors and load combinations as required by applicable building codes.
    - e. If no building codes govern, at a minimum comply with International Building Code, latest edition.
  3. Deflection Limits: Engineer assemblies to withstand design loads with deflections no greater than the following:
    - a. Lateral Deflection:  $1/360$ .
    - b. All other elements, including roof and wall panels:  $1/240$  of the span.
  4. Design secondary framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.
- B. Thermal Movements: Provide metal panel systems that 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 joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  1. Temperature Change (Range): 100 deg F, ambient; 180 deg F, material surfaces.
- C. Water Penetration for Metal Roof and Wall Panels: No water penetration.
- D. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

## 1.6 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following metal building system components:
  1. Structural-framing system.
  2. Metal roof panels.
  3. Metal wall panels.
  4. Flashing and trim.
  5. Accessories, including roof mounted items such as curbs, pipe penetrations, etc.
- B. Calculations for design criteria required by the engineer designing the foundations, including reactions and moments. This shall be provided as soon as possible after acceptance by Contractor of metal building supplier's contract.
- C. Design calculations, signed and sealed by a qualified Professional Engineer in the state of Texas.
- D. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work. Include drawings for fabrication and erection.

1. For all building systems include structural analysis data and shop drawings signed and sealed by a qualified Professional Engineer in the state of Texas.
  2. Anchor-Bolt Plans: Submit anchor-bolt plans before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation.
  3. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
  4. Metal Roof and Wall (if applicable) Panel Layout Drawings: Show layouts of metal (and translucent) panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
- E. Samples for Selection: For each type of building component with factory-applied color finish.
- F. Indicate welded connections using standard AWS symbols. Indicate net weld lengths.
- G. Submit manufacturer's printed installation instructions.
- H. Maintenance Data: For metal panel finishes to include in maintenance manuals.
- I. Warranties: Special warranties specified in this Section.

#### 1.7 QUALITY ASSURANCE

- A. Welding: Comply with AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- B. Structural Steel: Comply with AISC's "Specification for Structural Steel Buildings--Allowable Stress Design, Plastic Design," or AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- C. Cold-Formed Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members," or AISI's "Load and Resistance Factor Design Specification for Steel Structural Members," for design requirements and allowable stresses.
- D. Fire-Resistance Ratings: Where indicated, provide metal panel assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, unload, store and erect components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.



## 1.9 COORDINATION

- A. Coordinate size and location of concrete foundations and casting of anchor-bolt inserts into foundations.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations that may be required in other sections.
- C. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.
- D. Coordinate with other systems that interface with the metal building, including doors and windows, louvers, mechanical equipment, and the like.

## 1.10 WARRANTY

- A. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's single source, no dollar limit warranty standard form in which manufacturer agrees to repair or replace at manufacturer's cost, standing-seam, metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
  - 1. Warranty Period: Twenty years from date of Substantial Completion
  - 2. Erector will co-sign warranty, and make any required repairs for two years from date of Substantial Completion.
- B. Special Weathertightness Warranty for Wall Panels: Manufacturer's single source, no dollar limit warranty standard form in which manufacturer agrees to repair or replace at manufacturer's cost, metal wall panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
  - 1. Warranty Period: Twenty years from date of Substantial Completion
  - 2. Erector will co-sign warranty, and make any required repairs for two years from date of Substantial Completion.
- C. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, provide system by one of the following:

1. American International Building Systems.
2. Butler Mfg. Co.
3. Mid-West Steel Building Co.
4. Rigid Building Systems
5. Whirlwind Building Systems
6. Robert S. Henry Company
7. Others, with approval by Architect.
8. **NOTE:** Systems provided by Mid-West Steel Building Co. are specifically not permitted on this project.

## 2.2 STRUCTURAL-FRAMING MATERIALS

- A. W-Shapes: ASTM A 992; ASTM A 572, Grade 50 or 55; or ASTM A 529, Grade 50 or 55.
- B. Channels, Angles, M-Shapes, S-Shapes, Plate and Bar: ASTM A 36; ASTM A 572, Grade 50 or 55; or ASTM A 529, Grade 50 or 55.
- C. Steel Pipe: ASTM A 53, Type E or S, Grade B.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
- E. Joist Girders: "Standard Specifications for Joist Girders," in SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders."
- F. Steel Joists: "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders."
- G. Anchor Bolts: ASTM A 325 or Section 1C or ASTM A 307, plain finish.
- H. Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers. Plain finish.
- I. Anchor Rods: ASTM F 1554, Grade 36.
- J. Threaded Rods: ASTM A 193.
- K. Primer: SSPC-Paint 15, Type I, red oxide.

## 2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.4 MATERIALS FOR METAL PANELS

- A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80, with G90 coating designation, 24 gauge.
  - 2. Surface: Smooth, flat finish.
  - 3. Exposed Finishes: Apply the following coil coating, as specified or indicated on Drawings:
    - a. High-Performance Organic Finish (3-Coat Fluoropolymer): AA-C12C40R1x, with a minimum total dry film thickness of 1.5 mil. Comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
    - b. Colors, up to five (5) different colors, as selected by architect from manufacturer's full range.
    - c. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored backer finish, consisting of prime coat and wash coat with a total minimum dry film thickness of 0.5 mil.

## 2.5 THERMAL INSULATION FOR FIELD-ASSEMBLED METAL PANELS

- A. Refer to Division 7 section "Building Insulation".

## 2.6 MISCELLANEOUS MATERIALS

- A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads and as recommended by manufacturer. Provide fasteners with heads matching color of materials being fastened.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- C. Metal Panel Sealants:
  - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
  - 2. Joint Sealant: ASTM C 920; one-part silicone-rubber sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

## 2.7 FABRICATION, GENERAL

- A. Tolerances: Comply with MBMA's "Metal Building Systems Manual": Chapter IV, Section 9, "Fabrication and Erection Tolerances."
- B. Metal Panels: Fabricate and finish metal panels at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

## 2.8 STRUCTURAL FRAMING FABRICATION

- A. All framing members shall carry an identifying mark, either stamped, stenciled, or painted.
- B. Primary Framing including but not limited to transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; intermediate floor framing (if any); and wind bracing: Shop fabricate framing components to indicated size and section with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
- C. Secondary Framing including but not limited to purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members: Shop fabricate framing components from cold-formed, structural-steel sheet to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
- D. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly.
- E. Canopy Framing: Manufacturer's standard structural-framing system, designed to withstand required loads, fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide frames with attachment plates and splice members, factory drilled for field-bolted assembly.
- F. Bracing: Provide wind bracing as follows and as indicated on drawings:
  - 1. Rigid Portal Frames: Fabricate from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads. Locate in approximate locations indicated on drawings.
  - 2. Rods (ASTM A 36; ASTM A 572, Grade 50; or ASTM A 529, Grade 50) or Cable (ASTM A 475). Locate in roof plane only, no "X" bracing allowed in walls.
- G. Bolts: Provide plain finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated bolts for structural-framing components that are galvanized.

## 2.9 METAL ROOF AND WALL PANELS

- A. Standing-Seam Metal Roof Panels: MBCI Batten-lok, or equal approved by architect.

- B. Concealed-Fastener Metal Wall Panels: Berridge HR-16.
- C. Panel Lengths:
  - 1. Roof Panels: Fabricate roof panels in single piece for full length of roof slope from eave to slope, unless approved otherwise by Architect.
  - 2. Wall Panels: Fabricate wall panels in single piece for full length of wall, unless approved otherwise by Architect.

## 2.10 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Comply with indicated profiles and with dimensional and structural requirements.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, eave and ridge closures, clips and cleats, backing plates, sealants, gaskets, fillers, closure strips, thermal spacer blocks, and similar items. Match material and finish of metal roof panels, unless otherwise indicated.
- C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, eave and rake closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.
- D. Flashing and Trim: Formed from minimum 26 gauge metallic-coated steel sheet finished to match adjacent metal panels, as required to seal against weather and to provide finished appearance.
- E. Gutters and downspouts: Formed from minimum 26 gauge metallic-coated steel sheet; finished to match roof fascia and rake trim. Profile as shown, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, according to SMACNA's "Architectural Sheet Metal Manual."
  - 1. Supports: Fabricated from same material and finish as gutters; spaced 36 inches o.c.
  - 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
- F. Roof Ventilators: Gravity type, complete with hardware, flashing, closures, and fittings, as indicated on drawings.
- G. Roof Curbs: Fabricated from minimum 0.0428-inch - thick, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal roof panels; with welded top box and bottom skirt, and integral full-length cricket; capable of withstanding indicated loads and of size and height indicated. Include subframing.
- H. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

## 2.11 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

## PART 3 - EXECUTION

### 3.1 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to AISC Specification and manufacturer's written erection instructions and erection drawings.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place.
- C. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Promptly pack non-shrink grout solidly between bearing surfaces and plates so no voids remain and to obtain uniform bearing. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Align and adjust structural framing before permanently fastening. Erect framing true to line, level, plumb, rigid, and secure.
- F. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders," joist manufacturer's written recommendations, and requirements in these Specifications.
- G. Steel Deck: Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, and requirements of these Specifications.
- H. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- I. Erection Tolerances: Maintain erection tolerances of structural framing within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

### 3.2 PANEL INSTALLATION

- A. General: Anchor metal panels and other components of the Work securely in place according to manufacturer's recommendations, with provisions for thermal and structural movement. Use fasteners as recommended by manufacturer.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by manufacturer.
- D. Panels to be free of oilcanning, dimples, wrinkles, etc.
- E. Roof Panels: Provide metal roof panels of full length from eave to ridge, unless otherwise approved by Architect.
  - 1. Where conditions prevent one continuous run and panel lap joints are approved by Architect, lap panels 8 inches minimum, and seal with sealant tape between panels. Also seal with silicone sealant at panel edges.
  - 2. Where lap joints have been approved by Architect, align or stagger lap joints in accordance with manufacturer's instructions.
- F. Wall Panels: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated.
  - 1. Apply non-curing butyl sealant continuously between metal base channel (sill angle) and concrete.
  - 2. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

### 3.3 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
  - 2. Provide for thermal movement.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible.

- C. Gutters: Join minimum 96 inch – long sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 4 feet o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant.
- D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
  - 1. Provide elbows at base of downspouts to tie to storm.
- E. Circular Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Mount ventilators on flat level base. Install preformed filler strips at base to seal ventilator to metal roof panels.
- F. Continuous Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Join sections with splice plates and end-cap skirt assemblies where required to achieve indicated length. Install preformed filler strips at base to seal ventilator to metal roof panels.
- G. Roof Curbs: Install curbs at locations as may be indicated on Drawings. Install flashing around bases where they meet metal roof panels.
- H. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

### 3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:
  - 1. High-Strength, Field-Bolted Connections and Welded Connections.
- B. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

### 3.5 CLEANING AND 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 erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
- C. Metal Panels: On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
  - 1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 13125



## SECTION 14241 - HYDRAULIC PASSENGER ELEVATORS

### 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 hydraulic elevators.
- B. Coordinate the requirements of this Section with those of other sections that interface with Hydraulic Elevators.

#### 1.3 DEFINITIONS

- A. Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

#### 1.4 SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
- B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- C. Samples: For exposed finishes of cars, hoistway doors and frames, and signal equipment.
- D. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.
- E. Maintenance Manuals: Include operation and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at Project closeout as specified in Division 1.

- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

#### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: In addition to local governing regulations, comply with applicable provisions in ASME A17.1, "Safety Code for Elevators and Escalators." Comply with requirements for seismic zone in which project is located.
- B. Accessibility Requirements: Comply with Section 4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG), the Texas Accessibility Standards (TAS), and other governing regulations.
- C. The elevator shall follow design and manufacturing procedures certified in accordance with the International Organization for Standardization (ISO9001-2000) to meet product and service requirements for quality assurance for new products.

#### 1.6 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders, sumps, and floor drains in pits; entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

#### 1.7 WARRANTY

- A. Special Manufacturer's Warranty: Written warranty, signed by manufacturer agreeing to repair, restore, or replace defective elevator work within specified warranty period.
  - 1. Warranty Period: 12 months from date of Substantial Completion.

#### 1.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide **12 months'** full maintenance service by skilled employees of the elevator Installer. Include monthly preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies as used in the manufacture and installation of original equipment.
  - 1. Perform maintenance, including emergency callback service, during normal working hours.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on

date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide hydraulic elevators by one of the following:
  - 1. KONE, Inc.
  - 2. Otis Elevator Co.
  - 3. Schindler Elevator Corp.
  - 4. TK Elevator.
- B. Basis of Design:
  - 1. TK Elevator Endura 21 A.

### 2.2 MATERIALS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard preengineered elevator systems and as required for a complete system.
- B. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations. Provide either of the following:
  - 1. Pump, with fan-cooled squirrel-cage induction motor, mounted on top of oil tank with vibration isolation mounts. Enclose pump in prime-painted steel enclosure lined with 1-inch-thick, glass-fiber insulation board.
  - 2. Submersible pump, with submersible squirrel-cage induction motor, suspended inside tank from vibration isolation mounts.
  - 3. Provide variable-voltage variable-frequency motor control.
- C. Hydraulic Silencers: Provide hydraulic silencer containing pulsation-absorbing material in a blowout-proof housing at pump unit.
- D. Piping: Provide size, type, and weight piping recommended by manufacturer, and provide flexible connectors to minimize sound and vibration transmissions from power unit.
- E. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Specification Section.
- F. Car Frame and Platform: Welded steel units.
- G. Finish Materials: Provide the following materials and finishes for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated:

1. Enameled-Steel Sheet: Cold-rolled steel sheet complying with ASTM A 366/A 366M, matte finish, stretcher-leveled standard of flatness; hot-rolled steel sheet complying with ASTM A 569/A 569M may be used for door frames. Provide with factory-applied enamel finish; colors as selected by Architect.
2. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGP for postformed applications and Type HGS for flat applications; color, texture, and pattern as selected by Architect from plastic-laminate manufacturer's full range of products.
3. Satin Stainless Steel: ASTM A 666, Type 304, with No. 4 satin finish.

## 2.3 OPERATION SYSTEMS

- A. Passenger Elevators: Provide manufacturer's standard microprocessor operation system for each elevator or group of elevators as required to provide type of operation system indicated.
  1. Single Elevator: Provide "selective collective automatic operation" as defined in ASME A17.1. Provide onboard diagnostic capabilities.
- B. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated.
  1. Standby Power Operation: On activation of standby power, cars are returned to lowest floor and parked with doors open.
  2. Independent Service: Keyswitch in car control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to the door close button.
  3. Automatic Dispatching of Loaded Car: When car load exceeds a predetermined weight, doors will begin closing.
- C. Security Features: In addition to above operational features, provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.
  1. Keyswitch Feature: Car and hall push buttons are activated and deactivated by security keyswitches. Key is removable only in deactivated position.

## 2.4 SIGNAL EQUIPMENT

- A. General: Provide signal equipment for each elevator or group of elevators with hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements of acrylic or other permanent, nonyellowing translucent plastic.
- B. Car Control Stations: Provide manufacturer's standard semirecessed car control stations. Mount in return panel adjacent to car door, if not otherwise indicated.
  1. Include call buttons for each landing served and other buttons, switches, and controls required for specified car operation.
  2. Mark buttons and switches with manufacturer's standard identification for required use or function that complies with ASME A17.1.
  3. Mount controls at heights complying with ADA and TAS.

- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Fire Department Communication System: Provide flush-mounted cabinet in each car and required conductors in traveling cable for fire department communication system specified in Division 16 Sections.
- E. Car Position Indicator: For passenger elevator cars, provide illuminated-signal type, digital-display type, or segmented type, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car control station.
- F. Hall Push-Button Stations: Provide one hall push-button station at each landing for each elevator or group of elevators, but not less than one station for each four elevators in a group. For each group of passenger elevators, locate between two elevators at center of group or at location most convenient for approaching passengers.
  - 1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
  - 2. Provide units with direction-indicating buttons; two buttons at intermediate landings; one button at terminal landings.
- G. Hall Lanterns: Provide units with illuminated arrows, but provide single arrow at terminal landings.
  - 1. Provide units with flat faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.
  - 2. Place lanterns either above or beside each hoistway entrance, unless otherwise indicated. Mount at a minimum of 72 inches above finished floor.
  - 3. With each lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
    - a. At manufacturer's option, audible signals may be placed on each car.
- H. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations with text and graphics according to ASME A17.1, Appendix H.

## 2.5 DOOR REOPENING DEVICES

- A. Infrared Light Curtain: Provide infrared light curtain door protection to include equipping of leading edges of car doors with concealed transmitter and receiver infrared beam devices that detect the presence of an object in the process of passing through the hoistway entrance and car doorway. Device shall use multibeam scanning to detect obstructions in the door opening without any moving parts. Detector device shall prevent the doors from closing, or if they have already started closing, shall cause the doors to reopen and remain open while the object is

within the detection zone. Provide a minimum of forty (40) horizontal beams to fill the doorway from hoistway and door sills to a height of six (6) feet.

## 2.6 PASSENGER ELEVATOR CAR ENCLOSURES

- A. General: Provide manufacturer's standard enameled-steel car enclosures with removable wall panels, suspended ceiling, trim, accessories, access doors, doors, power door operators, sills (thresholds), lighting, and ventilation.
1. Front Walls: Flush hollow-metal panel construction, fabricated from metal indicated, with integral car door frames. Finish metal is enameled steelsatin stainless steel.
  2. Side and Rear Walls:
    - a. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch fire-retardant-treated particleboard with plastic-laminate panel backing complying with NEMA LD 3, Type BKV and manufacturer's standard protective edge trim. Panels have a flame-spread rating of 25 or less, when tested according to ASTM E 84.
  3. Stainless-Steel Doors: Flush, hollow-metal construction, fabricated from stainless steel. Finish is satin.
  4. Polished Metal Ceiling: Flush panels, of metal indicated, with low-voltage downlights in the center of each panel.
    - a. Polished stainless steel.
  5. Reveals: Finish metal is enameled steelsatin stainless steel.
  6. Fabricate car with recesses and cutouts for signal equipment.
  7. Fabricate car door frame integrally with front wall of car.
  8. Sills: Extruded aluminum, with grooved surface, 1/4 inch thick.
  9. Handrails: Manufacturer's standard handrails, satin stainless steel, at side and rear walls.
  10. Floor:
    - a. Floor prepared to receive resilient tile (specified in Division 9 Section "Resilient Tile Flooring").

## 2.7 PASSENGER HOISTWAY ENTRANCES

- A. General: Provide manufacturer's standard UL rated horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Provide frame size and profile to coordinate with hoistway wall construction.
1. Where gypsum board wall construction is indicated, provide self-supporting frames with reinforced head sections.
- B. Materials and Fabrication: Provide manufacturer's standards but not less than the following:
1. Stainless-Steel Frames, Doors and Transoms: Formed stainless-steel sheet (doors and transoms flush, hollow metal construction). Finish is satin.
  2. Sills: Extruded aluminum, with grooved surface, 1/4 inch thick.
  3. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

## 2.8 PASSENGER ELEVATOR TYPE, CAPACITY, SIZE & OTHER CHARACTERISTICS

- A. Elevator Type: Machine Room-less, Holeless (telescopic), manufacturer's standard to meet requirements herein.
- B. Rated Load: 2,100 lb.
- C. Rated Speed: 125 fpm up and 150 fpm down.
- D. Car Enclosure Dimensions:
  - 1. Inside Width: 68 inches.
  - 2. Inside Depth: 51 inches.
  - 3. Inside Height: 88 inches minimum.
- E. Hoistway Entrances:
  - 1. Width: 36 inches.
  - 2. Height: 84 inches.
  - 3. Type: Single-speed side sliding.
- F. Hall Fixtures:
  - 1. Typical Floors: Satin stainless steel.
- G. Additional Requirements:
  - 1. Provide inspection certificate in each car, mounted under acrylic cover with satin stainless-steel frame.
  - 2. Provide protective blanket hooks in one car and two complete sets of full-height blankets.
  - 3. Synchronization of jack stages shall be by direct mechanical means to ensure that elevator moves at a steady speed and provides a smooth ride.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Verify critical dimensions, and examine supporting structure and other conditions under which elevator work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install cylinders plumb and accurately placed for elevator car position and travel. Anchor securely in place, supported at pit floor.
- B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment,

inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

- C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.
- D. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cement fittings.
- E. Lubricate operating parts of systems as recommended by manufacturers.
- F. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- G. Leveling Tolerance: 1/4 inch, up or down, regardless of load and direction of travel.
- H. Adjust for smooth acceleration and deceleration of car so as not to cause passenger discomfort. Adjust doors to prevent opening of doors at any landing on the corridor side unless the car is at rest at that landing, or is in the leveling zone and stopping at that landing.
- I. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.

### 3.4 DEMONSTRATION

- A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of operational failure and other building emergencies. Train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.
- B. Make a final check of each elevator operation with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.



### 3.5 PROTECTION

- A. Temporary Use: Do not use elevators for construction purposes unless cars are provided with temporary enclosures, either within finished cars or in place of finished cars, to protect finishes from damage.
1. Provide full maintenance service by skilled, competent employees of elevator Installer for elevators used for construction purposes. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Use same parts and supplies as used in the manufacture and installation of original equipment.
  2. Provide protective coverings, barriers, devices, signs, and other procedures to protect elevators. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

END OF SECTION 14241

## SECTION 16670 - LIGHTNING PROTECTION SYSTEM FOR LOW RISE BUILDING

## 1.1 GENERAL

- A. The General Conditions, Supplementary General Conditions, Division 1 and the Section entitled "Electrical Work - General Requirements" apply to all work herein.
- B. Objective: To provide safety for the building and occupants by preventing damage to building structure caused by lightning.

## 1.2 STANDARDS

- A. The following specifications and standards of the latest issue form a part of this specification:
  - 1. Lightning Protection Institute  
Installation Standard, LPI 175
  - 2. Underwriters Laboratories, Inc.  
Installation Requirements, UL96A
  - 3. National Electrical Code (NEC)
  - 4. National Fire Protection Association  
Lightning Protection Code, NFPA 780
  - 5. U.S. Bureau of Standards

## 1.3 SCOPE

- A. The work covered in this section of the specifications consists of furnishing all labor, materials, and items of service required for the completion of a functional and unobtrusive lightning protection system as approved by the engineer, and in strict accordance with this section of the specifications and the applicable Contract Drawings. Provide Class I materials.
- B. If any departure from the Contract Drawings or submittal drawings covered below are deemed necessary by the Contractor, details of such departures and reasons therefore shall be submitted as soon as practical to the engineer for approval.

## 1.4 QUALITY ASSURANCE

- A. The lightning protection system shall conform to the requirements and standards for lightning protection systems of the LPI, UL, NFPA and NEC. Upon completion, application shall be made to the Underwriters Laboratories, Inc. for inspection and certification. In addition, the Lightning Protection Institute certified system certificate shall be issued and delivered to the owner ensuring that the concealed components have also been monitored during job progress.
- B. The system to be furnished under this specification shall be the standard product of manufacturers regularly engaged in the production of lightning protection equipment and shall be the manufacturer's latest approved design. The equipment shall be UL listed and properly UL labeled.

## 1.5 QUALIFIED MANUFACTURERS:

- A. Bonded Lightning Protection Systems, Inc. - Dallas

- B. Advanced Lightning Technology - Dallas
- C. Thompson Lightning Protection - Minnesota
- D. Harger Lightning Protection - Illinois
- E. East Coast Lightning Equipment - Connecticut

#### 1.6 SUBMITTALS

- A. Complete shop drawings showing the type, size and locations of all grounding, down conductors, through-wall assemblies, roof conductors and air terminals shall be submitted to the engineer for approval.

### PART 2 - PRODUCTS

- 2.1 LIGHTNING PROTECTION EQUIPMENT: All materials shall be copper and bronze and of the size, weight and construction to suit the application and used in accordance with LPI, UL, NEC and NFPA. Class I sized components are required for roof levels not exceeding 75 feet in height. Bolt-type connectors and splicers shall be utilized on Class I structures. Pressure squeeze clamps are not acceptable. All mounting hardware on the roof shall be stainless steel and, on the facade, shall be brass and/or copper.

#### 2.2 MATERIALS:

- A. All materials on the roof shall be copper as manufactured by Thompson Lightning Protection, Inc., Minneapolis, Minn., or approved equal, and shall be approved by the Underwriters' Laboratories, Inc. All down conductors shall be copper. All anchors on down conductors shall be Thompson #169 Loop Masonry Anchors which includes 1/4"-20 Pak-tite masonry anchors and 1/4" x 3/4" brass machine screws (no exceptions).
- B. STANDARD: All equipment used in this installation shall be UL listed and properly UL labeled. All equipment shall be new, and of a design and construction to suit the application where it is used in accordance with accepted industry standards and LPI, UL, NFPA and NEC code requirements.
- C. All roof-mounted and downlead conductors shall be Thompson No. 29X "Century rope lay copper with a minimum of 29 strand, 17-gauge heavy duty copper (99.97% pure), and shall be stranded cable weighing not less than 190 lbs. per 1000 feet, with 3/8" diameter.
- D. Air terminals shall be nickel-tipped copper, having a copper base. Air terminals shall be spaced not more than twenty feet apart. Provide flathead air terminals on the roof in areas where accidental implement may occur.

### PART 3 - INSTALLATION

- A. The installation shall be accomplished by an experienced installation company that is UL listed, a member of the Lightning Protection Institute, United Lightning Protection Association qualified, and an employer of Certified Master Installers of lightning protection systems. A Certified Master Installer shall directly supervise the work.
- B. All equipment shall be installed in a neat, workmanlike manner. The system shall consist of a complete conductor network at the roof and include air terminals, connectors, splicers,

bonds, copper down leads and proper ground terminals.

- C. Copper downlead cables shall be utilized. No penetration shall be made in the roof membrane.
- D. Provide 20% spare air terminals to owner for replacement stock.
- E. Where conductors are run in conduit for protection, the conductor shall be bonded to the entrance and exit point of the conduit by bonding wedges or approved methods to maintain electrical continuity.
- E. Down conductors shall be attached to ground devices in accordance with the specific provisions of the Underwriters' Laboratories, Inc., Code. All-down conductors shall be concealed. Any exposed conductors shall be approved by Architect.
- F. All metals of conductance within six feet of the lightning protection system shall be securely bonded and made a part thereof. Where stack or chimney is present, lead covered non-corrosive air terminals and conductors shall be used. Metal water pipes extending into the ground may be rated as best in ground virtue and should be made an integral part of the grounding system.

### 3.1 COORDINATION

- A. The lightning protection installer will work with any other trades present to insure a correct, neat and unobtrusive installation.
- B. It shall be the responsibility of the lightning protection installer to assure a solid bond to the main water service and to assure interconnection with other ground systems.

### 3.2 COMPLETION

- A. Upon completion of the installation, the lightning protection installer shall secure and deliver to the owner the Underwriters Laboratories, Inc. Master Label certification and the Lightning Protection Institute Certified System certification. The system will not be accepted without the UL Master Label plate and the LPI certification certificate.

END OF SECTION 16670

**GEOTECHNICAL INVESTIGATION**

Proposed Community Center  
Attack Poverty Facility  
1908 Avenue E  
Rosenberg, Texas

Reported to:

James Knight, Architect  
Director of Facilities / Architect - Fort Bend County  
Richmond, Texas

Prepared by:

Geoscience Engineering and Testing, Inc.  
Houston, Texas

PROJECT NO: 21G10708

January 2022



# GEOSCIENCE

ENGINEERING & TESTING, INC.

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HOUSTON

THE WOODLANDS

January 18, 2022

James Knight Architects  
Director of Facilities / Architect - Fort Bend County  
301 Jackson Street, Suite 301  
Richmond, Texas 77469

Attention: Mr. James Knight

Reference: Geotechnical Investigation  
Proposed Community Center  
Attack Poverty Facility  
1908 Avenue E  
Rosenberg, Texas  
GETI NO: 21G10708

Dear Mr. James Knight:

GEOSCIENCE ENGINEERING & TESTING, INC. (GETI) is pleased to submit this report for the above referenced project. This study was authorized and approved by you on December 27, 2021. This report briefly describes the procedures employed in our investigation and presents the conclusions and recommendations of our studies.

We appreciate the opportunity to work with you on this phase of the project. If you have any question concerning this report or require additional information, please contact us.

With Kindest Regards,

Roham Golrokh, PE  
Geotechnical Supervisor

Kishor Rawal, PE  
Senior Project Engineer

Telfryn L. John, PE  
President

F-4802

Copies Submitted: (1)

## I. INTRODUCTION

**Geoscience Engineering and Testing, Inc. (GETI)** is pleased to submit this report of our geotechnical investigation of subsurface conditions at the site of the proposed community center-Attack Poverty Facility located at 1908 Avenue E, in Rosenberg, Texas. GETI's investigation was authorized by Jaime Kovar and Mr. James Knight with Fort Bend County on December 18, 2021.

Based on the obtained information, the Community Center will be designed as a two-story steel structure with interior basketball court, bleachers and storage rooms at the west end, and offices, meeting rooms and bathrooms at the other. We assume the concrete floor is planned as slab on grade, and that internal and exterior walls to be CMU masonry construction or similar. Maximum column loads are anticipated to be around 250-kips, and maximum wall loads 1.5 kips per linear foot. Geoscience is not aware of any anticipated high lateral loads on foundation elements.

The purpose of the geotechnical investigation was to determine the subsurface soil conditions at the site of the proposed Community Center structures with particular reference to the recommendations for the design of the foundation for the structure and pavement.

*NOTE: The project photos (Plate No.11) were taken during the drilling operations. Please review and verify this is your building site. Notify GETI immediately if this not your site. (There are a few sites that are difficult to locate for a variety reasons.) We have been as diligent as possible in locating your site to assure that the recommendations given in our report correspond to your needs.*

## II. SUBSURFACE EXPLORATION

### 1. General

This report presents the results of our soil exploration and foundation analysis for the proposed community center-Attack Poverty Facility located at 1908 Avenue E, in Rosenberg, TX.

Scope of this investigation included a reconnaissance of the immediate site, the subsurface exploration, field and laboratory testing, an engineering analysis and evaluation of the subsurface materials. The purpose of this subsurface exploration and analysis was to determine soil profile components, the engineering characteristics of the subsurface materials and to provide criteria for use by design engineers and architects in preparing the foundation and pavement design.

The exploration and analysis of the subsurface conditions reported herein are considered in enough detail and scope to form a reasonable basis for the recommendations. The recommendations submitted are based on the available soil information and the preliminary design details furnished by Mr. James Knight with Fort Bend County. Any revision in plans for the proposed building, canopy, tanks, and pavement from those enumerated in this report should be brought to the attention of the soil engineer, so that he may determine, if changes in the recommendations are required. If deviations from the noted subsurface conditions are encountered during construction, they should also be brought to the attention of the soil engineer.

## **2. Description of the Site**

The site of the proposed community center-Attack Poverty Facility, for which this subsurface exploration was undertaken, is located at 1908 Avenue E, in Rosenberg, Texas. The site is a vacant property, and the surface was relatively flat and covered with grass. The surface soils were fat clays at the time of drilling operation. The site geology for the geographic area corresponds to the Beaumont Formation, Quaternary Period, and Holocene, Pleistocene Epoch or Series<sup>1</sup>.

## **3. Field Investigation**

The field investigation, completed on January 05, 2022, and performed to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project site, drilling the exploratory borings and recovering the representative soil samples. The boring locations were determined by the client which were later approved by Geoscience.

The subsurface soil conditions were explored by advancing and sampling six test soil borings. The soil borings B-1 and B-3 were drilled to the depth of 30-feet; while B-2 and B-4 were drilled to the depth of 20-feet and borings B-5 and B-6 were drilled to the depth of 6-feet each, below the existing ground surface. Approximate soil boring locations are shown on the Soil Boring Plan, Plate No. 1.

Sample depth and description of soil classification (based on the Unified Soil Classification System) are presented on the Soil Boring Logs, Plate Nos. 2 through 7. Keys to terms and symbols used on the soil boring logs are shown on Plate No. 7. Photographs appear on Plate No. 11.

The soil borings were of 3-inch nominal diameter. Both relatively undisturbed and disturbed soil samples were obtained at 2-foot intervals continuously to a depth of 12-feet, between 13 and 15-feet and at 5-foot intervals thereafter. The soil borings were performed with a drilling rig equipped with rotary head conventional solid-stem augers were used to advance the holes. Representative disturbed or undisturbed soil samples were obtained employing thin-walled sampling procedures in general accordance with ASTM D1587. Blow counts (if necessary) were obtained in general accordance with ASTM D-1586 Standard Penetration Test (SPT) and Split-Barrel Sampling of cohesionless soil. Soil samples were identified according to the boring number and depth and wrapped in aluminum foil and polyethylene plastic wrapping bags to prevent moisture loss and disturbance. All of the samples were transported to our geotechnical laboratory for examination, testing and analysis. All borings were backfilled after final water readings were obtained with the soil cuttings accumulated during the drilling operation unless noted otherwise on the soil boring logs.

### **3.1 Field Strength Tests**

During the field boring operation, samples of the cohesive soil from the thin-walled tube were frequently tested in compression by use of a calibrated soil penetrometer to provide a measure of shear strength and blow counts from the SPT for cohesionless soil, to aid in characterizing the soil consistency.

### **3.2 Water Level Measurement**

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<sup>1</sup> Note: USGS, TNRIS, UTBEG, GEOLOGIC ATLAS OF TEXAS



The information in this report summarizes conditions as found on the date the borings were drilled. Groundwater was not encountered in the borings during the drilling operation. Long-term monitoring of the groundwater level was beyond the scope of this study. It should be noted that the groundwater table may be expected to fluctuate with environmental variations such as frequency and magnitude of rainfall and the time of the year when construction begins.

#### 4. Surface Fault

A cursory review of available surface faulting maps<sup>2</sup> shows no well-documented principal fault was located within the 1-mile around the site. Nevertheless, the nearest growth fault to this site appears to be the Clodine Fault which is several miles to the northeast near Pecan Grove Plantation. A detailed surface fault investigation is beyond the scope of this investigation. It should be noted that the coastal plains in this region have a complex geology, which includes active surface faulting.

#### 5. Laboratory Testing

In addition to the field investigation, a supplemental laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials necessary in analyzing their behavior under the proposed loading conditions.

During the laboratory investigation all field soil samples from the boring were examined and classified by a soil engineer. Laboratory tests were then performed on selected soil samples to evaluate and determine the physical and engineering properties of the soils in accordance with the prescribed ASTM standards and methods. The following laboratory tests were performed:

LABORATORY TEST	TEST STANDARD
Moisture Content of Soils	ASTM D2216
Moisture Content and In Situ Dry Density of Soils	ASTM D2937
Percent Soil Particles Passing a No. 200 Sieve	ASTM D1140
Unconfined Compressive Strength of Cohesive Soils	ASTM D2166
Liquid Limit, Plastic Limit, and Plasticity Index of Soils	ASTM D4318

Strength properties of the soils were determined by means of unconfined compression tests performed on undisturbed samples.

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<sup>2</sup> Note: USGS, Verbeek and Clanton (1978), Shah and Lanning-Rush (2005)

The type and number of the laboratory tests performed for this investigation are:

DESCRIPTIONS	No. of Test	DESCRIPTIONS	No. of Test
Hand Penetrometer Test	36	Dry Density Test	3
Moisture Content Test	42	Unconfined Compressive Test	3
Atterberg Limits	18	Minus Number 200 Sieve (%)	4

The tests noted above were performed to establish the index properties and to aid in the proper classification of the subsurface soils. The test results are shown on the soil boring logs and are presented on Plate Nos. 2 through 7.

### III. GENERAL DESCRIPTION OF SUBSURFACE MATERIALS

The specific subsurface stratigraphy as determined by the field exploration at the location drilled is shown in detail on the soil boring logs herein. However, the stratigraphy can be generalized as follow:

STRATUM NUMBER	RANGE OF DEPTH, ft.	SOIL DESCRIPTION
I	0 – 6' in B-1 through B-6	Soft to very stiff, dark gray; light brown FAT CLAY (CH)*
II	6' – 10' in B-2	Firm to hard, reddish brown; reddish brown and light brown LEAN CLAY/SANDY LEAN CLAY (CL)*
	6' – 12' in B-1	
	6' – 15' in B-3, B-4	
III	10' – 12' in B-2	Very stiff to hard, reddish brown and light brown FAT CLAY (CH)*
IV	12' – 20' in B-1, B-2	Medium dense, reddish brown and light brown SILTY CLAYEY SAND (SC-SM)*
	15' – 20' in B-3, B-4	
V	20' – 30' in B-1, B-3	Very stiff to hard, light brown and reddish-brown FAT CLAY with calcareous nodules (CH)*

\* Classification is in accordance with the Unified Soil Classification System

Laboratory tests results for the soils indicate Liquid Limits (LL) ranging from 41 to 89 percent, the Plasticity Indices (PI) ranging from 6 to 57, and moisture content from 9 to 33 percent.

#### 1. Swell Potential

Based on plasticity index results, the silty clayey sand, sandy lean clay, lean clay, and fat clay subsoils are characterized as having a low to very high shrink/swell potential.

When the moisture content of clay soil increases, the volume increases; conversely, when the moisture content of this type of soils decreases, the soil volume decreases. The volume changes can result in foundation movement and stresses.

## 2. Potential Vertical Rise (PVR)

The magnitude of the moisture induced vertical movement was calculated using the Texas Department of Transportation method (Tex-124-E) in conjunction with current moisture profile. Based on the method, the potential vertical rise (PVR) at the locations of the test borings drilled is estimated to be in approximately 4-inches. More movement may occur in areas where the soil dries, and water subsequently ponds during or after construction. Site grading may also influence the potential for movement.

The estimated PVR value is reduced to be approximately 1-inch when 4½ -feet of the existing topsoil is replaced with structural select fill material with a Liquid Limit (LL) less than 35 percent and a Plasticity Index (PI) between 10 to 20. Alternatively, the PVR value can be reduced to be less than 1-inch by stabilizing the top 8-inches of the cut grade with 6% lime and elevating the grade by placing at least 3½ -feet of compacted sandy clay structural select fill material with a Liquid Limit (LL) that does not exceed 35 percent and a Plasticity Index (PI) between 10 to 20.

Pressure chemical injection may be effective in reducing potential vertical rise. However, subsequent testing is required after injection to evaluate effectiveness and influence on foundation design parameters. GETI should be contacted concerning monitoring and testing criteria, and sampling and testing.

The PVR may be reduced to alternate values with a lesser thickness of structural fill as follows:

Amount of Fill	Potential Vertical Rise (PVR)
4 ½ -feet	1-inch
4-feet	1 ¼ -inches
3-feet	1 ¾ -inches
2-feet	2 ½ -inches
1-foot	3 ½ -inches

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#### IV. FOUNDATION RECOMMENDATION

##### 1. Foundations and Risks

Many foundations are designed and constructed based on economics, risks, soil type, foundation shape and structural loading. Many times, due to economic considerations, higher risks are accepted in foundation design. It should be noted that some levels of risk are associated with all types of foundations. All of these foundations must be stiffened in the areas where expansive soils are present, and trees should be removed prior to construction.

A general discussion of flooding considerations related to foundation systems and site development is subsequently provided in this report.

##### 2. Foundation Discussion

In general, the foundation for the structures must satisfy two independent criteria. First, the maximum design pressure exerted at foundation levels should not exceed the allowable net bearing pressure based on an adequate factor of safety with respect to soil shear strength. Second, the magnitude of total and differential settlements or heave under sustained foundation loads must be such that the structure movement is within tolerable limits.

Various types of foundation such as Slab-on-Grade, Spread Footings, Underreamed Drilled (Belled) Footings, Straight Shaft Footings etc. have been discussed for the support of the proposed structure. Based on the field investigation and laboratory test results, the soils are silty clayey sand, sandy lean clay, lean clay, and fat clay having a low to very high shrink/swell potential.

Details of soil strata are given in soil boring logs, Plate Nos. 2 and 3.

In our opinion, for this type of soil strata Underreamed Drilled Footings (Drilled Piers), Augered Cast-In-Place (ACIP) Piles, Shallow Foundation Design (Slab-on-Grade) and Spread Footing Recommendation are considered suitable foundation systems. Details are given in the following sections.

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## 2.1 Underreamed Footings (Drilled Piers)

Based on the soil condition revealed by the field soil test borings and laboratory tests, it is our understanding that the structure at the site can be supported on a foundation system comprised of drilled underreamed footing bearing at a depth of 12-feet below existing grade. The pier footings should bear on same elevation belled in the layer of firm to hard, reddish brown and light brown lean clay or fat clay.

The footing on these sites may be sized for an estimate net allowable bearing pressure of 3,500 psf for dead load plus sustained live load. The bearing pressure contains a factor of safety of 2.5 and may be increased 25 percent for total load conditions, whichever is critical. Spacing between the centers of the two adjacent footings should be at least 3 times of the bell diameter.

The plinths of underreamed footing should be reinforced with enough reinforcing (tension) steel to resist the potential tension force caused by uplift loads due to expansive soils between the depth of seasonal moisture changes (9 to 10-feet) and the final ground surface elevation. An adhesion value of 1.50 tsf should be applied to the straight shaft portion of the drilled footings for computation of uplift loads.

Caving of soils around the footings may occur during construction of the drilled piers due to the presence of sands. In case the bell on the drilled footings cannot be constructed due to the occurrence of caving, it is recommended that the construction contractor should use cased piers or convert this Underreamed footings to Straight shaft footings immediately. Should the straight shaft footings be used due to caving of sands and high-water level, the straight shaft piers should be placed at a depth not less than 18-feet below the existing ground surface. The bottom of the piers should be dry and clean.

If water is encountered during installation, it should be pumped out prior to concrete placement. A tremie should be used to displace water with concrete. Temporary casings or drilling slurry may be adopted to stabilize the excavation and counteract encountered groundwater. In such cases, shaft piers are installed by placing concrete using 'slurry displacement' or "underwater concrete placement" method using a tremie. No pier excavation should be done at a distance less than 3 pier diameters in proximity to newly cast piers for a period of at least 24 hours. We recommend that the drilling be performed under the supervision of a qualified representative of the Geotechnical Engineer.

Experience indicates that underreams can be successfully installed and based on local practice for performing underreamed drill pier is to utilize 3.0 to 1.0 for underream to shaft ratio. Should caving occur during bell operation, the shaft diameter may have to be increased, thereby changing the bell to shaft ratio. If the soil conditions warrant the changing of the shaft diameter, the structural engineer of record should be informed about any changes, because they may require a change in reinforcing steel or bell diameter. Another alternative would be to change the typical 45-degree angle of the underreamed to 60 degree. The concrete should be placed promptly after drilling to minimize the potential for caving of the foundation soils. By the end of the day, each drilled hole must be filled with concrete, i.e., no open holes at the end of the day.

No footing should be poured without the prior approval of the project engineer, architect, or owner's representative. Since the exact locations of the footings are not known at this time, a detailed settlement analysis was not authorized, nor performed. It is anticipated that the footing designed using the recommended allowable bearing capacity will experience small settlement that will be within the tolerable limits for the proposed structure.

Note: The soil stratigraphy and groundwater conditions may vary within the proposed construction site. Hence, we recommend drilling at least 2-test piers before the construction of the foundation to verify the groundwater level and soil stratigraphy at the site.

### **Inspection during Construction of Drilled Piers**

The recommendations are based on the subsoil data in the field exploration and laboratory testing. Due to the geological deposition of the Pleistocene soils in the Gulf Coastal area, variances may occur between boring locations, therefore, the footing excavations should be inspected under the supervision of a qualified representative of the geotechnical engineer to confirm that the bearing soils are similar to those encountered in our field exploration and that the footing area have been properly prepared.

The geotechnical engineer should be immediately notified if any subsoil condition be uncovered that will alter the conclusions and recommendations contained in this report. Further investigation and supplemental recommendations may be required, if such a condition is encountered.

Prior to placement of concrete, the footings should be inspected to monitor that:

1. The footing bears in the proper bearing strata at the depth recommended in this report.
2. The footing shafts are of the proper dimensions and reinforcing steel is placed as shown on the structural drawings.
3. The footings are concentric with the shaft and the shaft has been drilled plumb within specified tolerances.
4. Excessive cutting and any other soft compressible materials have been removed from the bottom of the excavations.

### **Pier Floor Slab Options**

There may be two options for floor slab:

**a) Slab supported by piers only:** In this option slab is supported by only grade beams, which are supported by piers. In this case loads are applied on only piers. Slab should be raised from the ground surface by at least 8-inches to avoid the vertical displacement of the slab. The slab should be tied and stiffened with grade beams. Details for void boxes are given below:

### **Void Boxes**

A void/crawl space of 8-inches may be provided beneath the grade beams. This void space allows for movement of the expansive soils below the grade beams without distressing the structural system. Structural cardboard void forms are often used to provide this void space.

Void boxes are typically placed under the grade beams to provide this void space, and act as a barrier separating the grade beams from the expansive soils. The purpose for using the void boxes is when the underlying expansive soils swell, the void boxes will then collapse, thus minimizing the uplift loads caused from the expansive soils on the grade beams.

These voids may act as a channel for water to travel under a foundation system with poor area drainage, however, if this condition occurs, it may result in the subsequent swelling of the soils and an increase in subsoil moisture loads on the floor slabs. It is our opinion that the determination whether to provide voids under the grade beams be made by the owner, builder, engineer, or architect after both the positive and negative aspects are evaluated. Our experience with these voids, as well as the experiences of other experts, suggests that even though they may be effective in reducing swell pressures on the grade beams, they may provide free water which would be available for absorption by slab support soils.

**b) Slab supported by grade beams and sub-grade:** Another option is that the slab may be supported by the grade beams and the sub-grade (soil beneath the slab). This option will require the removal of roots, organic and unsuitable materials, and replacement with structural select fill as out lined in the “Structural Fill and Subgrade Preparation”.

Due to the soil characteristics at this site, at least **36-inches** of structural select fill materials having a Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 & 20 are required to minimize the possibility of vertical displacement. The structural select fill material can be used to elevate the grade, or the existing grade can be undercut for placing structural select fill material.

*If positive site drainage is not provided nor assured, the required amount of structural select fill material must be based on the PVR.*

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## 2.2 Augered Cast-In-Place (ACIP) Piles

GETI alternatively recommends Augered Cast-in-Place (ACIP) piles for the proposed structure. ACIP piles, also known as Continuous Flight Auger (CFA) piles, are cast in-place using a hollow stem auger with continuous flights. These are recommended for heavily loaded structures and most interior loads.

The actual depth and size of the ACIP pile should be determined based on the column loads by the structural engineer. 18-inch diameter ACIP piles are typically used based on the local practice and equipment capability. Occasionally, 24-inch and larger diameter piles can also be used, however, these are not very common in practice in the Greater Houston or Southeast Texas area.

Augered Cast-In-Place (ACIP) pile foundations are designed based on the static method of analysis. GETI has provided total axial load carrying capacity values for single, isolated 18-inch and 24-inch diameter piles. Based on soil properties obtained from the soil borings drilled in January 2022, the axial (compression) load carrying capacities, estimated at a different foundation depth are presented herein as Figures 1 and 2.

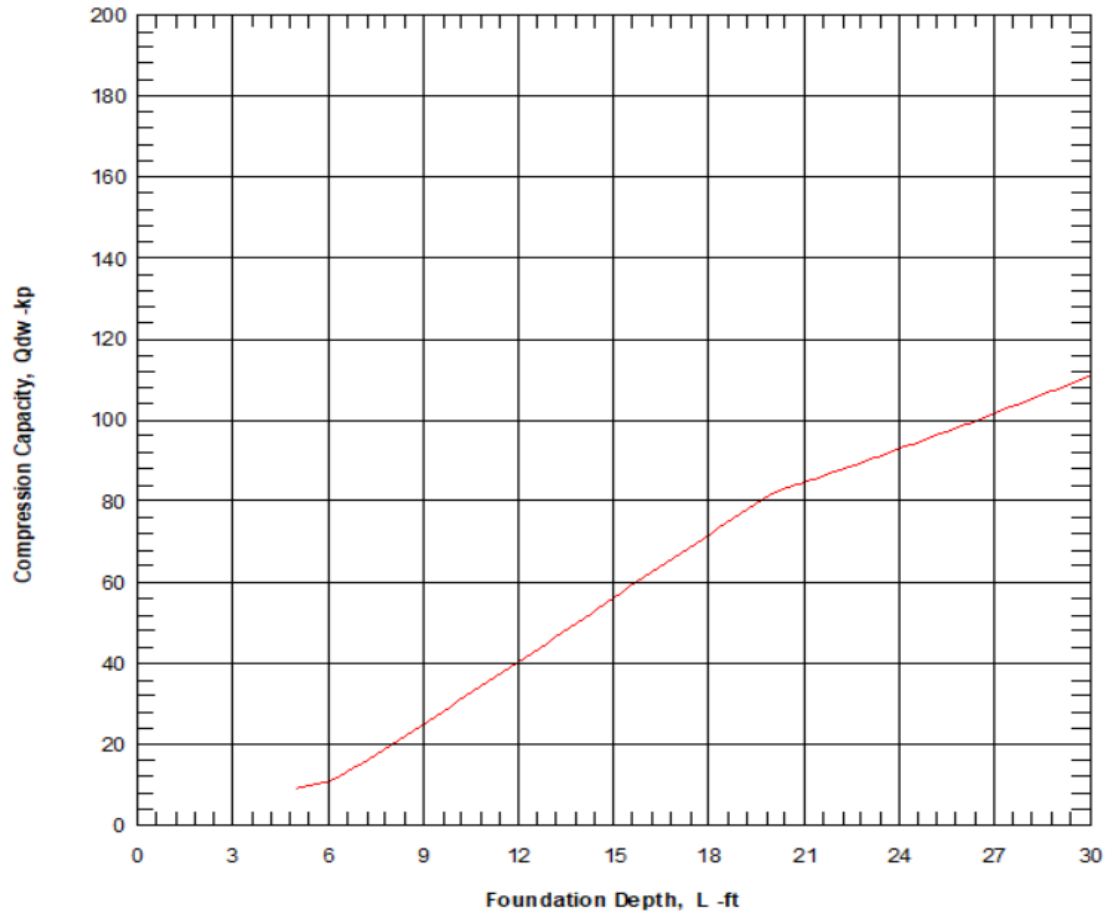
The axial load capacities shown in the figures are based on a characteristic undrained shear strength ( $c_u$ ) at different depths. The top 5-feet of the pile should be excluded from the skin friction capacity to account for the construction disturbance and active soil moisture variation. The resulting allowable axial capacities are shown for an applied Factor of Safety (FS) 3 for end bearing; and FS = 2 for side friction, respectively. The uplift capacity curve includes the Factor of safety (FS) of 3.0

The allowable capacities with varying depths of pile are shown in Figures 1 & 2 below.

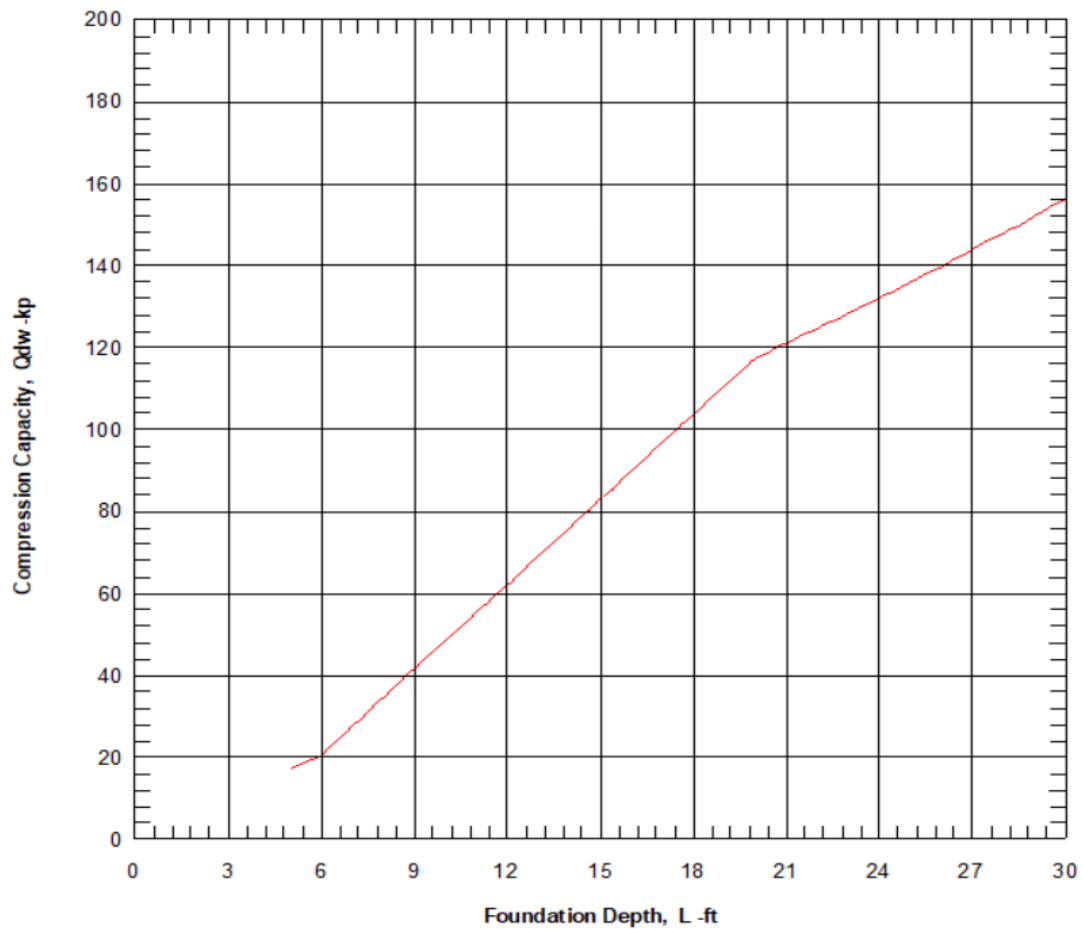
Based on the figures generated by ALLPILE software, the allowable axial load capacity shown at a depth of 30-feet for an 18-inch single, isolated ACIP pile is estimated as **110-kips**, whereas the allowable axial load capacity at a depth of 30-feet for a 24-inch isolated pile is estimated as **150-kips**.

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**Figure 1: Estimated Allowable Capacity of 18-inch Diameter ACIP PILE**



**Figure 2:** Estimated Allowable Capacity of **24-inch** Diameter **ACIP PILE**

### **Pile Floor Slab Options**

**Slab supported by grade beams and sub-grade:** The slab may be supported by the grade beams and the sub-grade (soil beneath the slab). This option will require the removal of roots, organic and unsuitable materials, and replacement with structural select fill as out lined in the “Structural Fill and Subgrade Preparation”.

**Select Fill requirement:** Due to the soil characteristics at this site, **at least 36-inches** of structural select fill materials having a liquid limit less than 35 percent and a plasticity index (PI) between 10 & 20 are required to minimize the possibility of vertical displacement as well as to provide the uniform support to the floor slab. The select fill must be compacted at least 95% of the maximum dry density as per ASTM D698.

### **Group Piles & Axial Capacity**

The overall allowable axial load carrying capacity of a group piles is the sum of the individual allowable capacities, however, in some cases this may be less than the sum of individual capacities. A reduction load bearing factor may not be required, if the pile groups are installed with a center-to-center spacing of at least 3 times the pile diameter. However, a pile spacing of 2.5 times the pile diameter can also be adopted with a pile axial group load efficiency of 80 %. Closer spacing of piles could result in increased settlement and reduction in load carrying capacity.

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### 2.3 Shallow Foundation (Slab-on-Grade) Design Parameters

As an alternative, the lighter structures at this site can be supported on a foundation system comprised of Slab-On-Grade. This option will require the removal of roots, organic and unsuitable materials, and replacement with structural select fill as outlined in the "Structural Fill and Subgrade Preparation".

Due to the soil characteristics at this site, at least **36-inches** of structural select fill materials having a Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 & 20 are required to minimize the possibility of vertical displacement. The structural select fill material can be used to elevate the grade, or the existing grade can be undercut for placing structural select fill material. *If positive site drainage is not provided nor assured, the required amount of structural select fill material shall be based on the PVR.*

A thickened reinforced slab stiffened with grade beams can be used for this project. The grade beam under the slab should be 2.5-feet below the final soil grade. The recommendation design parameters are summarized below:

Bearing Capacity:	Dead Load Only:	1,200 psf
	Total (dead and live):	1,800 psf

Foundation slab designed in accordance with above capacity values will have a factor of safety of 3.0 and 2.0 with respect to shearing failure for dead and total loading, respectively. Footing weight below final grade can be neglected in the determination of design loading.

A bedding layer of leveling sand, maximum of 2-inches thick may be placed immediately beneath the floor slab vapor barrier. A vapor barrier consisting of 6 mil plastic sheeting should be placed over the sand cushion to prevent water migration through the concrete slab. The excavation for the grade beams should be clean and free of any loose materials prior to concrete placement.

To assure firm surface soils, and to qualify the use of tabulated capacities, this site requires proof-rolling the building site with a 15-ton roller, or other equivalent suitable equipment as approved by the engineer. The proof-rolling serves to compact surficial soils and to detect any soft or loose zones. The proof-rolling operations should be observed by an experienced geotechnician.

In regions where soft soils are located from proof roll, undercut at least 4-feet of existing soil, process, and replace and compact to provide at least 2-feet of stiff soil on the underside of grade beams; or place and compact structural select fill to provide at least 2-feet of stiff soil on the underside of grade beams. The replaced soil or the placed Structural Select fill material should be placed in maximum of 8-inch loose lift and compacted to a minimum of 95 percent of the maximum dry density as per ASTM D-698. The moisture content should be with -1% to +3% of optimum moisture.

Information was not available on whether fill will be used to raise site prior to construction. In the event fill is placed on the site, specifications should require a uniform thickness throughout the slab area and placement in accordance with our recommendation given in the section "Structural Fill and Subsurface Preparation". Lack of proper consideration of these factors will result in additional stresses and inferior slab performance.

In general, site preparation should consist of removing any grass, weeds, and undesirable materials. The exposed subgrade should be proof-rolled to detect local weak areas which should be excavated, processed, and re-compacted in loose lifts of approximately 8-inch thickness. In floor slab, subgrade soils should be compacted to a minimum of 95% of standard proctor Density Test (ASTM D-698) at moisture content within -1% to + 3 % of optimum moisture. Tree stumps, if present, should be removed below floor slab grade and backfill with structural select fill materials.

## 2.4 Spread Footing Recommendation

Based upon the soil condition revealed by the field soil test borings, the structure at this site can be supported on a foundation system comprised of shallow spread or strip footings. The footing should be founded at a depth of 6-feet below existing grade supported on the firm to very stiff, dark gray, light brown fat clay. The spread foundation design parameters are summarized below for a footing with width that equals or exceeds 3-feet. The footing length and/or width should not exceed 20-feet.

Due to the soil characteristics at this site, at least **36-inches** of structural select fill materials having a Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 & 20 are required to minimize the possibility of vertical displacement. The structural select fill material can be used to elevate the grade, or the existing grade can be undercut for placing structural select fill material. *If positive site drainage is not provided nor assured, the required amount of structural select fill material shall be based on the PVR.*

Allowable Bearing Capacity:

Dead Load Only:	2,000 psf
Total (dead and live):	3,000 psf

The foundation for footing should be preferably skillfully excavated by utilizing equipment with a smooth-mouth bucket, or by hand. If a toothed bucket is used, excavation with this bucket should be stopped 12 inches above final excavation grade and the excavation completed with a smooth-mouthed bucket or by hand labor. Steel should then be placed, and the footing cast (poured) the same day of excavation. Sides of the excavation should be removed prior to steel placement. If for some reason the footing cannot be cast the same day of excavation, a seal slab should be placed on the exposed foundation soils.

If the foundation is formed, the edges should be backfilled with lean concrete or compacted cement-stabilized sand (two sack of cement per cubic yard of sand). The excavation should be sloped sufficiently to create internal sumps for runoff collection and removal. All forming materials should be removed prior to backfilling.

No footing should be cast (poured) without the prior approval of engineers, architect, or owner's representative. A detailed settlement analysis was not authorized, nor performed, at this time, since the exact size and location of the footing are not known at this time. It is anticipated that the footing designed using the allowable bearing capacity will experience small settlements, which will be well within the tolerable limits for the proposed structure. A detailed settlement analysis can be performed, if desired.

The foundation should be protected against erosion, because should support soils be eroded away, a foundation failure could occur. The footing should be designed to provide proper support for the proposed structure, associated with differential movements, which may occur due to changes in the support soils moisture contents.

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## V. PAVEMENT RECOMMENDATIONS

Based on our field investigation and test results in the borings at the parking area (B-5 and B-6), the surficial soils are fat clay. Therefore, these surface soils can be easily handled, retain compaction, and minimize or eliminate rutting if stabilized.

GETI recommends the upper 6 inches of the exposed fat clay final subgrade be stabilized by the addition of 6% lime. Lime stabilization would require the addition of 32 pounds of lime per square yard based on subgrade thickness of 6 inches and a soil dry weight of 100 pounds per cubic foot (pcf).

If the upper 8 inches of the exposed final subgrade be stabilized, it would require the addition of 42 pounds of lime per square yard. The actual stabilization requirements may be varied in the field depending on conditions at the time of construction and should be established by running tests on the exposed subgrade soils.

The actual stabilization requirements may vary in the field depending on conditions at the time of construction and should be established by running tests on the exposed subgrade soils. The stabilized subgrade should be compacted to at least 95% of the standard proctor maximum dry density (ASTM D698) within three percentage points of the optimum moisture content.

Texas Department of Transportation 2014 Standard Specification, Item 260 and 264, should be used as a procedural guide for lime treatment of the subgrade soils and Item 265 for the procedural guide for the lime and fly ash treatment.

The required quantity of lime for use in stabilization as provided above is an estimated value only. The actual quantity of lime should be based on tests performed on the soils used at the time of construction.

The assumptions utilized in our pavement thickness analysis are summarized on Plate No. 9. The following pavement thicknesses are based on these assumptions and procedures published by the Portland Cement Association and the National Crushed Stone Association.

Recommendations for material properties for the paving layers are provided on Plate No. 10. It is estimated that the service life for a properly constructed and maintained pavement will be in order of 20 years. Proper civil design features such as joint design, quantity shoulder support should be incorporated into the plans and specifications. Joints for concrete pavements may be designed using the Texas Department of Highways Item 360.4 (Latest Revision). Periodic maintenance will be required.

Reinforcement for rigid pavement should consist of No. 3 bar placed at 15-inches on center in each direction. Control joints should be placed 15 ft. on center, and expansion joints should not exceed 60 ft. on center.

<b>Automobile Only (DI-1)</b> Daily EAL 5 or less	<b>Flexible Base</b>	<b>Rigid Pavement</b>
	2.0" Hot Mix Asphaltic Concrete	5.0" Reinforced Concrete
	6.0" Crushed Limestone	6.0" Stabilized Compacted Subgrade
	6.0" Stabilized Compacted Subgrade	

<b>Light Duty Access Lanes (DI-2)</b> Daily EAL 6 to 20	<b>Flexible Base</b>	<b>Rigid Pavement</b>
	2.0" Hot Mix Asphaltic Concrete	6.0" Reinforced Concrete
	8.0" Crushed Limestone	6.0" Stabilized Compacted Subgrade
	6.0" Stabilized Compacted Subgrade	

<b>Medium Duty Access Drives (DI-3)</b> Daily EAL 21 to 75	<b>Flexible Base</b>	<b>Rigid Pavement</b>
	3.0" Hot Mix Asphaltic Concrete	6.0" Reinforced Concrete
	8.0" Crushed Limestone	8.0" Stabilized Compacted Subgrade
	8.0" Stabilized Compacted Subgrade	

### 1. Concrete Pavement for Heavy Truck Traffic

Based on a Portland Cement Association (PCA) procedure reported by Yoder and Witczak, "Principles of Pavement Design", 2nd Edition, for a modulus of subgrade reaction defined as 100 lbs./in<sup>3</sup>:

- An eight (8) inch concrete pavement with a modulus of rupture strength of 600 psi (corresponding compressive strength exceeds 4500-psi) should provide adequate service for 100 % truck traffic, 66.67% of the truck axles are tandem with 31 kip loads and 33.33% of the truck axles are single with 10-kip loads.
- A seven (7) inch concrete pavement with a modulus of rupture of 650 psi (corresponding compressive strength exceeds 5300 psi) should provide a 20-year life for 10 % truck traffic, 40% of the truck axles are tandem with 31-kip loads, 60% of the truck axles are single with 10-kip loads.

### Rigid Pavement Reinforcement and Joint Spacing.

For rigid pavement with thickness not exceeding 6 inches, the reinforcement should consist of No. 3 bar placed at 15-inches on center in each direction. Whereas, for the 7 inch and 8-inch rigid pavement thickness, the reinforcement should consist of No. 3 bar placed at 12-inches on center in each direction, or No. 4 bar placed at 15-inches on center in each direction. Control joints should be placed 15 ft. on center, and expansion joints should not exceed 60 ft. on center.



## VI. GENERAL CONSTRUCTION CONSIDERATIONS

- 1.1 In general, remove all vegetation, tree roots, organic topsoil, and any undesirable materials from the construction area. Tree trunks and roots under the floor slabs should be removed to a root size of less than 1/2-inch. All the excavated/extracted tree holes must be backfilled with structural fill or grout or flowable fill. We recommend that the stripping depth be evaluated at the time of construction by a soil technician.
- 1.2 Any on-site fill soils, encountered in the structure areas during construction, must have records of successful compaction tests signed by a registered professional engineer that confirms the use of the fill and record of construction and earthwork testing. These tests must have been performed on all the lifts for the entire thickness of the fill. If no compaction test results are available, the fill soil must be removed, processed, and re-compacted in accordance with our recommendations of "Structural Fill and Subgrade Preparation".
- 1.3 Excavation and placing select fill soils, if needed, should extend at least 2-feet beyond the edge of the structure. Should the structure pad be elevated with higher amount of fill, the select fill soils should extend beyond the edge of the structure equal the height of elevated pad. A maximum distance of 5-feet select fill beyond the edge of the grade beams will suffice for the pad over 5-feet or higher thickness. The fill soils should be tested comprehensively to evaluate the degree of compaction.
- 1.4 Structural select Fill, used to elevate the existing grade, should have the minimum side slope in general as follows:

Average Slope Height (ft)	Recommended Slope (H:V)
0 - 2	1:1
2 - 4	2:1
4 - 6	3:1
6+	4:1

- 1.5 The subgrade areas should then be proof-rolled with a 15-ton roller, or other equivalent suitable equipment as approved by the engineer. The proof-rolling serves to compact surficial soils and to detect any soft or loose zones. Any soils deflecting excessively under moving loads should be undercut to firm soils and re-compacted. The proof-rolling operations should be observed by an experienced geotechnician.
- 1.6 In the areas where expansive soils are present, rough grade the site with structural fill soils to insure positive drainage. Due to their high permeability of sands, sands should not be used for site grading where expansive soils are present.
- 1.7 We recommend that the site and soil conditions used in the structural design of the foundation be verified by the engineer's site visit after all the earthwork and site preparation has been completed prior to the concrete placement.

## **2. Structural Fill and Subgrade Preparation**

It is recommended that the subgrade and fill be prepared as follow:

- 2.1 The site should be stripped to suitable depth to remove any top soil and miscellaneous fill material. The exposed subgrade surface then should be proof rolled. All soft or loose soils should be removed and replaced with select fill materials.
- 2.2 The natural subgrade should be scarified to a minimum depth of 6-inches. The scarified soils should then be recompact to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor Density Test (ASTM D698). The moisture content should range from -1% to +3% of optimum moisture.
- 2.3 The Structural Select fill should consist of a clean Sandy Clay with Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 and 20. Specifications should require a uniform thickness throughout the slab area.
- 2.4 The Structural Select fill material should be placed in maximum of 8-inches loose lift and compacted to a minimum of 95 percent of the maximum dry density as per ASTM D698. The moisture content should be within -1% to +3% of optimum moisture.
- 2.5 A bedding layer of leveling sand may be placed beneath the floor slab vapor barrier. The leveling sand depth should not exceed 2-inches; and the leveling sand must be covered with plastic sheeting. A vapor barrier consisting of 6-mil plastic sheeting should be placed over the sand cushion to prevent water migration through the concrete slab. The excavations for the grade beams should be clear and free of any loose materials prior to concrete placement.
- 2.6 In cut areas, the soils should be excavated to grade, and the surface soils proof rolled and scarified to a minimum depth of 6-inches and recompact to the previously mentioned density tests at the time of construction.
- 2.7 The select fill soil extending from the building towards the building line should be capped with on-site high plastic clay soils in order to retard any water seepage into subgrade soils.

## **3. Surface Drainage**

It is recommended that the site drainage be well developed. Surface water should be directed away from the foundation soils (use a minimum of 2% with 10-feet away of foundation). No ponding of surface water should be allowed near the structure. The following drainage precaution should always be observed during construction and after the structure has been completed.

- 1) Backfill around the structure should be a cohesive soil material which should be moistened and compacted to at least 90-percent of standard proctor density. Any cohesionless soil material accumulated around the perimeter of the structure during construction should be removed and not allowed to be mixed with or covered by the backfill material.

- 2) Where landscaping is to be installed next to the perimeter of grade beam, a moisture barrier or other suitable means should be installed to prevent moisture from entering the underlying clay soils.
- 3) Roof downspouts and drains should discharge well away from the limits of the foundation or grade beams.

#### **4. Vegetation Control**

We recommend trees not to be closer than half the canopy diameter of the mature tree from the grade beams, typically a minimum of 20-feet. This will minimize possible foundation settlement caused by the tree root systems.

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## **VII. GENERAL FLOODING CONSIDERATIONS - FOUNDATION SYSTEMS AND SITE DEVELOPMENT**

Determining site specific flood zone(s) and related building criteria is beyond the scope of this report. Due to regional storm and flooding events, municipalities and counties in the Texas gulf coast region have revised and developed design standards to reduce the risk of flood loss for future development and redevelopment. Rules and regulations concerning flood hazard areas define requirements for permitted floor elevations and may define the type of foundation construction. Although other criteria may apply, the required floor elevations (and in some instances required lowest horizontal structural member elevations) may be defined using a specified freeboard distance above an elevation that corresponds to the 500-year flood plain (0.2 percent chance of reaching in any given year).

Site development engineering firms provide services for site drainage and assuring compliance with floor elevations defined by standards for type of constructed facility in the region where the subject property is located. Surveying firms provide certificates for finished floor elevations that may or will be required for compliance with standards.

General Definitions Concerning Site Development and Construction: Elevated Floor Construction can be defined as an engineered foundation system that is not constructed on natural grade, but uses a combination of vertical and horizontal members to support a structure above natural grade; Fill means any material that is placed in an area and increases the elevation of that area or displaces water volume; Conveyance may be defined as the flow of water during the base flood with a velocity that is greater than one foot per second or a depth that is greater than one foot; Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than the height specified for the site in the flood insurance study; and Floodway Conveyance Offset Volume means the volume of material that must be excavated and removed from the special flood hazard area to provide an equivalent storage volume necessary to reduce loss of conveyance associated with development within the floodway.

No Net Fill – May be defined as any reduction in flood plain storage or conveyance capacity within the 1 percent or 100-year flood plain must be offset with a hydraulically equivalent (one-to-one) volume of mitigation enough to offset the reduction. The reduction may result from development or the placement of fill within the 1% flood plain or 100-year flood plain.

Structural Floor Elevation Requirements - To provide a required structural floor elevation in regions corresponding to “coastal high hazard” areas, fill is not permitted to support a structure, and all space between the lowest horizontal structural member and the final soil grade is provided by a crawl space or walk space that is open so as to not impede the flow of water; whereas in other flood risk regions, a crawl space or walk space enclosed by perimeter load bearing stem walls may be permitted for a required structural floor elevation, provided the load bearing wall has sufficient openings to facilitate automatic entry and exit of floodwaters. In areas with a low flood risk, permits may be obtained for Grade-Supported Stiffened Non-Structural Slab, Stiffened Non-Structural Slab with Deep Foundations, Structural Slab with Void Space and Deep Foundations, and other types of shallow foundation systems.

Floodway Requirements - The bottom of the lowest horizontal sill, beam or member supporting the structure in the floodway may be required to be at least 36-inches above the 0.2 percent or 500-year flood elevation.; A hydraulic analysis of pre- and proposed development conditions may be required to

show no increase in the elevation of the base flood will occur as a result of a development; and The minimum embedment below natural grade for driven piles and drilled piers may be 20-feet.

#### **FLOODING CONSIDERATIONS – LINKS FOR FOUNDATION SYSTEMS AND SITE DEVELOPMENT**

The following links primarily correspond to Houston and Harris County. This partial list does not address all affected counties or municipalities that may have additional or specific requirements concerning design standards to reduce the risk of flood loss for future development and redevelopment.

#### **2018 CITY OF HOUSTON CONSTRUCTION CODES:**

[https://edocs.publicworks.houstontx.gov/documents/divisions/planning/enforcement/hpw\\_ce1199\\_2018\\_city\\_of\\_houston\\_codes.pdf](https://edocs.publicworks.houstontx.gov/documents/divisions/planning/enforcement/hpw_ce1199_2018_city_of_houston_codes.pdf)

#### **CITY OF HOUSTON ORDINANCE NO.2018-258**

[https://library.municode.com/tx/houston/ordinances/code\\_of\\_ordinances?nodeId=891265](https://library.municode.com/tx/houston/ordinances/code_of_ordinances?nodeId=891265)

#### **CITY OF HOUSTON - PUBLIC WORKS BUILDING CODE ENFORCEMENT BRANCH - BUILDING CODE DESIGN CRITERIA**

[https://edocs.publicworks.houstontx.gov/documents/divisions/planning/enforcement/hpw\\_ce1110\\_coh\\_building\\_code\\_design\\_criteria.pdf](https://edocs.publicworks.houstontx.gov/documents/divisions/planning/enforcement/hpw_ce1110_coh_building_code_design_criteria.pdf)

#### **HARRIS COUNTY**

<http://www.eng.hctx.net/permits>  
<http://www.eng.hctx.net/Portals/23/Publications/FP101.pdf>  
<https://www.hcfd.org/contact-us/floodplain-administrators/>  
[http://www.eng.hctx.net/Portals/33/Publications/FPM\\_REGS\\_Nov7.pdf](http://www.eng.hctx.net/Portals/33/Publications/FPM_REGS_Nov7.pdf)

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## VIII. DISCLAIMER

The information and recommendation contained in the report summarized condition found at the site of the proposed community center-Attack Poverty Facility located at 1908 Avenue E, in Rosenberg, Texas specified and on the date the field exploration was completed. The attached soil boring logs are a true representation of the soils encountered at the stratigraphy as found during the field exploration and drilling of the subject site.

Reasonable variations from the subsurface information presented in this report are assumed. If conditions encountered during construction are significantly different than those presented in this report, GETI should be notified immediately.

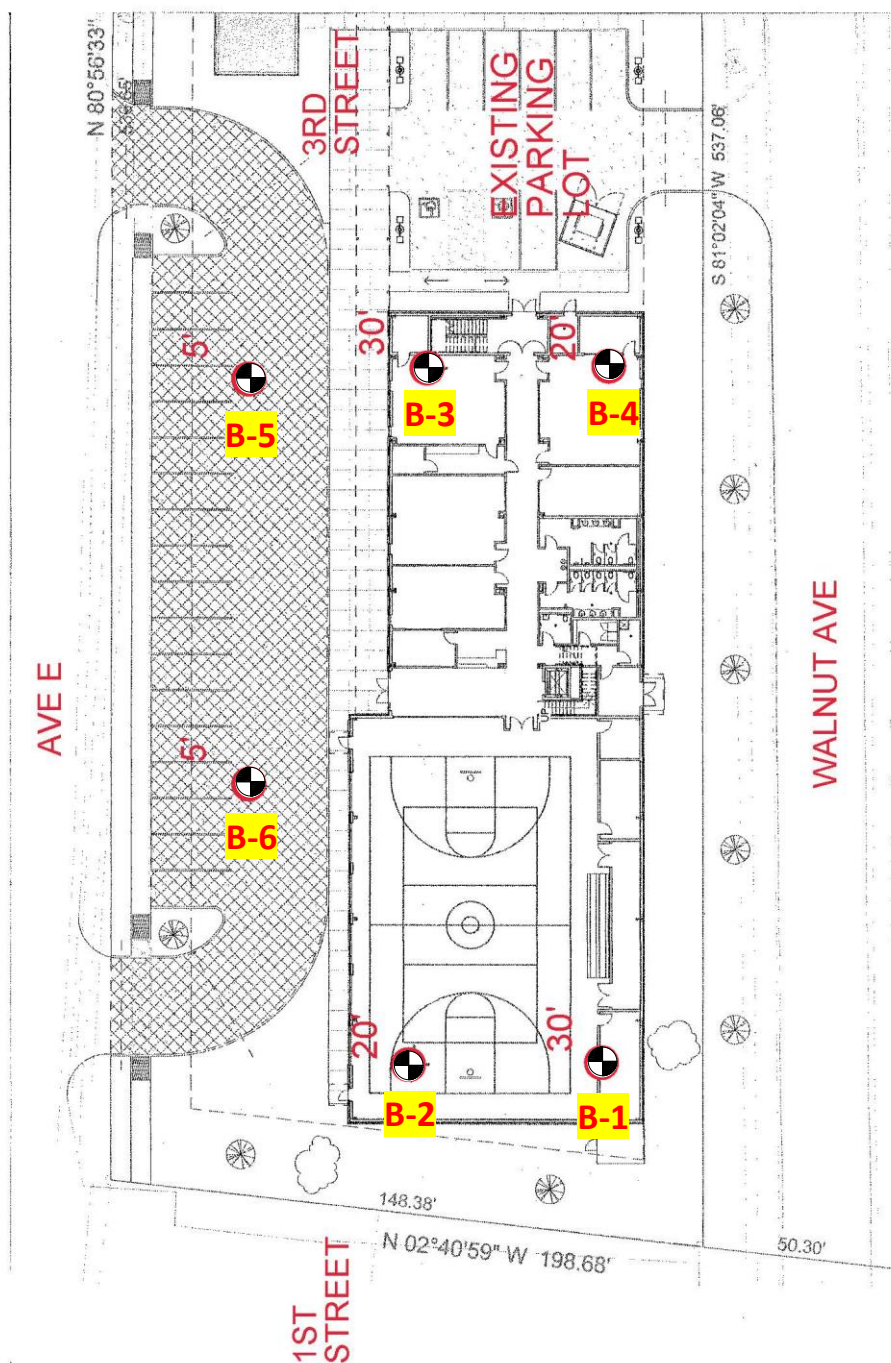
The report was prepared for the sole and exclusive use by our client, based on specific and limited objectives. All reports, boring logs, field data, laboratory test results, and other documents prepared by GETI as instruments of service shall remain the property of GETI. Reuse of these documents is not permitted without written approval by GETI, which also assumes no responsibility or obligation for the unauthorized use of this report by other parties and for purposes beyond the stated project objectives and work limitations.

In addition, the construction process may itself alter site soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures and all conditions encountered. We recommend that the owner retain Geoscience Engineering and Testing, Inc. to provide this service as well as the construction material and testing and inspection required during the construction phase of the project.

The standard of care for all professional engineering and related services performed by Geoscience Engineering & Testing, Inc. (GETI) corresponds to other geotechnical firms under similar circumstances in the project locality. GETI makes no warranties, express or implied, under this agreement or in connection with any services performed or furnished by us.

We would welcome the opportunity to discuss our recommendation with you and hope we may have the opportunity to provide any additional studies or service to complete this project. The following illustrations are attached and complete this report:

ILLUSTRATIONS	PLATE NUMBERS
Boring Locations Plan	1
Boring Logs	2-7
Symbols and Terms used on Boring Logs	8
Assumptions for Pavement Analysis	9
Pavement Material Recommendations	10
Site Pictures	11



Approximate Boring  
Location

#### LOCATION

Proposed Community Center  
Attack Poverty Facility  
1908 Avenue E  
Rosenberg, Texas  
GETI NO: 21G10708

NOT TO SCALE

PLATE NO.: 1



<b>PROJECT: Proposed Community Center</b> <b>Attack Poverty Facility</b> 1908 Avenue E Rosenberg, Texas												<b>BORING NO.: B-1</b>		<b>DEPTH: 30'</b>					
<b>CLIENT: James Knight Architects</b> Director of Facilities / Architect - Fort Bend County Richmond, Texas												<b>PROJECT NO. 21G10708</b>		<b>DATE: January 5, 2022</b>					
												<b>Drilling Crew: GXP</b>							
												<b>Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler</b>							
												<b>Water was NOT encountered during drilling operation</b>							
<b>FIELD DATA</b>						<b>LABORATORY DATA</b>						<b>DRILLING METHOD (S)</b>							
<b>DEPTH (FEET)</b>	<b>SOIL SYMBOL</b>	<b>SAMPLES</b>	<b>N: BLOWS/FT</b>	<b>T: INCHES/100 BLOWS</b>	<b>P: TONS/SQ FT</b>	<b>RQD: PERCENT</b>	<b>MOISTURE CONTENT (%)</b>	<b>DRY DENSITY POUNDS/CU. FT</b>	<b>ATTERBERG LIMITS (%)</b>			<b>MINUS NO. 200 SIEVE (%)</b>	<b>SHEAR STRENGTH (TSF)</b>	<b>Continuous Flight Auger &amp; Intermittent Sampling</b>  <b>Legend</b>  <div><div>Fat Clay</div><div>Lean Clay / Silty Clay</div><div>Silty Sand / Sandy Silt</div><div>Fill</div><div>Clayey Sand</div><div>Silty Clayey Sand</div></div>					
									<b>LIQUID LIMIT</b>	<b>PLASTIC LIMIT</b>	<b>PLASTICITY INDEX</b>								
									<b>LL</b>	<b>PL</b>	<b>PI</b>			<b>DESCRIPTION OF STRATUM</b>					
5			P=1.0			31		75	29	49			Dark gray FAT CLAY (CH) - firm to stiff with roots from 0 to 2' - soft to firm from 2' to 4' - firm from 4' to 6'						
			P=0.5			32													
			P=0.75			28													
10			P=2.75			20		48	19	29			Very stiff, reddish brown LEAN CLAY (CL)						
			P=2.25			14													
			P=4.0+			19		49	20	29	99								
15			N=23			14		20	14	6	34		Medium dense, reddish brown and light brown SILTY CLAYEY SAND (SC-SM)						
			N=21			10													
25			P=3.5			14								Very stiff, light brown and reddish brown FAT CLAY with calcareous nodules (CH)					
			P=3.0			20													
30																			
N- STANDARD PENETRATION TEST RESISTANCE T- TXDOT CONE PENETRATION RESISTANCE P- POCKET PENETROMETER RESISTANCE R- PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION												<b>GEOSCIENCE ENGINEERING</b> <b>&amp;</b> <b>TESTING, INC</b>				<b>PLATE NO. 2</b>			



<b>PROJECT: Proposed Community Center</b> <b>Attack Poverty Facility</b> 1908 Avenue E Rosenberg, Texas													<b>BORING NO.:</b> B-2 <b>PROJECT NO.</b> 21G10708 <b>Drilling Crew:</b> GXP <b>Drilling Type:</b> Truck/Trailer Mounted Rig w/ 3-inch Sampler			<b>DEPTH:</b> 20' <b>DATE:</b> January 5, 2022			
<b>CLIENT: James Knight Architects</b> Director of Facilities / Architect - Fort Bend County Richmond, Texas													Water was <b>NOT</b> encountered <b>during drilling operation</b>						
FIELD DATA							LABORATORY DATA							DRILLING METHOD (S)					
DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	<b>Continuous Flight Auger &amp; Intermittent Sampling</b>  <div><div>Legend</div><div><div>Fat Clay</div><div>Fill</div><div>Lean Clay / Silty Clay</div><div>Clayey Sand</div><div>Silty Sand / Sandy Silt</div><div>Silty Clayey Sand</div></div></div>					
									LL	PL	PI								
			P=1.25				19		59	23	36			Stiff, brown FAT CLAY with calcareous nodules and roots (CH)					
			P=1.25				30							Dark gray FAT CLAY (CH) - stiff from 2' to 4' - firm to stiff from 4' to 6'					
5			P=1.0				29		88	32	56								
			P=3.25				17	113					1.50	Very stiff, reddish brown SANDY LEAN CLAY (CL)					
			P=3.0				16												
10			P=4.0+				25		52	20	32			Very stiff to hard, reddish brown and light brown FAT CLAY (CH)					
			N=22				10							Medium dense, reddish brown and light brown SILTY CLAYEY SAND (SC-SM)					
			N=21				9												
25																			
30																			
N- STANDARD PENETRATION TEST RESISTANCE T- TXDOT CONE PENETRATION RESISTANCE P- POCKET PENETROMETER RESISTANCE R- PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										GEOSCIENCE ENGINEERING & TESTING, INC					PLATE NO. 3				

<div>PROJECT: Proposed Community Center Attack Poverty Facility 1908 Avenue E Rosenberg, Texas</div> <div>CLIENT: James Knight Architects Director of Facilities / Architect - Fort Bend County Richmond, Texas</div>												<div>BORING NO.: B-3 PROJECT NO. 21G10708 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler</div>				<div>DEPTH: 30' DATE: January 5, 2022</div>	
Water was NOT encountered during drilling operation																	
FIELD DATA						LABORATORY DATA						DRILLING METHOD (S)					
DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	<div>Continuous Flight Auger &amp; Intermittent Sampling</div> <div><div>Legend</div><div><div>Fat Clay</div><div>Lean Clay / Silty Clay</div><div>Silty Sand / Sandy Silt</div><div>Fill</div><div>Clayey Sand</div><div>Silty Clayey Sand</div></div></div>			
									LL	PL	PI						
0			P=0.75				29								Firm, dark gray FAT CLAY (CH) - with roots from 0 to 2'		
2			P=0.75				28		80	30	50						
4			P=0.75				26										
6			P=4.0+				17		31	16	15	57			Reddish brown SANDY LEAN CLAY (CL) - very stiff to hard from 6' to 8' - very stiff from 8' to 10'		
8			P=3.5				22										
10			P=4.0				22	101					1.40		Reddish brown LEAN CLAY (CL) - very stiff from 10' to 12'  - stiff from 13' to 15'		
12			P=1.5				21		31	16	15						
14															Medium dense, reddish brown and light brown SILTY CLAYEY SAND (SC-SM)		
16																	
18																	
20			N=22				22										
22																	
24			P=4.0+				14		51	21	30				Very stiff to hard, light brown and reddish brown FAT CLAY with calcareous nodules (CH)		
26																	
28			P=4.0+				14										
30																	
N- STANDARD PENETRATION TEST RESISTANCE T- TXDOT CONE PENETRATION RESISTANCE P- POCKET PENETROMETER RESISTANCE R- PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION										GEOSCIENCE ENGINEERING & TESTING, INC					PLATE NO. 4		

<div>PROJECT: Proposed Community Center Attack Poverty Facility 1908 Avenue E Rosenberg, Texas</div> <div>CLIENT: James Knight Architects Director of Facilities / Architect - Fort Bend County Richmond, Texas</div>													<div>BORING NO.: B-4 PROJECT NO. 21G10708 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler</div>			<div>DEPTH: 20' DATE: January 5, 2022</div>	
Water was NOT encountered during drilling operation																	
FIELD DATA						LABORATORY DATA							DRILLING METHOD (S)				
DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	<div>Continuous Flight Auger &amp; Intermittent Sampling</div> <div><div>Legend</div><div><div>Fat Clay</div><div>Lean Clay / Silty Clay</div><div>Silty Sand / Sandy Silt</div><div>Fill</div><div>Clayey Sand</div><div>Silty Clayey Sand</div></div></div>			
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX						
									LL	PL	PI						
			P=1.5				23		61	25	37			Dark gray FAT CLAY (CH) - firm to stiff with roots from 0 to 2' - soft to firm from 2' to 4' - firm from 4' to 6'			
			P=1.5				21						1.75	Very stiff, reddish brown LEAN CLAY (CL)			
			P=3.75				18		61	25	37			Very stiff to hard, reddish brown SANDY LEAN CLAY (CL)			
			P=3.25				19	117						Reddish brown LEAN CLAY (CL) - very stiff from 10' to 12' - firm to stiff from 13' to 15'			
			P=4.0+				17							Medium dense, reddish brown and light brown SILTY CLAYEY SAND (SC-SM)			
			P=3.25				20										
			P=1.0				20		30	16	14	86					
			N=20				22										
						</											

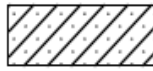
<b>PROJECT: Proposed Community Center</b> <b>Attack Poverty Facility</b> 1908 Avenue E Rosenberg, Texas <b>CLIENT: James Knight Architects</b> Director of Facilities / Architect - Fort Bend County Richmond, Texas												BORING NO.: <b>B-5</b> PROJECT NO. 21G10708 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler		DEPTH: <b>6'</b> DATE: January 5, 2022	
Water was <b>NOT</b> encountered <b>during drilling operation</b>															
FIELD DATA						LABORATORY DATA						DRILLING METHOD (S)			
DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	<b>Continuous Flight Auger &amp; Intermittent Sampling</b>  <div><div><div>Legend</div><div><div>Fat Clay</div><div>Lean Clay / Silty Clay</div><div>Silty Sand / Sandy Silt</div><div>Fill</div><div>Clayey Sand</div><div>Silty Clayey Sand</div></div></div></div>	
									LL	PL	PI				
<b>DESCRIPTION OF STRATUM</b>															
			P=1.0			26		89	32	57			Dark gray FAT CLAY (CH) - firm to stiff with roots from 0 to 2' - soft to firm from 2' to 4'		
			P=0.5			33									
5			P=1.0			29		83	30	53			Firm to stiff, light brown FAT CLAY (CH)		
10															
15															
20															
25															
30															
N- STANDARD PENETRATION TEST RESISTANCE T- TXDOT CONE PENETRATION RESISTANCE P- POCKET PENETROMETER RESISTANCE R- PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION									GEOSCIENCE ENGINEERING & TESTING, INC				PLATE NO. 6		

<div>PROJECT: Proposed Community Center Attack Poverty Facility 1908 Avenue E Rosenberg, Texas</div> <div>CLIENT: James Knight Architects Director of Facilities / Architect - Fort Bend County Richmond, Texas</div>												<div>BORING NO.: B-6 PROJECT NO. 21G10708 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler</div>				<div>DEPTH: 6' DATE: January 5, 2022</div>			
												Water was NOT encountered during drilling operation							
FIELD DATA						LABORATORY DATA						DRILLING METHOD (S)							
DEPTH (FEET)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT	T: INCHES/100 BLOWS	P: TONS/SQ FT	RQD: PERCENT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU. FT	ATTERBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	<div>Continuous Flight Auger &amp; Intermittent Sampling</div> <div><div>Legend</div><div><div>Fat Clay</div><div>Lean Clay / Silty Clay</div><div>Silty Sand / Sandy Silt</div><div>Fill</div><div>Clayey Sand</div><div>Silty Clayey Sand</div></div></div>					
									LL	PL	PI								
0			P=1.5				30		70	27	43			Stiff, dark gray FAT CLAY (CH)					
1			P=1.25				27		76	29	47								
5			P=1.5				26												
10																			
15																			
20																			
25																			
30																			
N- STANDARD PENETRATION TEST RESISTANCE T- TXDOT CONE PENETRATION RESISTANCE P- POCKET PENETROMETER RESISTANCE R- PERCENTAGE OF ROCK CORE RECOVERY RQD - ROCK QUALITY DESIGNATION									GEOSCIENCE ENGINEERING & TESTING, INC					PLATE NO. 7					

## KEY TO SOIL CLASSIFICATION AND SYMBOLS



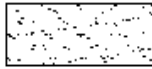
Gravel (GW, GP,  
GM, GC)



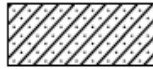
Clayey Sand (SC)



Sandy Silt (ML)



Sand (SW, SP)



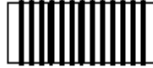
Clayey Silt (ML)



Silty or  
Sandy Clay (CL)



Silty Sand (SM)



Silt (ML)



Clay (CH)

### CONSISTENCY OF COHESIVE SOILS

Description	Shear Strength KSF	Penetration Resistance Blows/ Ft
Very Soft	Less than 0.25	0 - 2
Soft	0.25 - 0.5	2 - 4
Firm	0.5 - 1.00	4 - 8
Stiff	1.00 - 2.00	8 - 15
Very Stiff	2.00 - 4.00	15 - 30
Hard	Greater than 4.00	>30

### RELATIVE DENSITY OF COHESIONLESS SOILS

Description	Penetration Resistance Blows / Ft	Relative Density %
Very Loose	0 - 4	0 - 15
Loose	4 - 10	15 - 35
Medium dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	>50	85 - 100

### Soil Structure

CALCAREOUS NODULES

-- Nodules of Calcium Carbonate

FERROUS NODULES

-- Nodules of Ferrous Material

SLICKENSIDED

-- Having inclined planes of weakness that are slick and glossy

BLOCKY

-- Having inclined planes of weakness that are frequent and rectangular in pattern

LAMINATED

-- Composed of thin layers of varying soil type and texture

FISSURED

-- Containing shrinkage cracks frequently filled with fine sand

INTERBEDDED

-- Composed of alternate layers of different soil types



Shelby Tube  
Sample



Standard Penetration  
Test



Auger or Wash  
Sample



No Recovery

### GROUNDWATER



(24 hours) - Water Level after drilling (time increment after drilling)



- Free Water observed during drilling

### FAILURE DESCRIPTION (COMPRESSION TEST)

B - Bulge

S - Shear

M/S - Multiple Shear

SLS - Failure surface occurring along slickensided plane

SAS - Failure surface occurring along or in sand seam

SS - Failure surface occurring in or along other secondary structure such as calcareous pockets

## **ASSUMPTIONS FOR PAVEMENT ANALYSIS**

### **1.0     Traffic Conditions - (National Crushed Stone Assoc.)**

#### **1.01         Parking Lots (DI-1)**

Light traffic - Few vehicles heavier than cars.  
No regular use by trucks.

Daily EAL = 5 or less

#### **1.02         Parking Lots & Light duty Access Lanes (DI-2)**

Medium-Light traffic - Maximum of 1000 vehicles per day,  
including not more than 10 percent two axle loaded trucks  
or larger vehicles carrying light loads or empty.

Daily EAL = 6 to 20

#### **1.03         Medium Duty Access Drives (DI-3)**

Medium traffic - Maximum of 3000 vehicles per day, including  
not more than 10 percent two axle trucks or 1 percent heavy trucks  
with three or more axles.

Daily EAL = 21 to 75

### **2.0     Flexible Base Pavement**

#### **2.01         Saturated CBR of natural clay subgrade: 3**

#### **2.02         CBR of imported clay subgrade: 6**

### **3.0     Rigid Pavement**

#### **3.01         Modulus of subgrade reaction: 100 pci (imported clay subgrade)**

#### **3.02         Modulus of rupture: 500 psi at 7 days (concrete)**

**PLATE NO.: 9**

## PAVEMENT MATERIAL RECOMMENDATIONS

- 1.0 Limestone Base - Base material shall be composed of crushed limestone meeting the requirements of grade 1 in the Texas Department of Transportation (TxDOT) 2014 Standard Specifications Item 247. The limestone shall be compacted to a minimum of 95 percent of the maximum density as determined by the Modified moisture/density relation (ASTM D1557).
  
- 2.0 Hot Mix Asphaltic Concrete Surface Course (Class "A") - The asphaltic surface course should be plant mixed, hot laid Type "D": (Fine Graded Surface Course) and meet the requirements specified in TxDOT Item 340.
  
- 3.0 Concrete - The materials and properties of concrete shall meet the applicable requirements in the ACI Manual of Concrete Practice. The concrete shall have a minimum modulus of rupture of 500 psi at 7 days as per ASTM C 293. It is our experience that concrete with a compressive strength of 3000 psi should meet this criteria. The mixture shall contain 3 to 5 percent entrained air.

PLATE NO.: 10





**Project No.: 21G10708**  
**PLATE NO.: 11**



# FORT BEND COUNTY NEW COMMUNITY CENTER

Avenue E and Second Street Rosenberg, Texas 77471



## CONSTRUCTION DOCUMENTS 05.03.2022

### ABBREVIATIONS

A/C	AIR CONDITIONING	LAV	LAVATORY
AC	ACOUSTICAL	MAT	MATERIAL
ACM	ALUMINUM COMPOSITE PANEL	MBM	METAL BUILDING
ADJ	ADJUSTABLE	MECH	MECHANICAL
AFF	ABOVE FINISHED FLOOR	MFR	MANUFACTURER
ALUM	ALUMINUM	MIN	MINIMUM
ANOD	ANODIZED	MO	MASONRY OPENING
APPROX	APPROXIMATE	MTD	MOUNTED
BD	BOARD	MTL	METAL
BLDG	BUILDING	NIC	NOT IN CONTRACT
BO	BOTTOM OF	NOM	NOMINAL
BOS	BACK OF STEEL	NTS	NOT TO SCALE
BRK	BRICK	OC	ON CENTER
BS	BOTH SIDES	O/O	OUTSIDE FACE TO OUTSIDE FACE
BTWN	BETWEEN	OPNG	OPENING
CJ	CONTROL JOINT	OPP HND	OPPOSITE HAND
CL	CENTER LINE	P LAM	PLASTIC LAMINATE
CLG	CEILING	PF	PREFINISHED
CLR	CLEARANCE	PFN	PREFINISHED
CMU	CONCRETE MASONRY UNIT	PLYWD	PLYWOOD
C O	CASED OPENING	PLMBG	PLUMBING
COL	COLUMN	PTD	PAINTED
CONC	CONCRETE	PTN	PARTITION
CONT	CONTINUOUS	R/A	RETURN AIR
COORD	COORDINATE	R	RADIUS
CORR	CORRIDOR	RAG	RETURN AIR GRILLE
CPT	CARPET	RE	REFER TO
DIA	DIAMETER	REQD	REQUIRED
DIM	DIMENSION	REQS	REQUIREMENTS
DP	DEEP	RES	RESILIENT
DS	DOWNSPOUT	RO	ROUGH OPENING
DTL	DETAIL	SAN	SANITARY
DWGS	DRAWINGS	SC	SOLID CORE
EA	EACH	SF	SQUARE FEET
EDF	ELECTRIC DRINKING FOUNTAIN	SHT	SHEET
EJ	EXPANSION JOINT	SHT MTL	SHEET METAL
ELEC	ELECTRICAL	SIM	SIMILAR
EQ	EQUAL	SPEC	SPECIFIED/SPECIFICATIONS
EXG	EXISTING	SQ	SQUARE
EXPD	EXPOSED	STRUC	STRUCTURAL/STRUCTURE
EXT	EXTERIOR	SS	STAINLESS STEEL
EWC	ELECTRIC WATER COOLER	STL	STEEL
EWV	ELECTRIC WATER HEATER	STD	STANDARD
FD	FLOOR DRAIN	SUSP	SUSPENDED
FEC	FIRE EXTINGUISHER CABINET	T&G	TONGUE AND GROOVE
F/F	FACE TO FACE (INSIDE)	TCP	TEXTURED CONCRETE PAVING
FF	FINISHED FLOOR	TEL	TELEPHONE
FIN FLR	FINISHED FLOOR	THK	THICK
FIXT	FIXTURE	TOB	TOP OF BRICK
FOB	FACE OF BRICK	TOC	TOP OF CONCRETE
FV	FIELD VERIFY	TOP	TOP OF PAVING
GA	GAUGE	TOS	TOP OF STEEL
GALV	GALVANIZED	TR	TREATED
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GFRG	GLASS FIBER-REINFORCED	UNO	UNLESS NOTED OTHERWISE
GYP	GYP	VCT	VINYL COMPOSITION TILE
HC	HOLLOW CORE	VERT	VERTICAL
HDWR	HARDWARE	VIF	VERIFY IN FIELD
HDCP	HANDICAP (ACCESSIBLE)	VOL	VOLUME
HFS	HALF FULL SCALE	VWC	VINYL WALLCOVERING
HM	HOLLOW METAL	W/	WITH
HORIZ	HORIZONTAL	WC	WATER CLOSET
HT	HEIGHT	WD	WOOD
INSUL	INSULATION	WP	WORKING POINT
INT ELEV	INTERIOR ELEVATION	WWF	WELDED WIRE FABRIC
JT	JOINT		

THE ABOVE LISTING OF ABBREVIATIONS ARE INCLUDED FOR THE CONVENIENCE OF THE CONTRACTOR AND IS NOT INTENDED AS A COMPLETE LISTING OF ALL ABBREVIATIONS USED IN THE CONTRACT DOCUMENTS. OTHER ABBREVIATIONS MAY BE USED AND SHALL HAVE THE SAME MEANING AS IN COMMON OR NORMAL TECHNICAL LANGUAGE.



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NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

### CONTACTS

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CONTACT(S): JAMES KNIGHT

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#### STRUCTURAL ENGINEER

SCA CONSULTING ENGINEERS  
12511 EMILY COURT  
HOUSTON, TX 77478  
PH. (713) 779-7252  
CONTACT(S): LARRY FUNK

#### CIVIL ENGINEER

ALJ LINDSEY  
5629 FM 1960 WEST, SUITE 314  
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CONTACT(S): BRETT HANRAHAN

#### MEP ENGINEER

THE TOWER COMPANY  
5444 WESTHEIMER, SUITE 1680  
HOUSTON, TX 77056  
PH. (713) 626-7600  
CONTACT: BILL TOWER

### MASTER LEGEND

101	DOOR ID
A	WINDOW ID
1	PARTITION TYPE (RE: SCHEDULE)
Room name 101	ROOM NAME & NUMBER
1X	KEYED NOTES
1 A101	DETAILED FLOOR PLAN & PLAN DETAILS
1 Ref A8.X	INTERIOR ELEVATION(S)
1 Ref A101	EXTERIOR ELEVATION(S)
1 A5.X	BUILDING SECTION
1 A6.X	WALL SECTION

### GENERAL NOTES

- A. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CODES, INCLUDING THE 2018 INTERNATIONAL BUILDING CODE AND ROSENBERG UNIFIED DEVELOPMENT CODE. THE DRAWINGS AND SPECIFICATIONS ARE AN OUTLINE OF THE MINIMUM MATERIAL REQUIREMENTS AND THEIR APPLICATION. MANUFACTURER'S SPECIFICATIONS AND REQUIREMENTS, WHEN IN EXCESS OF MINIMUM SPECIFICATIONS, SHALL CONTROL.
- B. BEFORE COMMENCING WORK, CONTRACTOR SHALL PERFORM A SURVEY OF EXISTING CONDITIONS IN ORDER TO VERIFY ACCURACY AND COMPATIBILITY OF DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS WITH ACTUAL CONDITIONS. CONTRACTOR SHALL NOTIFY ARCHITECT IMMEDIATELY IN WRITING OF ALL DISCREPANCIES FOUND WHICH MAY AFFECT THE WORK. PROCEEDING WITH THE WORK SHALL CONSTITUTE ACCEPTANCE BY THE CONTRACTOR THAT CONDITIONS ARE CORRECT AND THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR CONDITIONS.
- C. REPAIR AND REPLACE TO ITS ORIGINAL CONDITIONS ANY EXISTING ADJACENT CONSTRUCTION AFFECTED BY THE NEW CONSTRUCTION WORK.
- D. ALL CONSTRUCTION SHALL BE COMPLETE, FINISHED, AND OF THE HIGHEST QUALITY WORKMANSHIP. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE OWNER AND ARCHITECT. VERIFY ALL SPECIFICATIONS WITH THE ARCHITECT PRIOR TO COMMENCING THE WORK.
- E. DO NOT SCALE DRAWINGS.

### DRAWING INDEX

#### GENERAL

A0.0	TITLE
A0.1	CODE ANALYSIS
A0.2	LIFE SAFETY PLANS
A0.3	PARTITION SCHEDULE

#### CIVIL

C0.0	COVER SHEET
C0.1	GENERAL NOTES
C0.2	TOPOGRAPHIC SURVEY
C0.3	PLAT
C1.0	DEMOLITION PLAN
C1.1	DIMENSION CONTROL PLAN
C2.0	UTILITY PLAN
C3.0	EXISTING OVERALL DRAINAGE AREA MAP
C3.1	STORM SEWER PLAN
C4.0	GRADING PLAN
C5.0	PAVING PLAN
C6.0	EROSION CONTROL PLAN
C7.0	CONSTRUCTION DETAILS (1 OF 4)
C7.1	CONSTRUCTION DETAILS (2 OF 4)
C7.2	CONSTRUCTION DETAILS (3 OF 4)
C7.3	CONSTRUCTION DETAILS (4 OF 4)
C7.4	CITY OF ROSENBERG PAVEMENT DETAILS
C7.5	CITY OF ROSENBERG UTILITY DETAILS

#### ARCHITECTURAL

D1.0	DEMOLITION SITE PLAN
A1.0	OVERALL SITE PLAN
A1.1	ENLARGED SITE PLAN
A2.0	FOUNDATION FORMING PLAN
A2.1	1ST FLOOR PLAN
A2.2	2ND FLOOR PLAN
A2.3	1ST FLOOR REFLECTED CEILING PLAN
A2.4	2ND FLOOR REFLECTED CEILING PLAN
A2.5	ROOF PLAN
A2.6	1ST FLOOR FINISH PLAN
A2.7	2ND FLOOR FINISH PLAN
A3.1	DOOR & WINDOW SCHEDULE
A4.1	EXTERIOR ELEVATIONS
A4.2	EXTERIOR ELEVATIONS
A5.1	BUILDING SECTIONS
A5.2	BUILDING SECTIONS
A6.1	WALL SECTIONS
A6.2	WALL SECTIONS
A6.3	STAIR / ELEVATOR SECTIONS
A6.4	STAIR SECTIONS
A7.1	ENLARGED PLANS
A7.2	ENLARGED PLANS - STAIR / ELEV
A8.1	INTERIOR ELEVATIONS

A8.2	INTERIOR ELEVATIONS
A9.1	DOOR / WINDOW DETAILS
A9.2	PLAN DETAILS
A9.3	SECTION DETAILS
A9.4	SECTION DETAILS
A9.5	INTERIOR SECTION DETAILS
A10.1	2012 TAS
A10.2	2012 TAS
A10.3	2012 TAS
T2.1	I.T. & SECURITY TECHNOLOGY FLOOR PLAN
T2.2	I.T. & SECURITY TECHNOLOGY FLOOR PLAN
S0.000	COVER SHEET
S0.001	3D VIEWS
S0.100	GENERAL NOTES AND SPECIFICATIONS
S0.101	GENERAL NOTES AND SPECIFICATIONS
S0.102	GENERAL NOTES AND SPECIFICATIONS
S1.100	FOUNDATION PLAN
S2.100	SECOND FLOOR FRAMING PLAN
S2.110	ROOF FRAMING PLAN
S3.100	TYPICAL FOUNDATION SECTIONS
S3.101	TYPICAL FOUNDATION SECTIONS
S3.110	FOUNDATION SECTIONS
S3.111	FOUNDATION SECTIONS
S4.100	TYPICAL STEEL FRAMING DETAILS
S4.101	TYPICAL STEEL FRAMING DETAILS
S4.102	TYPICAL METAL STUD FRAMING DETAILS
S4.110	FRAMING SECTIONS
S4.111	FRAMING SECTIONS
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#### MEP

MEP1.0	MEP SPECIFICATIONS
M0.1	MECHANICAL SCHEDULES
M0.2	MECHANICAL SCHEDULES
M0.3	MECHANICAL DETAILS
M1.1	MECHANICAL PLAN - 1ST FLOOR
M1.2	MECHANICAL PLAN - 2ND FLOOR
M1.3	MECHANICAL PLAN - ROOF
E0.1	ELECTRICAL ONE-LINE DIAGRAM
E0.2	ELECTRICAL DETAILS
E0.3	ELECTRICAL PANEL SCHEDULES
E0.4	ELECTRICAL PANEL SCHEDULES
E0.5	LIGHTNING PROTECTION ADD ALTERNATE
E1.0	SITE LIGHTING PLAN
E1.0P	SITE LIGHTING PHOTOMETRIC PLAN
E1.1	LIGHTING PLAN - 1ST FLOOR
E1.2	LIGHTING PLAN - 2ND FLOOR
E2.1	POWER PLAN - 1ST FLOOR
E2.2	POWER PLAN - 2ND FLOOR

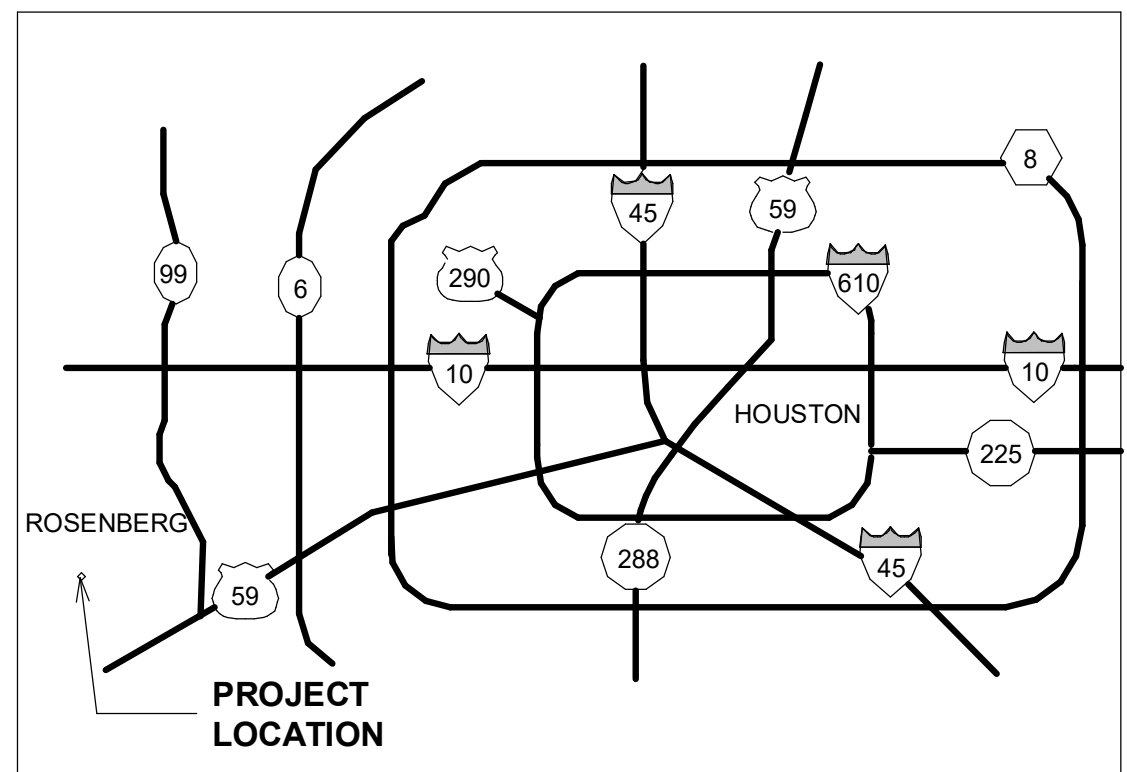
E3.1	MECH EQUIPMENT POWER PLAN - 1ST FLOOR
E3.2	MECH EQUIPMENT POWER PLAN - 2ND FLOOR
E3.3	MECH EQUIPMENT POWER PLAN - ROOF
P0.1	PLUMBING SCHEDULES
P0.2	PLUMBING DETAILS
P1.0	PLUMBING UNDERFLOOR PLAN
P1.1	PLUMBING 1ST FLOOR PLAN
P1.2	PLUMBING 2ND FLOOR PLAN

#### SPRINKLER & FIRE ALARM

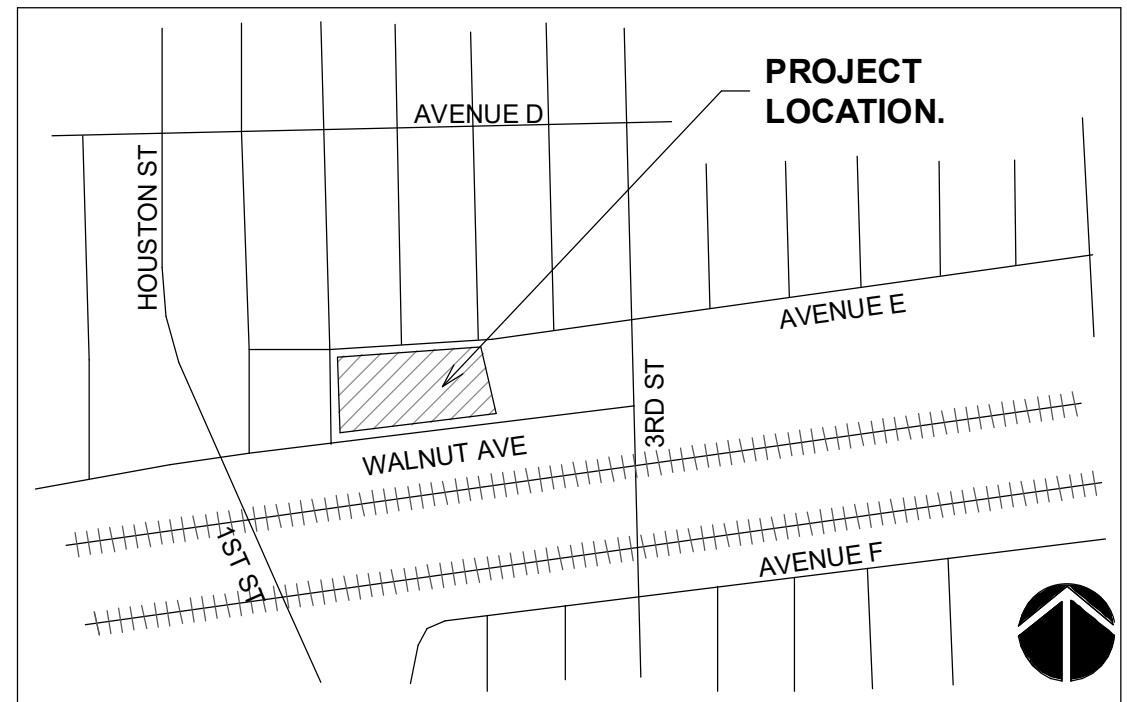
AUTOMATIC FIRE SPRINKLER SYSTEM DRAWINGS AND FIRE ALARM DETECTION SYSTEM DRAWINGS TO BE DEFERRED SUBMITTALS, AND ARE TO BE SUBMITTED SEPARATELY BY THE GENERAL CONTRACTOR.

TDLR #: TABS TABS2022015387

### VICINITY MAPS KEY MAP 604L



### SITE LOCATION MAP:



PROJECT NO.: 06-21-011

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# A0.0

TITLE



BUILDING CODE REVIEW

THE INFORMATION CONTAINED BELOW WAS COMPILED BY AND FOR THE EXCLUSIVE USE OF THE ARCHITECT IN THE DESIGN OF HIS PORTION OF THE WORK. IT IS ALSO INTENDED TO IDENTIFY TO THE CODE OFFICIAL THE ARCHITECT'S INTERPRETATION OF THE CODE. THE INFORMATION IS EXCERPTED FROM THE CODE IDENTIFIED BELOW UNLESS INDICATED OTHERWISE. IT IS INTENDED TO IDENTIFY REQUIREMENTS FOR THIS STRUCTURE PRIMARILY IN TERMS OF OCCUPANCY, CONSTRUCTION TYPE AND EGRESS. MISCELLANEOUS OTHER ISSUES MAY ALSO BE IDENTIFIED. THE INFORMATION IS NOT INTENDED TO INCLUDE ALL APPLICABLE PORTIONS OF THE CODE OR OTHER APPLICABLE CODES AND GOVERNING REGULATIONS. IT IS ALSO NOT INTENDED TO DIMINISH THE IMPORTANCE OR RELEVANCE OF OTHER PORTIONS OF CODES AND REGULATIONS THAT ARE APPLICABLE TO THE WORK CONTAINED IN THE DRAWINGS AND SPECIFICATIONS. CONSULTANTS, CONTRACTORS, MANUFACTURERS AND OTHER PARTIES THAT HAVE OR WILL PERFORM DESIGN OR CONSTRUCTION SERVICES ON THIS STRUCTURE SHALL NOT RELY ON THIS INFORMATION IN THE PERFORMANCE OF THEIR WORK. EACH SUCH PARTY SHALL BE RESPONSIBLE FOR THEIR OWN REVIEW AND COMPLIANCE OF CODES AND REGULATIONS.

PROJECT INFORMATION

PROJECT NUMBER: 06-21-011  
PROJECT NAME: FORT BEND COUNTY NEW COMMUNITY CENTER  
ADDRESS: AVENUE E AND SECOND STREET, ROSENBERG, TEXAS 77471

CODES / STANDARDS

2018 INTERNATIONAL BUILDING CODE (IBC)  
2018 INTERNATIONAL FIRE CODE (IFC)  
2018 INTERNATIONAL MECHANICAL CODE (IMC)  
2018 INTERNATIONAL PLUMBING CODE (IPC)  
2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)  
2017 NATIONAL ELECTRIC CODE (NEC)  
2012 TEXAS ACCESSIBILITY STANDARDS (TAS)  
UNIFIED DEVELOPMENT CODE - CITY OF ROSENBERG

BUILDING DESCRIPTION

NEW 2-STORY COMMUNITY CENTER

CHAPTER 3 - USE & OCCUPANCY CLASSIFICATIONS

A-3: ASSEMBLY  
E: EDUCATIONAL

CHAPTER 6 - TYPE OF CONSTRUCTION

II-B, SPRINKLERED

CHAPTER 5 - ALLOWABLE HEIGHT AND STORIES

BUILDING USE & CONSTRUCTION TYPE	ALLOWABLE BUILDING HEIGHT *	ALLOWABLE NUMBER OF STORIES**
A-3; TYPE IIB	75 FEET	3 STORIES
E; TYPE IIB	75 FEET	3 STORIES

\* FROM TABLE 504.3  
\*\* FROM TABLE 504.4

ACTUAL HEIGHT AND STORIES

ACTUAL HEIGHT: 34 FEET  
ACTUAL STORIES: 2 STORIES

CHAPTER 5 - ALLOWABLE BUILDING AREA PER STORY

BUILDING USE & CONSTRUCTION TYPE	ALLOWABLE BUILDING AREA *
A-3; TYPE IIB	38,000 SF
E; TYPE IIB	43,500 SF

\* FROM TABLE 506.2

ACTUAL BUILDING AREA PER STORY

LEVEL 1: 13,963 SF  
LEVEL 2: 7,633 SF

TOTAL: 21,596 SF

CHAPTER 5 - MIXED USE AND OCCUPANCY

NON-SEPARATED OCCUPANCY:  
USE MOST RESTRICTIVE CODE PROVISIONS

CHAPTER 6 - FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS

BUILDING ELEMENT	TYPE IIB	PROVIDED
PRIMARY STRUCTURAL FRAME	0	0
BEARING WALLS	0	0
EXTERIOR	0	0
INTERIOR	0	0
NONBEARING WALLS & PARTITIONS, RE: TABLE 602 EXTERIOR (FIRE SEPARATION DISTANCE > 30 FT)	0	0
NONBEARING WALLS & PARTITIONS	0	0
INTERIOR	0	0
FLOOR CONSTRUCTION & ASSOCIATED SECONDARY MEMBERS	0	0
ROOF CONSTRUCTION & ASSOCIATED SECONDARY MEMBERS	0	0

FROM TABLE 601, ALL VALUES IN HOURS

CHAPTER 7 - FIRE WALLS, BARRIERS, PARTITIONS, & HORIZONTAL ASSEMBLIES  
REQUIRED FIRE-RESISTANCE RATINGS

BUILDING ELEMENT	REQUIRED	PROVIDED	REFERENCE
FIRE WALLS	N/A	N/A	706.4
HORIZONTAL ASSEMBLIES	1	1	711.2
SHAFT ENCLOSURES (ELEVATOR)	1	1	713.4
INTERIOR EXIT STAIRWAY	1	1	1023.2
EXIT ACCESS STAIRWAY	0	0	1019.3 (1)
EXIT PASSAGEWAY	N/A	N/A	1024.3
CORRIDOR WALLS	N/A	N/A	1020.1

ALL VALUES IN HOURS

CHAPTER 7 - OPENING PROTECTIVES  
REQUIRED FIRE-RESISTANCE RATINGS

BUILDING ELEMENT	TYPE OF ASSEMBLY	ASSEMBLY RATING	PROTECTION REQUIRED	GLAZING MARK
DOOR	FIRE WALL	N/A	-	-
DOOR	FIRE BARRIER	1	1	D-H-60
DOOR VISION PANEL *	FIRE BARRIER	1	NOT PERMITTED	D-H-60
SIDELIGHT / TRANSOM	FIRE BARRIER	1	NOT PERMITTED	W-60
DOOR	FIRE PARTITION	N/A	-	-
DOOR VISION PANEL **	FIRE PARTITION	N/A	-	-

ALL VALUES IN HOURS U.N.O. FROM TABLE 716.1(2).  
\* VISION PANEL SIZE = 100 SQ IN MAX  
\*\* VISION PANEL SIZE = MAXIMUM TESTED (NOT RESTRICTED)

CHAPTER 8 - INTERIOR WALL & CEILING FINISHES

BUILDING ELEMENT	A-3 USE GROUP WITH SPRINKLER
INTERIOR EXIT STAIRWAYS, RAMPS, & EXIT PASSAGEWAYS	CLASS B
CORRIDORS & ENCLOSURES FOR EXIT ACCESS STAIRWAYS & EXIT ACCESS RAMPS	CLASS B
ROOMS & ENCLOSED SPACES	CLASS C

FROM TABLE 803.13 1 STORY MAXIMUM, A-3 IS MORE RESTRICTIVE THAN E

CHAPTER 9 - FIRE PROTECTION SYSTEMS

AUTOMATIC SPRINKLER SYSTEM: **REQUIRED** (SECTION 903)

STANDPIPE SYSTEM: **NOT REQUIRED** (SECTION 905)

PORTABLE FIRE EXTINGUISHERS: **REQUIRED** (SECTION 906)

(CLASS LIGHT: LOW HAZARD OCCUPANCY)  
MINIMUM RATED SINGLE EXTINGUISHER: 2-A  
MAXIMUM FLOOR AREA PER UNIT OF A: 3,000 SF  
MAXIMUM FLOOR AREA FOR EXTINGUISHER: 11,250 SF  
MAXIMUM TRAVEL DISTANCE TO EXTINGUISHER: 75 FT

FIRE ALARM SYSTEM: **REQUIRED** (SECTION 907)

SMOKE CONTROL SYSTEMS: **NOT REQUIRED** (SECTION 909)

CHAPTER 10 - OCCUPANT LOAD

REFER TO LIFE SAFETY PLANS: SHEET A0.2  
FOR OCCUPANT LOAD TABULATION

CHAPTER 10 - REQUIRED EXITS & EGRESS WIDTH

STORY	OCCUPANT LOAD	REQUIRED EXITS *	PROVIDED EXITS	REQUIRED WIDTH **	PROVIDED WIDTH
LEVEL 1	558	3	4	83.7"	198"
LEVEL 2	204	2	2	28.8"	77"
TOTAL	762		6	112.5"	275"

SEE LIFE SAFETY PLANS SHEET A0.2 FOR REQUIRED AND PROVIDED STAIR WIDTHS  
\* PER TABLE 1006.3.2  
\*\* PER SECTION 1005

CHAPTER 10 - COMMON PATH OF EGRESS TRAVEL

USE GROUP A & E, SPRINKLERED: **75 FT MAXIMUM** (TABLE 1006.2.1)

CHAPTER 10 - EXIT ACCESS TRAVEL DISTANCE

USE GROUP A & E, SPRINKLERED: **250 FT MAXIMUM** (SECTION 1017.2)

CHAPTER 15 - ROOF ASSEMBLIES

CONSTRUCTION TYPE = **CLASS C** (SECTION 1505.1)

CHAPTER 29 - PLUMBING

MINIMUM REQUIRED FIXTURES

BUILDING ELEMENT	A-3 (425 OCC)		E (327 OCC)		PROVIDED		
	MALE	FEMALE	MALE	FEMALE	MALE	WOMEN	UNISEX*
WATER CLOSETS	1/125	1/65	1/50				
	1.7	3.3	3.3	3.3	5	7	1
URINALS					2**		
LAVATORIES	1/200		1/50				
	1.1	1.1	2.3	2.3	5	5	1
DRINKING FOUNTAINS	1 PER 500		1 PER 100				
	.85		3.3		4		
WATER DISPENSER					2***		
SERVICE SINKS	1		1		1		

\* 2902.1.2: SINGLE-USER TOILET ROOMS IDENTIFIED AS BEING AVAILABLE FOR USE BY ALL PERSONS REGARDLESS OF THEIR SEX

\*\* IPC 424.2: URINALS SHALL NOT BE SUBSTITUTED FOR MORE THAN 67% OF THE REQUIRED WATER CLOSETS IN ASSEMBLY AND EDUCATION OCCUPANCIES.

\*\*\* IPC 410.4: IN OTHER THAN RESTAURANTS, WATER DISPENSERS SHALL BE PERMITTED TO BE SUBSTITUTED FOR NOT MORE THAN 50% OF THE REQUIRED NUMBER OF DRINKING FOUNTAINS.

ENERGY CODE REVIEW

CHAPTER 3 - GENERAL REQUIREMENTS

CLIMATE ZONE: 2A

CHAPTER 4 - OPAQUE THERMAL ENVELOPE INSULATION

MINIMUM REQUIREMENTS (R-VALUE)

BUILDING ELEMENT	REQUIRED	PROVIDED
ROOF INSULATION ENTIRELY ABOVE DECK METAL BUILDING ATTIC & OTHER	R-25ci N/A N/A	R-25ci
ABOVE GRADE WALLS: MASS METAL FRAMED WOOD FRAMED & OTHER	N/A R13 + R-5ci N/A	R19 + R-5ci
BELOW GRADE WALL	N/A	N/A
FLOORS MASS JOIST / FRAMING	N/A	N/A
SLAB ON GRADE FLOORS (UNHEATED)	NR	NR
OPAQUE DOORS (NONSWINGING)	R-4.75	R-4.75

PER TABLE C402.1.3

CHAPTER 4 - FENESTRATION


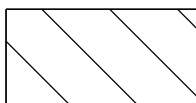
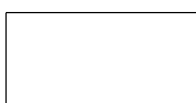
MINIMUM REQUIREMENTS

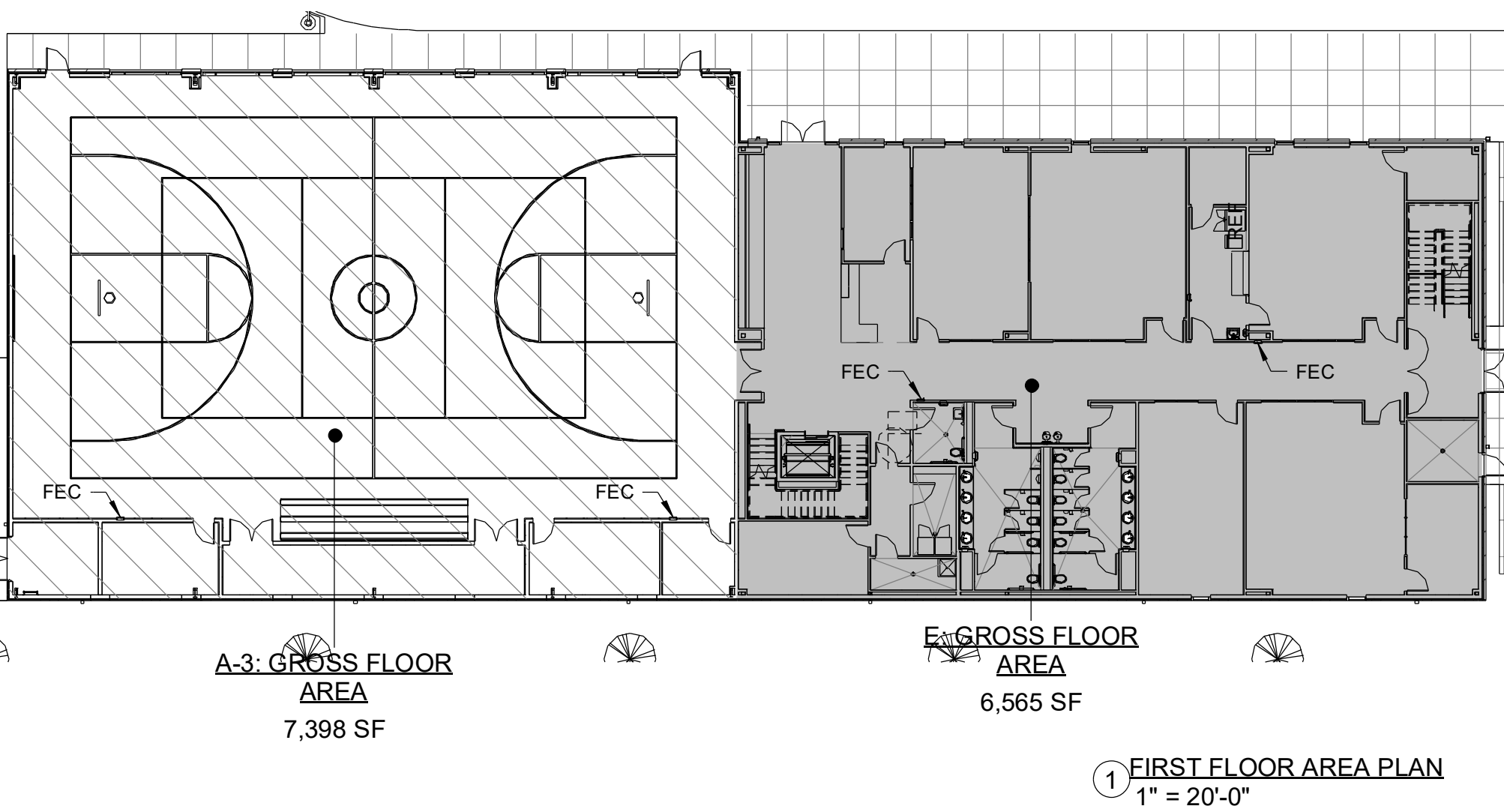
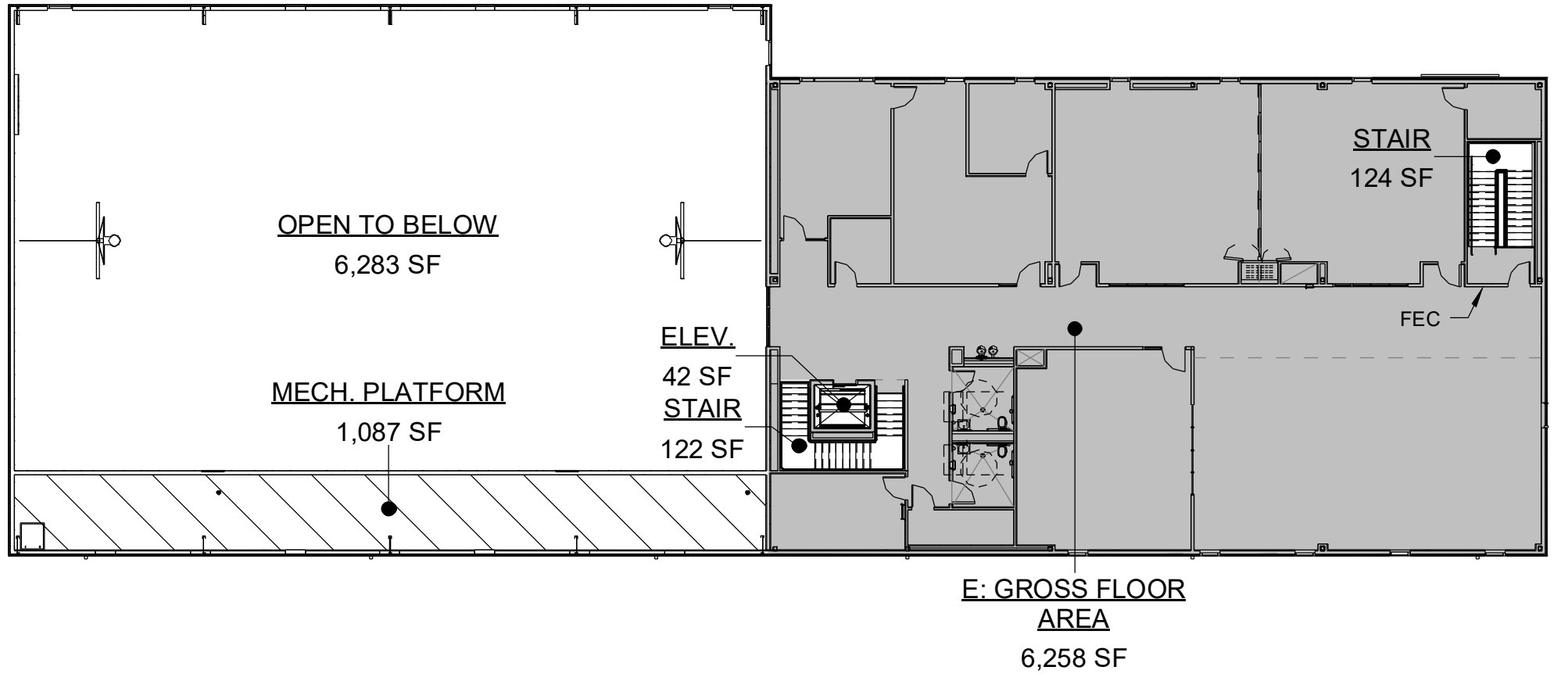
BUILDING ELEMENT	REQUIRED		PROVIDED	
VERTICAL FENESTRATION FIXED FENESTRATION OPERABLE FENESTRATION ENTRANCE DOORS	U-FACTOR		U-FACTOR	
	0.50		0.29	
	0.65		N/A	
SHGC: ORIENTATION	SEW		SEW	
	N		N	
	0.25	0.33	0.25	0.25
SKYLIGHTS U-FACTOR SHGC	0.30	0.37	0.25	0.25
	0.40	0.40	0.25	0.25
	0.65		N/A	

PER TABLE C402.4

BUILDING CODE REVIEW: AREA KEY PLANS

LEGEND

	E: GROSS FLOOR AREA
	A-3: GROSS FLOOR AREA
	OPEN TO BELOW







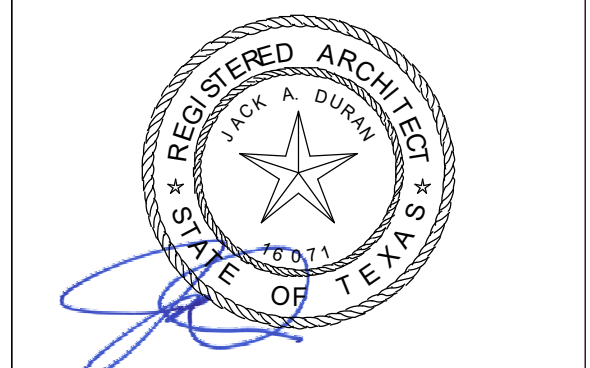
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AFFIXATION DATE: 05/03/22

A0.2  
LIFE SAFETY PLANS

FIRST FLOOR OCCUPANT LOAD SCHEDULE					
ROOM NAME	NO.	AREA	ROOM OCCUPANCY (IBC TABLE 1004.5)	AREA / OCC	OCC LOAD
LOBBY	100	1,309 SF	N-S		
GYM	101	6,296 SF	A-UNCON'D (TABLES & CHAIRS)	15 SF	420
STORAGE	102	161 SF	STORAGE	300 SF	1
STORAGE	103	290 SF	STORAGE	300 SF	1
STORAGE	104	181 SF	STORAGE	300 SF	1
OFFICE	105	99 SF	B-BUSINESS	150 SF	1
MECH / ELEC	106	182 SF	MECH / ELEC	300 SF	1
JAN	107	52 SF	N-S		
LAUNDRY	108	75 SF	STORAGE	300 SF	1
VEST.	109	68 SF	N-S		
STAFF	110	58 SF	N-S		
BOYS	111	236 SF	N-S		
GIRLS	112	244 SF	N-S		
TECH	113	389 SF	E- CLASSROOMS	20 SF	20
CLASS	114	565 SF	E- CLASSROOMS	20 SF	29
MEETING	115	151 SF	B-BUSINESS	150 SF	2
SPRINKLER	116	83 SF	N-S		
CLOSET	117	72 SF	N-S		
KIDS CAFE	118	551 SF	E- CLASSROOMS	20 SF	28
SERVING	119	145 SF	B-BUSINESS	150 SF	1
CLASS	120	548 SF	E- CLASSROOMS	20 SF	28
GAME ROOM	121	419 SF	E- CLASSROOMS	20 SF	21
RECEPT.	122	96 SF	B-BUSINESS	150 SF	1
DIRECTOR	123	145 SF	B-BUSINESS	150 SF	1
CORRIDOR	124	Redundant Room	N-S		
PANTRY	125	63 SF	N-S		
ELECTRICAL	126	118 SF	MECH / ELEC	300 SF	1
STAIR A	S-1A	128 SF	N-S		
STAIR B	S-1B	276 SF	N-S		
TOTALS		13,003 SF			558

SECOND FLOOR OCCUPANT LOAD SCHEDULE					
ROOM NAME	NO.	AREA	ROOM OCCUPANCY (IBC TABLE 1004.5)	AREA / OCC	OCC LOAD
CORRIDOR	200	1,167 SF	N-S		
LOUNGE	201	1,184 SF	A-UNCON'D (TABLES & CHAIRS)	15 SF	79
TECH	202	607 SF	E- CLASSROOMS	20 SF	31
MEN	203	68 SF	N-S		
WOMEN	204	68 SF	N-S		
STORAGE	205	66 SF	STORAGE	300 SF	1
MECH / ELEC	206	183 SF	MECH / ELEC	300 SF	1
CONFERENCE	207	278 SF	A-UNCON'D (TABLES & CHAIRS)	15 SF	18
ADMIN	208	417 SF	B-BUSINESS	150 SF	3
OFFICE	209	132 SF	B-BUSINESS	150 SF	1
CLASS	210	687 SF	E- CLASSROOMS	20 SF	35
CLASS	211	684 SF	E- CLASSROOMS	20 SF	35
CLOSET	212	72 SF	N-S		
IT	213	70 SF	N-S		
MECH. MEZZANINE	M200	1,002 SF	N-S		
STAIR A	S-2A	130 SF	N-S		
STAIR B	S-2B	169 SF	N-S		
TOTALS		6,984 SF			204

STAIRWAY EGRESS CAPACITY			
STAIR #	OCCUPANT LOAD	REQ'D EXIT WIDTH (SECTION 1005)	PROVIDED EXIT WIDTH
STAIR 1	102	102 X 0.20 = 20.4"	44"
STAIR 2	102	102 X 0.20 = 20.4"	44"

LIFE SAFETY PLAN LEGEND

**ROOM NAME** FLOOR AREA (SQUARE FEET)  
XX XXX SF  
XXX SF / OCC.  
OCCUPANT LOAD FACTOR PER IBC TABLE 1004.5  
ACTUAL COMPUTED OCCUPANT LOAD

XX" CLEAR EXIT WIDTH EXIT CAPACITY = XX"X" = XXX OCC.  
INDICATES CALCULATED MINIMUM EGRESS WIDTH PER SECTION 1005.3 (MIN. TO BE PROVIDED @ 36" DOOR = 33" CLEAR NET WIDTH)

LONGEST LENGTH OF TRAVEL DISTANCE PER IBC TABLE 1017.2  
(250' MAX. DISTANCE ALLOWABLE W/ SPRINKLER SYSTEM FOR "E")

1-HR FIRE RESISTANCE RATED BARRIER UL 419 (SEE SHEET A0.3 FOR UL ASSEMBLY DETAILS)

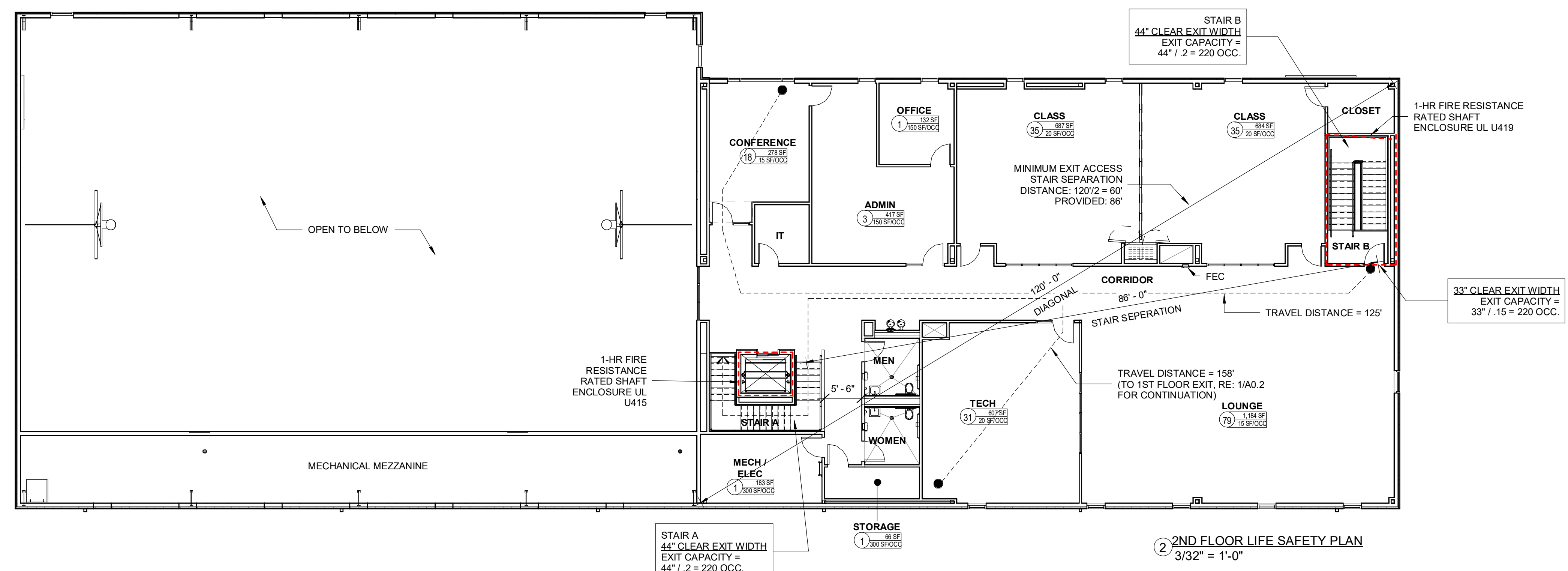
FEC FIRE EXTINGUISHER CABINET

TAS REQUIRED CLEAR DIMENSIONS

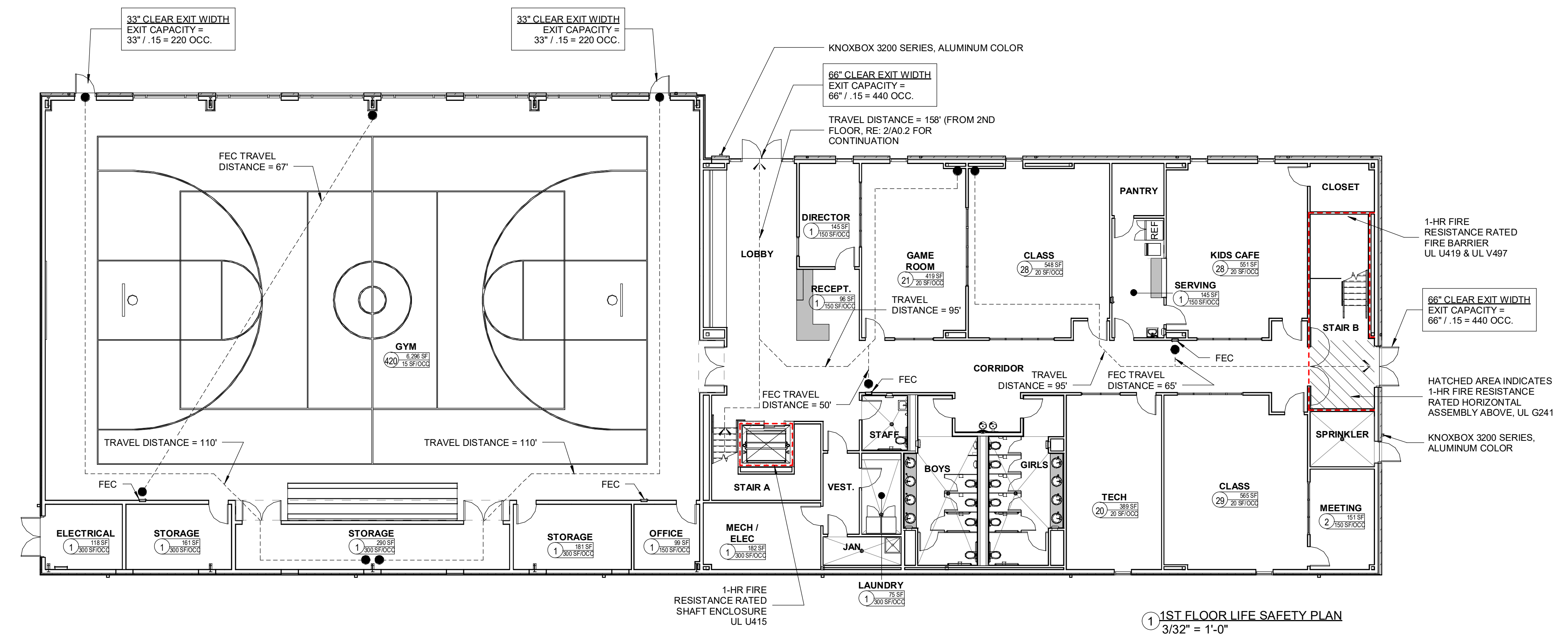
1-HR FIRE RATED SHAFT WALL UL U415 AT ELEVATOR

LIFE SAFETY PLAN GENERAL NOTES

- FIRE EXTINGUISHERS SHALL NOT BE OBSTRUCTED OR OBSCURED FROM VIEW. WHERE VISUAL OBSTRUCTION CANNOT BE COMPLETELY AVOIDED, PROVIDE MEANS TO INDICATE LOCATIONS OF EXTINGUISHERS.
- CONTRACTOR TO CONFIRM KNOX BOX LOCATION WITH FIRE MARSHAL PRIOR TO INSTALLATION.
- REFER TO ELECTRICAL DRAWINGS FOR EMERGENCY EGRESS LIGHTING LOCATIONS.
- RATED ASSEMBLIES TO BE MARKED AND IDENTIFIED ABOVE CEILINGS AND IN CONCEALED SPACES AS REQUIRED BY IBC 703.7



2ND FLOOR LIFE SAFETY PLAN  
3/32" = 1'-0"

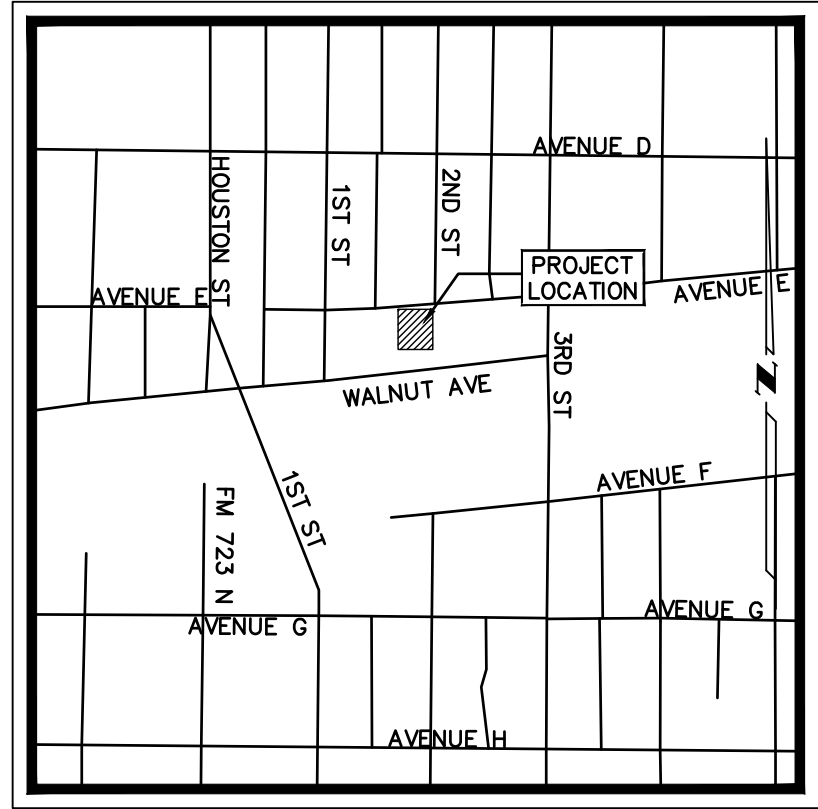


1ST FLOOR LIFE SAFETY PLAN  
3/32" = 1'-0"



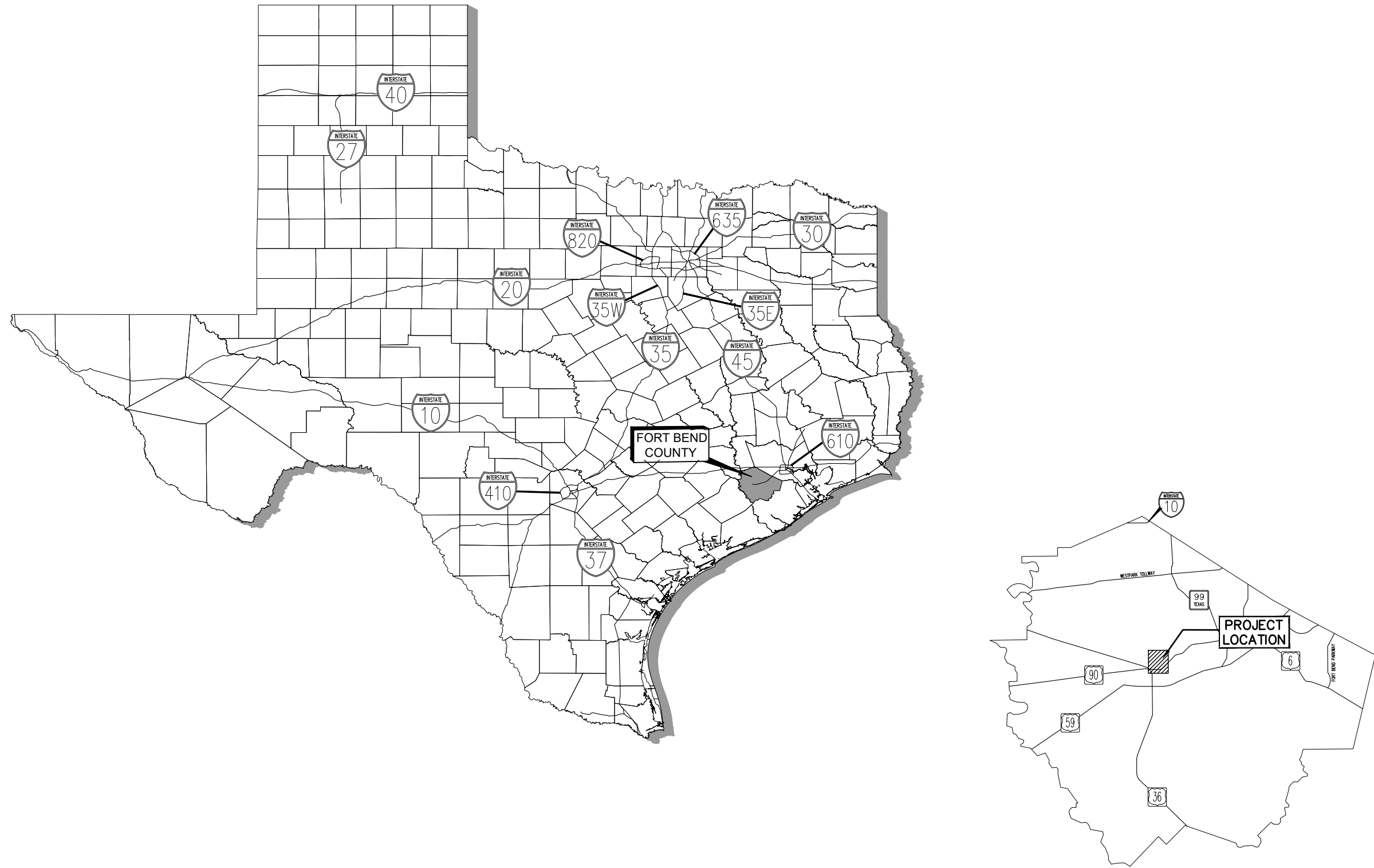






LOCATION MAP  
N.T.S.  
KEYMAP NO.: 604L  
ZIP CODE: 77471

CIVIL PLANS  
FOR  
FORT BEND COUNTY  
COMMUNITY CENTER  
LOCATED AT AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS



PLANS SUBMITTAL/REVIEW LOG

PROGRESS SET	01/26/2022
-COORDINATION SET	
COORDINATION SET	03/08/2022
ISSUE FOR PERMIT	03/31/2022

ACCORDING TO MAP NO. 48157C0245L OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S  
FLOOD INSURANCE RATE MAPS FOR FORT BEND COUNTY AND INCORPORATED AREAS, DATED  
4/2/14, THE SUBJECT TRACT IS SITUATED WITHIN: UNSHADED ZONE "X"

INDEX OF SHEETS	
CIVIL ENGINEERING (ALJ LINDSEY, LLC)	
SHEET NO.	DESCRIPTION
C0.0	COVER SHEET
C0.1	GENERAL NOTES
C0.2	TOPOGRAPHIC SURVEY
C0.3	PLAT
C1.0	DEMOLITION PLAN
C1.1	DIMENSION CONTROL PLAN
C2.0	UTILITY PLAN
C3.0	EXISTING OVERALL DRAINAGE AREA MAP
C3.1	STORM SEWER PLAN
C4.0	GRADING PLAN
C5.0	PAVING PLAN
C6.0	EROSION CONTROL PLAN
C7.0	CONSTRUCTION DETAILS (1 OF 4)
C7.1	CONSTRUCTION DETAILS (2 OF 4)
C7.2	CONSTRUCTION DETAILS (3 OF 4)
C7.3	CONSTRUCTION DETAILS (4 OF 4)
C7.4	CITY OF ROSENBERG PAVEMENT DETAILS
C7.5	CITY OF ROSENBERG UTILITY DETAILS

CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

ALJLindsey  
Civil Engineering, Inc. Suite 314  
Houston, TX 77060  
281.301.5655  
FRN F-11526

31 MARCH 2022

ALJ PROJECT NO.  
65321CV.002  
DATE: MARCH 2022  
SCALE: N/A  
DRAWN BY: SRH  
CHECKED BY: BTH

COVER SHEET

FORT BEND COUNTY  
COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS

SHEET  
C0.0

REVISIONS  
DATE



GENERAL NOTES

- THE LOCATION OF ALL UTILITIES SHOWN ON THESE PLANS WAS TAKEN FROM AVAILABLE SURVEY INFORMATION AND/OR EXISTING PUBLIC RECORDS. THE EXACT LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES MUST BE DETERMINED BY CONTRACTOR. IT SHALL BE THE DUTY AND RESPONSIBILITY OF THE CONTRACTOR TO ASCERTAIN WHETHER ANY ADDITIONAL FACILITIES OTHER THAN THOSE SHOWN ON THE PLANS MAY BE PRESENT. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF A DISCREPANCY AND/OR CONFLICT IS DISCOVERED. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED TO EXISTING UTILITIES DURING CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PUBLIC UTILITIES, PAVEMENT TO REMAIN, CURBS, SIDEWALKS, SIGNS, TREES, ETC., IN THE CONSTRUCTION OF THIS PROJECT. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES. DURING CONSTRUCTION ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE OWNING/OPERATING AUTHORITY, WITH NO COST TO THE CITY, COUNTY, PRIVATE UTILITY OWNERS, ENGINEER, OR THE OWNER.
- CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND UTILITY LINES AND SHALL NOTIFY THE FOLLOWING AGENCIES 72 HOURS PRIOR TO EXCAVATING OR AUGERING NEAR EXISTING FACILITIES.

A. TEXAS ONE CALL SYSTEM AT 1-800-245-4545

B. LONE STAR NOTIFICATION CENTER AT 1-800-669-8344

C. TEXAS EXCAVATION SAFETY SYSTEM AT 1-800-344-8377
- PRIOR TO ANY CONSTRUCTION ACTIVITY, CONTRACTOR IS TO ACQUIRE ALL REQUIRED CONSTRUCTION PERMITS FROM APPROPRIATE AUTHORITIES. CONTRACTOR SHALL GIVE AT LEAST 48 HOURS NOTICE TO ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS, OR PERSONS IN CHARGE OF PUBLIC AND PRIVATE UTILITY LINES AFFECTED BY HIS OPERATIONS PRIOR TO COMMENCEMENT OF WORK.
- THE ENGINEER AND THE CITY/COUNTY OR MUD SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE CONTRACTOR CONNECTING TO ANY EXISTING UTILITY LINES.
- NO CONNECTIONS SHALL BE MADE TO EXISTING PUBLIC WATER LINES OR PUBLIC SANITARY SEWERS UNTIL ALL PROPOSED WATER OR SEWER LINES HAVE BEEN THOROUGHLY CLEANED, TESTED (AS REQUIRED) AND APPROVED BY THE APPROPRIATE AUTHORITIES.
- HORIZONTAL AND VERTICAL INFORMATION REGARDING UTILITY CONNECTIONS TO PROPOSED BUILDINGS ON THIS SET OF PLANS TERMINATE AT FIVE (5) FEET FROM THE NEAREST BUILDING WALL.
- ALL MANHOLES, CLEAN-OUTS, VALVE BOXES, FIRE HYDRANTS, ETC MUST BE ADJUSTED TO PROPER LINE AND GRADE BY THE CONTRACTOR PRIOR TO AND AFTER THE PLACING OF PERMANENT PAVING. UTILITIES MUST BE MAINTAINED TO PROPER LINE AND GRADE DURING CONSTRUCTION. THE PAVING FOR THIS DEVELOPMENT.
- ALL APPURTENANCES WILL BE ASSUMED TO BE IN GOOD CONDITION UNLESS OTHERWISE CONFIRMED IN WRITING PRIOR TO COMMENCEMENT OF WORK.
- OVERHEAD LINES EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING CONSTRUCTION. TEXAS ELEC. SECTION 752, HEALTH AND SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSON OR EQUIPMENT MAY COME WITHIN 6 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CIVIL AND CRIMINAL LIABILITY.
- CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND ALL REGULATIONS OF UTILITY COMPANIES CONCERNING SAFETY AND HEALTH PRACTICES. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SITE TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY/COUNTY STANDARDS, TEXAS STATE LAW, AND O.S.H.A. STANDARDS FOR ALL EXCAVATION.
- PRIOR TO THE START OF CONSTRUCTION, OWNER AND CONTRACTOR ARE RESPONSIBLE FOR SUBMITTING THE "NOTICE OF INTENT" (N.O.I.) AND ANY ADDITIONAL INFORMATION REQUIRED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ). UPON COMPLETION OF THE PROJECT, OWNER AND CONTRACTOR ARE RESPONSIBLE FOR SUBMITTING THE "NOTICE OF TERMINATION" (N.O.T.).
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE AT ALL TIMES DURING CONSTRUCTION
- CONTRACTOR SHALL REMOVE ALL MUD, DIRT, AND DEBRIS DEPOSITED OR DROPPED ON THE EXISTING ROADWAY AT THE END OF EACH WORK DAY. MATERIAL THAT IS HAZARDOUS TO TRAFFIC OR OTHERWISE PRESENTS A SAFETY CONCERN, SHALL BE REMOVED IMMEDIATELY.
- CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL STATE AND LOCAL REGULATIONS RELATED TO STORM WATER POLLUTION AND QUALITY. REFER TO EROSION CONTROL PLAN.
- CONTRACTOR SHALL REESTABLISH ALL TURF DISTURBED DURING CONSTRUCTION TO ACCEPTABLE OPERATING CONDITION, AS DETERMINED BY OWNER AND/OR REGULATORY AGENCIES.
- CONTRACTOR SHALL MAINTAIN A WORKSITE FREE OF TRASH AND DEBRIS.
- CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES. NO TREE SHALL BE REMOVED OR ALTERED WITHOUT WRITTEN PERMISSION FROM OWNER OR ENGINEER. EQUIPMENT OR MATERIALS SHALL NOT BE STAGED UNDER THE DRIP LINE OF EXISTING TREES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A SET OF "AS BUILT" PLANS FOR ALL WORK PERFORMED ON AND OFF SITE. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL PROVIDE AS-BUILT PLANS IDENTIFYING ALL DEVIATIONS OR VARIATIONS FROM ORIGINAL PLANS TO THE OWNER AND THE ENGINEER.
- ALL TRAFFIC CONTROL AND WARNING SIGNS SHALL BE IN ACCORDANCE WITH TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
- ALL SIDEWALKS, RAMPS, AND HANDRAILS TO MEET OR EXCEED CITY/COUNTY, TAS, AND ADA REQUIREMENTS.
- ALL MATERIAL AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY/COUNTY RULES AND REGULATIONS, CONSTRUCTION SPECIFICATIONS AND CONSTRUCTION DETAILS.
- ALL EXCESS SPOIL MATERIAL GENERATED FROM CONSTRUCTION ACTIVITY TO BE HAULED OFFSITE AND DISPOSED IN ACCORDANCE WITH LOCAL LAWS, RULES, AND REGULATIONS.
- AT THE END OF ALL CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL RESTORE THE EXISTING FACILITIES, TO EQUAL TO BETTER THAN EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. ALL FINISHED GRADES SHALL VARY UNIFORMLY BETWEEN THE FINISHED ELEVATIONS SHOWN.
- CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE TO EXISTING LANDSCAPING AND IRRIGATION. NO SEPARATE PAY.
- PRIOR TO SUBMITTAL OF BID OR PROPOSAL, CONTRACTOR SHALL VISIT PROJECT SITE AND BECOME FAMILIAR WITH THE PROJECT AND THE EXISTING CONDITIONS ON THE SITE. NO ADDITIONAL CONSIDERATION WILL BE GIVEN FOR ADDITIONAL WORK CAUSED BY FIELD CONDITIONS VISIBLE ON SITE DURING BIDDING BUT NOT SHOWN ON THESE PLANS.
- THERE WILL BE NO SEPARATE PAYMENT FOR WORK SHOWN ON THESE PLANS, UNLESS SPECIFICALLY ESTABLISHED IN THE BID SECTION OF THE CONTRACT DOCUMENTS. INCLUDE COST OF SAME TO WHICH THIS WORK IS A COMPONENT PART.
- IN THE EVENT OF A DISCREPANCY WITHIN THESE PLANS, OR BETWEEN THESE PLANS AND THE GEOTECHNICAL REPORT, THE MOST CONSERVATIVE CRITERIA SHALL APPLY.
- ALL UTILITY TRENCHES BELOW PROPOSED OR FUTURE PAVING SHALL BE BACKFILLED WITH CEMENT SAND.
- UTILITY TRENCHES ARE A COMMON SOURCE OF WATER INFILTRATION AND MIGRATION. ALL UTILITY TRENCHES THAT PENETRATE BENEATH THE BUILDING SHOULD BE EFFECTIVELY SEALED TO RESTRICT WATER INTRUSION AND FLOW THROUGH THE TRENCHES THAT COULD MIGRATE BELOW THE BUILDING. WE RECOMMEND CONSTRUCTING AN EFFECTIVE CLAY "TRENCH PLUG" THAT EXTENDS AT LEAST 5 FEET OUT FROM THE FACE OF THE BUILDING ELEVATION. THE PLUG MATERIAL SHOULD CONSIST OF CLAY COMPACTED AT A WATER CONTENT AT OR ABOVE THE SOILS OPTIMUM WATER CONTENT. THE CLAY FILL SHOULD BE PLACED TO COMPLETELY SURROUND THE UTILITY LINE AND BE COMPACTED IN ACCORDANCE WITH RECOMMENDATIONS IN THIS REPORT.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UTILITY TIE IN LOCATIONS FOR MATERIAL, SIZE, ELEVATION AND FIELD CONDITIONS. IN THE EVENT THE PLANS DO NOT REPRESENT FIELD CONDITIONS THE CONTRACTOR IS TO CONTACT THE ENGINEER AND OWNER IMMEDIATELY AND PRIOR TO PERFORMING ANY WORK.
- PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR TO CONFIRM POSSESSION OF LATEST DRAWINGS, INCLUDING ANY REVISIONS. IF THE DRAWINGS ARE NOT LABELED AS "CONSTRUCTION SET" ON THE COVER PAGE, CONTRACTOR TO CONTACT ENGINEER IMMEDIATELY.
- CONTRACTOR TO OBTAIN ALL PERMITS. OWNER WILL PROVIDE PAYMENT AS NECESSARY AND REQUESTED BY CONTRACTOR.

GRADING NOTES

- GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE START OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
- BEFORE STARTING CONSTRUCTION, CONTRACTOR SHALL VERIFY BENCHMARK ELEVATION AND NOTIFY ENGINEER IF ANY DISCREPANCY AND/OR CONFLICT IS FOUND.
- CONTRACTOR SHALL ENSURE THERE IS POSITIVE DRAINAGE FROM THE PROPOSED BUILDINGS AND NO PONDING IN EITHER PAVED OR LANDSCAPE AREAS, AND SHALL NOTIFY ENGINEER IF ANY GRADING DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR UTILITIES.
- CONTRACTOR SHALL PROTECT ALL MANHOLE COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES THAT ARE TO REMAIN IN PLACE, AND UNDISTURBED DURING CONSTRUCTION.
- ALL EXISTING CONCRETE PAVING, SIDEWALK, AND CURB DEMOLITION SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR. DISPOSAL SHALL BE AT AN APPROVED OFF-SITE, LAWFUL LOCATION, UNLESS DIRECTED OTHERWISE BY THE OWNER.
- FOR BUILDING PAD SUBGRADE PREPARATION AND GENERAL EARTHWORK OBSERVATIONS, REFER TO THE GEOTECHNICAL REPORT PREPARED BY GEOSCIENCE ENGINEERING AND TESTING INC., DATED JANUARY 18, 2022 (PROJECT NUMBER 21G10708). ALL MATERIAL SPECIFICATIONS AND TESTING SHALL BE ADHERED TO AS OUTLINED IN THIS REPORT. CONTRACTOR IS RESPONSIBLE FOR OBTAINING THIS REPORT PRIOR TO PRICING ITEMS IMPACTED BY THE REPORT.
- FINAL PAVEMENT GRADES SHALL BE WITHIN 0.05' OF DESIGN ELEVATIONS, EXCEPT FOR ADA AREAS, WHICH SHALL BE WITHIN 0.01' OF DESIGN ELEVATIONS. FINAL NON-PAVEMENT ELEVATIONS SHALL BE WITHIN 0.1' OF PROPOSED GRADE.
- ALL DETENTION PONDS SHALL BE GRADED TO WITHIN 0.1' OF PROPOSED ELEVATIONS AND WITHIN 6" OF HORIZONTAL LOCATION. AFTER COMPLETION AN AS-BUILT SURVEY WILL BE ORDERED BY OWNER, AND ANY POND NOT BUILT PER PLAN, WILL BE CORRECTED AT CONTRACTOR'S SOLE COST.

FRANCHISE UTILITY NOTES

- CONTRACTOR SHALL CALL THE TEXAS ONE CALL AND DIG-TESS AT LEAST 72 HOURS PRIOR TO COMMENCING DEMOLITION OR CONSTRUCTION ACTIVITIES. THE CONTRACTOR BEARS SOLE RESPONSIBILITY FOR VERIFYING LOCATIONS OF EXISTING UTILITIES, SHOWN OR NOT SHOWN, AND FOR ANY DAMAGE TO THESE FACILITIES.
- CONTRACTOR SHALL INSTALL LONG SWEEPS FOR DUTY CONDUITS WHERE A BEND IS GRAPHICALLY SHOWN.

PAVING AND STRIPING NOTES

- PAVEMENT DESIGN AND SOIL PREPARATION RECOMMENDATIONS GIVEN IN THE GEOTECHNICAL REPORT PREPARED BY GEOSCIENCE ENGINEERING AND TESTING INC., DATED JANUARY 18, 2022 (PROJECT NUMBER 21G10708) SHALL BE ADHERED TO FOR BOTH MATERIALS AND PRACTICE OF INSTALLATION. CONTRACTOR SHALL ENSURE ALL SPECIFICATIONS AND TESTING ARE MET AS OUTLINED IN THIS REPORT. CONTRACTOR IS RESPONSIBLE FOR OBTAINING THIS REPORT PRIOR TO PRICING ITEMS IMPACTED BY THE REPORT.
- ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND CITY/COUNTY STANDARDS.
- CONTRACTOR SHALL FURNISH ALL PAVEMENT MARKINGS FOR FIRE LANES, ROADWAY LANES, PARKING STALLS, HANDICAPPED PARKING SYMBOLS, ACCESS AISLES, STOP BARS AND SIGNS, AND MISCELLANEOUS STRIPING WITHIN PARKING LOT AS SHOWN ON THE PLANS.
- ALL JOINTS SHALL BE SEALED PER CITY/COUNTY SPECIFICATIONS. ALL JOINTS SHALL EXTEND THROUGH THE CURB.
- THE MATERIALS AND PROPERTIES OF CONCRETE SHALL MEET THE APPLICABLE REQUIREMENTS IN THE A.C.I. (AMERICAN CONCRETE INSTITUTE) MANUAL OF CONCRETE PRACTICE AS WELL AS CITY/COUNTY STANDARDS. IN THE EVENT OF A CONTRADICTION BETWEEN THESE TWO STANDARDS, THE MOST RESTRICTIVE (AS DETERMINED BY THE ENGINEER) SHALL APPLY.
- PAVEMENT THICKNESS'S SHOWN IN THIS PLAN SET ARE "MINIMUM" NOT AVERAGE. PAVEMENT THICKNESS AT ALL LOCATIONS SHALL EXCEED THE THICKNESS SPECIFIED.
- ANY DAMAGED PAVEMENT, CURB AND/OR SIDEWALK WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE TO THE SATISFACTION OF THE ENGINEER AND OWNER.
- BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY THAT SUITABLE HANDICAPPED ROUTES (PER A.D.A. & T.A.S) EXIST TO AND FROM EVERY DOOR. IN NO CASE SHALL:

A. HANDICAP RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL.

B. SIDEWALK CROSS SLOPES EXCEED 2.0 PERCENT.

C. LONGITUDINAL SIDEWALK SLOPES EXCEED 5.0 PERCENT.

D. CONTRACTOR SHALL CONTACT ENGINEER PRIOR TO PAVEMENT CONSTRUCTION IF ANY SLOPES EXCEED THE ABOVE LIMITS.
- REINFORCING BAR SPLICES SHALL BE STAGGERED WITH NO MORE THAN 2 SPLICES ADJACENT TO EACH OTHER.
- STABILIZED SUBGRADE SHALL EXTEND A MINIMUM OF 1 FOOT BEYOND EDGE OF ALL PAVEMENT, OR AS DIRECTED IN GEOTECHNICAL REPORT.
- ALL CONCRETE PAVEMENT SHALL BE FLOAT FINISHED MECHANICALLY WITH APPROVED SELF-PROPELLED MACHINES. HANDING FLOATING SHALL BE PERMITTED ONLY IN AREAS INACCESSIBLE TO A FINISHING MACHINE. AFTER FLOATING, CONTRACTOR SHALL PROVIDE A FINE OR MEDIUM-COARSE "BROOM FINISH", UNLESS OTHERWISE INDICATED BY THE OWNER. FOR ALL EXTERIOR SIDEWALKS, EXTERIOR RAMPS, EQUIPMENT AND TRANSFORMER PADS, AND SITE PAVING, BROOMING SHALL BE DONE TRANSVERSELY TO THE DIRECTION OF MAIN TRAFFIC. ALL FINISHING SHALL CONFORM TO A.C.I.301. CONTRACTOR SHALL DETERMINE THE APPROPRIATE MEANS & METHODS TO PROTECT THE FINISHED CONCRETE FROM PRECIPITATION FOR A MINIMUM OF 24 HOURS.
- CONTRACTOR SHALL PROTECT THE FINISHED CONCRETE PAVEMENT AGAINST LOSS OF MOISTURE FOR NO LESS THAN 72 HOURS IN CONFORMANCE WITH THE A.C.I. MANUAL OF CONCRETE PRACTICE.
- ALL PROPOSED PAVEMENT WITHIN ANY PUBLIC ROW SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROPRIATE DETAIL FROM THE APPLICABLE GENERALITY.
- STORM SEWERS
  - STORM SEWER PIPE USED FOR CONNECTION TO STORM SEWER IN PUBLIC RIGHT-OF-WAY OR CONSTRUCTED WITHIN PUBLIC EASEMENTS SHALL BE REINFORCED CONCRETE PIPE ASTM C-76, CLASS III, WITH RUBBER GASKET PER ASTM C-443 AND SHALL EXTEND TO FIRST PRIVATE INLET OR MANHOLE. ALL OTHER PRIVATE STORM SEWER MAY BE SELECTED PER THE FOLLOWING CRITERIA:

A. CORRUGATED HIGH-DENSITY POLYETHYLENE (HDPE) (4 INCHES TO 48 INCHES IN DIAMETER): AASHTO M 294, DUAL WALL WITH WATER TIGHT (ASTM D3212) BELL-TO-BELL COUPLES, TRADE NAME N-12 BY ADS OR EQUAL

B. POLYVINYL CHLORIDE (PVC) CORRUGATED PIPE PER ASTM F 949 (4 INCHES TO 36 INCHES (102-MM TO 914-MM)) WITH ELASTOMETRIC GASKET JOINTS, TRADE NAME A-2000 BY CONTECH OR EQUAL

C. STEEL REINFORCED HIGH-DENSITY POLYETHYLENE (HDPE) (24 INCHES TO 48 INCHES IN DIAMETER): AASHTO M 294, HIGH PERFORMANCE JOINTS (ASTM D3212), TRADE NAME DUROMAXX OR EQUAL

D. REINFORCED CONCRETE PIPE (RCP): ASTM C76, CLASS III WITH RUBBER GASKET JOINTS PER ASTM C-443
  - STORM SEWERS IN PUBLIC R.O.W. OR PUBLIC EASEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF ROSENBERG STANDARD CONSTRUCTION SPECIFICATIONS FOR STORM DRAINAGE INCLUDING ALL CURRENT AMENDMENTS THERETO. ALL STORM SEWER ON PRIVATE PROPERTY SHALL BE CONSTRUCTED PER SPECIFICATIONS AND DETAILS IN THESE DRAWINGS AND IN ACCORDANCE WITH THE PIPE MANUFACTURERS RECOMMENDATIONS.
  - ALL SEWERS UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1 1/2 SACK COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM DESIGNATION D-698/AASHTO T99). MOISTURE CONTENT OF BACKFILL SHALL BE WITHIN PARAMETERS ESTABLISHED BY THE PROCTOR TEST.
  - TRENCH BACKFILL SHALL BE SUITABLE EARTH MATERIAL PLACED IN 8 INCH LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS ON EACH LIFT. BACKFILL TO BE MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM DESIGNATION D-698/AASHTO T99). MOISTURE CONTENT OF BACKFILL SHALL BE WITHIN PARAMETERS ESTABLISHED BY THE PROCTOR TEST.
  - PROPOSED PIPE STUB-OUTS ARE TO BE PLUGGED WITH 8" BRICK WALLS, UNLESS OTHERWISE NOTED.

WATER LINES

- WATER LINES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF ROSENBERG AND TCEQ REGULATIONS, STANDARD SPECIFICATIONS, AND CONSTRUCTION DETAILS.
- 4" THRU 12" WATER LINES SHALL BE P.V.C. CLASS 150, DR-18, AWWA C-900 AND 1" THRU 3" WATER LINES SHALL BE PVC SCHEDULE 40, 4" THRU 54" D.I.P. WATER LINES SHALL BE AWWA C104 (ANSI A21.51) AND DOUBLE WRAPPED IN 8-MIL POLYETHYLENE. PIPE SHALL BE LINED IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
- CONCRETE THRUST BLOCKS SHALL BE PROVIDED AS NECESSARY TO PREVENT PIPE MOVEMENT. WHERE PREVENTING MOVEMENT OF 16" OR GREATER PIPE IS NECESSARY DUE TO THRUST, USE RESTRAINED JOINTS.
- ALL WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" OVER PIPE AND BACKFILLED WITH CEMENT STABILIZED SAND TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM C33, LATEST EDITION.
- ALL WATER LINE AND SEWER LINE CROSSINGS SHALL BE CONSTRUCTED PER TCEQ REGULATIONS.
- ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C-500 AND SHALL BE OF THE RESILIENT SEAT TYPE.
- ALL WATER LINES TO BE DISINFECTED IN CONFORMANCE WITH AWWA C-651 AND THE TEXAS STATE DEPARTMENT OF HEALTH. AT LEAST ONE BACTERIOLOGICAL SAMPLE SHALL BE COLLECTED FOR EACH 1,000 LINEAR FEET OF WATER LINE AND SHALL BE REPEATED IF CONTAMINATION PERSISTS.
- ALL BELOW GRADE VALVES SHALL BE GASKETED, HUB-END GATE VALVES WITH A CAST IRON BOX, EXCEPT WHERE FLANGES ARE CALLED OUT ON THE PLANS. ALL VALVES ARE TO OPEN COUNTERCLOCKWISE PER CITY OF ROSENBERG REQUIREMENTS.
- 4" THRU 12" FITTINGS SHALL BE CEMENT MORTAR LINED COMPACT DUCTILE IRON PRESSURE FITTINGS PER ANSI A21.53, OR PUSH ON FITTINGS PER ANSI A21.10 PRESSURE RATED AT 250 PSIG.
- HYDROSTATIC TESTING: ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH THE LATEST CITY OF ROSENBERG AND TCEQ REQUIREMENTS. TESTS ARE TO BE PERFORMED ON THE TOTAL FOOTAGE OF WATER PIPE LINE INCLUDED IN THE PROJECT.
- ALL WATER LINES TO HAVE 4" MINIMUM COVER TO FINISHED GRADE AND MINIMUM 12" CLEAR TO OTHER UTILITIES AT CROSSING UNLESS OTHERWISE NOTED ON PLANS. ALL WATER LINE INSTALLED OVER 8" DEEP SHALL UTILIZE RESTRAINED JOINT FITTINGS.
- CONTRACTOR SHALL KEEP WATER PIPE CLEAN AND CAP (OR OTHERWISE EFFECTIVELY COVER) OPEN PIPE ENDS TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPE LINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.

- ALL FIRE LINES TO BE DESIGNED, INSTALLED AND TESTED PER NFPA REGULATIONS.

SANITARY SEWERS

- ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF ROSENBERG AND TCEQ CRITERIA AND BE SUBJECT TO A REQUIRED FIELD TESTING. TESTS ARE TO BE PERFORMED ON THE TOTAL FOOTAGE OF SEWER LINE INCLUDED IN THE PROJECT. REQUIREMENTS OF TEXAS ADMINISTRATIVE CODE, TITLE 30 CHAPTER 217, "DESIGN CRITERIA FOR SEWERAGE SYSTEMS" SHALL GOVERN WHERE CONFLICTS EXIST EXCEPT WHERE CITY REQUIREMENTS ARE OF HIGHER STANDARDS.
- SANITARY SEWER PIPE USED FOR CONNECTION TO SEWER IN PUBLIC RIGHT-OF-WAY SHALL BE C900 P.V.C. PIPE MEETING ASTM SPECIFICATION D3034 WITH RUBBER GASKET JOINTS. ALL OTHER PRIVATE SANITARY SEWER PIPE MATERIAL SHALL CONFORM TO THE FOLLOWING CRITERIA:

A) POLYVINYL CHLORIDE (PVC) SCHEDULE 40 TO BE USED FOR PIPE SIZES 6 INCHES AND SMALLER.

B) STANDARD DIMENSION RATIO (SDR) 26 PVC CAN BE USED FOR PIPE SIZES 8 INCHES AND LARGER. SEE NOTE 6 BELOW REGARDING SDR26 FITTINGS.
- ALL SANITARY SEWER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" OVER PIPE AND BACKFILLED WITH CEMENT STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE.
- ALL SANITARY SEWERS AND WATER LINES CROSSINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ROSENBERG AND TCEQ REGULATIONS.
- SANITARY SEWER MANHOLE RIMS OUTSIDE OF PROPOSED PAVING WILL BE SET 3"- 6" ABOVE THE SURROUNDING LEVEL FINISHED GRADE AFTER PAVING AND GRADING OPERATIONS.
- SDR 26 P.V.C. PIPE USES "FULL BODIED" SDR 26 P.V.C. FITTINGS OR D.I.P. FITTINGS WITH APPROPRIATE ADAPTERS. AWWA C-900 DR-18 P.V.C. PIPE USES EITHER AWWA C900 DR-18 P.V.C. FITTINGS OR D.I.P. FITTINGS.
- DEFLECTION TEST: DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID SEWER PIPE BETWEEN MANHOLES. SERVICE LEADS SHALL NOT BE TESTED OR TESTED SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. THE DEFLECTION TEST SHALL USE A RIGID 7-SIDED MANDREL, WITH A DIAMETER EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE. NO MECHANICAL PULLING IS ALLOWED.
- INFILTRATION, EXFILTRATION OR LOW-PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC, TITLE 30 217.2 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.
- NO CONNECTIONS SHALL BE MADE TO THE EXISTING SANITARY SEWER LINES UNTIL ALL PROPOSED SEWER LINES HAVE BEEN THOROUGHLY CLEANED, TESTED AND APPROVED BY THE ENGINEER. THE ENGINEER AND CITY SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE CONTRACTOR CONNECTING TO ANY EXISTING SEWER LINES.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE CITY AT LEAST 48 HOURS PRIOR TO PRESSURE AND DEFLECTION TEST ON ALL SANITARY LINES.
- ALL SEWER LINES ENTERING A MANHOLE AT A FLOWLINE HIGHER THAN 3.0' OR 36" ABOVE THE MANHOLE INVERT MUST BE PROVIDED WITH A DROP PIPE OUTSIDE OF THE MANHOLE.

SWPPP NOTES

- POTENTIAL POLLUTANT SOURCES ASSOCIATED WITH CONSTRUCTION SITE:  
-ADHESIVES, PESTICIDES, DETERGENTS, PAINTS, FUELS, SOLVENTS, SEALANTS, FERTILIZERS, OILS, HERBICIDES, CLEANING SOLUTIONS, CONCRETE/CEMENT/PLASTER
- STORM WATER QUALITY MEASURE IMPLEMENTATION RELATIVE TO LAND DISTURBING ACTIVITIES:

A. PRIOR TO CONSTRUCTION: SILT FENCING SHALL BE INSTALLED IN ALL LOCATIONS SHOWN ON SITE MAP THAT WILL NOT BE DISTURBED DURING THE INITIAL GRADING PROCESS. THE STABILIZED CONSTRUCTION EXIT SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

B. DURING CONSTRUCTION:

B.1. IMMEDIATELY AFTER PAVING CONSTRUCTION IS COMPLETE, INLET PROTECTION TRAPS WILL BE INSTALLED ON ALL NEWLY CONSTRUCTED INLETS.

B.2. WHEN EXISTING SILT FENCING NEEDS TO BE REMOVED FOR CONSTRUCTION OR ACCESS PURPOSES, IT WILL BE REPLACED AS SOON AS POSSIBLE AFTER CONSTRUCTION IN THE VICINITY OF THE REMOVED FENCE IS COMPLETE.

B.3. AS SOON AS PRACTICABLE AFTER SITE GRADING IS COMPLETE, FINAL STABILIZATION PROCEDURES SUCH AS TURF ESTABLISHMENT AND INSTALLATION OF PLANT MATERIAL WILL BE COMMENCED.

C. AFTER CONSTRUCTION: AFTER CONSTRUCTION ACTIVITY AND SITE STABILIZATION PROCEDURES ARE COMPLETE, STRUCTURAL EROSION AND SEDIMENT CONTROLS WILL BE REMOVED. SOIL DISTURBED BY THE REMOVAL OF CONTROLS WILL BE STABILIZED.

- PERMANENT STORM WATER CONTROLS: AFTER CONSTRUCTION ACTIVITY IS COMPLETE, AREAS NOT COVERED BY CONCRETE PAVEMENT OR BY STRUCTURES WILL BE LANDSCAPED AND IRRIGATED. ONCE ESTABLISHED, THIS VEGETATION WILL HELP PREVENT SEDIMENT RUNOFF IN THE FUTURE STORM EVENTS. NEWLY GRADED AREA WILL BE TEXTURED TO REDUCE FLOW VELOCITY.
- MATERIAL HANDLING AND SPILL PREVENTION PLAN:

A. HAZARDOUS MATERIALS WILL BE STORED AND USED IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS. DISPOSAL WILL BE PERFORMED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION, AND IN ACCORDANCE WITH STATE AND LOCAL LAWS AND REGULATIONS.

B. THE FOLLOWING PROCEDURES WILL BE FOLLOWED FOR CONTAINMENT AND CLEAN-UP OF SPILLS:

B.1. ALL SPILLS WILL BE CLEANED UP AND PROPERLY REMOVED IN ACCORDANCE WITH STATE REGULATIONS AND LOCAL ORDINANCES.

B.2. SOIL AND SPILLED MATERIALS WILL BE COLLECTED UNTIL NO VISIBLE EVIDENCE OF SPILLED MATERIAL REMAINS.

B.3. THE TYPE OF MATERIAL AND QUANTITY OF RELEASE SHALL BE IDENTIFIED, AND APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SHALL BE WORN AS RECOMMENDED BY THE PRODUCT-SPECIFIC MSDS.

B.4. SPILL CONTAINMENT MAY BE INCLUDE CONSTRUCTION OF EARTH DIKES AROUND THE SPILL AREA, DEPLOYMENT OF ABSORBENT MATERIALS, OR USE OF COMMERCIALY AVAILABLE KITS.

B.5. CONTAMINATED SOIL AND SPILLED MATERIAL WILL BE STORED IN APPROPRIATE AND PROPERLY LABELED CONTAINERS, AND DISPOSED OF IN ACCORDANCE WITH STATE, LOCAL, AND FEDERAL RULES AND REGULATIONS.

C. GENERAL PERMIT MAINTENANCE REQUIREMENTS (FROM GENERAL PERMIT):

A. ALL PROTECTIVE MEASURES IDENTIFIED IN THIS SWPPP MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION. IF, THROUGH INSPECTION OR OTHER MEANS, THE PERMITEE DETERMINES THAT BMP'S ARE NOT OPERATING EFFECTIVELY, THEN THE PERMITEE SHALL PERFORM MAINTENANCE AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS, AND PRIOR TO THE NEXT RAIN EVENT, IF FEASIBLE. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS IMPRACTICABLE, THE REASON SHALL BE DOCUMENTED IN THE SWPPP AND MAINTENANCE MUST BE SCHEDULED AND ACCOMPLISHED AS SOON AS PRACTICABLE. EROSION AND SEDIMENTATION CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED, OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY.

B. IF PERIODIC INSPECTIONS OR OTHER INFORMATION INDICATES A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY, OR IS DAMAGED, THEN THE OPERATOR MUST REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER MAKING THE DISCOVERY.

C. SEDIMENT MUST BE REMOVED FROM SEDIMENT TRAPS AND SEDIMENTATION PONDS NO LATER THAN THE TIME THAT DESIGN CAPACITY HAS BEEN REDUCED BY 50%. FOR PERIMETER CONTROLS SUCH AS SILT FENCES, BERMS, ETC., THE TRAPPED SEDIMENT MUST BE REMOVED BEFORE IT REACHES 50% OF THE ABOVE GROUND HEIGHT.

D. IF SEDIMENT ESCAPES THE SITE, ACCUMULATIONS MUST BE REMOVED AT A FREQUENCY THAT MINIMIZES OFF-SITE IMPACTS, AND PRIOR TO THE NEXT RAIN EVENT, IF FEASIBLE. IF THE PERMITEE DOES NOT OWN THE OFFSITE CONVEYANCE, THEN THE PERMITEE MUST WORK WITH THE OWNER OR OPERATOR OF THE PROPERTY TO REMOVE THE SEDIMENT.

- EROSION AND SEDIMENT CONTROLS:

A. THE FOLLOWING NON-STRUCTURAL EROSION AND SEDIMENT CONTROLS WILL BE UTILIZED ON THE PROJECT SITE:

A.1. WHERE PRACTICAL, CARE WILL BE TAKEN TO PROTECT NATURAL VEGETATION THAT DOES NOT NEED TO BE REMOVED FOR CONSTRUCTION PURPOSES.

A.2. PLACEMENT OF CONCRETE PARKING AND DRIVEWAY AREAS WILL BE PERFORMED AS SOON AS POSSIBLE AFTER SUB-GRADE STABILIZATION, TO MINIMIZE THE AMOUNT OF TIME DISPOSED SOIL IS EXPOSED TO THE ELEMENTS. THIS PRACTICE WILL REDUCE THE FREQUENCY THAT MAINTENANCE IS REQUIRED ON THE STRUCTURAL BMP'S.

A.3. THE GENERAL PERMIT REQUIRES THAT EROSION AND STABILIZATION MEASURES MUST BE INITIATED WITHIN 14 DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED. IF CONSTRUCTION ACTIVITY IS SCHEDULED TO RESUME WITHIN 21 DAYS FROM THE CESSATION OF CONSTRUCTION ACTIVITY, EROSION AND STABILIZATION MEASURES ARE NOT REQUIRED FOR THAT PORTION OF THE SITE.

A.4. STABILIZATION PROCEDURES SUCH AS TURF ESTABLISHMENT AND INSTALLATION OF PLANT MATERIAL SHOULD BE COMMENCED AS SOON AS PRACTICABLE AFTER SITE GRADING IS COMPLETE AND FINAL.

B. THE FOLLOWING STRUCTURAL EROSION AND SEDIMENT CONTROLS WILL BE UTILIZED ON THE PROJECT SITE:

B.1. A STABILIZED CONSTRUCTION EXIT WILL BE INSTALLED AT THE LOCATION WHERE CONSTRUCTION TRAFFIC EXITS THE PROJECT SITE

B.2. INLET PROTECTION TRAPS WILL BE INSTALLED AT ALL INLETS IMMEDIATELY AFTER CONCRETE PAVEMENT IS PLACED

B.3. SILT FENCING (FILTER FABRIC FENCE OR REINFORCED FILTER FABRIC FENCE) WILL BE INSTALLED ALONG THE PROPERTY BOUNDARY AND ADJACENT TO EXISTING DITCHES, BAYOUS, STREAMS, RIVERS, AND/OR CHANNELS.

B.4. ANY SEDIMENT THAT ENTERS THE STORM SEWER SYSTEM WILL BE REMOVED IMMEDIATELY (NOT FLUSHED).

B.5. SINCE ALL PROPOSED INLETS DRAIN LESS THAN 10-ACRES, SEDIMENT BASINS ARE NOT REQUIRED FOR THIS SITE.

B.6. WHERE PRACTICAL, CARE WILL BE TAKEN TO PROTECT NATURAL VEGETATION THAT DOES NOT NEED TO BE REMOVED FOR CONSTRUCTION PURPOSES.

- TRAFFIC NOTES
  - CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD – LATEST EDITION WITH REVISIONS) DURING CONSTRUCTION.
  - NO LANES SHALL BE BLOCKED FROM 7 A.M. TO 9 A.M. AND 4 P.M. TO 6:30 P.M. MONDAY THRU FRIDAY.
  - OFF DUTY POLICE OFFICERS/FLAGGERS ARE REQUIRED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED.
  - CONTRACTOR SHALL COVER THE EXCAVATION WITH STEEL PLATES ANCHORED PROPERLY DURING NON-WORKING HOURS AND ALLOW NORMAL TRAFFIC FLOW. IF COVERING IS NOT FEASIBLE, USE TRANSTEX FR 336 EFX 36" DELINEATOR OR APPROVED EQUAL WITH SHEETING AND BASE EXPOSED TO PAVEMENT NEXT TO EXCAVATION DURING NON-WORKING HOURS.
  - APPROVED COPIES OF "TRAFFIC CONTROL PLANS: SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES.  
\*\*THESE PLANS SHALL BE DRAWN TO SCALE ON REPRODUCIBLE MYLARS AND SEALED BY A LICENSED ENGINEER IN THE STATE OF TEXAS. PLANS WILL BECOME A PART OF THE CONTRACT DRAWINGS.  
\*\*THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND OPERATION FOR ANY AND ALL TRAFFIC CONTROL MEASURES AS REQUIRED BY REGULATING AGENCIES OR FOR THE SAFE EXECUTION OF THE WORK SHOWN WITHIN THESE CONSTRUCTION DOCUMENTS. NO SEPERATE PAY.

ALJLindsey

Civil Engineer  
No. 12908  
Houston, TX 77068  
281.301.5665  
FRN F-1126

31 MARCH 2022

AL PROJECT NO.  
65321-CV-002

DATE: MARCH 2022

SCALE: N/A

DRAWN BY: SRH

CHECKED BY: BTH

FORT BEND COUNTY  
COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS

SHEET  
C0.1

REVISIONS

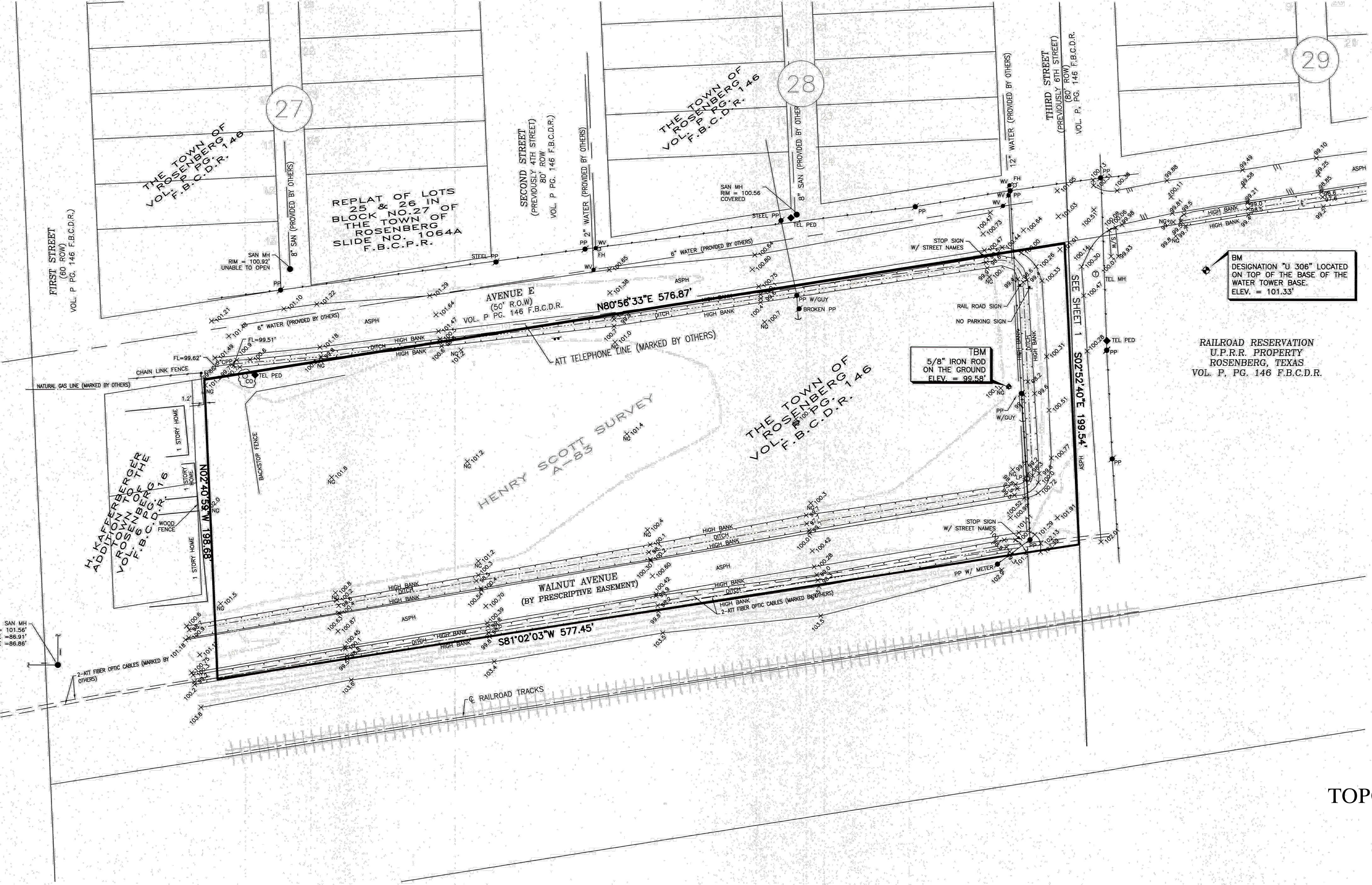
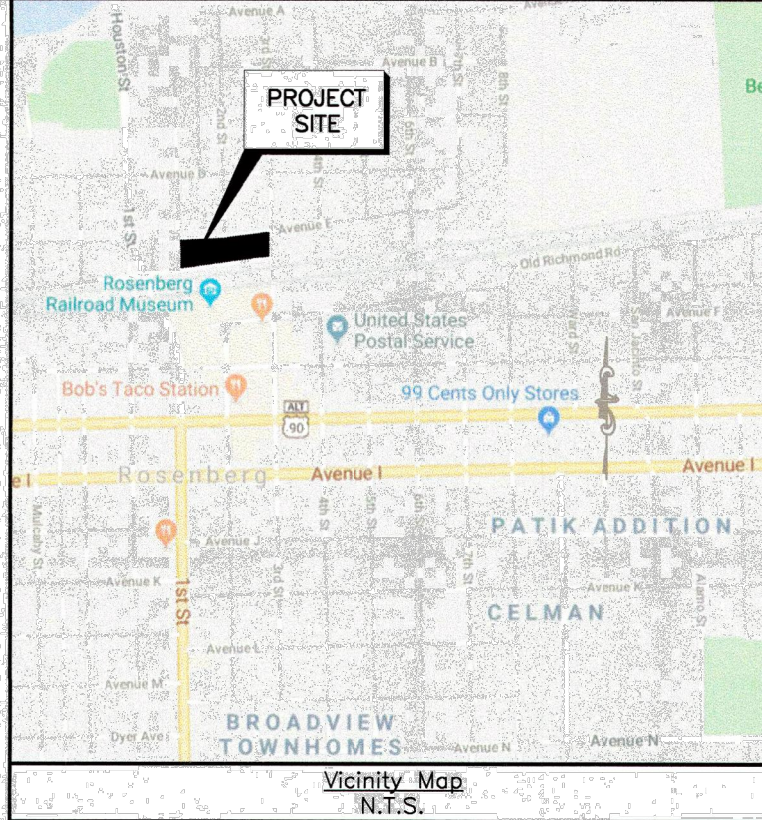
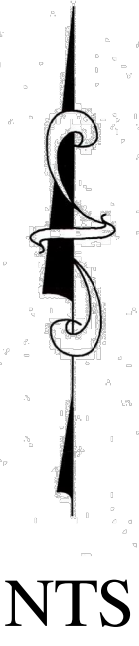
DATE



**BENCHMARK:**  
Bench Mark Disk STAMPED U 306 1935 with a CGS mark logo. Set at the southeast corner of the junction of 3rd Street and Avenue E, next Santa Fe Railway Station, in the top of the southwest corner of a 2 1/2- by 2 1/2-foot concrete base of a former water tower, about 2 feet higher than the Avenue.  
Elevation: 101.33 feet NAVD83

**TEMPORARY BENCHMARK:**  
A 5/8" iron rod on the ground located at the west edge of pavement of 3rd Street as shown hereon.  
Elevation: 99.58 feet NAVD83, 2001

- LEGEND**
- |                |                                      |
|----------------|--------------------------------------|
| (CM)           | CONTROL MONUMENT                     |
| CL             | CENTER LINE                          |
| E. TRANS       | E. TRANSFORMER                       |
| ESMT           | EASEMENT                             |
| FND            | FOUND                                |
| FH             | FIRE HYDRANT                         |
| FP             | FENCE POST                           |
| GUY            | GUY WIRE                             |
| IR/IP          | IRON ROD/IRON PIPE                   |
| MH             | MANHOLE                              |
| PP             | POWER POLE                           |
| SIGN           | SIGN                                 |
| TEL PED        | TELEPHONE PEDESTAL                   |
| R.O.W.         | RIGHT OF WAY                         |
| TEL SAN        | SANITARY                             |
| TEL SAN        | WITH                                 |
| WM             | WATER METER                          |
| WV             | WATER VALVE                          |
| F.B.C.C.F. NO. | FORT BEND COUNTY CLERK'S FILE NUMBER |
| F.B.C.D.R.     | FORT BEND COUNTY DEED RECORDS        |
| F.B.C.P.R.     | FORT BEND COUNTY PLAT RECORDS        |



- GENERAL NOTES:**
- The Basis of Bearings shown hereon is referenced to the Texas Coordinate System, NAD83, South Central Zone (TXSC 4204) based on National Geodetic Survey Monumentation; based on GPS measurements.
  - According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Fort Bend County, Texas, Map No. 4815700245 L dated April 2, 2014, year the subject tract appears to be within (a) Unshaded Zone "X", defined as areas outside the 0.2% annual chance floodplain.
  - This flood statement does not imply that the property or structures thereon will be free from flooding or flood damage. On rare occasions floods can and will occur and flood heights may be increased by man-made or natural causes. The location of the flood zone was determined by scaling from said FEMA map. The actual location, as determined by elevation contours, may differ. KM Surveying, LLC assumes no liability as to the accuracy of the location of the flood zone limits. This flood statement shall not create liability on the part of KM Surveying, LLC.
  - This survey has been prepared without the benefit of a Commitment for Title Insurance or Abstractor's Certificate and therefore easements or encumbrances may exist which are not shown hereon. No research of the Public Records of Fort Bend County regarding these easements or encumbrances was performed by KM Surveying, LLC.
  - Fences shown hereon with dimensional ties are shown where they were physically measured. The fence line may meander between measured locations.
  - The square footage totals as shown hereon are based on the mathematical closure of the courses and distances reflected on this survey. It does not include the tolerances that may be present due to the positional accuracy of the boundary monumentation.
  - This survey does not determine the location of wetlands, fault lines, toxic waste, cemeteries, landfills, dumps or any other environmental issues.
  - KM Surveying, LLC has not been provided with construction plans showing the location of underground utilities. Underground utilities may exist which are not shown hereon.
  - Research for adjoiner tracts was performed by KM Surveying, LLC.
  - Fences shown hereon with dimensional ties are shown where they were physically measured. The fence line may meander between measured locations.
  - Readily visible improvements/utilities were located with this survey, no subsurface probing, excavation or exploration was performed by KM Surveying, LLC.
  - ONE CALL UTILITY LOCATION SERVICE was performed for this survey on March 6, 2019 to locate and mark all utilities. (1-800-344-8377)

We, KM Surveying, LLC, acting by and through Kevin Drew McRae, a Texas Registered Professional Land Surveyor, hereby certify that this survey was made on the ground under my supervision.

Surveyed on this the 7th day of March, 2019

*Kevin Drew McRae*  
Kevin Drew McRae  
Registered Professional Land Surveyor  
Texas Registration No. 5485

STATE OF TEXAS  
REGISTERED  
KEVIN DREW MCRAE  
5485  
PROFESSIONAL  
LAND SURVEYOR

**TOPOGRAPHIC SURVEY  
C0.2**

3		
2		
1	corrected water meter to son. sewer clean out	jrm 3/11/19
REV	DESCRIPTION	BY DATE
<b>KM Surveying, LLC</b>		
3902 REESE ROAD - SUITE C-100		
ROSENBERG, TEXAS 77471		
713-234-6627 www.kmsurveying.com		
TOLPS FIRM #10178700		
<b>TOPOGRAPHIC SURVEY</b>		
<b>2.6228 ACRE TRACT</b>		
<b>OUT OF RAILROAD RESERVATION</b>		
<b>TOWN OF ROSENBERG</b>		
<b>VOL. P. PG. 146 F.B.C.D.R.</b>		
<b>HENRY SCOTT SURVEY A-83</b>		
<b>FORT BEND COUNTY, TEXAS</b>		
DATE: March 2019	SCALE: NTS	JOB NO.: 0113-1901
DWG. NAME: 0113-1901 topo ave a.dwg	DRAWING NO.: Sheet 1	



STATE OF TEXAS  
COUNTY OF FORT BEND

We, Attack Poverty, acting by and through Brandon Baca, CEO, and Pete Rigby, Board Chairman, owners hereinafter referred to as Owners of the 0.8628 acre tract described in the above and foregoing plat of ATTACK POVERTY-ROSE 2, do hereby make and establish said subdivision of said property according to all lines, dedications, restrictions and notations on said plat and hereby dedicate to the use of the public forever, all streets, alleys, parks, watercourses, drains, easements and public places shown thereon for the purposes and considerations therein expressed, and do hereby bind ourselves, our heirs, successors and assigns to warrant and forever defend the title to the land so dedicated.

FURTHER, Owners have dedicated and by these presents do dedicate to the use of the public for public utility purposes forever unobstructed aerial easements. The aerial easements shall extend horizontally an additional 11 feet six inches for ten feet perimeter ground easements; five feet six inches for 16 feet perimeter ground easements; or seven feet six inches for 14 feet perimeter ground easements, from a plane 16 feet above ground level upward, located adjacent to and adjoining said public utility easements that are designated with aerial easements (U.E. and A.E.) as indicated and depicted hereon, whereby the aerial easement totals 21 feet six inches in width.

FURTHER, owners have dedicated and by these presents do dedicate to the use of the public for public utility purposes forever unobstructed aerial easements. The aerial easements shall extend horizontally an additional ten feet for ten feet back-to-back ground easements; seven feet for 16 feet back-to-back ground easements; or nine feet for 14 feet back-to-back ground easements, from a plane 16 feet above ground level upward, located adjacent to both sides and adjoining said public utility easements that are designated with aerial easements (U.E. and A.E.) as indicated and depicted hereon, whereby the aerial easement totals 30 feet in width.

FURTHER, Owners do hereby covenant and agree that all of the property within the boundaries of this plat is hereby restricted to prevent the drainage of any septic tanks into any public or private street, permanent access easement, road or alley or any drainage ditch, either directly or indirectly.

FURTHER, Owners do hereby dedicate to the public a strip of land twenty (20) feet wide on each side of the center line of any and all bayous, creeks, gullies, ravines, draws, sloughs or other natural drainage courses located in said plat, as easements for drainage purposes, giving the City of Rosenberg, Fort Bend County, or any other governmental agency, the right to enter upon said easement at any and all times for the purpose of construction and maintenance of drainage facilities and structures.

FURTHER, Owners do hereby covenant and agree that all of the property within the boundaries of this plat and adjacent to any drainage easement, ditch, gully, creek or natural drainage way shall hereby be restricted to keep such drainage ways and easements clear of fences, buildings, planting and other obstructions to the operations and maintenance of the drainage facility and that such abutting property shall not be permitted to drain directly into this easement except by means of an approved drainage structure.

FURTHER, we do hereby acknowledge the receipt of the "Orders for Regulation of Outdoor Lighting in the Unincorporated Areas of Fort Bend County, Texas", and do hereby covenant and agree that this site has complied with or has exceeded all lighting regulations as defined within this order as adopted by Fort Bend County Commissioners' Court on March 23, 2004, and any subsequent amendments.

IN TESTIMONY WHEREOF, the Attack Poverty has caused these presents to be signed by Brandon Baca, its CEO, and Pete Rigby, its Board Chairman, hereunto authorized, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

By: Attack Poverty

Brandon Baca, CEO

Pete Rigby, Board Chairman

STATE OF TEXAS  
COUNTY OF FORT BEND

Before me, the undersigned authority, on this day personally appeared Brandon Baca, CEO, and Pete Rigby, Board Chairman of Attack Poverty, known to me to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they executed the same for the purposes and considerations therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Notary Public in and for the  
State of Texas

My Commission Expires:

I, (or we), Wallis Bank, owner and holder (or owners and holders) of a lien (or liens) against the property described in the plat known as ATTACK POVERTY-ROSE 2, against the property described instrument of record under Fort Bend County Clerk's File Nos. 2021142111 and 2021142114 of the Official Records (or Deed of Trust Records) of Fort Bend County, Texas, do hereby in all things subordinate to said plat said lien(s) and I (or we) hereby in all things subordinate to said plat said lien(s) and I (or we) hereby confirm that I am (or we are) the present owner (or owners) of said lien(s) and have not assigned the same nor any part thereof.

Signature of Lienholder

Printed Name

STATE OF TEXAS  
COUNTY OF \_\_\_\_\_

Before me, the undersigned authority, on this day personally appeared \_\_\_\_\_ of Wallis Bank, known to me to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they executed the same for the purposes and considerations therein expressed and in the capacity therein and herein set out, and as the act and deed of said corporation.

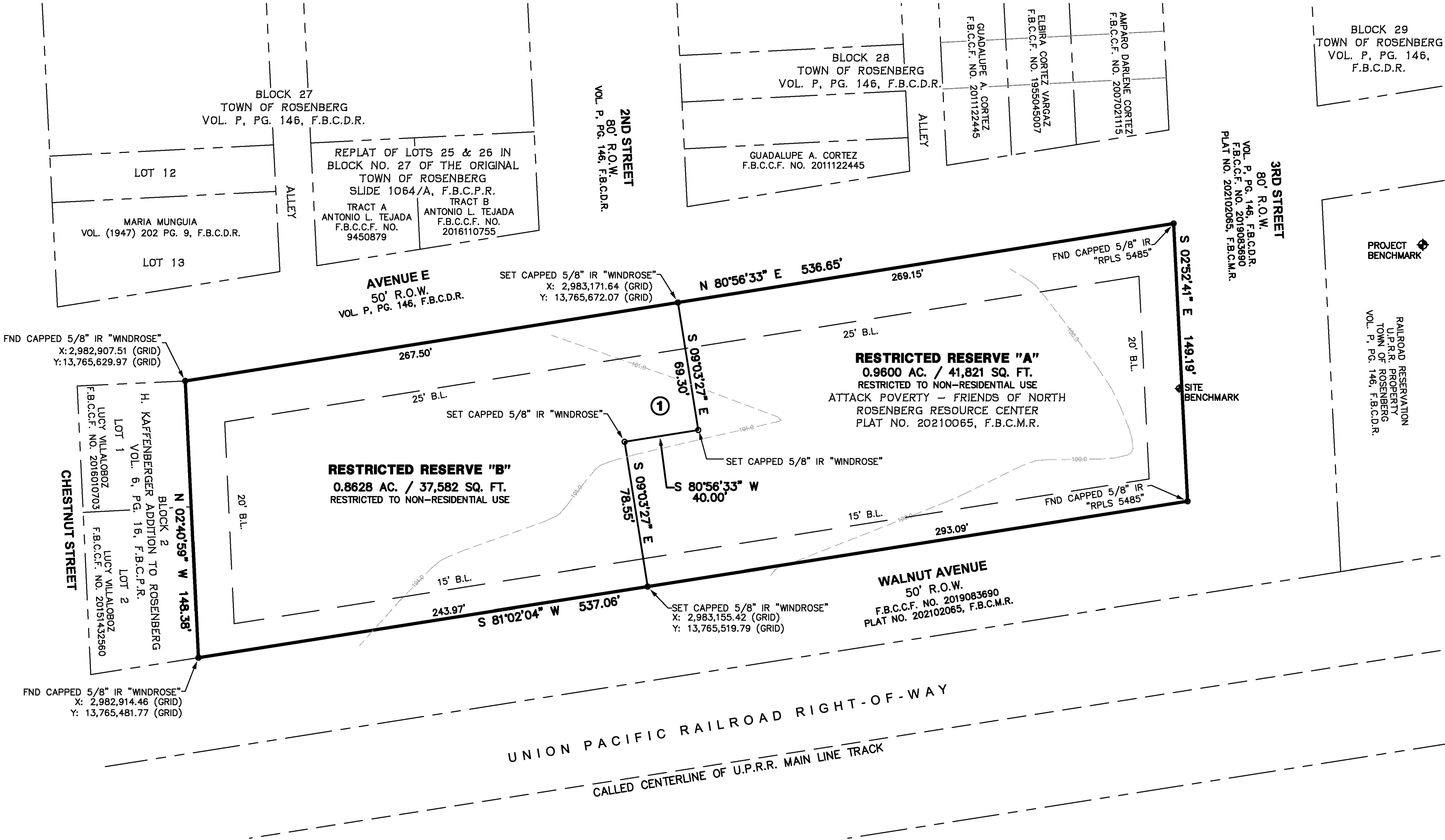
GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Notary Public in and for the  
State of Texas

My Commission Expires:

I, Liao M. Dobrowski, am authorized under the laws of the State of Texas to practice the profession of surveying and hereby certify that the above subdivision is true and accurate; was prepared from an actual survey of the property made under my supervision on the ground; that, except as shown all boundary corners, angle points, points of curvature and other points of reference have been marked with iron (or other objects of a permanent nature) pipes or rods having an outside diameter of not less than five eighths (5/8) inch and a length of not less than three (3) feet; and that the plat boundary corners have been tied to the Texas Coordinate System of 1983, South Central Zone.

Liao M. Dobrowski  
Registered Professional Land Surveyor  
Texas Registration No. 6544



This is to certify that the Planning Commission of the City of Rosenberg, Texas, has approved this plat and subdivision of ATTACK POVERTY-ROSE 2 in conformance with the laws of the State of Texas and the ordinances of the City of Rosenberg as shown hereon and authorized recording of this plat this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

By: Pete Pavlovsky  
Chairman

By: Anthony Sulak  
Secretary

This is to certify that the City Council of the City of Rosenberg, Texas, has approved this plat and subdivision of ATTACK POVERTY-ROSE 2 in conformance with the laws of the State of Texas and the ordinances of the City of Rosenberg as shown hereon and authorized recording of this plat this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

By: Kevin Raines  
Mayor

By: Danyel Swint  
City Secretary

I, Laura Richard, County Clerk in and for Fort Bend County, hereby certify that the foregoing instrument with its certificate of authentication was filed for recordation in my office on \_\_\_\_\_, 20\_\_\_\_, at \_\_\_\_\_ o'clock \_\_\_\_\_M., and duly recorded on \_\_\_\_\_, 20\_\_\_\_, in Plat No. \_\_\_\_\_ of the Map Records of Fort Bend County, for said county.

Witness my hand and seal of office, at Richmond, Texas, the day and date last above written.

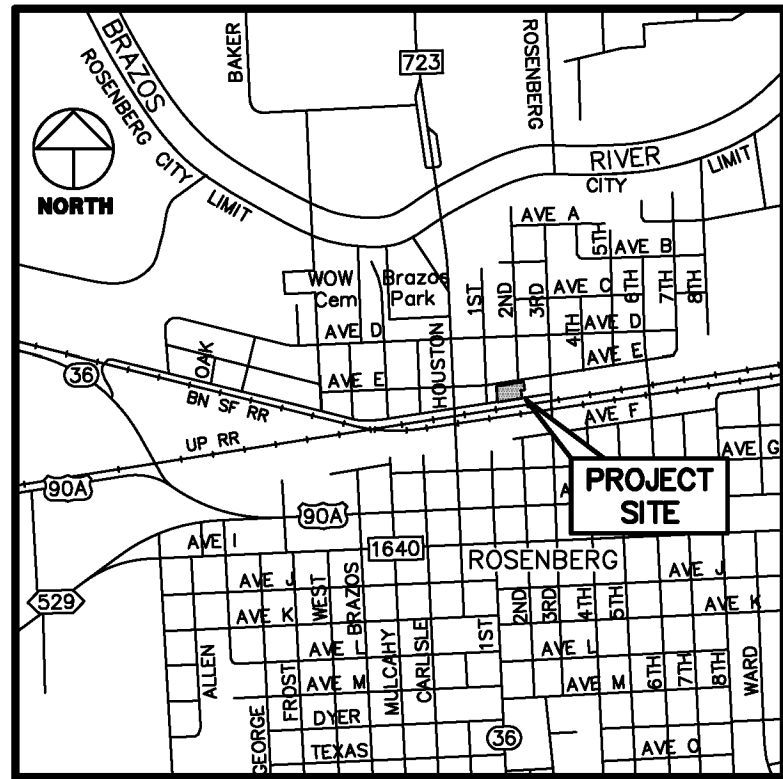
Laura Richard  
Clerk of the County Court  
of Fort Bend County, Texas

By: \_\_\_\_\_ Deputy

#### GENERAL NOTES

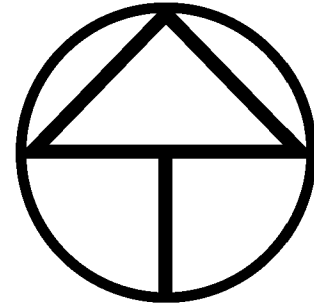
- BEARINGS WERE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (NAD 83). ALL DISTANCES SHOWN HEREON ARE SURFACE DISTANCES AND MAY BE BROUGHT TO GRID BY APPLYING THE FOLLOWING SCALE FACTOR: 0.9998705270.
- PROJECT BENCHMARK: DISK STAMPED "U 306 1935" WITH A CGS MARK LOGO SET AT THE SOUTHEAST CORNER OF THE JUNCTION OF 3RD STREET AND AVENUE E, NEXT SANTA FE RAILWAY STATION, IN THE TOP OF THE SOUTHWEST CORNER OF A 2 1/2- BY 2 1/2-FOOT CONCRETE BASE OF A FORMER WATER TOWER, ABOUT 2 FEET HIGHER THAN THE AVENUE. ELEVATION: 101.33 FEET NAVD88.
- SITE BENCHMARK: A 5/8" IRON ROD ON THE GROUND LOCATED AT THE WEST EDGE OF PAVEMENT OF 3RD STREET AS SHOWN HEREON. ELEVATION: 99.56 FEET NAVD88, 2001 ADJ.
- ELEVATIONS USED FOR DELINEATING CONTOUR LINES ARE BASED UPON U.S.C. & G.S. DATUM, NVD-88 (1991 ADJ.)
- THIS PLAT WAS PREPARED TO MEET CITY OF ROSENBERG AND FORT BEND COUNTY REQUIREMENTS.
- THIS PLAT WAS PREPARED FROM INFORMATION FURNISHED BY TEXAS AMERICAN TITLE COMPANY, CPL NO. 2791021-11619, DATED NOVEMBER 11, 2021. THE SURVEYOR HAS NOT ABSTRACTED THE ABOVE PROPERTY.
- ATTACK POVERTY-ROSE 2 APPEARS TO LIE WITHIN UNSHADED ZONE "X", AS PER FLOOD INSURANCE RATE MAP, MAP NUMBER 48157C0245L REVISED/DATED APRIL 2, 2014.
- APPROVAL OF THIS PLAT WILL EXPIRE ONE YEAR FROM CITY COUNCIL APPROVAL IF NOT RECORDED IN THE REAL PROPERTY RECORDS OF THE COUNTY OF FORT BEND.
- THERE ARE NO PIPELINES NOR PIPELINE EASEMENTS WITHIN THE LIMITS OF THE SUBDIVISION.
- FIVE-EIGHTHS INCH (5/8") IRON RODS THREE FEET (3') IN LENGTH ARE SET ON ALL PERMETER BOUNDARY CORNERS, ALL ANGLE POINTS, ALL POINTS OF CURVATURE AND TANGENCY, AND ALL BLOCK CORNERS, UNLESS OTHERWISE NOTED.
- THE DRAINAGE SYSTEM FOR THIS SUBDIVISION SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE FORT BEND COUNTY DRAINAGE CRITERIA MANUAL WHICH ALLOWS STREET FLOODING DURING INTENSE RAINFALL EVENTS.

- ALL EASEMENTS ARE CENTERED ON LOT LINES UNLESS OTHERWISE INDICATED.
- SIDEWALKS SHALL BE BUILT OR CAUSED TO BE BUILT THROUGH RESTRICTIVE COVENANTS WITHIN ALL ROAD RIGHTS-OF-WAY DEDICATED TO THE PUBLIC.
- ALL OF THE PROPERTY SUBDIVIDED IN THE FOREGOING PLAT IS WITHIN THE INCORPORATED BOUNDARIES OF THE CITY OF ROSENBERG, TEXAS.
- SITE PLANS SHALL BE SUBMITTED TO THE CITY OF ROSENBERG FOR STAFF REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. DRIVEWAY REQUIREMENTS FOR THE LOCATIONS, WIDTHS AND OFFSET FROM AN INTERSECTION AND ANY EXISTING DRIVEWAYS OR PROPOSED DRIVEWAYS, SHALL CONFORM TO THE DESIGN STANDARDS OF THE CITY OF ROSENBERG.
- NO OWNER OF THE LAND SUBJECT TO AN EASEMENT MAY PLACE, BUILD OR CONSTRUCT ANY PERMANENT BUILDING, STRUCTURE OR OBSTRUCTION OF ANY KIND OVER, UNDER OR UPON THE EASEMENT, PROVIDED THAT SUCH OWNER MAY CROSS OR COVER THE EASEMENT WITH A PAVED DRIVEWAY/PARKING LOT UNDER THE FOLLOWING CONDITIONS: THE DRIVEWAY SHALL BE JOINED AT THE BOUNDARY LINE OF THE EASEMENT TO LIMIT THE AMOUNT OF PAVING THAT MUST BE REMOVED TO PROVIDE ACCESS, AND THERE SHALL BE NO OBLIGATION OF THE CITY TO REPLACE/REPAIR ANY PAVING REMOVED IN THE EXERCISE OF THIS EASEMENT.
- SUBJECT TO RESTRICTIONS SET FORTH BY INSTRUMENT FILED FOR RECORD UNDER PLAT NO. 20210065, F.B.C.M.R. AND UNDER F.B.C.C.F. NO. 2019083690.
- THE TOP OF ALL FLOOR SLAB ELEVATIONS SHALL BE A MINIMUM OF \_\_\_\_\_ FEET ABOVE MEAN SEA LEVEL. THE TOP OF SLAB ELEVATION AT ANY POINT ON THE PERIMETER OF THE SLAB SHALL NOT BE LESS THAN EIGHTEEN (18) INCHES ABOVE NATURAL GROUND. ANY FUTURE DEVELOPMENT SHOULD VERIFY THAT THE MINIMUM SLAB ELEVATION IS AT LEAST 12 INCHES ABOVE THE MAXIMUM ANTICIPATED PONDING OR SHEET FLOW ELEVATION FOR THE SITE.
- FORT BEND COUNTY HAS SUBMITTED A VARIANCE REQUEST IN COORDINATION WITH ATTACK POVERTY AND THE BOYS AND GIRLS CLUB OF GREATER HOUSTON. A NEW BOYS AND GIRLS CLUB CENTER IS PROPOSED TO BE LOCATED ON THE WEST SIDE OF THE ATTACK POVERTY SITE. STAFF HAS NO OBJECTIONS TO THE REQUEST REGARDING THE REDUCTION OF BUILDING LINES ALONG THE WEST AND SOUTH PLAT BOUNDARY. MOTION BY COUNCILOR, DISTRICT NO. 3 TIMOTHY P. ANDERS, SECONDED BY COUNCILOR AT-LARGE, POSITION 2 ALICIA CASAS TO APPROVE A BUILDING LINE VARIANCE REQUEST BY FORT BEND COUNTY FOR AN ADDITION ON THE "ATTACK POVERTY" PROPERTY LOCATED AT 1908 AVENUE E, ON JULY 21, 2021.



CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS

**VICINITY MAP**  
SCALE: 1" = 2,000'



**NORTH**

GRAPHIC SCALE: 1" = 40'

#### ABBREVIATIONS

- FND - FOUND
- F.C. - FILM CODE
- F.B.C.C.F. - FORT BEND COUNTY CLERKS FILE
- F.B.C.D.R. - FORT BEND COUNTY DEED RECORDS
- F.B.C.M.R. - FORT BEND COUNTY PLAT RECORDS
- IP - IRON PIPE
- IR - IRON ROD
- NO. - NUMBER
- PS - PAGE
- R.O.W. - RIGHT-OF-WAY
- SQ. FT. - SQUARE FEET
- VL - VOLUME
- A.E. - AERIAL EASEMENT
- B.L. - BUILDING LINE
- S.S.E. - SANITARY SEWER EASEMENT
- ST.S.E. - STORM SEWER EASEMENT
- U.E. - UTILITY EASEMENT
- W.L.E. - WATER LINE EASEMENT
- H.L.P. - HOUSTON LIGHTING AND POWER
- D.E. - DRAINAGE EASEMENT
- P.L. - PROPERTY LINE
- (S) - SET CAPPED 5/8" IR "WINDROSE"

**PLAT**  
**C0.3**

## ATTACK POVERTY-ROSE 2

A SUBDIVISION OF  
1.8228 AC. / 79,403 SQ. FT.  
BEING A REPLAT OF RESTRICTED RESERVE "A",  
BLOCK 1, ATTACK POVERTY - FRIENDS OF NORTH ROSENBERG  
RESOURCE CENTER, PLAT NO. 20210065, F.B.C.M.R.  
SITUATED IN THE  
H. SCOTT SURVEY, ABSTRACT NO. 83  
CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS

1 BLOCK 2 RESERVES

DECEMBER 27, 2021

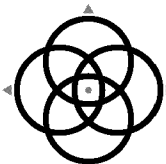
PURPOSE OF REPLAT: TO CREATE TWO (2) RESTRICTED RESERVES

Owner

Attack Poverty

3727 Greenbriar, Suite 100  
Stafford, TX 77477

Surveyor



**WINDROSE**  
LAND SURVEYING | PLATTING

11111 RICHMOND AVE., SUITE 150 | HOUSTON, TX 77082 | 713.458.2281  
FIRM REGISTRATION NO. 10108800 | WINDROSESERVICES.COM



CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

GENERAL NOTES

1. ALL SAWCUTS TO EXTEND FULL DEPTH OF EXISTING PAVEMENT, AND IN NO CASE SHALL THE PROPOSED CONCRETE PAVEMENT SECTION BE LESS THAN 24 INCHES IN WIDTH. CONTRACTOR TO SAWCUT ALONG GUTTER OF EXISTING PAVEMENT AND ADJUST LOCATION OF SAWCUT TO ENSURE ADEQUATE WIDTH OF PROPOSED PAVEMENT.
2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL FOR ALL WORK TO BE DONE IN RIGHT-OF-WAY ACCORDING TO THE LATEST MUTCD REQUIREMENTS.
3. CONTRACTOR TO CLEAR AND GRUB PROJECT SITE AS NECESSARY FOR INSTALLATION OF PROPOSED FACILITIES. CLEARING AND GRUBBING CONSISTS OF REMOVAL AND DISPOSAL OF TREES, STUMPS, BRUSH, ROOTS, VEGETATION, LOGS, RUBBISH AND OTHER OBJECTIONABLE MATTER WITHIN THE DESIGNATED AREA. CONTRACTOR TO REMOVE STUMPS AND ROOTS WITHIN CLEARING LIMITS TO MINIMUM DEPTH OF TWO (2') FEET BELOW NATURAL GROUND ELEVATION. CLEARED AND GRUBBED MATERIAL BECOMES PROPERTY OF THE CONTRACTOR, TO BE THE REMOVED FROM THE WORK SITE OR DISPOSED OF AT NO EXTRA COST TO THE OWNER.
4. CONTRACTOR RESPONSIBLE TO CLEAR AND DEMO ALL WITHIN LIMITS OF DISTURBANCE LINE AS NOTED.

LEGEND

- |          |                         |
|----------|-------------------------|
| — GAS —  | EXISTING GAS LINE       |
| == WL == | EXISTING STORM SEWER    |
| — WL —   | EXISTING WATER LINE     |
| — SS —   | EXISTING SANITARY SEWER |
| — OH —   | EXISTING OH POWER LINE  |
| ●        | EXISTING MANHOLE        |
| — 100 —  | EXISTING CONTOUR        |

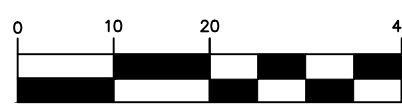
KEYED NOTES

- EXISTING FEATURES TO BE REMOVED
- ① FENCE
  - ② LIGHT POLE (TO BE RELOCATED)
  - ③ PAVEMENT STRIPING
- EXISTING CONCRETE PAVEMENT (TO BE REMOVED)
- LIMITS OF DISTURBED AREA
- SAWCUT

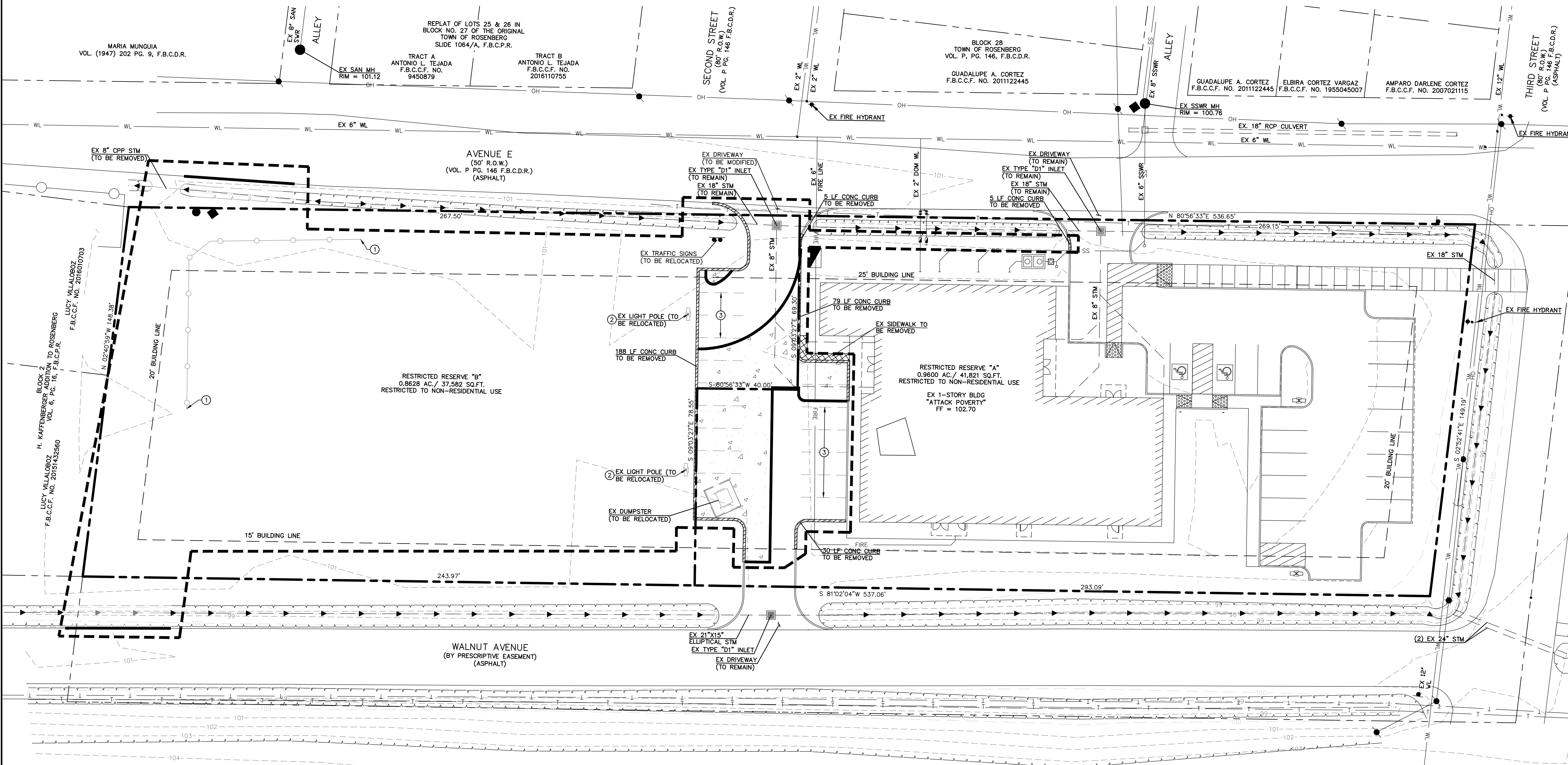
MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

BENCHMARK:  
BENCH MARK DISK STAMPED U 306 1935 WITH A CGS MARK LOGO. SET AT THE SOUTHEAST CORNER OF THE JUNCTION OF 3RD STREET AND AVENUE E, NEXT TO SANTA FE RAILWAY STATION, IN THE TOP OF THE SOUTHWEST CORNER OF A 2 1/2 - B 2 1/2-FOOT CONCRETE BASE OF A FORMER WATER TOWER, ABOUT 2 FEET HIGHER THAN THE AVENUE. ELEVATION = 101.33 FEET NAVD88

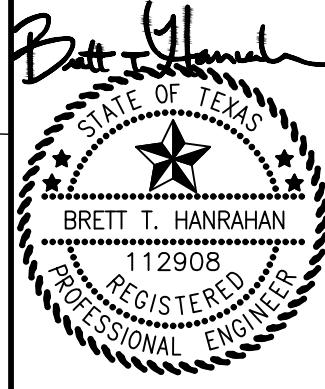
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A 1" IRON ROD ON THE GROUND LOCATED AT THE WEST EDGE OF PAVEMENT OF 3RD STREET AS SHOWN HEREON. ELEVATION = 99.58 FEET NAVD88, 2001



GRAPHIC SCALE



ALJLindsey  
Civil Engineers  
12908  
Houston, TX 77060  
281.301.5655  
FRN F-11526



31 MARCH 2022

ALL PROJECT NO.  
65321.CV.002  
DATE: MARCH 2022  
SCALE: 1" = 20'  
DRAWN BY: SRH  
CHECKED BY: BTH

DEMOLITION PLAN

FORT BEND COUNTY  
COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS

SHEET  
C1.0



CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
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FIRE LANE MARKING NOTES

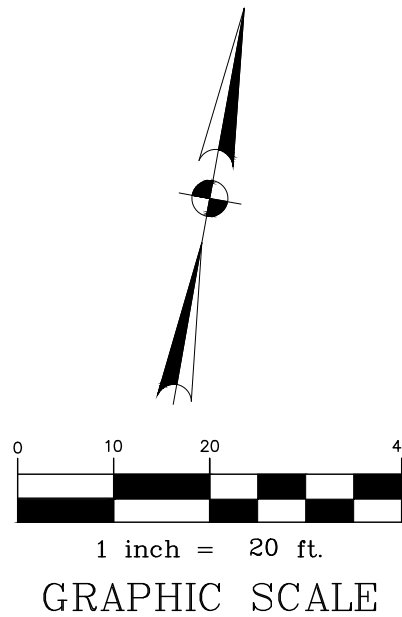
CURBS LOCATED ON EITHER SIDE OF A FIRE LANE SHALL BE PAINTED RED OR A RED STRIPE SHALL BE PLACED ALONG THE PAVEMENT WHERE THERE IS NO CURB. WHERE A FIRE LANE PASSES BETWEEN HEAD-IN PARKING SPACES, THE RED STRIPE SHOULD BE PLACED ALONG THE REAR OF THESE SPACES CLEARLY DEFINING THE FIRE LANE. PAINTED CURBS AND FIRE LANE STRIPES SHALL ALSO BE CONSPICUOUSLY AND LEGIBLY MARKED WITH THE WARNING "FIRE LANE-TOW AWAY ZONE" IN WHITE LETTERS AT LEAST THREE (3) INCHES IN HEIGHT, AT INTERVALS NOT EXCEEDING (50) FEET

GENERAL NOTES

1. PAVEMENT DIMENSIONS AND RADII ARE FACE TO FACE OF CURB, UNLESS OTHERWISE NOTED.
2. RADII ARE 3' UNLESS OTHERWISE NOTED.
3. REFER TO SITE ELECTRICAL PLAN FOR PROPOSED SITE LIGHTING LAYOUT.
4. REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING/FOUNDATION DIMENSIONS.

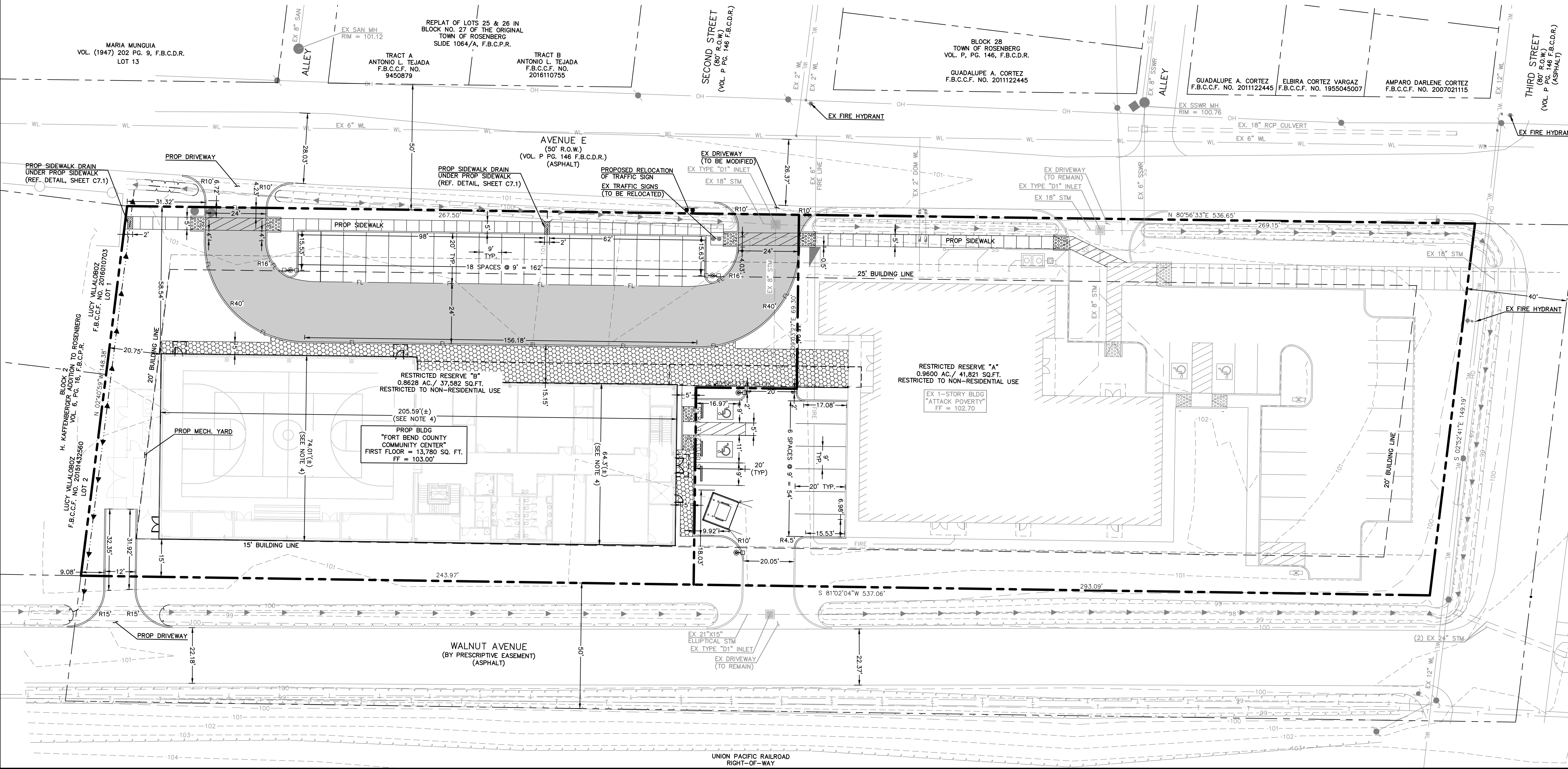
LEGEND

	PROPOSED BUILDING PERIMETER SIDEWALK
	PROPOSED CURB RAMP
	EX. MANHOLE
	EX. STORM SEWER
	EX. WATER LINE
	EX. SANITARY SEWER LINE
	EX. OVERHEAD POWER LINE
	EX. UNDERGROUND GAS LINE
	EX. MAJOR CONTOUR
	EX. MINOR CONTOUR

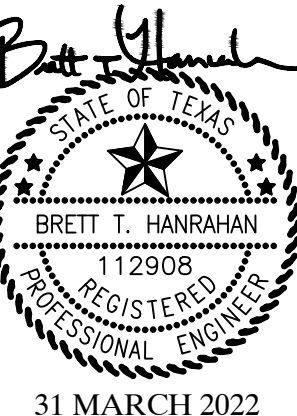


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ELEVATION = 99.58 FEET NAVD88, 2001



ALJLindsey  
Civil Engineers  
1100 W. Suite 314  
Houston, TX 77068  
281.301.5655  
FRN F-11526



ALL PROJECT NO.  
65321.CV.002  
DATE: MARCH 2022  
SCALE: 1" = 20'  
DRAWN BY: SRH  
CHECKED BY: BTH

DIMENSION CONTROL  
PLAN

FORT BEND COUNTY  
COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS

SHEET  
C1.1



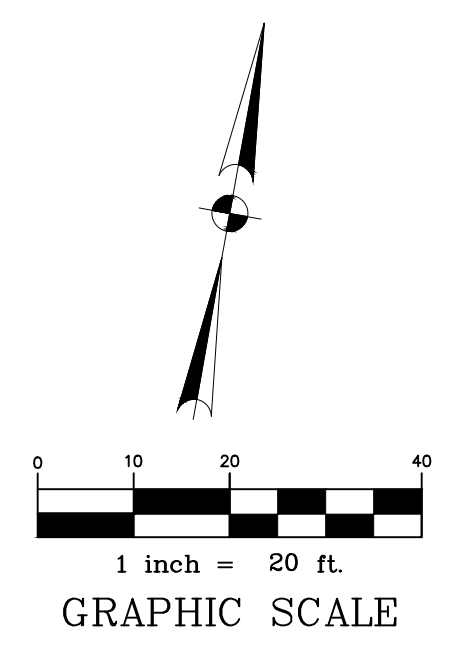
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TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

FIRE DEPARTMENT CONNECTION MUST BE LOCATED WITHIN 100' OF  
EXISTING FIRE HYDRANT PER FORT BEND COUNTY FIRE MARSHAL  
REGULATIONS. VERIFY DISTANCE PRIOR TO INSTALLATION.

MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON  
THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS  
REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND  
MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE  
EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS  
SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

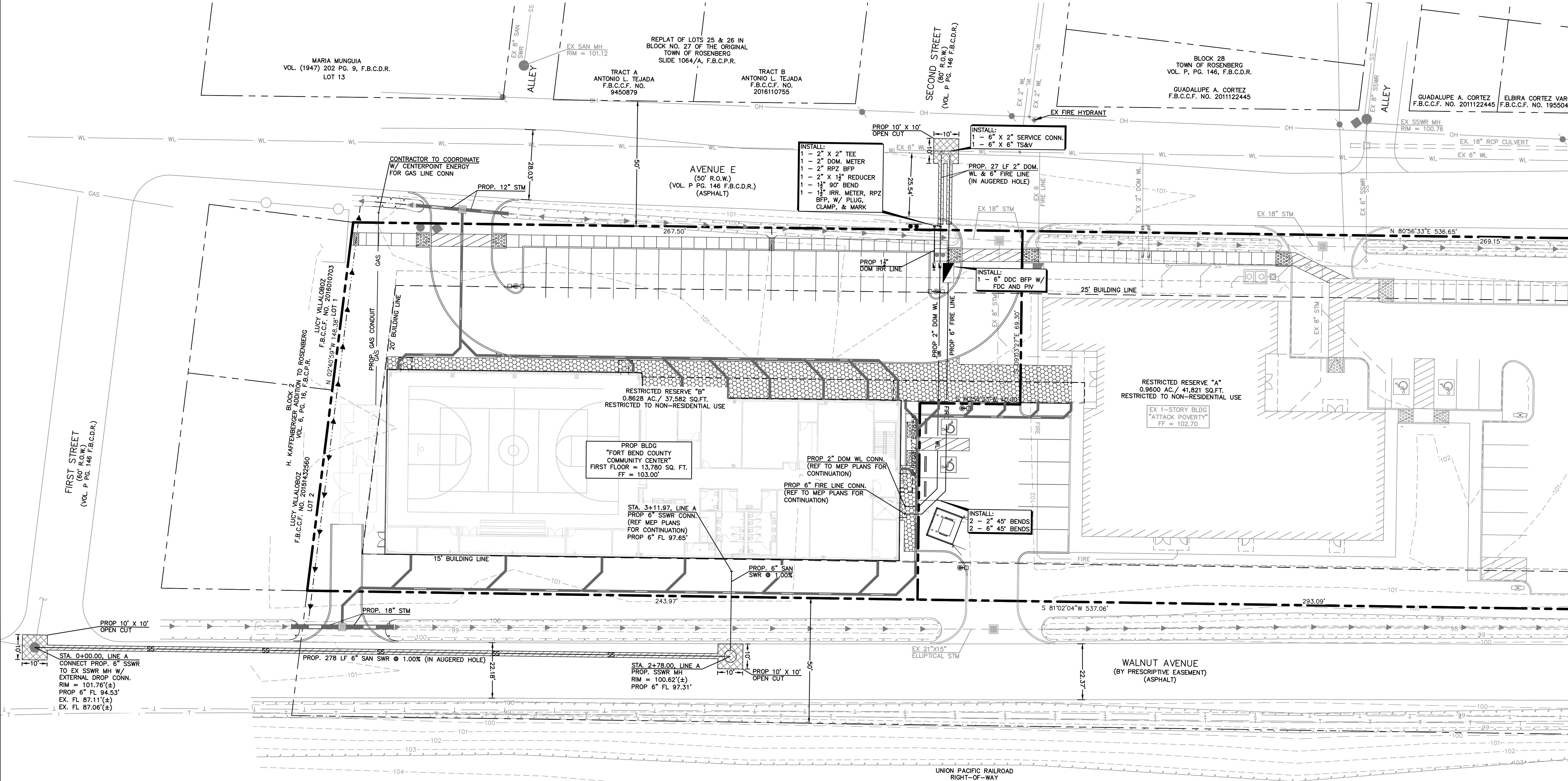
- GENERAL NOTES**
- REFERENCE SANITARY SEWER AND WATER LINE NOTES SHEET C0.1  
FOR PIPE MATERIAL REQUIREMENTS.
  - REFER TO SITE ELECTRICAL PLAN FOR PROPOSED SITE LIGHTING  
LAYOUT.
  - REFERENCE MEP PLANS FOR CONTINUATION OF SANITARY AND  
WATER FACILITIES INSIDE BUILDING.
  - ALL CLEANOUTS LOCATED WITHIN CONCRETE PAVEMENT TO BE  
TRAFFIC RATED.
  - CONTRACTOR TO VERIFY ALL PROPOSED UTILITY CONNECTIONS FOR  
BOTH LOCATION AND DEPTH PRIOR TO ORDERING MATERIALS OR  
COMMENCEMENT OF WORK.
  - FIRE LINE IS SHOWN FOR ALIGNMENT AND POINT OF CONNECTION  
PURPOSES ONLY. ALL FIRE LINES ARE TO BE DESIGNED AND  
INSTALLED BY A LICENSED RME-U, INCLUDING BUT NOT LIMITED TO  
MATERIALS, THRUST BLOCKING, APPURTENANCES, ETC.

LEGEND	
SS	PROPOSED SANITARY SEWER
WL	PROPOSED WATER LINE
FIRE	PROPOSED FIRE LINE
	PROPOSED STORM SEWER
EX. SS	EX. STORM SEWER
EX. WL	EX. WATER LINE
EX. SS	EX. SANITARY SEWER LINE
EX. 100	EX. MAJOR CONTOUR
EX. 99	EX. MINOR CONTOUR



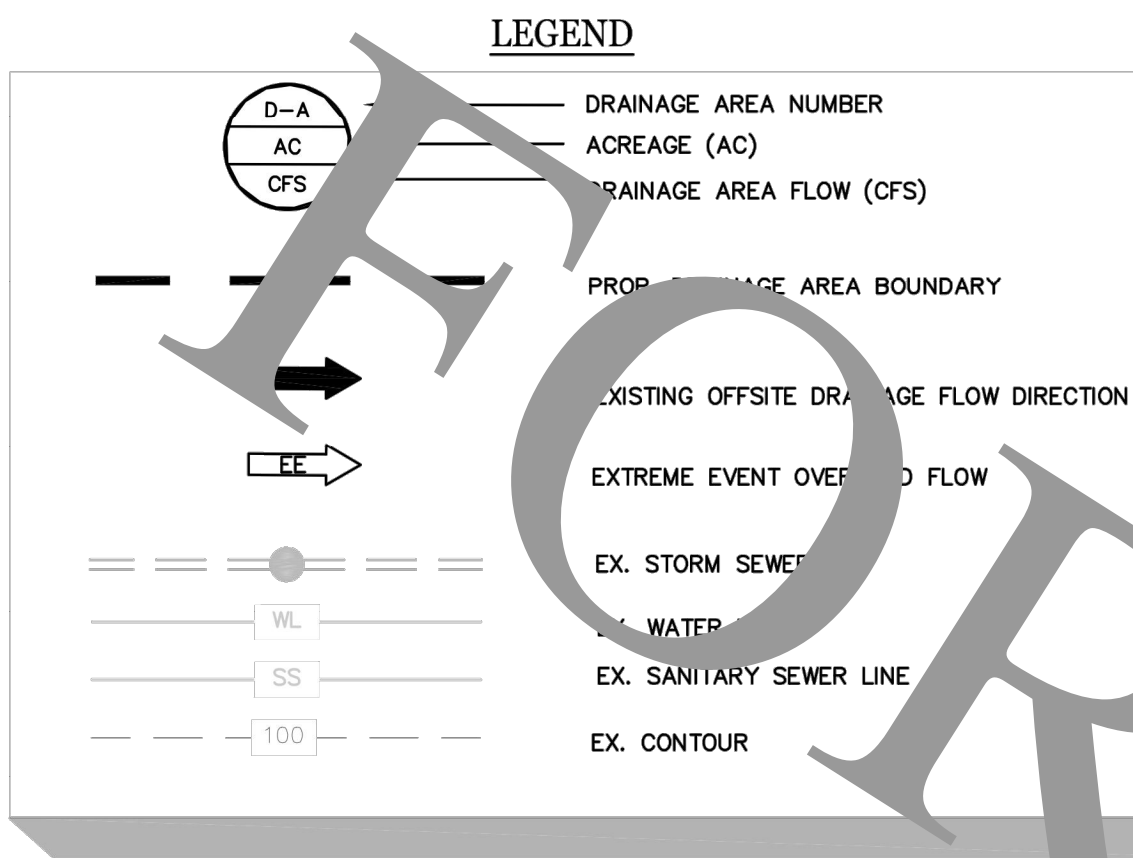
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ALJLindsey Civil Engineers 112908 Houston, TX 77060 281.301.5655 FRN F-11526		DATE
BRETT T. HANRAHAN REGISTERED PROFESSIONAL ENGINEER 112908 31 MARCH 2022		REVISIONS
ALL PROJECT NO. 653.21.CV.002	DATE: MARCH 2022	SCALE: 1" = 20'
DRAWN BY: SRH		CHECKED BY: BTH
UTILITY PLAN		
FORT BEND COUNTY COMMUNITY CENTER AVENUE E AND SECOND STREET CITY OF ROSENBERG, TEXAS		
SHEET C2.0		





EXISTING 18" CULVERT CALCULATIONS

Pipe Size:	18" RCP
Pipe Material:	Concrete
Inlet FL:	97.50
Outlet FL:	97.20
Length:	47.92
Slope:	0.62%

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Outlet Velocity (ft/s)
0.00	0.00	97.54	0.00
1.60	1.60	98.44	1.11
3.21	3.21	98.87	1.84
4.81	4.81	99.30	2.88
6.41	6.41	99.77	3.84
8.02	8.02	100.30	4.80
8.27	8.27	100.39	4.95
11.22	8.79	100.79	5.27
12.82	8.45	100.82	5.06
14.43	8.16	100.85	4.89
16.03	7.78	100.87	4.66

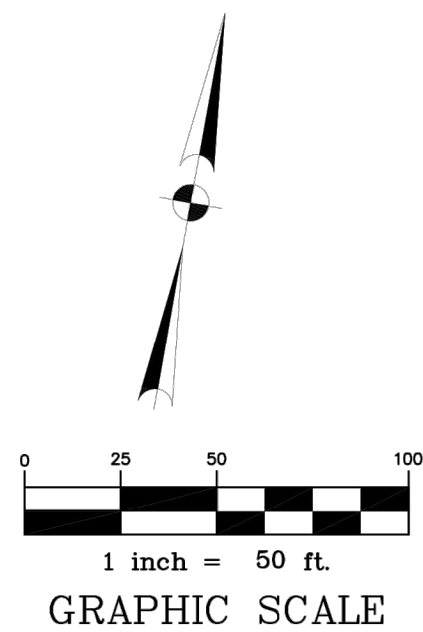
\*CALCULATIONS ABOVE ARE COMPUTED FROM HY-8

DUAL 24" CULVERT CALCULATIONS

Pipe Size:	(2) 24" RCP
Pipe Material:	Concrete
Inlet FL:	97.50 (97.00 - 8" buried)
Outlet FL:	97.20 (96.70 - 8" buried)
Length:	48
Slope:	0.62%

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Outlet Velocity (ft/s)
0.00	0.00	97.50	0.00
2.85	2.85	98.64	0.59
5.71	5.71	99.09	0.93
8.56	8.56	99.42	1.43
11.41	11.41	99.71	1.82
14.27	14.27	99.98	2.27
14.71	14.71	100.02	2.34
19.97	19.97	100.48	3.18
22.82	22.82	100.73	3.63
25.68	24.18	100.77	3.85
28.53	25.12	100.80	4.00

\*CALCULATIONS ABOVE ARE COMPUTED FROM HY-8

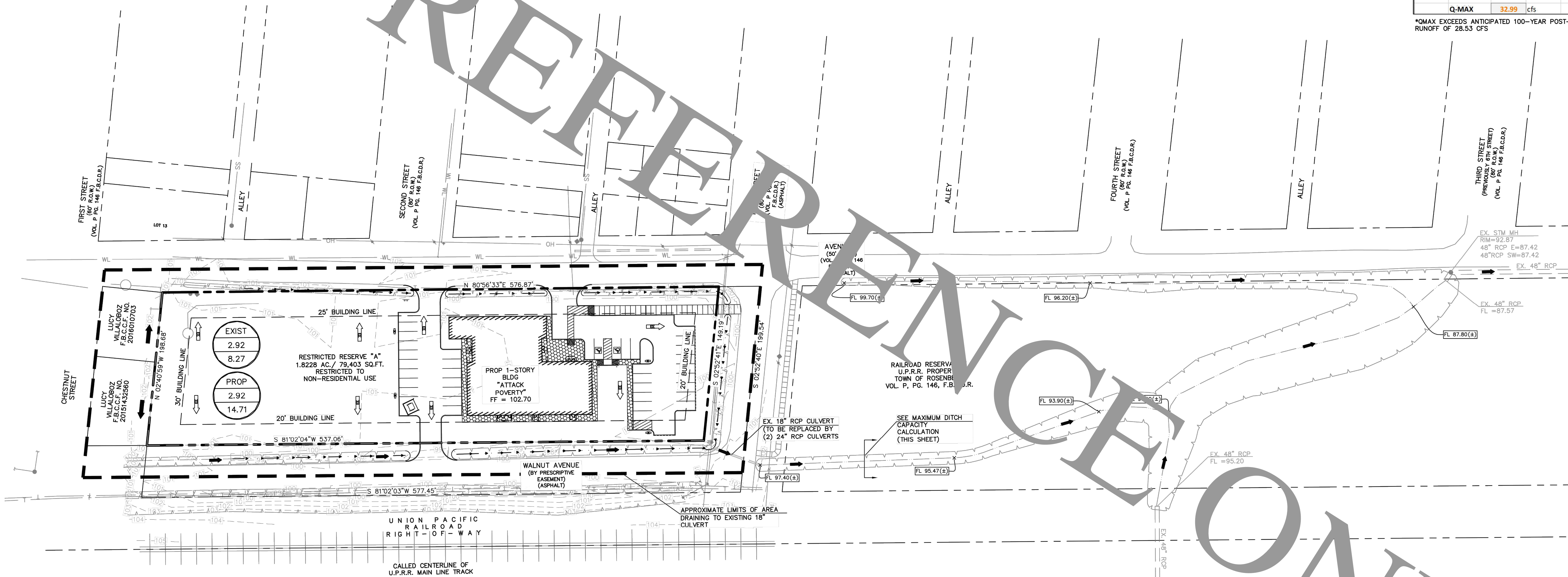


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ELEVATION: 99.58 FEET NAVD88, 2001

EXISTING DITCH CAPACITY

Triangular Shaped	
Depth	2.5 feet
Base Width	15 feet
n Value	0.03
Slope	0.001 ft/ft
Q-MAX	32.99 cfs

\*Q-MAX EXCEEDS ANTICIPATED 100-YEAR POST-DEVELOPED RUNOFF OF 28.53 CFS



EXISTING VERSUS PROPOSED RUNOFF

Manhole No.	Drainage Area (acres)	Total Area (acres)	Runoff Coefficient C	Weighted Runoff Coefficient C	DA C * A	Total C * A	Overland Flow Distance (ft)	Flow Time (min)	Intensity Conc. (in/hr)	Drainage Area Flow (cfs)	Total Flow (cfs)
From	to										
EX	EX	2.92	0.45	0.45	1.33	1.33	610	3.39	10.00	8.27	8.27
PROP	PROP	2.92	0.81	0.81	2.36	2.36	610	3.39	10.00	14.71	14.71

EXISTING FACTORED RUNOFF COEFFICIENT:

RESIDENTIAL: 0.20 ACRES  
UNDEVELOPED: 1.88 ACRES  
ROADWAY R.O.W.: 0.84 ACRES  
 $C = \frac{0.20 \times 0.50 + 1.88 \times 0.25 + 0.84 \times 0.90}{2.92} = 0.454$

PROPOSED FACTORED RUNOFF COEFFICIENT:

RESIDENTIAL: 0.20 ACRES  
COMMERCIAL: 1.88 ACRES  
ROADWAY R.O.W.: 0.84 ACRES  
 $C = \frac{0.20 \times 0.50 + 1.88 \times 0.80 + 0.84 \times 0.90}{2.92} = 0.808$

WHERE, C =

UNDEVELOPED, FLAT LAND: 0.25  
RESIDENTIAL: 0.50  
COMMERCIAL: 0.80  
ROADWAY R.O.W.: 0.90

ELEVATION NOTE:

ALL EXISTING AND PROPOSED ELEVATIONS HAVE BEEN ADJUSTED BY +0.20'.

MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

CALL BEFORE YOU DIG  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

PROJECT NO.	02319 CV 034	DATE:	MARCH 2021	SCALE:	1:30	DRAWN BY:	BAM	CHECKED BY:	KAD
PROJECT NAME:	ATTACK POVERTY 1908 AVENUE E CITY OF ROSENBERG, TEXAS								
PROJECT LOCATION:	ATTACK POVERTY 1908 AVENUE E CITY OF ROSENBERG, TEXAS								
PROJECT DESCRIPTION:	EXISTING OVERALL DRAINAGE AREA MAP								
PROJECT OWNER:	CITY OF ROSENBERG, TEXAS								
PROJECT MANAGER:	BRETT T. HANRAHAN								
PROJECT ENGINEER:	BRETT T. HANRAHAN								
PROJECT DATE:	19 MARCH 2021								
PROJECT REVISIONS:	03/19/2021 RFI 02 12/23/2020 RFI 01 11/11/2020 CITY COMMENTS 10/26/2020 CITY COMMENTS 09/30/2020 CITY COMMENTS 09/04/2020 CITY COMMENTS 07/13/2020 ISSUE								
PROJECT DATE:	03/19/2021								



Manhole No.	From	to	Drainage Area (acres)	Total Area (acres)	Runoff Coefficient C	Weighted Coefficient C	DA C * A	Total C * A	Time of Conc. (min)	Intensity I (in/hr)	Drainage Area Flow (cfs)	Total Flow (cfs)
EXR1	A0		0.22	0.22	0.80	0.80	0.18	0.18	22.66	3.95	0.69	0.69
EXA1	A0		0.43	0.43	0.80	0.80	0.34	0.34	23.62	3.87	1.33	1.33
EXA2	A0		0.13	0.13	0.80	0.80	0.10	0.10	21.98	4.00	0.42	0.42
A1	A0		0.12	0.12	0.80	0.80	0.10	0.10	21.88	4.01	0.39	0.39
A2	A0		0.35	0.35	0.80	0.80	0.28	0.28	23.31	3.90	1.09	1.09
A3	A0		0.11	0.11	0.80	0.80	0.09	0.09	21.78	4.02	0.35	0.35
A4	A0		0.14	0.14	0.80	0.80	0.11	0.11	22.07	4.00	0.45	0.45
R1	A0		0.32	0.32	0.80	0.80	0.26	0.26	23.18	3.91	1.00	1.00

\*THE DRAINAGE CALCULATIONS LISTED ABOVE ARE BASED ON THE 3-YEAR STORM EVENT PER FORT BEND COUNTY DESIGN GUIDELINES.

Manhole No.	From	to	Drainage Area (acres)	Total Area (acres)	Runoff Coefficient C	Weighted Coefficient C	DA C * A	Total C * A	Time of Conc. (min)	Intensity I (in/hr)	Drainage Area Flow (cfs)	Total Flow (cfs)
EXR1	A0		0.22	0.22	0.80	0.80	0.18	0.18	22.66	7.28	1.28	1.28
EXA1	A0		0.43	0.43	0.80	0.80	0.34	0.34	23.62	7.17	2.47	2.47
EXA2	A0		0.13	0.13	0.80	0.80	0.10	0.10	21.98	7.37	0.77	0.77
A1	A0		0.12	0.12	0.80	0.80	0.10	0.10	21.88	7.38	0.71	0.71
A2	A0		0.35	0.35	0.80	0.80	0.28	0.28	23.31	7.20	2.02	2.02
A3	A0		0.11	0.11	0.80	0.80	0.09	0.09	21.78	7.39	0.65	0.65
A4	A0		0.14	0.14	0.80	0.80	0.11	0.11	22.07	7.36	0.82	0.82
R1	A0		0.32	0.32	0.80	0.80	0.26	0.26	23.18	7.22	1.85	1.85

\*THE DRAINAGE CALCULATIONS LISTED ABOVE ARE BASED ON THE 100-YEAR STORM EVENT PER FORT BEND COUNTY DESIGN GUIDELINES.

#### GENERAL NOTES

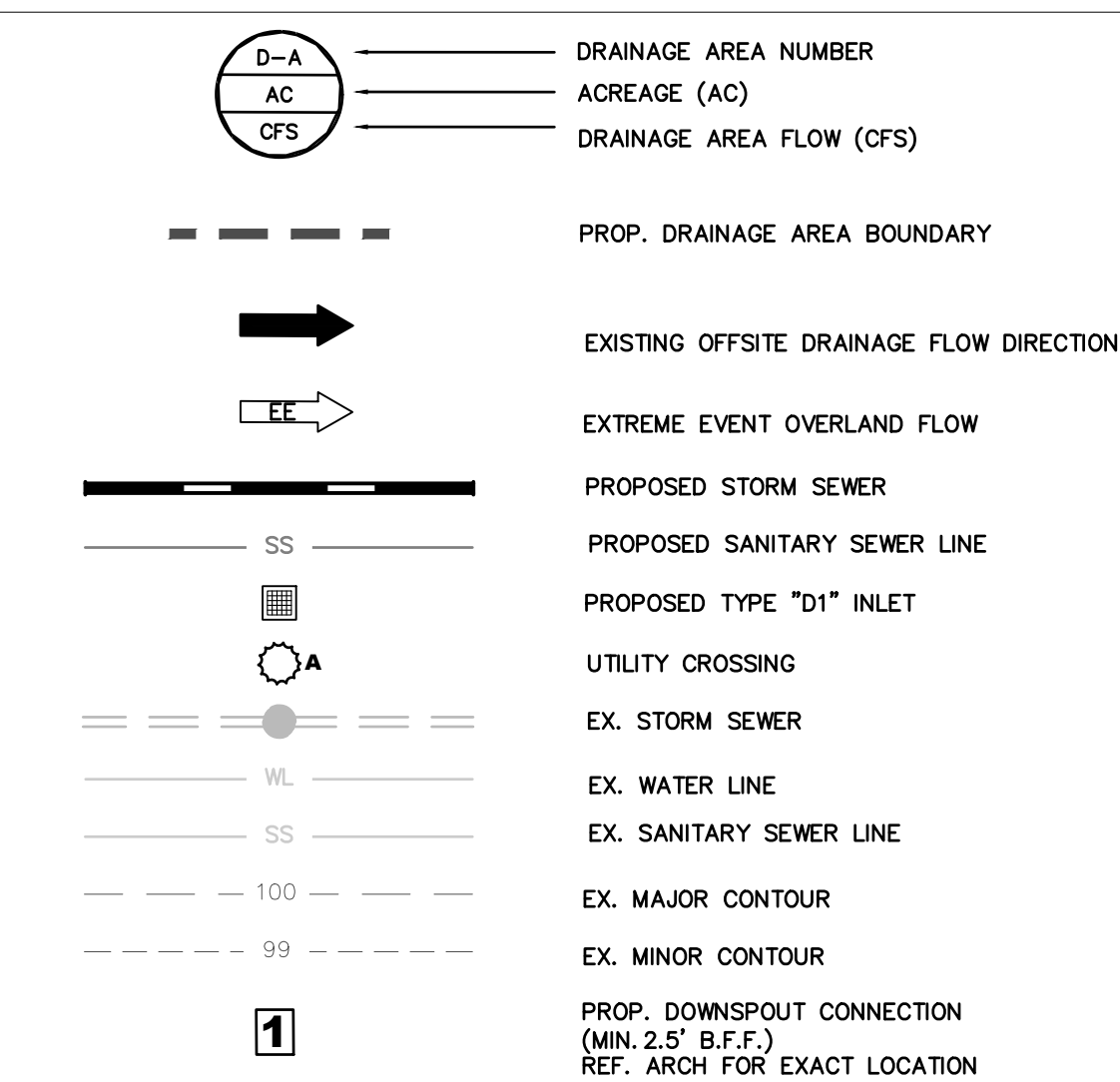
- REFERENCE STORM SEWER NOTES SHEET C0.1 FOR PIPE MATERIAL REQUIREMENTS.
- REFERENCE MEP PLANS FOR EXACT CONTINUATION OF PROPOSED STORM SEWER INSIDE OF BUILDING.
- FOR TYPE "A" INLET, JUNCTION BOX, TYPE "C" MANHOLE, TYPE "BB" INLET, TRENCH DRAIN, AND BACKFILL DETAILS, SEE SHEET C7.1.
- CONTRACTOR TO VERIFY STORM SEWER CONNECTION FOR LOCATION AND DEPTH PRIOR TO ORDERING MATERIALS OR COMMENCEMENT OF WORK.
- TOP OF GRATE ELEVATIONS SHOWN ARE FOR REFERENCE ONLY. SEE GRADING ON SHEET C4.0 FOR FINAL TOP OF GRATE ELEVATIONS.

MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

#### CROSSING TABLE

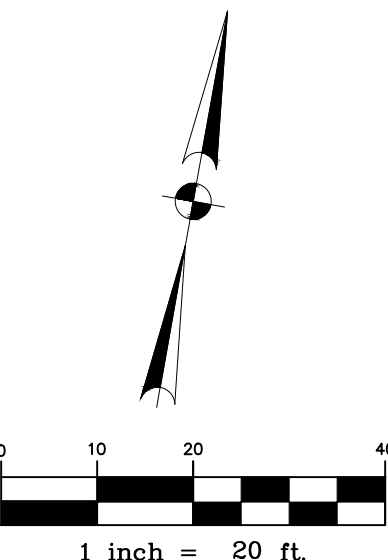
	SAN	STM	CLR
A	6" 97.56'	8" 99.92'	1.86'

#### LEGEND



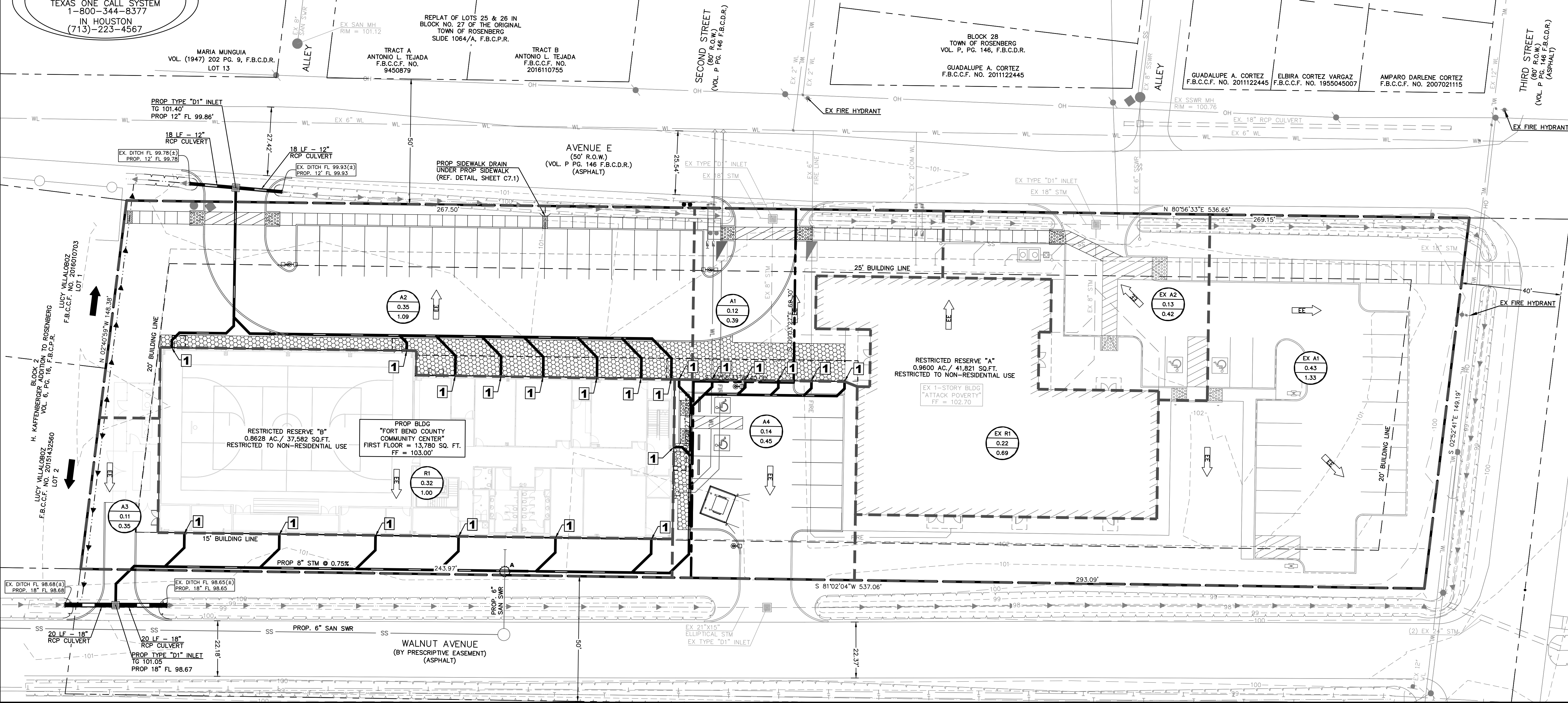
BENCHMARK: BENCH MARK DISK STAMPED U 306 1935 WITH A CGS MARK LOGO. SET AT THE SOUTHEAST CORNER OF THE JUNCTION OF 3RD STREET AND AVENUE E, NEXT TO SANTA FE RAILWAY STATION, IN THE TOP OF THE SOUTHWEST CORNER OF A 2 1/2 - B 2 1/2-FOOT CONCRETE BASE OF A FORMER WATER TOWER, ABOUT 2 FEET HIGHER THAN THE AVENUE. ELEVATION = 101.33 FEET NAVD88

TEMPORARY BENCHMARK "A": A 1" IRON ROD ON THE GROUND LOCATED AT THE WEST EDGE OF PAVEMENT OF 3RD STREET AS SHOWN HEREON. ELEVATION = 99.58 FEET NAVD88, 2001



GRAPHIC SCALE

CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567



DATE

REVISIONS

No.

ALJLindsey

Civil Engineer, No. 12908, State 314  
Houston, TX 77060  
281.301.5655  
FRN F-11526

31 MARCH 2022

ALL PROJECT NO.  
65321.CV.002

DATE: MARCH 2022

SCALE: 1" = 20'

DRAWN BY: SRH

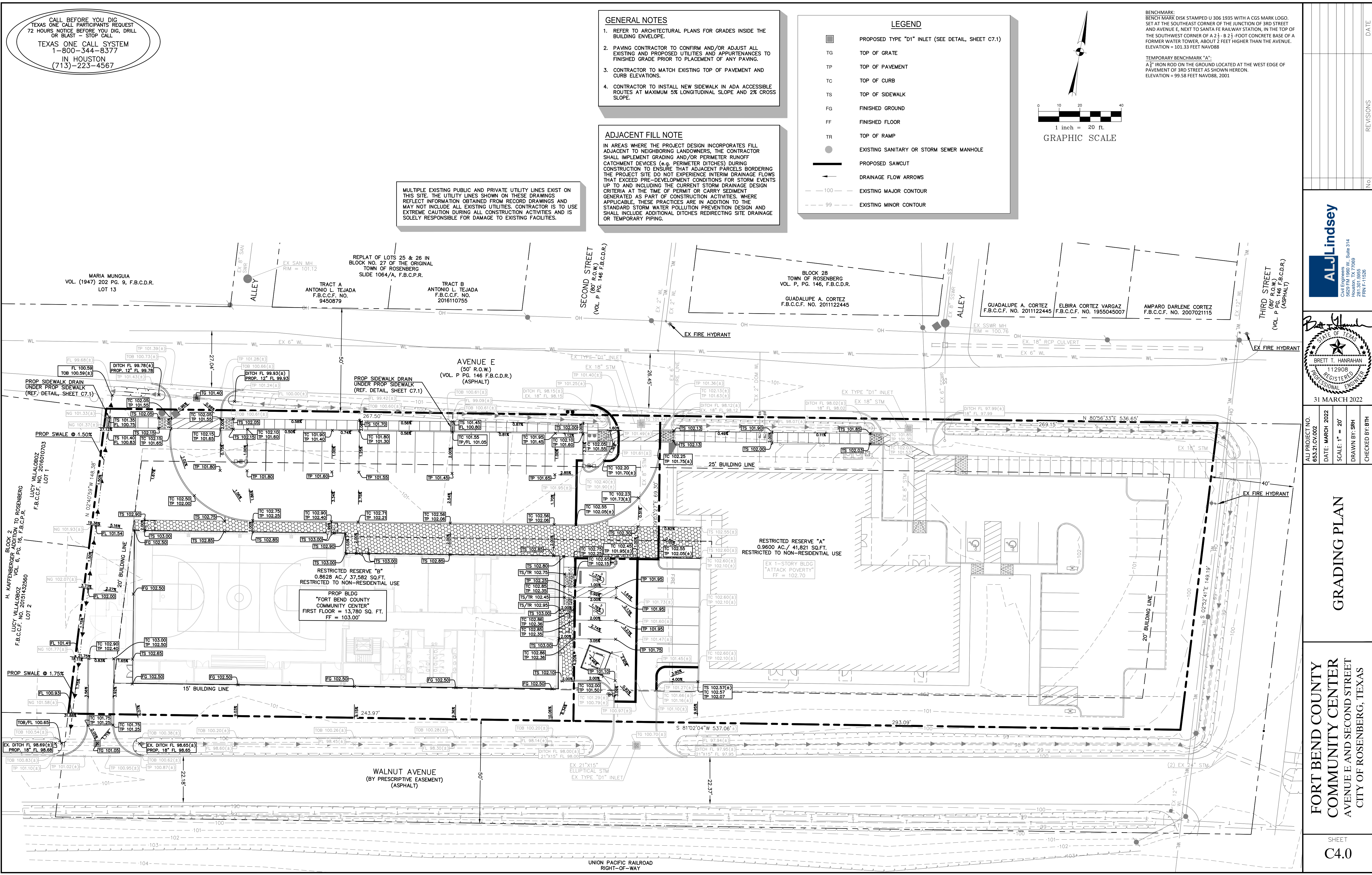
CHECKED BY: BTH

FORT BEND COUNTY  
COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS

SHEET  
C3.1

STORM SEWER PLAN





CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

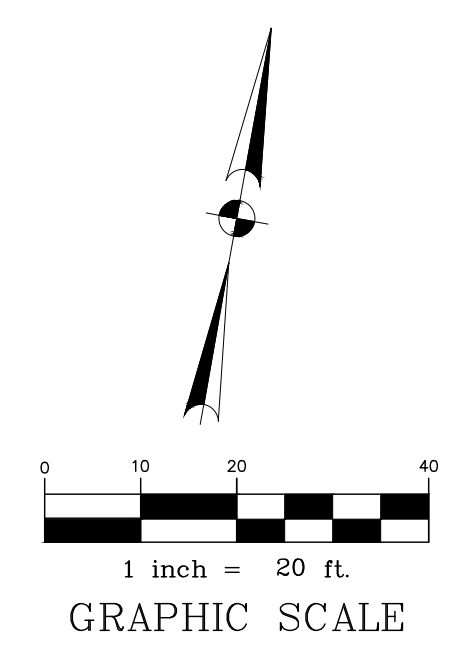
- GENERAL NOTES**
- REFER TO ARCHITECTURAL PLANS FOR GRADES INSIDE THE BUILDING ENVELOPE.
  - PAVING CONTRACTOR TO CONFIRM AND/OR ADJUST ALL EXISTING AND PROPOSED UTILITIES AND APPURTENANCES TO FINISHED GRADE PRIOR TO PLACEMENT OF ANY PAVING.
  - CONTRACTOR TO MATCH EXISTING TOP OF PAVEMENT AND CURB ELEVATIONS.
  - CONTRACTOR TO INSTALL NEW SIDEWALK IN ADA ACCESSIBLE ROUTES AT MAXIMUM 5% LONGITUDINAL SLOPE AND 2% CROSS SLOPE.

**ADJACENT FILL NOTE**

IN AREAS WHERE THE PROJECT DESIGN INCORPORATES FILL ADJACENT TO NEIGHBORING LANDOWNERS, THE CONTRACTOR SHALL IMPLEMENT GRADING AND/OR PERIMETER RUNOFF CATCHMENT DEVICES (E.G. PERIMETER DITCHES) DURING CONSTRUCTION TO ENSURE THAT ADJACENT PARCELS BORDERING THE PROJECT SITE DO NOT EXPERIENCE INTERIM DRAINAGE FLOWS THAT EXCEED PRE-DEVELOPMENT CONDITIONS FOR STORM EVENTS UP TO AND INCLUDING THE CURRENT STORM DRAINAGE DESIGN CRITERIA AT THE TIME OF PERMIT OR CARRY SEDIMENT GENERATED AS PART OF CONSTRUCTION ACTIVITIES. WHERE APPLICABLE, THESE PRACTICES ARE IN ADDITION TO THE STANDARD STORM WATER POLLUTION PREVENTION DESIGN AND SHALL INCLUDE ADDITIONAL DITCHES REDIRECTING SITE DRAINAGE OR TEMPORARY PIPING.

**LEGEND**

TG	TOP OF GRATE
TP	TOP OF PAVEMENT
TC	TOP OF CURB
TS	TOP OF SIDEWALK
FG	FINISHED GROUND
FF	FINISHED FLOOR
TR	TOP OF RAMP
●	EXISTING SANITARY OR STORM SEWER MANHOLE
—	PROPOSED SAWCUT
→	DRAINAGE FLOW ARROWS
— 100 —	EXISTING MAJOR CONTOUR
— 99 —	EXISTING MINOR CONTOUR



BENCHMARK:  
BENCH MARK DISK STAMPED U 306 1935 WITH A CGS MARK LOGO.  
SET AT THE SOUTHEAST CORNER OF THE JUNCTION OF 3RD STREET  
AND AVENUE E, NEXT TO SANTA FE RAILWAY STATION, IN THE TOP OF  
THE SOUTHWEST CORNER OF A 2 1/2 - B 2 1/2-FOOT CONCRETE BASE OF A  
FORMER WATER TOWER, ABOUT 2 FEET HIGHER THAN THE AVENUE.  
ELEVATION = 101.33 FEET NAVD88

TEMPORARY BENCHMARK "A":  
A 1" IRON ROD ON THE GROUND LOCATED AT THE WEST EDGE OF  
PAVEMENT OF 3RD STREET AS SHOWN HEREON.  
ELEVATION = 99.58 FEET NAVD88, 2001

MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

ALJLindsey Civil Engineers & Surveyors, Inc. Suite 314 281.301.5655 FBN F-1126	
BRETT T. HANRAHAN REGISTERED PROFESSIONAL ENGINEER 12908 31 MARCH 2022	
AL PROJECT NO. 65321.CV.002	DATE: MARCH 2022
SCALE: 1" = 20'	DRAWN BY: SRH
CHECKED BY: BTH	
GRADING PLAN	
FORT BEND COUNTY COMMUNITY CENTER AVENUE E AND SECOND STREET CITY OF ROSENBERG, TEXAS	
SHEET C4.0	



CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL


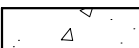

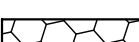

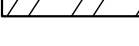






TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

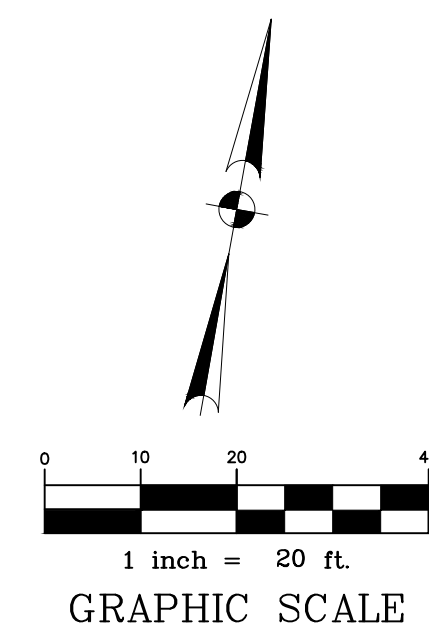
## GENERAL NOTES

1. REFER TO SITE ELECTRICAL PLAN FOR PROPOSED SITE LIGHTING LAYOUT.
2. PAVEMENT AND SUBGRADE THICKNESS INCLUDED ON THIS SHEET FOR REFERENCE ONLY. REFER TO GEOTECHNICAL REPORT PROVIDED BY **GEOSCIENCE ENGINEERING AND TESTING INC.**, DATED **JANUARY 18, 2022** (PROJECT NUMBER **21G0708**).
3. REFER TO IRRIGATION PLAN FOR EXACT LOCATION OF IRRIGATION SLEEVES.
4. MAXIMUM CONTROL JUMP SPACING TO BE 15-FT AND EXPANSION JUMP SPACING TO BE 60-FT.
5. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS AND ALL STEEL TO BE GRADE 60, UNLESS OTHERWISE SPECIFIED IN GEOTECHNICAL REPORT.
6. PAVING CONTRACTOR TO CONFIRM AND/OR ADJUST ALL EXISTING AND PROPOSED UTILITIES AND APPURTENANCES TO FINISHED GRADE PRIOR TO PLACEMENT OF ANY PAVING.

MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

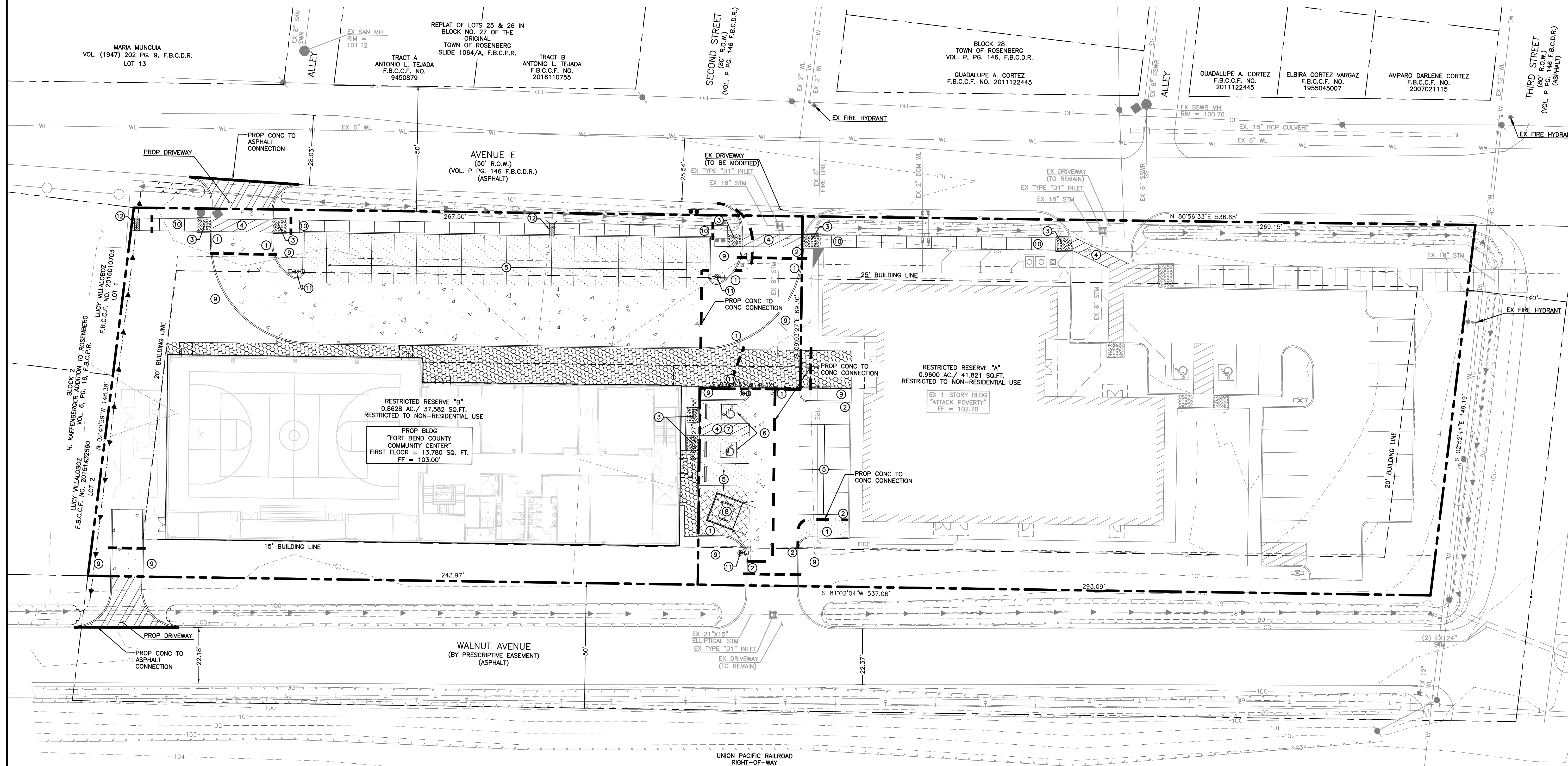
## KEYED NOTES

- |  |  |  |
|--|--|--|
| <p>① PROPOSED 6" MONOLITHIC CONCRETE CURB (SEE DETAIL, SHEET C7.0)</p> <p>② TIE PROPOSED CURB INTO EXISTING CURB</p> <p>③ CONSTRUCT CURB RAMP (SEE DETAIL, SHEET C7.0)</p> <p>④ 4" PAINTED WHITE STRIPING @ 2' O.C. @ 45°</p> <p>⑤ 90° WHITE PARKING LOT STRIPING</p> <p>⑥ HANDICAP PARKING SYMBOL W/ SIGNAGE (REF. ARCH PLANS)</p> <p>⑦ HANDICAP ACCESSIBLE PARKING STALL STRIPING</p> <p>⑧ DUMPSTER ENCLOSURE</p> <p>⑨ LANDSCAPED AREA (REF. LANDSCAPE PLANS)</p> <p>⑩ CONCRETE SIDEWALK (WIDTH PER PLANS)</p> <p>⑪ LIGHT POLE (REF. ELECTRICAL PLANS)</p> <p>⑫ SIDEWALK DRAIN (REF. DETAIL, SHEET C7.1)</p> | <br><br><br><br><br><br><br><br><br><br><br> | <p>PROPOSED 5" LIGHT DUTY CONCRETE PAVEMENT WITH STABILIZED SUBGRADE (SEE NOTE 2)</p> <p>PROPOSED 6" MEDIUM DUTY CONCRETE PAVEMENT WITH STABILIZED SUBGRADE (SEE NOTE 2)</p> <p>PROPOSED 7" HEAVY DUTY CONCRETE PAVEMENT WITH STABILIZED SUBGRADE (SEE NOTE 2)</p> <p>PROPOSED BUILDING PERIMETER SIDEWALK (REF. ARCHITECTURAL PLANS FOR SURFACE FINISH, SEE GRADING ON SHEET C4.0)</p> <p>PROPOSED DRIVEWAY PER CITY OF ROSENBERG STANDARDS (REF. DETAIL, SHEET C7.4)</p> <p>PROPOSED IRRIGATION SLEEVE (SEE NOTE 3)</p> <p>CONCRETE TO ASPHALT PAVEMENT CONNECTION (INCLUDING 2' SAWCUT, EXISTING PAVEMENT REMOVAL, CONCRETE PAVEMENT HEADER AND SEALED JOINTS)</p> <p>CONCRETE TO CONCRETE PAVEMENT CONNECTION (INCLUDING 2' SAWCUT, EXISTING PAVEMENT REMOVAL, CONCRETE PAVEMENT HEADER AND SEALED JOINTS)</p> |
|--|--|--|

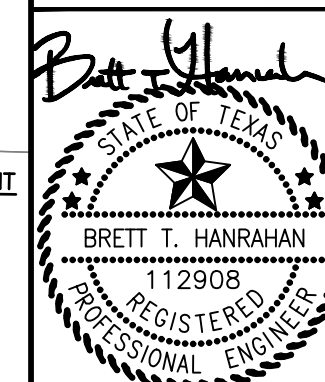


**BENCHMARK:**  
BENCH MARK DISK STAMPED U 306 1935 WITH A CGS MARK LOGO.  
SET AT THE SOUTHEAST CORNER OF THE JUNCTION OF 3RD STREET  
AND AVENUE E, NEXT TO SANTA FE RAILWAY STATION, IN THE TOP OF  
THE SOUTHWEST CORNER OF A 2 1/2 - 2 1/2-FOOT CONCRETE BASE OF A  
FORMER WATER TOWER, ABOUT 2 FEET HIGHER THAN THE AVENUE.  
ELEVATION = 101.33 FEET NAVD88

**TEMPORARY BENCHMARK "A":**  
A 3/8" IRON ROD ON THE GROUND LOCATED AT THE WEST EDGE OF  
PAVEMENT OF 3RD STREET AS SHOWN HEREON.  
ELEVATION = 99.58 FEET NAVD88, 2001



**ALJLindsey**



31 MARCH 2022

ALU PROJECT NO.  
 653.21.CV.002  
 DATE: MARCH 2022  
 SCALE: 1" = 20'  
 DRAWN BY: SRH  
 CHECKED BY: STI

## PAVING PLAN

**FORT BEND COUNTY  
COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS**

SHEET  
C5.0



CALL BEFORE YOU DIG  
TEXAS ONE CALL PARTICIPANTS REQUEST  
72 HOURS NOTICE BEFORE YOU DIG, DRILL  
OR BLAST - STOP CALL  
TEXAS ONE CALL SYSTEM  
1-800-344-8377  
IN HOUSTON  
(713)-223-4567

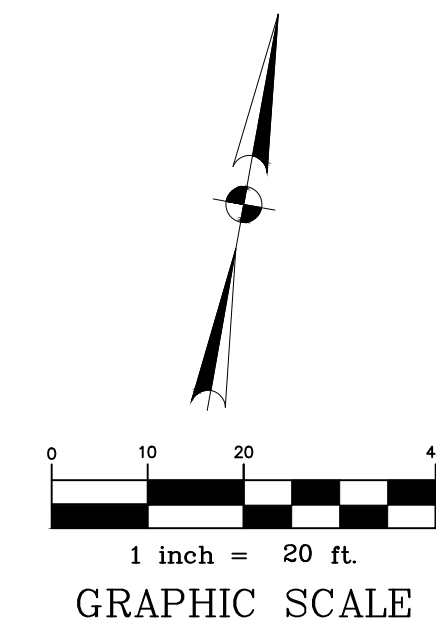
#### GENERAL NOTES

- CONTRACTOR TO MAINTAIN A CLEAN PROJECT SITE AND ENSURE THAT ALL DEBRIS IS PLACED IN DESIGNATED AREA PER PLANS. ALL SPOIL MATERIAL GENERATED FROM CONSTRUCTION ACTIVITY TO BE HAULED OFFSITE AND DISPOSED IN ACCORDANCE WITH LOCAL LAWS, RULES, AND REGULATIONS.

MULTIPLE EXISTING PUBLIC AND PRIVATE UTILITY LINES EXIST ON THIS SITE. THE UTILITY LINES SHOWN ON THESE DRAWINGS REFLECT INFORMATION OBTAINED FROM RECORD DRAWINGS AND MAY NOT INCLUDE ALL EXISTING UTILITIES. CONTRACTOR IS TO USE EXTREME CAUTION DURING ALL CONSTRUCTION ACTIVITIES AND IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES.

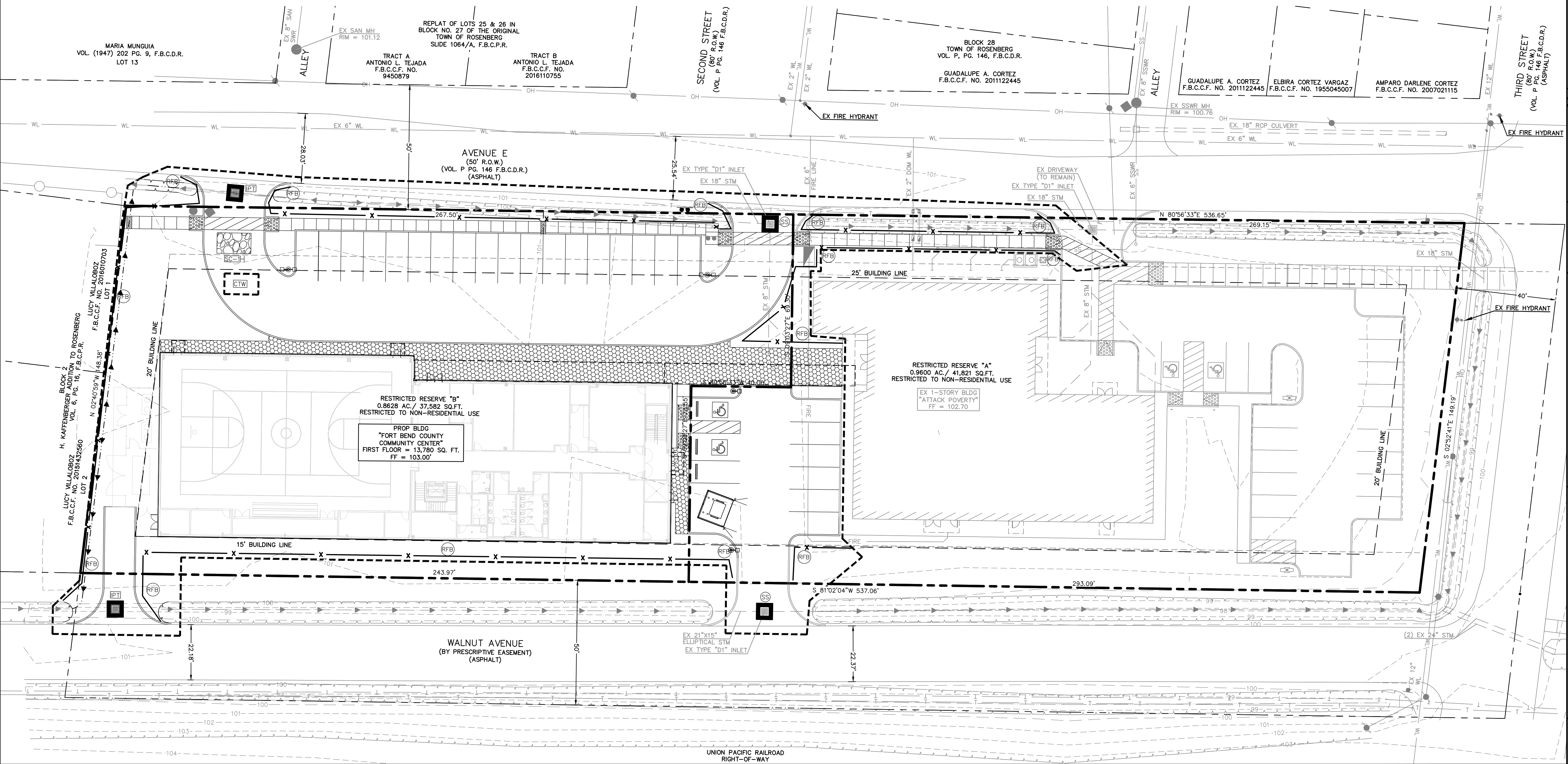
#### LEGEND

- SC-1 STABILIZED CONSTRUCTION ENTRANCE (SEE DETAIL, SHEET C7.3)
- CTW CONCRETE TRUCK WASHOUT (SEE DETAIL, SHEET C7.3)
- X RFB SILT FENCE (SEE DETAIL, SHEET C7.3)
- IPB INLET PROTECTION BARRIER (SEE DETAIL, SHEET C7.3)
- SS SILT STACK INLET PROTECTION BARRIER (SEE DETAIL, SHEET C7.3)
- LIMITS OF DISTURBED AREA
- 100 --- EX. CONTOUR

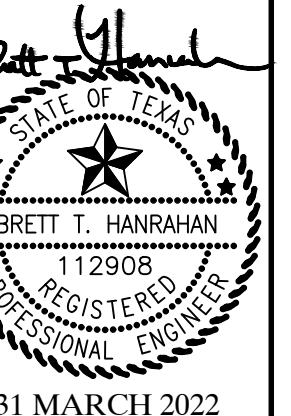


BENCHMARK:  
BENCH MARK DISK STAMPED U 306 1935 WITH A CGS MARK LOGO.  
SET AT THE SOUTHEAST CORNER OF THE JUNCTION OF 3RD STREET  
AND AVENUE E, NEXT TO SANTA FE RAILWAY STATION, IN THE TOP OF  
THE SOUTHWEST CORNER OF A 2 1/2 - B 2 1/2-FOOT CONCRETE BASE OF A  
FORMER WATER TOWER, ABOUT 2 FEET HIGHER THAN THE AVENUE.  
ELEVATION = 101.33 FEET NAVD88

TEMPORARY BENCHMARK "A":  
A 1" IRON ROD ON THE GROUND LOCATED AT THE WEST EDGE OF  
PAVEMENT OF 3RD STREET AS SHOWN HEREON.  
ELEVATION = 99.58 FEET NAVD88, 2001



**ALJLindsey**  
Civil Engineer  
No. 12908  
Houston, TX 77060  
281.301.5655  
FRN F-1126



31 MARCH 2022

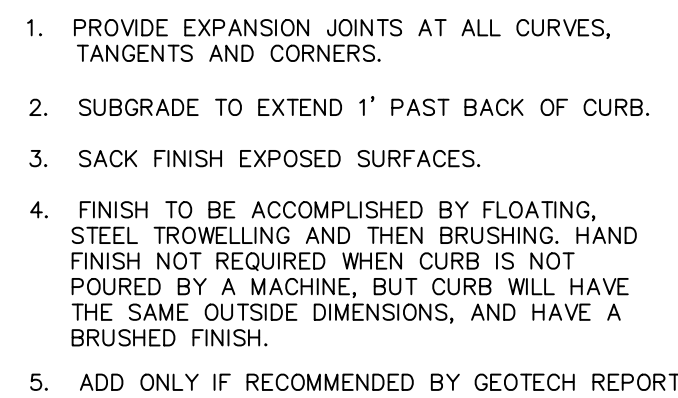
ALL PROJECT NO.  
65321.CV.002  
DATE: MARCH 2022  
SCALE: 1" = 20'  
DRAWN BY: SRH  
CHECKED BY: BTH

### EROSION CONTROL PLAN

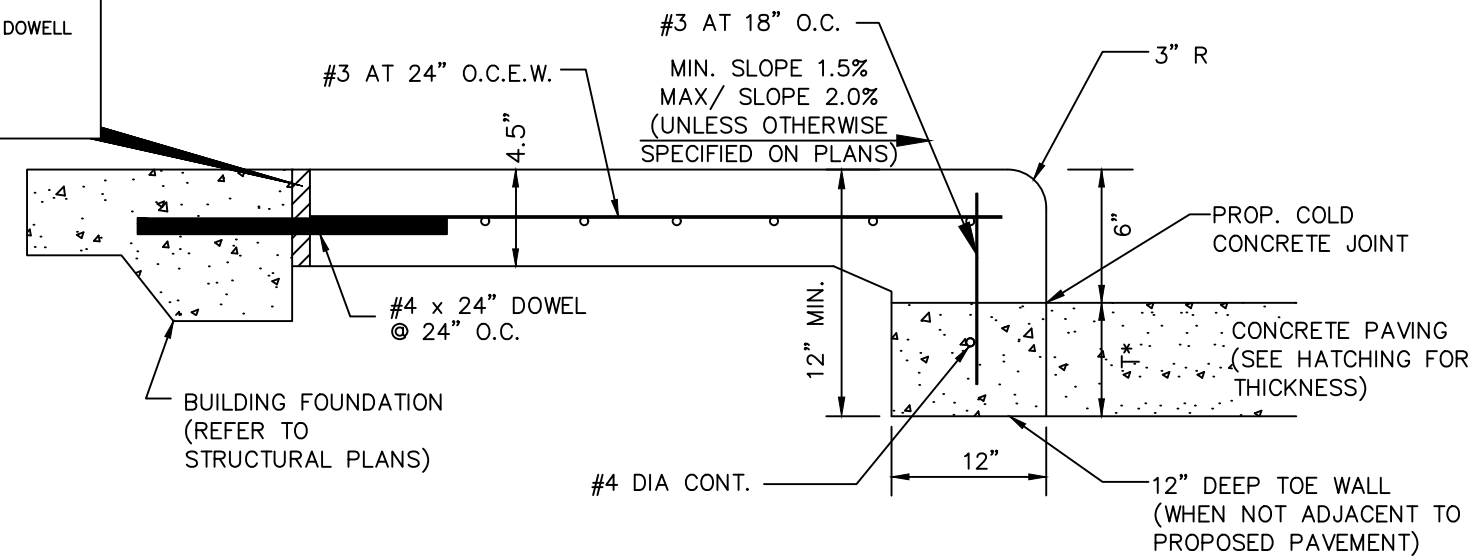
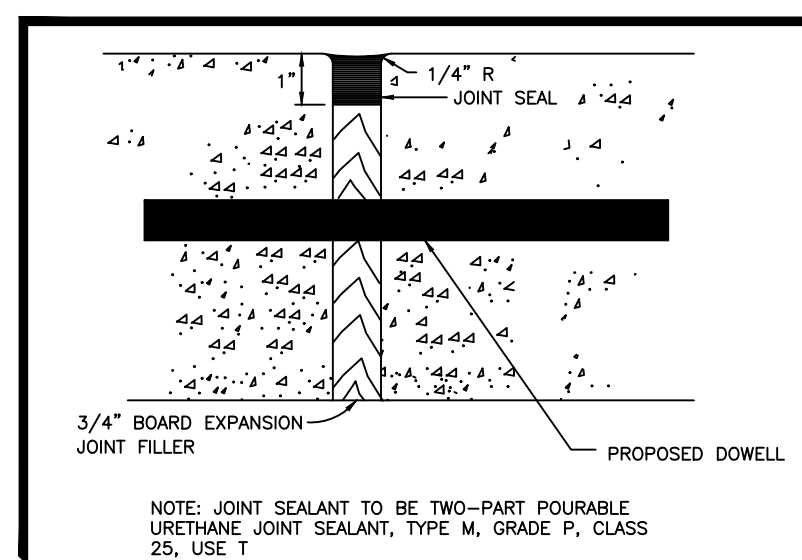
**FORT BEND COUNTY  
COMMUNITY CENTER**  
AVENUE E AND SECOND STREET  
CITY OF ROSENBERG, TEXAS

SHEET  
**C6.0**



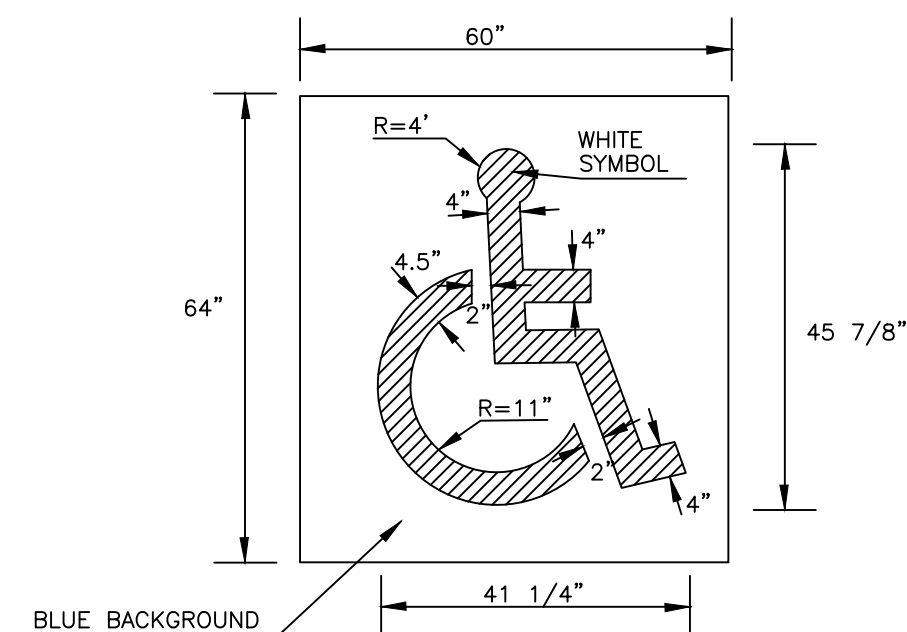


6" MONOLITHIC CONCRETE CURB  
N.T.S.

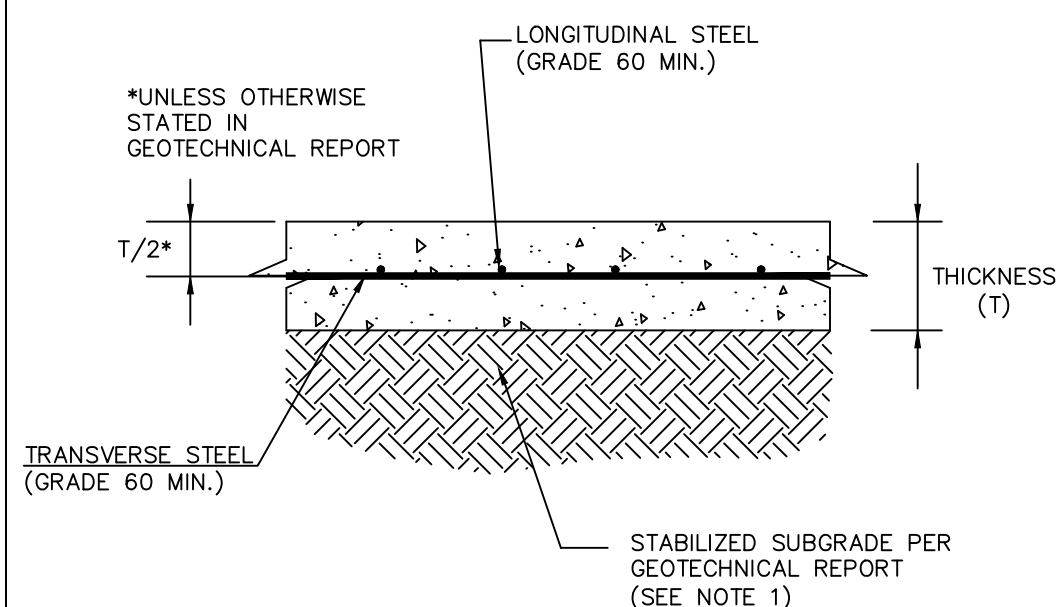


BUILDING PERIMETER SIDEWALK  
N.T.S.

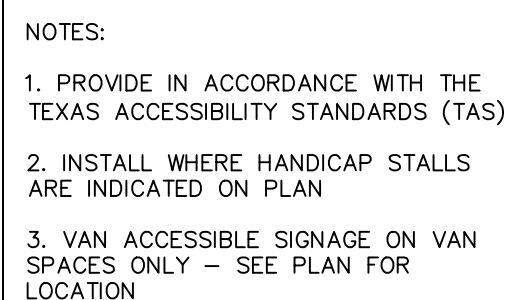
\* = FOR REQUIRED PAVEMENT/SUBGRADE THICKNESS, SEE HATCHING ON PLAN. REFERENCE GEOTECHNICAL REPORT FOR SPECIFICATIONS.



HANDICAP SURFACE PAINT DETAIL  
N.T.S.

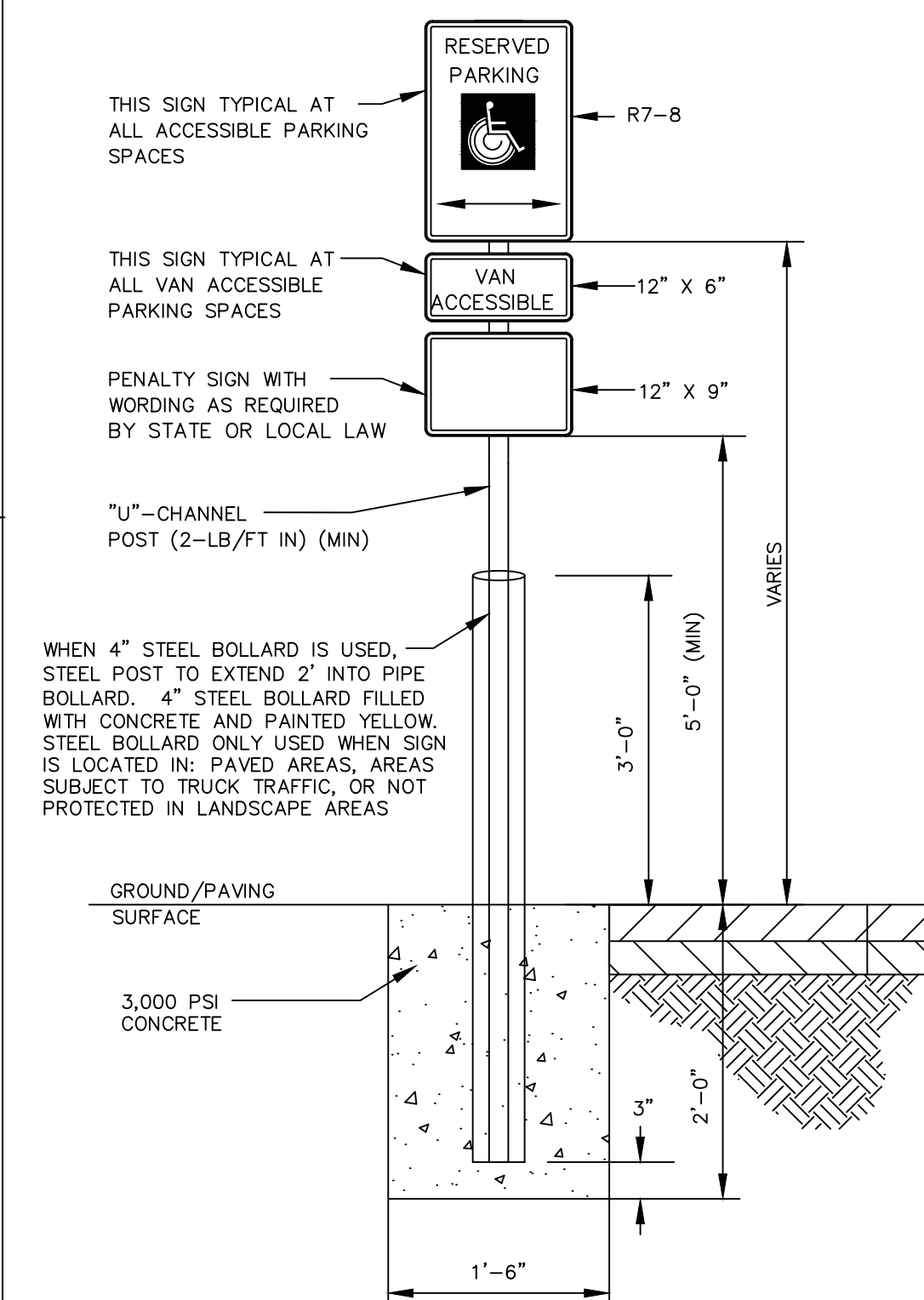


CONCRETE PAVING SECTION  
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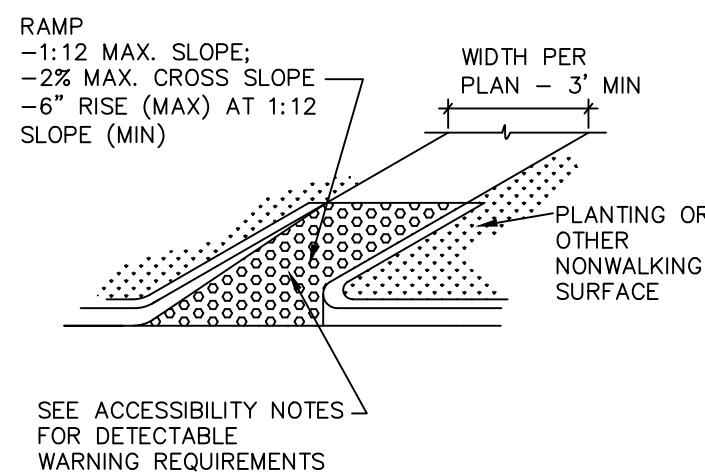


COLOR CHART

BLUE: LETTERS, BORDER, & SYMBOL  
WHITE: SIGN BACKGROUND



ACCESSIBLE PARKING SIGN  
N.T.S.



CURB RAMP DETAIL - SQUARE SIDES  
N.T.S.

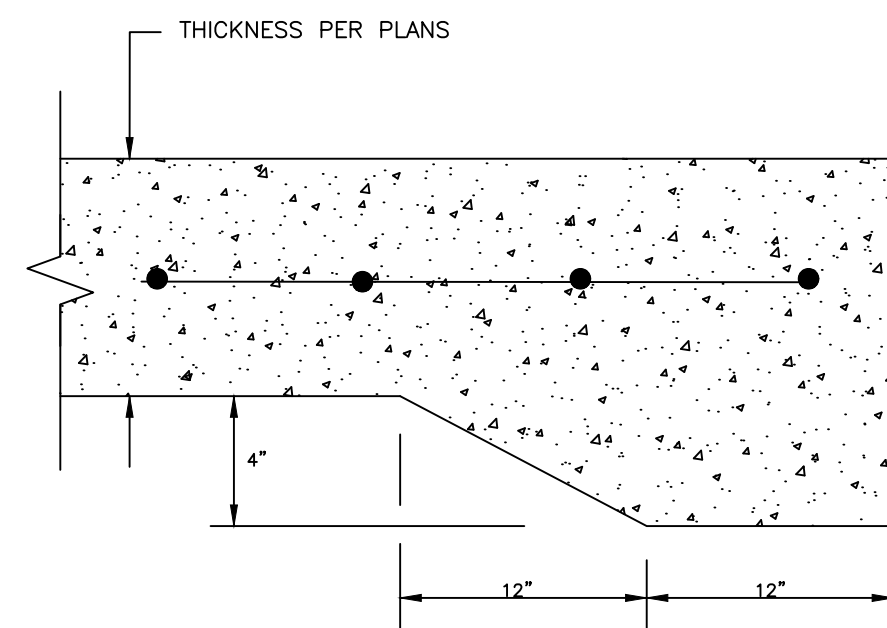
ACCESSIBILITY NOTES:

1. ALL ACCESSIBLE SPACES AND ACCESSIBLE ROUTES SHALL COMPLY WITH THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND CITY/COUNTY REQUIREMENTS.
2. ACCESSIBLE PARKING SPACES AND DRIVE AISLES SHALL BE LEVEL WITH SURFACE. SLOPES NOT EXCEEDING 1:48 (2.08%) IN ALL DIRECTIONS. CURB RAMPS SHALL BE PROVIDED AT ALL PASSENGER LOADING ZONES.
3. EACH ACCESSIBLE PARKING SPACE SHALL BE DESIGNATED AS RESERVED BY AN APPROPRIATE SIGN SHOWING THE SYMBOL OF ACCESSIBILITY PER TAS SECTION 216.5. SPACES COMPLYING WITH TAS SECTION 502.6 SHALL HAVE AN ADDITIONAL SIGN "VAN-ACCESSIBLE" MOUNTED BELOW THE SYMBOL OF ACCESSIBILITY.
  - A. SIGNS SHALL BE LOCATED 60" MIN. ABOVE THE GROUND, FLOOR, OR PAVING SURFACE MEASURED TO THE BOTTOM OF THE SIGN SO THEY CANNOT BE OBSCURED BY A VEHICLE PARKED IN THE SPACE.
  - B. SIGNS LOCATED WITHIN AN ACCESSIBLE ROUTE SHALL COMPLY WITH TAS SECTION 307.4.
  - C. CHARACTERS AND SYMBOLS ON OVERHEAD SIGNS SHALL COMPLY WITH TAS SECTION 703.5.
4. SLOPES OF CURB RAMPS SHALL COMPLY WITH TAS SECTION 405.2. TRANSITIONS FROM CURBS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE, IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20.
5. SURFACES OF CURB RAMPS SHALL COMPLY WITH TAS SECTIONS 405.4 AND 302.1.

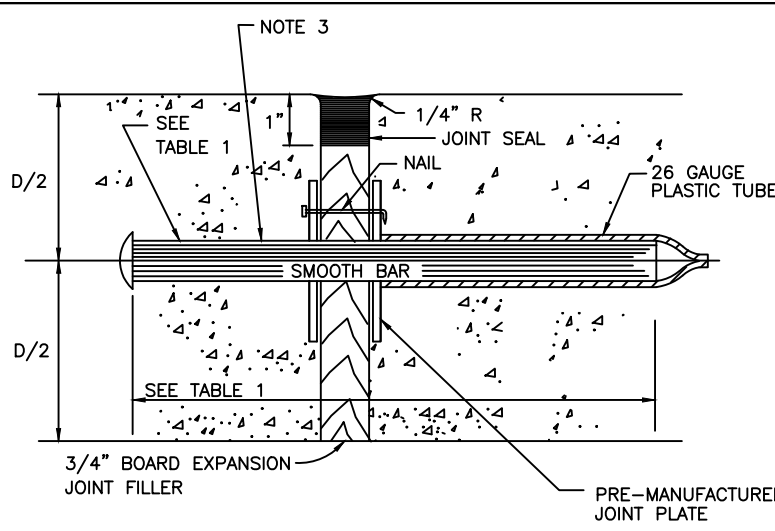
CURB RAMPS IN PUBLIC RIGHT-OF-WAY  
ALL CURB RAMPS SHALL COMPLY WITH ARCHITECTURAL BARRIERS ADMINISTRATIVE RULE  
68.102(B)(2);

- B. DETECTABLE WARNING STRIP SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING.

CURB RAMPS NOT IN PUBLIC RIGHT-OF-WAY  
ALL CURB RAMPS NOT CONSTRUCTED IN PUBLIC RIGHT-OF-WAY SHALL COMPLY WITH TAS  
406.  
A. DETECTABLE WARNING STRIPS ARE NOT REQUIRED ON CURB RAMPS NOT IN PUBLIC  
RIGHT-OF-WAY.



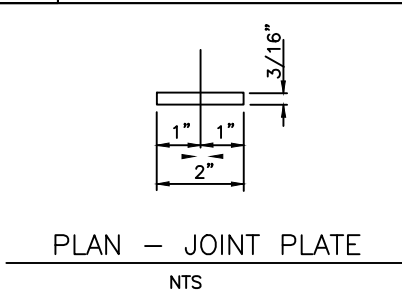
STANDARD PAVING HEADER  
N.T.S.



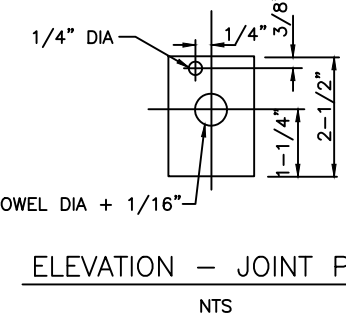
SECTION  
DOWEL TYPE EXPANSION JOINT  
NTS

TABLE 1

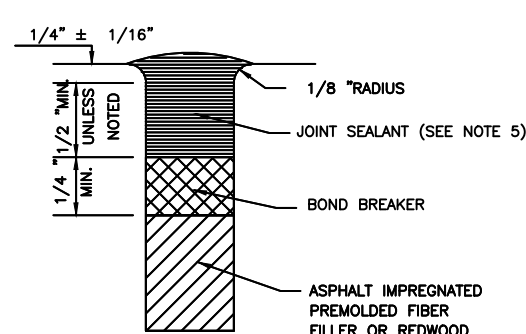
PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS		
	DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12



## NTS



ELEVATION - JOINT PLATE  
NTS

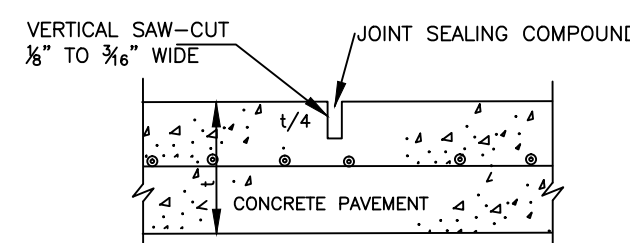


EXPANSION JOINT  
N.T.S.

N.T.S.

NOTES:

1. STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS. SPACING AND BAR SIZE MAY BE REDUCED IF GEOTECHNICAL REPORT PROVIDES RECOMMENDATIONS.
2. CENTER DOWEL HORIZONTALLY ON JOINT.
3. CENTER DOWEL VERTICALLY IN CONCRETE BASE. EXTEND THICKENED CONCRETE AS NEEDED TO MAINTAIN 3" MIN COVER.
4. THE LOCATION OF CONSTRUCTION JOINTS MAY BE VARIED WITH THE APPROVAL OF THE COUNTY ENGINEER.
5. JOINT SEALANT TO BE TWO-PART POURABLE URETHANE JOINT SEALANT, TYPE M, GRADE P, CLASS 25, USE T

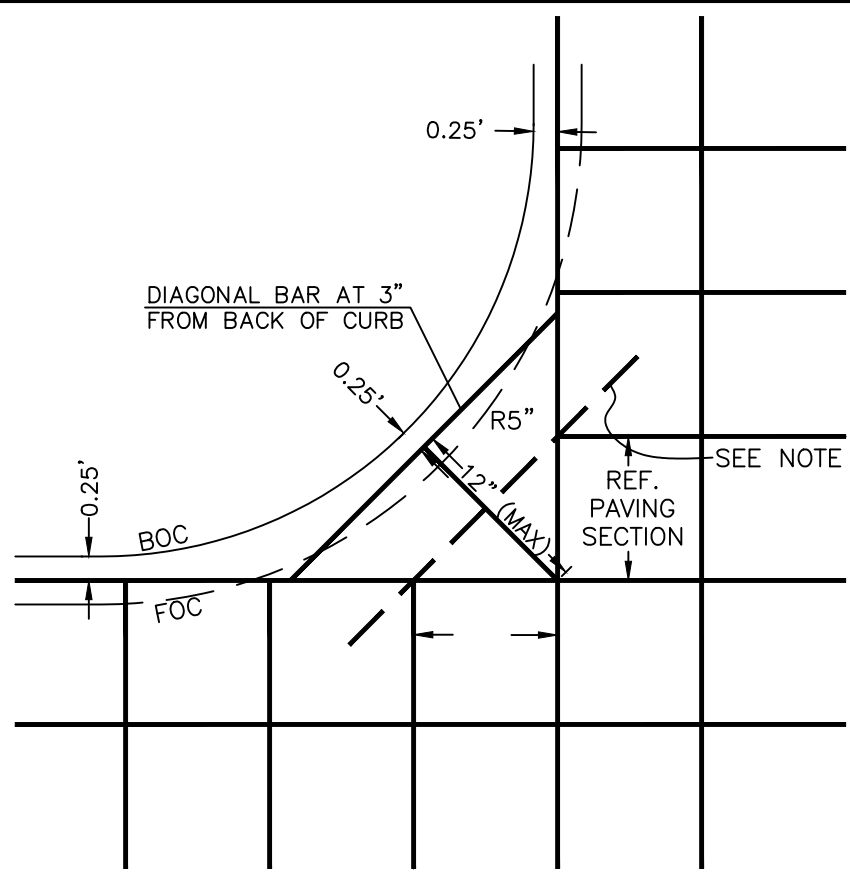


CONTROL JOINT  
N.T.S.

N.T.S.

ALL JOINT TO BE PROPERLY SEALED  
WITH JOINT SEALING COMPOUND  
CONSISTING OF TWO-PART POURABLE  
URETHANE JOINT SEALANT, TYPE M,  
GRADE P, CLASS 25, USE T

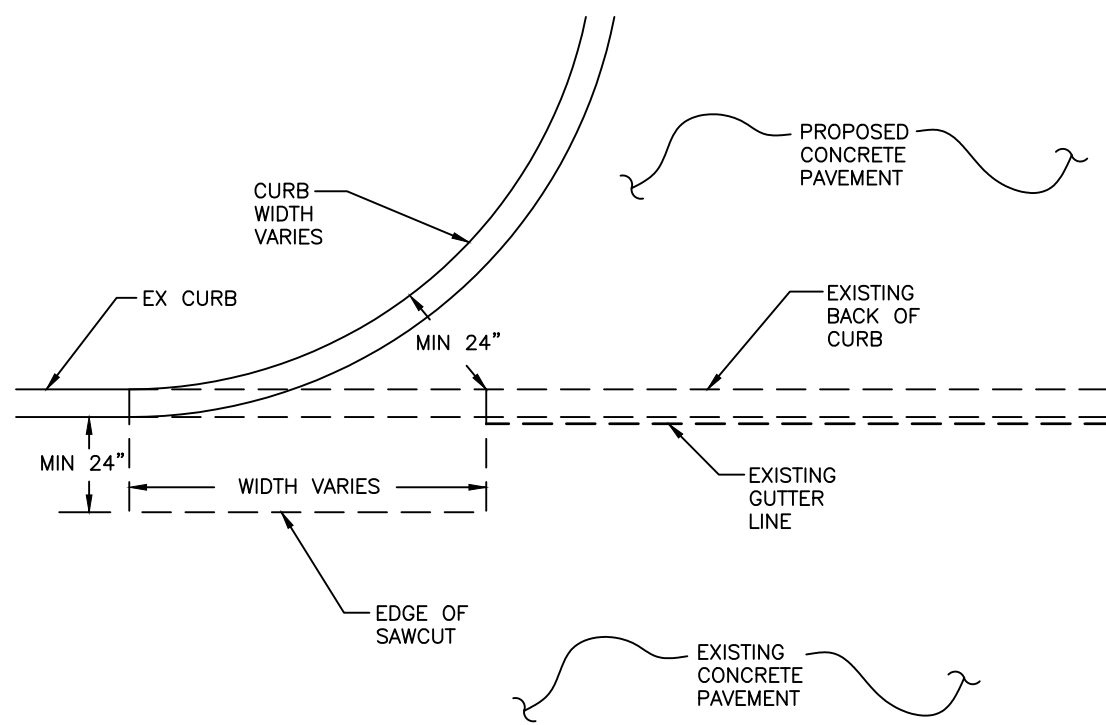




- NOTES
- CONTRACTOR TO ADD EXTRA DIAGONAL BAR IF DISTANCE TO NEAREST CORNER EXCEEDS 12".
  - FOR RADIUS OVER 10', CONTRACTOR TO PLACE LONG BAR AT 3" FROM BACK OF CURB ALONG ENTIRE RADIUS.

BAR SCHEMATIC FOR SMALL RADIUS CURVE

N.T.S.



SAWCUT DETAIL

N.T.S.

4 - NO. 4 BARS EXTEND FULL LENGTH ACROSS BLOCK-OUT TIE EACH END OF DIAGONL BARS

GRATE INLET (REF INLET DETAILS)

EXPANSION JOINT ALL 4 SIDES

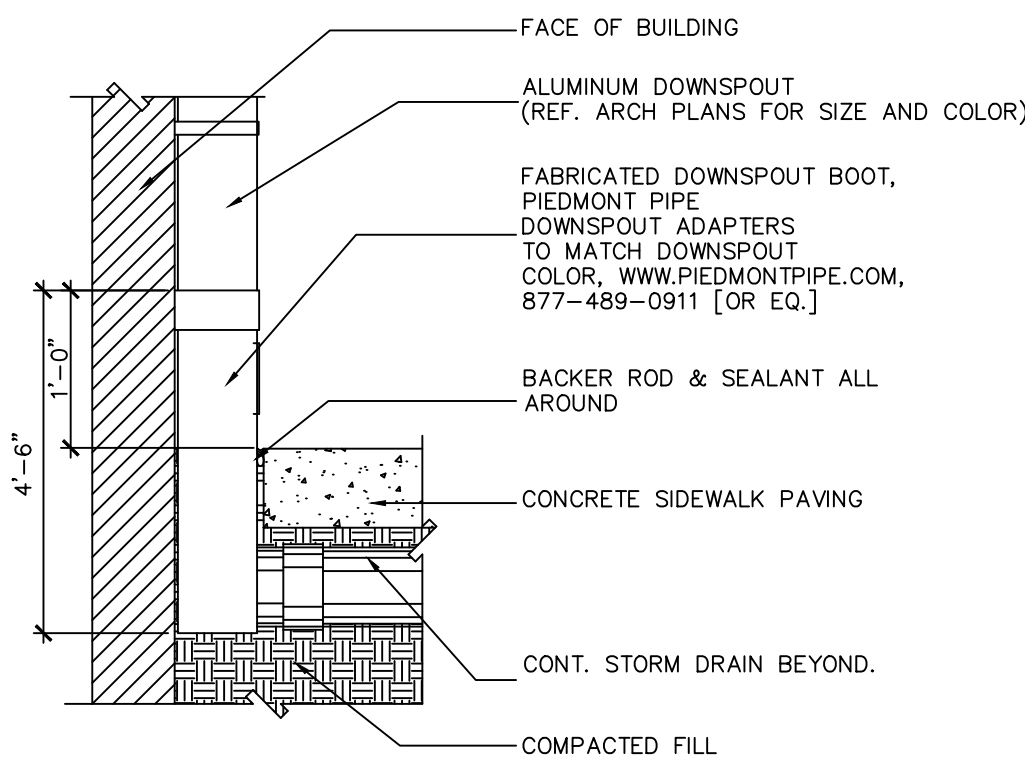
OUTSIDE WALL OF INLET

(DIAGONAL) 3 - NO. 3 BARS AT 12" ON CENTER (TYPICAL)

8 - NO. 3 BARS EXTEND TO TIE TO ONE PAVEMENT REINFORCEMENT BAR EACH SIDE OF BLOCK-OUT

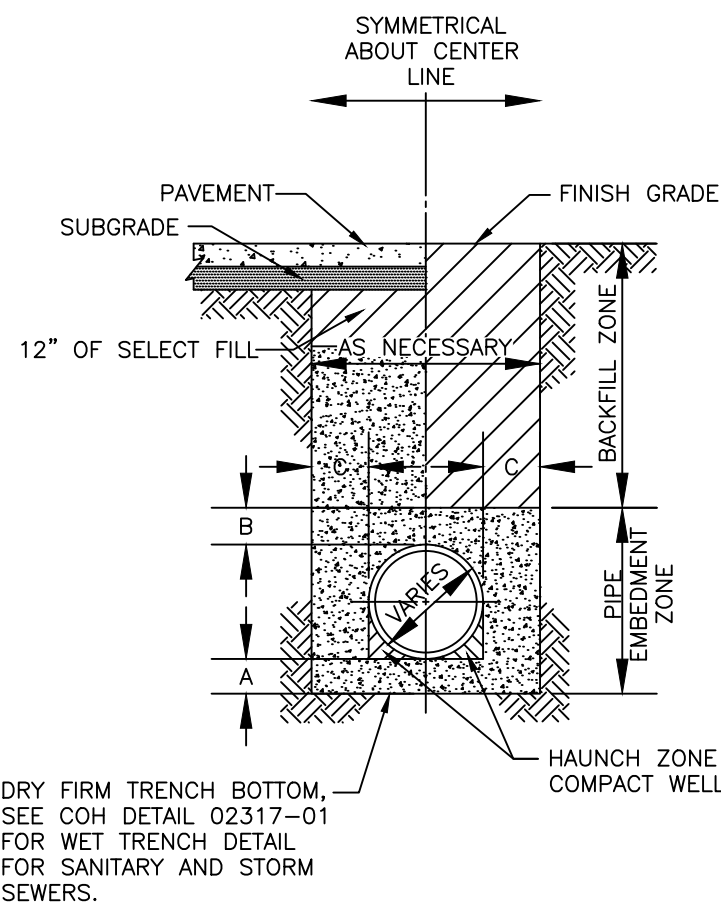
GRATE INLET CONCRETE BLOCKOUT

N.T.S.



DOWNSPOUT DETAIL

N.T.S.



WATER, SANITARY AND STORM BEDDING AND BACKFILL FOR DRY STABLE TRENCH

N.T.S.

DIMENSIONAL REQUIREMENTS

PIPE SIZE	A	B	C
20" AND SMALLER	6"	12"	9"
21" THRU 48"	6"	12"	12"
54" THRU 66"	9"	12"	15"
72" AND LARGER	12"	18"	15"

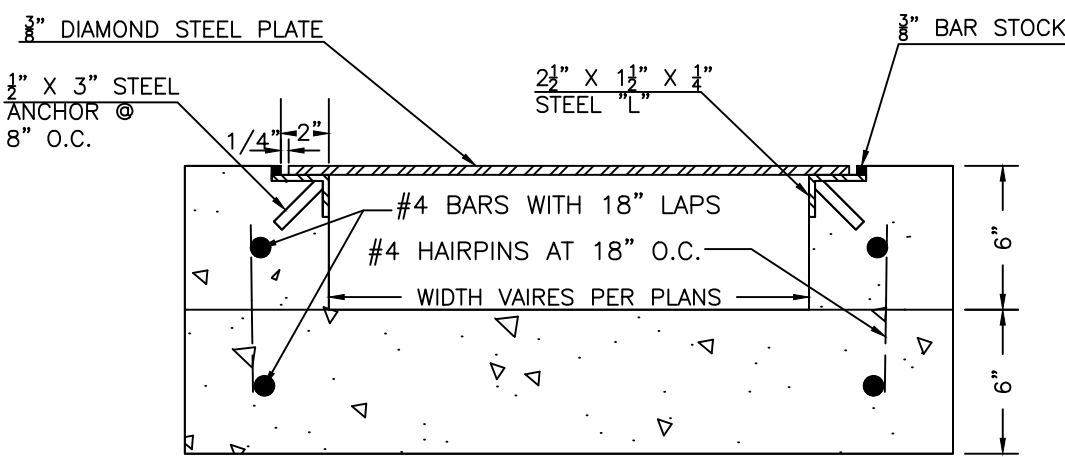
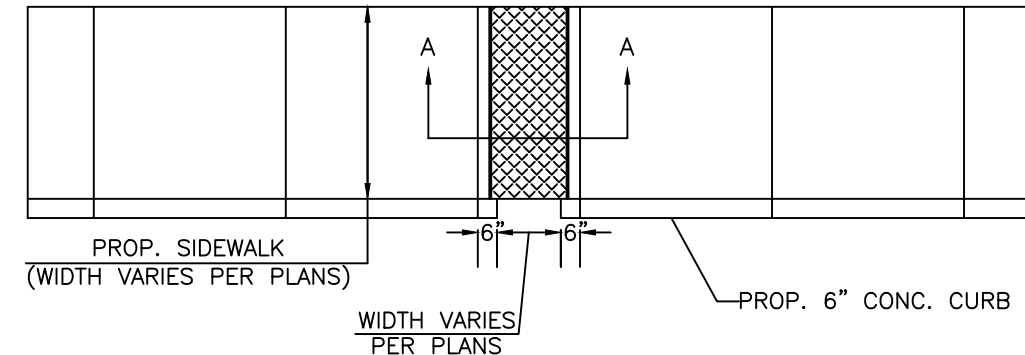
MATERIAL REQUIREMENTS

BACKFILL ZONE

- IN PAVED AREAS, USE CEMENT STABILIZED SAND, PLACE IN 8" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY, TO WITHIN 12" OF SUBGRADE.
- IN UNPAVED AREAS, USE SOIL EXCAVATED FROM TRENCH, PLACE IN 8" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.

PIPE EMBEDMENT ZONE

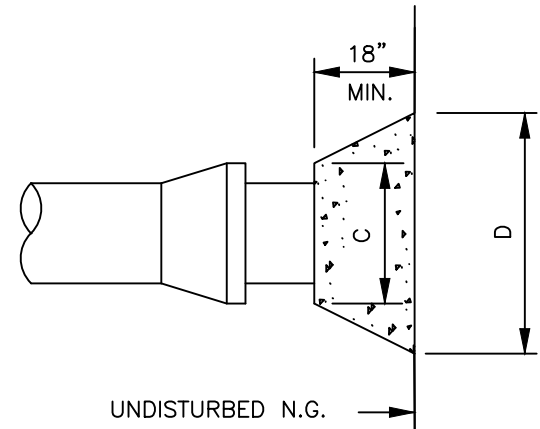
- FOR STORM AND SANITARY SEWERS, USE CEMENT STABILIZED SAND, PLACE IN 8" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.
- FOR WATER LINES, USE SAND, PLACE IN 8" LIFTS AND COMPACT TO 95% STANDARD PROCTOR DENSITY.



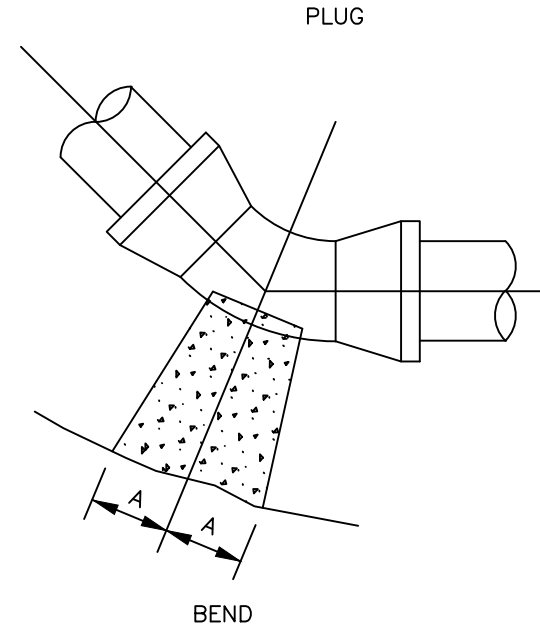
SIDEWALK DRAIN UNDER PROP. SIDEWALK

N.T.S.

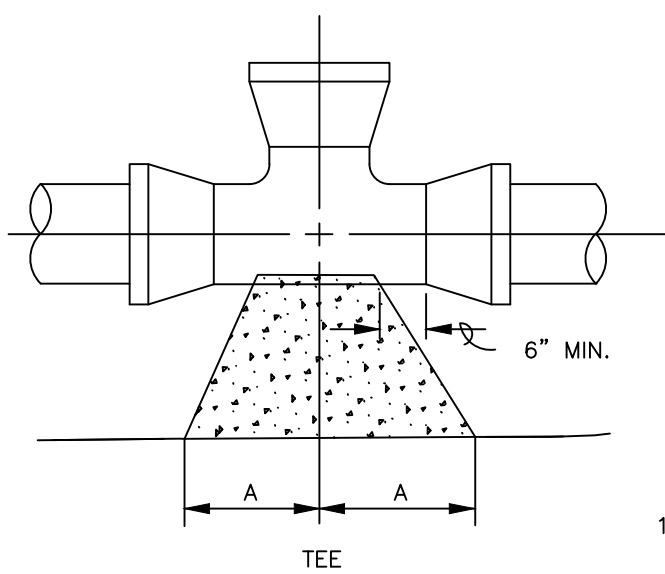
SIZE	90° BEND		45° BEND		22 1/2° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
2 1/2 "	12"	7"	6"	7"	6"	6"	7"	8"	8"	14"
4"	14"	8"	7"	9"	6"	6"	8"	11"	8"	18"
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"



BEND & TEE



BEND



TEE

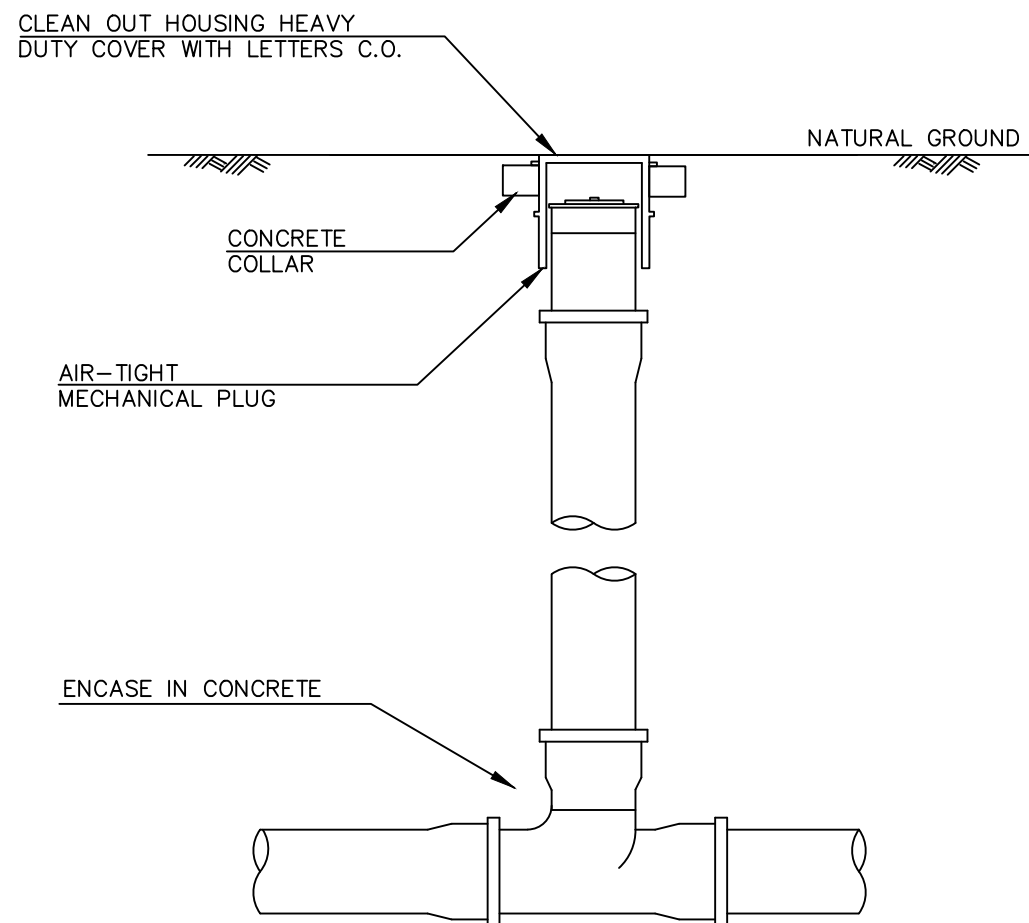
24" MIN.-12" & LARGER PIPE  
18" MIN.-10" & SMALLER PIPE

UNDISTURBED N.G.

NOTE:  
THRUST BLOCKS AT TRENCH FACE MUST HAVE A MINIMUM BEARING SURFACE OF 1.0 SQ. FOOT AND THE LEAST DIMENSION SHALL BE NO SMALLER THAN 1.5 TIMES PIPE DIAMETER, BUT NOT LESS THAN 1.0 FT.

THRUST-BLOCKING

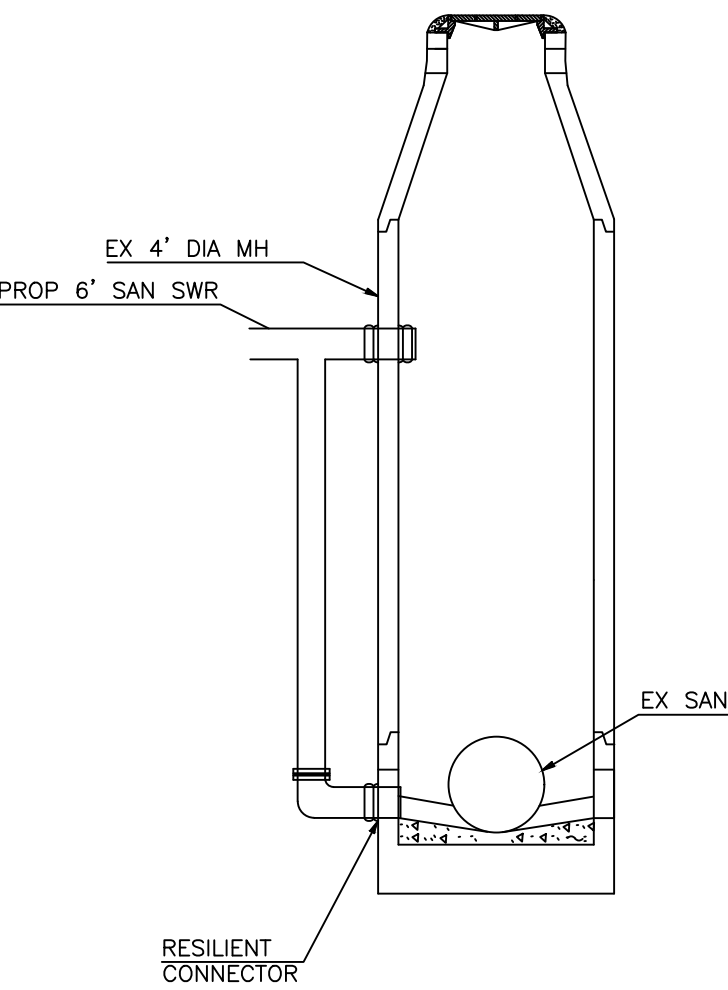
N.T.S.



CLEANOUT DETAIL

N.T.S.

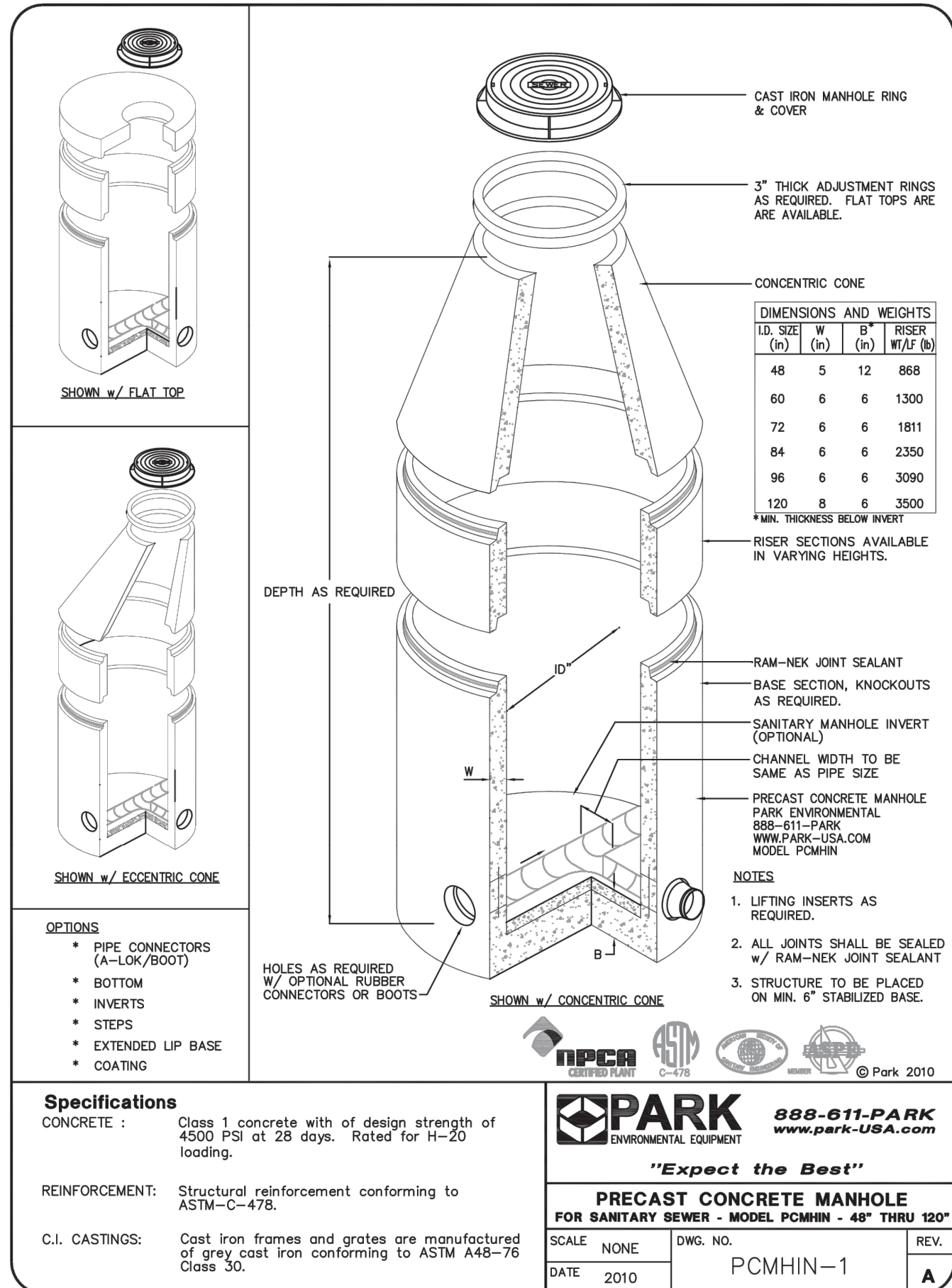
CLEANOUT SERIES 8310 MADE BY JOSAM MANUFACTURING CO., OR APPROVED EQUAL WITH SCORIATED COVER AND BRASS INTERNAL PLUG.



EXTERNAL DROP CONNECTION DETAIL

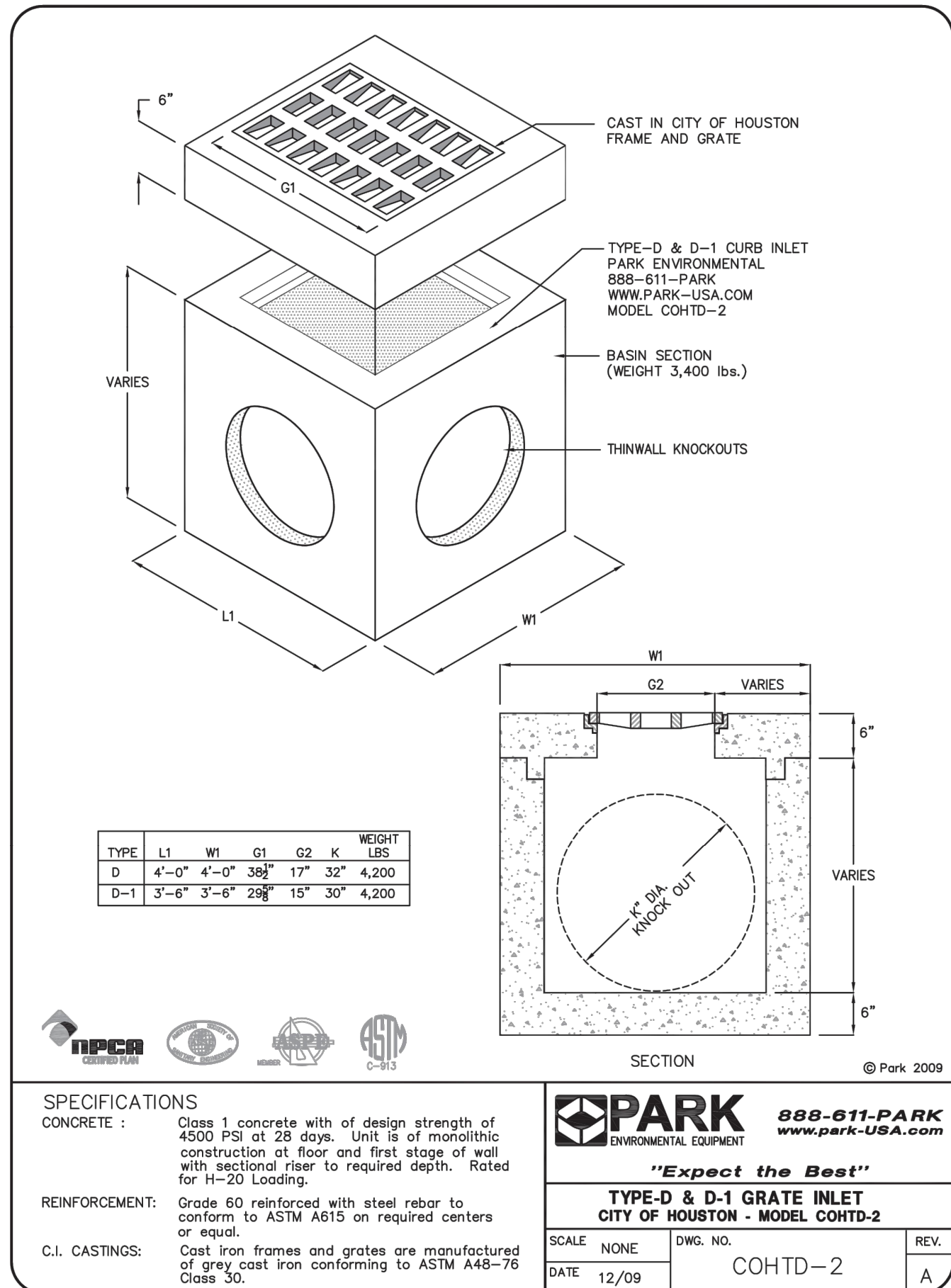
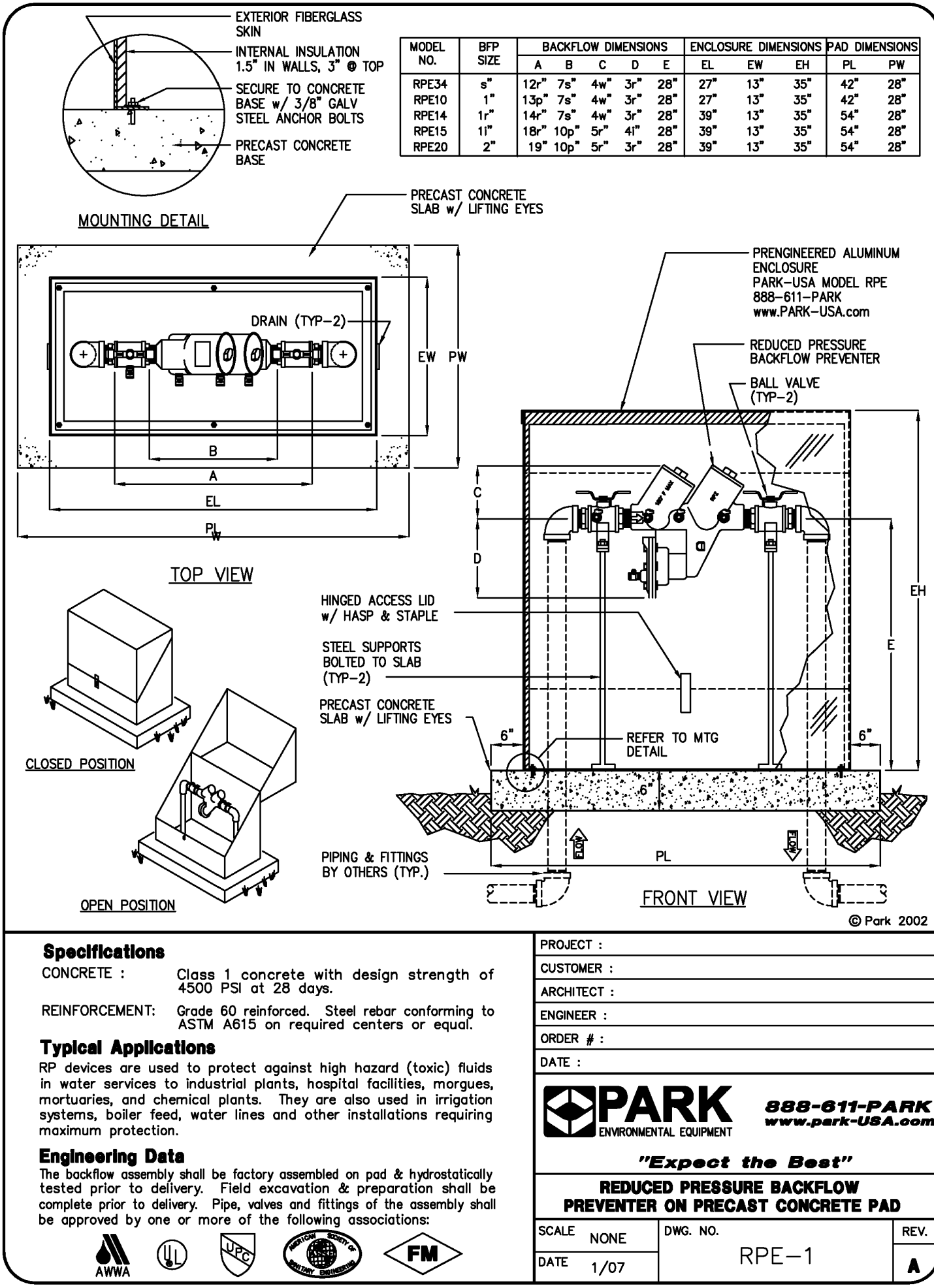
N.T.S.





3-46

All drawings are available for download at [www.park-usa.com](http://www.park-usa.com) in .dwg & .pdf formats



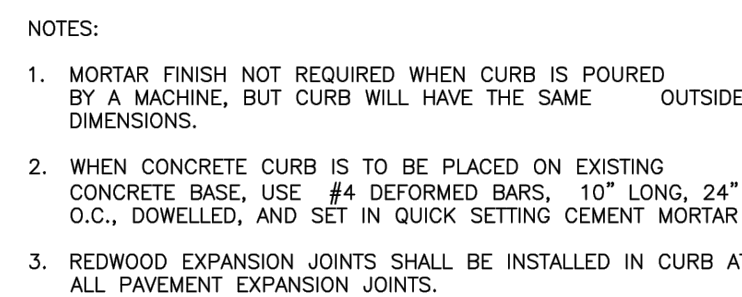
3-24

All drawings are available for download at [www.park-usa.com](http://www.park-usa.com) in .dwg & .pdf formats









DESIGN:	CAD:	SCALE	DATE:	DRAWING:
CAK	STAFF	NTS	12/10	P-100a



Contraction joints shall be spaced 10' O.C.  
Concrete shall have five (5) sacks of cement  
per cubic yard of concrete.

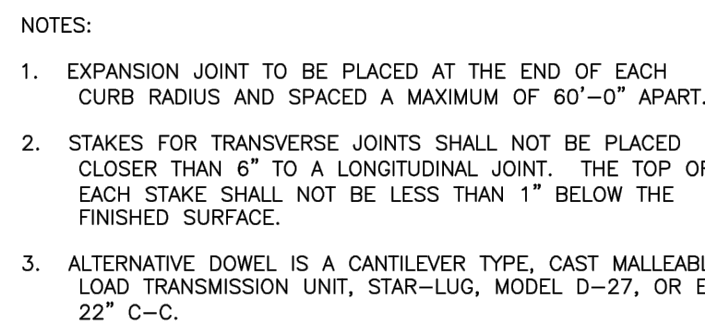
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CAK	STAFF	NTS	11/11	P-101



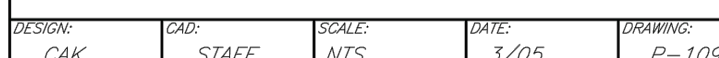
DESIGN:	CAD:	SCALE:	DATE:	DRAWING:
CAK	STAFF	NTS	12/10	P-104



DESIGN:	CAD:	SCALE:	DATE:	DRAWING:
CAK	STAFF	NTS	12/10	P-100



DESIGN:	CAD:	SCALE:	DATE:	DRAWING:
CAK	STAFF	NTS	12/10	P-107



## DRIVEWAY PAVEMENT CONSTRUCTION TABLE

NOTES:

1. SAW CUT & BREAKOUT NO MORE THAN 72 HOURS PRIOR TO PROPOSED CONCRETE PLACEMENT. NOTIFY CITY OF ROSENBERG PRIOR TO CUT.
2. UNSTABLE SUBGRADE SHALL BE EXCAVATED & REPLACED WITH CONCRETE.
3. IT IS CONTRACTOR'S RESPONSIBILITY TO NOTIFY CITY OF ROSENBERG OF ANY BIRD BATH PROBLEMS PRIOR TO CONSTRUCTION OF DRIVEWAY.
4. USE 1"x2" TREATED STAKES FOR HEADER.
5. EDGE ALL SIDES WITH EDGING TOOL AND BROOM FINISH.
6. FOR INDUSTRIAL DRIVES, PAVEMENT SHALL HAVE A DEPTH OF 8" (N.).
7. EXPANSION JOINT AT PROPERTY LINE REQUIRED. 3/4" REDWOOD BOARD WITH NO. 4 DOWELS MINIMUM.
8. MAXIMUM ALLOWABLE DRIVEWAY GRADE IN PUBLIC RIGHT-OF-WAY IS 5%.
9. DRIVEWAY GRADE MUST MEET A.D.A. AND T.A.S. SIDEWALK SLOPE, SIDEWALKS MUST BE SCORED TO MATCH ADJACENT SIDEWALK. IF SLOPE IS CONTINUED THROUGH THE RIGHT-OF-WAY LINE, A 3/4" REDWOOD EXPANSION JOINT WITH DOWELS AT RIGHT-OF-WAY LINE.
10. REFER TO GENERAL, C.S.S., ASPHALT, AND CONCRETE PAVEMENT NOTES.

### STANDARD DRIVEWAY CONSTRUCTION TABLE & NOTES

DESIGN:	CAD:	SCALE:	DATE:	DRAWING:
CAK	STAFF	NTS	04/15	P-112







FORT BEND COUNTY  
NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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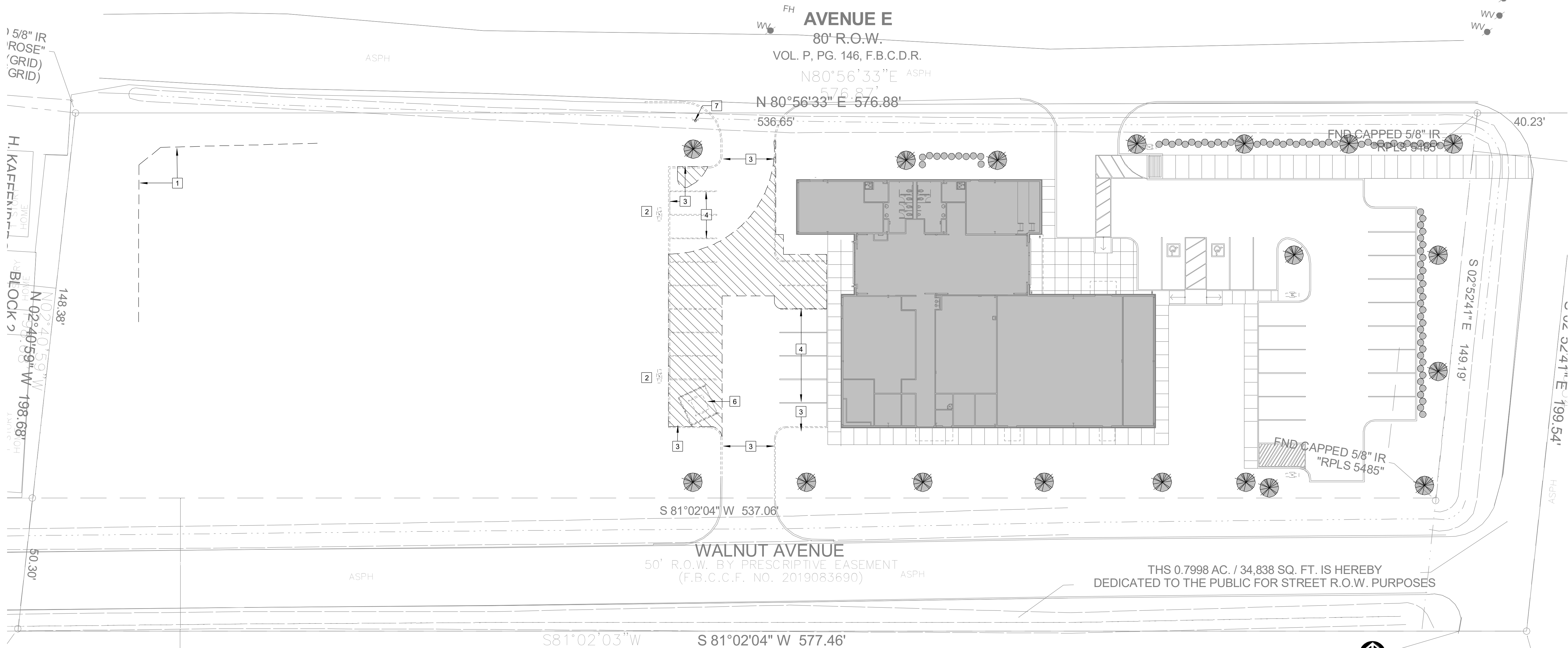
MARK	DATE	ISSUED FOR:
	05.03.2022	ISSUE



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AFFIXATION DATE: 05/03/22

D1.0

DEMOLITION SITE  
PLAN



CODED NOTES

- 1 REMOVE EXISTING FENCE
- 2 RELOCATE SITE LIGHT POLE, RE: ELEC
- 3 REMOVE CONCRETE CURB
- 4 REMOVE PAVEMENT STRIPING
- 5 REMOVE EXISTING CONCRETE PAVEMENT
- 6 EXISTING DUMPSTER TO BE RELOCATED
- 7 RELOCATE TRAFFIC SIGN

LEGEND

- EXISTING CONCRETE TO BE REMOVED, RE: CIVIL
- EXISTING BUILDING TO REMAIN
- EXISTING TREE TO REMAIN

GENERAL NOTES

1. AS A RESULT OF DEMOLITION, PATCH AND REPAIR DAMAGED ADJACENT SURFACES.
2. BEFORE COMMENCING WORK, CONTRACTOR SHALL PERFORM A SURVEY OF EXISTING CONDITIONS IN ORDER TO VERIFY ACCURACY AND COMPATIBILITY OF DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS WITH ACTUAL CONDITIONS. CONTRACTOR SHALL NOTIFY ARCHITECT IMMEDIATELY, IN WRITING, OF ALL DISCREPANCIES FOUND WHICH MAY AFFECT THE WORK. PROCEEDING WITH THE WORK SHALL CONSTITUTE ACCEPTANCE BY THE CONTRACTOR THAT CONDITIONS ARE CORRECT AND THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR CONDITIONS.
3. RE: ELECTRICAL FOR LIGHT FIXTURES TO BE REMOVED.



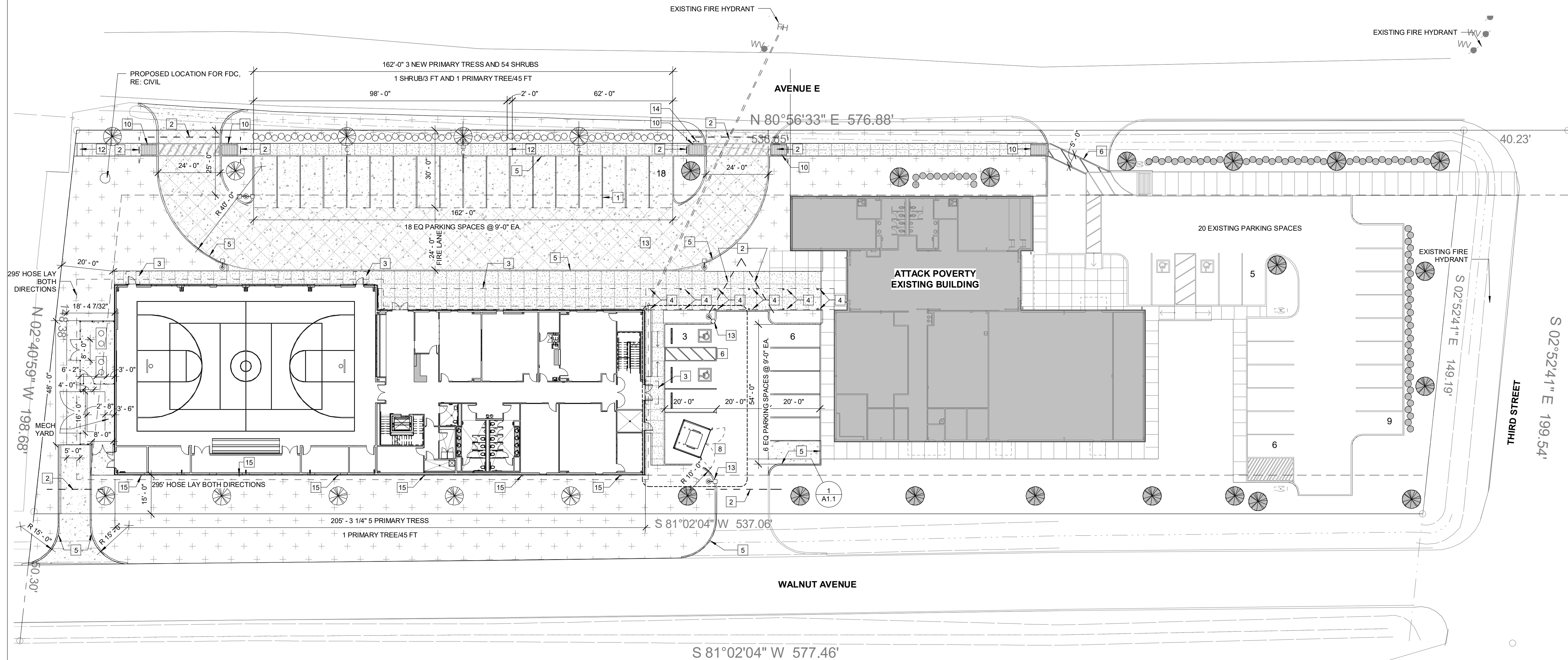
Total Parking (including Attack Poverty) = 47 spaces

New Parking (serving proposed building) = 27 spaces

**Section 1-418 of Rosenberg Unified Development Code**  
**Sec. A.1.vi Per Square Feet (sf) of Assembly Area.** This phrase "per sf." of assembly area" means that the number of parking spaces is based on the number of square feet in the largest room used for assembly (e.g. at a school, this is often the gymnasium, but it could also be a theater or lunch room).

**Parking Related Space Analysis:**  
**Recreation Space:** 7200 SF. 1/300 = 24 spaces required, 26 provided  
**Office Space:** 600 sf. 1/250 = 3 spaces required, 4 provided

(Existing Attack Poverty Building = 17 spaces required)



1 SITE PLAN  
1" = 20'-0"

### CODED NOTES

- |  |  |
|--|--|
| 1 4" WIDE PAINTED WHITE STRIPE, TYP., RE: CIVIL  | 8 RELOCATED EXISTING DUMPSTER ENCLOSURE                              |
| 2 4" PVC IRRIGATION SLEEVES (EXTEND 12" PAST CONCRETE), RE: CIVIL                                      | 9 HANDICAP PARKING SIGN, RE: CIVIL                                   |
| 3 DASHED LINE INDICATES CANOPY   | 10 HANDICAP CURB RAMP, RE: 5/A1.1                                    |
| 4 CANOPY COLUMNS, SOUTH COLUMNS TIED TO STORM  | 11 4" H x 6" DIA GALV STEEL BOLLARD FILLED W/ CONCRETE PAINTED (TYP) |
| 5 6" MONOLITHIC CONCRETE CURB, RE: CIVIL   | 12 PROPERTY SIDEWALK DRAIN, RE: CIVIL                                |
| 6 5'-0" WIDE (MIN) H.C. ACCESSIBLE AISLE, 4" WIDE PAINTED WHITE STRIPING @ 45 DEG, 12" O.C., RE: CIVIL | 13 RELOCATED PARKING LIGHT, RE: ELEC (TOTAL OF 2)                    |
| 7 CONCRETE WHEEL STOP, RE: SPECS   | 14 RELOCATED TRAFFIC SIGN, RE: CIVIL                                 |
|  | 15 DOWNSPOUT TIED TO STORM, RE: CIVIL                                |

### LEGEND

- |  |   |
|--|---|
| NEW CONCRETE PAVING, RE: CIVIL   | NEW TREE  |
| NEW CONCRETE SIDEWALK, RE: CIVIL   | EXISTING TREE TO REMAIN   |
| PROVIDE HYDROMULCH IN CONSTRUCTION CONTRACT LIMITS AND ALL AREAS DISTURBED DURING CONSTRUCTION | NEW SHRUB   |
| FIRE LANE  | EXISTING SHRUB TO REMAIN  |
| EXISTING BUILDING TO REMAIN  | 4" PVC SLEEVES FOR OWNER INSTALLED IRRIGATION SYSTEM, RE: CIVIL |
|  | EXPANSION JOINT, RE: CIVIL                                      |
|  | NEW PARKING LIGHT, RE: ELEC. 2 EXISTING TO BE RELOCATED         |

### GENERAL NOTES

- INFORMATION CONTAINED ON THE ARCHITECTURAL SITE DRAWING(S) HAS BEEN TAKEN FROM SURVEYS AND CIVIL DRAWINGS. THE INTENT OF THE ARCHITECTURAL SITE DRAWING(S) IS TO INDICATE THE OVERALL RELATIONSHIP OF THE BUILDINGS, PAVING & OTHER SITE FEATURES. NO GUARANTEE IS MADE TO THE ACCURACY OF THE ARCHITECTURAL SITE DRAWING(S) DO NOT EXCEED 1:20 (5%) SLOPE ON PAVING & SIDEWALKS.
- DO NOT EXCEED 1:50 (2%) SLOPE ON LANDINGS AT DOORS & CROSS SLOPE ON SIDEWALKS & RAMPS. IF ELEVATIONS & DIMENSIONS INDICATED ON DRAWING(S) EXCEED THESE SLOPES, CONSULT ARCHITECT AND CIVIL ENGINEER
- VERIFY ALL INFORMATION SHOWN WITH CIVIL, MEP, AND OTHER DRAWINGS. IF DISCREPANCIES EXIST, CONSULT WITH ARCHITECT AND ENGINEER(S) PRIOR TO CONSTRUCTION
- ALL APPROVALS SHALL BE OBTAINED FROM AUTHORITIES HAVING JURISDICTION ON THIS PROPERTY PRIOR TO CONSTRUCTION
- THE ARCHITECTURAL SITE DRAWING(S) SHOWS LOCATION OF SIDEWALKS, RE: CIVIL FOR CONSTRUCTION & PAVING DETAILS, JOINTS, ETC
- RE: CIVIL DRAWINGS FOR PARKING REQUIREMENTS, & OTHER ITEMS NOT SHOWN ON ARCHITECTURAL THAT MAY BE REQUIRED FOR PERMITTING AND/OR CONSTRUCTION

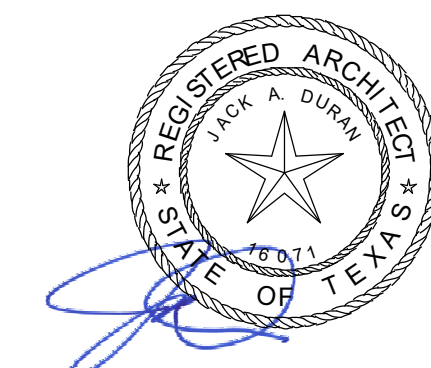
## FORT BEND COUNTY NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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AFFIXATION DATE: 05/03/22

## A1.0 OVERALL SITE PLAN





126 West Bruce Street, Suite 102  
Harrisonburg, VA 22801  
540.437.1228

333 Cypress Run, Suite 350  
Houston, TX 77094  
281.497.1040

FORT BEND COUNTY  
NEW COMMUNITY CENTER

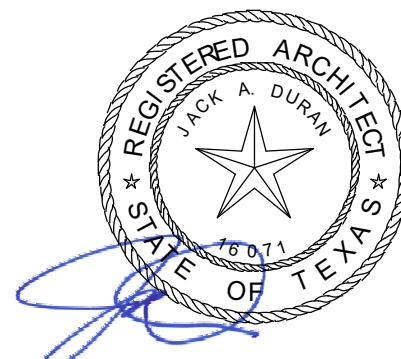
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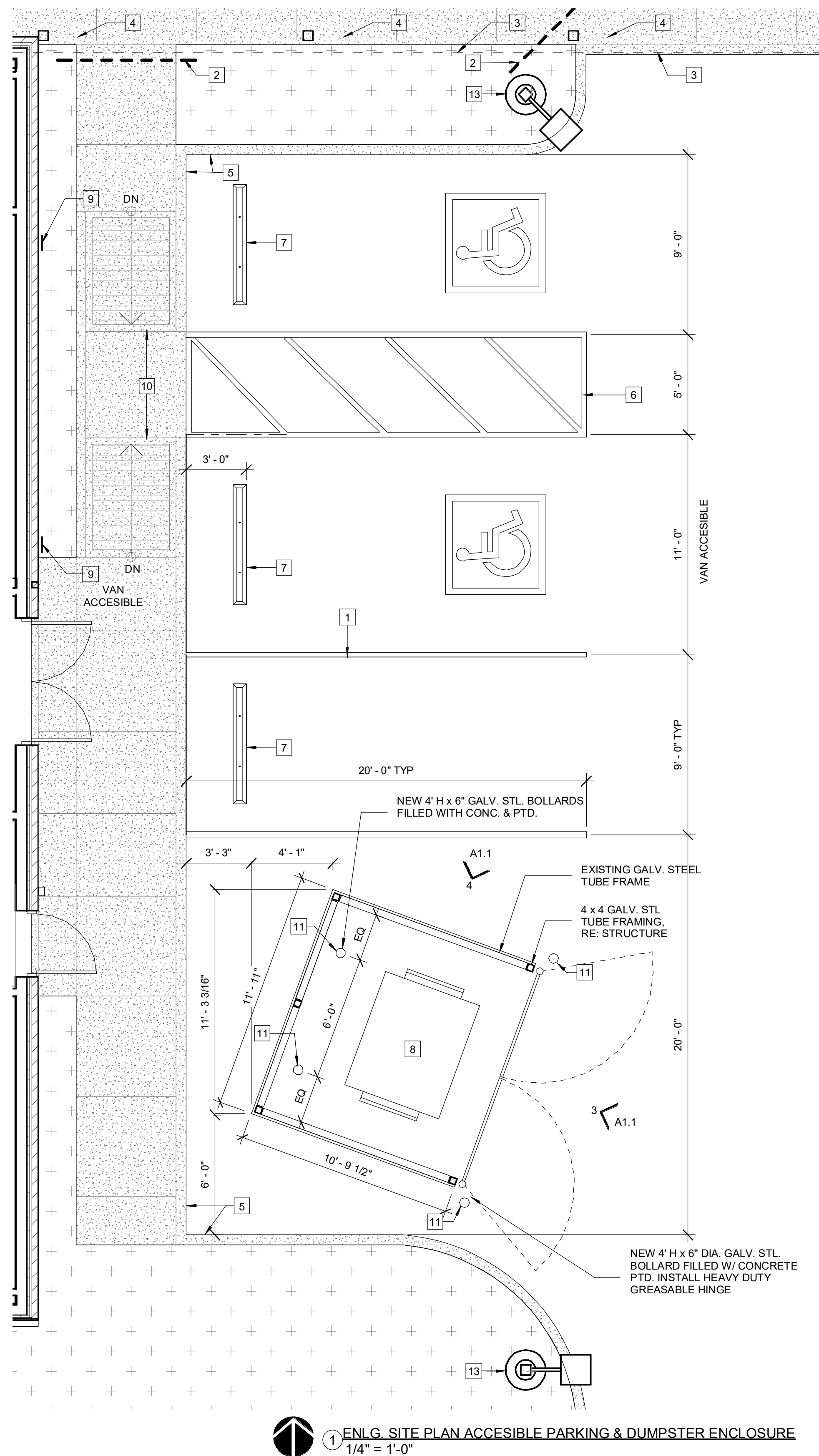


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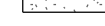



AFFIXATION DATE: 05/03/22

## A1.1

# ENLARGED SITE PLAN



① ENLG. SITE PLAN ACCESIBLE PARKING & DUMPSTER ENCLOSURE  
1/4" = 1'-0"

CODED NOTES			LEGEND			GENERAL NOTES		
1	4" WIDE PAINTED WHITE STRIPE, TYP., RE: CIVIL	8	RELOCATED EXISTING DUMPSTER ENCLOSURE		NEW CONCRETE PAVING, RE: CIVIL		NEW TREE	1. INFORMATION CONTAINED ON THE ARCHITECTURAL SITE DRAWING(S) HAS BEEN TAKEN FROM SURVEYS AND CIVIL DRAWINGS. THE INTENT OF THE ARCHITECTURAL SITE DRAWING(S) IS TO INDICATE THE OVERALL RELATIONSHIP OF THE BUILDINGS, PAVING & OTHER SITE FEATURES. NO GUARANTEE IS MADE TO THE ACCURACY OF THE ARCHITECTURAL SITE DRAWING(S) DO NOT EXCEED 1:20 (5%) SLOPE ON PAVING & SIDEWALKS.
2	4" PVC IRRIGATION SLEEVES (EXTEND 12" PAST CONCRETE), RE: CIVIL	9	HANDICAP PARKING SIGN, RE: CIVIL		NEW CONCRETE SIDEWALK, RE: CIVIL		EXISTING TREE TO REMAIN	2. DO NOT EXCEED 1:50 (2%) SLOPE ON LANDINGS AT DOORS & CROSS SLOPE ON SIDEWALKS & RAMP. IF ELEVATIONS & DIMENSIONS INDICATED ON DRAWING(S) EXCEED THESE SLOPES, CONSULT ARCHITECT AND CIVIL ENGINEER
3	DASHED LINE INDICATES CANOPY	10	HANDICAP CURB RAMP, RE: 5/A1.1		PROVIDE HYDROMULCH IN CONSTRUCTION CONTRACT LIMITS AND ALL AREAS DISTURBED DURING CONSTRUCTION		NEW SHRUB	3. VERIFY ALL INFORMATION SHOWN WITH CIVIL, MEP, AND OTHER DRAWINGS. <u>IF DISCREPANCIES EXIST, CONSULT WITH ARCHITECT AND ENGINEER(S) PRIOR TO CONSTRUCTION</u>
4	CANOPY COLUMNS, <u>SOUTH COLUMNS</u> TIED TO STORM	11	4" H x 6" DIA GALV STEEL BOLLARD FILLED W/ CONCRETE PAINTED (TYP)		FIRE LANE		EXISTING SHRUB TO REMAIN	4. ALL APPROVALS SHALL BE OBTAINED FROM AUTHORITIES HAVING JURISDICTION ON THIS PROPERTY PRIOR TO CONSTRUCTION
5	6" MONOLITHIC CONCRETE CURB, RE: CIVIL	12	PROPERTY SIDEWALK DRAIN, RE: CIVIL		RELOCATED PARKING LIGHT, RE: ELEC (TOTAL OF 2)		EXPANSION JOINT, RE: CIVIL	5. THE ARCHITECTURAL SITE DRAWING(S) SHOWS LOCATION OF SIDEWALKS. RE: CIVIL FOR CONSTRUCTION & PAVING DETAILS, JOINTS, ETC
6	5'-0" WIDE (MIN) H.C. ACCESSIBLE AISLE, 4" WIDE PAINTED WHITE STRIPING @ 45 DEG, 12" O.C., RE: CIVIL	13	RELOCATED TRAFFIC SIGN, RE: CIVIL		EXISTING BUILDING TO REMAIN		NEW PARKING LIGHT, RE: ELEC. 2 EXISTING TO BE RELOCATED	6. RE: CIVIL DRAWINGS FOR PARKING REQUIREMENTS, & OTHER ITEMS NOT SHOWN ON ARCHITECTURAL THAT MAY BE REQUIRED FOR PERMITTING AND/OR CONSTRUCTION
7	CONCRETE WHEEL STOP, RE: SPECS	15	DOWNSPOUT TIED TO STORM, RE: CIVIL					

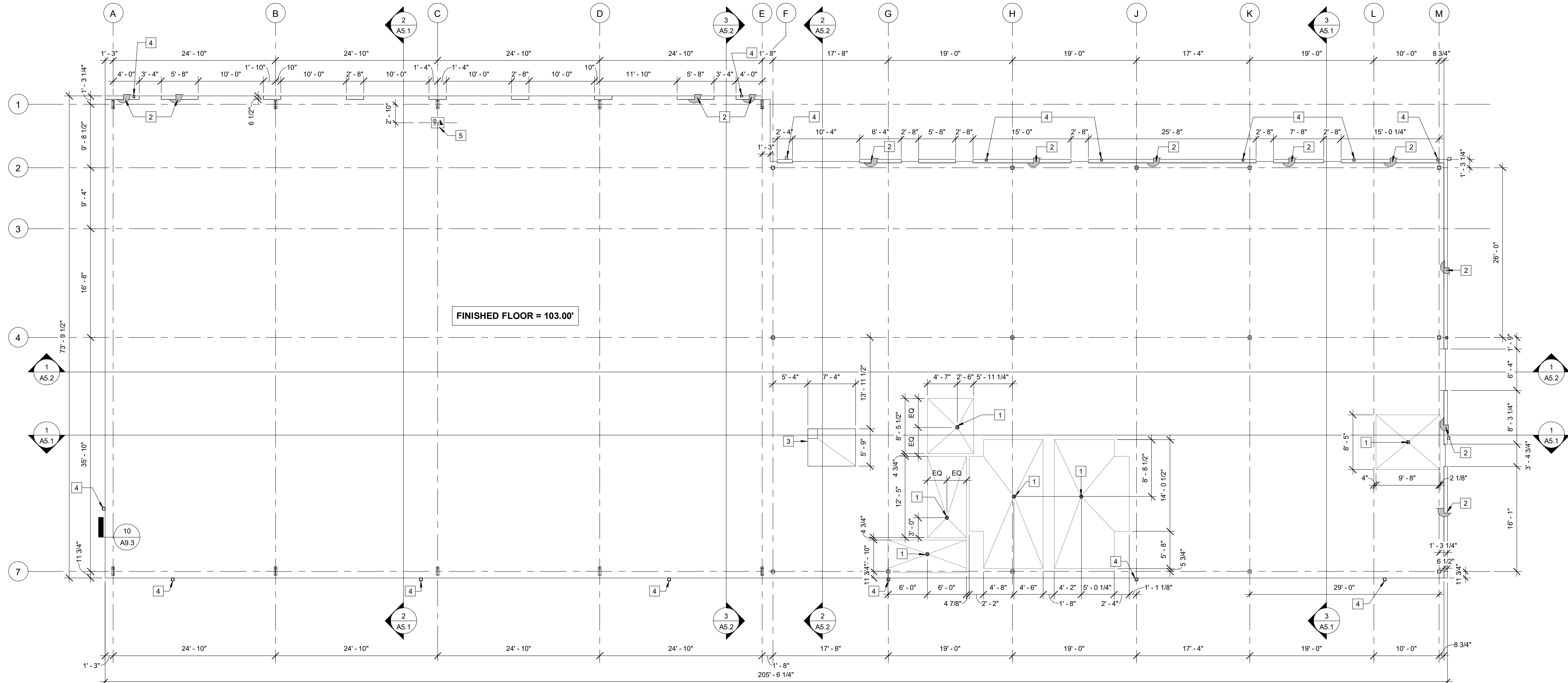
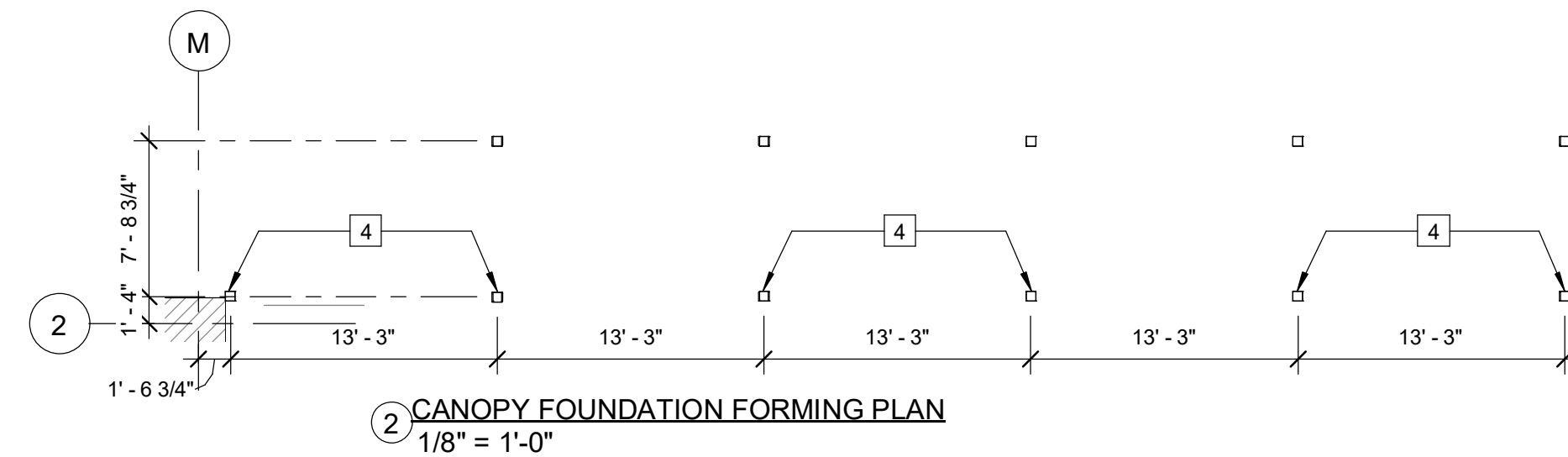
**FORT BEND COUNTY  
NEW COMMUNITY CENTER**  
AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

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**A2.0**  
FOUNDATION  
FORMING PLAN



① FOUNDATION FORMING PLAN  
1/8" = 1'-0"

**CODED NOTES**

- FLOOR DRAIN, RE: PLUMBING SLOPE FOUNDATION TO DRAIN 2% MAX SLOPE IN ANY DIRECTION, TYPICAL
- 2-5/8" DEEP X 6-1/2" WIDE MASONRY LEDGE, TYP @ BRICK
- 5'-0" DEEP ELEVATOR PIT W/ 2'-0" X 2'-0" SUMP PIT (RE: STRUCT. & MEP)
- DS TIED TO STORM RE: CIVIL
- FULLY RECESSED FLOOR RECEPTACLE W/ POWER & DATA FOR REFEREE TABLE PROVIDE THREE (3) 1-1/2" CONDUIT WITH PULL-STRINGS TO ADJACENT PERIMETER WALL

**LEGEND**

SLAB LEDGE

**GENERAL NOTES**

- REFER TO STRUCTURAL FOR ADDITIONAL FOUNDATION INFORMATION.
- REFER TO PLUMBING PLANS FOR FLOOR DRAIN INFORMATION.
- REFER TO DEMOLITION PLANS FOR DEMOLITION INFORMATION.



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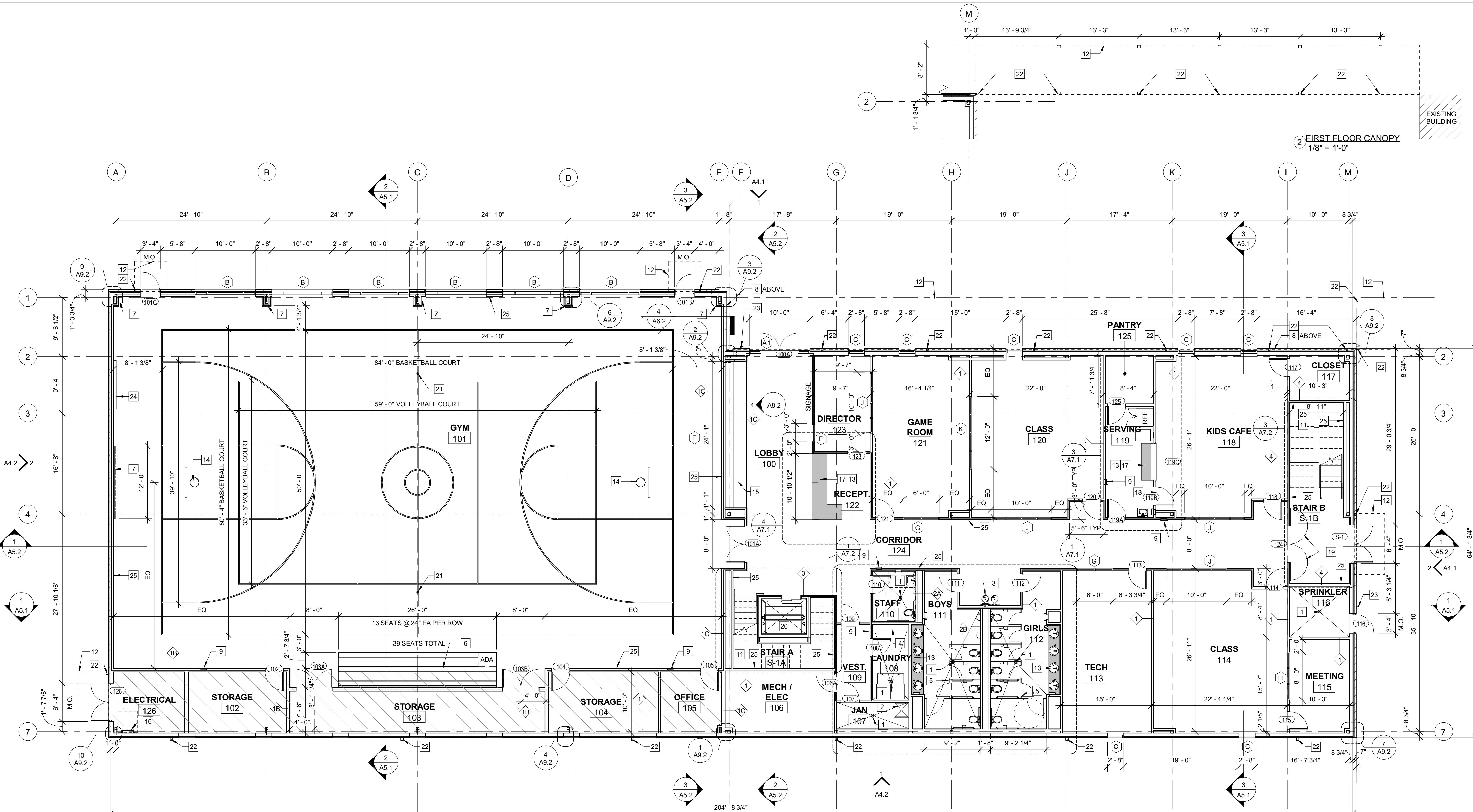
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**A2.1**

1ST FLOOR PLAN



**1 FIRST FLOOR**  
1/8" = 1'-0"

**CODED NOTES**

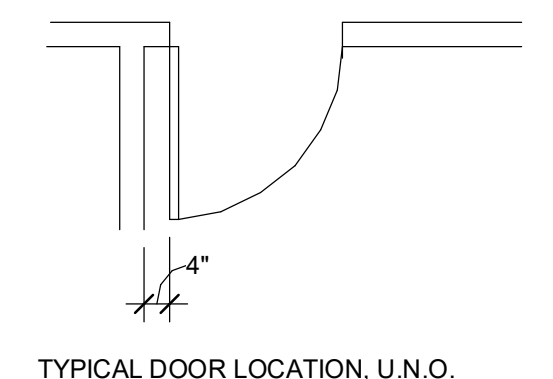
- |  |  |   |
|--|--|---|
| 1 FLOOR DRAIN, RE: PLUMBING  | 9 RECESSED FIRE EXTINGUISHER CABINET   | 18 DUTCH DOOR, RE: DOOR SCHED.  |
| 2 MOP SINK, RE: PLUMBING   | 10 9'-0" HIGH OPERABLE PARTITION, PAIRED-PANEL (HUF COR 632 OR APPROVED EQUAL)                 | 19 MAGNETIC HOLD-OPEN TIED TO FIRE ALARM, RE: ELEC & DOOR SCHED   |
| 3 ELECTRIC DRINKING FOUNTAIN (EDF) W/ BOTTLED WATER FILLER, RE: PLUMB'G                    | 11 PTD. STL. STAIR W/ SCHED. FINISH SET IN POURED CONC. TREADS, W/ STL. HAND & GUARDRAILS      | 20 MACHINE ROOM-LESS HYDRAULIC ELEVATOR, 2100LBS (THYSSEN KRUPP ENDURA MRL 2100 OR APPROVED EQUAL) RE: ELEC             |
| 4 12" DEEP WALL SHELVES  | 12 QUARTZSTONE COUNTERTOP  | 21 VOLLEYBALL SLEEVE  |
| 5 FLOOR-TO-CEILING PHENOLIC CORE TOILET PARTITIONS MOUNTED TO STRUCTURE ABOVE, RE: STRUCT. | 13 BASKETBALL RETRACTABLE ELEC BACKBOARD, 72" X 42" FIBERGLASS (DRAPER, INC OR APPROVED EQUAL) | 22 DOWNSPOUT TIED TO STORM, RE: CIVIL   |
| 6 TELESCOPIC BLEACHERS (HUSSEY MAXAM1 SYSTEM W/ COURTSIDE XC10 SEATS, NON-ELECTRIC)        | 14 WOOD BENCH, RE: 1 & 3/A8.2  | 23 KNOX BOX (3200 SERIES) AT 60" A.F.F. COLOR ALUMINUM  |
| 7 WALL PADS MTD. ON 5/8" PLYWOOD   | 15 ACCESS LADDER W/ INSULATED HATCH ABOVE AT ROOF & FLOOR HATCH AT MECH. MEZZANINE             | 24 SCOREBOARD   |
| 8 EXTERIOR ILLUMINATED SIGNAGE, RE: ELEC.  | 16 P. LAM CASEWORK   | 25 8'-0" HIGH ABUSE-RESISTANT 5/8" TYPE "X" GYPSUM WALL BOARD IN GYM 101 AND 4'-0" HIGH AT ALL CORRIDORS AND STAIRWELLS |

**LEGEND**

- |     |  |
|-----|--|
| 101 | DOOR IDENTIFICATION, RE: DOOR SCHEDULE, SHEET A3.1         |
| 11  | WINDOW IDENTIFICATION, RE: WINDOW SCHEDULE, SHEET A3.1     |
| 1A  | PARTITION TYPE, RE: SHEET A0.3                             |
| --- | 2' x 6' PORTER ATHLETIC DURASAFE WALL PADS ON 5/8" PLYWOOD |
| ==  | ABUSE-RESISTANT GYPSUM WALL BOARD                          |
| ▨   | MECHANICAL MEZZANINE ABOVE                                 |

**GENERAL NOTES**

1. VERIFY ALL INFORMATION WITH CIVIL, STRUCTURAL, MEP AND ALL OTHER CONSTRUCTION DOCUMENTS PRIOR TO START OF CONSTRUCTION - IF ANY DISCREPANCIES EXIST, CONSULT THE ARCHITECT, ENGINEER, AND APPLICABLE CONSULTS.
2. STRUCTURAL STEEL COLUMNS ARE SHOWN FOR REFERENCE ONLY. REFER TO STRUCTURAL DRAWINGS FOR DIMENSIONS AND ADDITIONAL INFORMATION
3. DIMENSIONS ARE TO FACE OF GWP & TO CENTERLINE OF COLUMNS. U.N.O. DIMENSIONS TO EXTERIOR WALLS ARE TO FACE OF EXTERIOR FINISH.
4. REFER TO ENLARGED PLANS & DETAILS FOR ADDITIONAL INFORMATION AND DIMENSIONS
5. ALL EXPOSED STEEL TO BE PAINTED, U.N.O.



TYPICAL DOOR LOCATION, U.N.O.

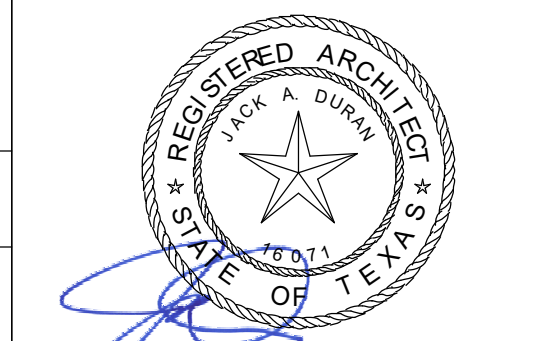


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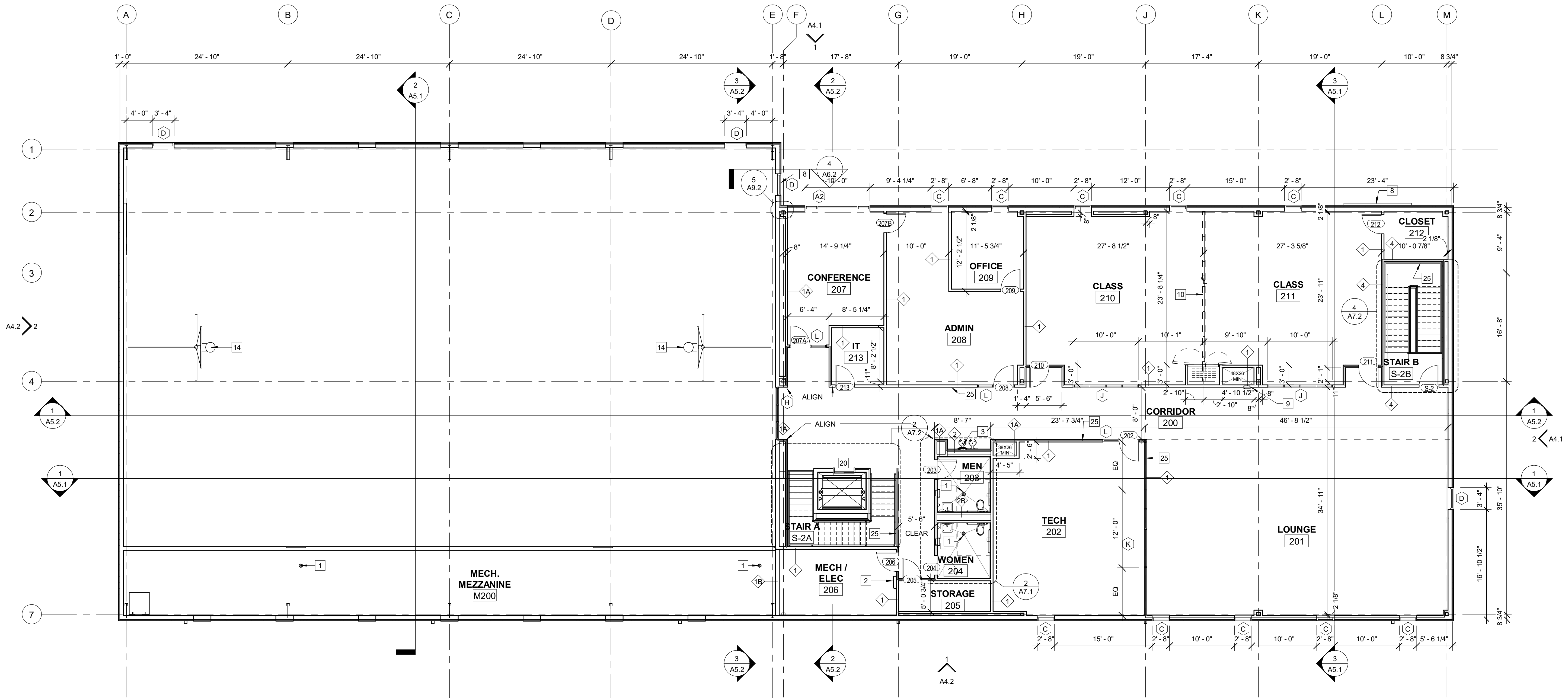
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A2.2

2ND FLOOR PLAN



1 SECOND FLOOR  
1/8" = 1'-0"

CODED NOTES

- FLOOR DRAIN, RE: PLUMBING
- MOP SINK, RE: PLUMBING
- ELECTRIC DRINKING FOUNTAIN (EDF) W/ BOTTLED WATER FILLER, RE: PLUMB'G
- 12" DEEP WALL SHELVES
- FLOOR-TO-CEILING PHENOLIC CORE TOILET PARTITIONS MOUNTED TO STRUCTURE ABOVE, RE: STRUCT.
- TELESCOPIC BLEACHERS (HUSSEY MAXAM1 SYSTEM W/ COURTSIDE XC10 SEATS, NON-ELECTRIC)
- WALL PADS MTD. ON 5/8" PLYWOOD
- EXTERIOR ILLUMINATED SIGNAGE, RE: ELEC.

- RECESSED FIRE EXTINGUISHER CABINET
- 9'-0" HIGH OPERABLE PARTITION, PAIRED-PANEL (HUFOR 632 OR APPROVED EQUAL)
- PTD. STL. STAIR W/ SCHED. FINISH SET IN POURED CONC. TREADS, W/ STL. HAND & GUARDRAILS
- QUARTZSTONE COUNTERTOP
- BASKETBALL RETRACTABLE ELEC BACKBOARD, 72" X 42" FIBERGLASS (DRAPER, INC OR APPROVED EQUAL)
- WOOD BENCH, RE: 1 & 3/A8.2
- ACCESS LADDER W/ INSULATED HATCH ABOVE AT ROOF & FLOOR HATCH AT MECH. MEZZANINE
- P. LAM CASEWORK

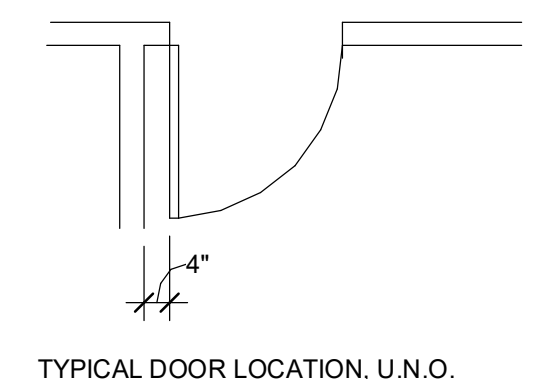
- DUTCH DOOR, RE: DOOR SCHED.
- MAGNETIC HOLD-OPEN TIED TO FIRE ALARM, RE: ELEC & DOOR SCHED
- MACHINE ROOM-LESS HYDRAULIC ELEVATOR, 2100LBS (THYSSEN KRUPP ENDURA MRL 2100 OR APPROVED EQUAL) RE: ELEC
- VOLLEYBALL SLEEVE
- DOWNSPOUT TIED TO STORM, RE: CIVIL
- KNOX BOX (3200 SERIES) AT 60" A.F.F. COLOR ALUMINUM
- SCOREBOARD
- 8'-0" HIGH ABUSE-RESISTANT 5/8" TYPE "X" GYPSUM WALL BOARD IN GYM 101 AND 4'-0" HIGH AT ALL CORRIDORS AND STAIRWELLS

LEGEND

- DOOR IDENTIFICATION, RE: DOOR SCHEDULE, SHEET A3.1
- WINDOW IDENTIFICATION, RE: WINDOW SCHEDULE, SHEET A3.1
- PARTITION TYPE, RE: SHEET A0.3
- 2' x 6' PORTER ATHLETIC DURASAFE WALL PADS ON 5/8" PLYWOOD
- ABUSE-RESISTANT GYPSUM WALL BOARD
- MECHANICAL MEZZANINE ABOVE

GENERAL NOTES

- VERIFY ALL INFORMATION WITH CIVIL, STRUCTURAL, MEP AND ALL OTHER CONSTRUCTION DOCUMENTS PRIOR TO START OF CONSTRUCTION - IF ANY DISCREPANCIES EXIST, CONSULT THE ARCHITECT, ENGINEER, AND APPLICABLE CONSULTS.
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- DIMENSIONS ARE TO FACE OF GWB & TO CENTERLINE OF COLUMNS, U.N.O. DIMENSIONS TO EXTERIOR WALLS ARE TO FACE OF EXTERIOR FINISH.
- REFER TO ENLARGED PLANS & DETAILS FOR ADDITIONAL INFORMATION AND DIMENSIONS
- ALL EXPOSED STEEL TO BE PAINTED, U.N.O.

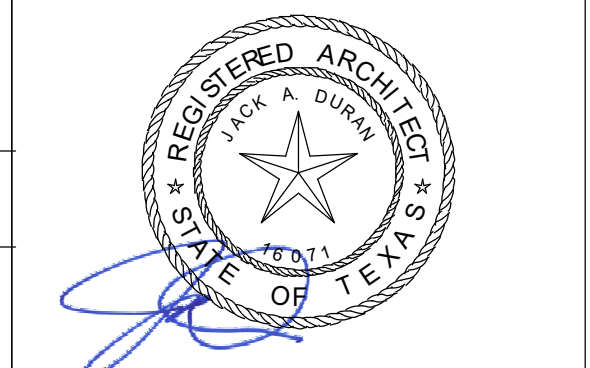


TYPICAL DOOR LOCATION, U.N.O.

**FORT BEND COUNTY**  
**NEW COMMUNITY CENTER**  
AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

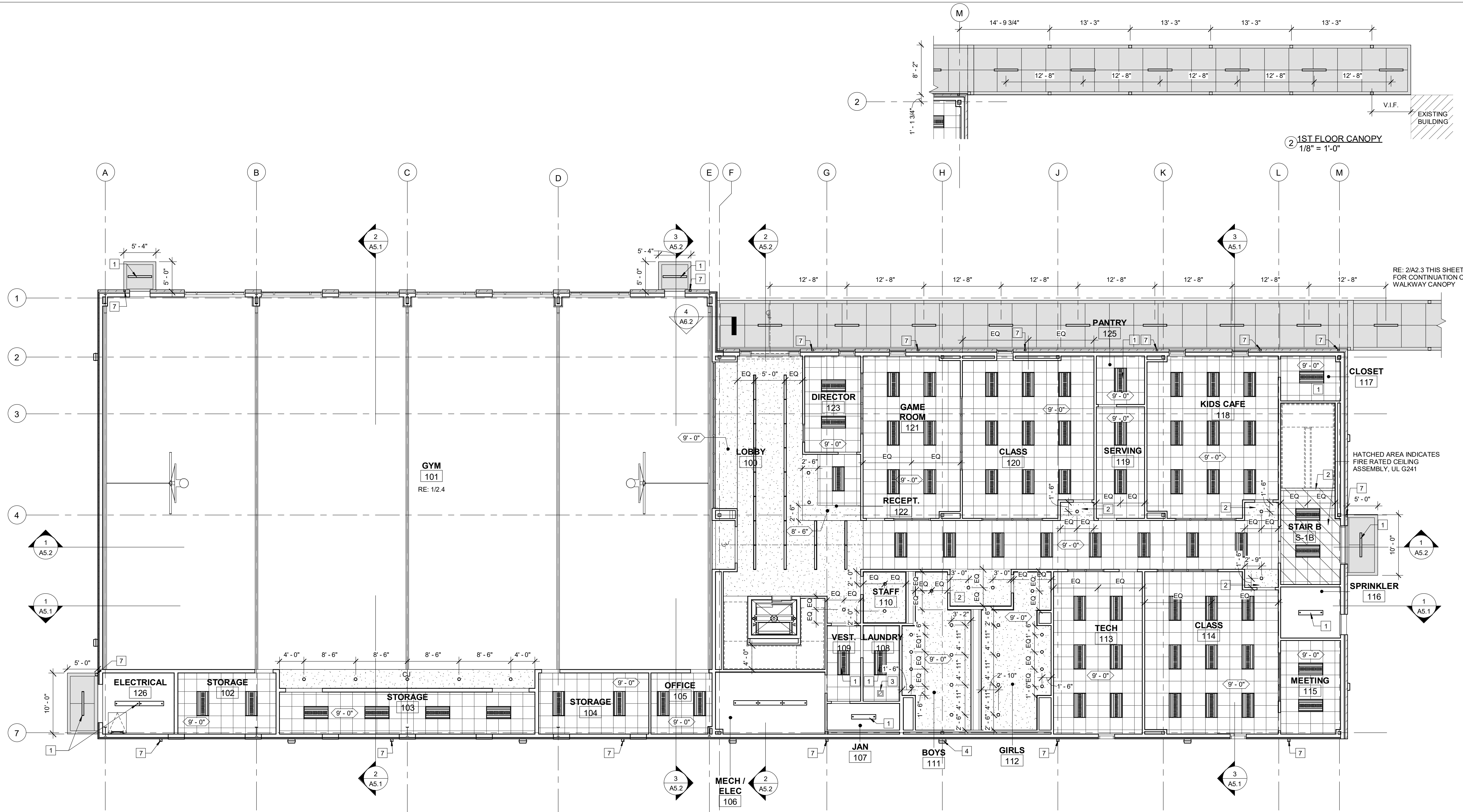
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**A2.3**  
**1ST FLOOR REFLECTED CEILING PLAN**



**1ST FLOOR REFLECTED CEILING PLAN**  
1/8" = 1'-0"

**CODED NOTES**

- 1 CENTER LIGHT IN ROOM
- 2 GYPSUM BULKHEAD
- 3 DRYER VENT RE: MECH
- 4 MECHANICAL LOUVER, RE: MEP
- 5 MECHANICAL GRILLE, RE: MEP
- 6 LADDER
- 7 DOWNSPOUT TIED TO STORM, RE: CIVIL
- 8 SCOREBOARD

**LEGEND**

- 2' X 4' LAY-IN LED FIXTURE
- 2' X 2' LAY-IN LED FIXTURE
- 1' X 4' SUSPENDED LED
- RECESSED LED DOWNLIGHT
- LED INDIRECT PENDANT
- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- 2' X 2' SUSPENDED ACOUSTICAL CEILING TILE & GRID, RE: SHEET A2.6
- PAINTED GYPSUM BOARD CEILING. COLOR: BRIGHT WHITE TYP U.N.O.
- PAINTED EXPOSED CEILING
- 12'-0" CEILING HEIGHT
- CONTROL JOINT
- FLOOR ACCESS HATCH (BILCO SM-3 ACCESS DOOR, SURFACE MOUNT W/ POST & CHAINS) & POST-UP LADDER EXTENSION AT MECHANICAL MEZZANINE, INSULATED ROOF HATCH, & POST-UP LADDER EXTENSION AT ROOF

**GENERAL NOTES**

- 1. REFLECTED CEILING PLAN INDICATES LAYOUT & ARRANGEMENT OF MOST MECHANICAL & ELECTRICAL DEVICES ON CEILINGS AS WELL AS OF BASIC CEILING MATERIALS.
- 2. RE: ELECTRICAL & MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION ON CEILING DEVICES & COMPONENTS WHICH MAY NOT BE SHOWN ON REFLECTED CEILING PLAN.
- 3. REVIEW LAYOUT & COORDINATE LOCATION OF ALL EQUIPMENT PRIOR TO STARTING WORK. REPORT ANY DISCREPANCIES TO ARCHITECT & ENGINEER.
- 4. ALL CEILING PENETRATIONS SUCH AS, BUT NOT LIMITED TO LIGHT FIXTURES, SPRINKLER HEADS & EXIT SIGNS SHALL BE CENTERED IN CEILING TILE.
- 5. CEILINGS SHALL BE 9'-0" UNLESS NOTED OTHERWISE.



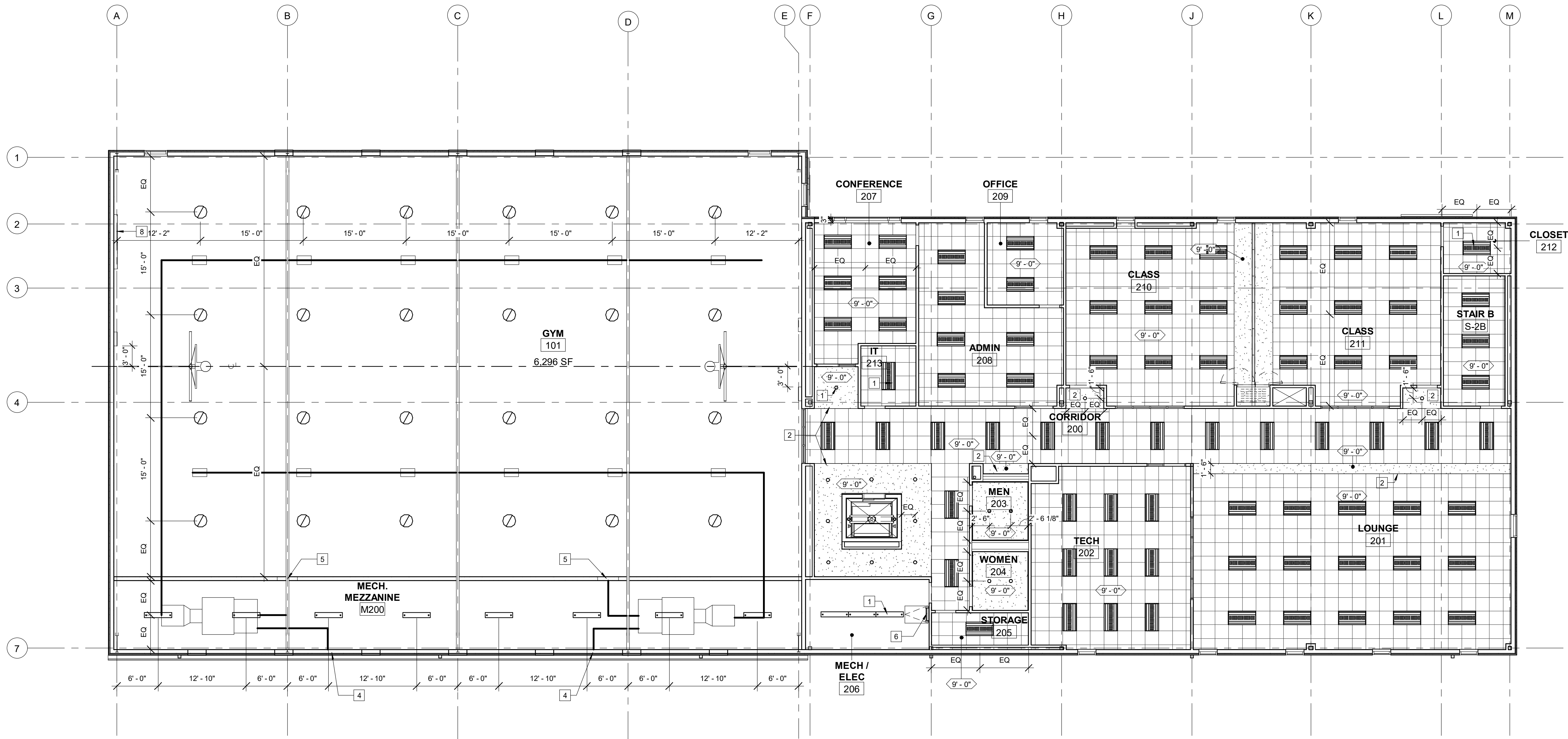
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**A2.4**  
2ND FLOOR  
REFLECTED  
CEILING PLAN



1 2ND FLOOR REFLECTED CEILING PLAN  
1/8" = 1'-0"

CODED NOTES

- CENTER LIGHT IN ROOM
- GYPSUM BULKHEAD
- DRYER VENT RE: MECH
- MECHANICAL LOUVER, RE: MEP
- MECHANICAL GRILLE, RE: MEP
- LADDER
- DOWNSPOUT TIED TO STORM, RE: CIVIL
- SCOREBOARD

LEGEND

- |  |                            |  |  |  |  |
|--|----------------------------|--|--|--|--|
|  | 2' X 4' LAY-IN LED FIXTURE |  | SUPPLY AIR DIFFUSER  |  | CEILING HEIGHT   |
|  | 2' X 2' LAY-IN LED FIXTURE |  | RETURN AIR GRILLE  |  | CONTROL JOINT  |
|  | 1' X 4' SUSPENDED LED      |  | 2' X 2' SUSPENDED ACOUSTICAL CEILING TILE & GRID, RE: SHEET A2.6 |  | FLOOR ACCESS HATCH (BILCO SM-3 ACCESS DOOR, SURFACE MOUNT W/ POST & CHAINS) & POST-UP LADDER EXTENSION AT MECHANICAL MEZZANINE, INSULATED ROOF HATCH, & POST-UP LADDER EXTENSION AT ROOF |
|  | RECESSED LED DOWNLIGHT     |  | PAINTED GYPSUM BOARD CEILING, COLOR: BRIGHT WHITE TYP U.N.O.     |  |  |
|  | LED INDIRECT PENDANT       |  | PAINTED EXPOSED CEILING  |  |  |

GENERAL NOTES

- REFLECTED CEILING PLAN INDICATES LAYOUT & ARRANGEMENT OF MOST MECHANICAL & ELECTRICAL DEVICES ON CEILINGS AS WELL AS OF BASIC CEILING MATERIALS.
- RE: ELECTRICAL & MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION ON CEILING DEVICES & COMPONENTS WHICH MAY NOT BE SHOWN ON REFLECTED CEILING PLAN.
- REVIEW LAYOUT & COORDINATE LOCATION OF ALL EQUIPMENT PRIOR TO STARTING WORK. REPORT ANY DISCREPANCIES TO ARCHITECT & ENGINEER.
- ALL CEILING PENETRATIONS SUCH AS, BUT NOT LIMITED TO LIGHT FIXTURES, SPRINKLER HEADS & EXIT SIGNS SHALL BE CENTERED IN CEILING TILE.
- CEILINGS SHALL BE 9'-0" UNLESS NOTED OTHERWISE.



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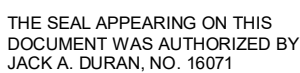
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AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

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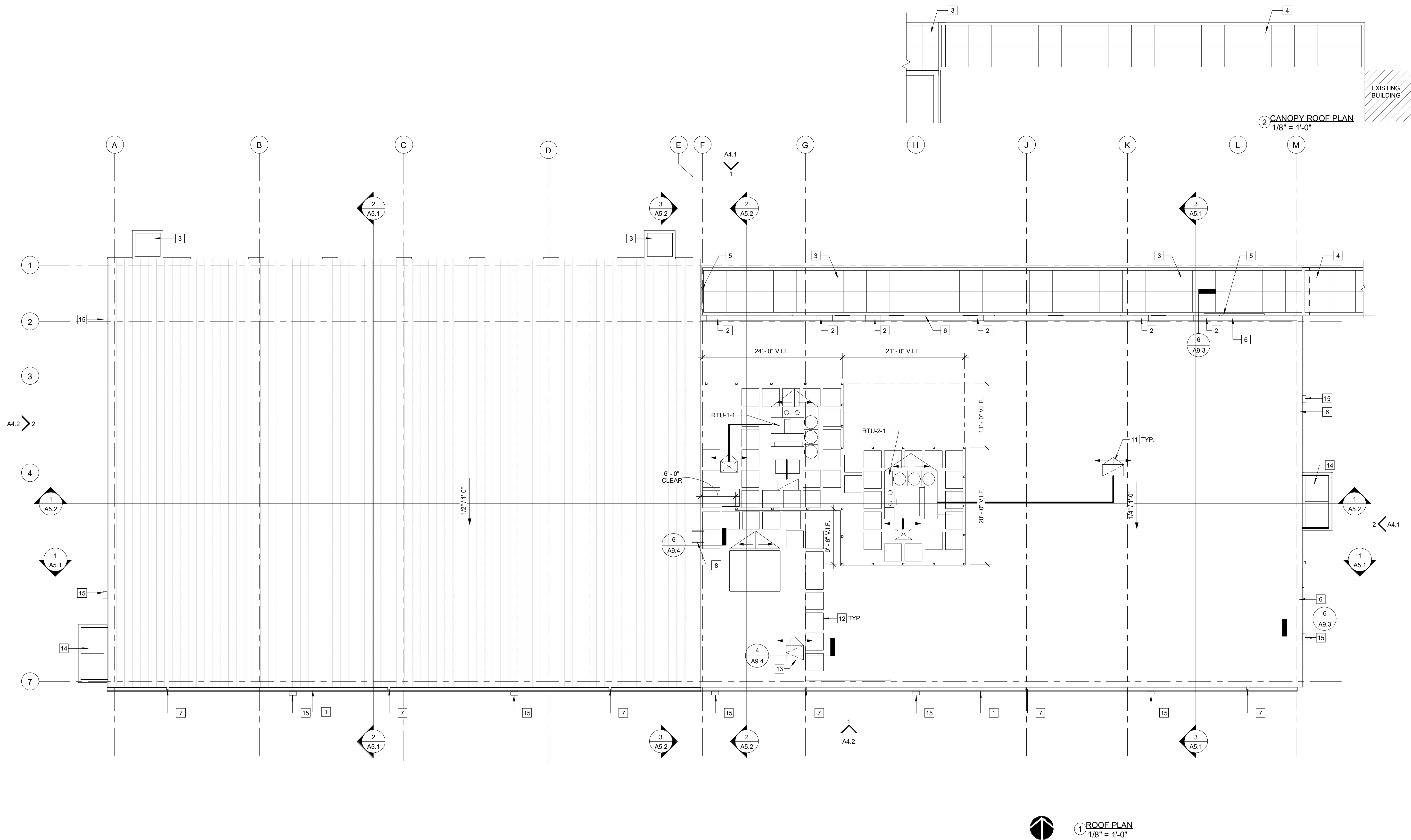
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## A2.5

## ROOF PLAN

CODED NOTES

- |   |                                       |    |   |
|---|---------------------------------------|----|---|
| 1 | PRE-FINISHED MTL GUTTER BY PEMB       | 10 | PRE-FINISHED DS TO DAYLIGHT ONTO SS SPLASH PAN                      |
| 2 | ACM PRE-FINISHED COPING CAP           | 11 | PROVIDE CRICKET AT ALL DOWNWARD OBSTRUCTIONS                        |
| 3 | CANTILEVERED ACM CANOPY               | 12 | 3' x 3' TPO WALKPAD, FIELD VERIFY WITH RTUS AND REQUIRED CLEARANCES |
| 4 | ACM WALKWAY CANOPY                    | 13 | 30" x 36" INSULATED ROOF HATCH, BILCO E-50 OR APPROVED QUAL         |
| 5 | EXTERIOR ILLUMINATED SIGNAGE RE: ELEC | 14 | SUSPENDED ACM CANOPY  |
| 6 | PRE-FINISHED MTL COPING CAP           | 15 | EXTERIOR WALL PACK, RE: ELEC  |
| 7 | 5 x 5 PF DS TIED TO STORM             |    |   |
| 8 | EXT. GALV. LADDER BY PEMB, PAINTED    |    |   |

## LEGEND

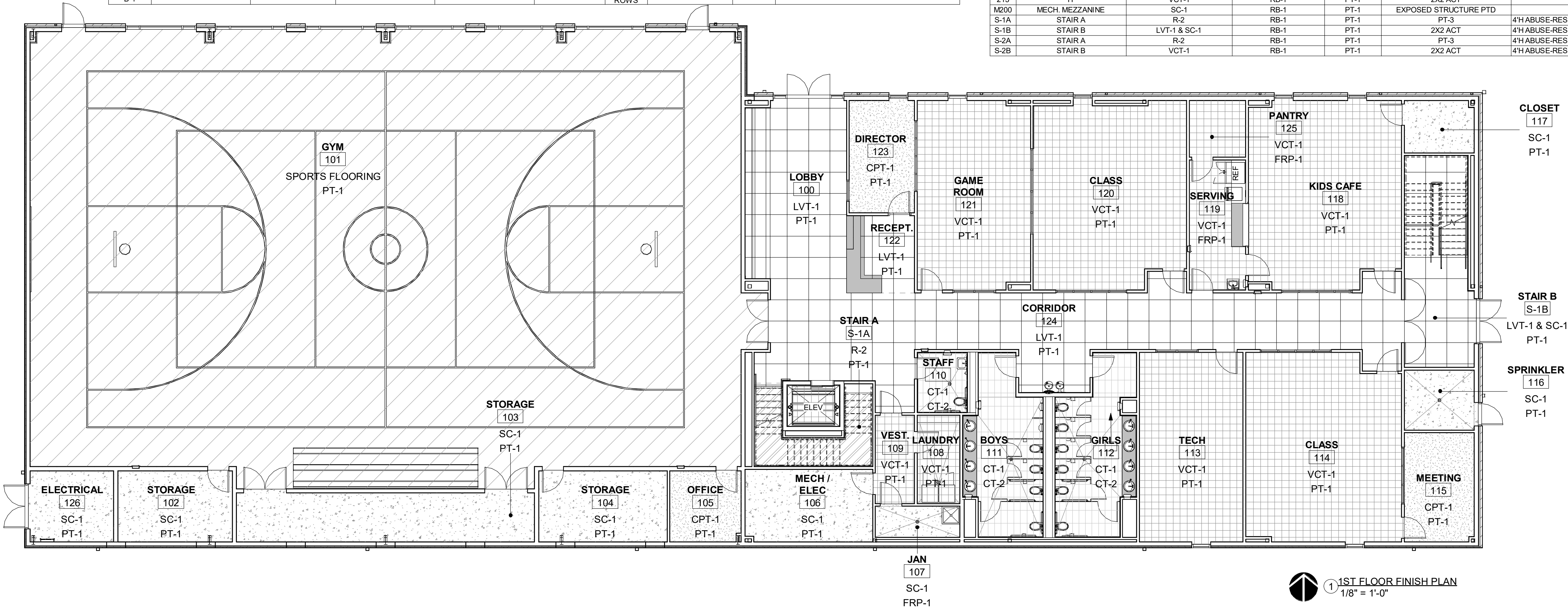
- |   |  |
|---|--|
|  | PRE-FINISHED MTL ROOF BY PEMB  |
|  | 80 MIL TPO ROOF, SLOPE TO GUTTER   |
|  | EQUIPMENT SCREEN WITH<br>PREFINISHED METAL WALL PANELS<br>& GALV. TS COLUMNS & FRAME |

## GENERAL NOTES

1. VERIFY ALL INFORMATION WITH CIVIL, STRUCTURAL, MEP AND ALL OTHER CONSTRUCTION DOCUMENTS PRIOR TO START OF CONSTRUCTION - IF ANY DISCREPANCIES EXIST, CONSULT THE ARCHITECT, ENGINEER, AND APPLICABLE CONSULTS.
2. STRUCTURAL STEEL COLUMNS ARE SHOWN FOR REFERENCE ONLY. REFER TO STRUCTURAL DRAWINGS FOR DIMENSIONS AND ADDITIONAL INFORMATION
3. DIMENSIONS ARE TO FACE OF GWB & TO CENTERLINE OF COLUMNS, U.N.O. DIMENSIONS TO EXTERIOR WALLS ARE TO FACE OF EXTERIOR FINISH.



MATERIAL SCHEDULE								
MARK	MATERIAL	MANUFACTURER	DESCRIPTION					REMARKS
			STYLE / COLLECTION	COLOR	ITEM NO.	SIZE	INSTALL PATTERN	
SPORTS	SPORTS FLOORING	TARKETT SPORTS	OMNISPORTS/MULTI-USE	TBD		ROLL	EAST-WEST	PT-6 & 7 ARE BB AND VB STRIPING
LVT-1	LUXURY VINYL TILE	EF CONTRACT	MELANGE	TBD	EFCM5	9 X 48	ASHLAR	5 mm
CT-1	PORCELAIN TILE (FLOORS)	DALTILE	AMBASSADOR/STONE ATTACHE	TBD		12 X 24	3RD BOND	
CT-2	PORCELAIN TILE (WALLS)	DALTILE	AMBASSADOR/STONE ATTACHE	TBD		12 X 24	3RD BOND	
CPT-1	CARPET TILE	MOHAWK GROUP	HYPER EARTH	TBD		12 X 36	TBD	-
VCT-1	VINYL COMPOSITION TILE	ARMSTRONG	RAVE/EXCELON	TBD		12 X 12	QUARTER TURN	
RB-1	RESILIENT BASE	ROPPE	COVE BASE	TBD		OK	N/A	-
RB-2	RESILIENT TREADS, RISERS & LANDING	ROPPE	RUBBER	TBD			N/A	
PT-1	PAINT (FIELD)	SHERWIN WILLIAMS		TBD			N/A	FIELD
PT-2	PAINT (ACCENT) *	SHERWIN WILLIAMS		TBD			N/A	ACCENT *LOCATIONS TO BE DETERMINED
PT-3	PAINT (CEILING)	SHERWIN WILLIAMS		TBD			N/A	CEILINGS
PT-4	PAINT (EXP. STRUCT)	SHERWIN WILLIAMS		TBD			N/A	EXPOSED STRUCTURE
PT-5	PAINT (DOOR FRAMES)	SHERWIN WILLIAMS		TBD			N/A	GALV HM DOORS & FRAMES
Q-1	QUARTZ COUNTERTOP	WILSONART		TBD			N/A	STRAIGHT -
PLAM-1	PLASTIC LAMINATE	WILSONART		TBD			N/A	CABINETS
PLAM-1	PLASTIC LAMINATE	WILSONART		TBD			N/A	DOORS
PLAM-3	PLASTIC LAMINATE	WILSONART		TBD			N/A	RR UNDERCOUNTER SINK PANEL
PLAM-4	PLASTIC LAMINATE	WILSONART		TBD			N/A	TOILET PARTITIONS - SOLID CORE PHENOLIC
P-1	WALL & BACKBOARD	PORTER	DURASAFE	TBD	56001xx & 90306048xx	24 x 70 x 2	N/A	VINYL - MTD. ON 5/8" PLYWOOD
B-1	BLEACHERS	HUSSEY	MAXAM1	TBD		26' x 3 ROWS	N/A	



FINISH SCHEDULE						
NO.	ROOM NAME	FLOOR	BASE	WALLS	CEILING, RE: RCP	Comments
100	LOBBY	LVT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
101	GYM	SPORTS FLOORING	RB-1	PT-1	EXPOSED STRUCTURE PTD	8H ABUSE-RESISTANT GWB
102	STORAGE	SC-1	RB-1	PT-1	2X2 ACT	
103	STORAGE	SC-1	RB-1	PT-1	2X2 ACT	
104	STORAGE	SC-1	RB-1	PT-1	2X2 ACT	
105	OFFICE	CPT-1	RB-1	PT-1	2X2 ACT	
106	MECH / ELEC	SC-1	RB-1	PT-1	2X2 ACT	
107	JAN	SC-1	RB-1	FRP-1	EXPOSED STRUCTURE PTD	
108	LAUNDRY	VCT-1	RB-1	PT-1	2X2 ACT	
109	VEST.	VCT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
110	STAFF	CT-1	CT-2	CT-2	PTD GWB	
111	BOYS	CT-1	CT-2	CT-2	PT-3	
112	GIRLS	CT-1	CT-2	CT-2	PT-3	
113	TECH	VCT-1	RB-1	PT-1	2X2 ACT	
114	CLASS	VCT-1	RB-1	PT-1	2X2 ACT	
115	MEETING	CPT-1	RB-1	PT-1	2X2 ACT	
116	SPRINKLER	SC-1	RB-1	PT-1	EXPOSED STRUCTURE PTD	
117	CLOSET	SC-1	RB-1	PT-1	2X2 ACT	
118	KIDS CAFE	VCT-1	RB-1	PT-1	2X2 ACT	
119	SERVING	VCT-1	RB-1	FRP-1	VINYL 2X2 ACT	
120	CLASS	VCT-1	RB-1	PT-1	2X2 ACT	
121	GAME ROOM	VCT-1	RB-1	PT-1	2X2 ACT	
122	RECEPT.	LVT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
123	DIRECTOR	CPT-1	RB-1	PT-1	2X2 ACT	
124	CORRIDOR	LVT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
125	PANTRY	VCT-1	RB-1	FRP-1	VINYL 2X2 ACT	
126	ELECTRICAL	SC-1	RB-1	PT-1	2X2 ACT	
200	CORRIDOR	LVT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
201	LOUNGE	LVT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
202	TECH	VCT-1	RB-1	PT-1	2X2 ACT	
203	MEN	CT-1	CT-2	CT-2	PTD GWB	
204	WOMEN	CT-1	CT-2	CT-2	PTD GWB	
205	STORAGE	SC-1	RB-1	PT-1	2X2 ACT	
206	MECH / ELEC	SC-1	RB-1	PT-1	EXPOSED STRUCTURE PTD	
207	CONFERENCE	CPT-1	RB-1	PT-1	2X2 ACT	
208	ADMIN	CPT-1	RB-1	PT-1	2X2 ACT	
209	OFFICE	CPT-1	RB-1	PT-1	2X2 ACT	
210	CLASS	VCT-1	RB-1	PT-1	2X2 ACT	
211	CLASS	VCT-1	RB-1	PT-1	2X2 ACT	
212	CLOSET	SC-1	RB-1	PT-1	2X2 ACT	
213	IT	VCT-1	RB-1	PT-1	2X2 ACT	
M200	MECH. MEZZANINE	SC-1	RB-1	PT-1	EXPOSED STRUCTURE PTD	
S-1A	STAIR A	R-2	RB-1	PT-1	PT-3	4H ABUSE-RESISTANT GWB
S-1B	STAIR B	LVT-1 & SC-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB
S-2A	STAIR A	R-2	RB-1	PT-1	PT-3	4H ABUSE-RESISTANT GWB
S-2B	STAIR B	VCT-1	RB-1	PT-1	2X2 ACT	4H ABUSE-RESISTANT GWB



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FORT BEND COUNTY

NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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A2.6

1ST FLOOR  
FINISH PLAN

#### CODED NOTES

1

#### LEGEND

	OMNISPORTS MULTI-USE SPORTS FLOORING 6.2 MM W/ TARKOLAY INSTALLATION		RUBBER TREADS, RISERS & LANDINGS (R-2)
	LVT (LVT-1)		PORCELAIN TILE (CT-1)
	VCT (VCT-1)		SEALED CONCRETE (SC-1)
	CARPET (CPT-1)		QUARTZ COUNTERTOP (Q-1)

#### GENERAL NOTES

- RE: FINISH SCHEDULE SHEET A2.6
- FINISH INSTALL PATTERNS ARE TBD AND PLANS & ELEVATIONS ARE NOT INDICATIVE OF INSTALL PATTERNS



FORT BEND COUNTY  
NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
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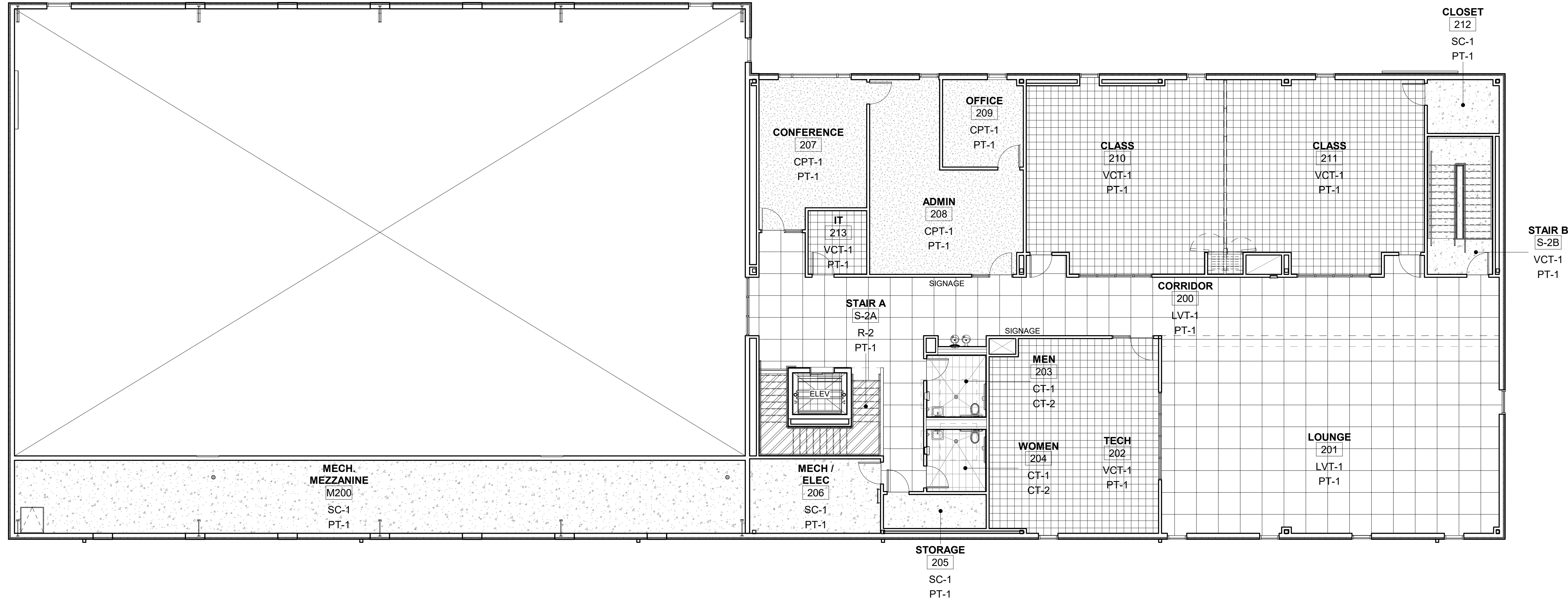
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**A2.7**

2ND FLOOR  
FINISH PLAN



1 2ND FLOOR FINISH PLAN  
1/8" = 1'-0"

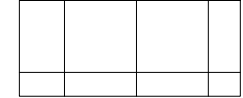
CODED NOTES

1

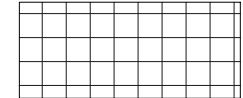
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OMNISPORTS MULTI-USE  
SPORTS FLOORING  
6.2 MM W/ TARKOLAY  
INSTALLATION



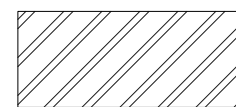
LVT  
(LVT-1)



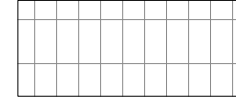
VCT  
(VCT-1)



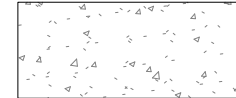
CARPET  
(CPT-1)



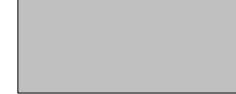
RUBBER TREADS, RISERS & LANDINGS  
(R-2)



PORCELAIN TILE (CT-1)



SEALED CONCRETE (SC-1)



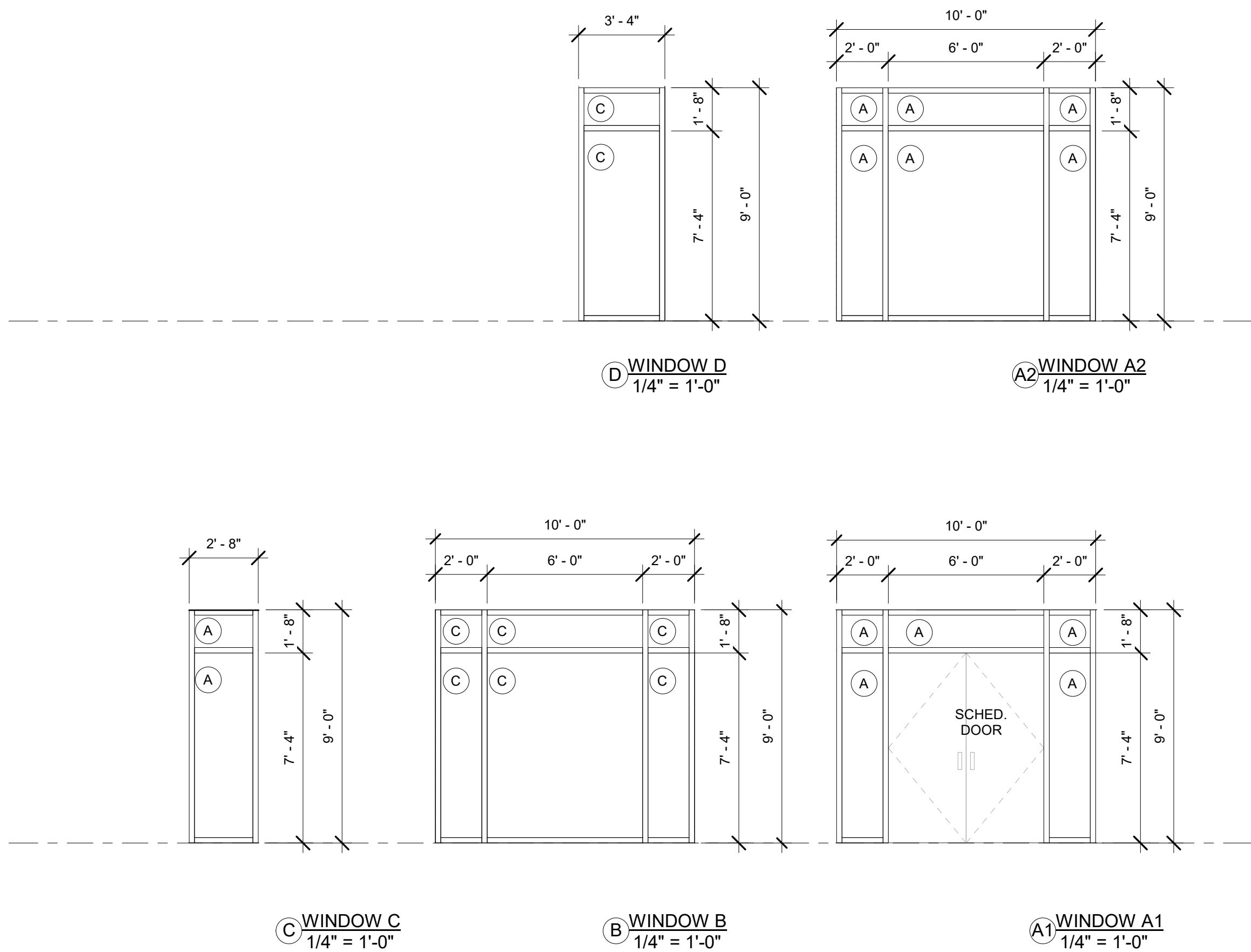
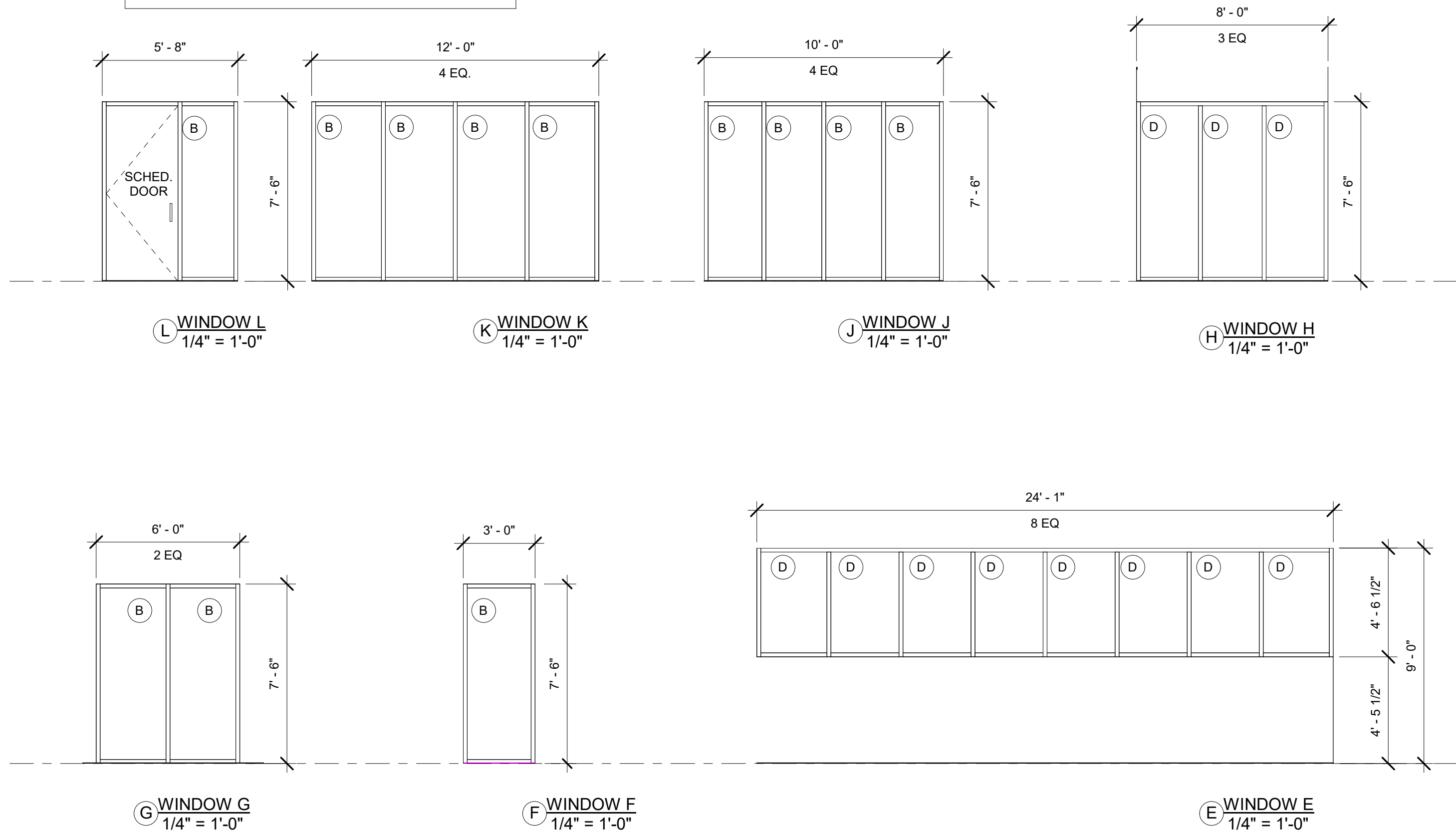
QUARTZ COUNTERTOP (Q-1)

GENERAL NOTES

- RE: FINISH SCHEDULE SHEET A2.6
- FINISH INSTALL PATTERNS ARE TBD AND PLANS & ELEVATIONS ARE NOT INDICATIVE OF INSTALL PATTERNS

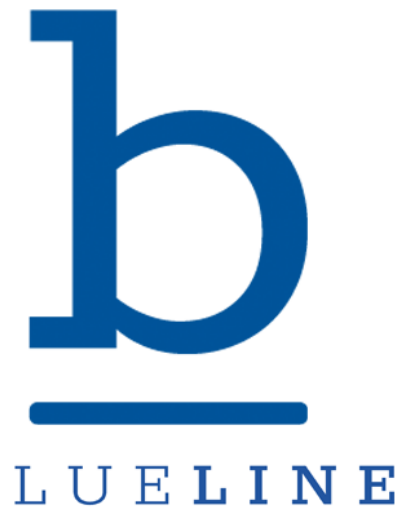
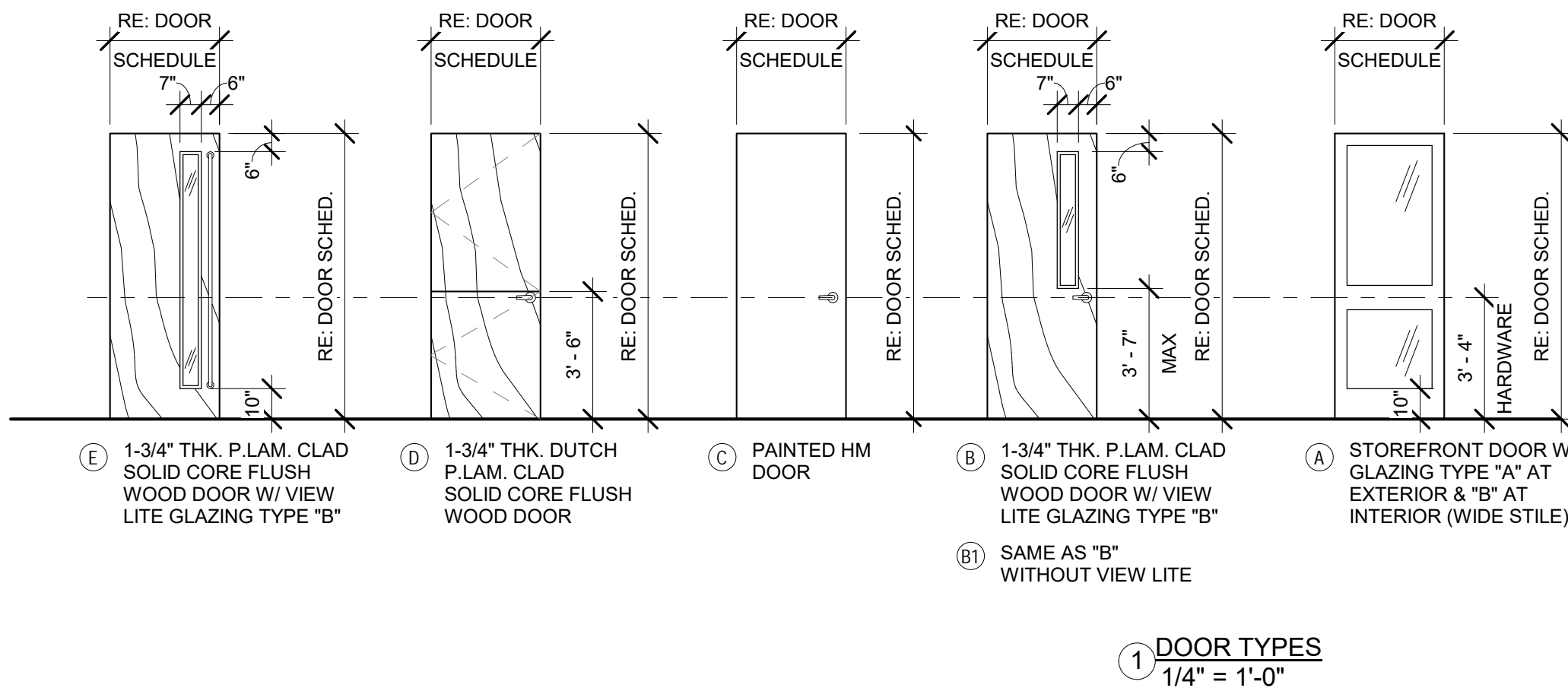
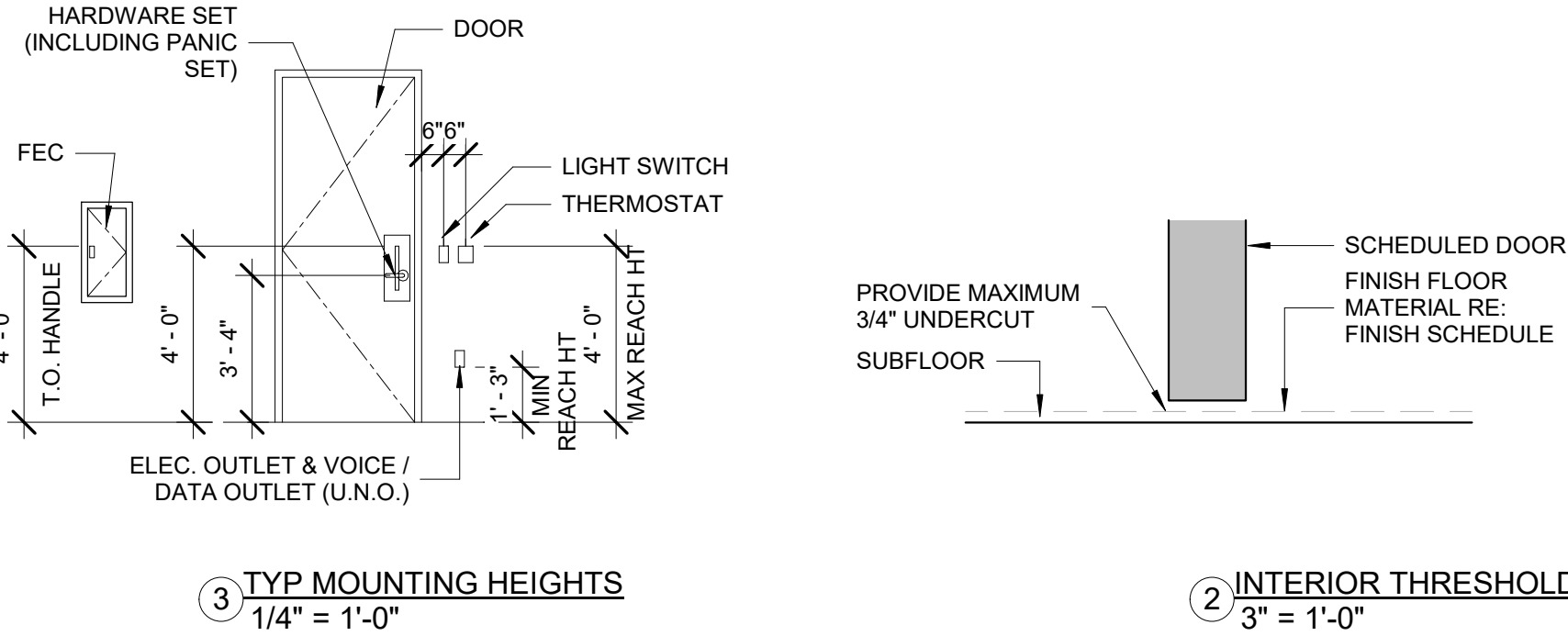
## GLAZING SCHEDULE

- A** 1" INSULATED GRAY TINTED LOW-E, TEMPERED SAFETY GLASS
- B** 1/4" CLEAR TEMPERED SAFETY GLASS (INTERIOR)
- C** 1" LAMINATED INSULATED GRAY TINTED LOW-E, TEMPERED SAFETY GLASS
- D** 1/4" LAMINATED CLEAR TEMPERED SAFETY GLASS (INTERIOR)



## DOOR SCHEDULE

DOOR NO.	DOOR TYPE	FRAME TYPE	DOOR SIZE	DETAILS (RE: A9.1 U.N.O.)	HARDWARE SET	FIRE RATING	PANIC	CLOSER	COMMENTS
			WIDTH HEIGHT	HEAD JAMB SILL					
100A	A	AL	6'-0" 7'-4"	8 7	1				
101A	E	AL	6'-0" 7'-4"	14 14	2/A3.2		X	X	LADDER PULLS
101B	C	HM	3'-0" 7'-4"	4 2	1		X	X	NO EXTERIOR HARDWARE
101C	C	HM	3'-0" 7'-4"	4 2	1		X	X	NO EXTERIOR HARDWARE
102	B1	AL	3'-0" 7'-4"	14 14	2/A3.2				
103A	B1	AL	6'-0" 7'-4"	14 14	2/A3.2				
103B	B1	AL	6'-0" 7'-4"	14 14	2/A3.2				
104	B1	AL	3'-0" 7'-4"	14 14	2/A3.2				
105	B	AL	3'-0" 7'-4"	14 14	2/A3.2				
106A	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	HOLD-OPEN CLOSER
107	B1	AL	3'-0" 7'-4"	14 14	2/A3.2				
108	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
109	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
110	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	OCCUPANCY INDICATOR
111	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
112	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
113	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
114	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
115	B	AL	3'-0" 7'-4"	14 14	2/A3.2				
116	C	HM	3'-0" 7'-4"	4 2	1				
117	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
118	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
119A	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
119B	D	AL	3'-0" 7'-4"	14 14	2/A3.2				DUTCH DOOR
119C	-	SS	6'-0" 7'-0"	7/A8.2 7/A8.2		As Specified in 08 36 00			COILING COUNTER SHUTTER
120	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
121	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
123	B	AL	3'-0" 7'-4"	14 14	2/A3.2				
124	B1	HM	6'-0" 7'-4"	14 14	2/A3.2		X	X	180 DEG. SWING MAG HOLD OPEN
125	B	AL	3'-0" 7'-4"	14 14	2/A3.2				
126	C	HM	6'-0" 7'-4"	4 3	1		X	X	HOLD-OPEN CLOSER
202	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
203	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	OCCUPANCY INDICATOR
204	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	OCCUPANCY INDICATOR
205	B1	AL	3'-0" 7'-4"	14 14	2/A3.2				
206	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	HOLD-OPEN CLOSER
207A	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
207B	B	AL	3'-0" 7'-4"	14 14	2/A3.2				
208	B	AL	3'-0" 7'-4"	14 14	2/A3.2			X	
209	B	AL	3'-0" 7'-4"	14 14	2/A3.2				
210	B	AL	3'-0" 7'-4"	14 14	2/A3.2		X	X	
211	B	AL	3'-0" 7'-4"	14 14	2/A3.2		X	X	
212	B1	AL	3'-0" 7'-4"	14 14	2/A3.2				
213	B1	AL	3'-0" 7'-4"	14 14	2/A3.2			X	HOLD-OPEN FUNCTION
S-1	C	HM	6'-0" 7'-4"	4 2	1		X	X	NO EXTERIOR HARDWARE
S-2	B1	HM	3'-0" 7'-4"	14 14	2/A3.2		60	X	60 MIN



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## FORT BEND COUNTY NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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## A3.1

### DOOR & WINDOW SCHEDULE



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NEW COMMUNITY CENTER

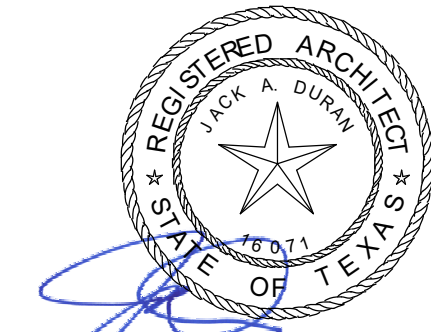
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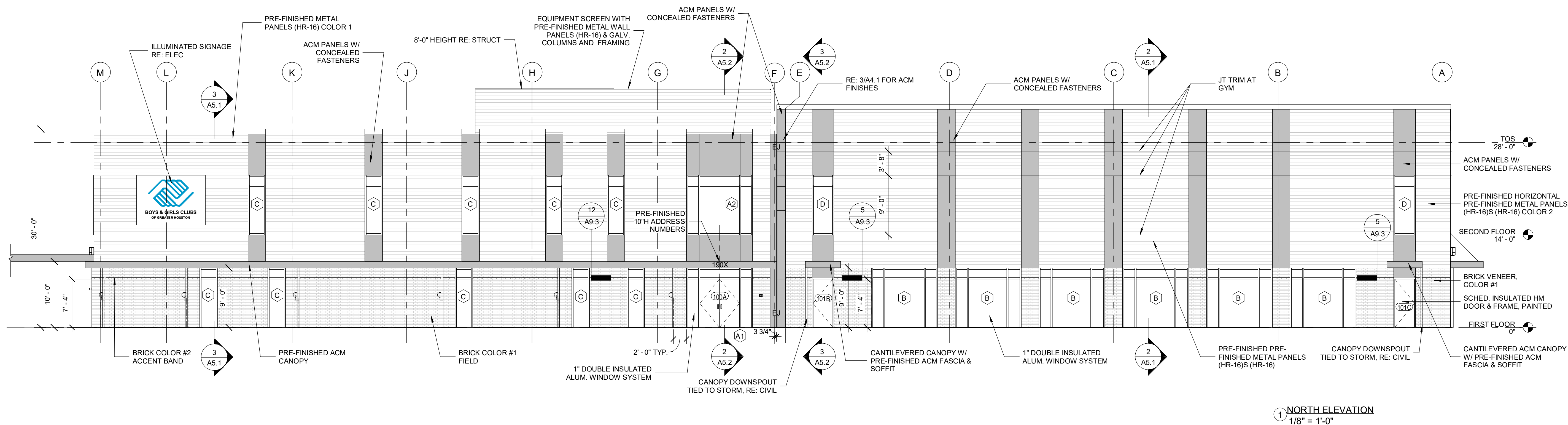
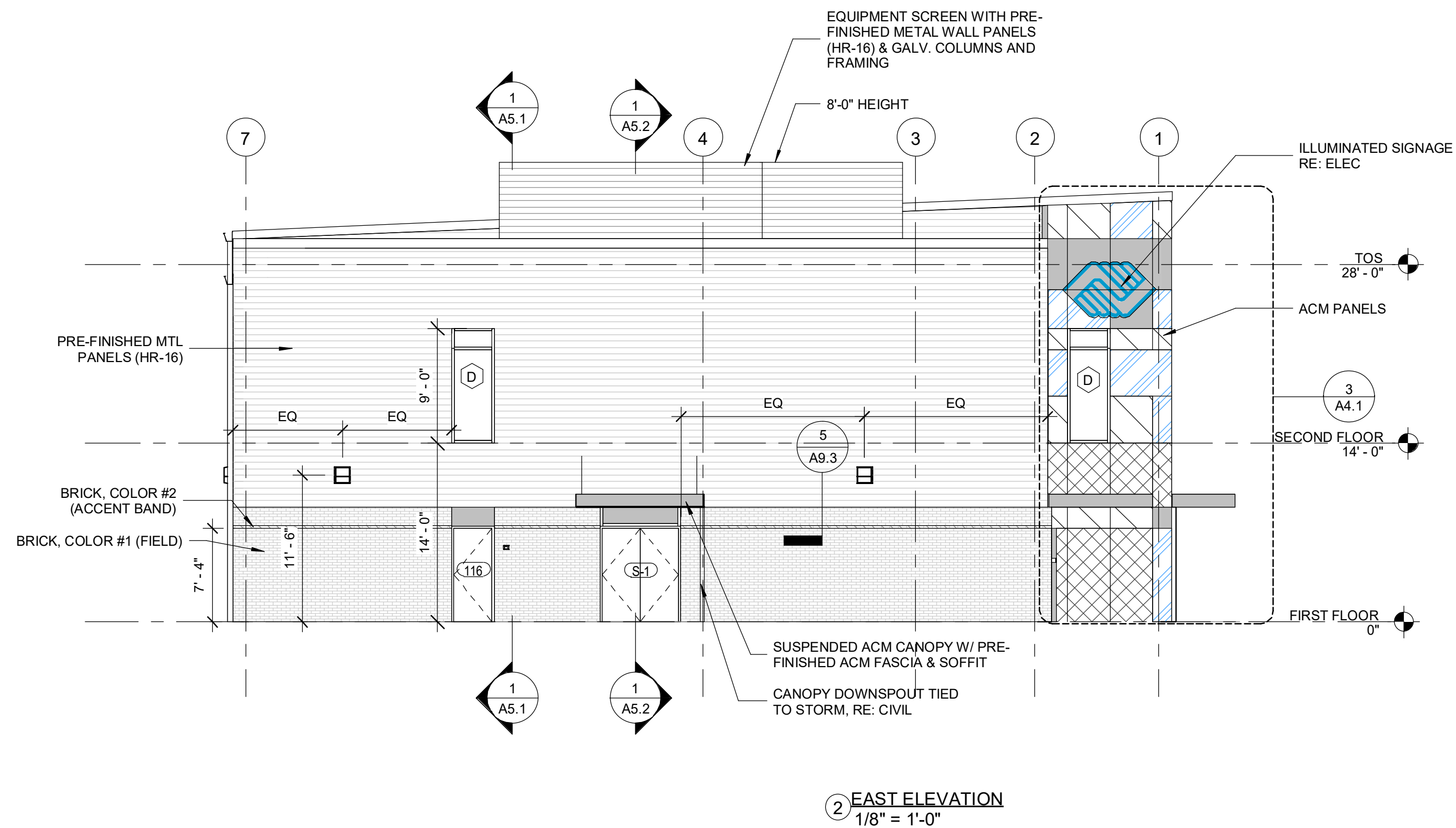
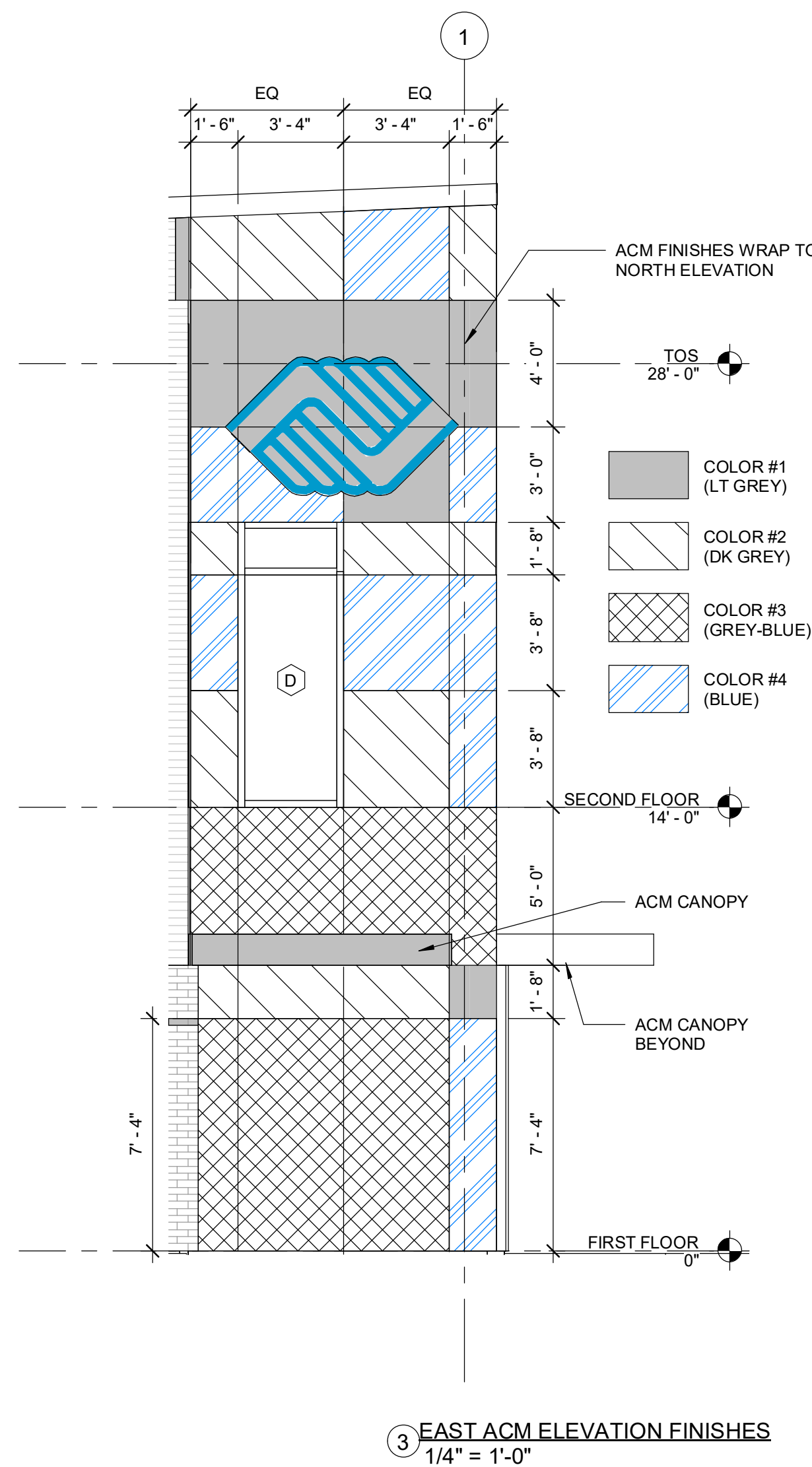


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## A4.1

## EXTERIOR ELEVATIONS





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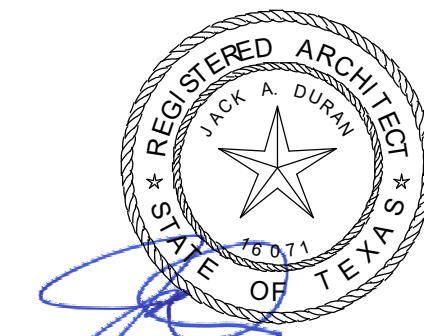
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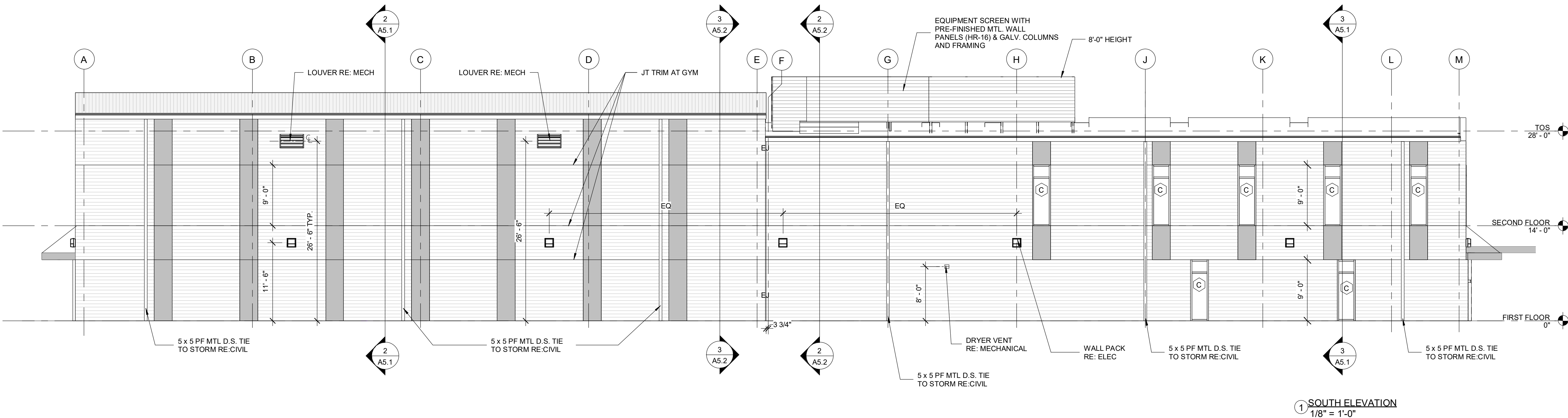
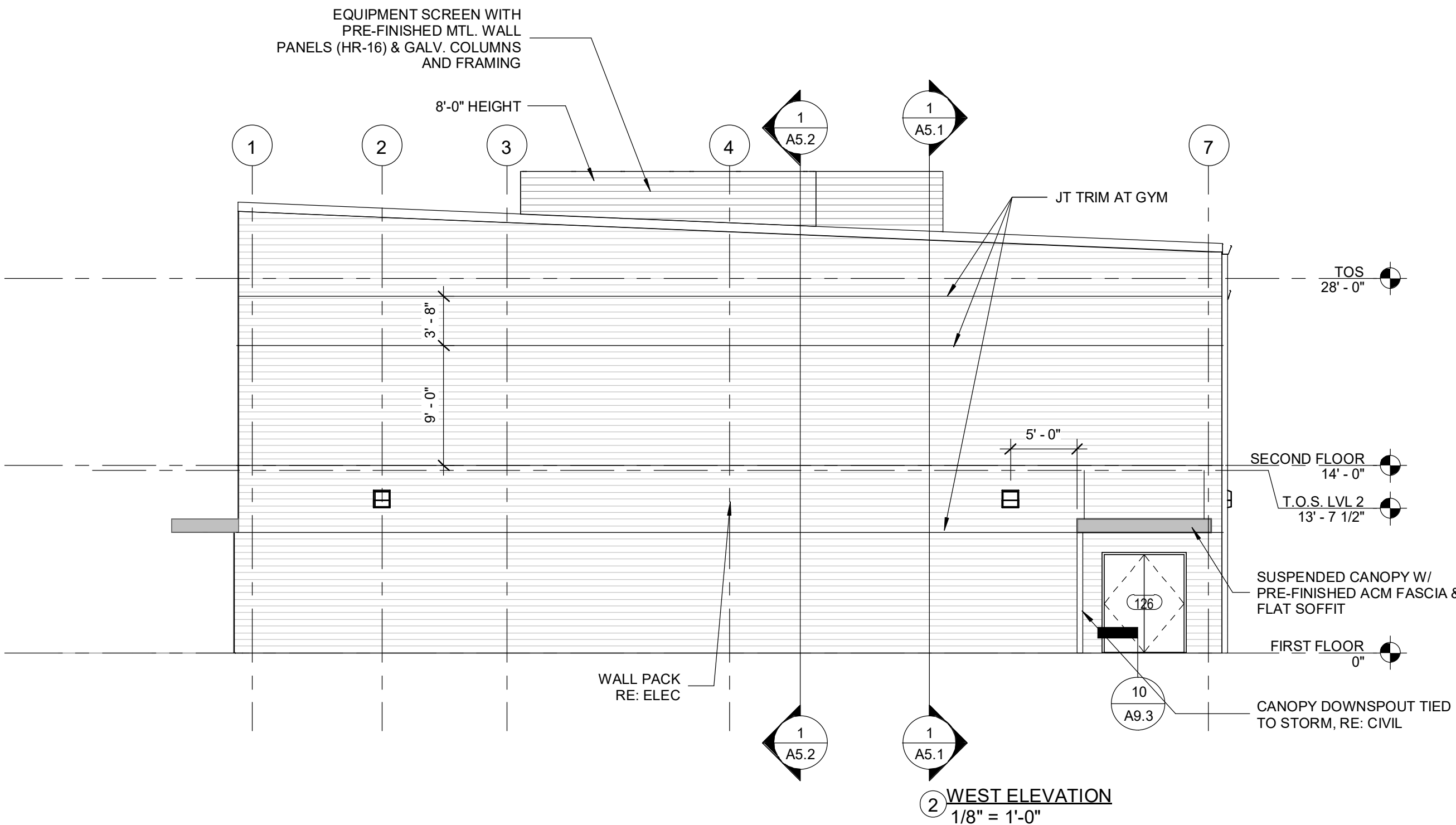


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AFFIXATION DATE: 05/03/22

A4.2

EXTERIOR  
ELEVATIONS







333 Cypress Run, Suite 350  
Houston, TX 77094  
281.497.1040

FORT BEND COUNTY  
NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

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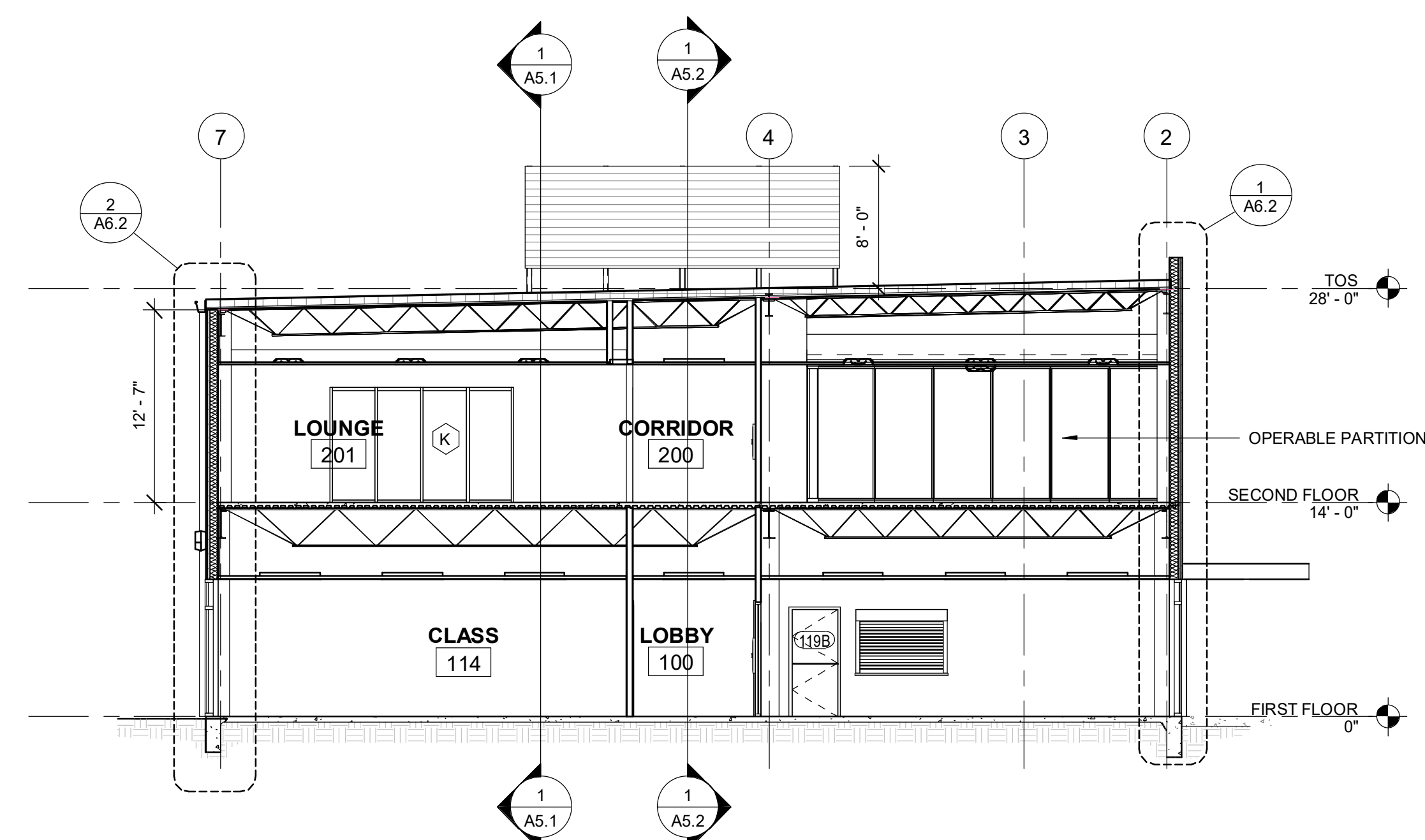
COPYRIGHT: 2022

[illegible]

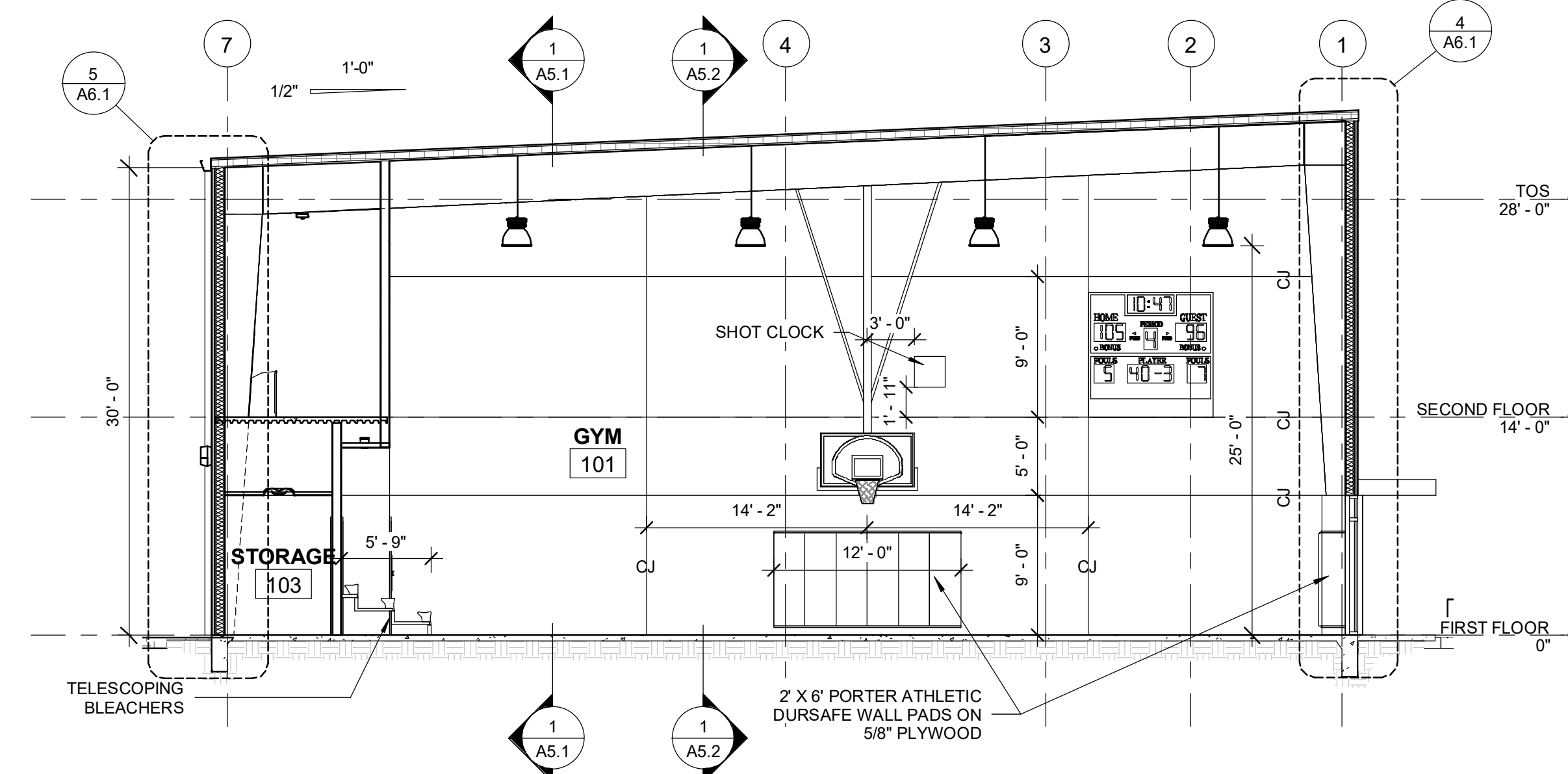
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## A5.1

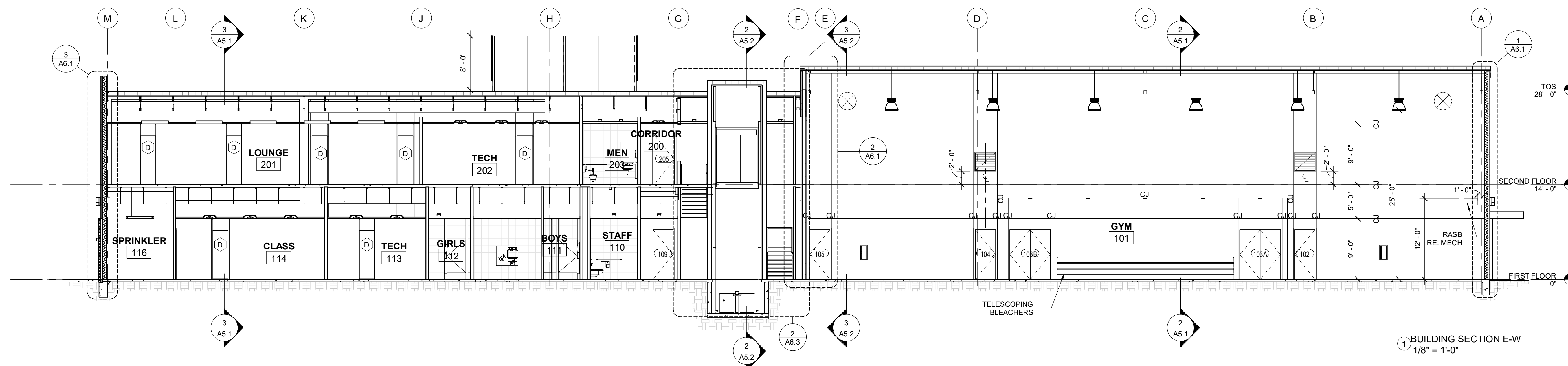
## BUILDING SECTIONS



3 BUILDING SECTION N-S  
1/8" = 1'-0"



② BUILDING SECTION N-S GYM  
1/8" = 1'-0"



1 BUILDING SECTION E-W  
1/8" = 1'-0"



BLUELINE

126 West Bruce Street, Suite 102  
Harrisonburg, VA 22801  
540.437.1228

333 Cypress Run, Suite 350  
Houston, TX 77094  
281.497.1040

FORT BEND COUNTY  
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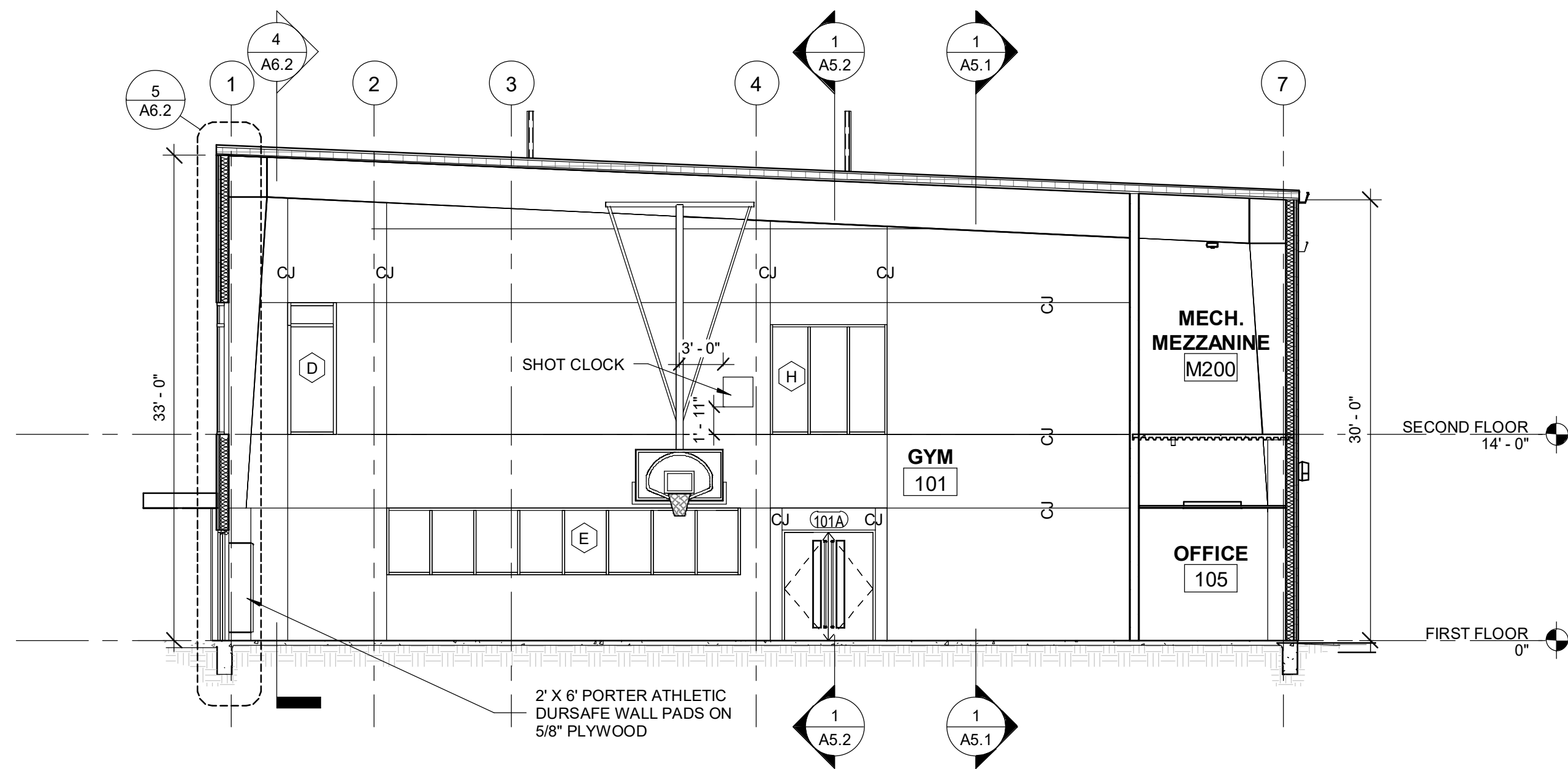


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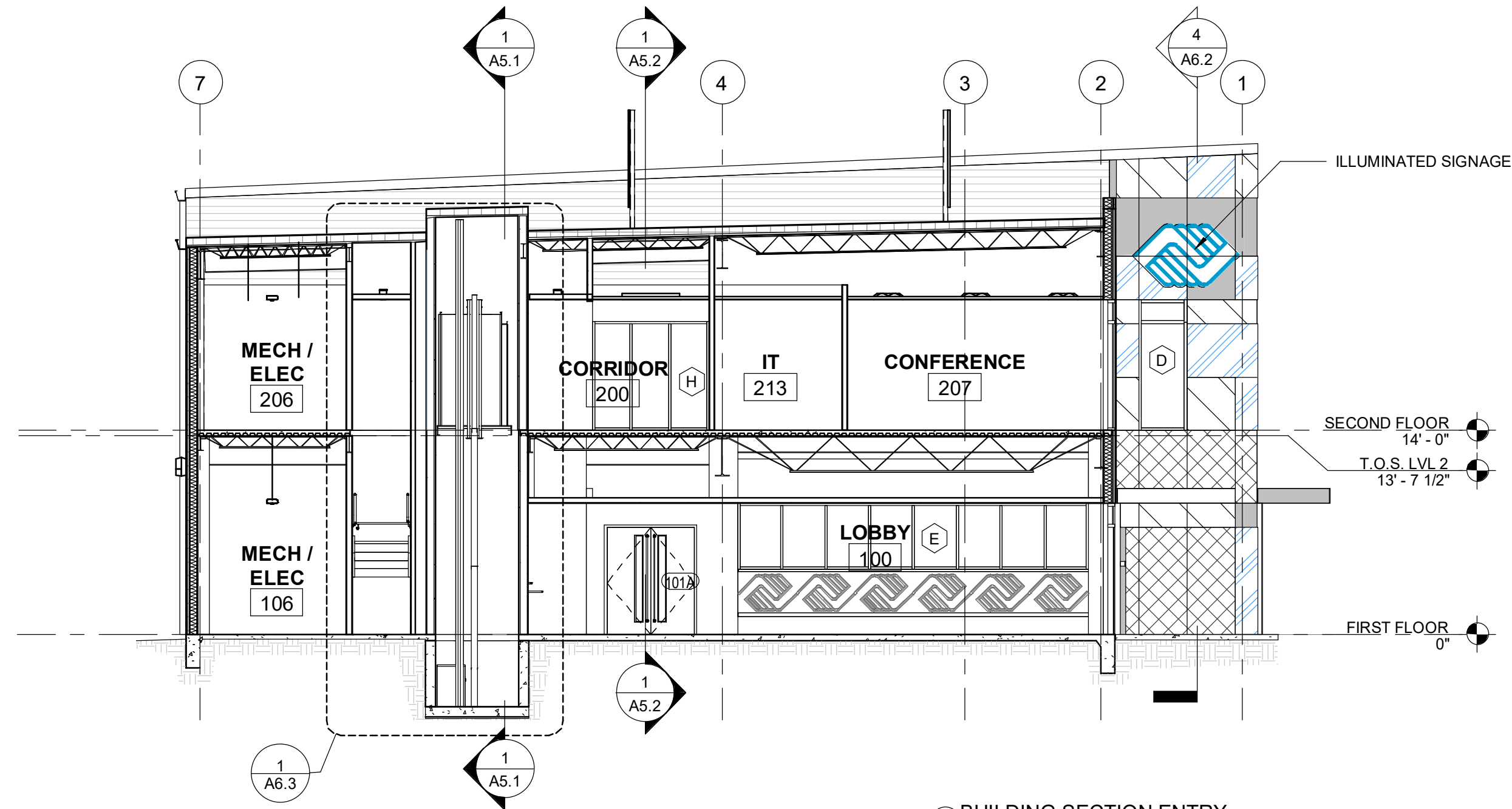
AFFIXATION DATE: 05/03/22

A5.2

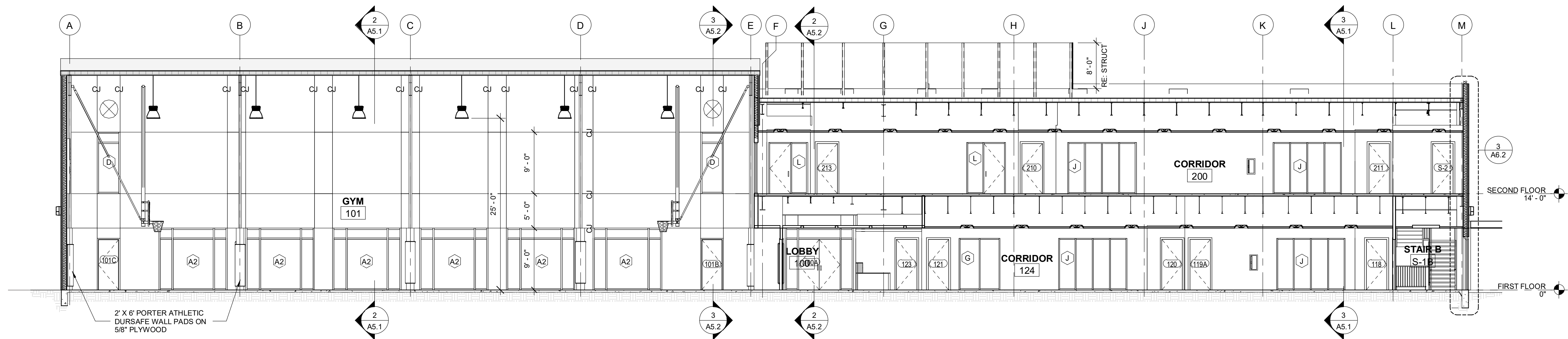
BUILDING  
SECTIONS



3 BUILDING SECTION GYM DOOR NS  
1/8" = 1'-0"

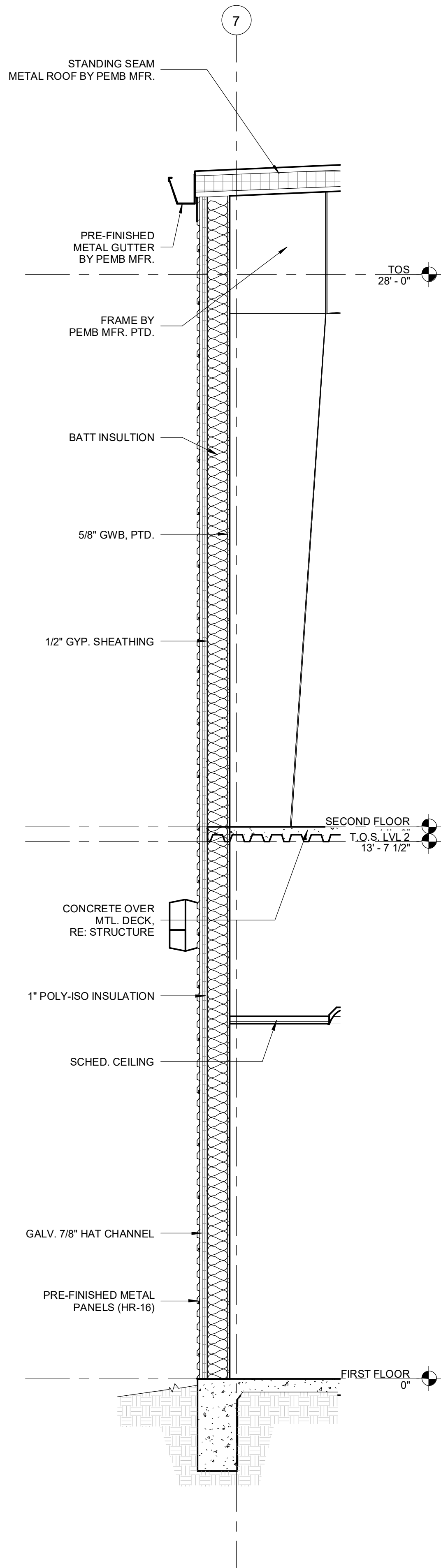


2 BUILDING SECTION ENTRY  
1/8" = 1'-0"

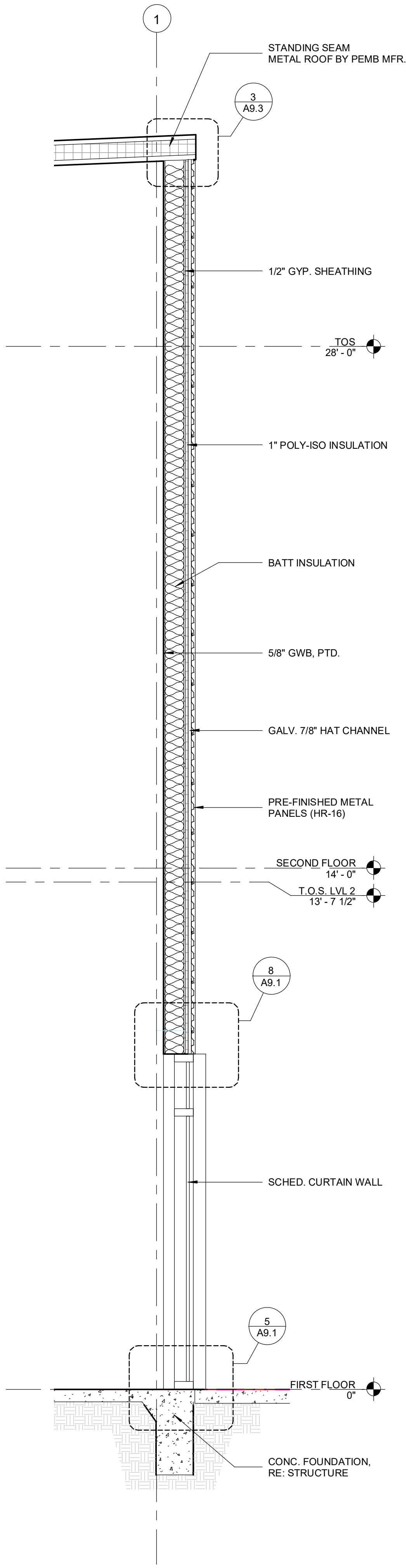


1 BUILDING SECTION E-W  
1/8" = 1'-0"

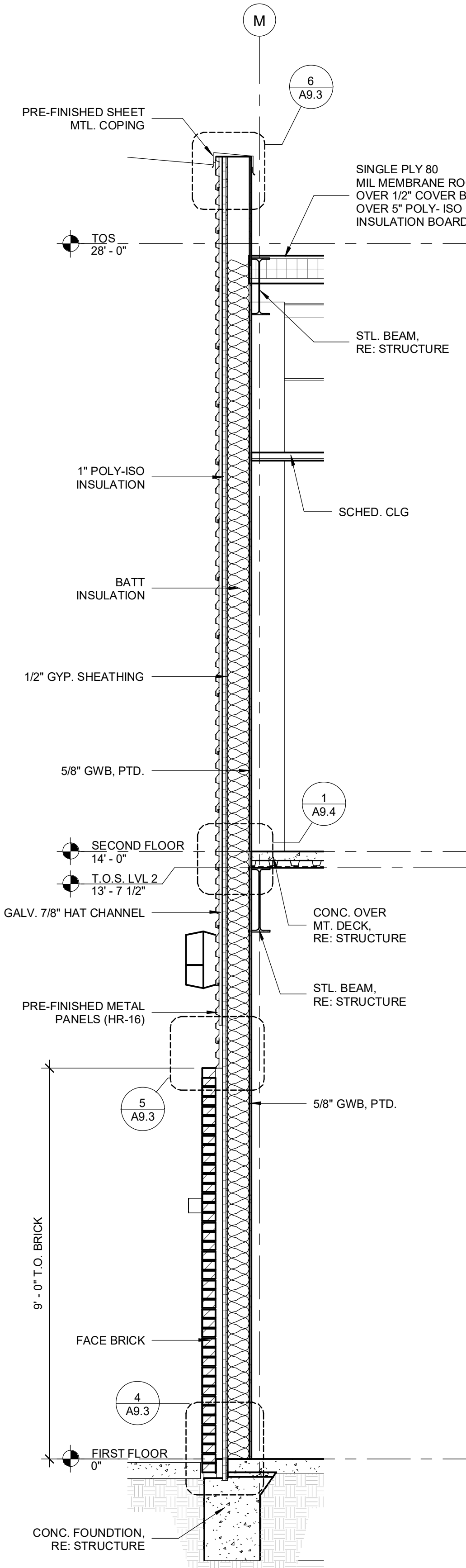




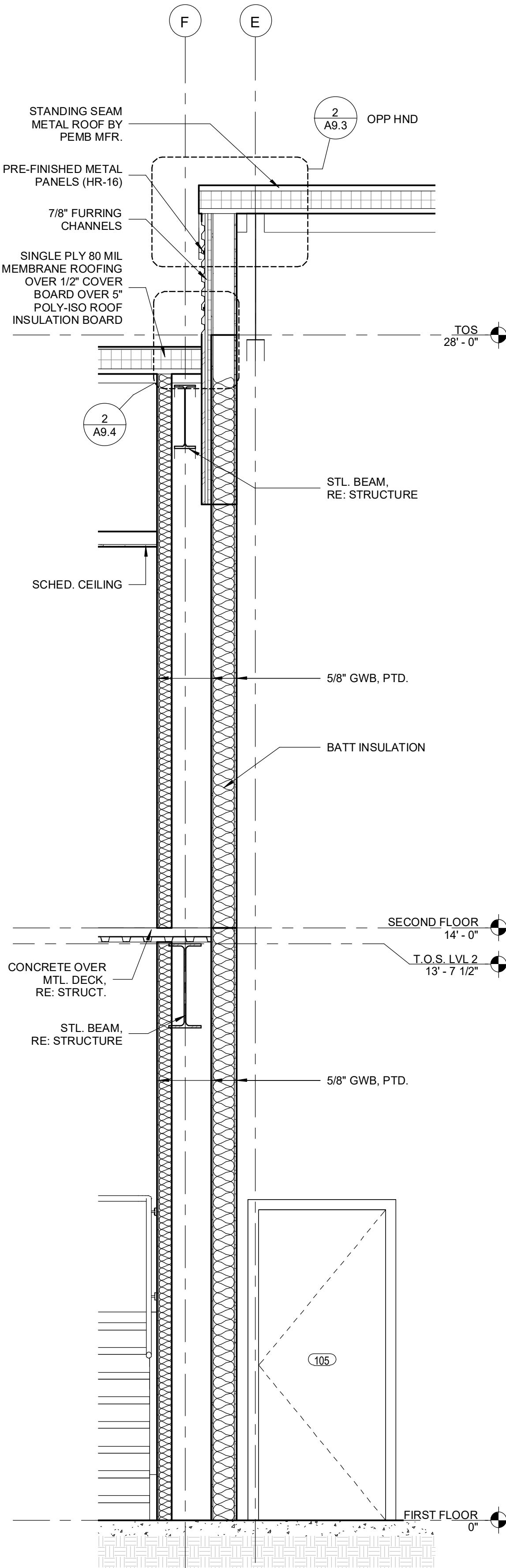
5 WALL SECTION  
1/2" = 1'-0"



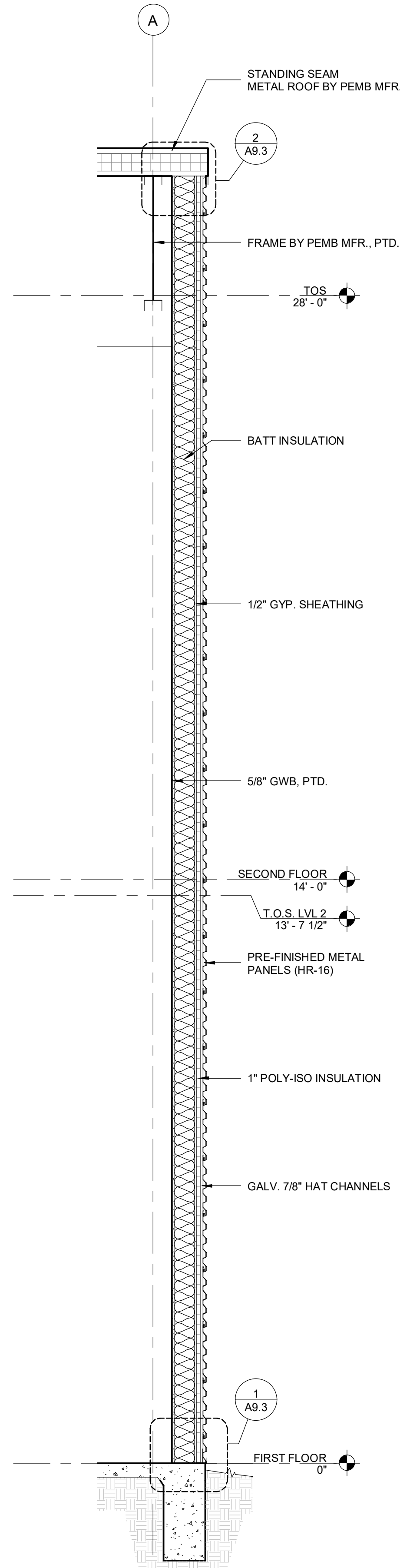
4 WALL SECTION  
1/2" = 1'-0"



3 WALL SECTION  
1/2" = 1'-0"



2 WALL SECTION  
1/2" = 1'-0"



1 WALL SECTION  
1/2" = 1'-0"

**FORT BEND COUNTY  
NEW COMMUNITY CENTER**

AVENUE E AND SECOND STREET  
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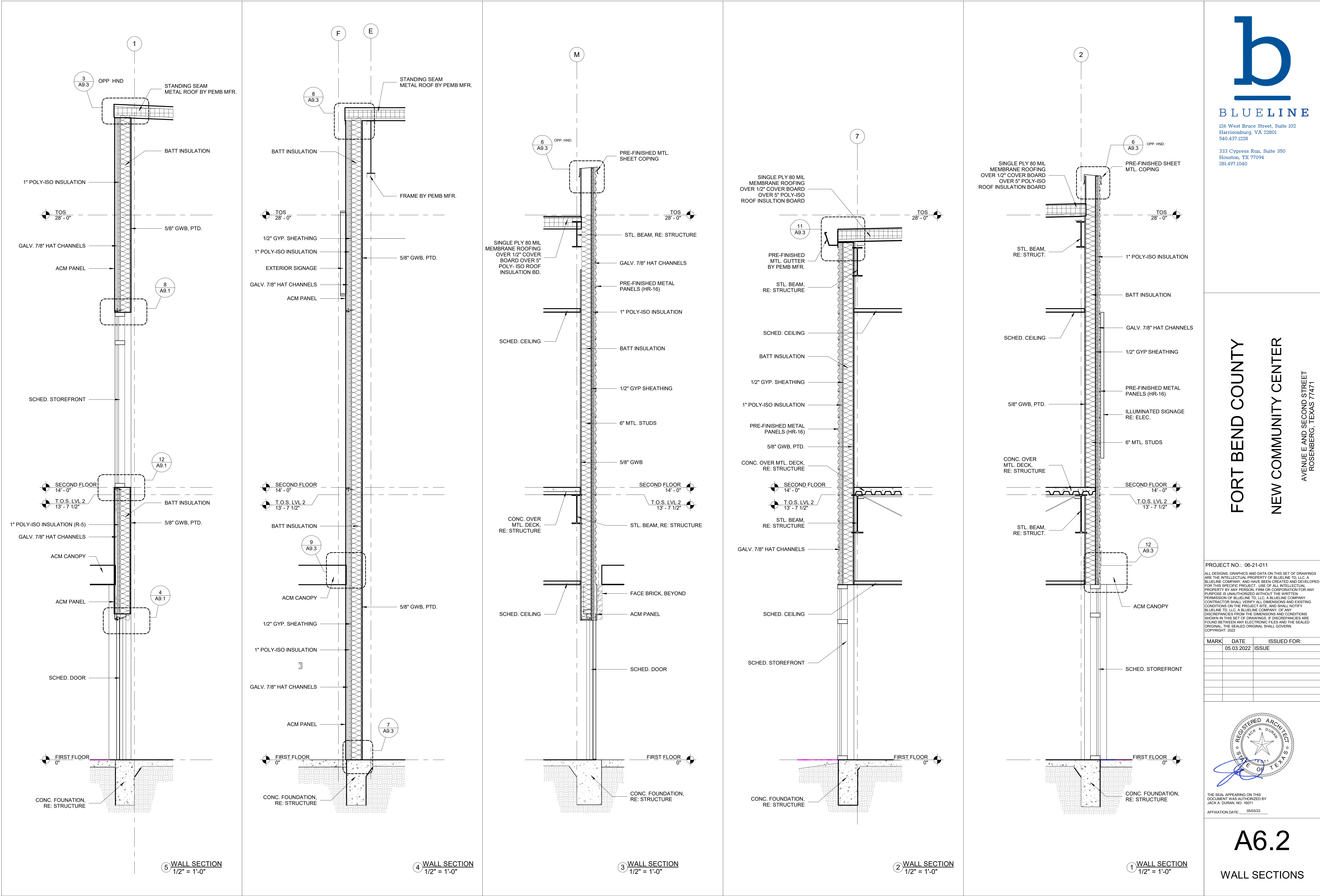
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**A6.1**

WALL SECTIONS





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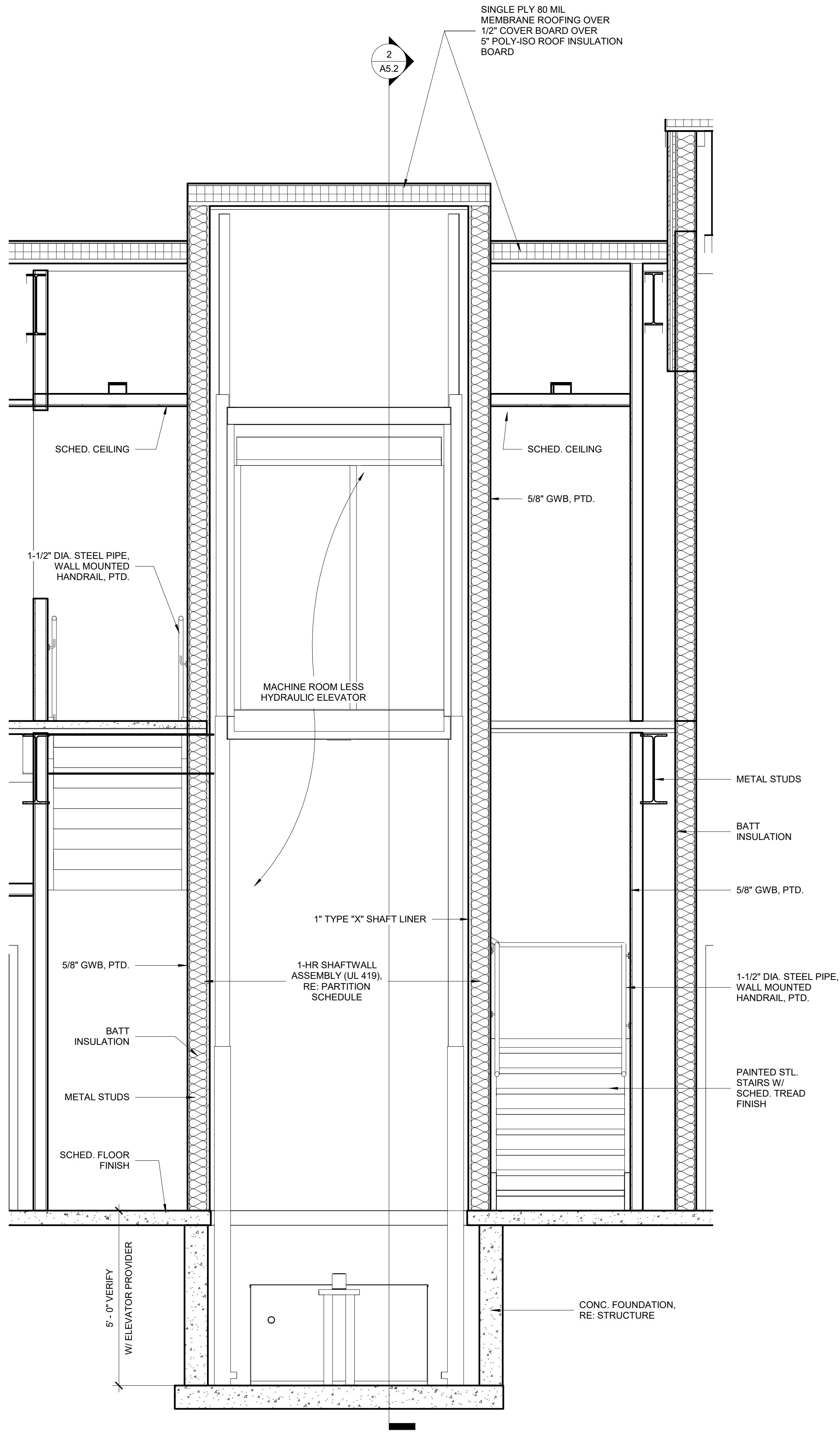
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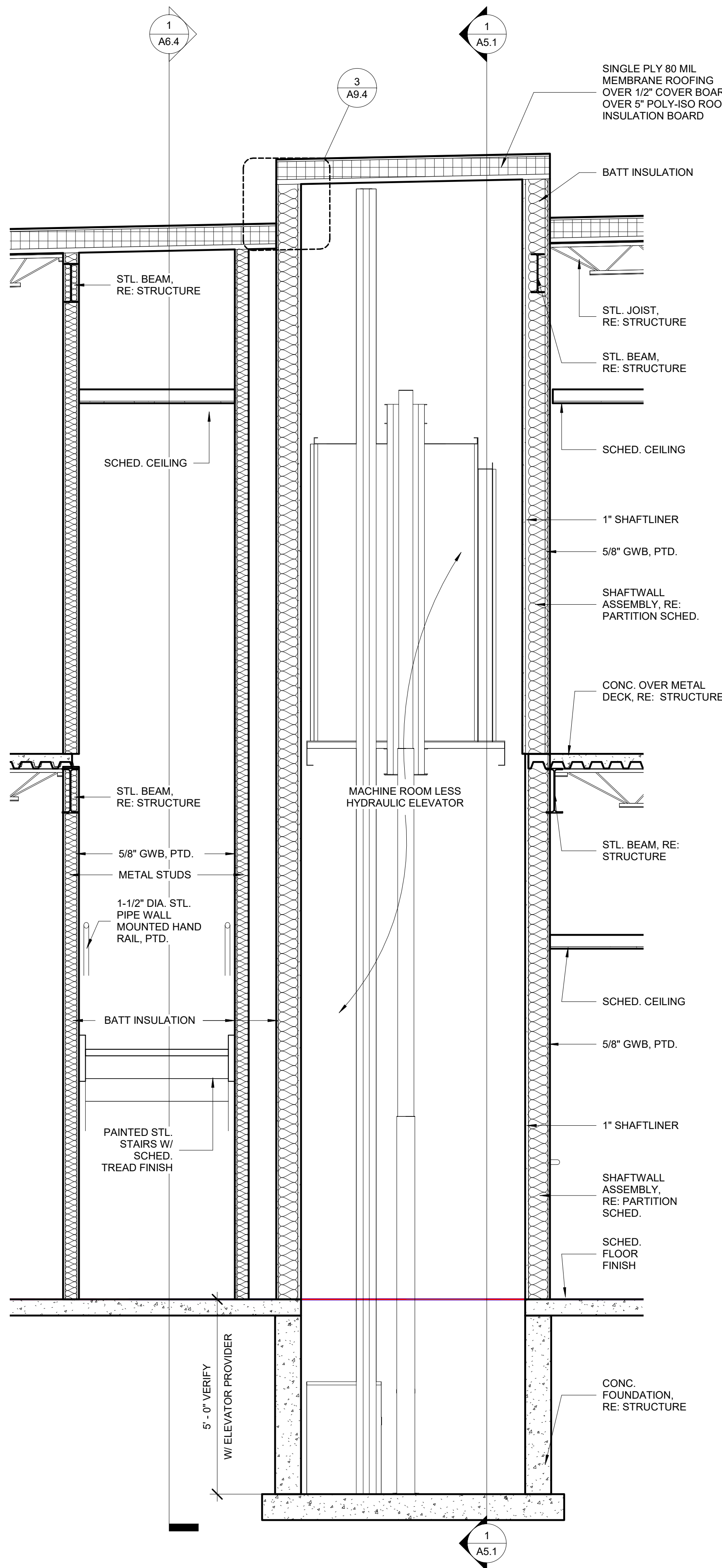
A6.2

WALL SECTIONS





2 ELEVATOR SECTION  
1/2" = 1'-0"



1 ELEVATOR SECTION  
1/2" = 1'-0"

FORT BEND COUNTY  
NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
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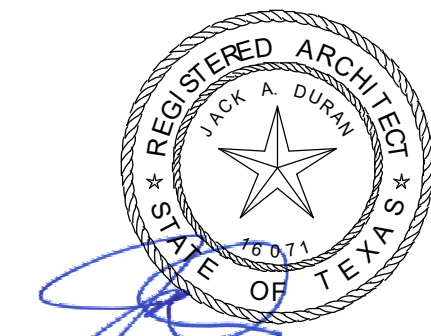
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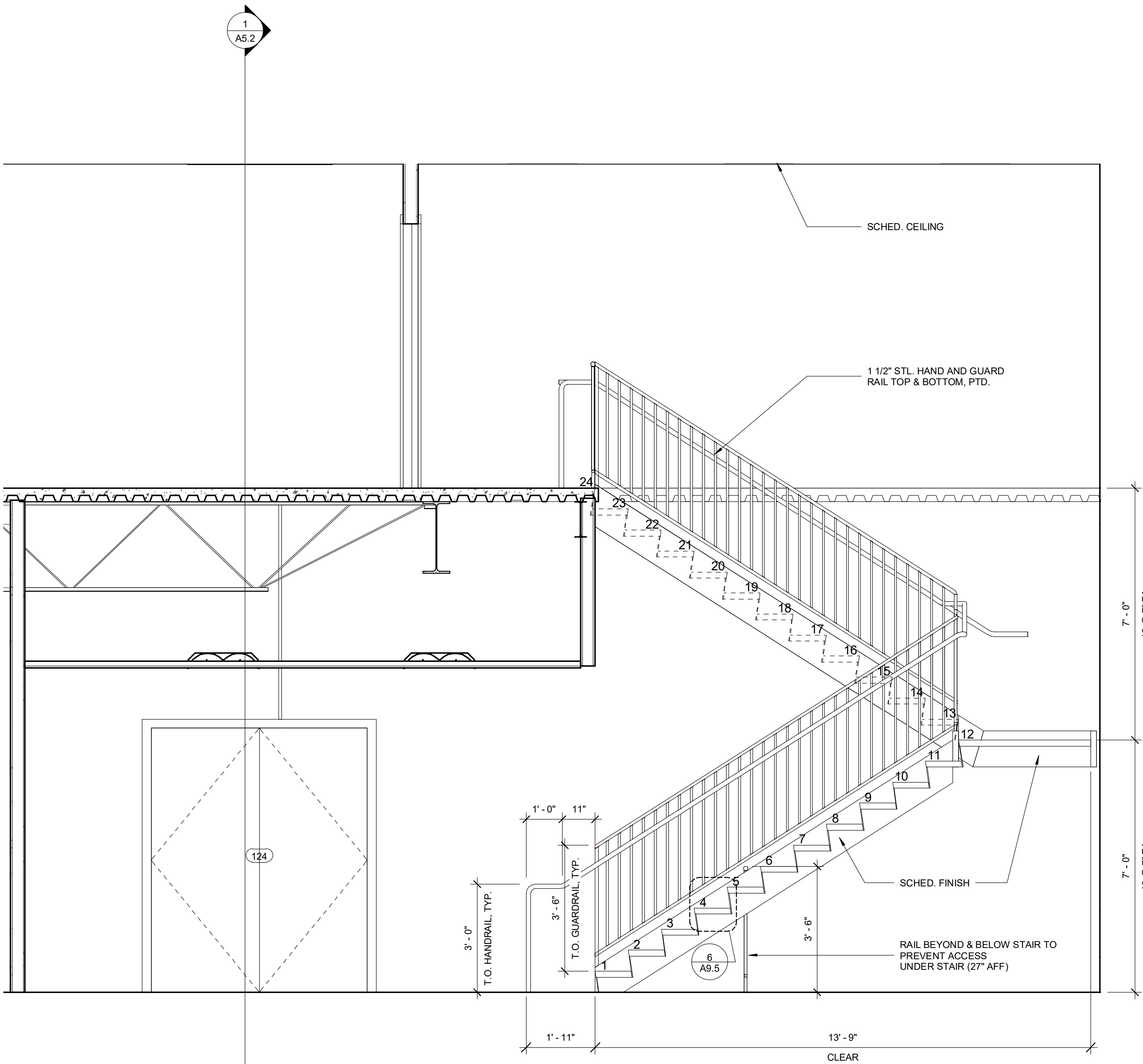


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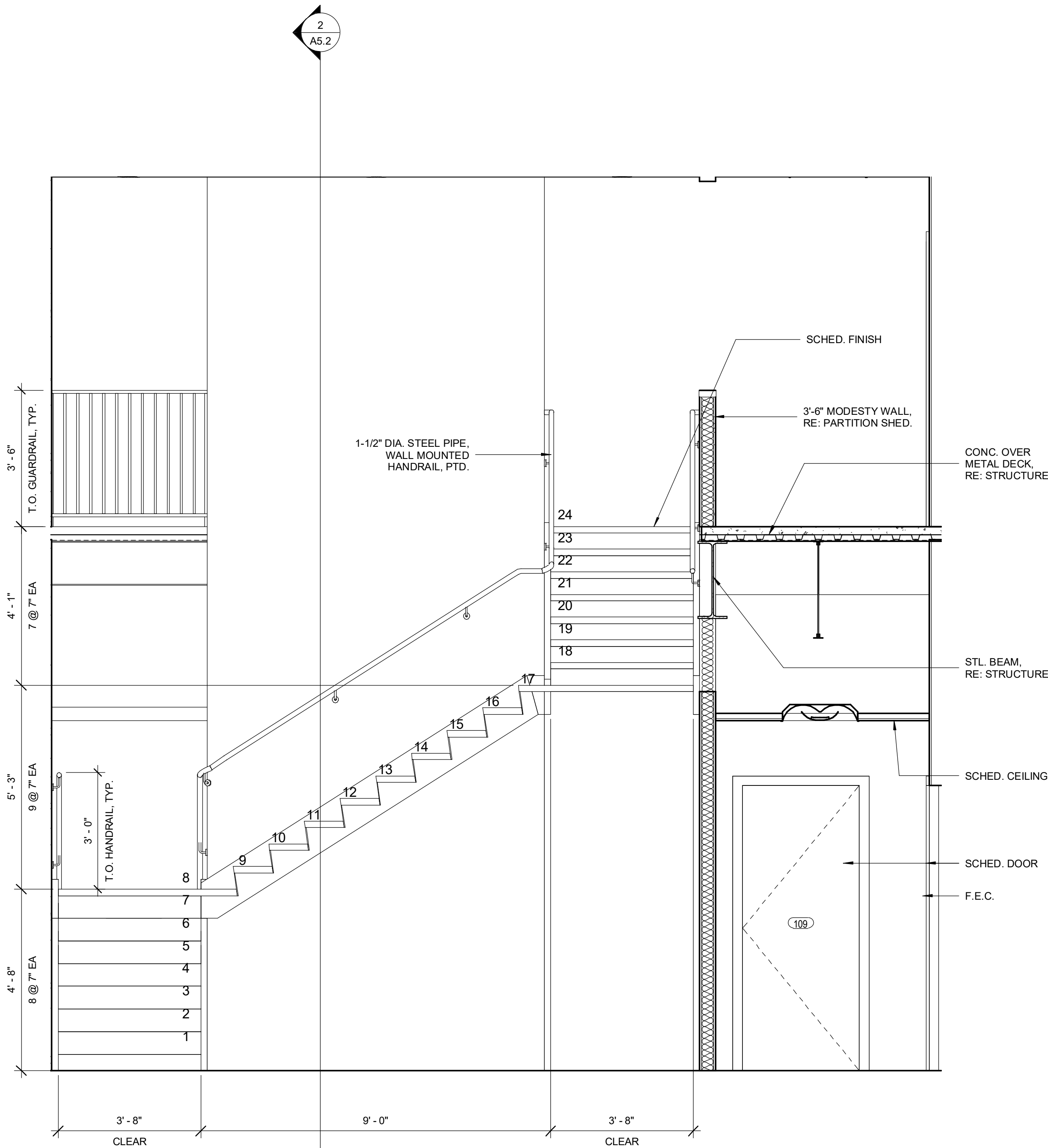
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**A6.4**

STAIR SECTIONS

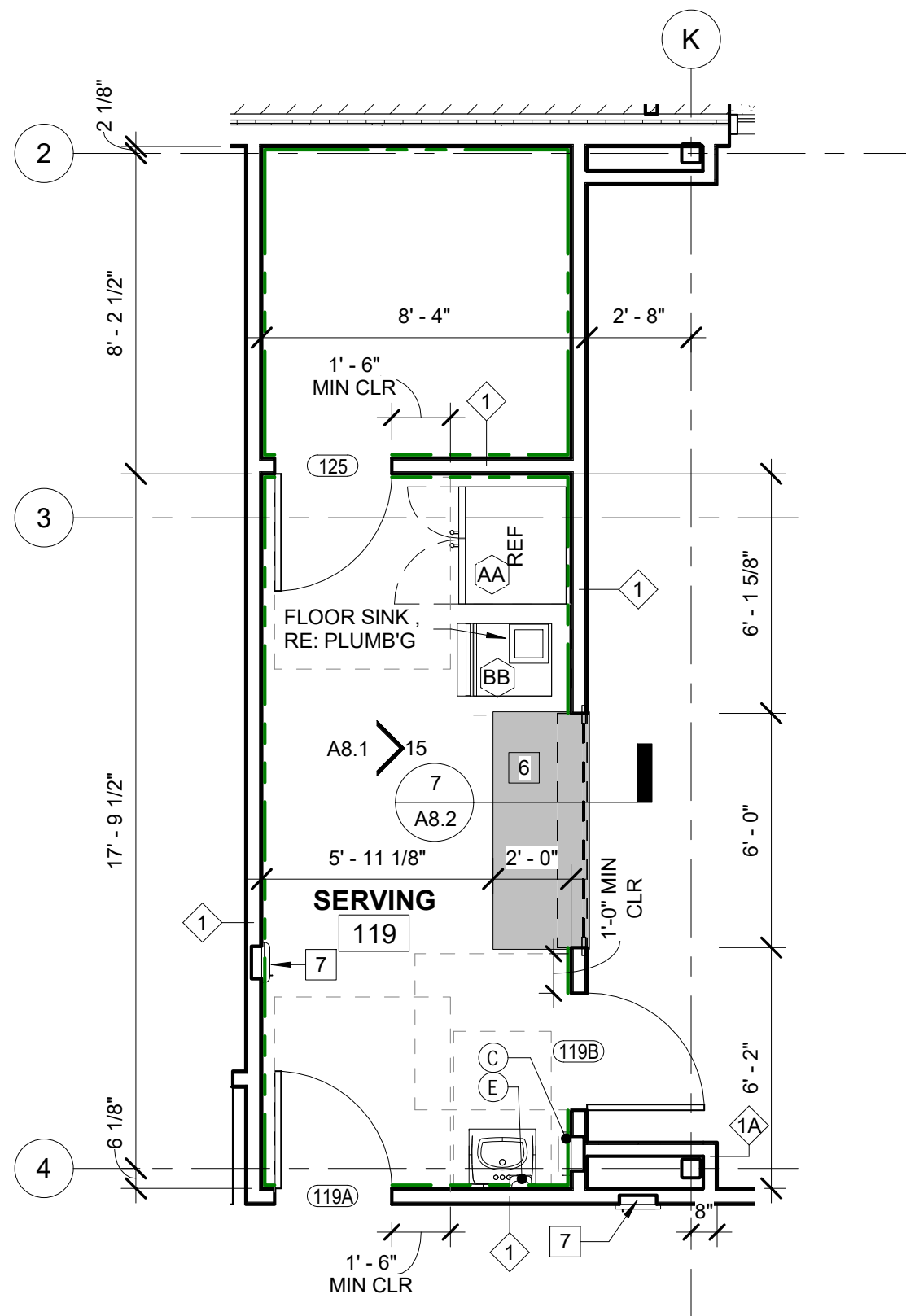


② STAIR B SECTION  
1/2" = 1'-0"

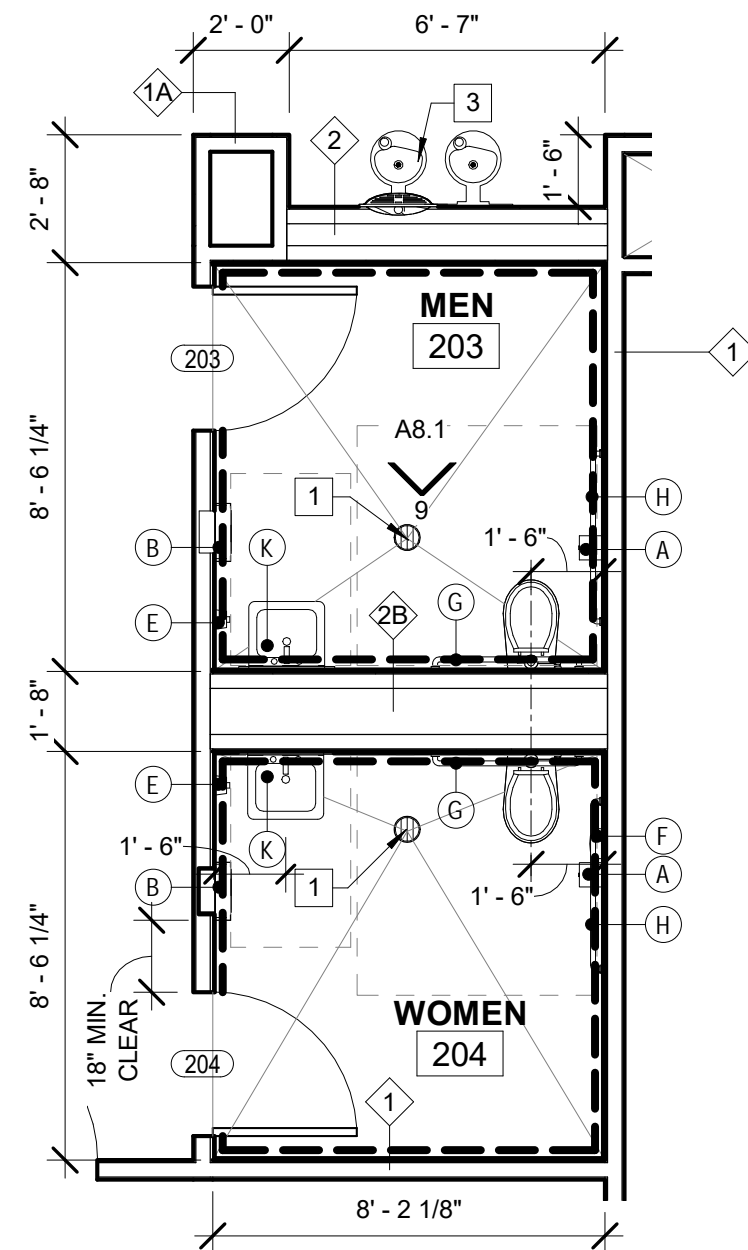


① STAIR A SECTION  
1/2" = 1'-0"

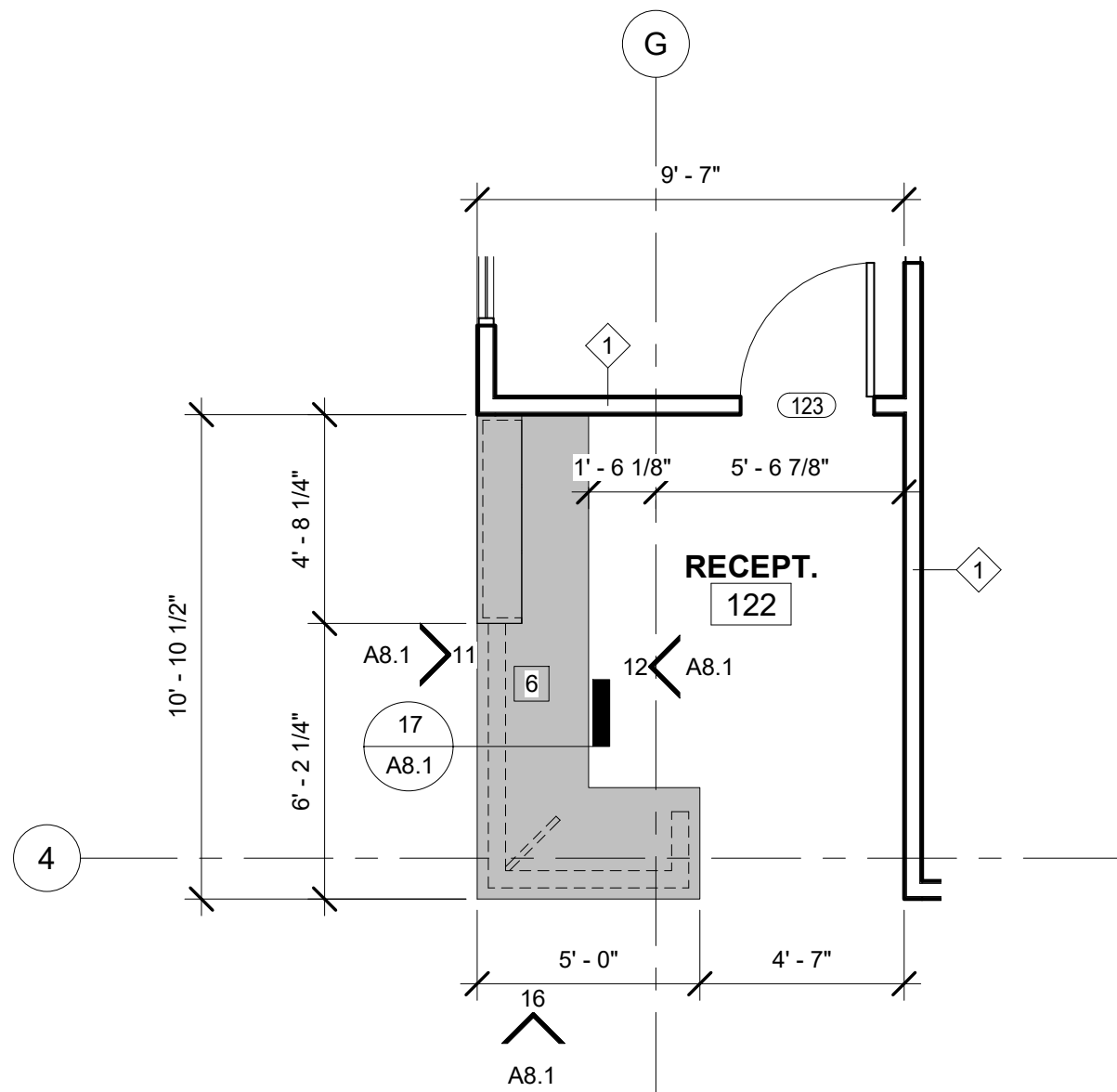




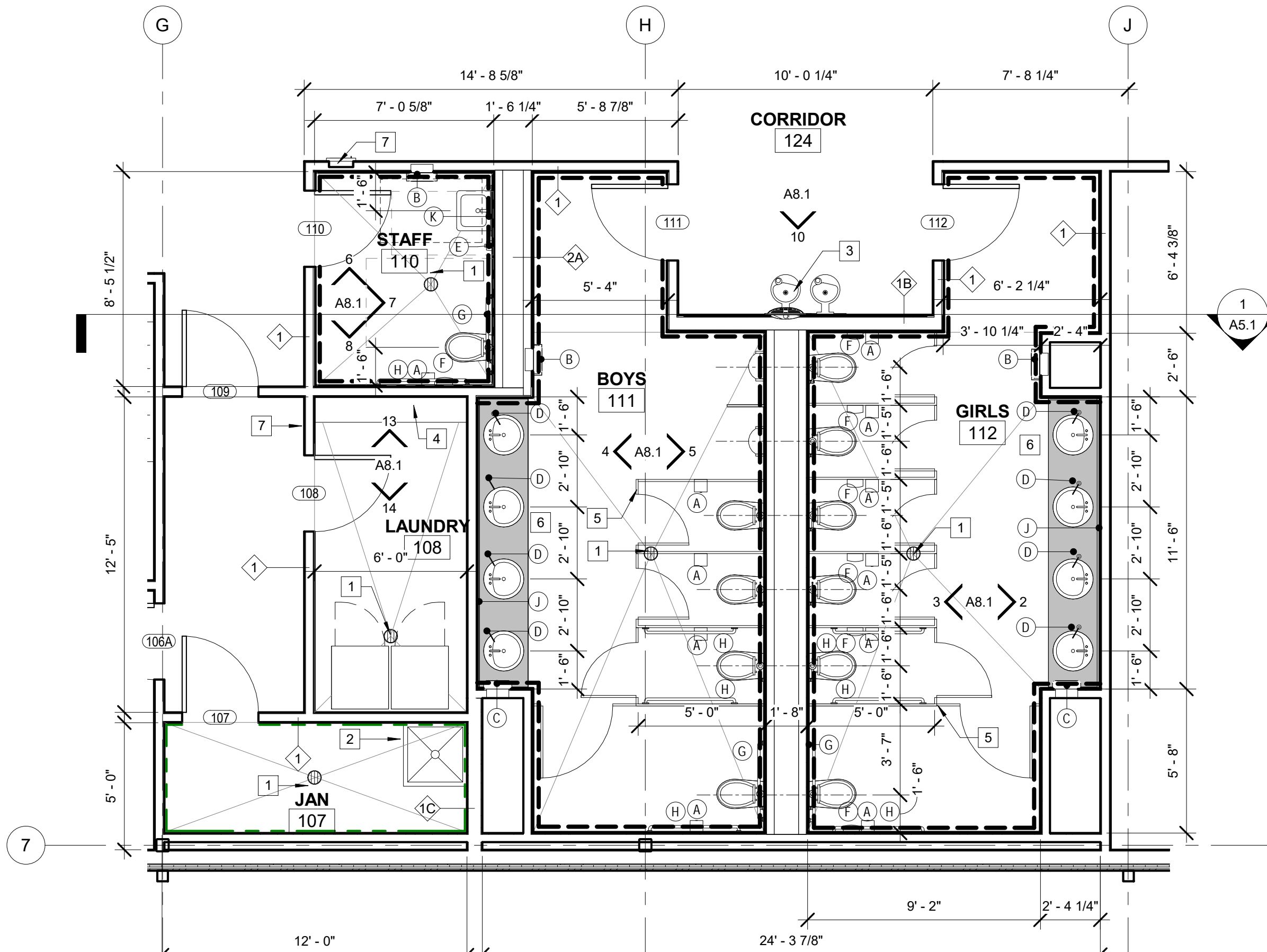
3 FIRST FLOOR - SERVING  
1/4" = 1'-0"



2 ENLG. PLAN - RR  
1/4" = 1'-0"



4 FIRST FLOOR - RECEPTION  
1/4" = 1'-0"



1 ENLG. PLAN - RR  
1/4" = 1'-0"

## CODED NOTES

- 1 FLOOR DRAIN, RE: PLUMB'G
- 2 MOP SINK, RE: PLUMB'G
- 3 ELECTRIC DRINKING FOUNTAIN (EDF) WOTH BOTTLED WATER FILLER
- 4 12" WALL SHELVES
- 5 FLOOR-TO-CEILING PHENOLIC CORE TOILET PARTITIONS MOUNTED TO STRUCTURE ABOVE, RE: STRUCT.
- 6 QUARTZSTONE COUNTERTOPS
- 7 SEMI-RECESSED FIRE EXTINGUISHER & CABINET (FEC)

## APPLIANCE SCHEDULE

- AA REFRIGERATOR:  
ADA-COMPLIANT SIDE-BY SIDE 23 CU FT.  
STAINLESS STEEL, COUNTER-DEPTH  
SAMSUNG RS23A500ASR OR APPROVED  
EQUAL
- BB ICE MAKER & STORAGE BIN:  
STAINLESS STEEL ICE MACHINE W/ 250 LBS  
STORAGE BIN, 195 POS ICE CUBES  
VEVOR COMMERCIAL ICE MACHINE OR  
APPROVED EQUAL

## TOILET ACCESSORY SCHEDULE

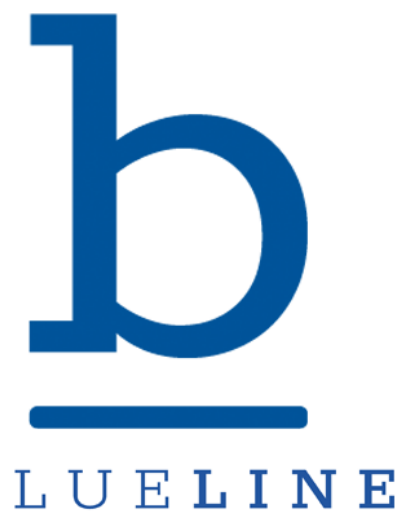
- A TOILET TISSUE DISPENSER
- B TOWEL DISPENSER / WASTE RECEPTACLE
- C TOWEL DISPENSER
- D SOAP DISPENSER (LAVATORY)
- E SOAP DISPENSER (WALL MTD)
- F NAPKIN DISPOSAL
- G 36" GRAB BAR
- H 42" GRAB BAR
- J MIRROR (FULL HEIGHT)
- K MIRROR 24 x 36

## LEGEND

- INDICATES FULL HEIGHT  
CERAMIC TILE, U.N.O.
- INDICATES 8'-0" HEIGHT  
FRP
- QUARTZSTONE  
COUNTERTOP AND  
BACKSPLASH

## GENERAL NOTES

1. REFER TO OVERALL FLOOR PLANS FOR ADDITIONAL INFORMATION
2. INTERIOR DIMENSIONS ARE TO FACE OF GWB AND TO STRUCTURAL COLUMN GRID LINES
3. REQUIRED CLEARANCES SHALL BE TO FACE OF FINISH
4. USE WATER RESISTANT GYPSUM WALL BOARD @ ALL WET WALLS, WALLS W/ PORCELAIN TILE, AND WALLS W/ FRP (TYP THROUGHOUT)
5. VERIFY ALL INFORMATION WITH CIVIL, STRUCTURAL, MEP AND ALL OTHER CONSTRUCTION DOCUMENTS PRIOR TO START OF CONSTRUCTION - IF ANY DISCREPANCIES EXIST, CONSULT THE ARCHITECT, ENGINEER, AND APPLICABLE CONSULTS.



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Harrisonburg, VA 22801  
540.437.1228

333 Cypress Run, Suite 350  
Houston, TX 77094  
281.497.1040

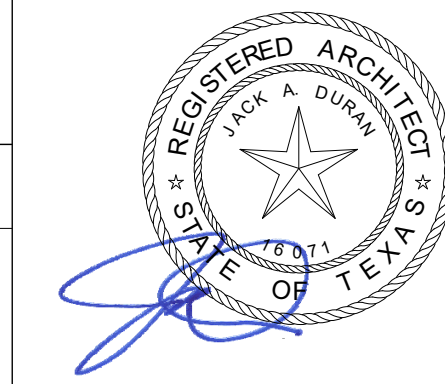
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AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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# A7.1

ENLARGED  
PLANS

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NEW COMMUNITY CENTER**  
AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

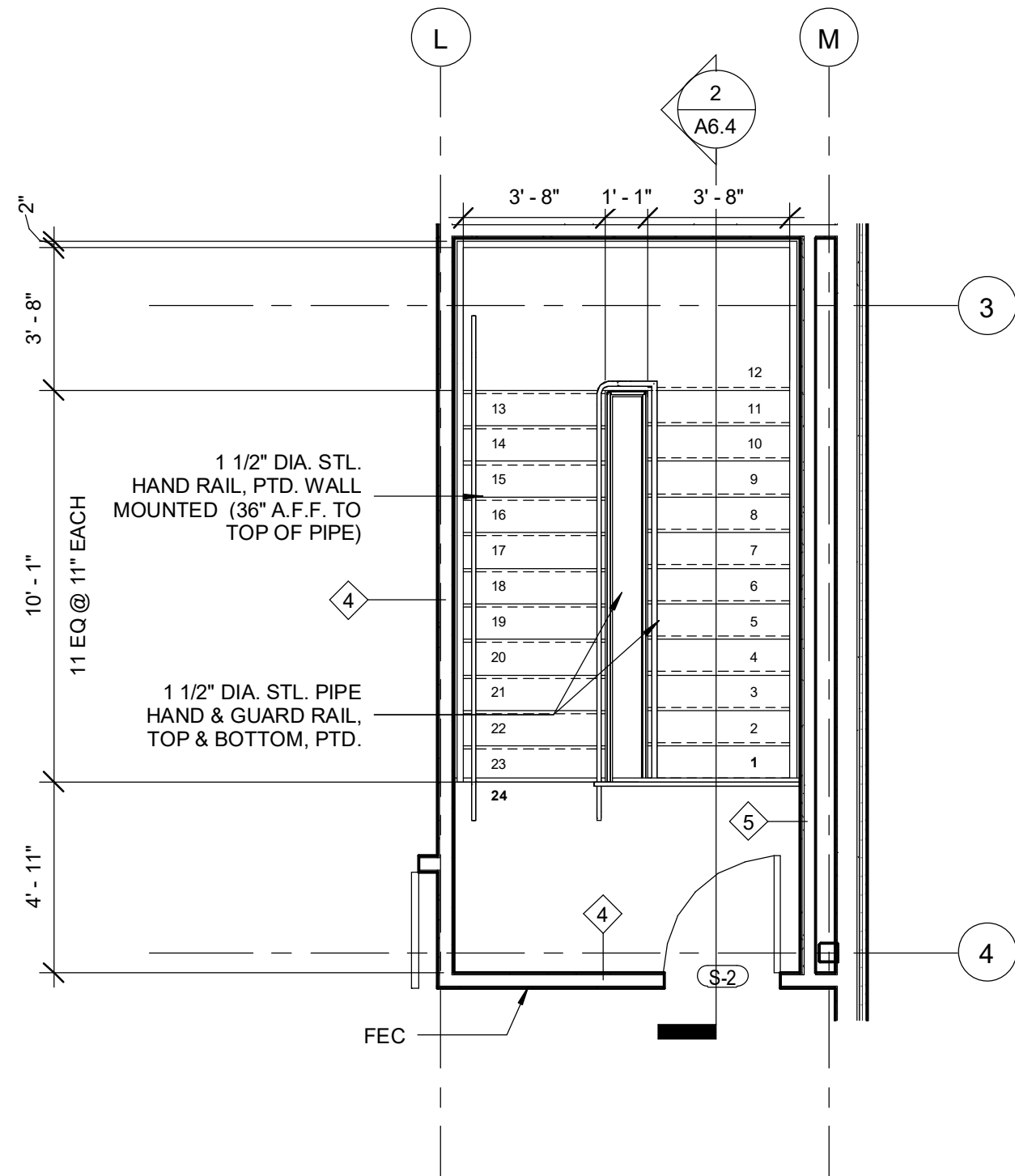
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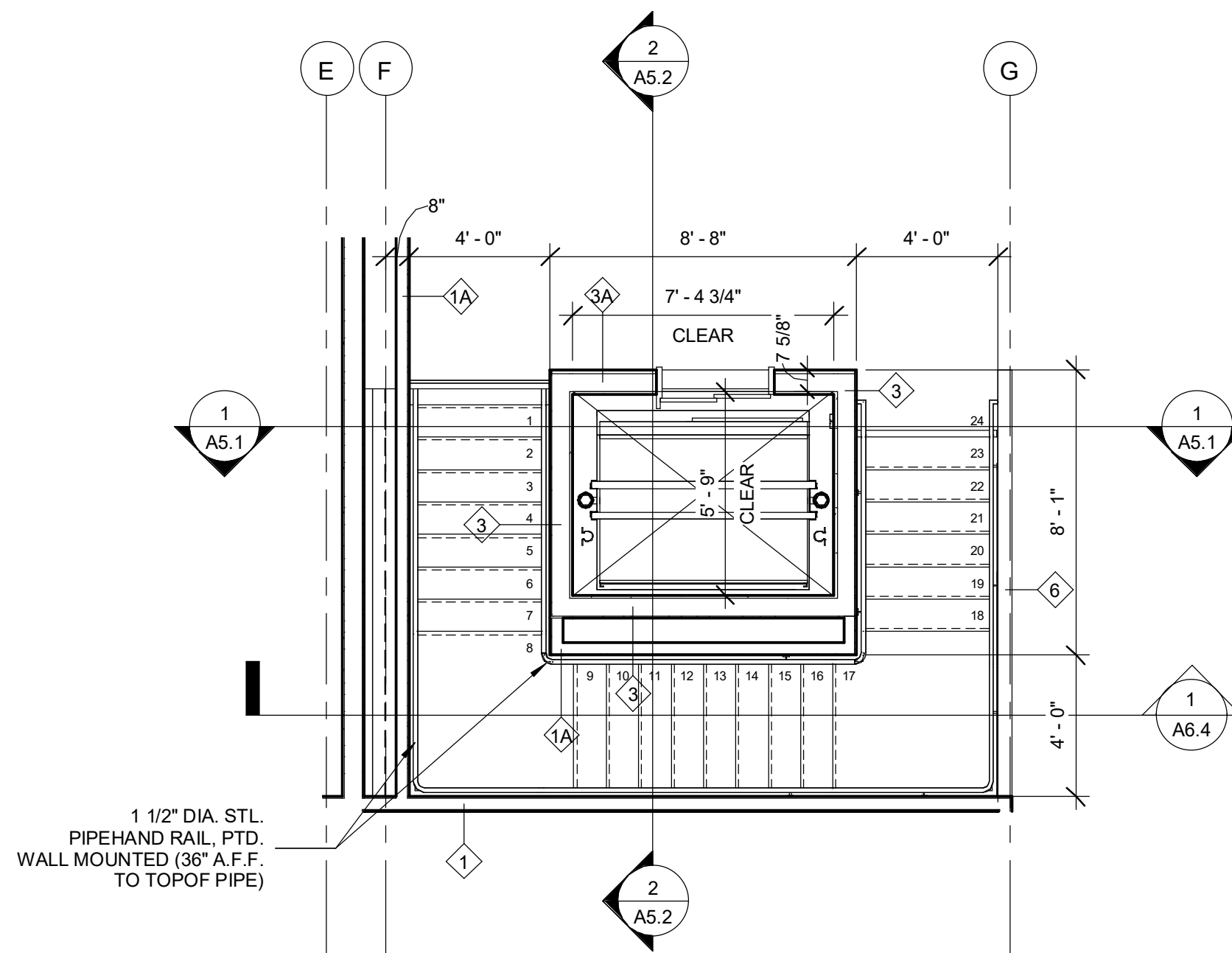


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AFFIXATION DATE: 05/03/22

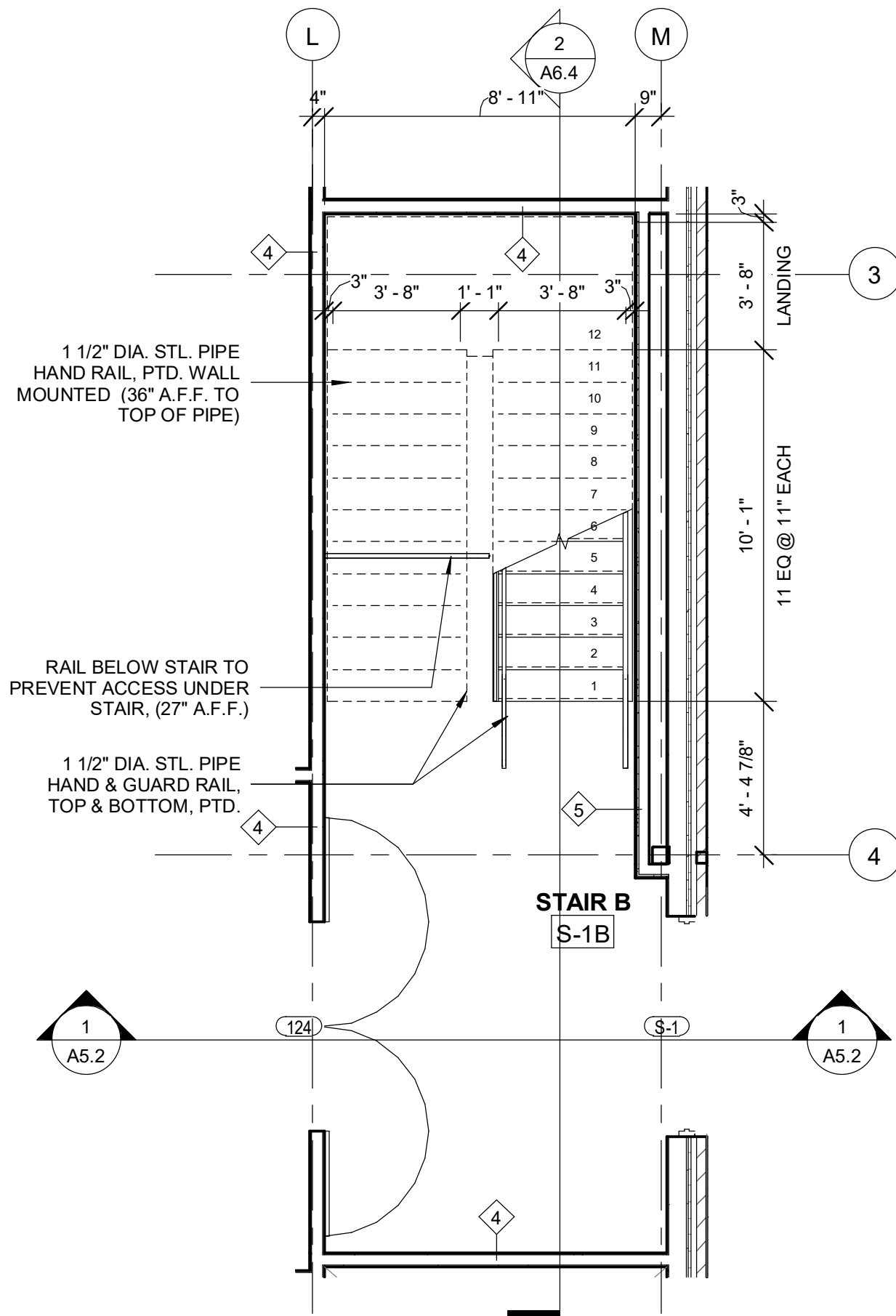
**A7.2**  
ENLARGED  
PLANS - STAIR /  
ELEV



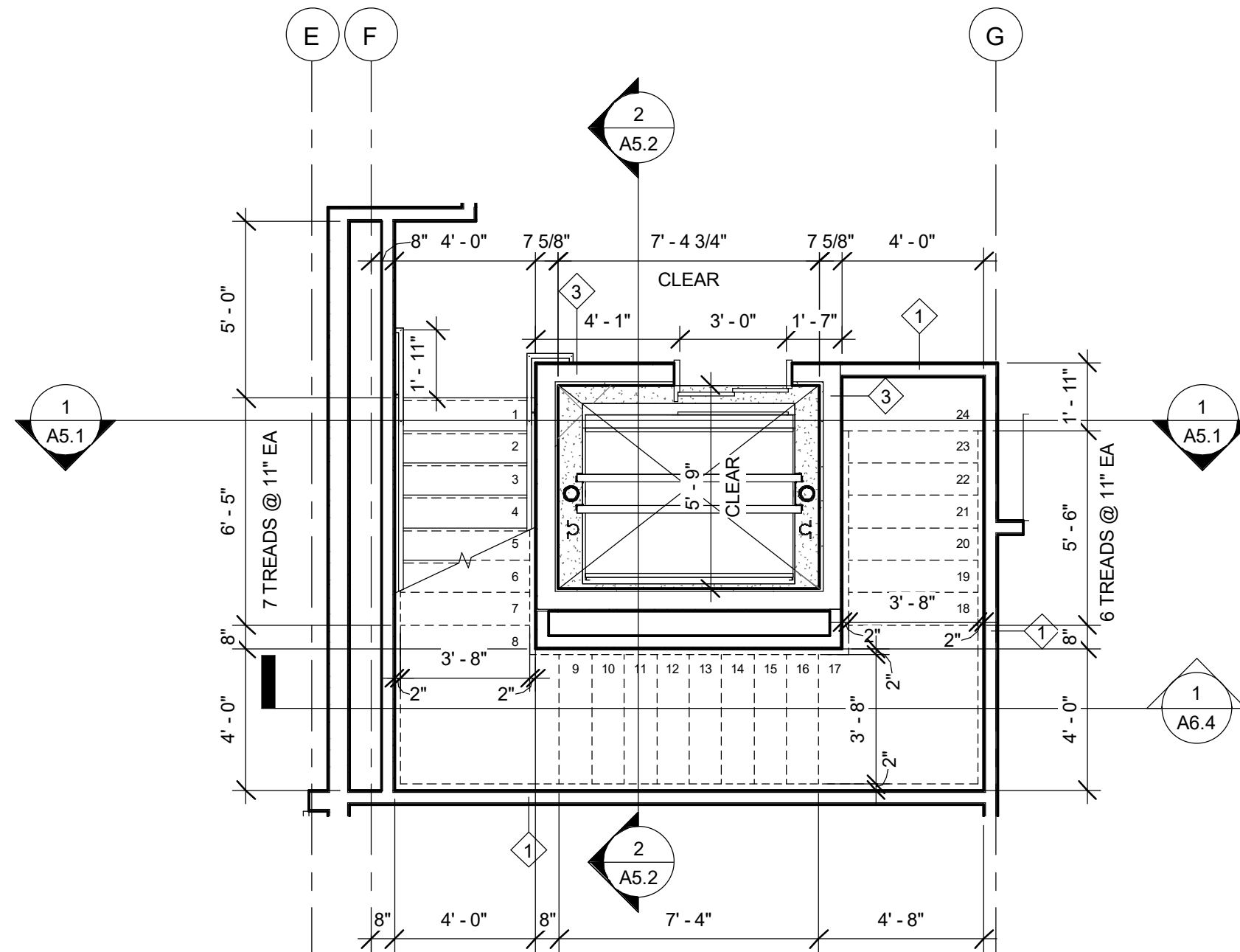
4 ENL.G. PLAN - STAIRS S-2  
1/4" = 1'-0"



2 SECOND FLOOR - STAIR/ELEV  
1/4" = 1'-0"

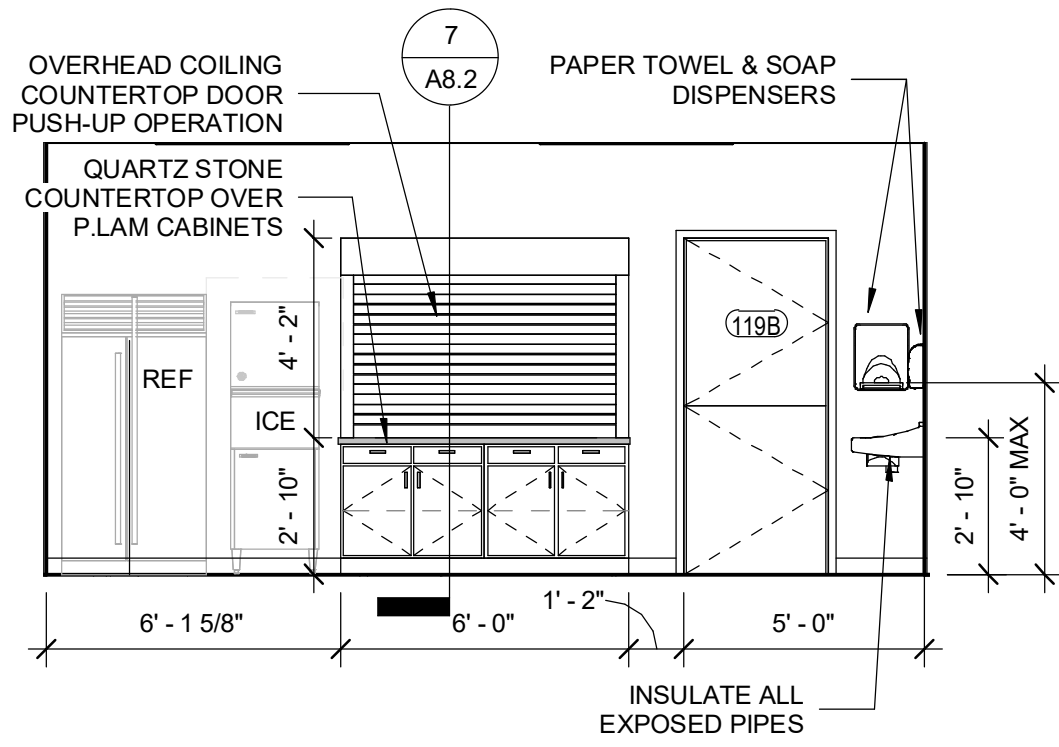


3 ENL.G. PLAN - STAIRS S-1  
1/4" = 1'-0"

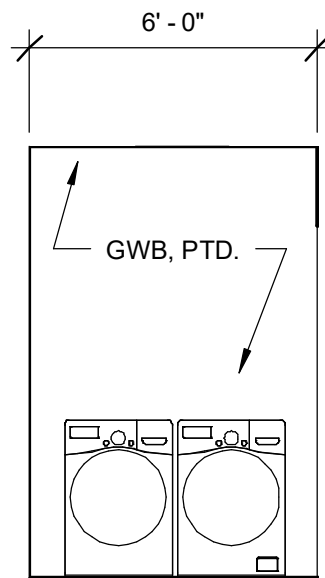


1 ENL.G. PLAN - ELEVATOR  
1/4" = 1'-0"

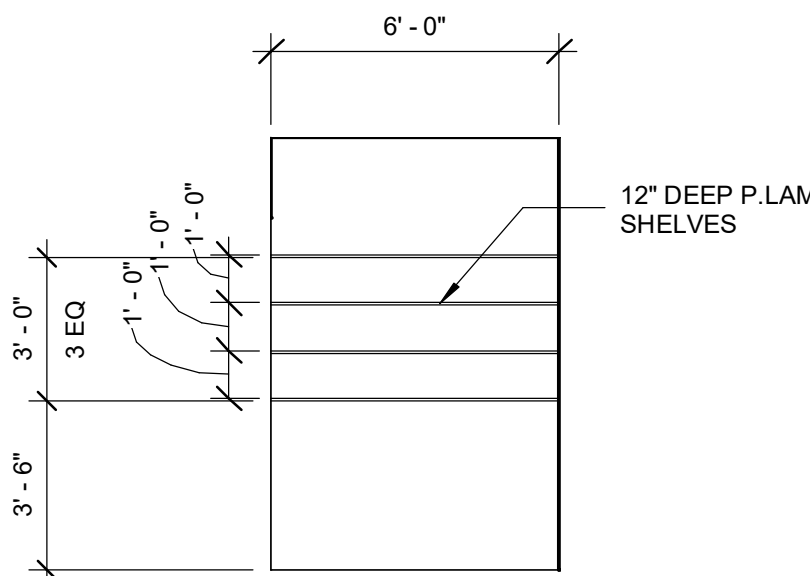




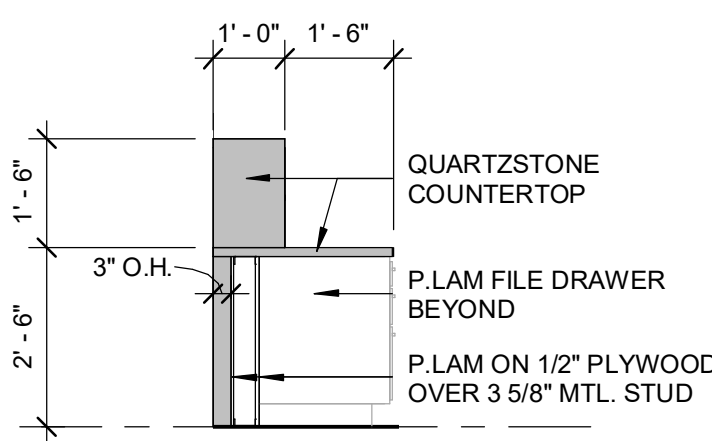
15 SERVING 119  
1/4" = 1'-0"



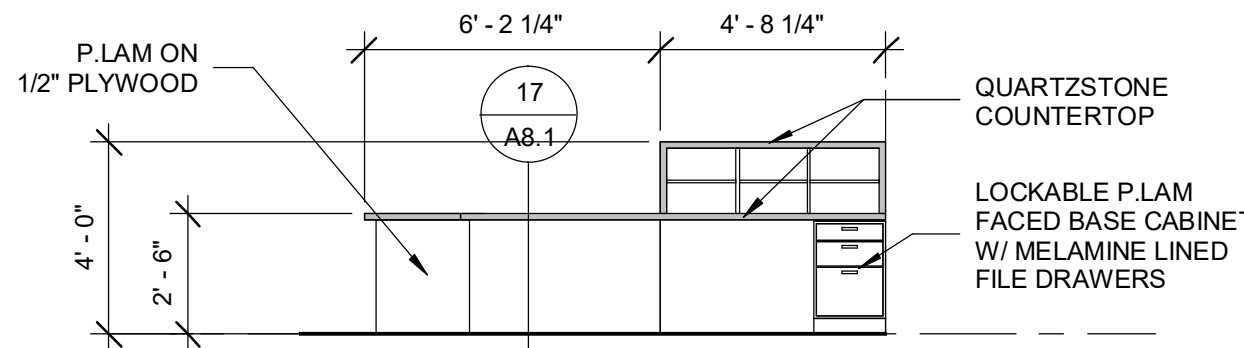
14 LAUNDRY 108 S  
1/4" = 1'-0"



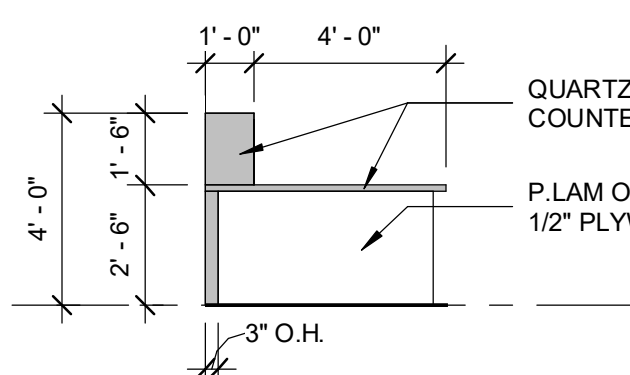
13 LAUNDRY 108 N  
1/4" = 1'-0"



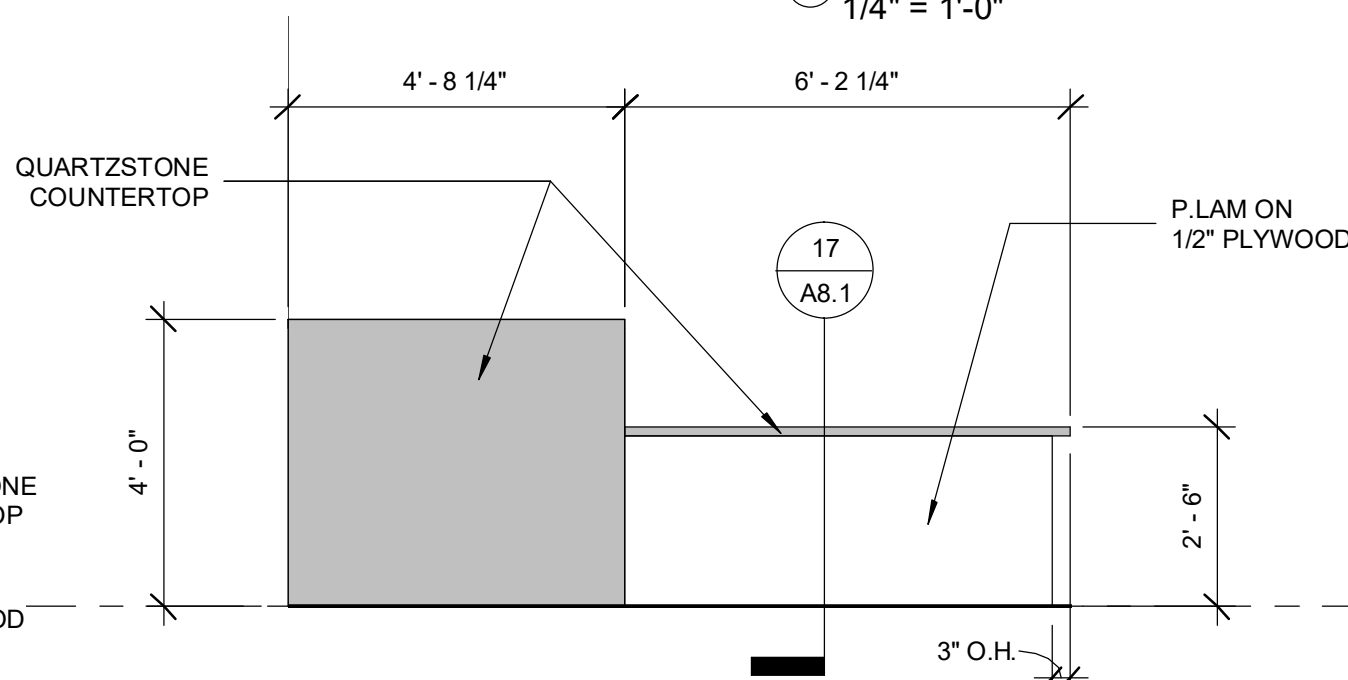
17 RECEPTION DETAIL  
3/8" = 1'-0"



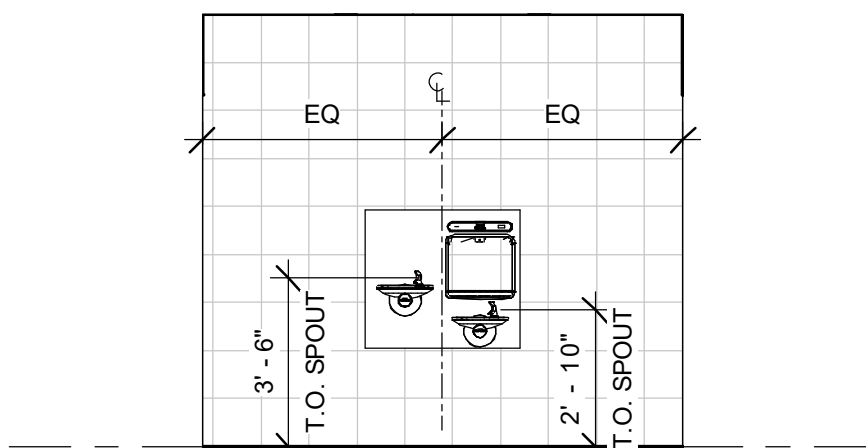
12 RECEPTION  
1/4" = 1'-0"



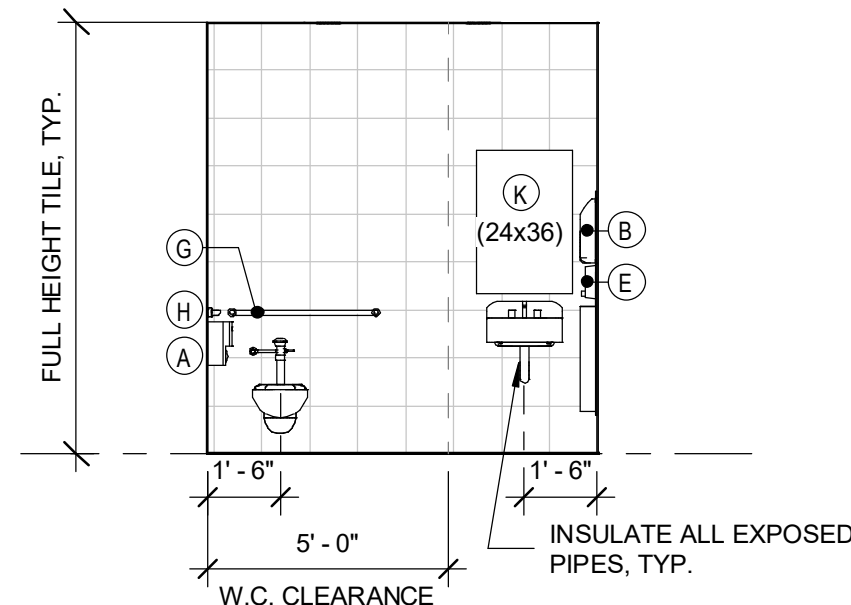
16 RECEPTION  
1/4" = 1'-0"



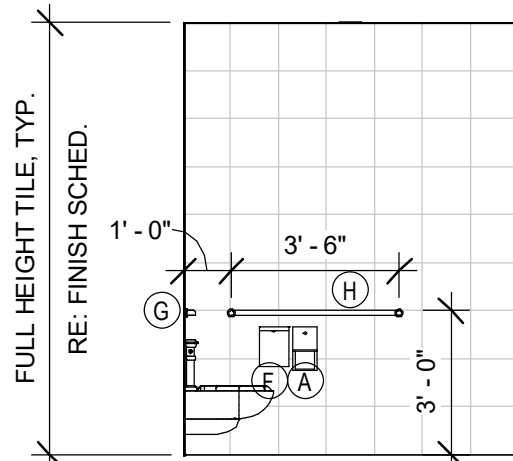
11 RECEPTION  
3/8" = 1'-0"



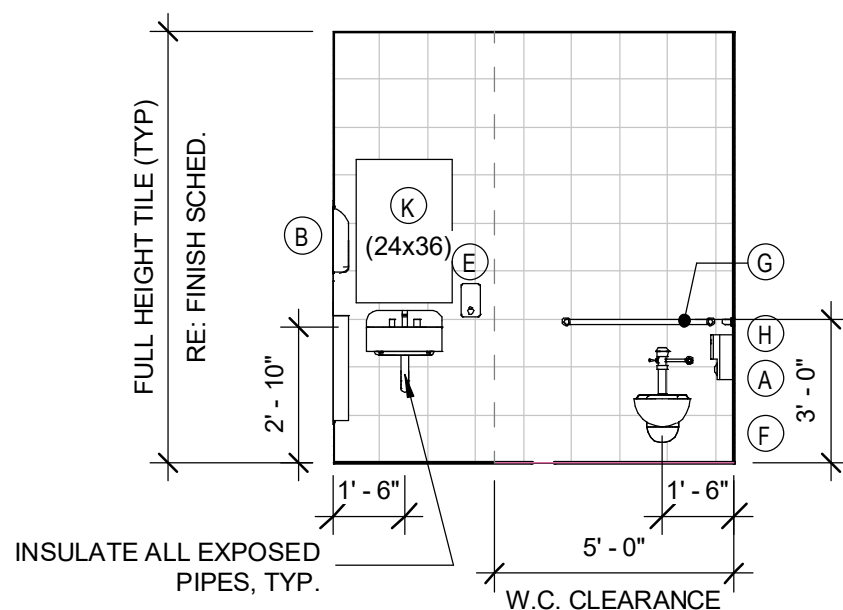
10 DRINKING FOUNTAIN  
1/4" = 1'-0"



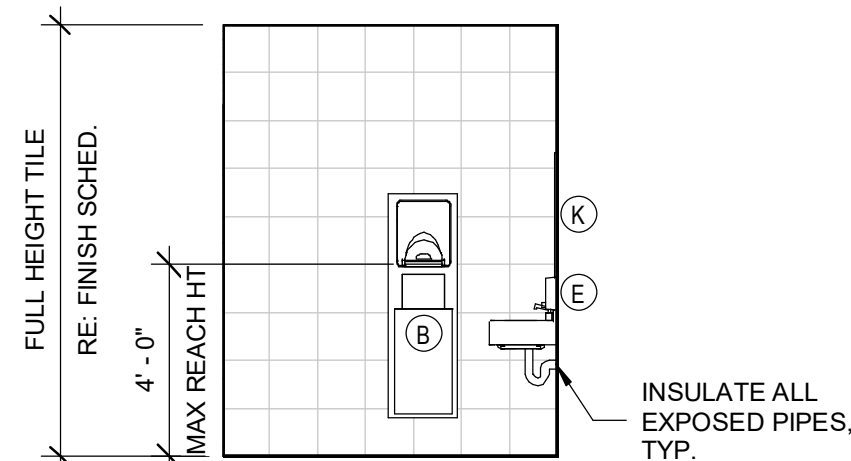
9 MEN 203  
1/4" = 1'-0"



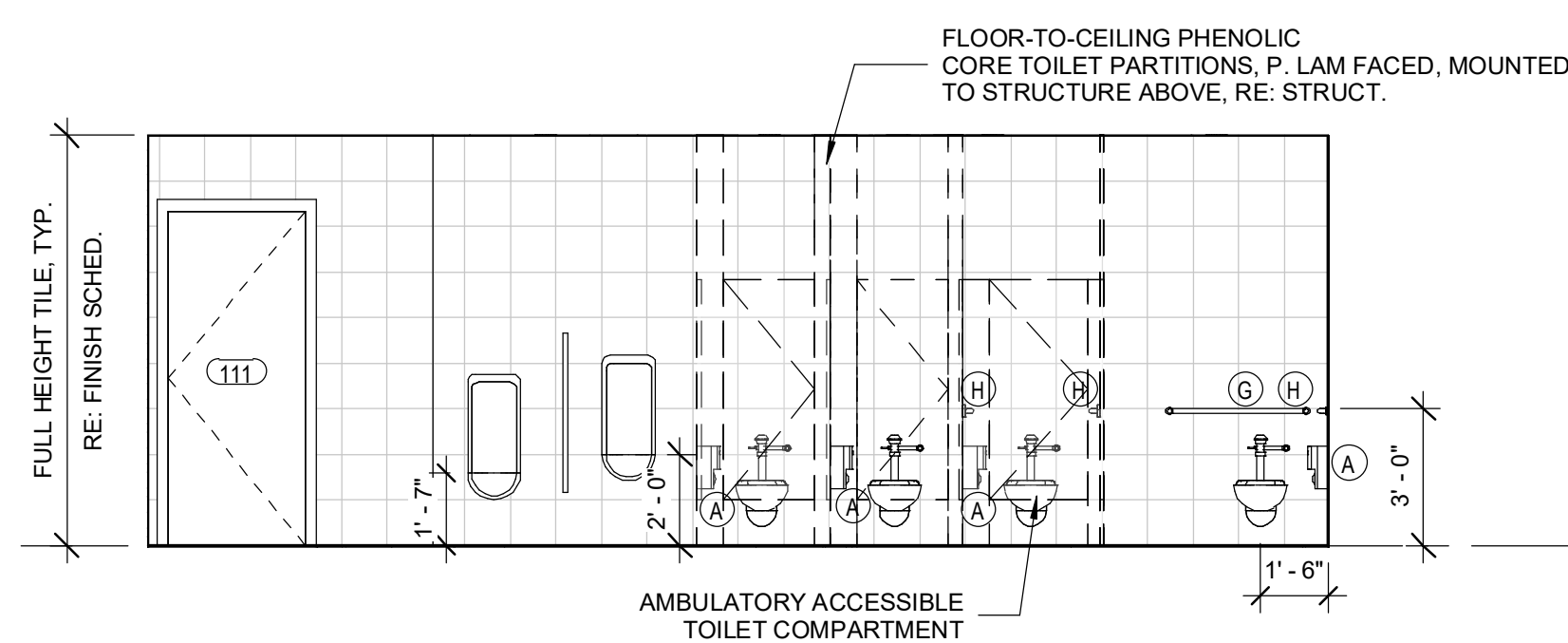
8 STAFF 110 S  
1/4" = 1'-0"



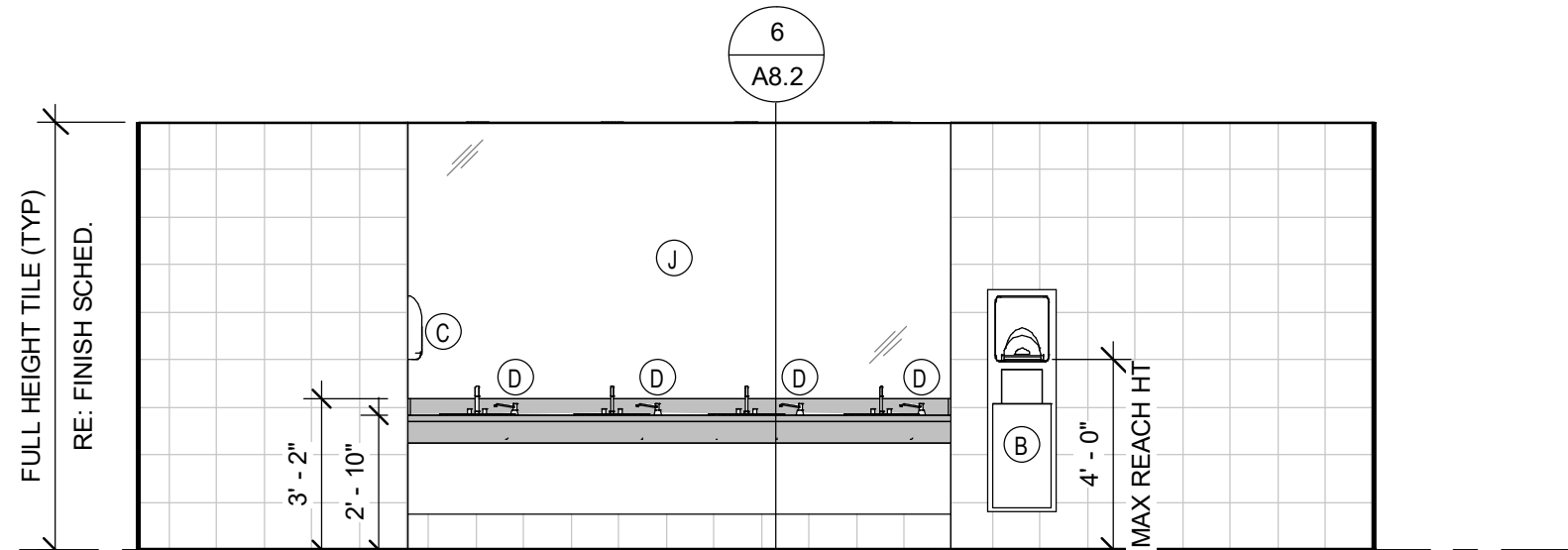
7 STAFF 110 E  
1/4" = 1'-0"



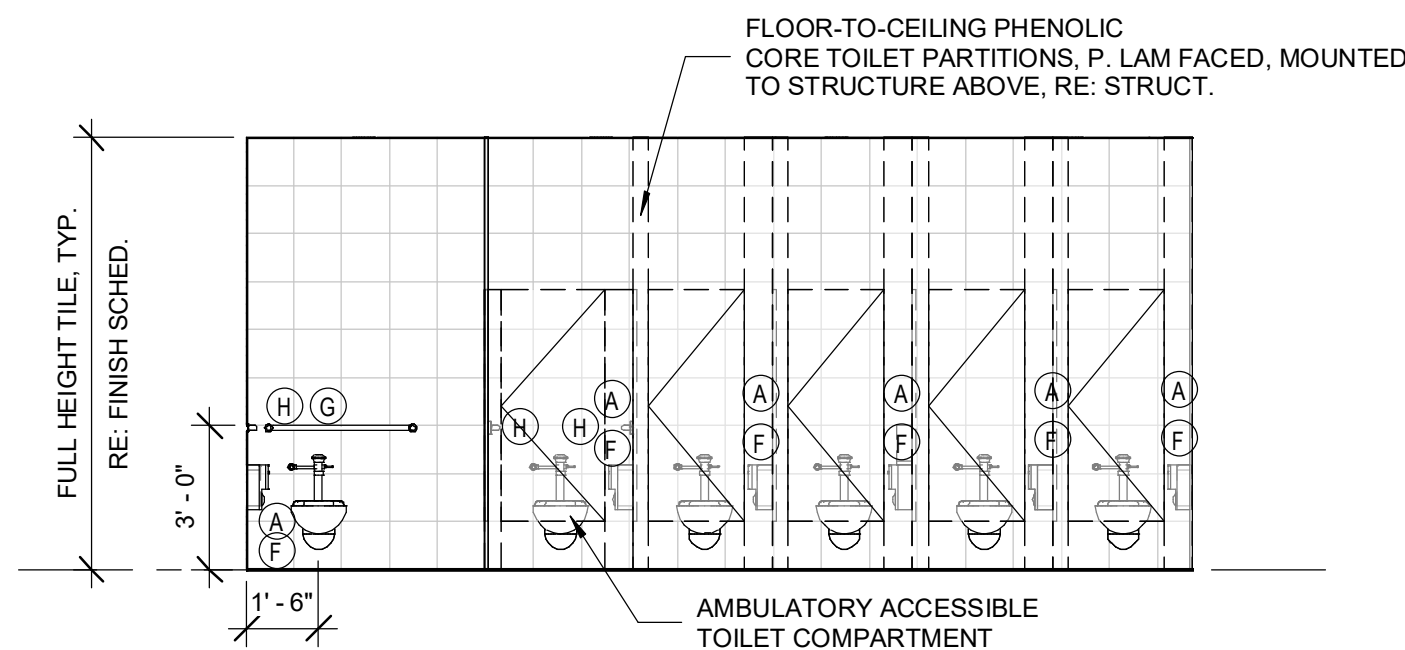
6 STAFF 110 N  
1/4" = 1'-0"



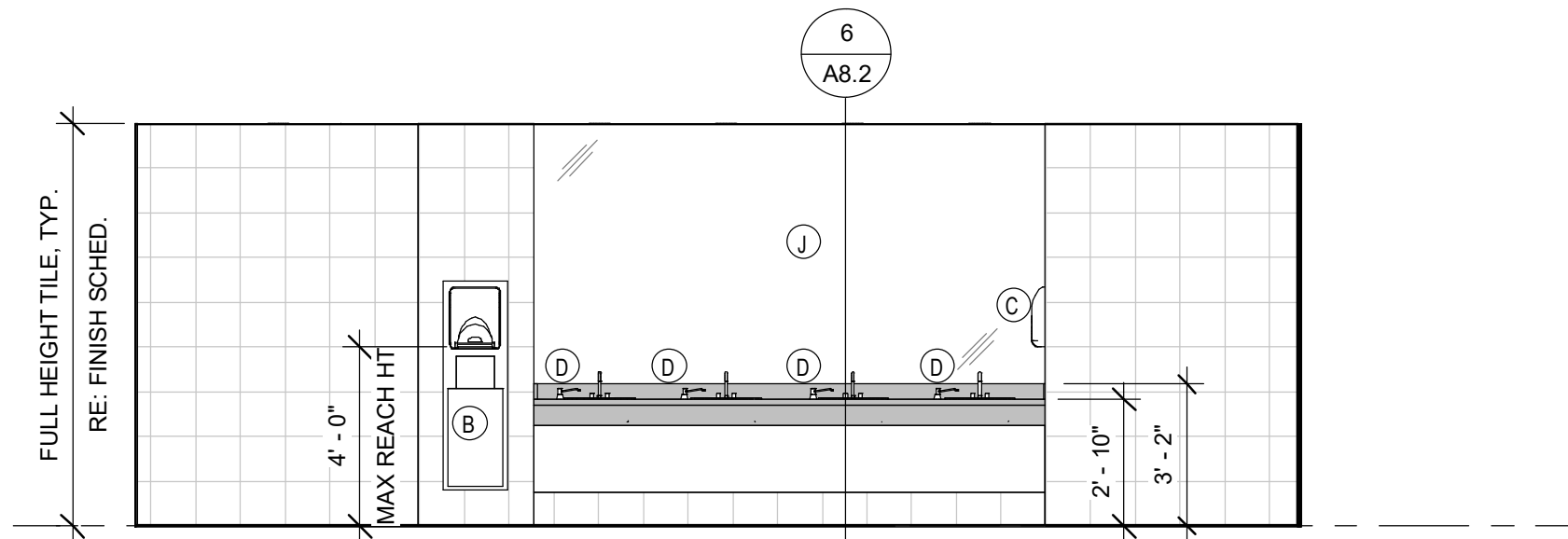
5 BOYS 111  
1/4" = 1'-0"



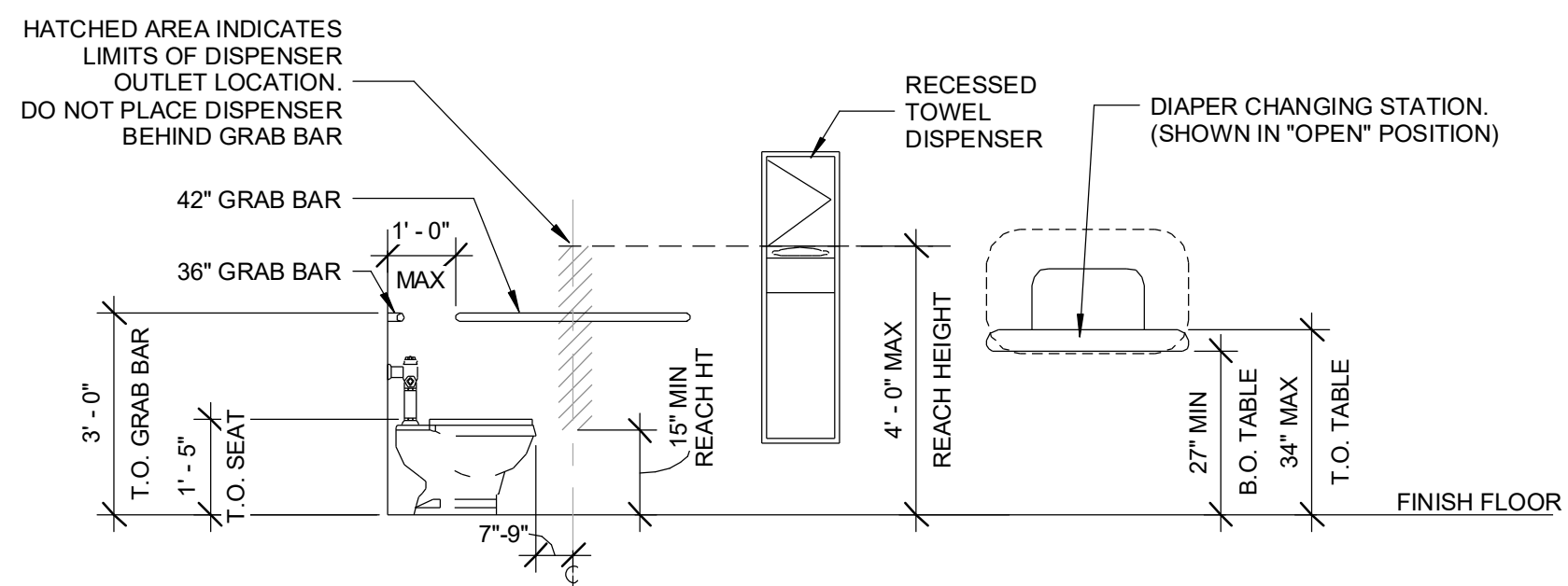
4 BOYS 111  
1/4" = 1'-0"



3 GIRLS 112  
1/4" = 1'-0"



2 GIRLS 112  
1/4" = 1'-0"



1 TYP RR MOUNTING HEIGHTS  
3/8" = 1'-0"

NOTE: RE: FINISH SCHEDULE FOR  
FINISH INSTALL PATTERNS.  
HATCH PATTERNS SHOWN ON  
PLANS & ELEVATIONS ARE NOT  
INDICATIVE OF INSTALL PATTERNS  
(TYP)

## TOILET ACCESSORY SCHEDULE

- |   |                                    |
|---|------------------------------------|
| A | TOILET TISSUE DISPENSER            |
| B | TOWEL DISPENSER / WASTE RECEPTACLE |
| C | TOWEL DISPENSER                    |
| D | SOAP DISPENSER (LAVATORY)          |
| E | SOAP DISPENSER (WALL MTD)          |
| F | NAPKIN DISPOSAL                    |
| G | 36" GRAB BAR                       |
| H | 42" GRAB BAR                       |
| J | MIRROR (FULL HEIGHT)               |
| K | MIRROR 24 x 36                     |

## GENERAL NOTES

- REFER TO OVERALL FLOOR PLANS FOR ADDITIONAL INFORMATION
- INTERIOR DIMENSIONS ARE TO FACE OF GWB AND TO STRUCTURAL COLUMN GRID LINES
- REQUIRED CLEARANCES SHALL BE TO FACE OF FINISH
- USE WATER RESISTANT GYPSUM WALL BOARD @ ALL WET WALLS, WALLS W/ PORCELAIN TILE, AND WALLS W/ FRP (TYP THROUGHOUT)
- VERIFY ALL INFORMATION WITH CIVIL, STRUCTURAL, MEP AND ALL OTHER CONSTRUCTION DOCUMENTS PRIOR TO START OF CONSTRUCTION - IF ANY DISCREPANCIES EXIST, CONSULT THE ARCHITECT, ENGINEER, AND APPLICABLE CONSULTS.

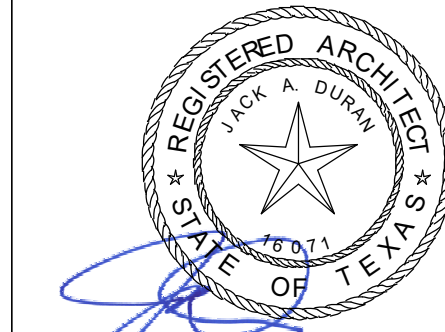
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PROJECT NO.: 06-21-011

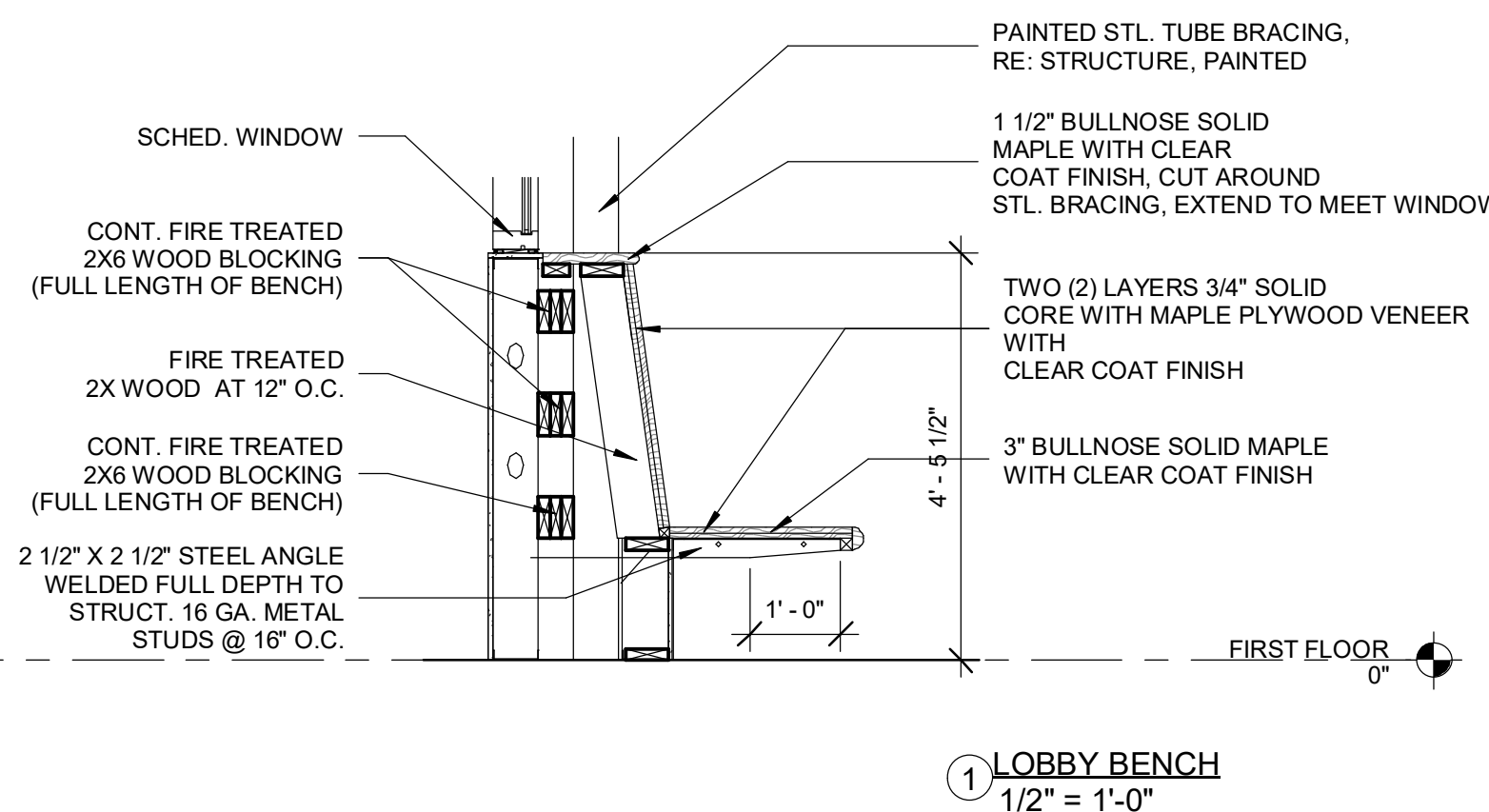
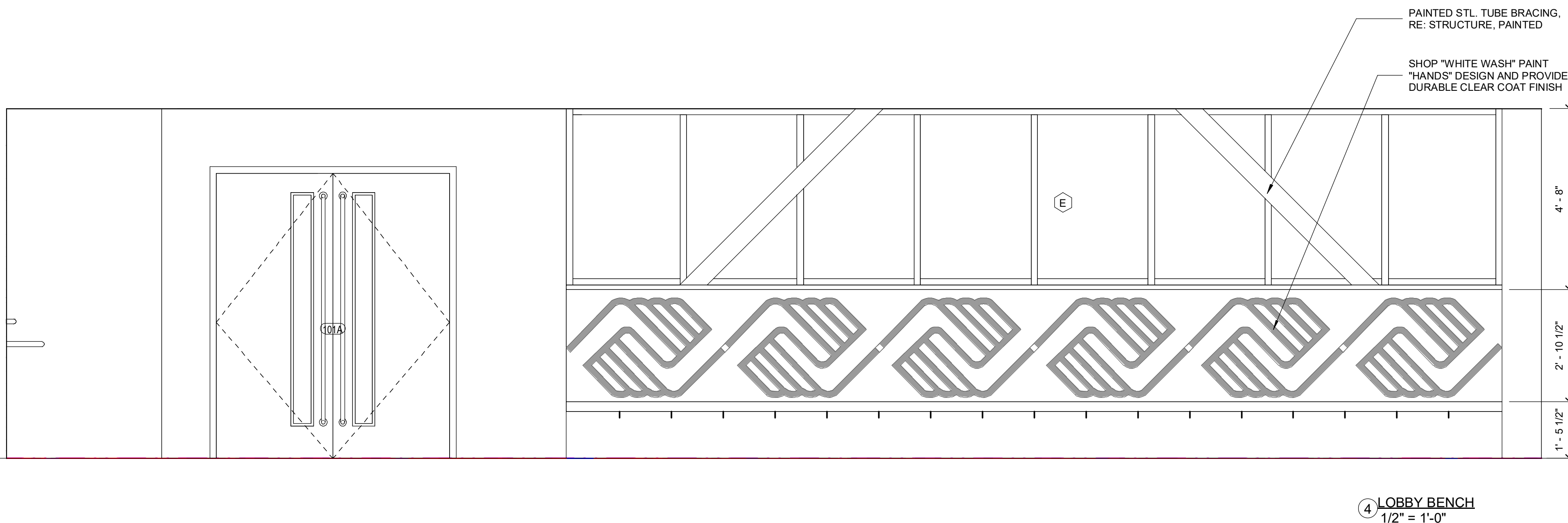
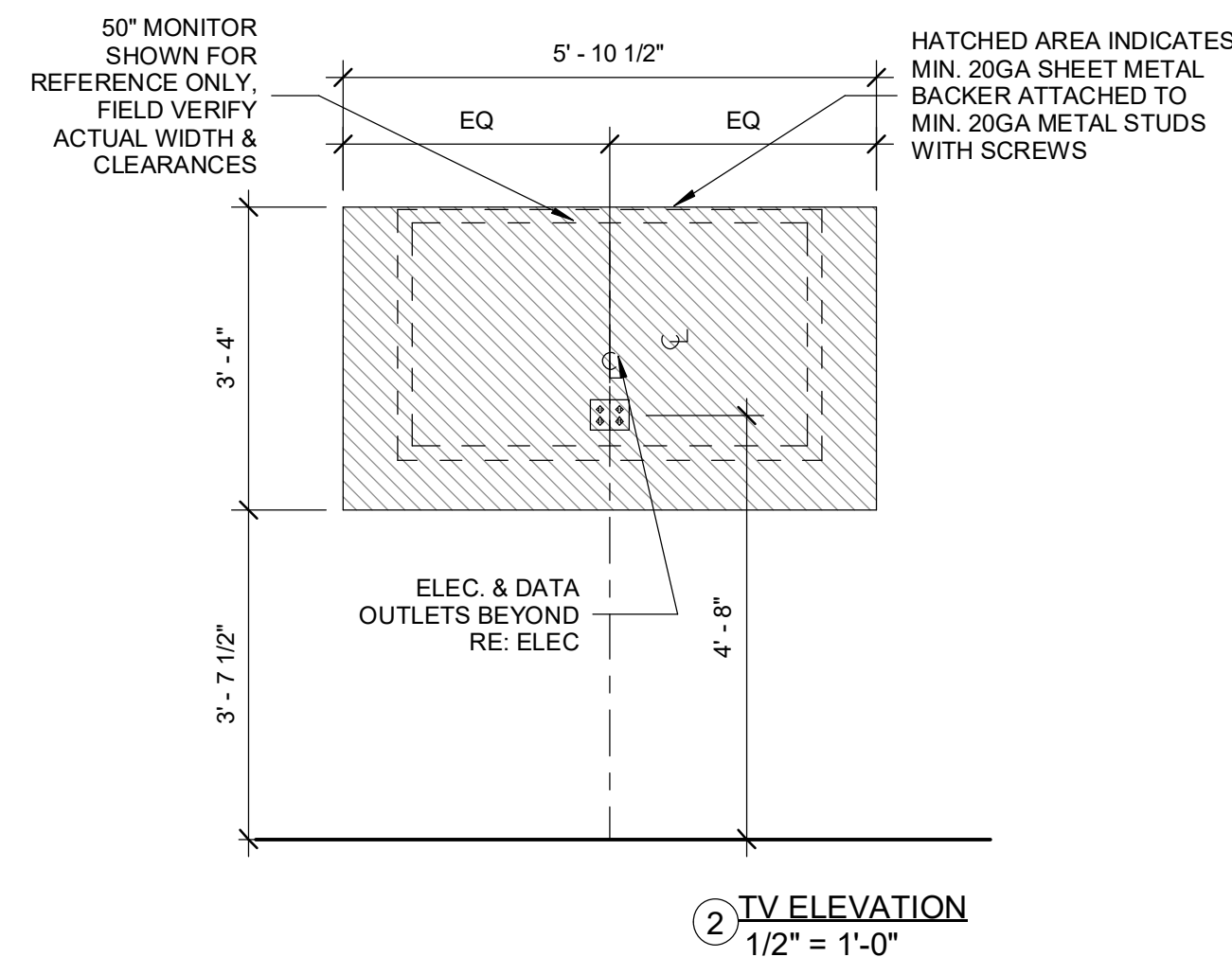
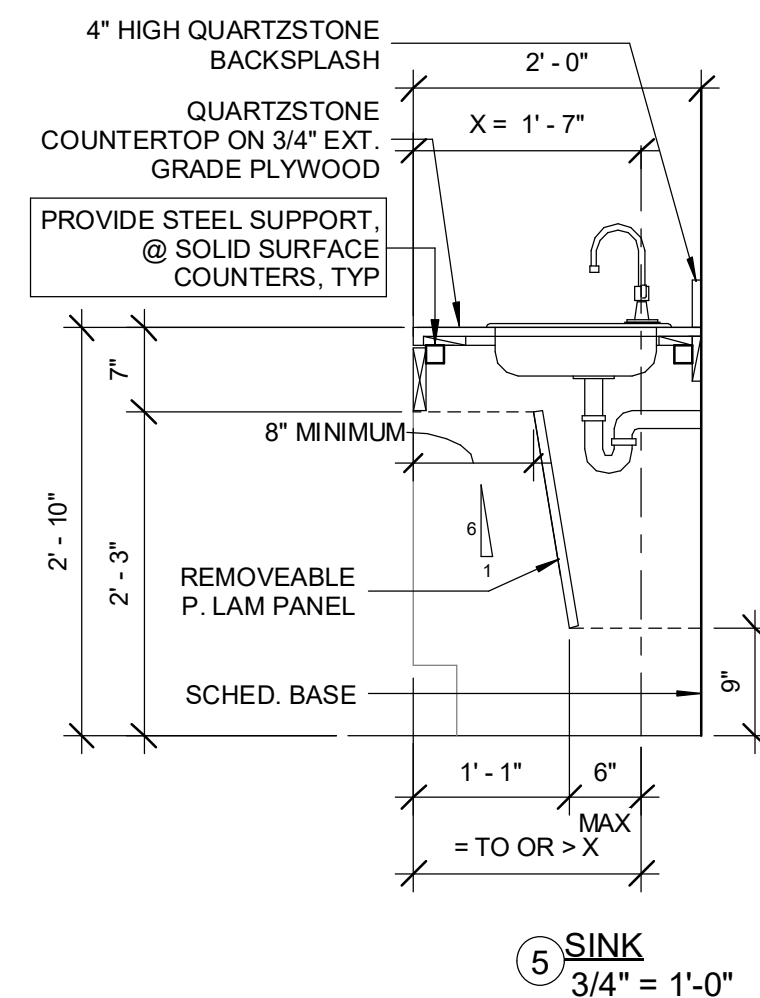
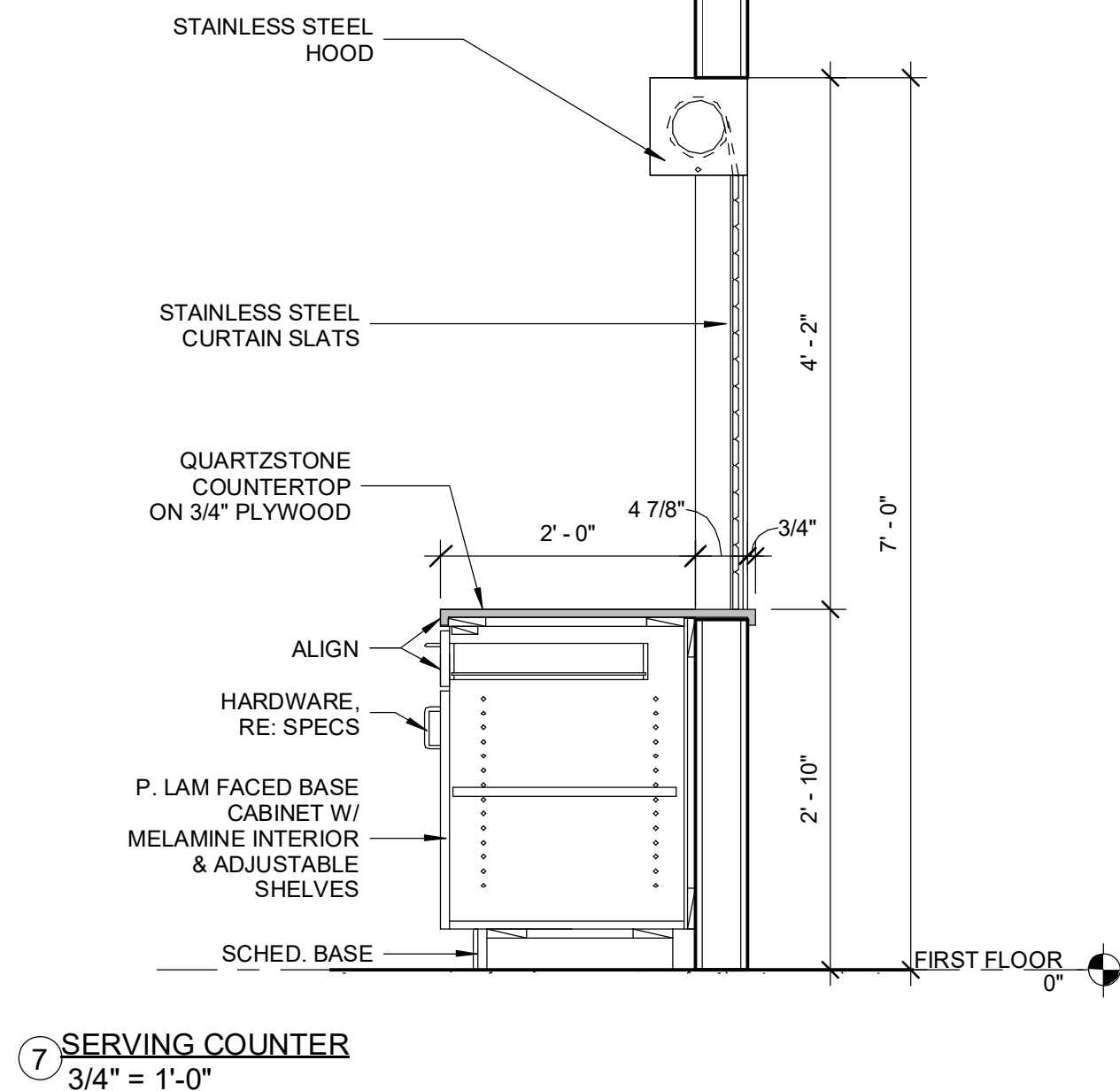
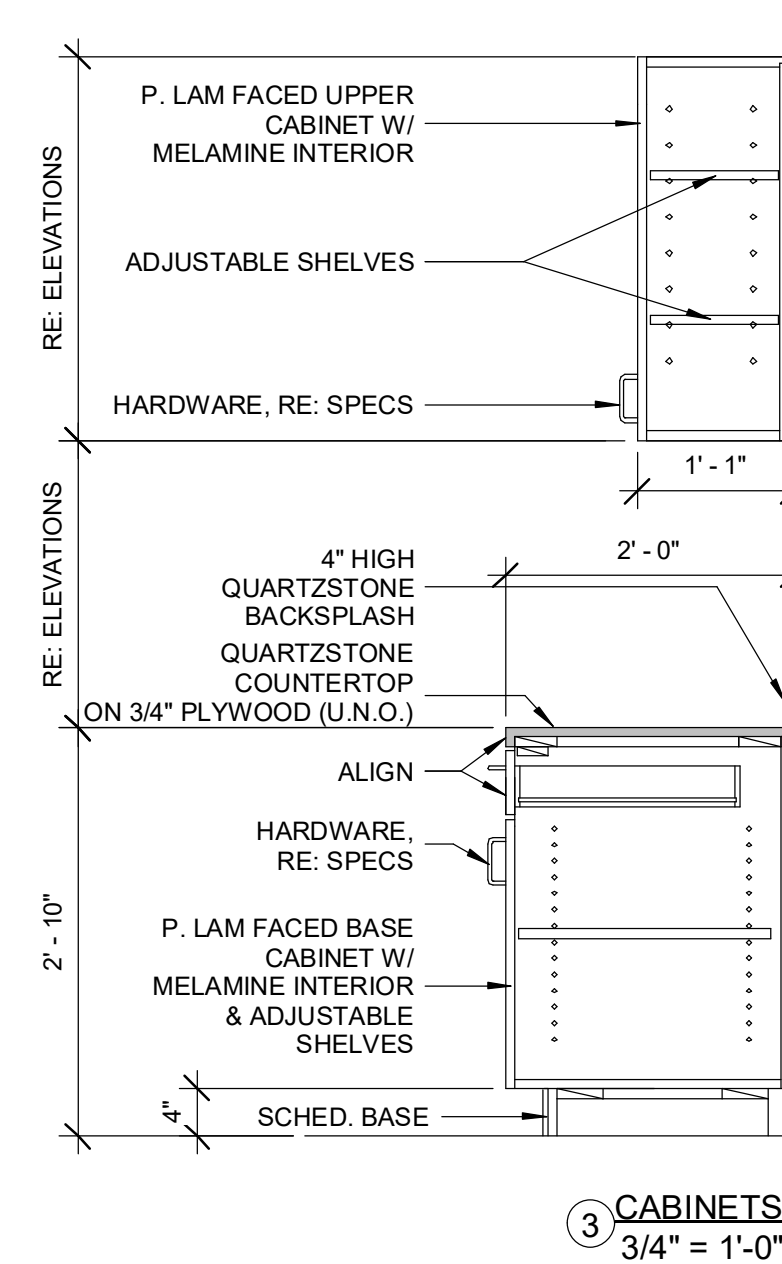
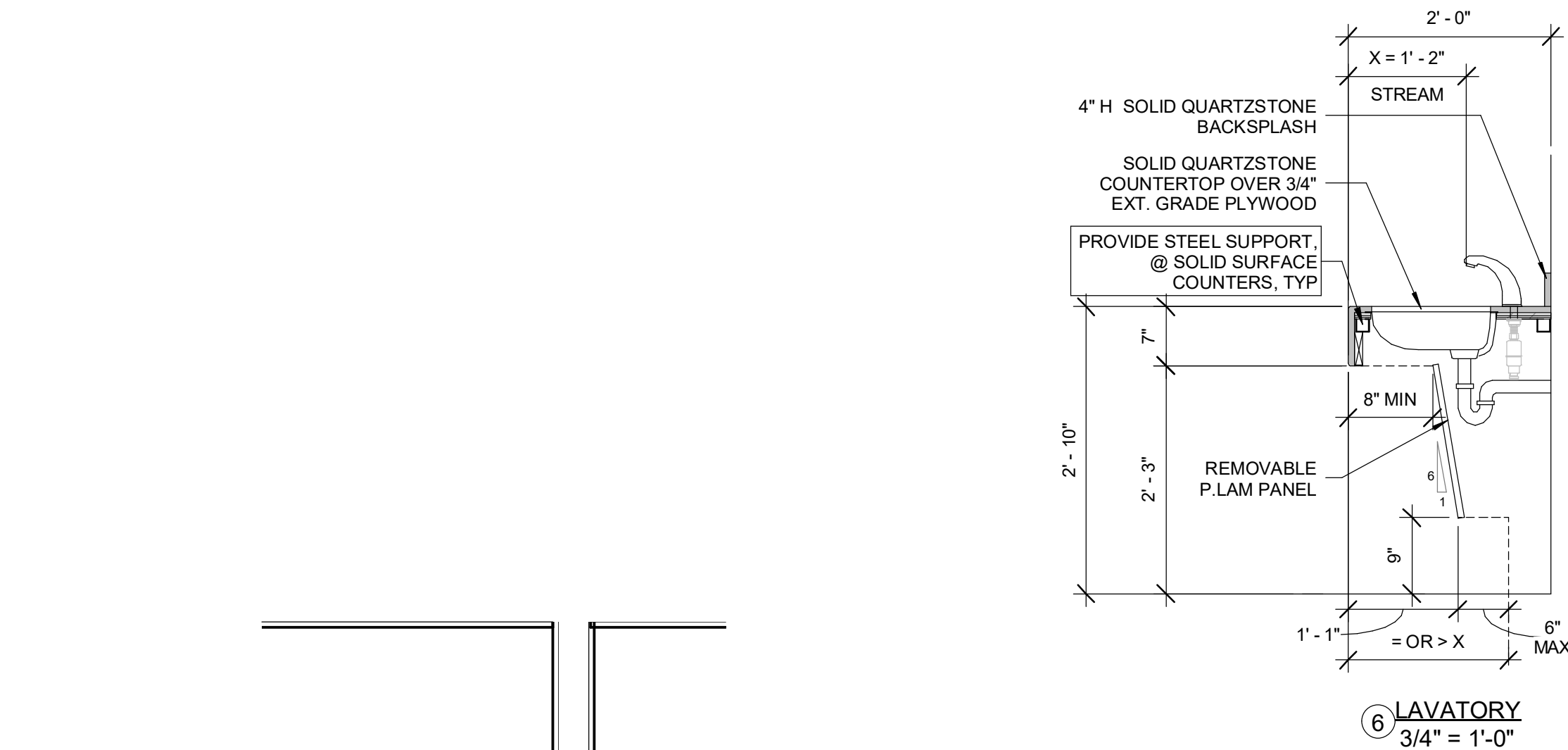
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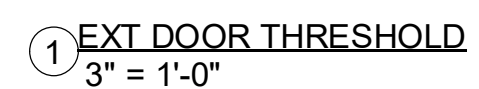
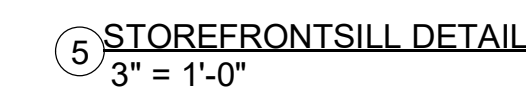
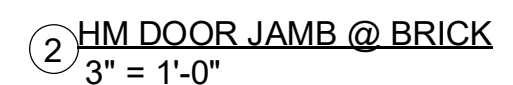
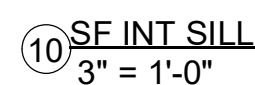
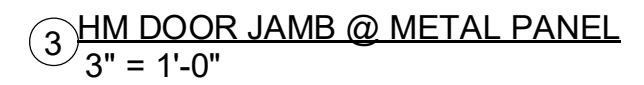
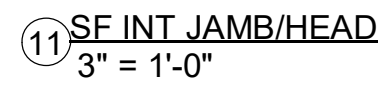


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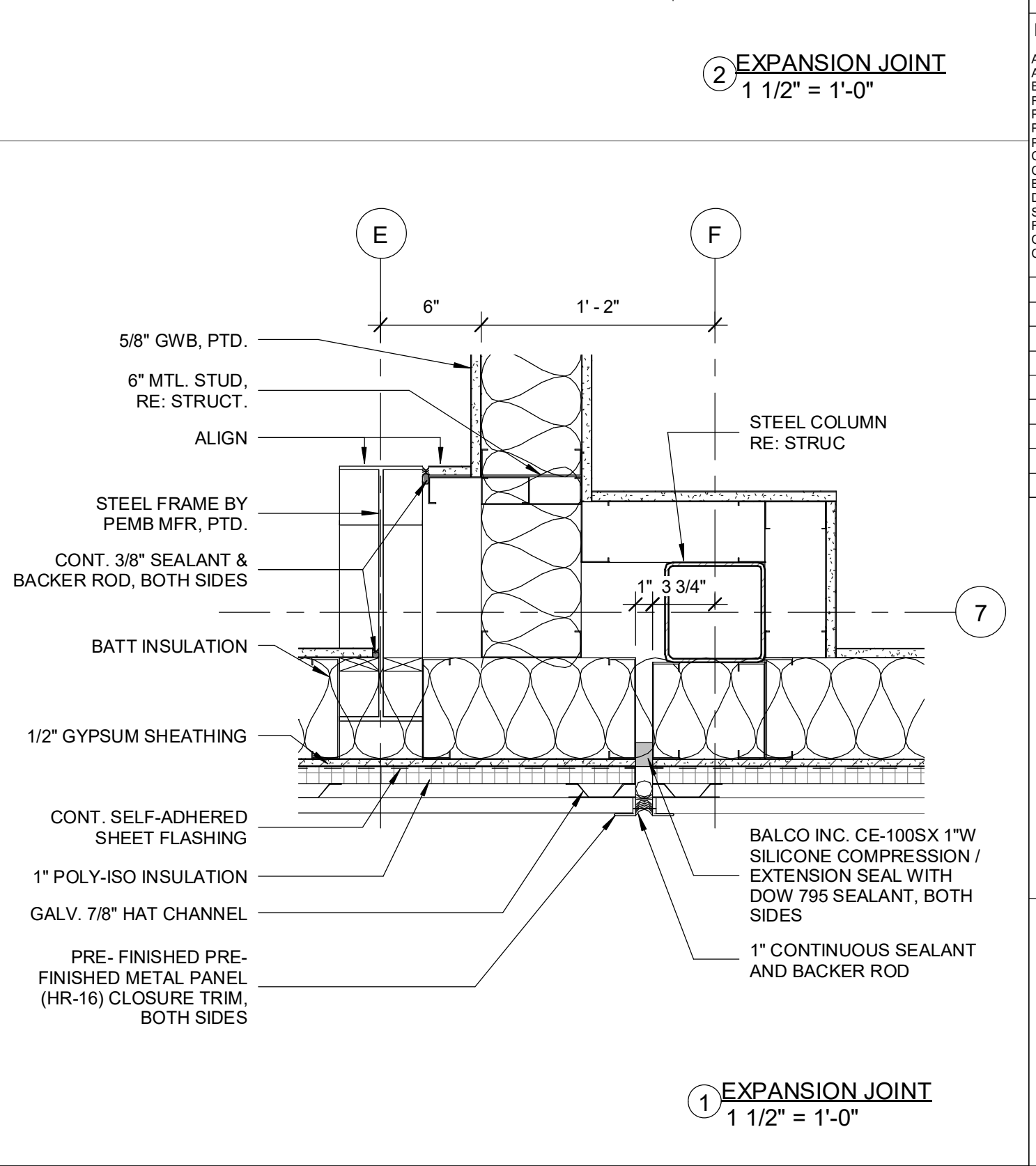
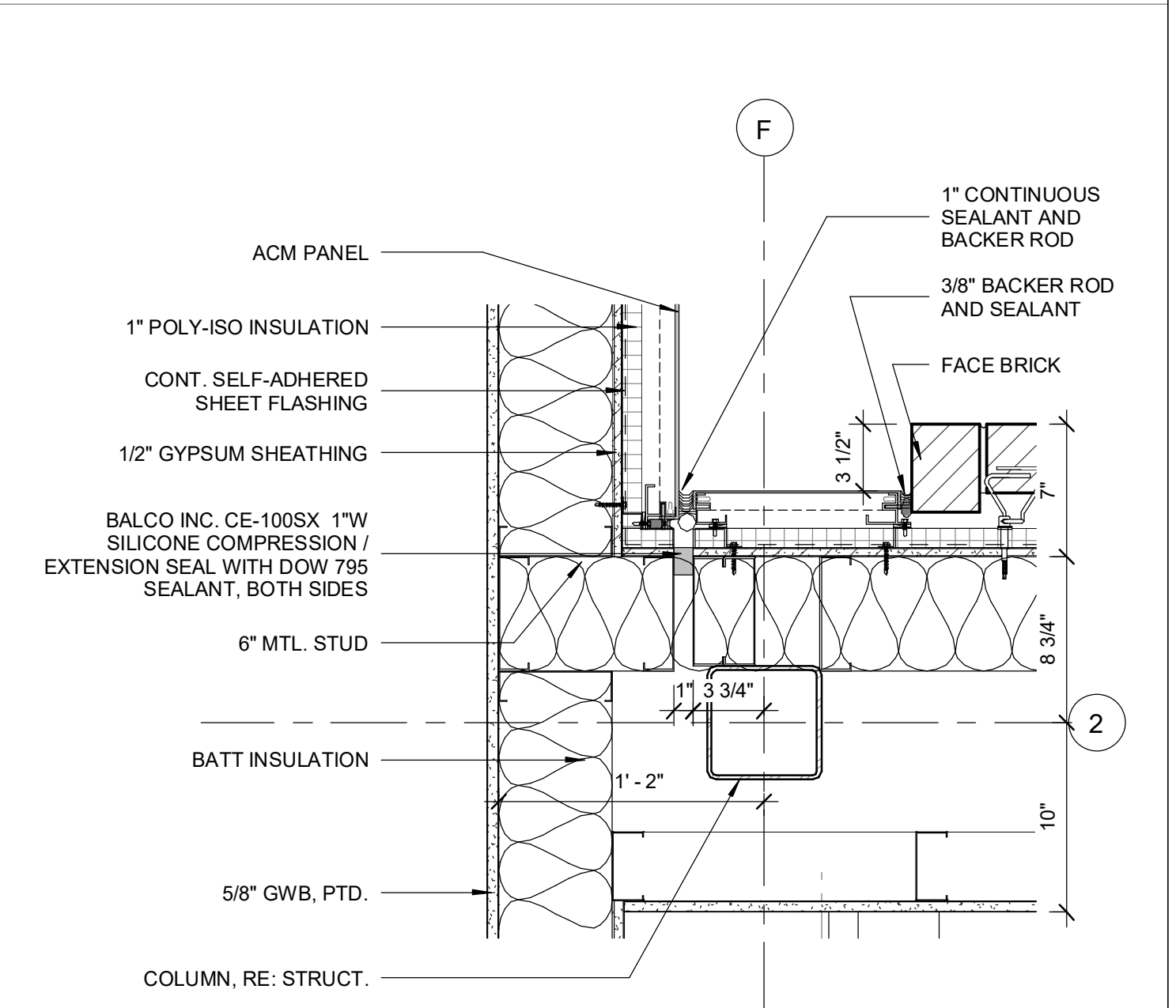
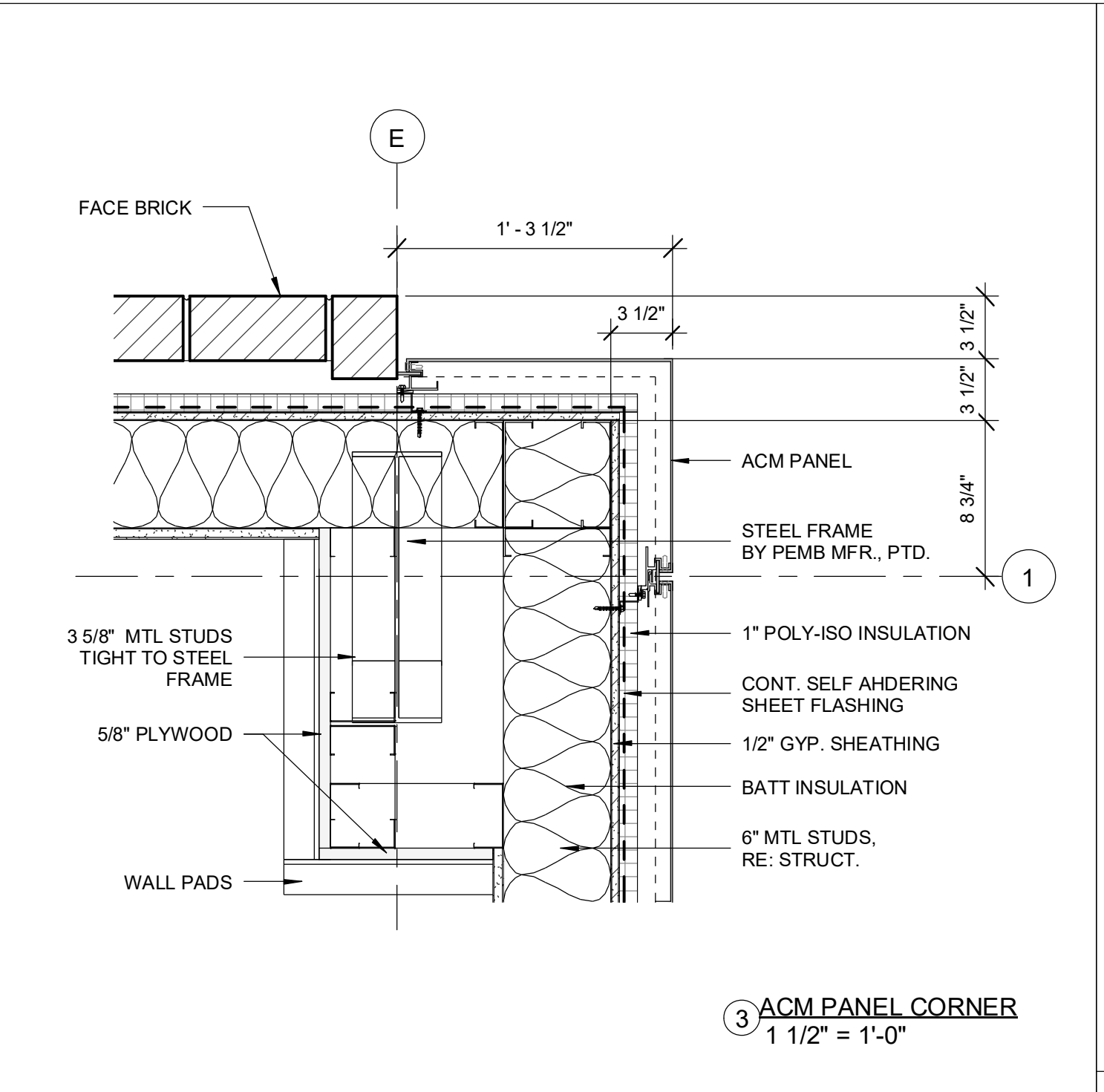
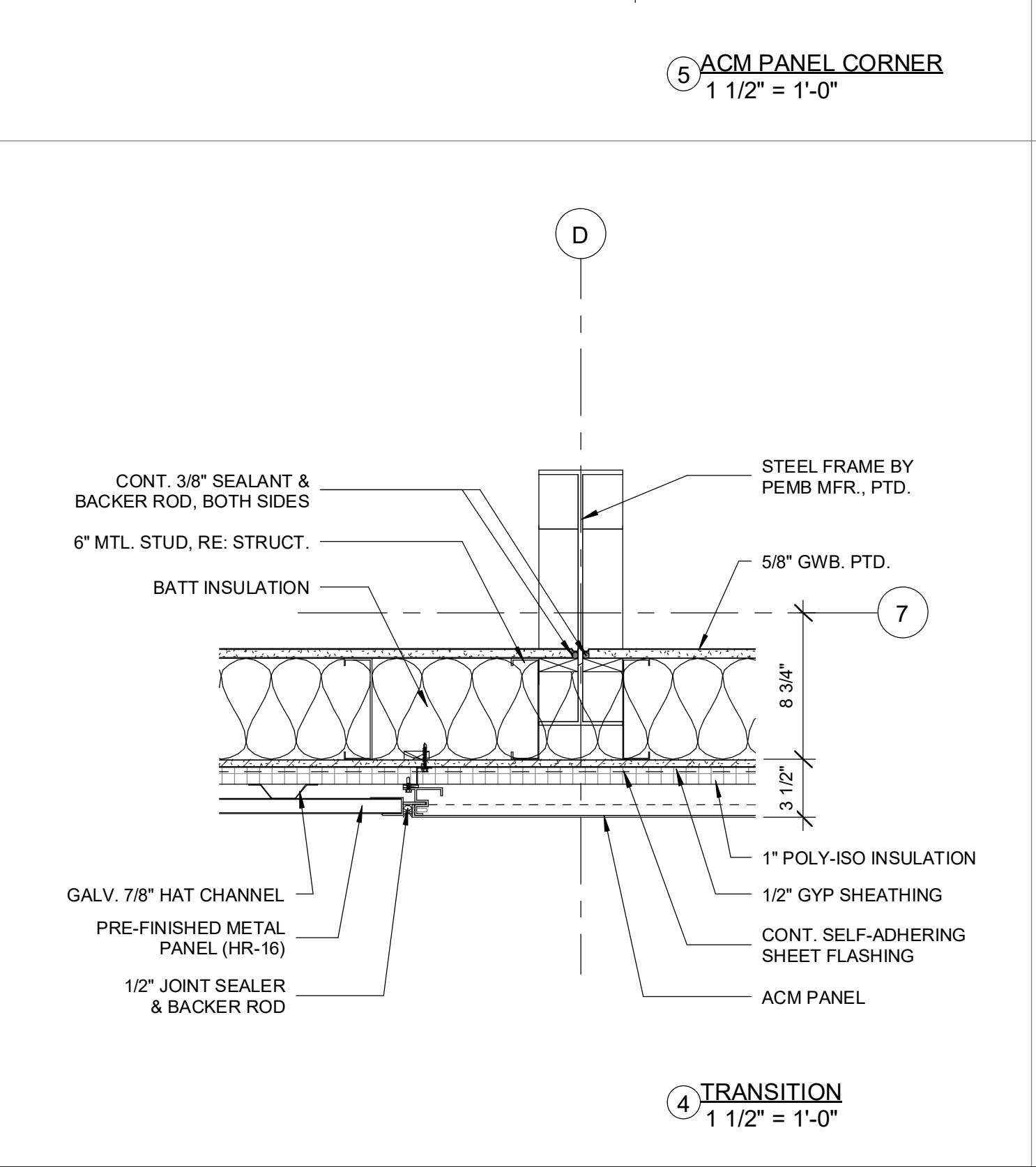
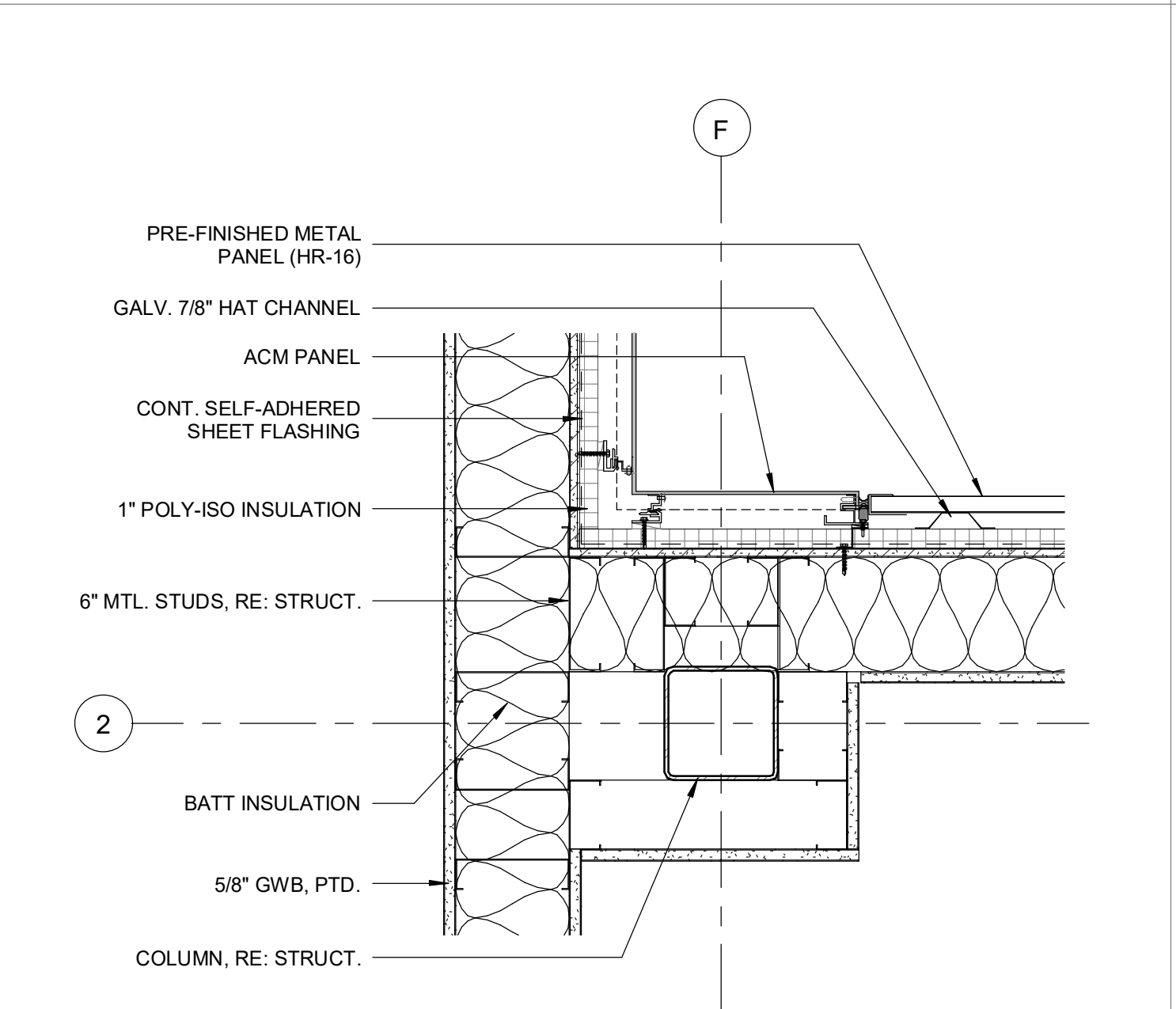
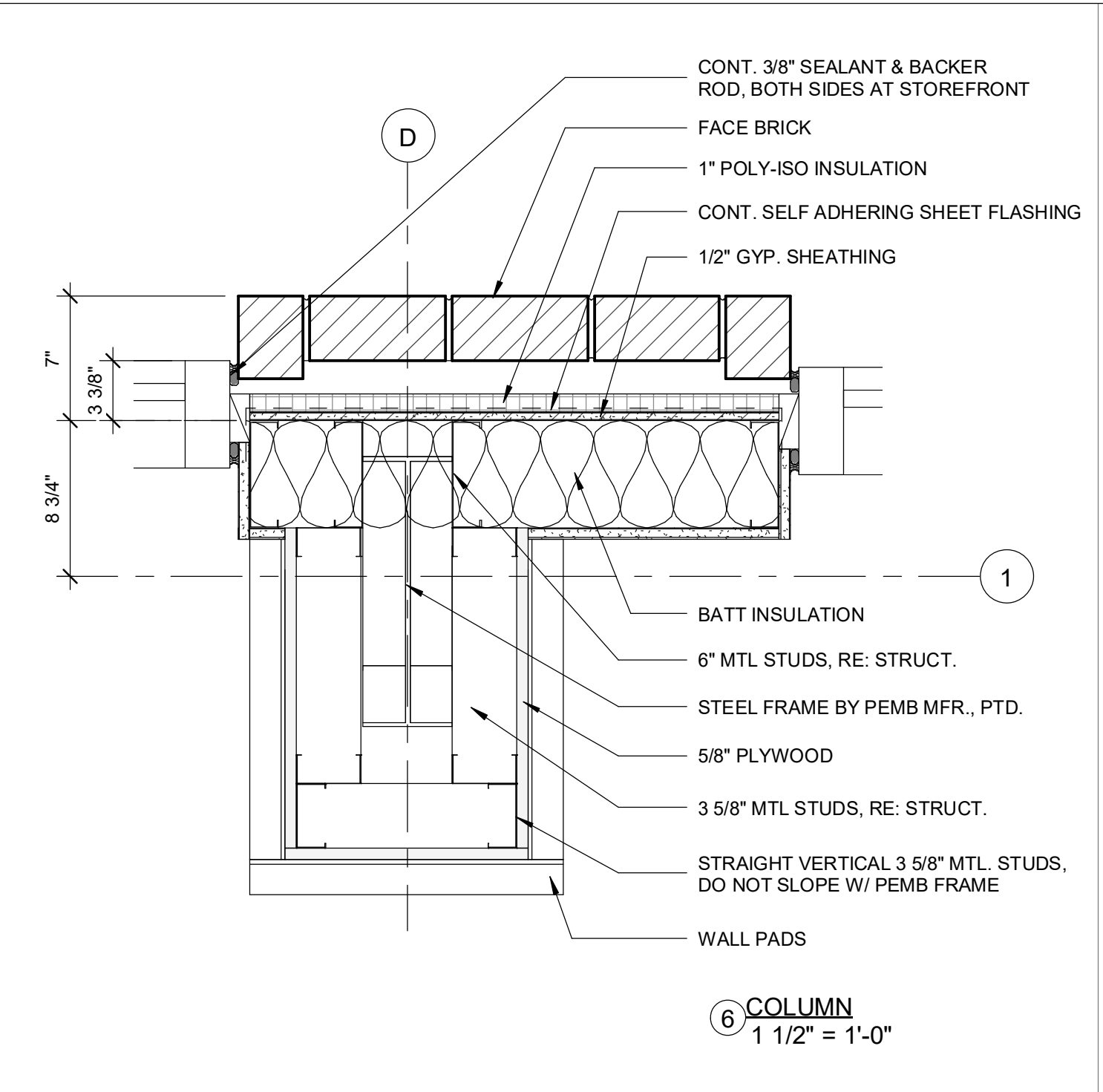
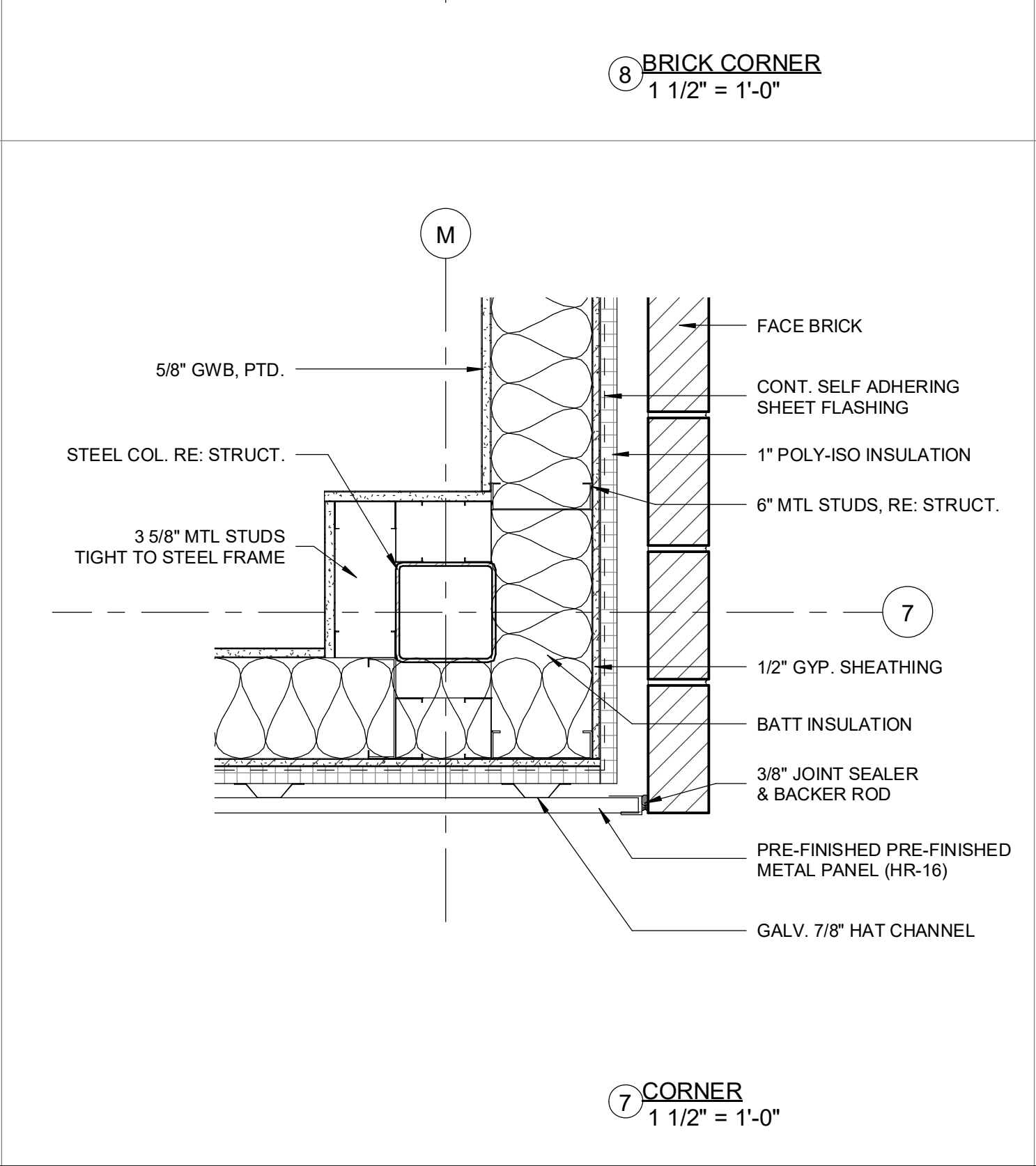
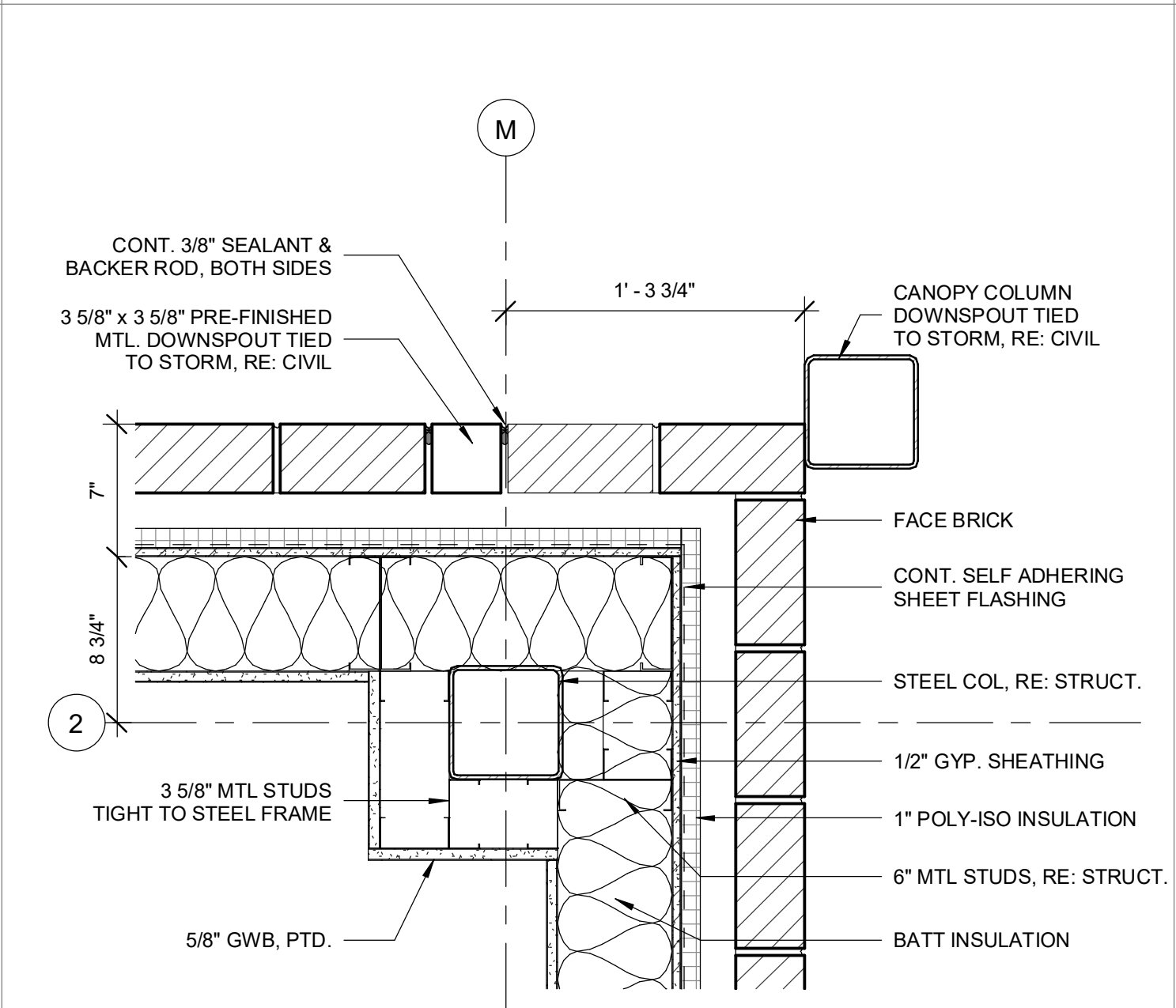
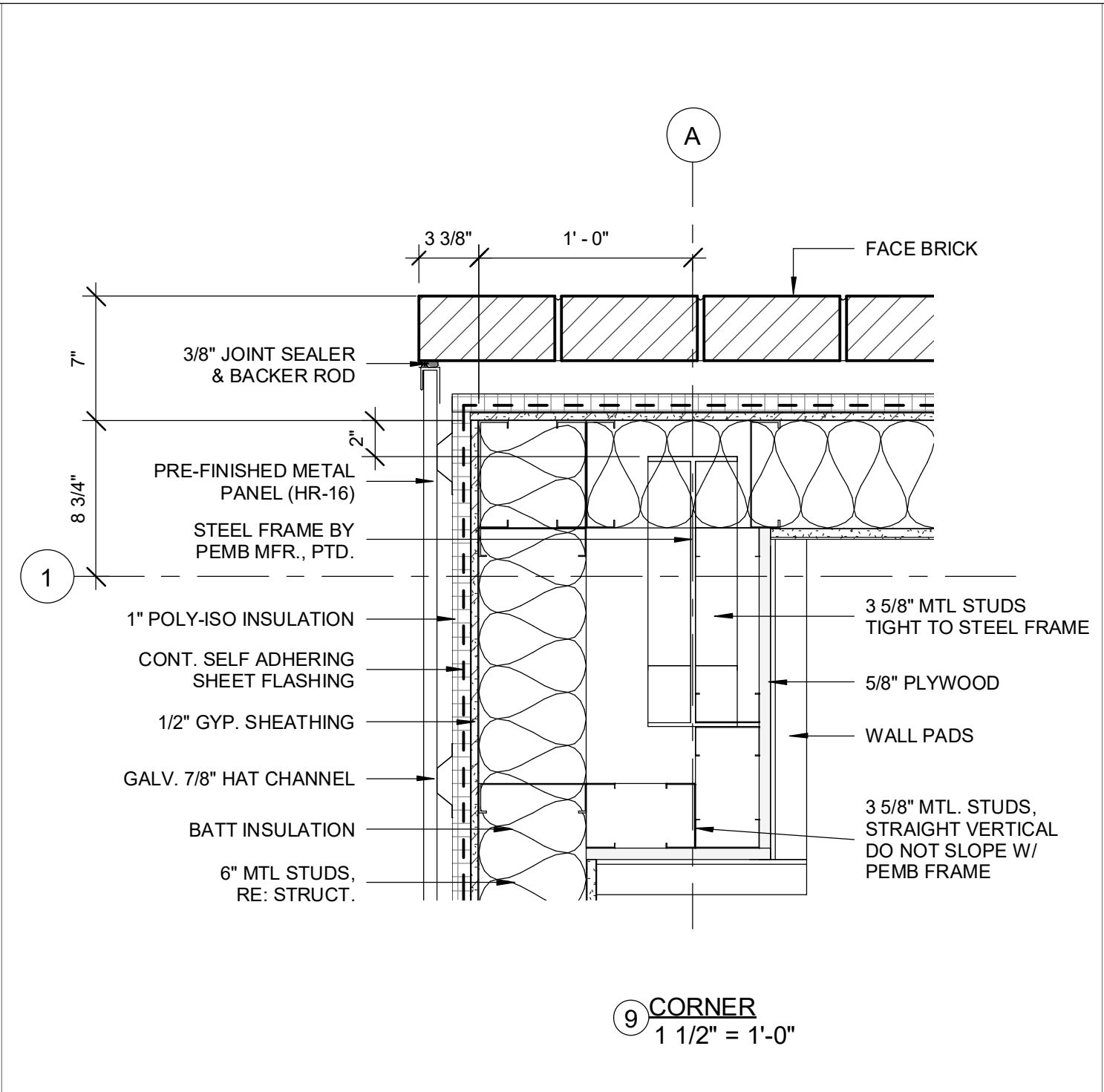
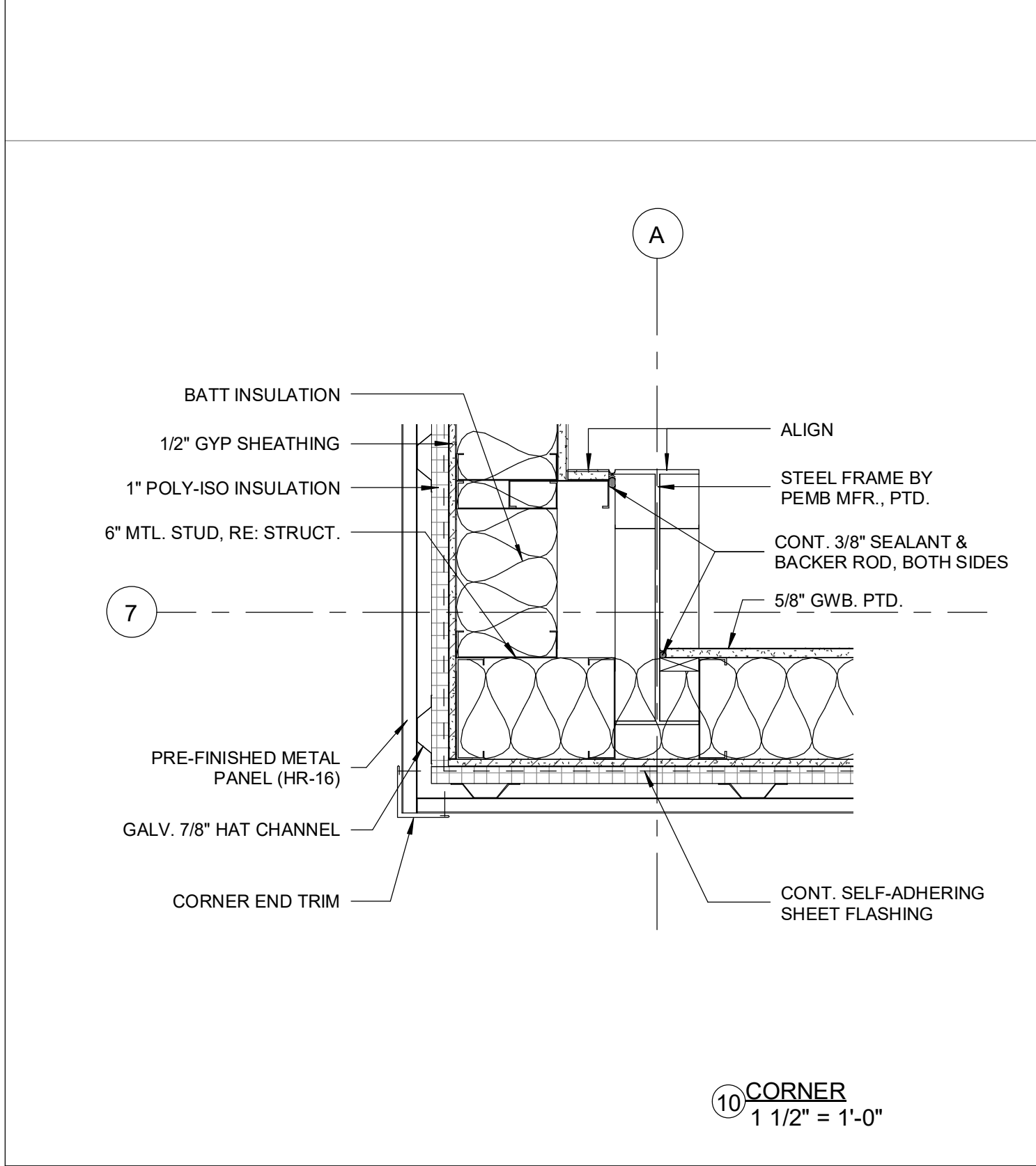
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**INTERIOR ELEVATIONS**

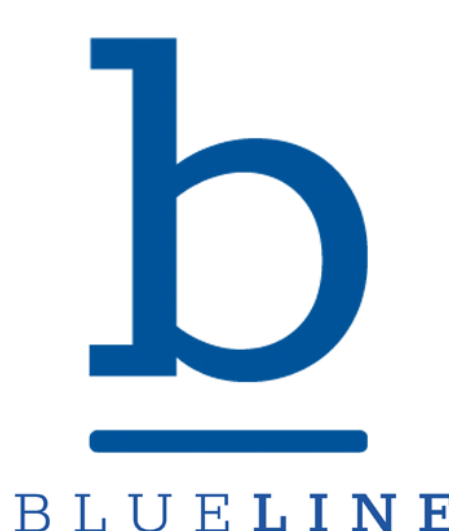












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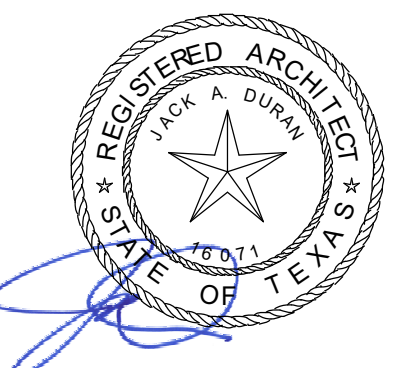
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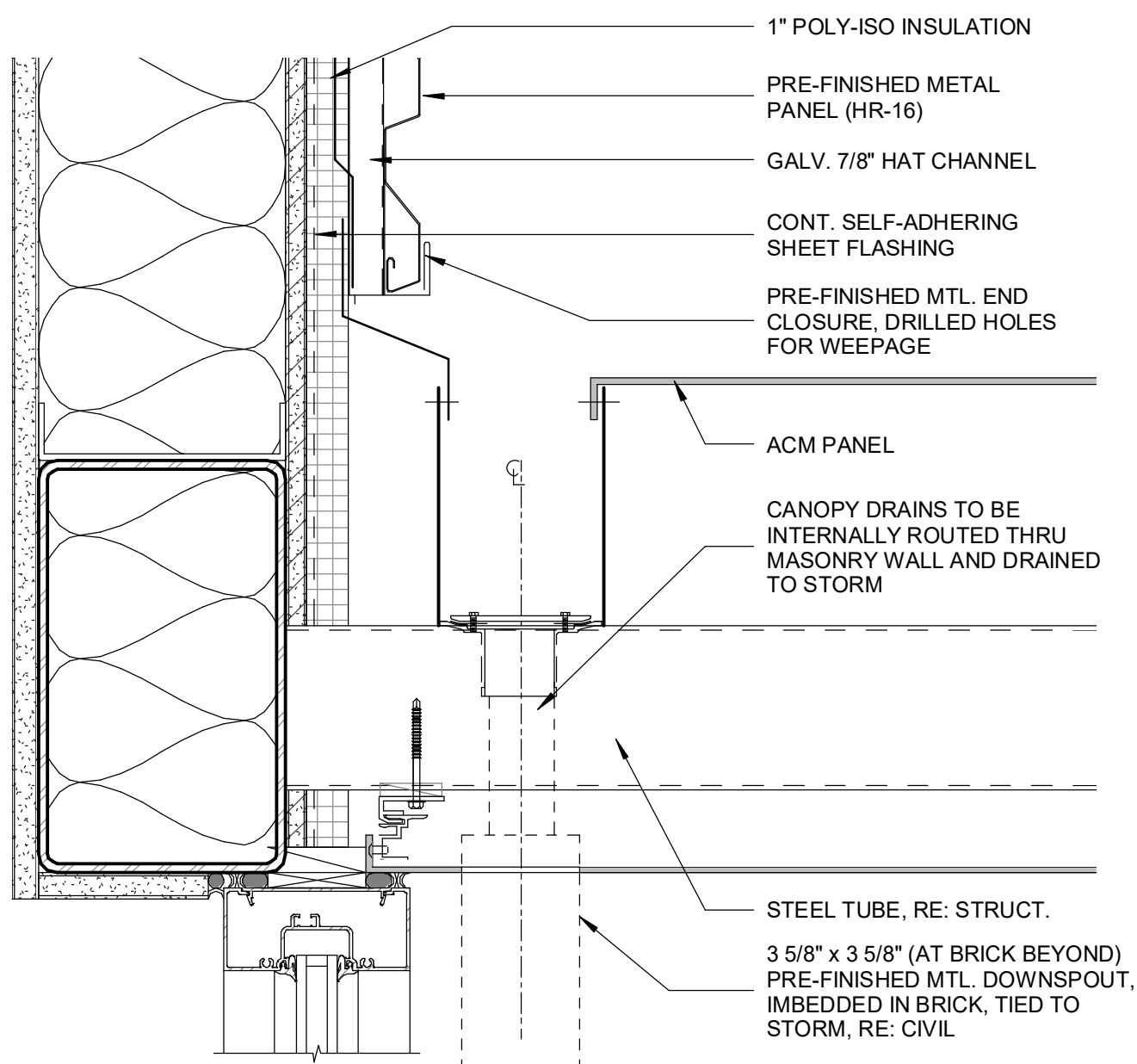
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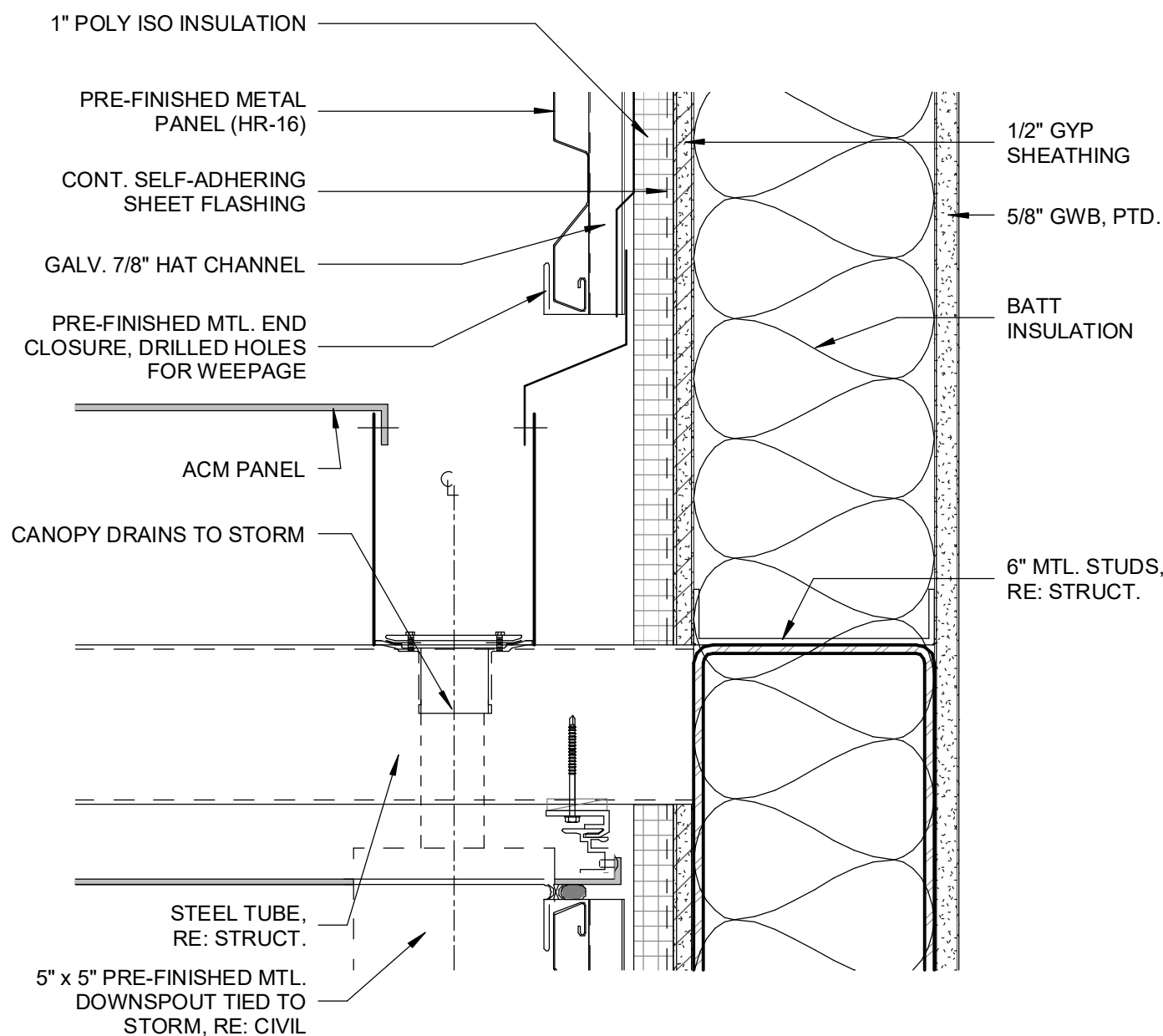
PLAN DETAILS

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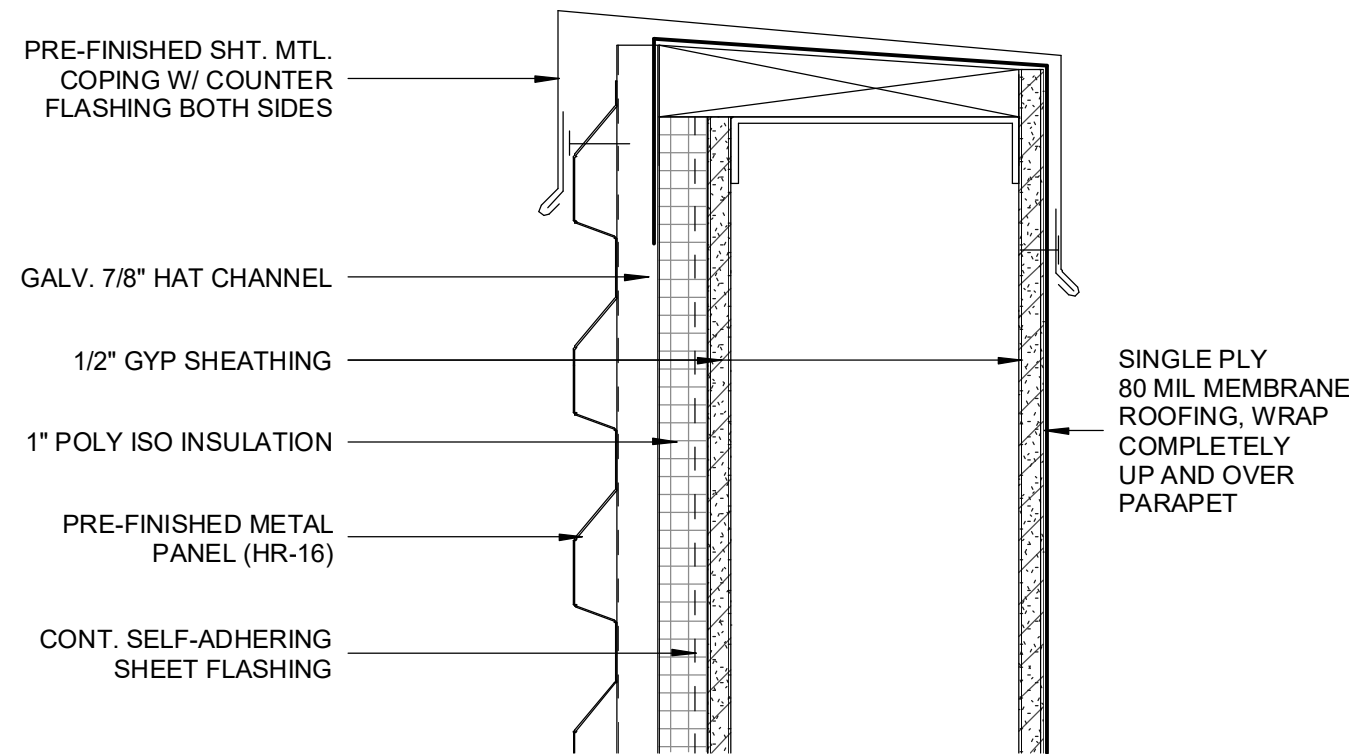




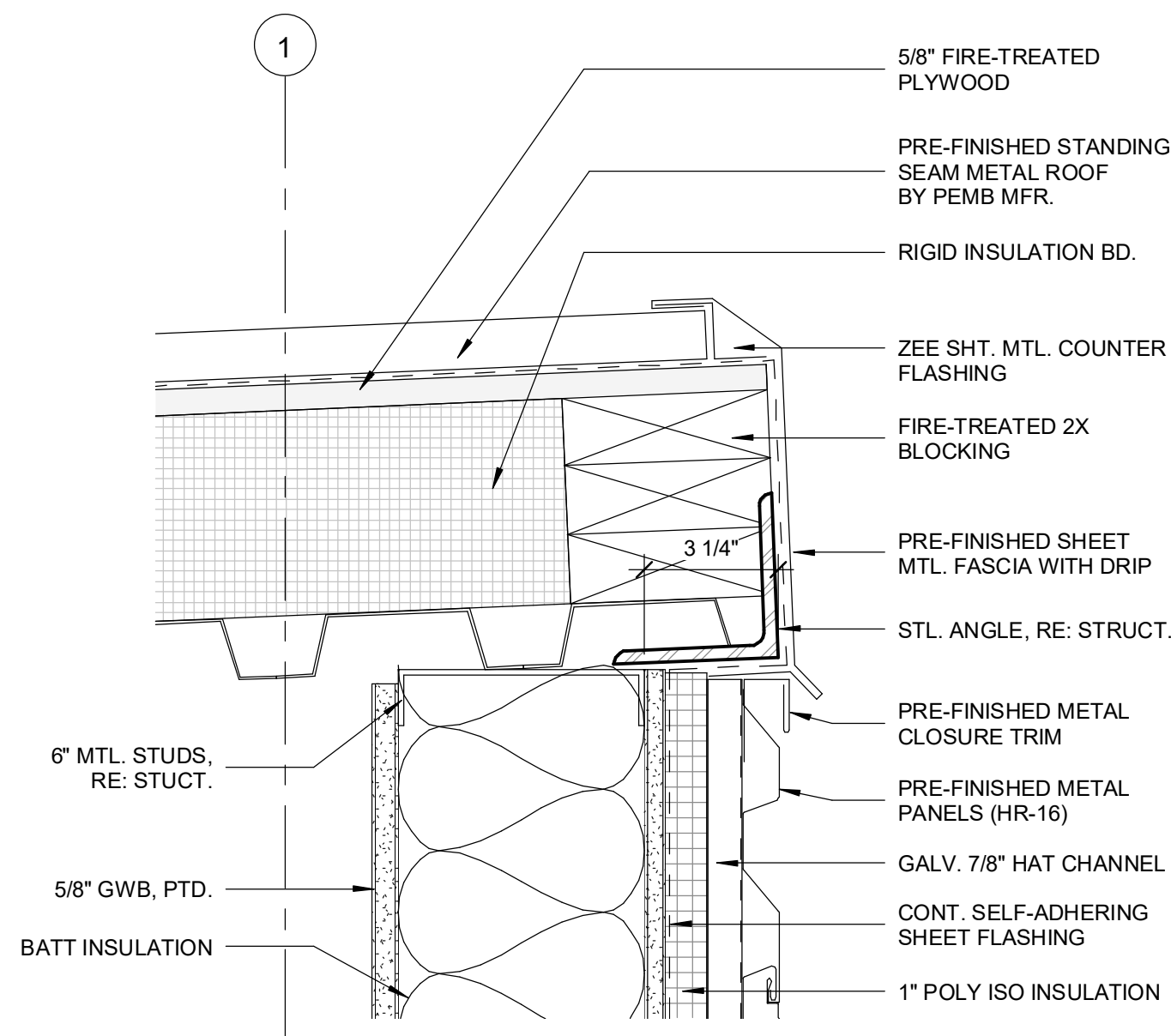
12 CANOPY AT BRICK  
3' = 1'-0"



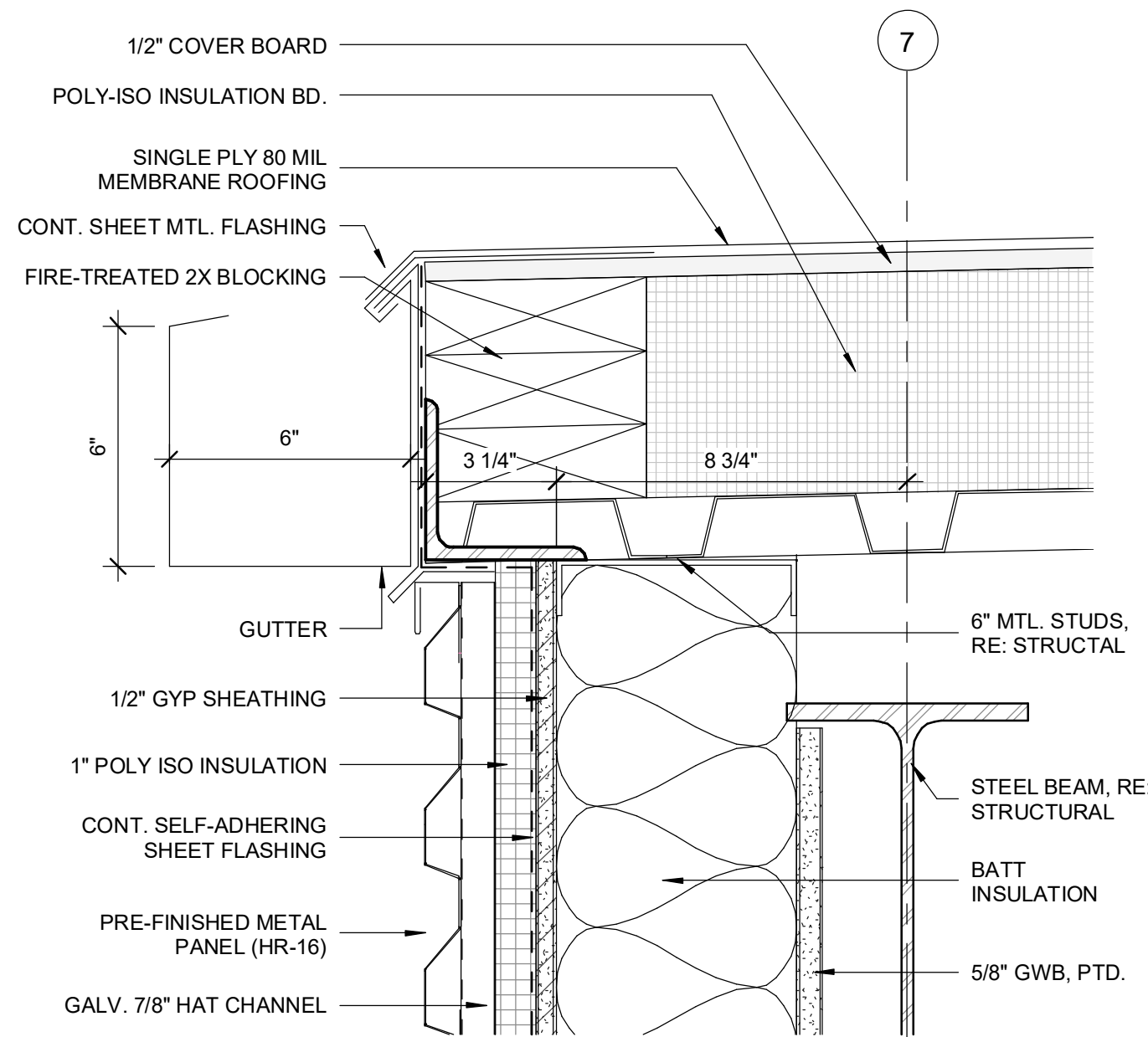
9 CANOPY AT ACM  
3' = 1'-0"



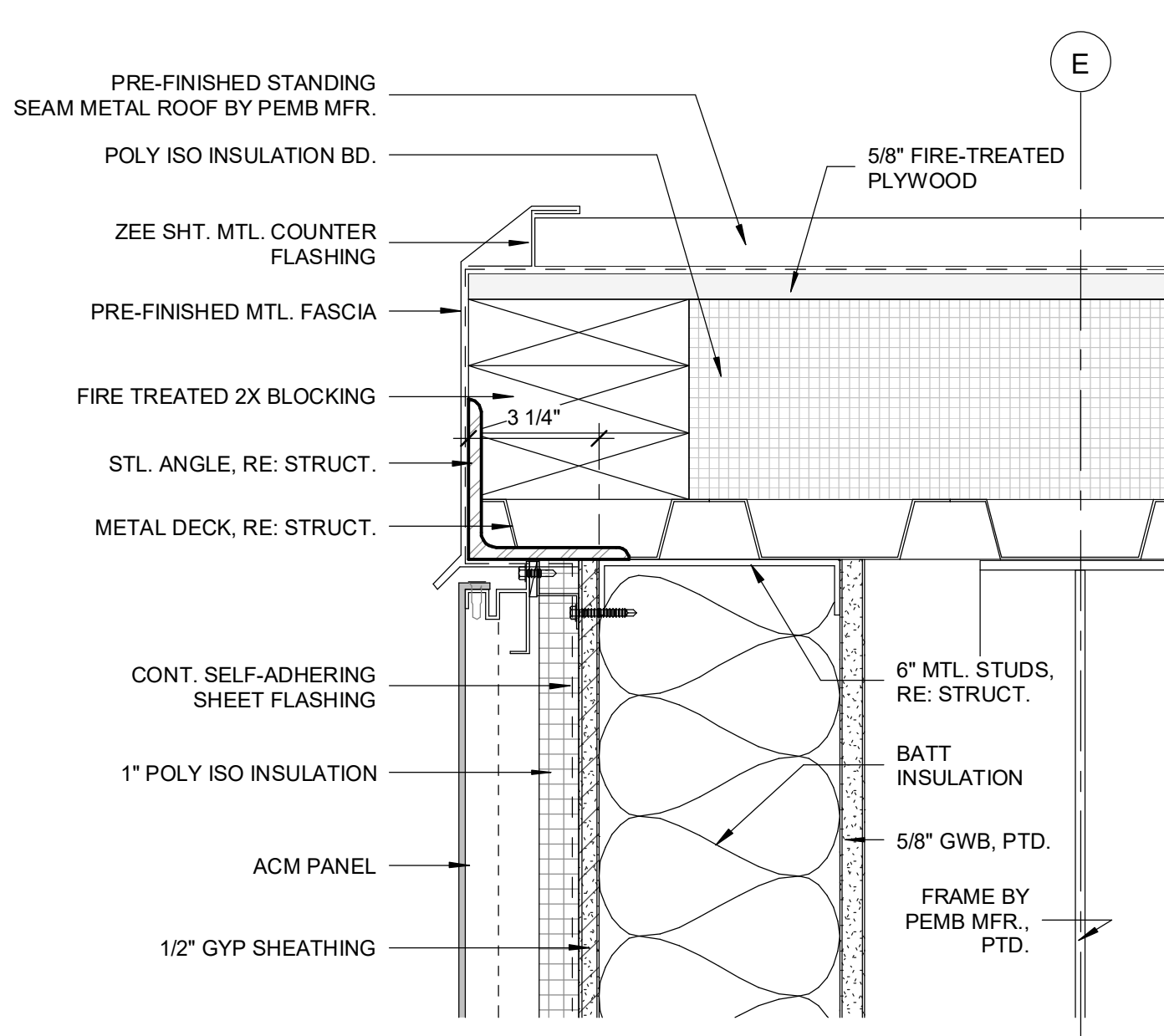
6 PARAPET  
3' = 1'-0"



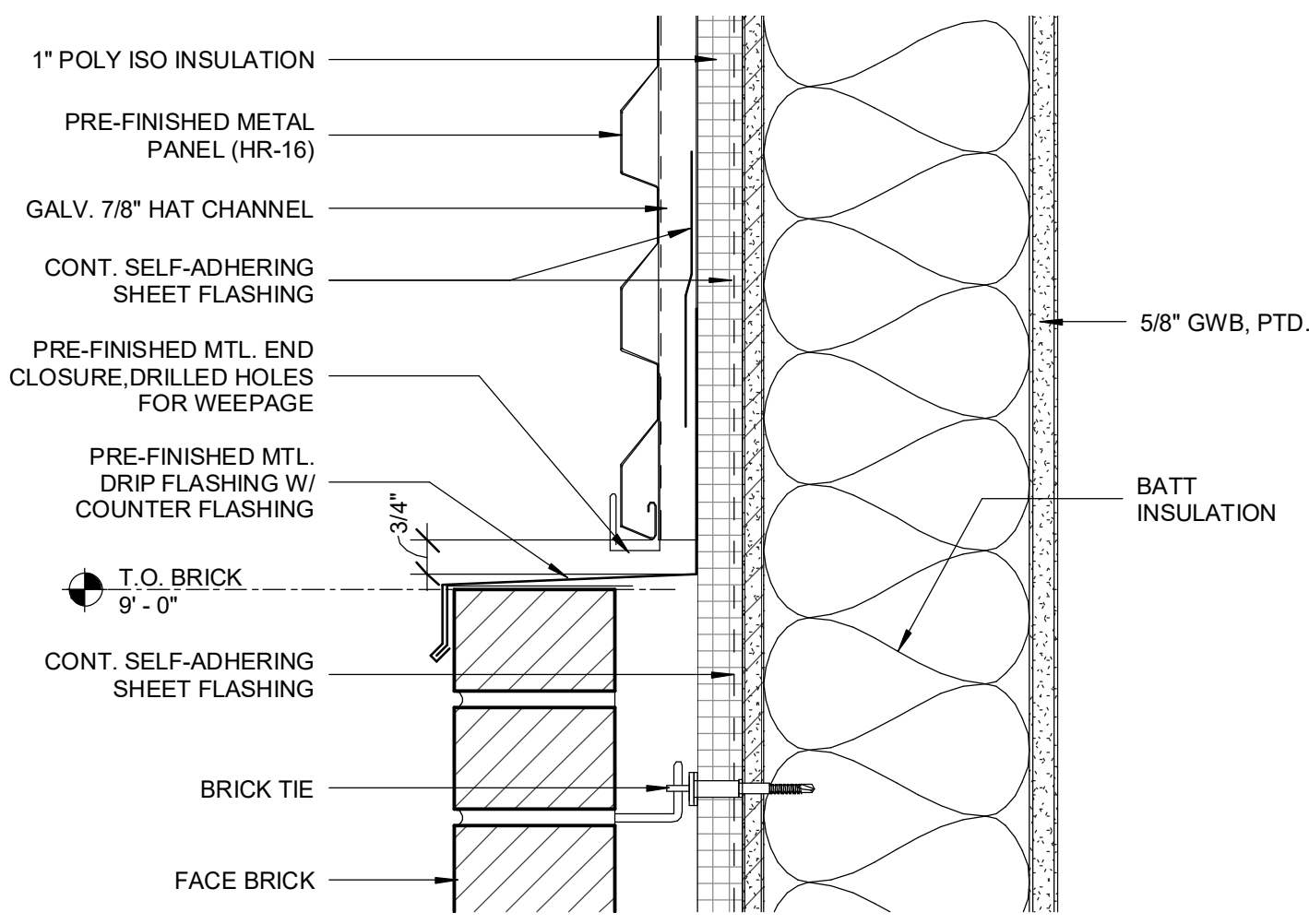
3 GYM HI EAVE  
3' = 1'-0"



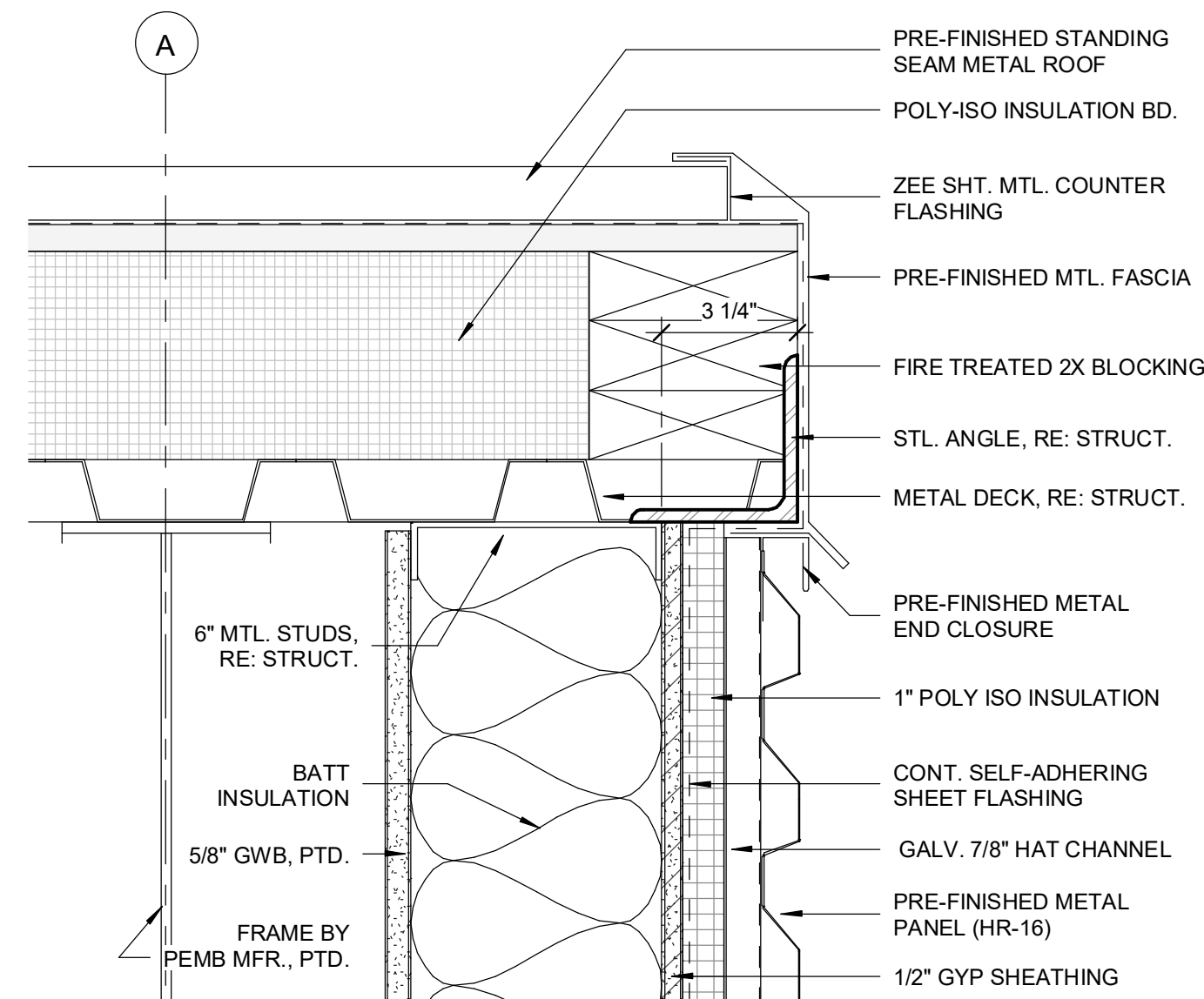
11 GYM LO EAVE  
3' = 1'-0"



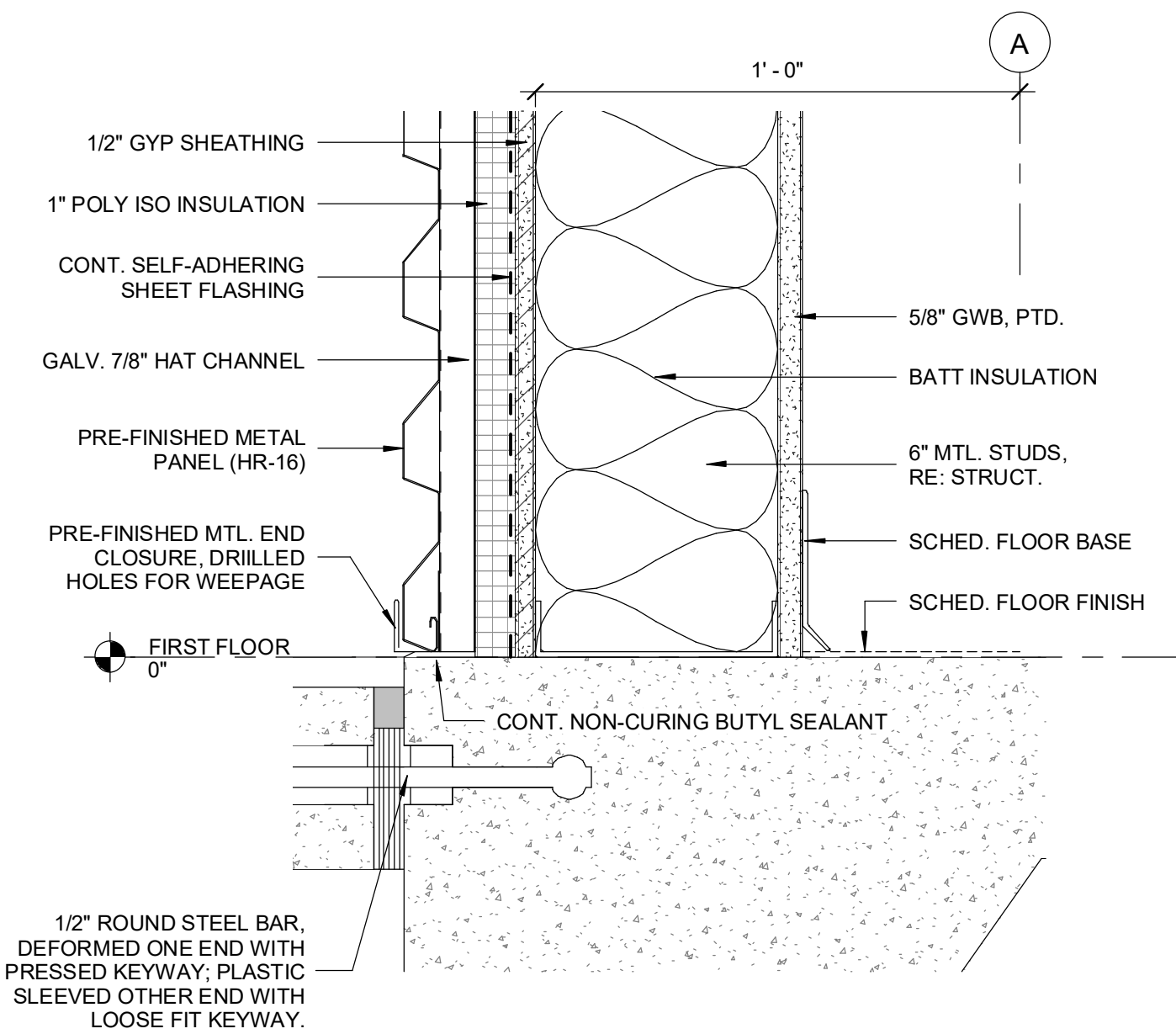
8 SIDE RAKE  
3' = 1'-0"



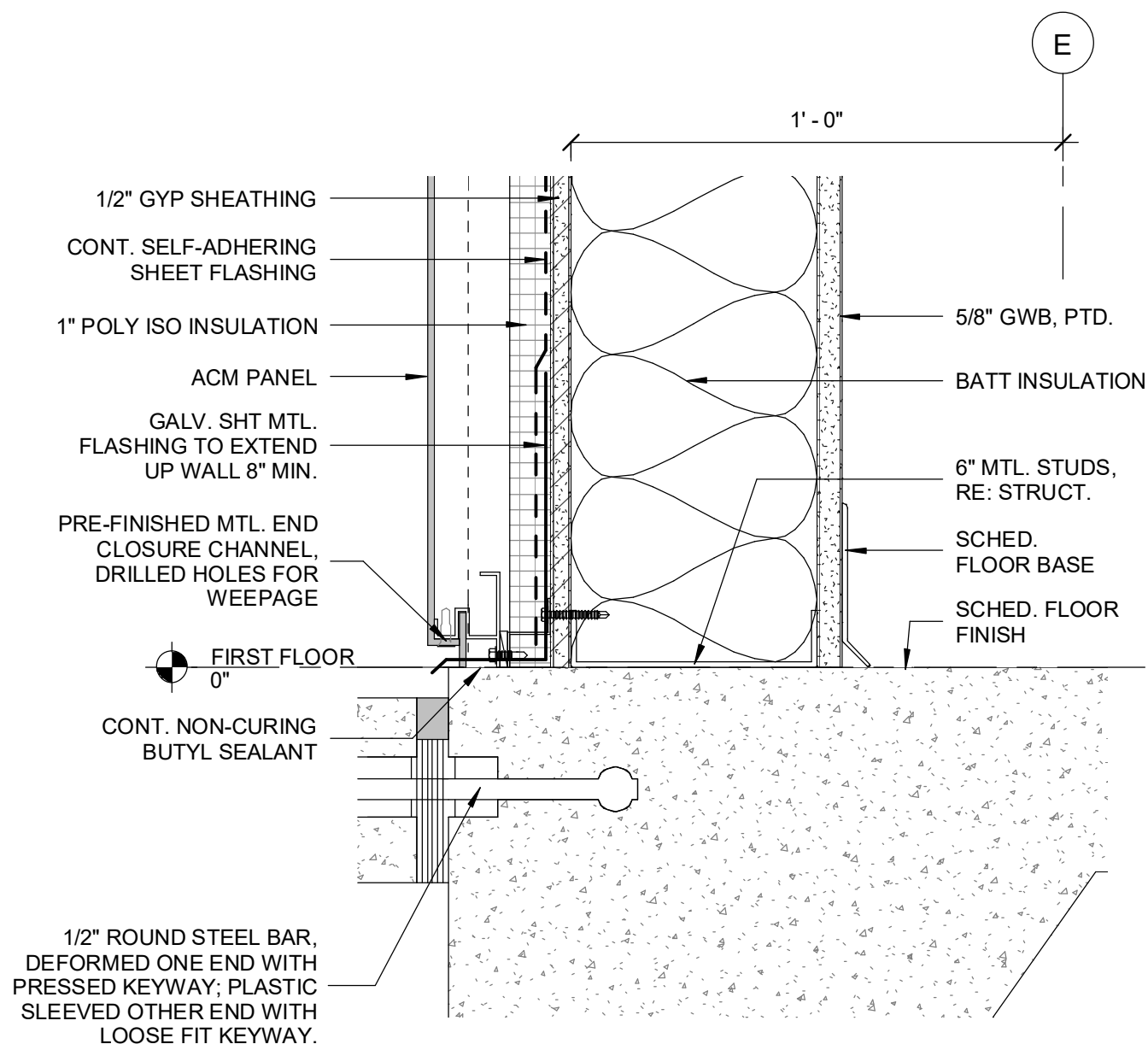
5 BRICK TO METAL PANEL TRANSITION  
3' = 1'-0"



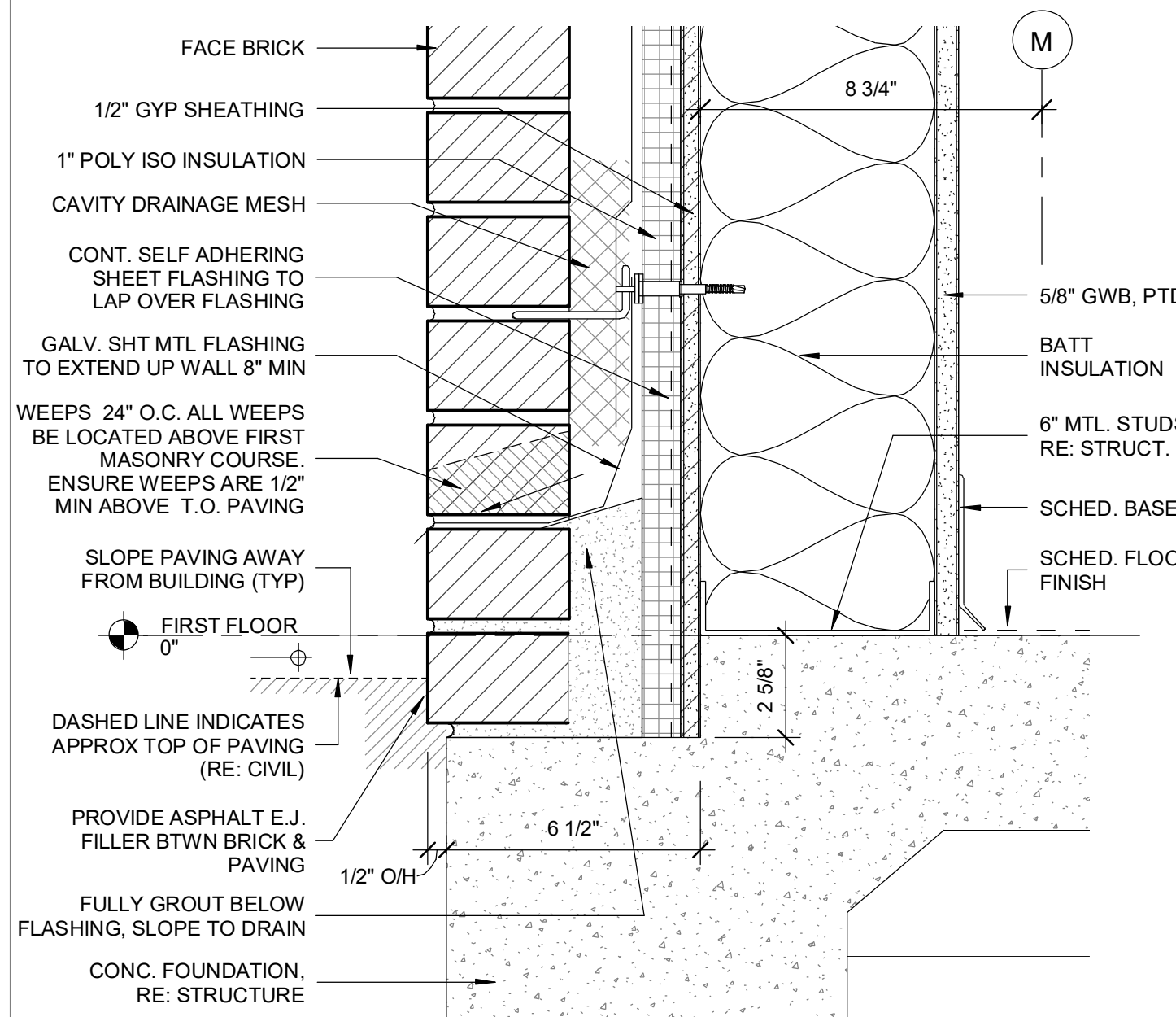
2 GYM SIDE RAKE  
3' = 1'-0"



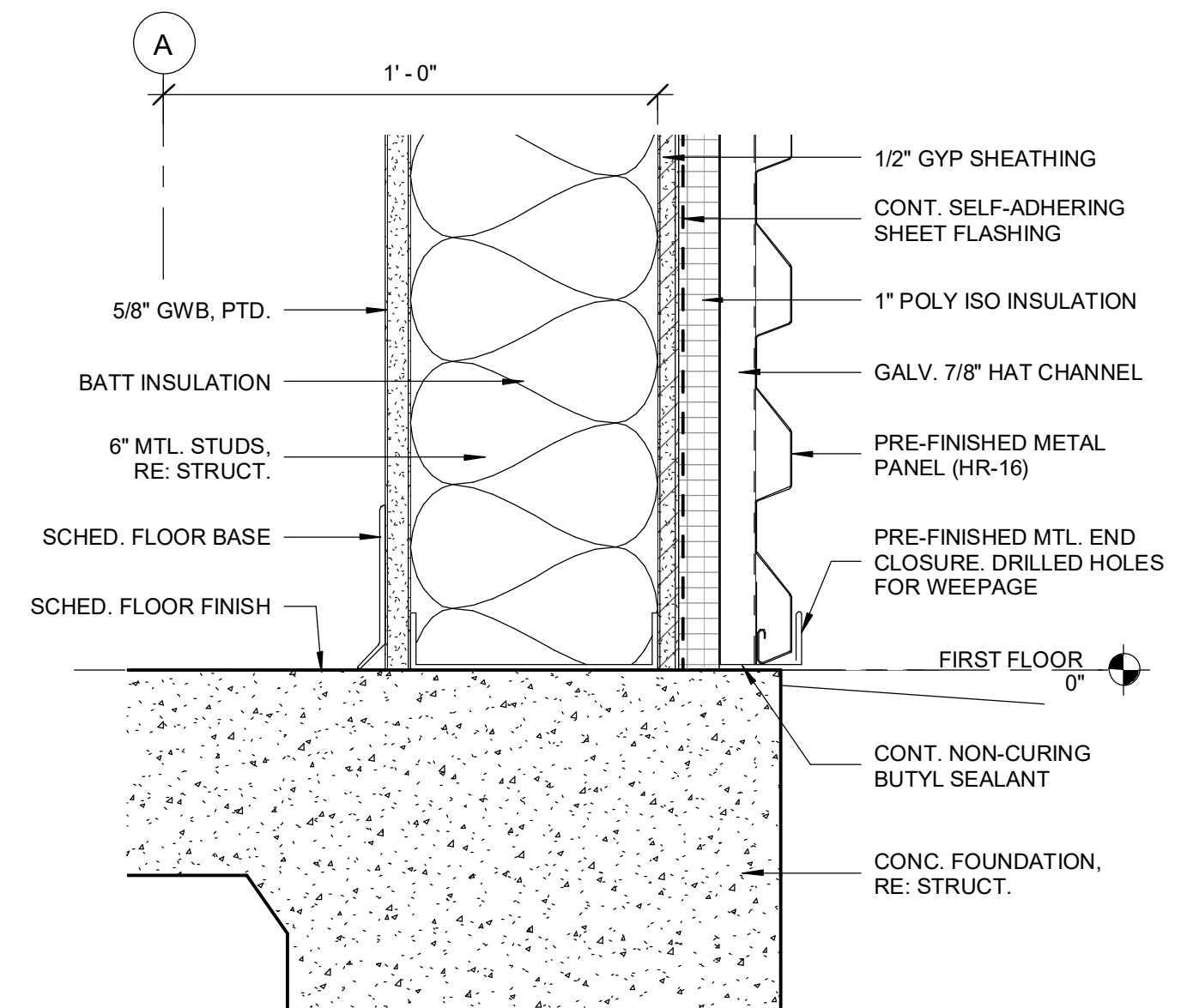
10 MTL PANEL BASE  
3' = 1'-0"



7 ACM BASE  
3' = 1'-0"



4 TYPICAL BRICK LEDGE  
3' = 1'-0"



1 METAL PANEL BASE  
3' = 1'-0"

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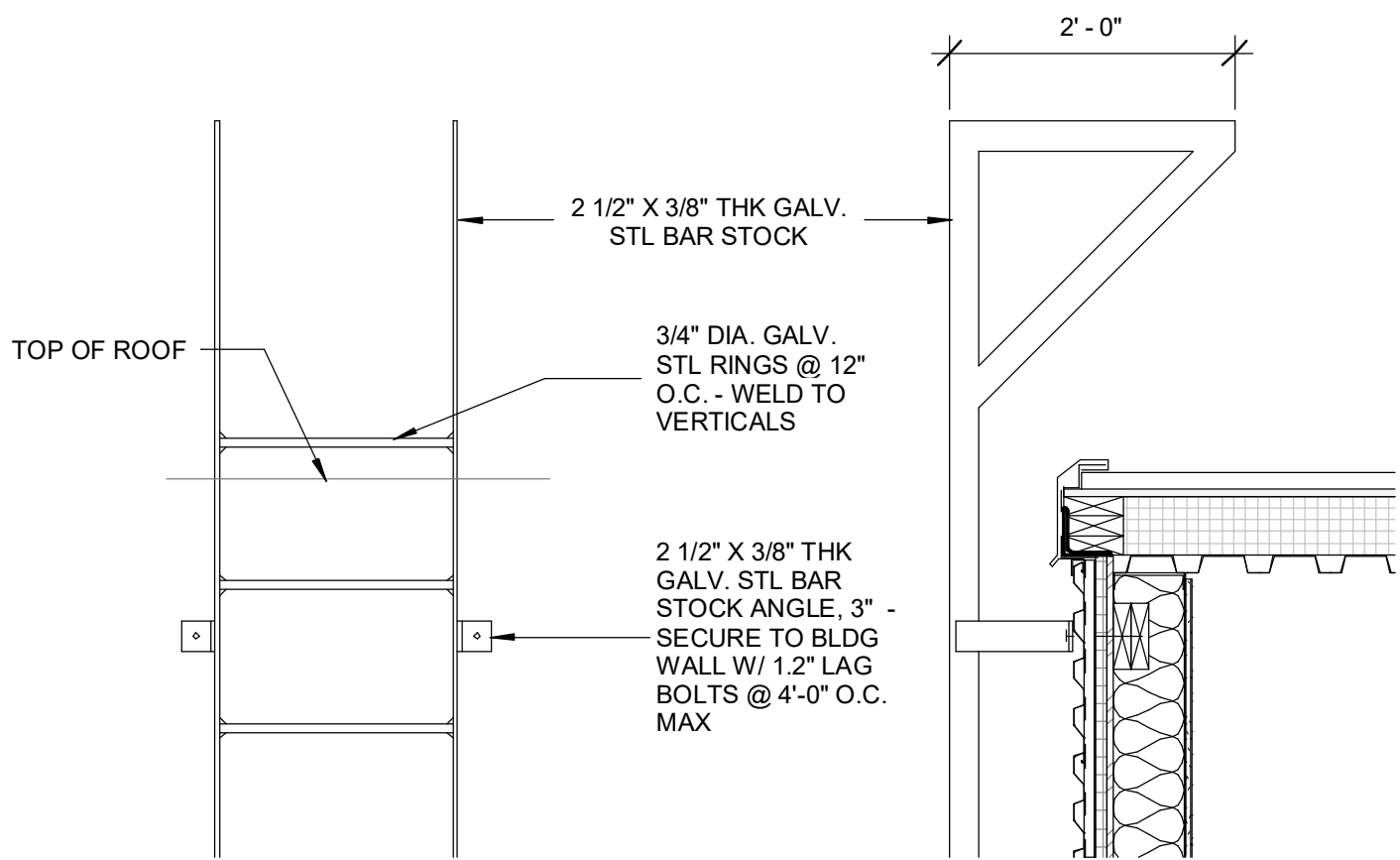
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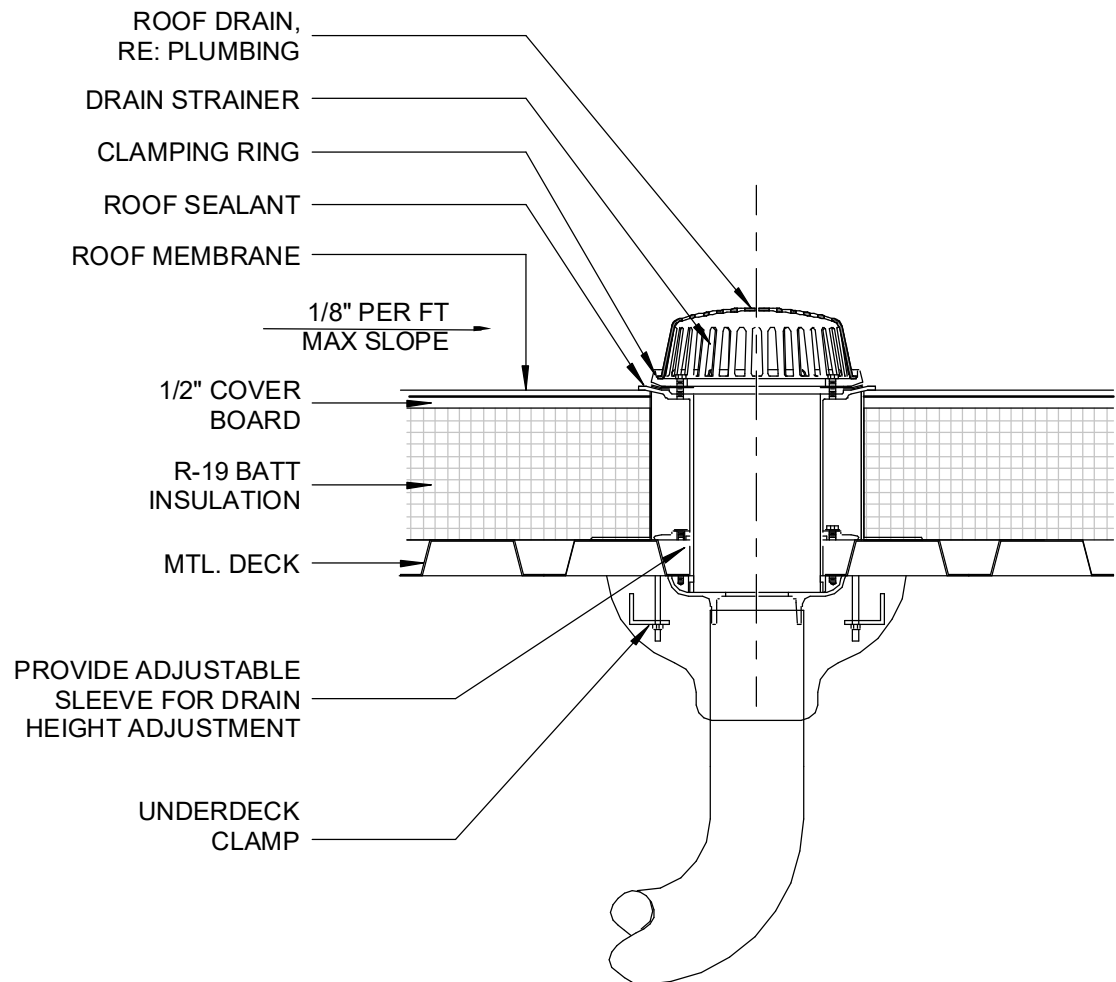
**A9.3**

**SECTION  
DETAILS**

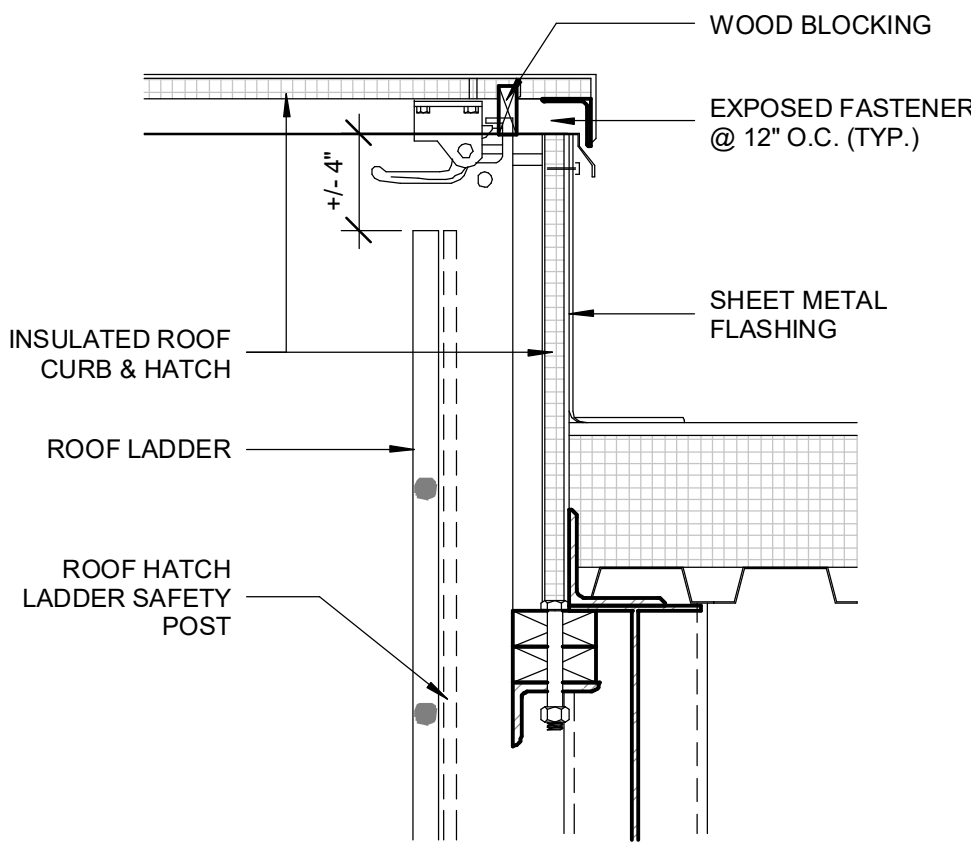




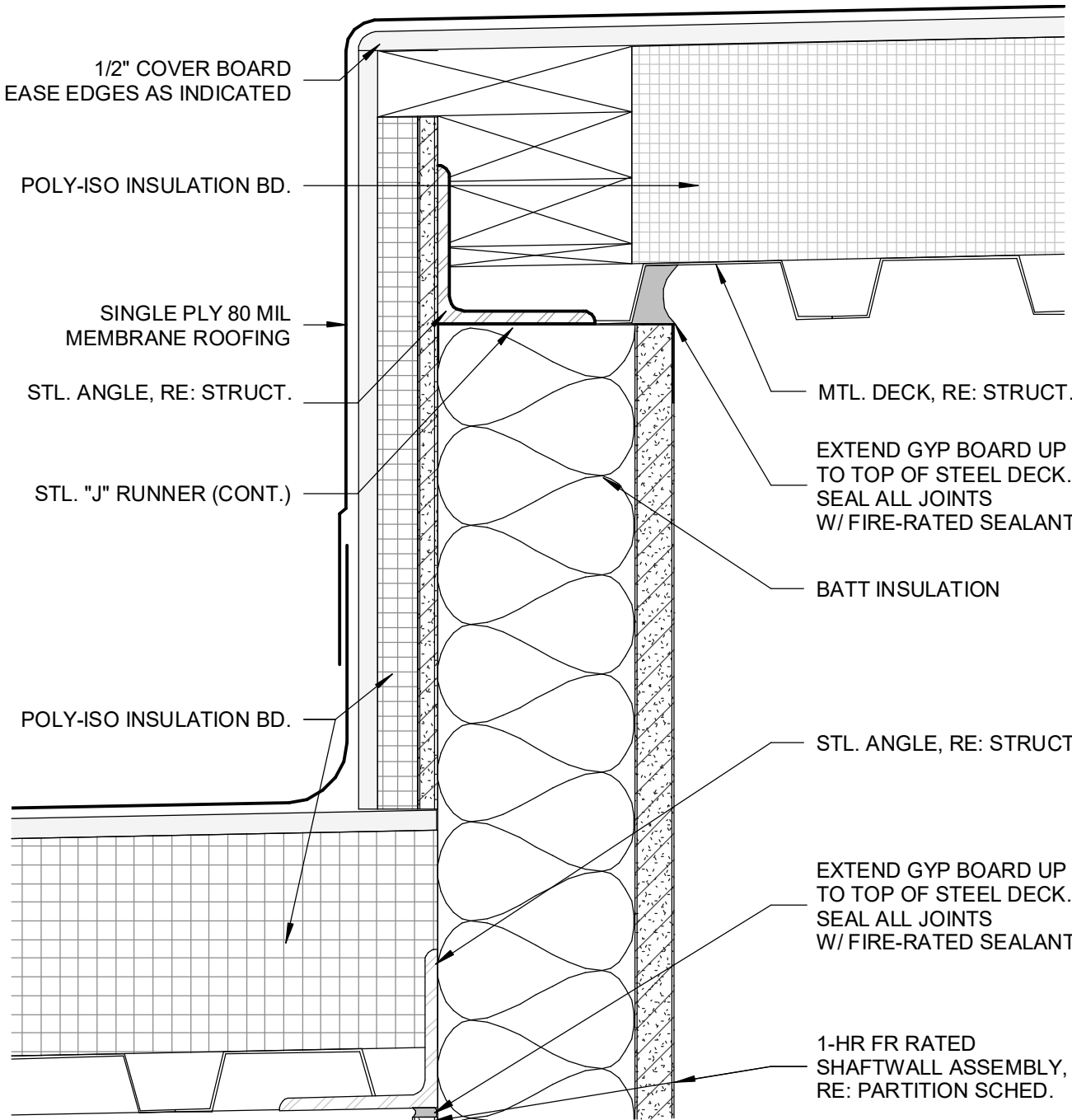
6 EXTERIOR LADDER  
3/4" = 1'-0"



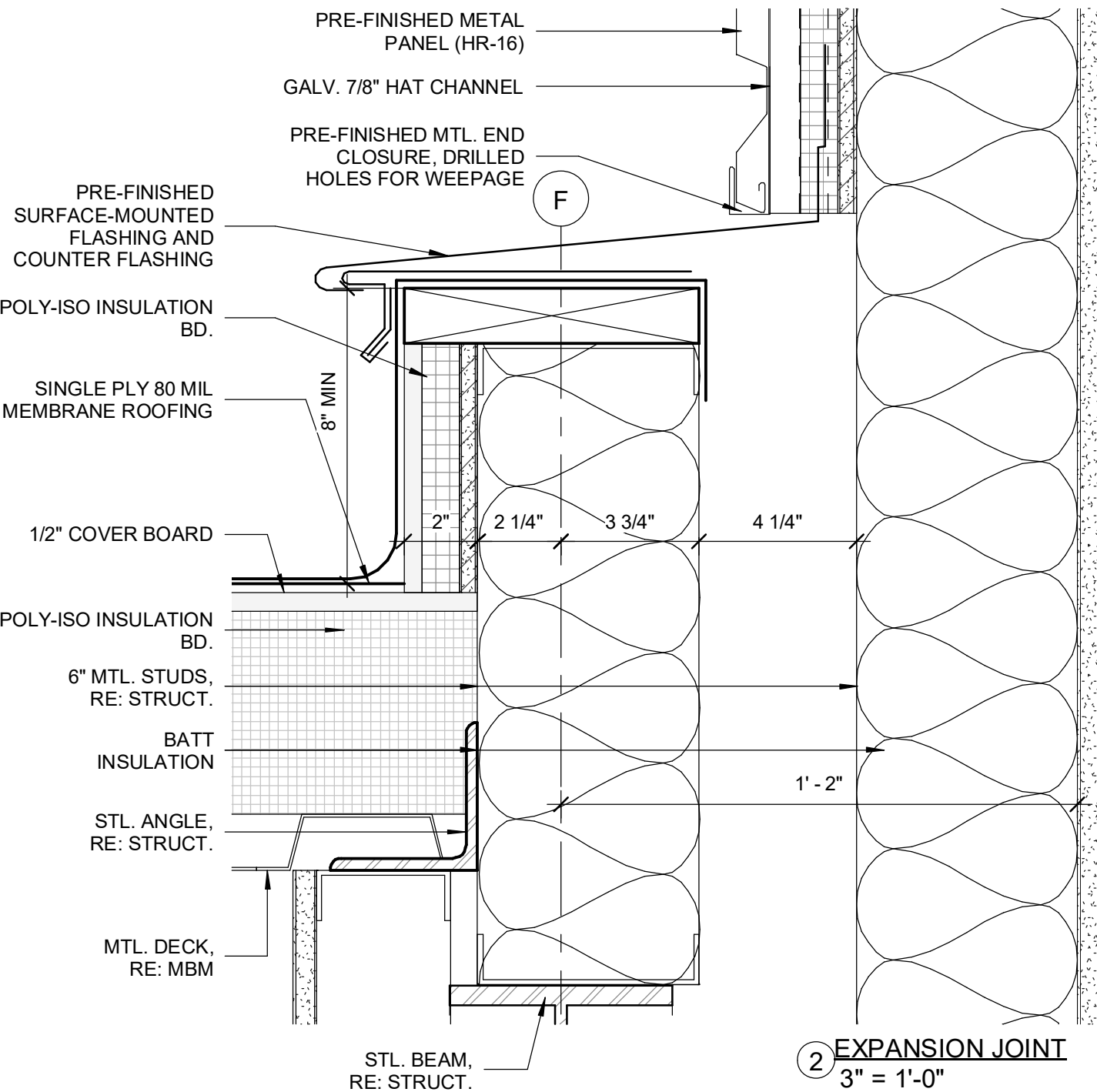
5 TYP. ROOF DRAIN  
1 1/2" = 1'-0"



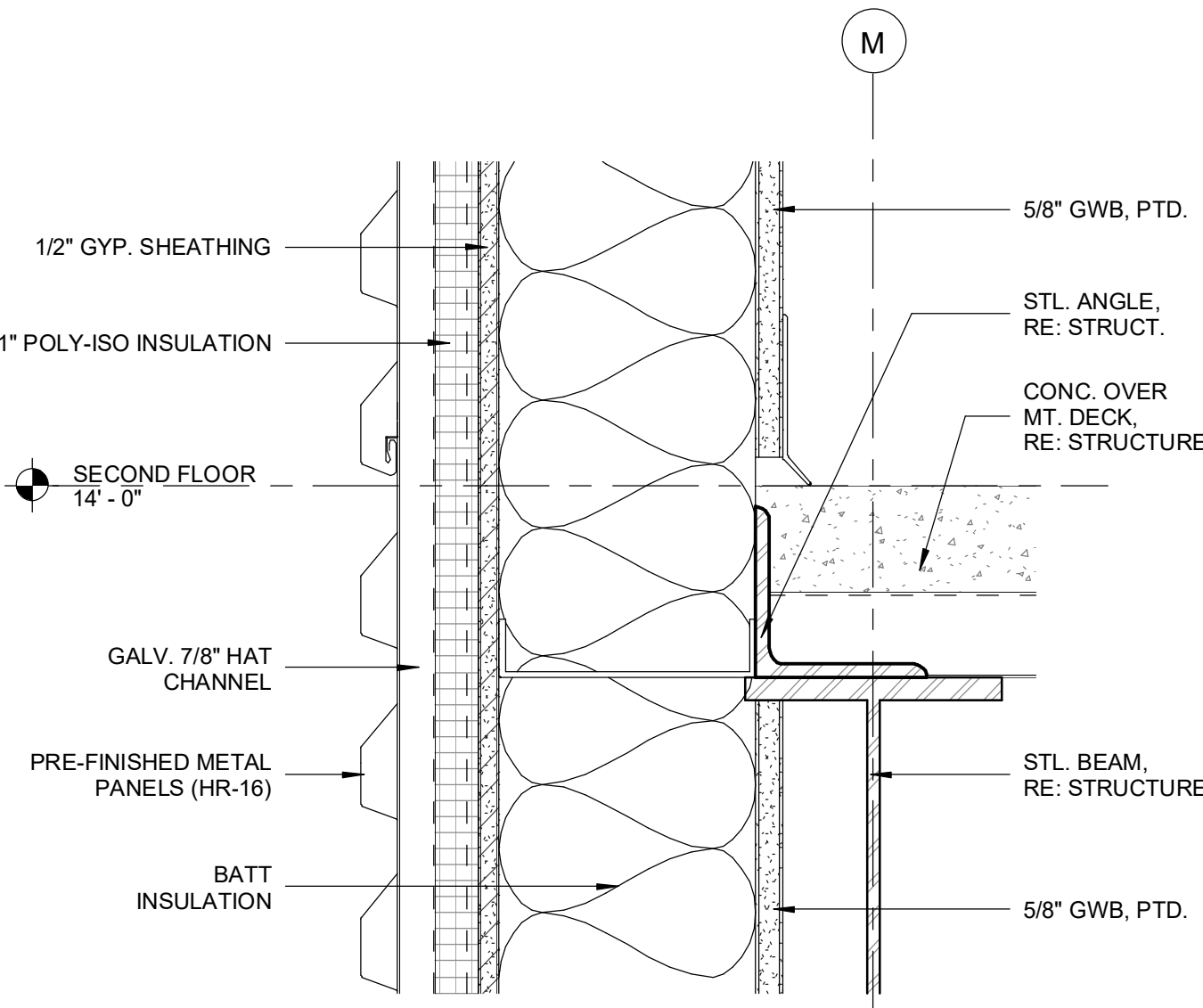
4 ROOF HATCH CURB  
1 1/2" = 1'-0"



3 ROOF AT ELEVATOR  
3" = 1'-0"



2 EXPANSION JOINT  
3" = 1'-0"

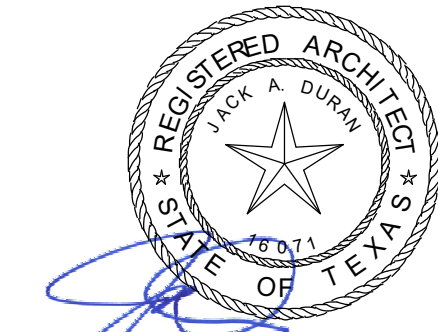


1 SECOND FLOOR AT EXTERIOR WALL  
3" = 1'-0"

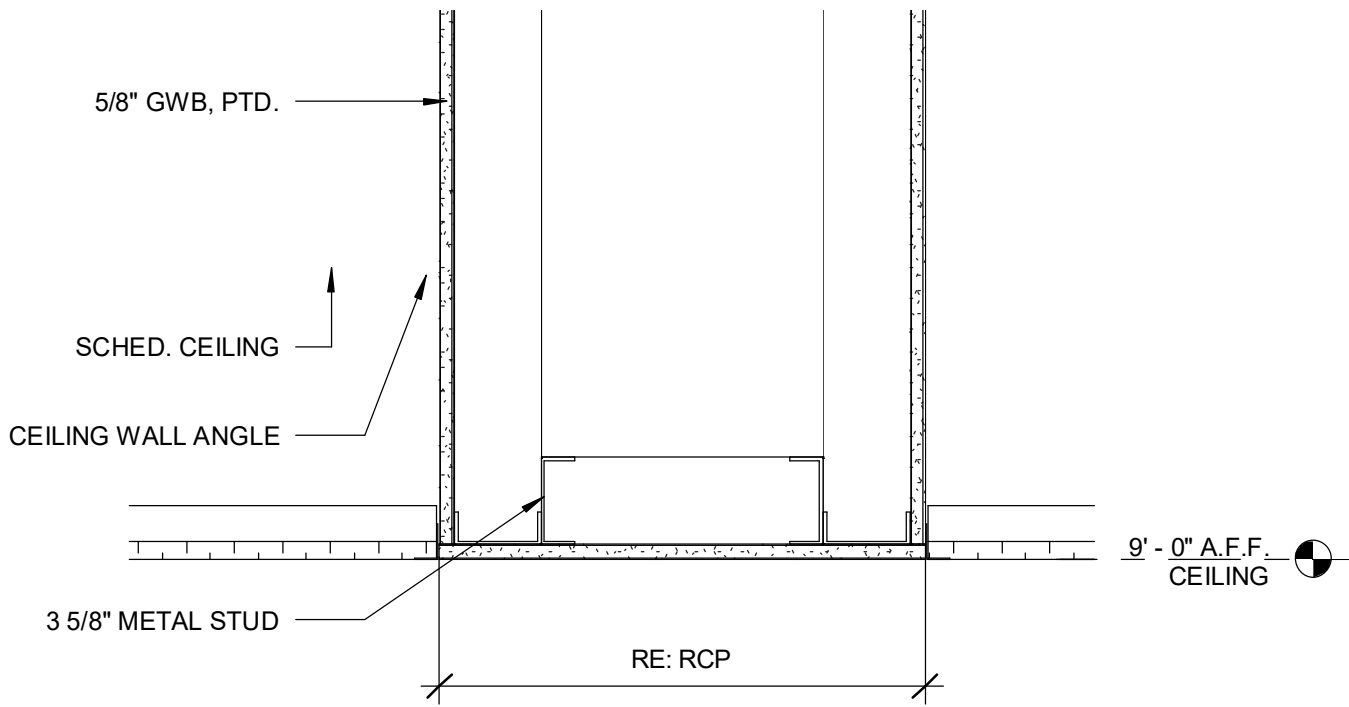
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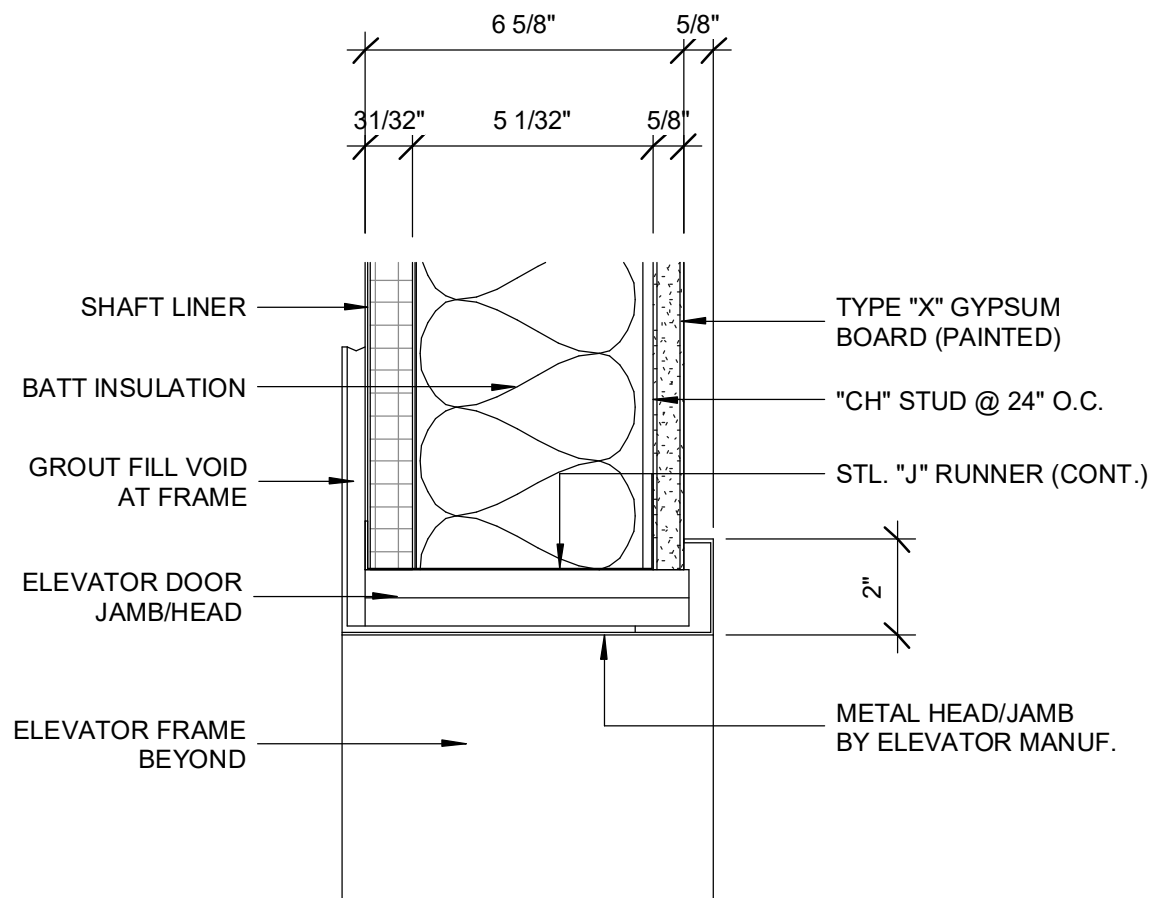
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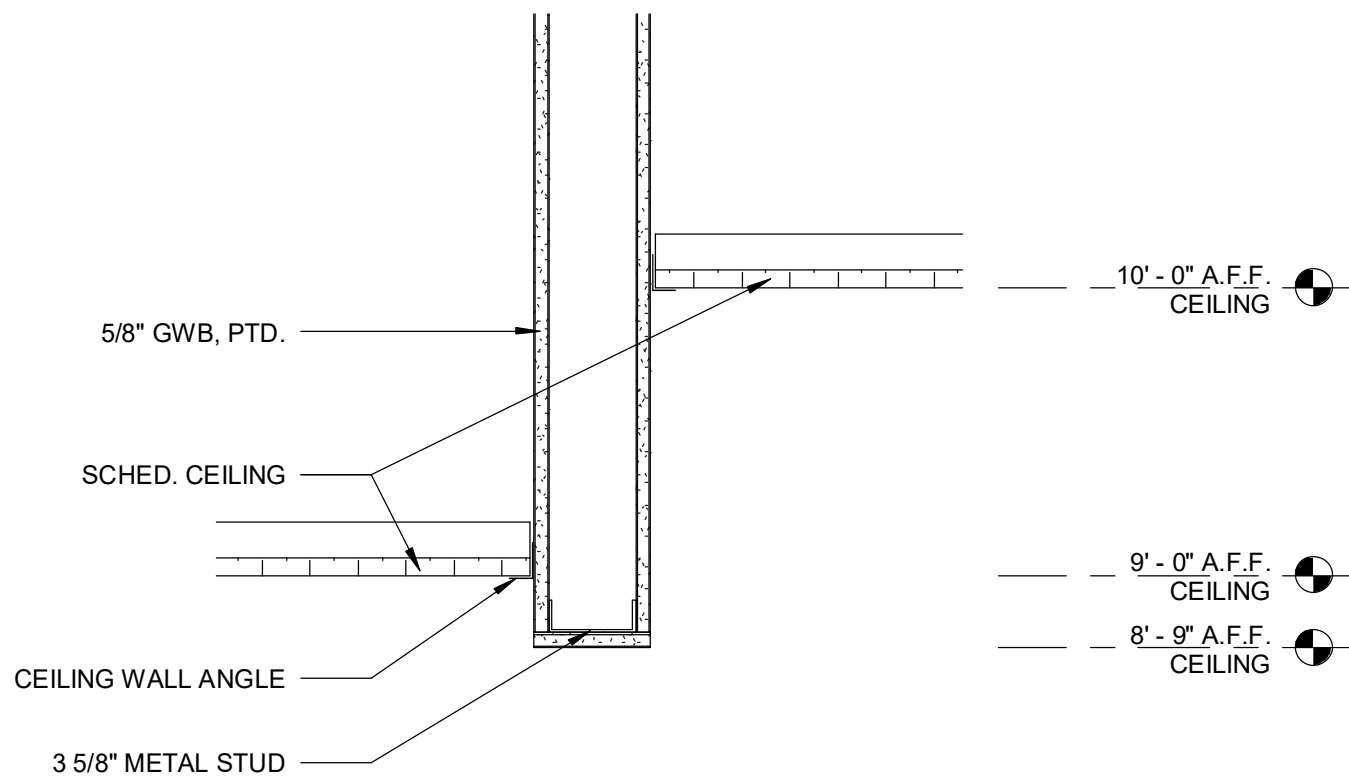
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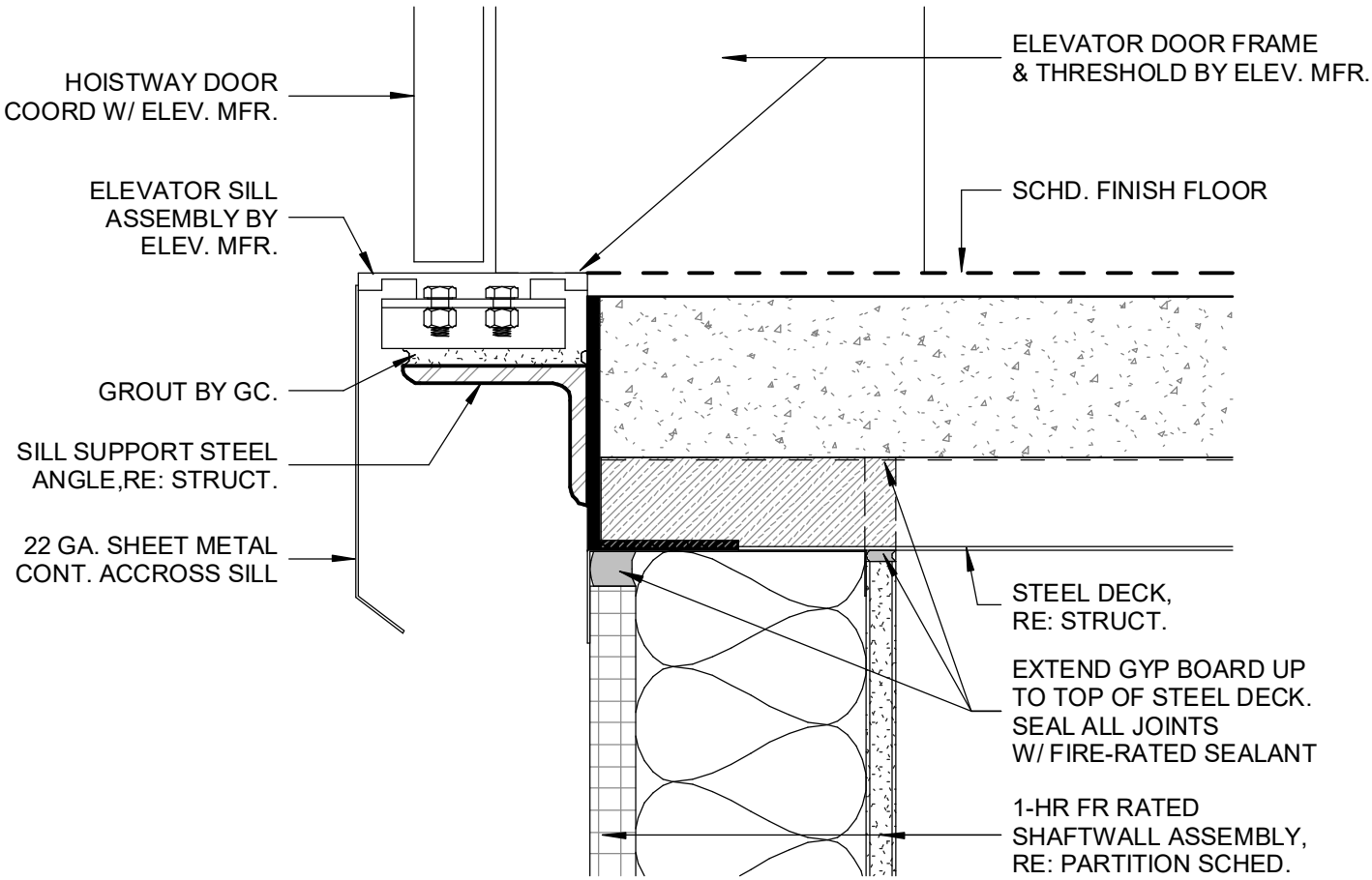
8 GYPSUM BULKHEAD  
1 1/2" = 1'-0"



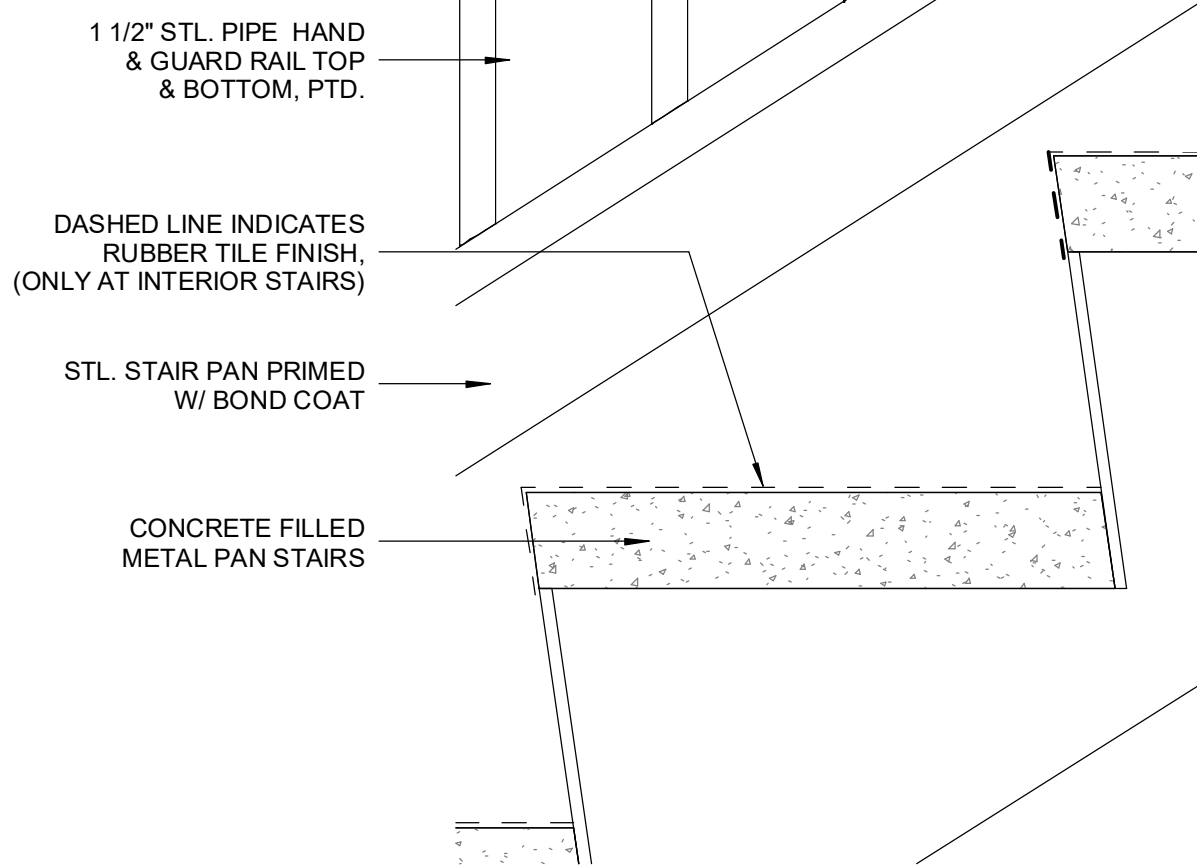
4 ELEVATOR HEAD/JAMB  
3" = 1'-0"



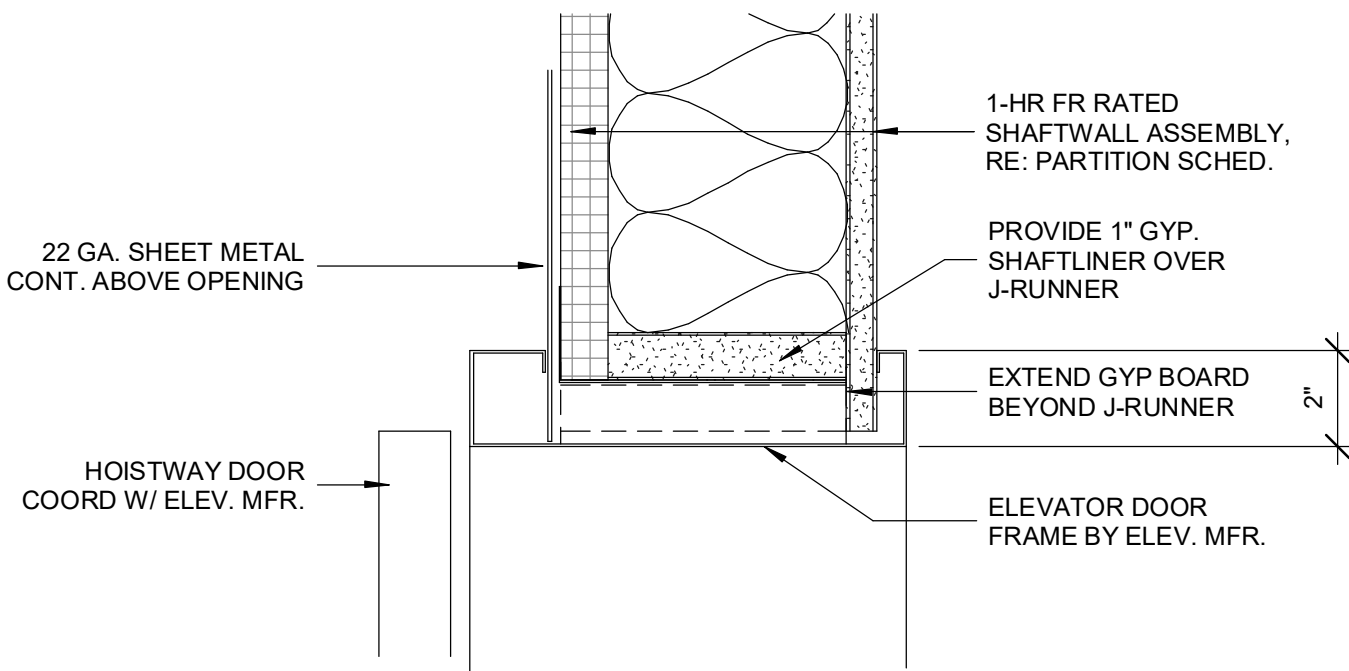
7 GYPSUM BULKHEAD  
1 1/2" = 1'-0"



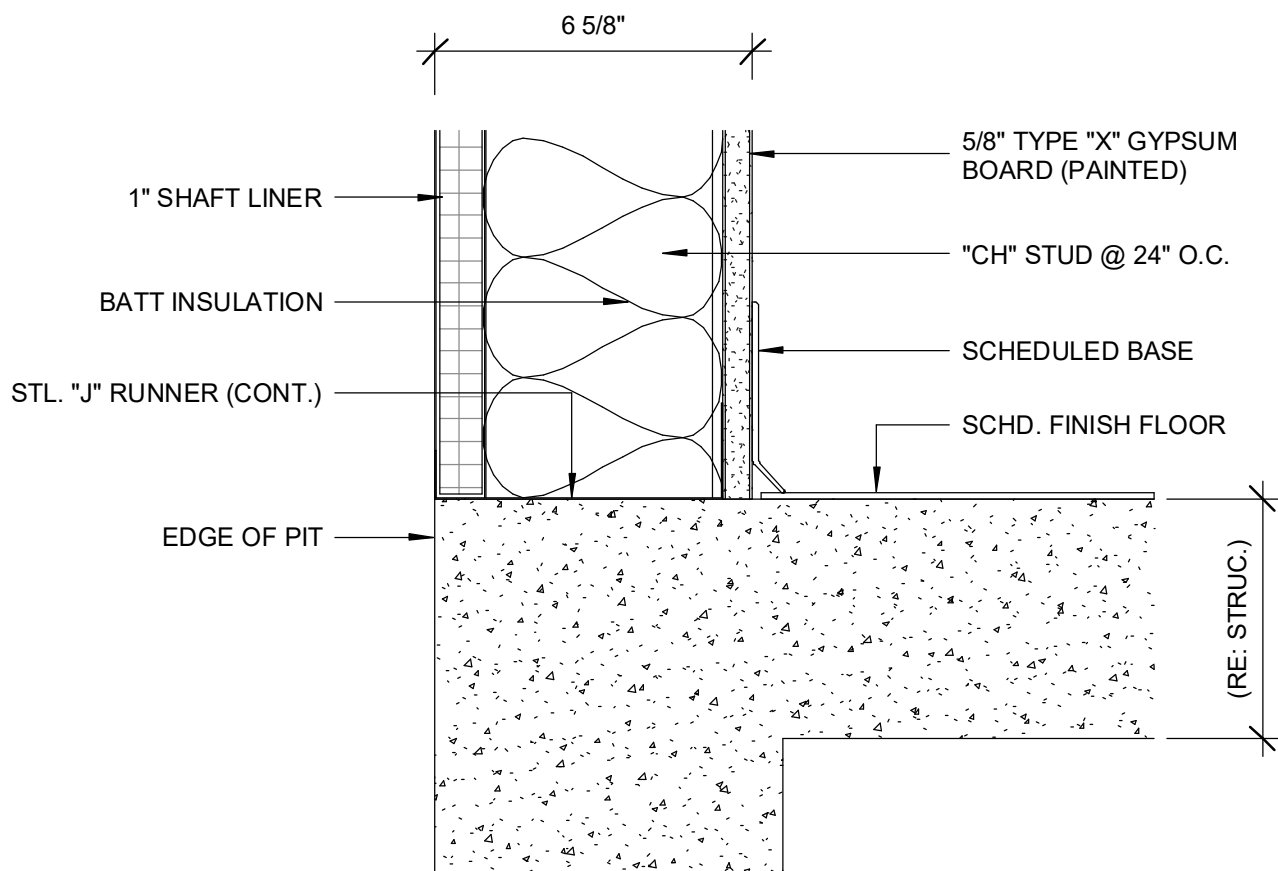
3 ELEVATOR THRESHOLD  
3" = 1'-0"



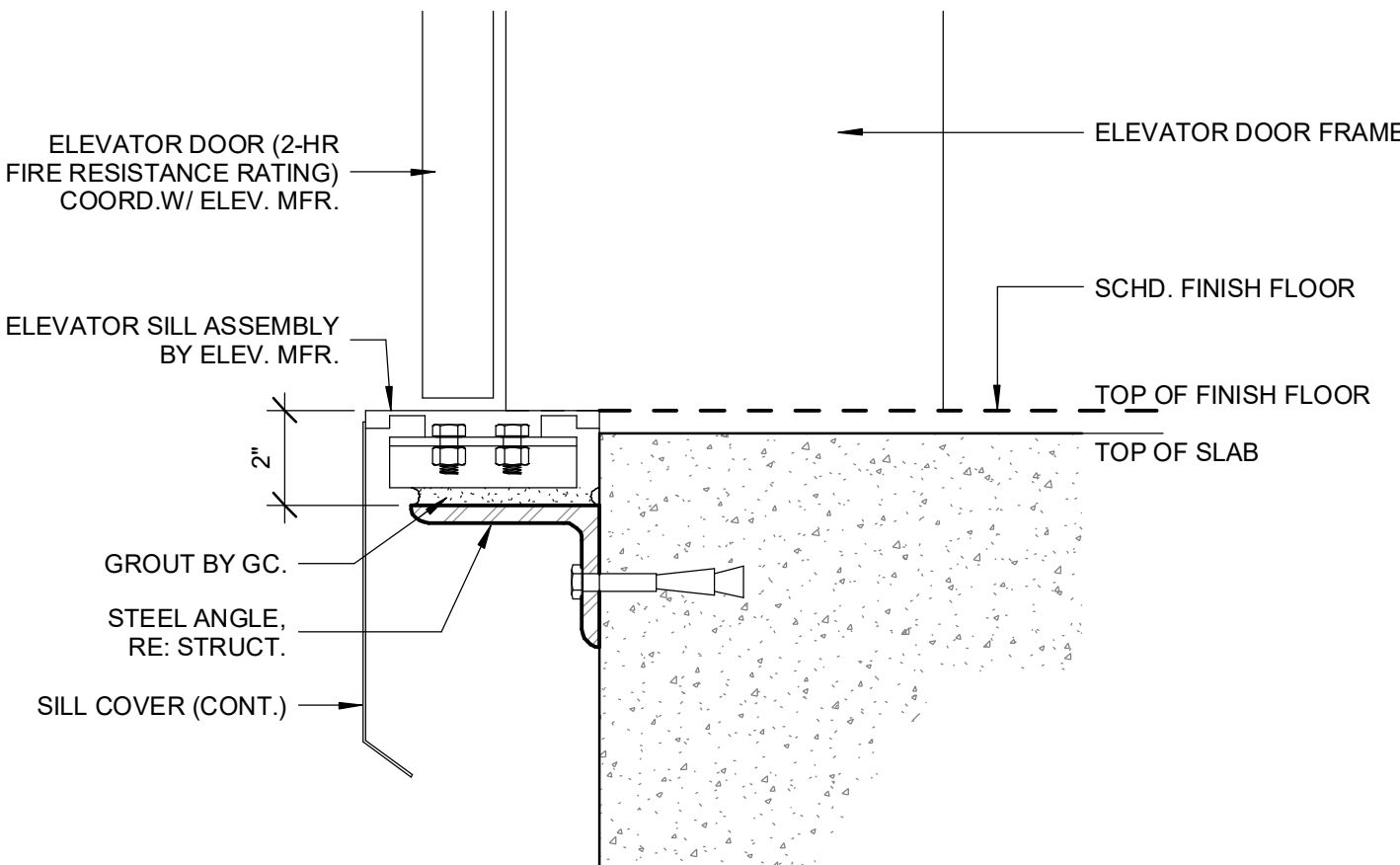
6 STAIR RISER/TREAD  
3" = 1'-0"



2 ELEVATOR HEAD  
3" = 1'-0"



5 ELEVATOR WALL BASE  
3" = 1'-0"



1 ELEVATOR THRESHOLD  
3" = 1'-0"



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A9.5  
INTERIOR  
SECTION  
DETAILS



CHAPTER 3: BUILDING BLOCKS

302 Floor or Ground Surfaces

302.2 Carpet. Carpet or carpet tile shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height shall be 1/2 inch (13 mm) maximum. Exposed edges of carpet shall be fastened to floor surfaces and shall have trim on the entire length of the exposed exposed edge. Carpet edge trim shall comply with 303.

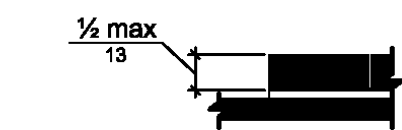


Figure 302.2 Carpet Pile Height

302.3 Openings. Openings in floor or ground surfaces shall not allow passage of a sphere more than 1/2 inch (13 mm) diameter except as allowed in 407.4.3, 409.4.3, 410.4, 810.5.3 and 810.10. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

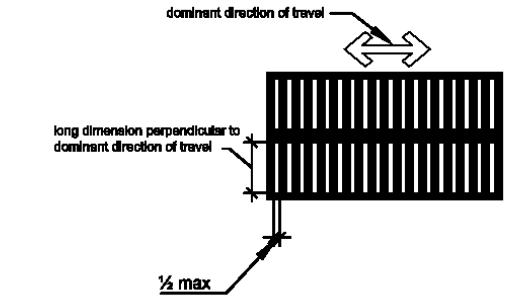


Figure 302.3 Elongated Openings in Floor or Ground Surfaces

303.2 Vertical. Changes in level of 1/4 inch (6.4 mm) high maximum shall be permitted to be vertical.

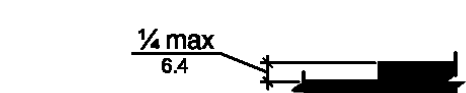


Figure 303.2 Vertical Change in Level

303.3 Beveled. Changes in level between 1/4 inch (6.4 mm) high minimum and 1/2 inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.

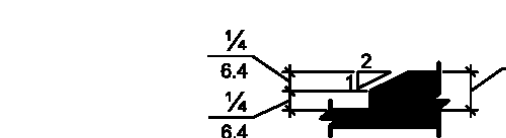


Figure 303.3 Beveled Change in Level

304 Turning Space

304.3.1 Circular Space. The turning space shall be a space of 60 inches (1525 mm) diameter minimum. The space shall be permitted to include knee and toe clearance complying with 306.

304.3.2 T-Shaped Space. The turning space shall be a T-shaped space within a 60 inch (1525 mm) square minimum with arms and base 36 inches (915 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with 306 only at the end of either the base or one arm.

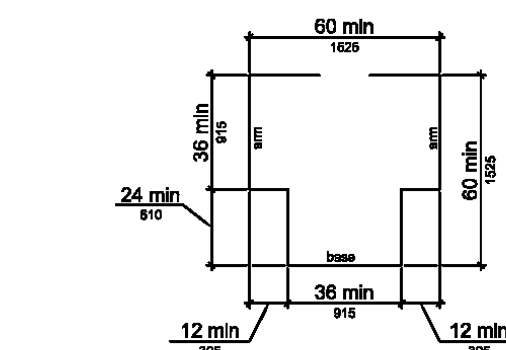


Figure 304.3.2 T-Shaped Turning Space

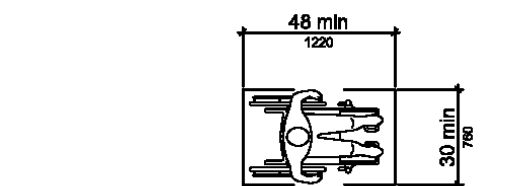


Figure 305.3 Clear Floor or Ground Space

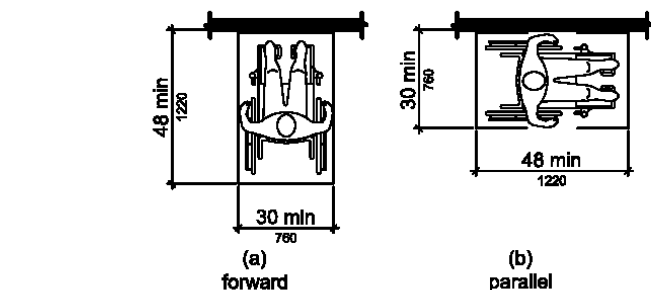


Figure 305.5 Position of Clear Floor or Ground Space

305.7.1 Forward Approach. Alcoves shall be 36 inches (915 mm) wide minimum where the depth exceeds 24 inches (610 mm).

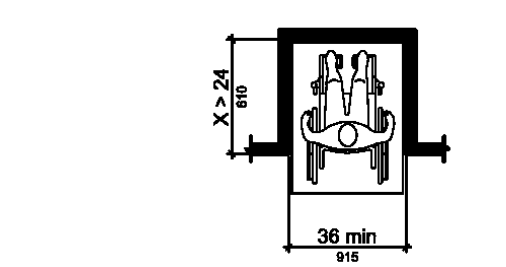


Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

305.7.2 Parallel Approach. Alcoves shall be 60 inches (1525 mm) wide minimum where the depth exceeds 15 inches (380 mm).

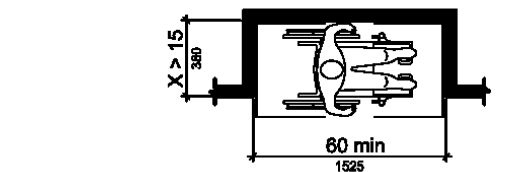


Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

306 Knee and Toe Clearance

306.2 Toe Clearance.

306.2.1 General. Space under an element between the finish floor or ground and 9 inches (230 mm) above the finish floor or ground shall be considered toe clearance and shall comply with 306.2.

306.2.2 Maximum Depth. Toe clearance shall extend 25 inches (635 mm) maximum under an element.

306.2.3 Minimum Required Depth. Where toe clearance is required at an element as part of a clear floor space, the toe clearance shall extend 17 inches (430 mm) minimum under the element.

306.2.4 Additional Clearance. Space extending greater than 6 inches (150 mm) beyond the available knee clearance at 9 inches (230 mm) above the finish floor or ground shall not be considered toe clearance.

306.2.5 Width. Toe clearance shall be 30 inches (760 mm) wide minimum.

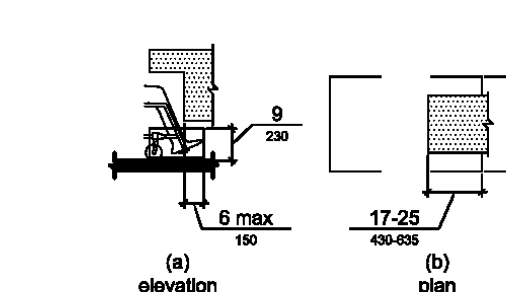


Figure 306.2 Toe Clearance

306.3 Knee Clearance.

306.3.1 General. Space under an element between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground shall be considered knee clearance and shall comply with 306.3.

306.3.2 Maximum Depth. Knee clearance shall extend 25 inches (635 mm) maximum under an element at 9 inches (230 mm) above the finish floor or ground.

306.3.3 Minimum Required Depth. Where knee clearance is required under an element as part of a clear floor space, the knee clearance shall be 11 inches (280 mm) deep minimum at 9 inches (230 mm) above the finish floor or ground, and 8 inches (203 mm) deep minimum at 27 inches (685 mm) above the finish floor or ground.

306.3.4 Clearance Reduction. Between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground, the knee clearance shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for each 6 inches (150 mm) in height.

306.3.5 Width. Knee clearance shall be 30 inches (760 mm) wide minimum.

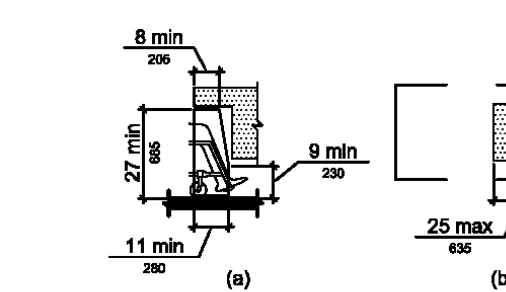


Figure 306.3 Knee Clearance

307 Protruding Objects

307.2 Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finish floor or ground shall protrude 4 inches (100 mm) maximum horizontally into the circulation path.

EXCEPTION: Handrails shall be permitted to protrude 4 1/2 inches (115 mm) maximum.

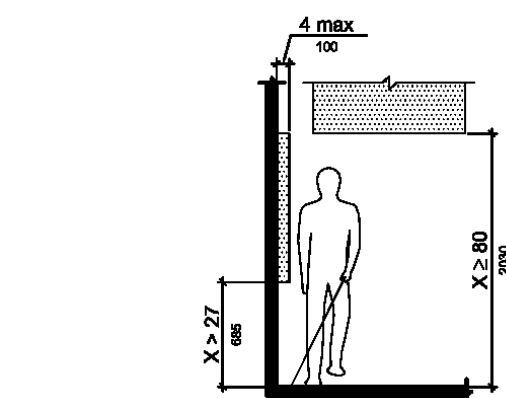


Figure 307.2 Limits of Protruding Objects

307.3 Post-Mounted Objects. Free-standing objects mounted on posts or pylons shall overhang circulation paths 12 inches (305 mm) maximum when located 27 inches (685 mm) minimum and 80 inches (2030 mm) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finish floor or ground.

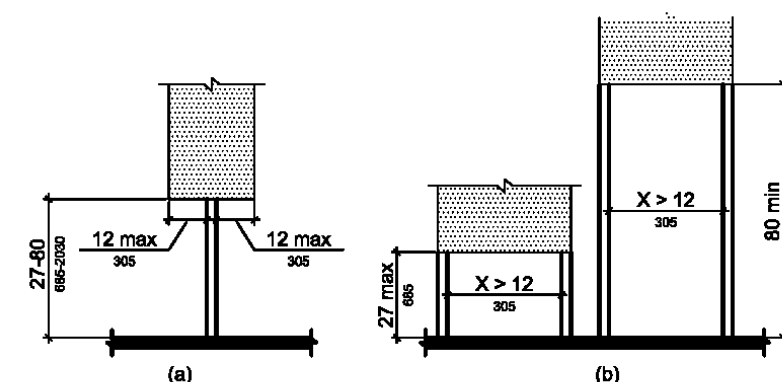


Figure 307.3 Post-Mounted Protruding Objects

307.4 Vertical Clearance. Vertical clearance shall be 80 inches (2030 mm) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2030 mm) high. The leading edge of such guardrail or barrier shall be located 27 inches (685 mm) maximum above the finish floor or ground.

EXCEPTION: Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

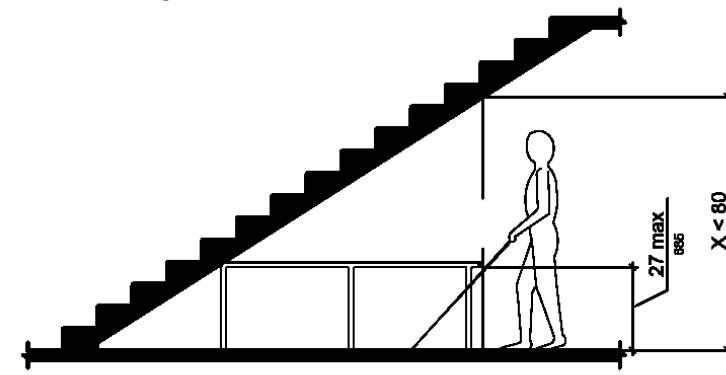


Figure 307.4 Vertical Clearance

308 Reach Ranges

Children's Reach Ranges	High (maximum)	Low (minimum)
Forward or Side Reach	36 in (915 mm)	20 in (510 mm)
Ages 3 and 4	40 in (1015 mm)	18 in (455 mm)
Ages 5 through 8	44 in (1120 mm)	16 in (405 mm)

308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

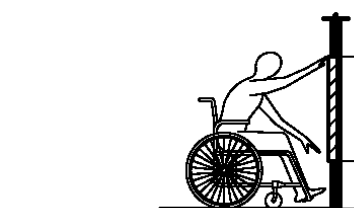


Figure 308.2.1 Unobstructed Forward Reach

308.2.2 Obstructed High Reach. Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm) maximum. Where the reach depth exceeds 20 inches (510 mm), the high forward reach shall be 44 inches (1120 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.

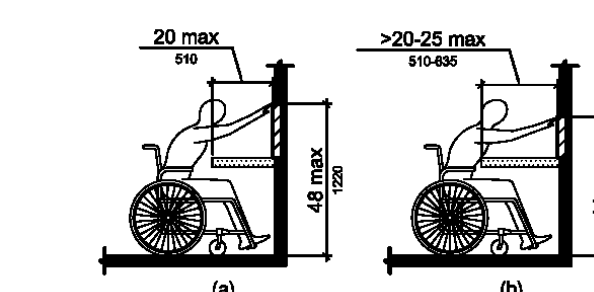


Figure 308.3.1 Unobstructed Side Reach

308.3 Side Reach.

308.3.1 Unobstructed. Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1220 mm) maximum and the low side reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

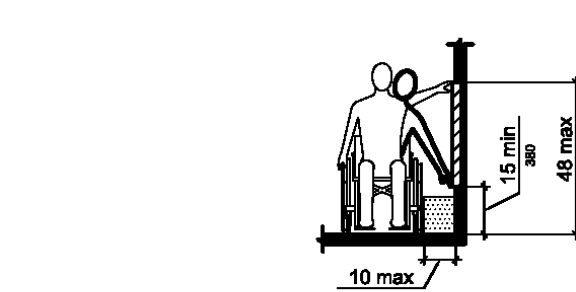


Figure 308.3.1 Unobstructed Side Reach

308.3.2 Obstructed High Reach. Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (865 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1220 mm) maximum for a reach depth of 10 inches (255 mm) maximum. Where the reach depth exceeds 10 inches (255 mm), the high side reach shall be 46 inches (1170 mm) maximum for a reach depth of 24 inches (610 mm) maximum.

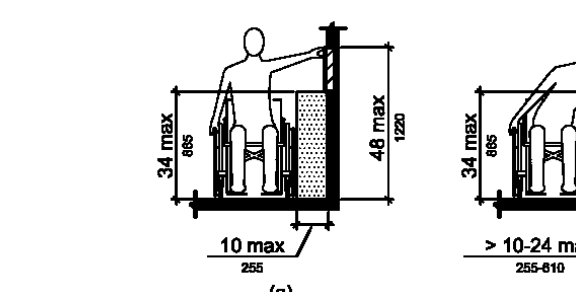


Figure 308.3.2 Obstructed High Side Reach

309 Operable Parts

309.2 Clear Floor Space. A clear floor or ground space complying with 305 shall be provided.

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to actuate operable parts shall be 5 pounds (22.2 N) maximum.

CHAPTER 4: ACCESSIBLE ROUTES

402.2 Components. Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doorways, ramps, curbs, ramps excluding the flared sides, elevators, and platform lifts. All components of an accessible route shall comply with the applicable requirements of Chapter 4.

Advisory 402.2 Components. Walking surfaces must have running slopes not steeper than 1:20, see 403.3. Other components of accessible routes, such as ramps (405) and curbs (406), are permitted to be more steeply sloped.

403 Walking Surfaces

403.1 General. Walking surfaces that are a part of an accessible route shall comply with 403.

403.2 Floor or Ground Surface. Floor or ground surfaces shall comply with 302.

403.3 Slope. The running slope of walking surfaces shall not be steeper than 1:20. The cross slope of walking surfaces shall not be steeper than 1:48.

403.4 Changes in Level. Changes in level shall comply with 303.

403.5 Clearances. Walking surfaces shall provide clearances complying with 403.5.

EXCEPTION: Within employee work areas, clearances on common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.

403.5.1 Clear Width. Except as provided in 403.5.2 and 403.5.3, the clear width of walking surfaces shall be 36 inches (915 mm) minimum.

EXCEPTION: The clear width shall be permitted to be reduced to 32 inches (815 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1220 mm) long minimum and 36 inches (915 mm) wide minimum.

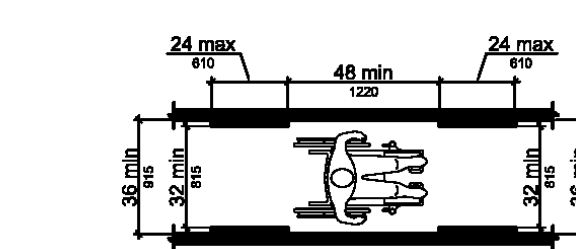


Figure 403.5.1 Clear Width of an Accessible Route

403.5.2 Clear Width at Turn. Where the accessible route makes a 180 degree turn around an element which is less than 48 inches (1220 mm) wide, clear width shall be 42 inches (1065 mm) minimum approaching the turn, 48 inches (1220 mm) minimum at the turn and 42 inches (1065 mm) minimum leaving the turn.

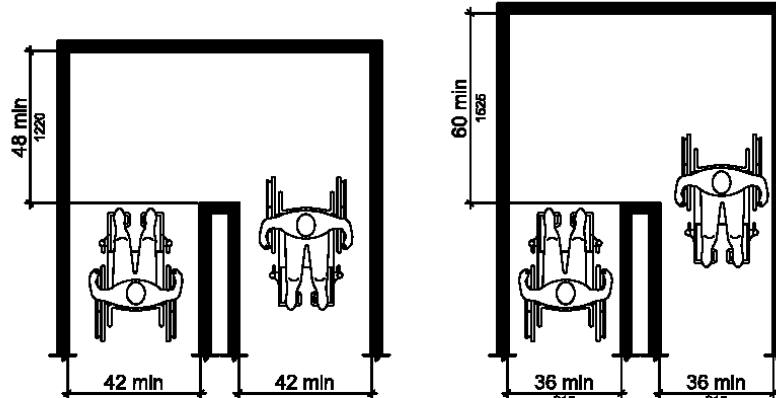


Figure 403.5.2 Clear Width at Turn

403.5.3 Passing Spaces. An accessible route with a clear width less than 60 inches (1525 mm) shall provide passing spaces at intervals of 200 feet (61 m) maximum.

404 Doors, Doorways, and Gates

404.2.3 Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).

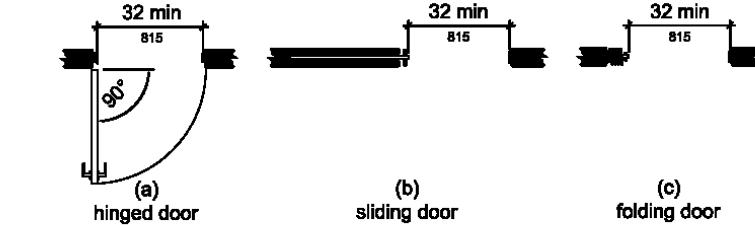


Figure 404.2.3 Clear Width of Doorways

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.



Figure 404.2.4 Maneuvering Clearances

404.2.4.3 Recessed Doors and Gates. Maneuvering clearances for forward approach shall be provided when any obstruction within 18 inches (455 mm) of the latch side of a doorway projects more than 8 inches (205 mm) beyond the face of the door, measured perpendicular to the face of the door or gate.

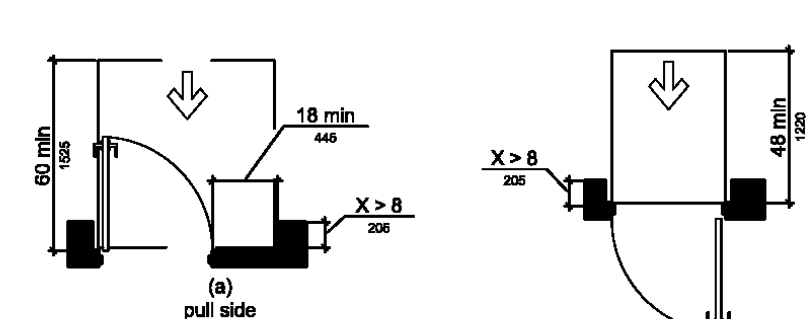


Figure 404.2.4.3 Maneuvering Clearances of Recessed Doors and Gates

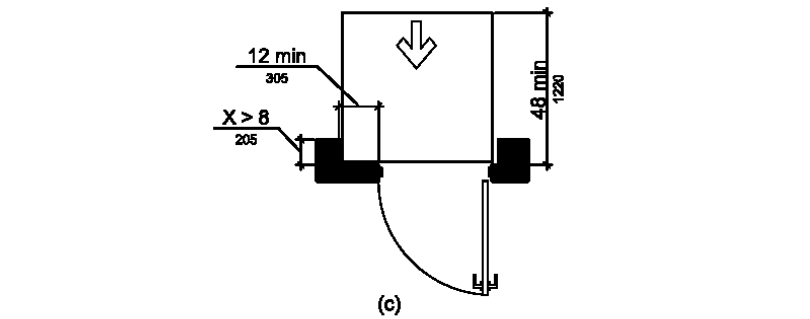


Figure 404.2.4.3 Maneuvering Clearances of Recessed Doors and Gates

404.2.6 Doors in Series and Gates in Series. The distance between two hinged or pivoted doors in series and gates in series shall be 48 inches (1220 mm) minimum plus the width of doors or gates swinging into the space.

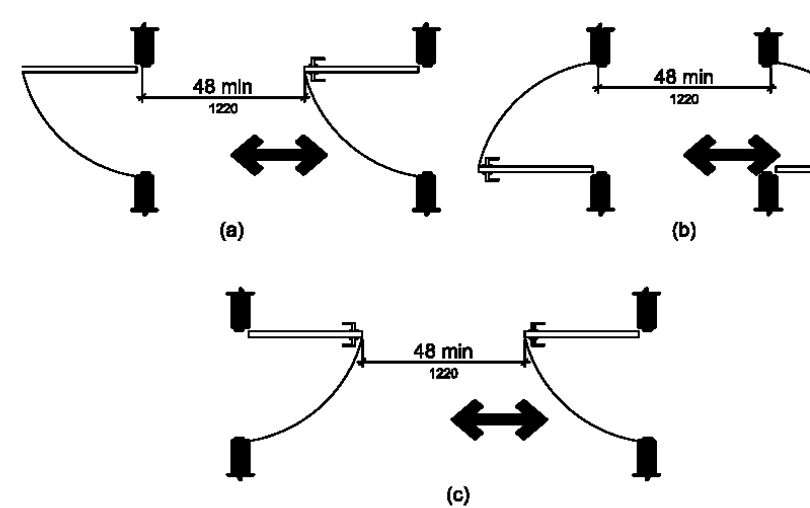


Figure 404.2.6 Doors in Series and Gates in Series

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 308.4. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

404.2.8.1 Door Closers and Gate Closers. Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

404.2.8.2 Spring Hinges. Door and gate spring hinges shall be adjusted so that from the open position of 70 degrees, the door or gate shall move to the closed position in 1.5 seconds minimum.

404.2.9 Door and Gate Operating Forces. Fire doors shall have a minimum operating force allowable by the appropriate administrative authority. The force for pushing or pulling open a door or gate other than fire doors shall be as follows:

1. Interior hinged doors and gates: 5 pounds (22.2 N) maximum.
2. Sliding or folding doors: 5 pounds (22.2 N) maximum.

These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door or gate in a closed position.

404.2.10 Door and Gate Surfaces. Swinging door and gate surfaces within 10 inches (255 mm) of the finish floor or ground measured vertically shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within 1/16 inch (1.6 mm) of the same plane as the other. Cavities created by added kick plates shall be capped.

404.2.11 Vision Lights. Doors, gates, and side lights adjacent to doors or gates, containing one or more glazing panels that permit viewing through the panels shall have the bottom of at least one glazed panel located 43 inches (1090 mm) maximum above the finish floor.

404.3 Automatic and Power-Assisted Doors and Gates. Automatic doors and automatic gates shall comply with 404.3. Full-powered automatic doors shall comply with ANSI/BHMA A156.10 (incorporated by reference, see "Referenced Standards" in Chapter 1). Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).

404.3.2 Maneuvering Clearances. Clearances at power-assisted doors and gates shall comply with 404.2.4. Clearances at automatic doors and gates without standby power and serving an accessible means of egress shall comply with 404.2.4.

404.3.7 Revolving Doors, Revolving Gates, and Turntables. Revolving doors, revolving gates, and turntables shall not be part of an accessible route.

405 Ramps

405.2 Slope. Ramp runs shall have a running slope not steeper than 1:12.

405.3 Cross Slope. Cross slope of ramp runs shall not be steeper than 1:48.

405.5 Clear Width. The clear width of a ramp run and, where handrails are provided, the clear width between handrails shall be 36 inches (915 mm) minimum.

405.6 Rise. The rise for any ramp run shall be 30 inches (760 mm) maximum.

405.7 Landings. Ramps shall have landings at the top and the bottom of each ramp run. Landings shall comply with 405.7.

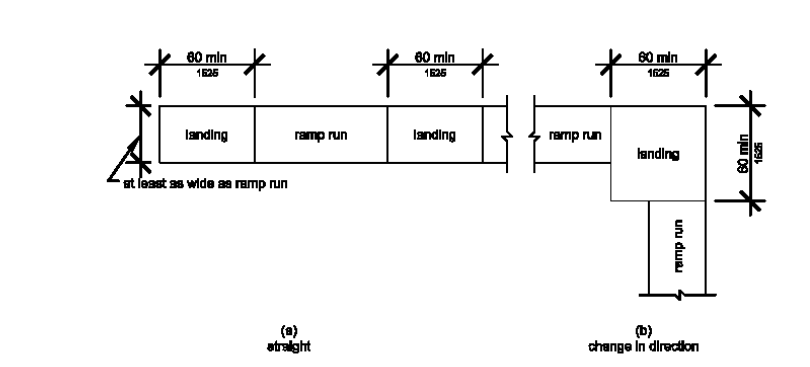


Figure 405.7 Ramp Landings

405.7.1 Slope. Landings shall have slope no steeper than 1:48. Changes in level are not permitted.

405.7.2 Width. The landing clear width shall be at least as wide as the widest ramp run leading to the landing.

405.7.3 Length. The landing clear length shall be 60 inches (1525 mm) long minimum.

405.7.4 Change in Direction. Ramps that change direction between runs at landings shall have a clear landing 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum.

405.7.5 Doorways. Where doorways are located adjacent to a ramp landing, maneuvering clearances required by 404.2.4 and 404.3.2 shall be permitted to overlap the required landing clearances.

405.8 Handrails. Ramp runs with a rise greater than 8 inches (150 mm) shall have handrails complying with 505.

405.9 Edge Protection. Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.

405.9.1 Extended Floor or Ground Surface. The floor or ground surface of the ramp run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505.

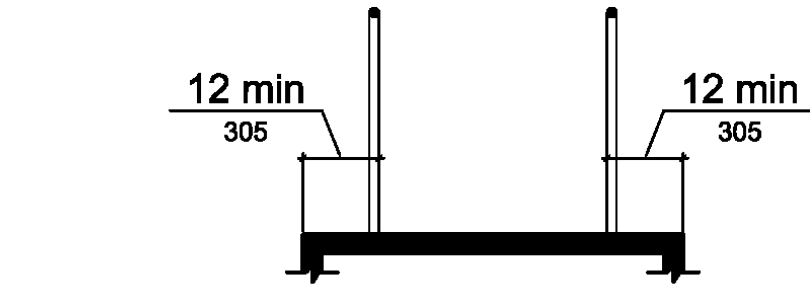


Figure 405.9.1 Extended Floor or Ground Surface Edge Protection

405.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.

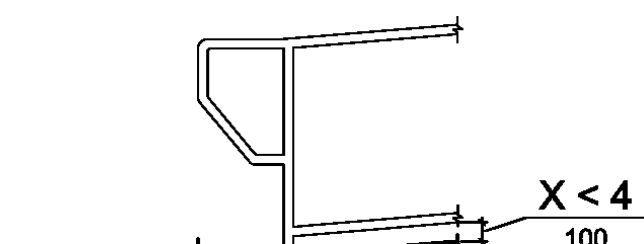


Figure 405.9.2 Curb or Barrier Edge Protection

406 Curb Ramps

406.1 General. Curb ramps on accessible routes shall comply with 406, 405.2 through 405.5, and 405.10.

406.2 Counter Slope. Counter slopes of adjoining gutters and road surfaces immediately adjacent to the curb ramp shall not be steeper than 1:20. The adjacent surfaces at transitions at curb ramps to walks, gutters, and streets shall be at the same level.

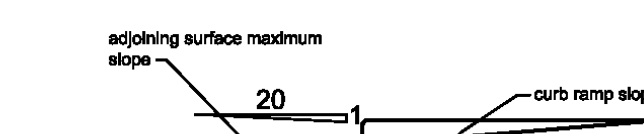


Figure 406.2 Counter Slope of Surfaces Adjacent to Curb Ramps

406.3 Sides of Curb Ramps. Where provided, curb ramp flares shall not be steeper than 1:10.

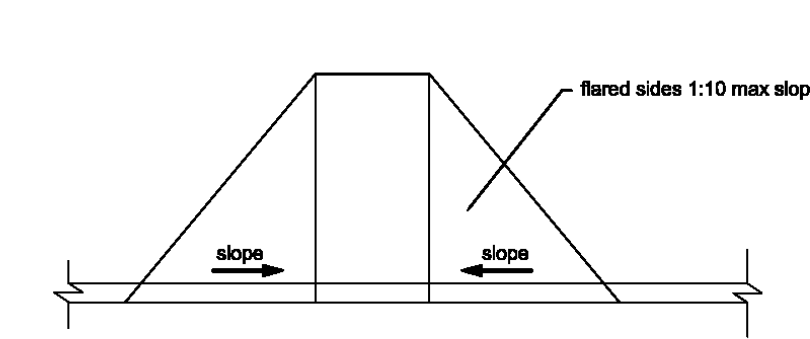


Figure 406.3 Sides of Curb Ramps

406.4 Landings. Landings shall be provided at the tops of curb ramps. The landing clear length shall be 36 inches (915 mm) minimum. The landing clear width shall be at least as wide as the curb ramp, excluding flared sides, leading to the landing.

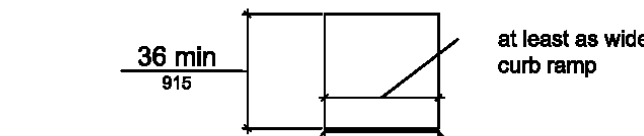


Figure 406.4 Landings at the Top of Curb Ramps

406.5 Location. Curb ramps and the flared sides of curb ramps shall be located so that they do not project into vehicular traffic lanes, parking spaces, or parking access aisles. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides.

406.6 Diagonal Curb Ramps. Diagonal or corner type curb ramps with returned curbs or other well-defined edges shall have the edges parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have a clear space 48 inches (1220 mm) minimum outside active traffic lanes of the roadway. Diagonal curb ramps provided at marked crossings shall provide the 48 inches (1220 mm) minimum clear space within the markings. Diagonal curb ramps with flared sides shall have a segment of curb 24 inches (610 mm) long minimum located on each side of the curb ramp and within the marked crossing.

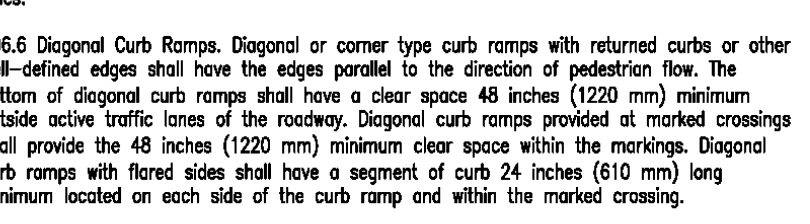


Figure 406.6 Diagonal or Corner Type Curb Ramps

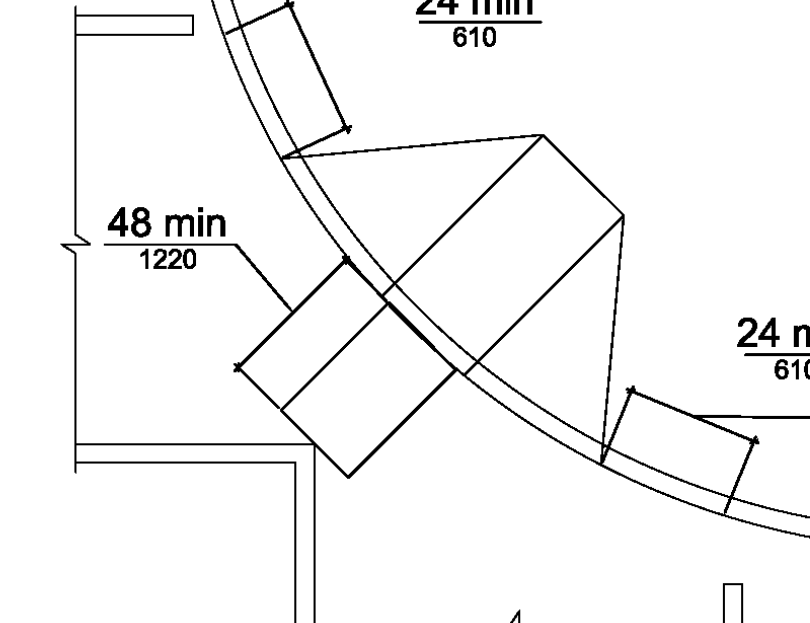
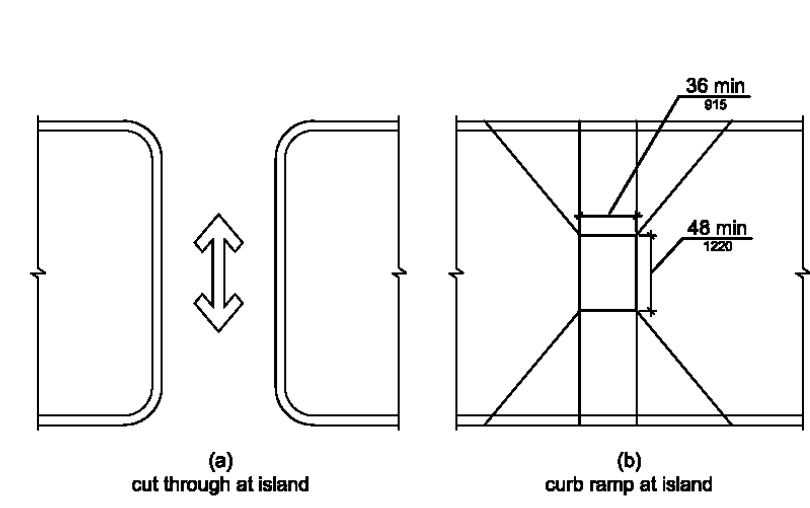


Figure 406.7 Islands in Crossings

406.7 Islands. Raised islands in crossings shall be cut through level with the street or have curb ramps at both sides. Each curb ramp shall have a level area 48 inches (1220 mm) long minimum by 36 inches (915 mm) wide minimum at the top of the curb ramp in the part of the island intersected by the crossings. Each 48 inch (1220 mm) minimum by 36 inch (915 mm) minimum area shall be oriented so that the 48 inch (1220 mm) minimum length is in the direction of the running slope of the curb ramp it serves. The 48 inch (1220 mm) minimum by 36 inch (915 mm) minimum area and the accessible route shall be permitted to overlap.





#### 407. Elevators

407.1 General. Elevators shall comply with 407 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

EXCEPTION: Existing conditions don't have to comply

407.2.1.2 Size. Call buttons shall be 3/4 inch (19 mm) minimum in the smallest dimension.

407.2.2.1 Visible and Audible Signals. A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call and the car's direction of travel. Where in-car signals are provided, they shall be visible from the floor area adjacent to the hall call buttons.

407.2.2.2 Visible Signals. Visible signal fixtures shall be centered at 72 inches (1830 mm) minimum above the finish floor or ground. The visible signal elements shall be 2 1/2 inches (64 mm) minimum measured along the vertical centerline of the element. Signals shall be visible from the floor area adjacent to the hall call button.

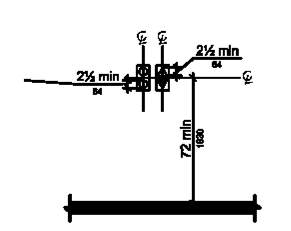
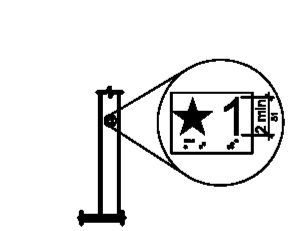


Figure 407.2.2.2 Visible Hall Signals

407.2.3.1 Floor Designation. Floor designations complying with 703.2 and 703.4.1 shall be provided on both jmb of elevator hoistway entrances. Floor designations shall be provided in both tactile characters and braille. Tactile characters shall be 2 inches (51 mm) high minimum. A tactile star shall be provided on both jmb of the main entry level.



407.2.3.2 Car Designations. Destination-oriented elevators shall provide tactile car verification complying with 703.2 on both jmb of the hoistway immediately below the floor designation. Car designations shall be provided in both tactile characters and braille. Tactile characters shall be 2 inches (51 mm) high minimum.

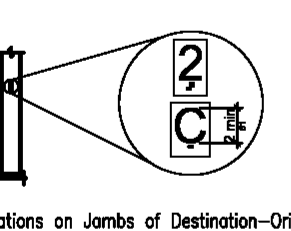


Figure 407.2.3.2 Car Designations on Jamb of Destination-Oriented Elevator Hoistway Entrances

407.3.3.1 Height. The device shall be activated by sensing an obstruction passing through the opening at 5 inches (125 mm) nominal and 29 inches (735 mm) nominal above the finish floor.

407.3.3.3 Duration. Door reopening devices shall remain effective for 20 seconds minimum.

407.3.4 Door and Signal Timing. The minimum acceptable time from notification that a car is answering a call or notification of the car assigned at the means for the entry of destination information until the doors of that car start to close shall be calculated from the following equation:

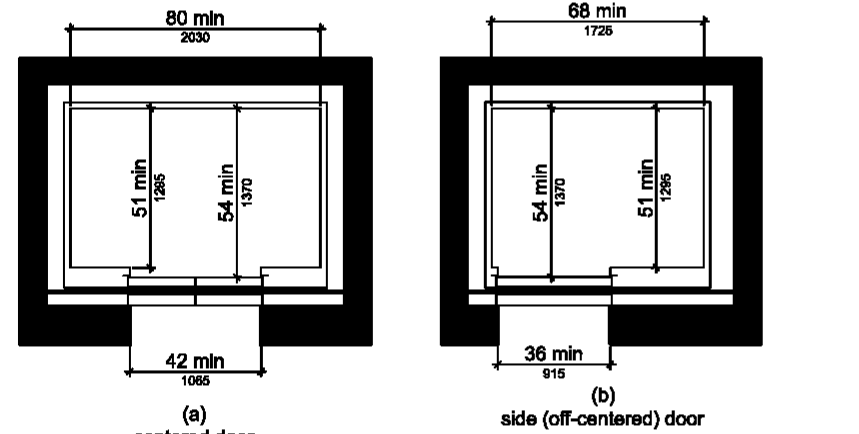
$$t = 0 / (1.5 \text{ ft/s}) \text{ or } t = 0 / (1.5 \text{ ft/s}) \text{ or } t = 5 \text{ seconds minimum where } t \text{ equals the total time in seconds and } 0 \text{ equals the distance (in feet or millimeters) from the point in the lobby or corridor 60 inches (1525 mm) directly in front of the foremost call button controlling that car to the centerline of the hoistway door.}$$

407.3.5 Door Delay. Elevator doors shall remain fully open in response to a car call for 3 seconds

407.3.6 Width. The width of elevator doors shall comply with Table 407.4.1.

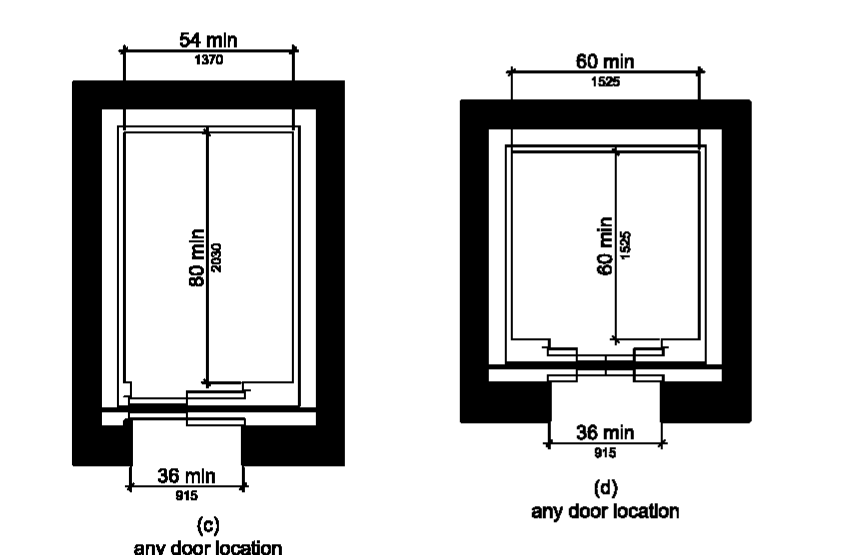
407.4 Elevator Car Requirements. Elevator cars shall comply with 407.4.

407.4.1 Car Dimensions. Inside dimensions of elevator cars and clear width of elevator doors shall comply with Table 407.4.1.



centered door

side (off-centered) door



centered door

side (off-centered) door

Figure 407.4.1 Elevator Car Dimensions

407.4.3 Platform to Hoistway Clearance. The clearance between the car platform sill and the edge of any hoistway landing shall be 1 1/4 inch (32 mm) minimum.

407.4.4 Leveling. Each car shall be equipped with a self-leveling feature that will automatically bring and maintain the car at floor landings within a tolerance of 1/2 inch (13 mm) under rated loading to zero loading conditions.

407.4.5 Illumination. The level of illumination at the car controls, platform, car threshold and car landing sill shall be 5 foot candles (54 lux) minimum.

407.4.6 Elevator Car Controls. Where provided, elevator car controls shall comply with 407.4.6 and 309.4.

407.4.6.1 Location. Controls shall be located within one of the reach ranges specified in 308.

407.4.6.2 Buttons. Car control buttons with floor designations shall comply with 407.4.6.2 and shall be raised or flush.

407.4.6.3 Size. Buttons shall be 3/4 inch (19 mm) minimum in their smallest dimension.

407.4.6.4 Height. Emergency control buttons shall have their centerlines 35 inches (890 mm) minimum above the finish floor.

407.4.7.1.1 Type. Control buttons shall be identified by tactile characters complying with 703.2.

407.4.7.1.3 Symbols. The control button for the emergency stop, alarm, door open, door close, main entry floor, and phone, shall be identified with tactile symbols as shown in Table 407.4.7.1.3.

407.4.8.1.1 Size. Characters shall be 1/2 inch (13 mm) high minimum.

407.4.8.2.2 Signal Level. The verbal annunciator shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the annunciator.

407.4.8.2.3 Frequency. The verbal annunciator shall have a frequency of 300 Hz minimum to 3000 Hz maximum.

408 Limited-Use/Limited-Application Elevators

408.1 General. Limited-use/limited-application elevators shall comply with 408 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

408.2 Elevator Landings. Landings serving limited-use/limited-application elevators shall comply with 408.2.

408.2.1 Call Buttons. Elevator call buttons and keypads shall comply with 407.2.1.

408.2.2 Hall Signals. Hall signal shall comply with 407.2.2.

408.2.3 Hoistway Signs. Signs of elevator hoistways shall comply with 407.2.3.1.

408.3 Elevator Doors. Elevator hoistway doors shall comply with 408.3.

408.3.1 Sliding Doors. Sliding hoistway and car doors shall comply with 407.3.1 through 407.3.3 and 408.4.1.

408.3.2 Swinging Doors. Swinging hoistway doors shall open and close automatically and shall comply with 404, 407.3.2 and 408.3.2.

408.3.2.1 Power Operation. Swinging doors shall be power-operated and shall comply with ANSI/BSA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).

408.3.2.2 Duration. Power-operated swinging doors shall remain open for 20 seconds minimum when activated.

408.4 Elevator Cars. Elevator cars shall comply with 408.4.

408.4.1 Car Dimensions and Doors. Elevator cars shall provide a clear width 42 inches (1065 mm) minimum and a car depth 54 inches (1370 mm) minimum. Car doors shall be positioned at the narrow ends of cars and shall provide 32 inches (815 mm) minimum clear width.

408.4.2 Floor Surfaces. Floor surfaces in platform lifts shall comply with 302 and 303.

408.4.3 Clear Floor Space. Clear floor space in platform lifts shall comply with 305.

408.4.4 Platform to Runway Clearance. The clearance between the platform sill and the edge of any runway landing shall be 1 inch (32 mm) minimum.

408.4.5 Operable Parts. Controls for platform lifts shall comply with 306.

408.4.6 Doors and Gates. Platform lifts shall have low-energy power-operated doors or gates complying with 404.3. Doors shall remain open for 20 seconds minimum. End doors and gates shall provide a clear width 32 inches (815 mm) minimum. Side doors and gates shall provide a clear width 42 inches (1065 mm) minimum.

EXCEPTION: Platform lifts serving two landings maximum and having doors or gates on opposite sides shall be permitted to have self-closing manual doors or gates.

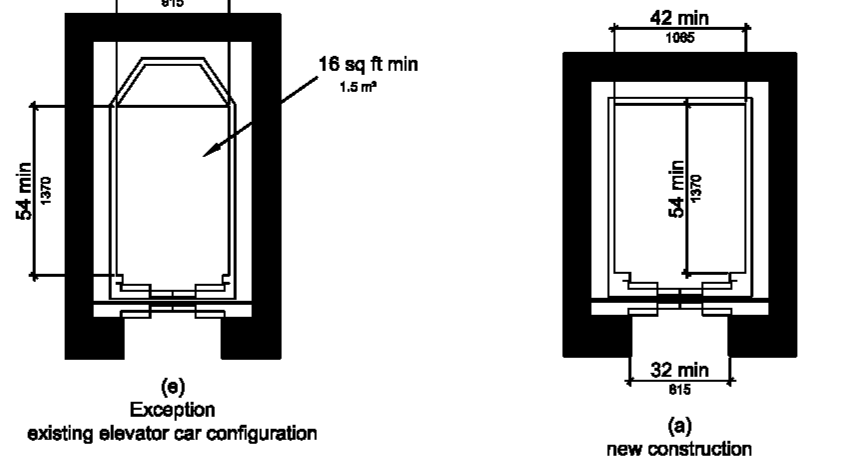


Figure 408.4.1 Limited-Use/Limited-Application (LULA) Elevator Car Dimensions

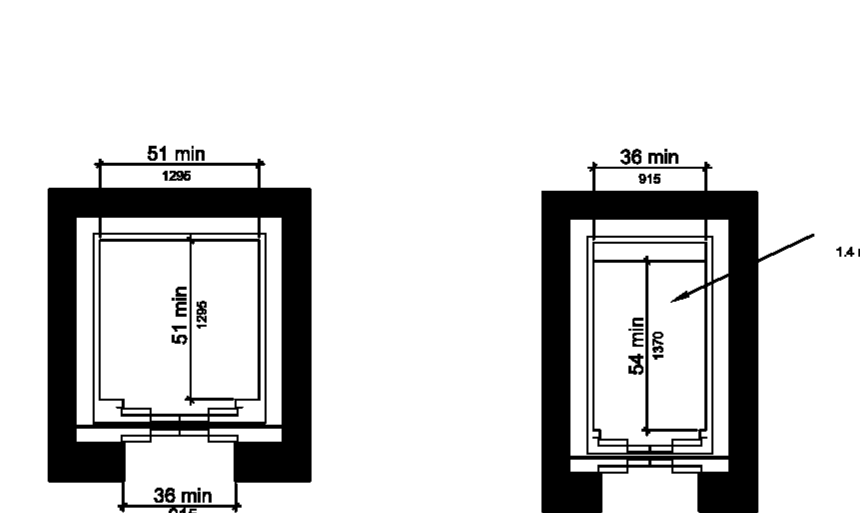


Figure 408.4.1 Limited-Use/Limited-Application (LULA) Elevator Car Dimensions

408.4.2 Floor Surfaces. Floor surfaces in elevator cars shall comply with 302 and 303.

408.4.3 Platform to Hoistway Clearance. The platform to hoistway clearance shall comply with 407.4.3.

408.4.4 Leveling. Elevator car leveling shall comply with 407.4.4.

408.4.5 Illumination. Elevator car illumination shall comply with 407.4.5.

408.4.6 Car Controls. Elevator car controls shall comply with 407.4.6. Control panels shall be centered on a side wall.

408.4.7 Designations and Indicators of Car Controls. Designations and indicators of car controls shall comply with 407.4.7.

408.4.8 Emergency Communications. Car emergency signaling devices complying with 407.4.9 shall be provided.

409 Private Residence Elevators

409.1 General. Private residence elevators that are provided within a residential dwelling unit required to provide mobility features complying with 602.2 through 609.4 shall comply with 409 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

409.2 Call Buttons. Call buttons shall be 3/4 inch (19 mm) minimum in the smallest dimension and shall comply with 309.

409.3 Elevator Doors. Hoistway doors, car doors, and car gates shall comply with 409.3 and 404.

409.3.1 Power Operation. Elevator car and hoistway doors and gates shall be power operated and shall comply with ANSI/BSA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1). Power operated doors and gates shall remain open for 20 seconds minimum when activated.

409.3.2 Location. Elevator car doors or gates shall be positioned at the narrow end of the clear floor spaces required by 409.4.1.

409.4 Elevator Cars. Private residence elevator cars shall comply with 409.4.

409.4.1 Inside Dimensions of Elevator Cars. Elevator cars shall provide a clear floor space of 36 inches (915 mm) minimum by 48 inches (1220 mm) minimum and shall comply with 305.

409.4.2 Floor Surfaces. Floor surfaces in elevator cars shall comply with 302 and 303.

409.4.3 Platform to Hoistway Clearance. The clearance between the car platform and the edge of any landing sill shall be 1 1/2 inch (38 mm) minimum.

409.4.4 Leveling. Each car shall automatically stop at a floor landing within a tolerance of 1/2 inch (13 mm) under rated loading to zero loading conditions.

409.4.5 Illumination Levels. Elevator car illumination shall comply with 407.4.5.

409.4.6 Car Controls. Elevator car control buttons shall comply with 409.4.6, 309.3, 309.4, and shall be raised or flush.

409.4.6.1 Size. Control buttons shall be 3/4 inch (19 mm) minimum in their smallest dimension.

409.4.6.2 Location. Controls shall be located within one of the reach ranges specified in 308.

409.4.6.3 Buttons. Car control buttons with floor designations shall comply with 407.4.6.2 and shall be raised or flush.

409.4.6.4 Height. Emergency control buttons shall have their centerlines 35 inches (890 mm) minimum above the finish floor.

409.4.7.1.1 Type. Control buttons shall be identified by tactile characters complying with 703.2.

409.4.7.1.3 Symbols. The control button for the emergency stop, alarm, door open, door close, main entry floor, and phone, shall be identified with tactile symbols as shown in Table 407.4.7.1.3.

409.4.8.1.1 Size. Characters shall be 1/2 inch (13 mm) high minimum.

409.4.8.2.2 Signal Level. The verbal annunciator shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the annunciator.

409.4.8.2.3 Frequency. The verbal annunciator shall have a frequency of 300 Hz minimum to 3000 Hz maximum.

409.4.9 Limited-Use/Limited-Application Elevators

409.4.9.1 General. Limited-use/limited-application elevators shall comply with 409 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

409.4.9.2 Elevator Landings. Landings serving limited-use/limited-application elevators shall comply with 409.4.9.2.

409.4.9.2.1 Call Buttons. Elevator call buttons and keypads shall comply with 407.2.1.

409.4.9.2.2 Hall Signals. Hall signal shall comply with 407.2.2.

409.4.9.2.3 Hoistway Signs. Signs of elevator hoistways shall comply with 407.2.3.1.

409.4.9.3 Elevator Doors. Elevator hoistway doors shall comply with 408.3.

409.4.9.3.1 Sliding Doors. Sliding hoistway and car doors shall comply with 407.3.1 through 407.3.3 and 408.4.1.

The ADA and other federal civil rights laws require that accessible features be maintained in working order so that they are accessible to and usable by those people they are intended to benefit. Building owners are reminded that the ASME A18 Safety Standard for Platform Lifts and Stairway Chairs requires routine maintenance and inspections. Insulated or temporary interruptions in service due to maintenance or repairs may be unavoidable; however, failure to take prompt action to effect repairs could constitute a violation of Federal laws and these requirements.

410.2 Floor Surfaces. Floor surfaces in platform lifts shall comply with 302 and 303.

410.3 Clear Floor Space. Clear floor space in platform lifts shall comply with 305.

410.4 Platform to Runway Clearance. The clearance between the platform sill and the edge of any runway landing shall be 1 inch (32 mm) minimum.

410.5 Operable Parts. Controls for platform lifts shall comply with 306.

410.6 Doors and Gates. Platform lifts shall have low-energy power-operated doors or gates complying with 404.3. Doors shall remain open for 20 seconds minimum. End doors and gates shall provide a clear width 32 inches (815 mm) minimum. Side doors and gates shall provide a clear width 42 inches (1065 mm) minimum.

EXCEPTION: Platform lifts serving two landings maximum and having doors or gates on opposite sides shall be permitted to have self-closing manual doors or gates.

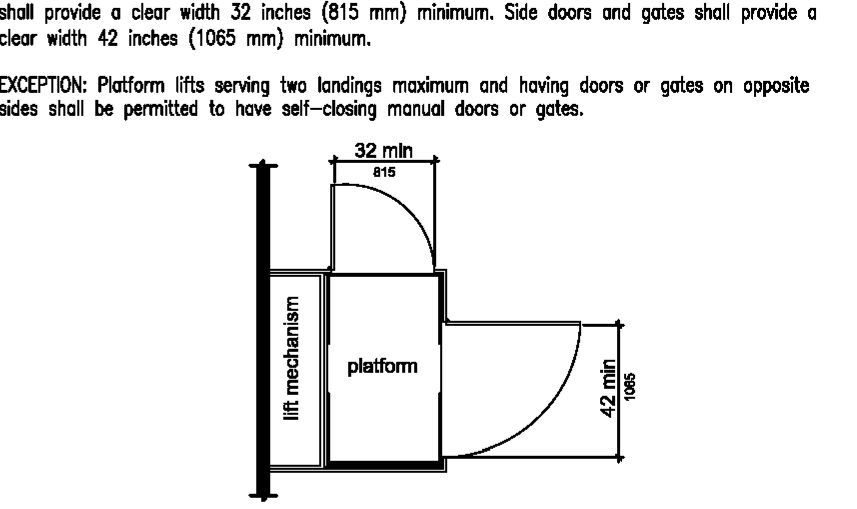


Figure 410.6 Platform Lift Doors and Gates

501 General

501.1 Scope. The provisions of Chapter 5 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

502 Parking Spaces

502.1 General. Car and van parking spaces shall comply with 502. Where parking spaces are marked with lines, width measurements of parking spaces and access aisles shall be made from the centerline of the markings.

EXCEPTION: Where parking spaces or access aisles are not adjacent to another parking space or access aisle, measurements shall be permitted to include the full width of the line defining the parking space or access aisle.

502.2 Vehicle Spaces. Car parking spaces shall be 96 inches (2440 mm) wide minimum and van parking spaces shall be 132 inches (3350 mm) wide minimum, shall be marked to define the width, and shall have an adjacent access aisle complying with 502.3.

EXCEPTION: Van parking spaces shall be permitted to be 96 inches (2440 mm) wide minimum where the access aisle is 96 inches (2440 mm) wide minimum.

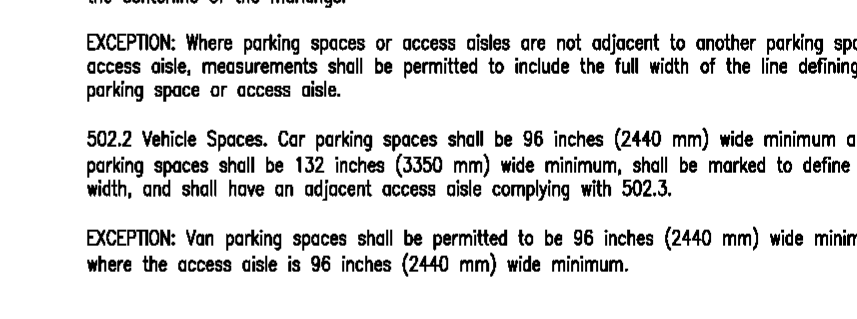


Figure 502.2 Vehicle Parking Spaces

502.3 Access Aisle. Access aisles serving parking spaces shall comply with 502.3. Access aisles shall adjoin an accessible route. Two parking spaces may be permitted to share a common access aisle.

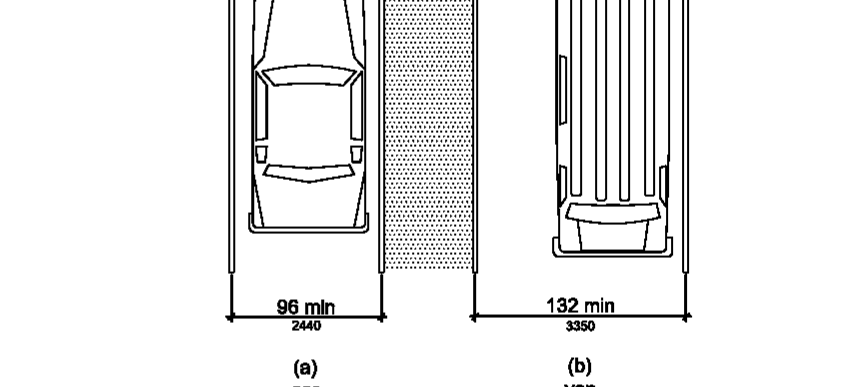


Figure 502.3 Access Aisle

502.3.1 Width. Access aisles serving car and van parking spaces shall be 60 inches (1525 mm) wide minimum.

502.3.2 Length. Access aisles shall extend the full length of the parking spaces they serve.

502.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

502.3.4 Location. Access aisles shall not overlap the vehicular way. Access aisles shall be permitted to be placed on either side of the parking space except for angled van parking spaces which shall have access aisles located on the passenger side of the parking spaces.

502.4 Floor or Ground Surfaces. Parking spaces and access aisles serving them shall comply with 302. Access aisles shall be at the street level or the parking spaces they serve. Changes in level are not permitted. EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

502.5 Vertical Clearance. Parking spaces for vans and access aisles and vehicular routes serving them shall provide a vertical clearance of 98 inches (2490 mm) minimum.

502.6 Identification. Parking space identification signs shall include the International Symbol of Accessibility complying with 703.2.1. Signs identifying van parking spaces shall contain the designation "van accessible." Signs shall be 60 inches (1525 mm) minimum above the finish floor or ground surface measured to the bottom of the sign.

502.7 Relationship to Accessible Routes. Parking spaces and access aisles shall be designed so that cars and vans, when parked, cannot obstruct the required clear width of adjacent accessible routes.

503 Passenger Loading Zones

503.2 Vehicle Pull-Up Space. Passenger loading zones shall provide a vehicular pull-up space 96 inches (2440 mm) wide minimum and 20 feet (6100 mm) long minimum.

503.3 Access Aisle. Passenger loading zones shall provide access aisles complying with 503 adjacent to the vehicle pull-up space. Access aisles shall adjoin an accessible route and shall not overlap the vehicular way.

503.3.1 Width. Access aisles serving vehicle pull-up spaces shall be 60 inches (1525 mm) wide minimum.

503.3.2 Length. Access aisles shall extend the full length of the vehicle pull-up spaces they serve.

503.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.4 Location. Access aisles shall be marked so as to discourage parking in them.

503.3.5 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.6 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.7 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.8 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.9 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.10 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.11 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.12 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.13 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.14 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.15 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.16 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.17 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.18 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.19 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.20 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.21 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.22 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.23 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.24 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.25 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.26 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.27 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.28 Marking. Access aisles shall be marked so as to discourage parking in them.

503.3.2



607.4.1.1 Back Wall. Two grab bars shall be installed on the back wall, one located in accordance with 609.4 and the other located 8 inches (205 mm) minimum and 10 inches (255 mm) maximum above the rim of the bathtub. Each grab bar shall be installed 15 inches (380 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

607.4.1.2 Control End Wall. A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

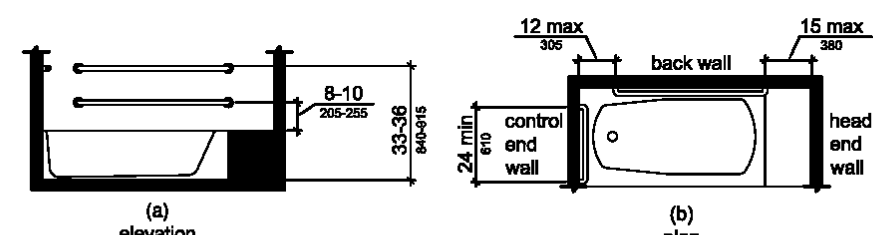


Figure 607.4.1 Grab Bars for Bathtubs with Permanent Seats

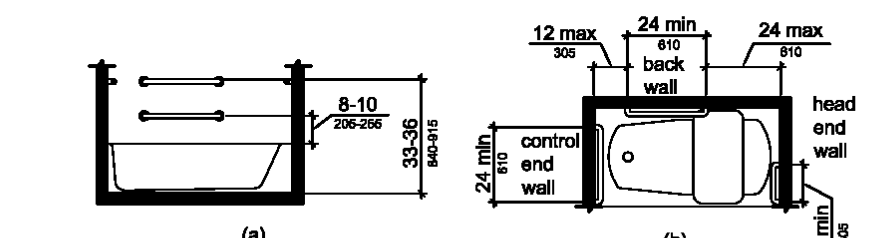


Figure 607.4.2 Grab Bars for Bathtubs with Removable In-Tub Seats

607.4.2 Bathtubs Without Permanent Seats. For bathtubs without permanent seats, grab bars shall comply with 607.4.2.

607.4.2.1 Back Wall. Two grab bars shall be installed on the back wall, one located in accordance with 609.4 and other located 8 inches (205 mm) minimum and 10 inches (255 mm) maximum above the rim of the bathtub. Each grab bar shall be 24 inches (610 mm) long minimum and shall be installed 24 inches (610 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

607.4.2.2 Control End Wall. A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

607.4.2.3 Head End Wall. A grab bar 12 inches (305 mm) long minimum shall be installed on the head end wall at the front edge of the bathtub.

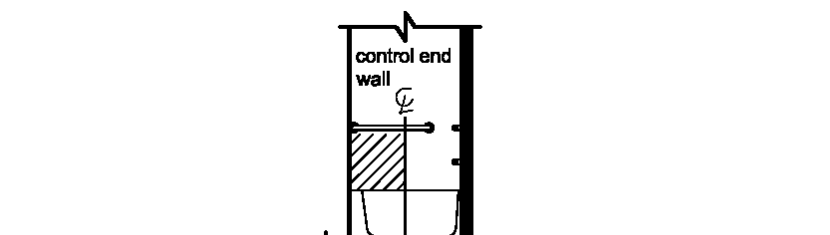


Figure 607.5 Bathtub Control Location

607.5 Controls. Controls, other than drain stoppers, shall be located on an end wall. Controls shall be between the bathtub rim and grab bar, and between the open side of the bathtub and the centerline of the width of the bathtub. Controls shall comply with 309.4.

607.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-passive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Bathtub shower spray units shall deliver water that is 120°F (49°C) maximum.

607.7 Bathtub Enclosures. Enclosures for bathtubs shall not obstruct controls, faucets, shower and spray units or obstruct transfer from wheelchairs onto bathtub seats or into bathtub. Enclosures on bathtubs shall not have tracks installed on the rim of the open face of the bathtub.

608 Shower Compartments

608.2 Size and Clearances for Shower Compartments. Shower compartments shall have sizes and clearances complying with 608.2.

608.2.1 Transfer Type Shower Compartments. Transfer type shower compartments shall be 36 inches (915 mm) by 36 inches (915 mm) clear inside dimensions measured at the center points of opposing sides and shall have a 36 inch (915 mm) wide minimum entry on the face of the shower compartment. Clearance of 36 inches (915 mm) wide minimum by 48 inches (1220 mm) long minimum measured from the control wall shall be provided.

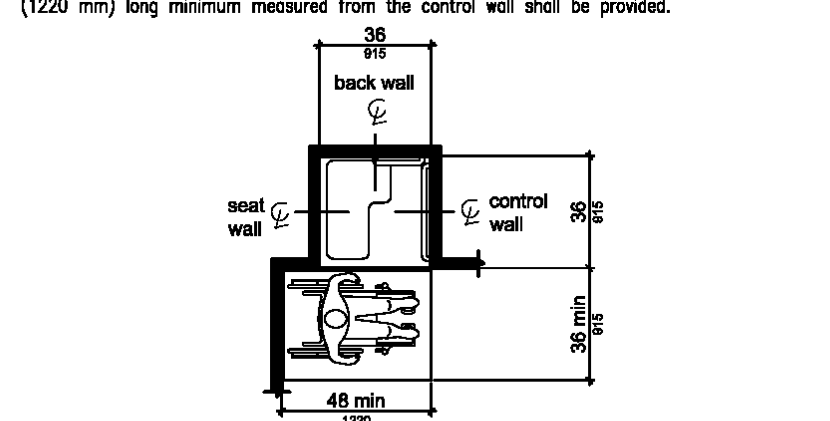


Figure 608.2.1 Transfer Type Shower Compartment Size and Clearance

608.2.2 Standard Roll-In Type Shower Compartments. Standard roll-in type shower compartments shall be 30 inches (760 mm) wide minimum by 60 inches (1525 mm) deep minimum clear inside dimensions measured at center points of opposing sides and shall have a 60 inches (1525 mm) wide minimum entry on the face of the shower compartment.

608.2.2.1 Clearances. A 30 inch (760 mm) wide minimum by 60 inch (1525 mm) long minimum clearance shall be provided adjacent to the open face of the shower compartment.

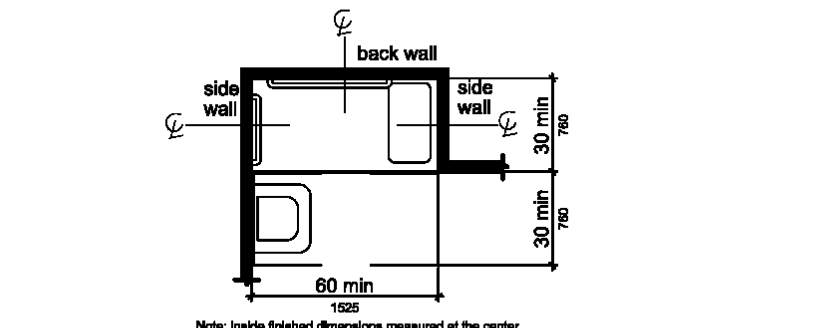


Figure 608.2.2 Standard Roll-In Type Shower Compartment Size and Clearance

608.2.3 Alternate Roll-In Type Shower Compartments. Alternate roll-in type shower compartments shall be 36 inches (915 mm) wide and 60 inches (1525 mm) deep minimum clear inside dimensions measured at center points of opposing sides. A 36 inch (915 mm) wide minimum entry shall be provided at one end of the long side of the compartment.

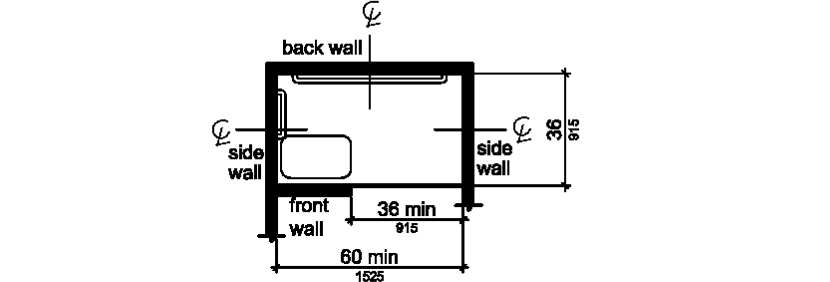


Figure 608.2.3 Alternate Roll-In Type Shower Compartment Size and Clearance

608.3 Grab Bars. Grab bars shall comply with 609 and shall be provided in accordance with 609.3. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the finish floor.

608.3.1 Transfer Type Shower Compartments. In transfer type shower compartments, grab bars shall be provided across the control wall and back wall to a point 18 inches (455 mm) from the control wall.

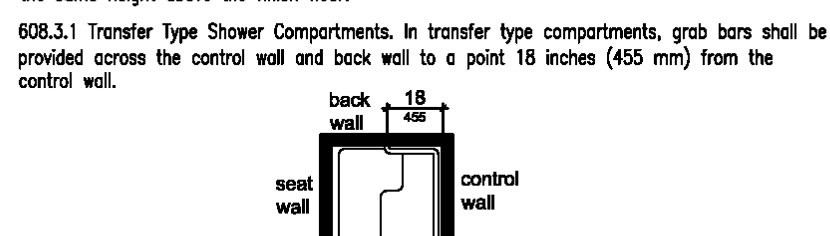


Figure 608.3.1 Grab Bars for Transfer Type Showers

608.3.2 Standard Roll-In Type Shower Compartments. Where a seat is provided in standard roll-in type shower compartments, grab bars shall be provided on the back wall and the side wall opposite the seat. Grab bars shall not be provided above the seat. Where a seat is not provided in standard roll-in type shower compartments, grab bars shall be provided on three walls. Grab bars shall be installed 6 inches (150 mm) maximum from adjacent walls.

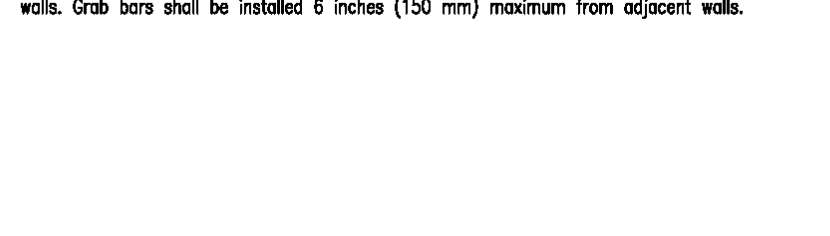


Figure 608.3.2 Standard Roll-In Type Shower Compartments

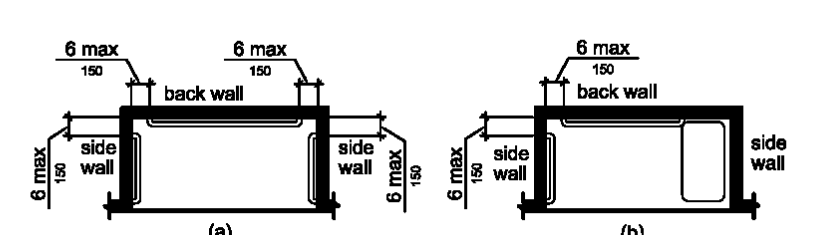


Figure 608.3.3 Grab Bars for Standard Roll-In Type Showers

608.3.3 Alternate Roll-In Type Shower Compartments. In alternate roll-in type shower compartments, grab bars shall be provided on the back wall and the side wall farthest from the compartment entry. Grab bars shall not be provided above the seat. Grab bars shall be installed 6 inches (150 mm) maximum from adjacent walls.

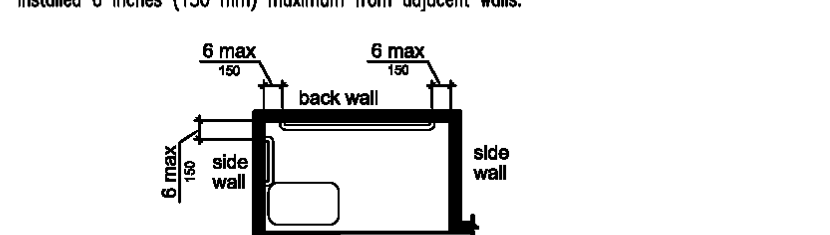


Figure 608.3.3 Alternate Roll-In Type Showers

608.4 Seats. A folding or non-folding seat shall be provided in transfer type shower compartments. A folding seat shall be provided in roll-in type showers required in transient lodging guest rooms with mobility features complying with 609.2. Seats shall comply with 610.609.5 Controls. Controls, faucets, and shower spray units shall comply with 309.4.

608.5.1 Transfer Type Shower Compartments. In transfer type shower compartments, the controls, faucets, and shower spray unit shall be installed on the side wall opposite the seat 38 inches (965 mm) minimum and 48 inches (1220 mm) maximum above the shower floor and shall be located on the control wall 15 inches (380 mm) maximum from the centerline of the seat toward the shower opening.

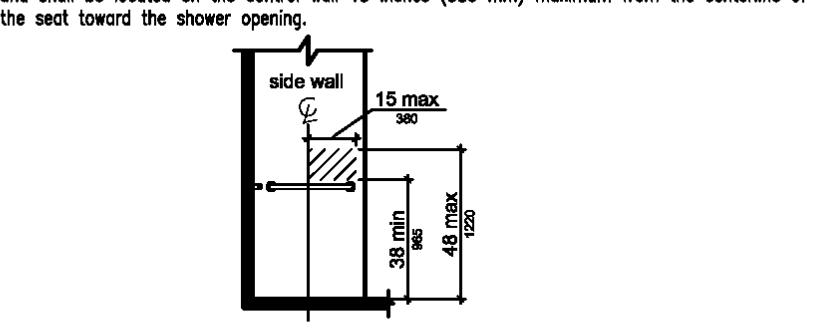


Figure 608.5.1 Transfer Type Shower Compartment Control Location

608.5.2 Standard Roll-In Type Shower Compartments. In standard roll-in type shower compartments, the controls, faucets, and shower spray unit shall be located above the grab bar, but no higher than 48 inches (1220 mm) above the shower floor. Where a seat is provided, the controls, faucets, and shower spray unit shall be installed on the back wall adjacent to the seat wall and shall be located 27 inches (685 mm) maximum from the seat wall.

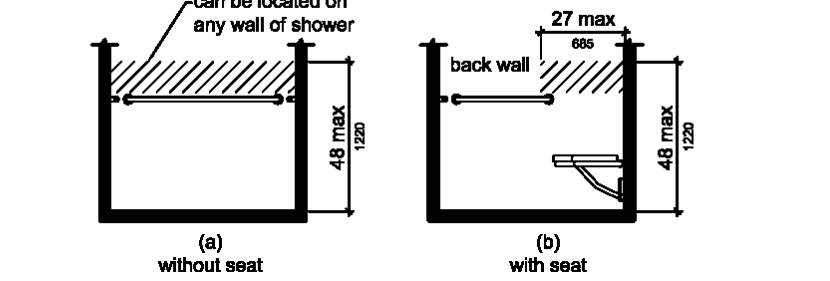


Figure 608.5.2 Standard Roll-In Type Shower Compartment Control Location

608.5.3 Alternate Roll-In Type Shower Compartments. In alternate roll-in type shower

bar, but no higher than 48 inches (1220 mm) above the shower floor. Where a seat is provided, the controls, faucets, and shower spray unit shall be located on the side wall adjacent to the seat wall and shall be located 27 inches (685 mm) maximum from the seat wall.

shower spray unit shall be installed on the side wall farthest from the compartment entry.

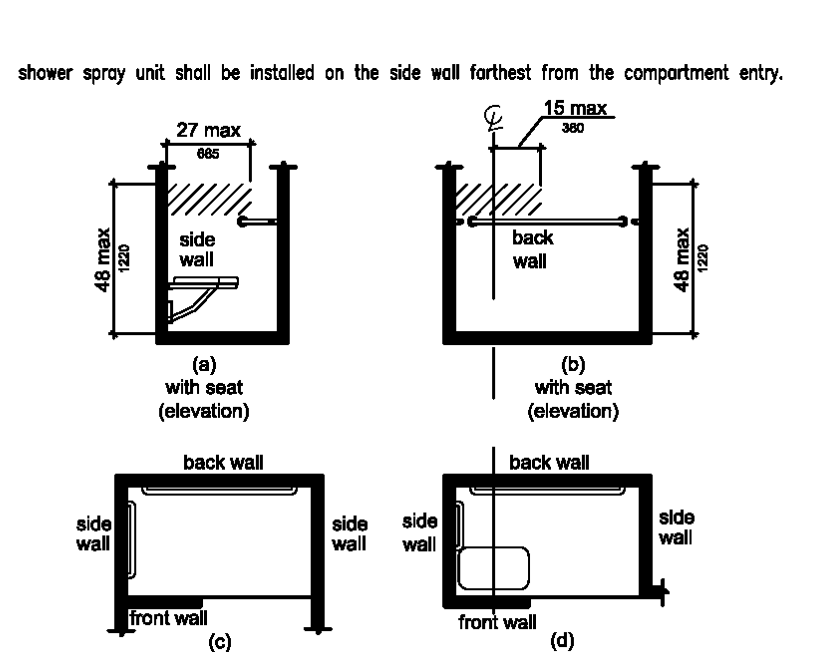


Figure 608.5.3 Alternate Roll-In Type Shower Compartment Control Location

608.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-passive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Shower spray units shall deliver water that is 120°F (49°C) maximum.

608.7 Thresholds. Thresholds in roll-in type shower compartments shall be 1/2 inch (13 mm) high maximum in accordance with 303. In transfer type shower compartments, thresholds 1/2 inch (13 mm) high maximum shall be beveled, rounded, or vertical.

608.8 Shower Enclosures. Enclosures for shower compartments shall not obstruct controls, faucets, and shower spray units or obstruct transfer from wheelchairs onto shower seats.

609 Grab Bars

609.1 General. Grab bars in toilet facilities and bathing facilities shall comply with 609.

609.2 Cross Section. Grab bars shall have a cross section complying with 609.2.1 or 609.2.2.

609.2.1 Circular Cross Section. Grab bars with circular cross sections shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.

609.2.2 Non-Circular Cross Section. Grab bars with non-circular cross sections shall have a cross-section dimension of 2 inches (51 mm) maximum and a perimeter dimension of 4 inches (100 mm) minimum and 4.8 inches (120 mm) maximum.

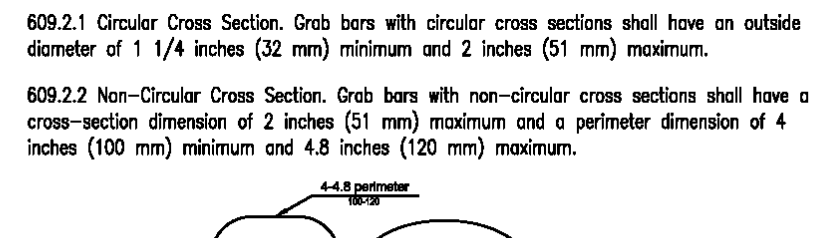


Figure 609.2.2 Non-Circular Cross Section

609.3 Spacing. The space between the wall and the grab bar shall be 1 1/2 inches (38 mm). The space between the grab bar and projecting objects below and at the ends shall be 1 1/2 inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.

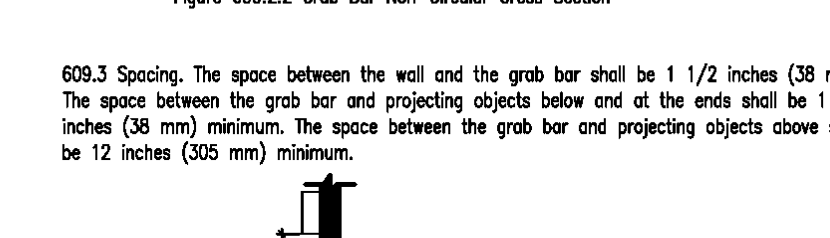


Figure 609.3 Spacing of Grab Bars

609.4 Position of Grab Bars. Grab bars shall be installed in a horizontal position, 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor measured to the top of the gripping surface, except that at water closets for children's use complying with 609.4, grab bars shall be installed in a horizontal position 18 inches (455 mm) minimum and 27 inches (685 mm) maximum above the finish floor measured to the top of the gripping surface. The height of the lower grab bar on the back wall of a bathtub shall comply with 607.4.1.1 or 607.4.2.1.

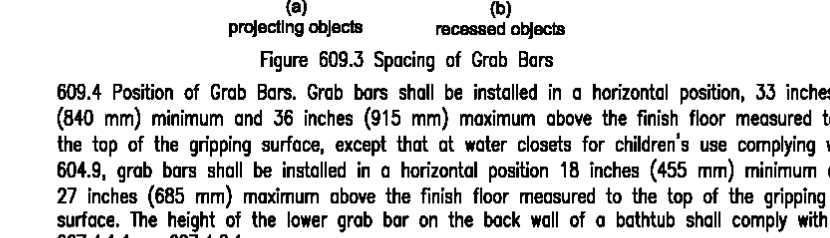


Figure 609.4 Position of Grab Bars

609.5 Surface Hazards. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges.

609.6 Fittings. Grab bars shall not rotate within their fittings.

609.7 Installation. Grab bars shall be installed in any manner that provides a gripping surface at the specified locations and that does not obstruct the required clear floor space.

609.8 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the grab bar, fastener, mounting device, or supporting structure.

610 Seats

610.2 Bathtub Seats. The top of bathtub seats shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum above the bathroom finish floor. The depth of a removable in-tub seat shall be 15 inches (380 mm) minimum and 18 inches (405 mm) maximum. The seat shall be capable of secure placement. Permanent seats at the head end of the bathtub shall be 15 inches (380 mm) deep minimum and shall extend from the back wall to or beyond the outer edge of the bathtub.

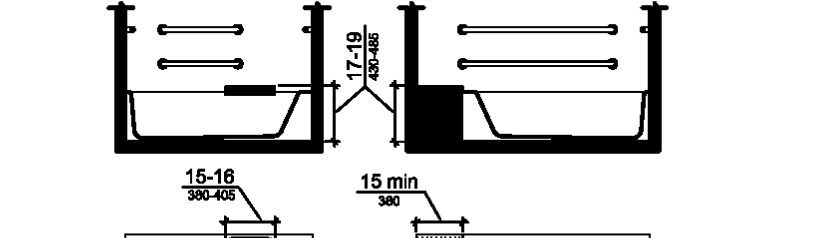


Figure 610.2 Bathtub Seats

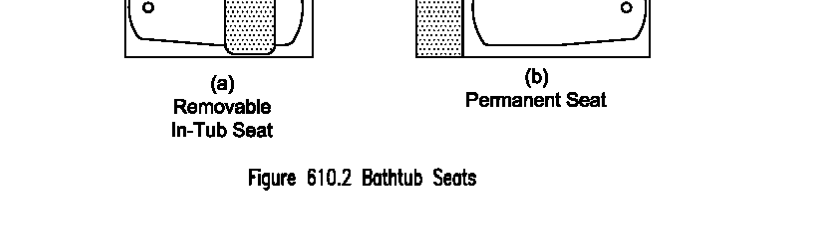


Figure 610.3 Rectangular Shower Seat

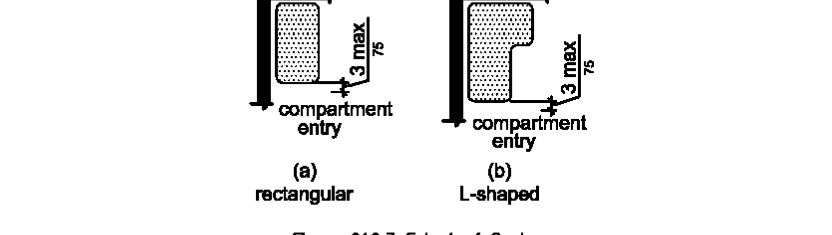


Figure 610.3.1 Rectangular Shower Seat

610.3.1 Rectangular Seats. The rear edge of a rectangular seat shall be 2 1/2 inches (64 mm) maximum and the front edge 15 inches (380 mm) minimum and 18 inches (405 mm) maximum from the seat wall. The side edge of the seat shall be 1 1/2 inches (38 mm) maximum from the adjacent wall.

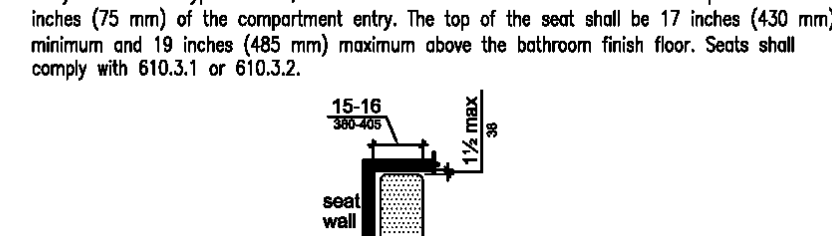


Figure 610.3.1 Rectangular Shower Seat

610.3.2 L-Shaped Seats. The rear edge of an L-shaped seat shall be 2 1/2 inches (64 mm) maximum and the front edge 15 inches (380 mm) minimum and 18 inches (405 mm) maximum from the seat wall. The rear edge of the "L" portion of the seat shall be 1 1/2 inches (38 mm) maximum from the wall and the front edge shall be 14 inches (355 mm) minimum and 15 inches (380 mm) maximum from the wall. The end of the "L" shall be 22 inches (560 mm) minimum and 23 inches maximum (585 mm) from the main seat wall.

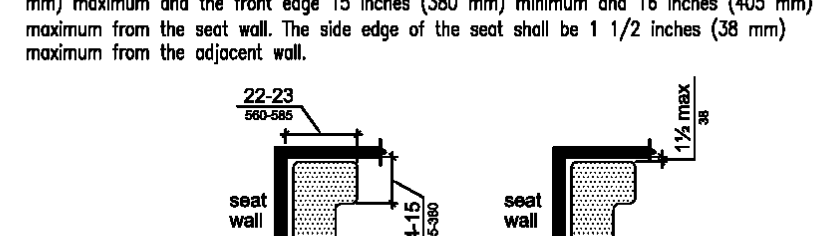


Figure 610.3.2 L-Shaped Shower Seat

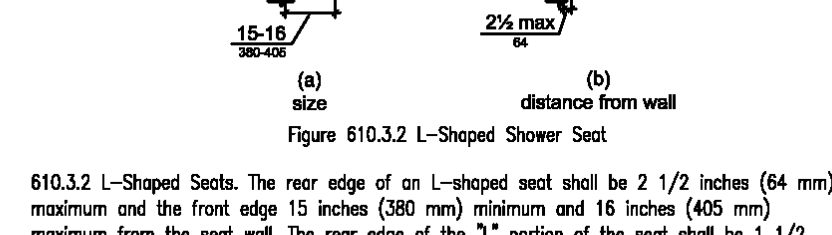


Figure 610.3.2 L-Shaped Shower Seat

610.4 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener, mounting device, or supporting structure.

611 Washing Machines and Clothes Dryers

611.2 Clear Floor Space. A clear floor or ground space complying with 305 positioned for parallel approach shall be provided. The clear floor or ground space shall be centered on the appliance.

611.3 Operable Parts. Operable parts, including doors, lint screens, and detergent and bleach compartments shall comply with 309.

611.4 Height. Top loading machines shall have the door to the laundry compartment located 36 inches (915 mm) maximum above the finish floor. Front loading machines shall have the bottom of the opening to the laundry compartment located 15 inches (380 mm) minimum and 36 inches (915 mm) maximum above the finish floor.

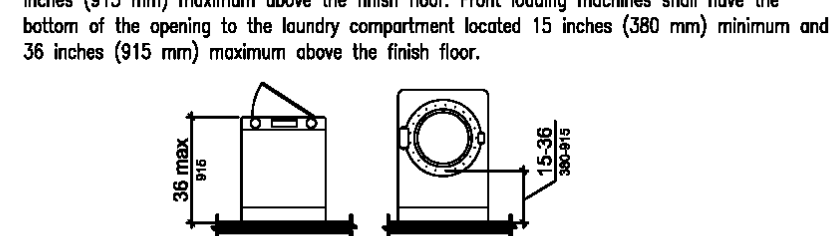


Figure 611.4 Height of Laundry Compartment Opening

612 Saunas and Steam Rooms

612.2 Bench. Where seating is provided in saunas and steam rooms, at least one bench shall comply with 903. Doors shall not swing into the clear floor space required by 903.2.

612.3 Turning Space. A turning space complying with 304 shall be provided within saunas and steam rooms

CHAPTER 7: COMMUNICATION ELEMENTS AND FEATURES

702 Fire Alarm Systems

702.1 General. Fire alarm systems shall have permanently installed audible and visible alarms complying with NFPA 72 (1999 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1), except that the maximum allowable sound level of audible notification appliances complying with section 4-3.2.1 of NFPA 72 (1999 edition) shall have a sound level no more than 110 dB at the minimum hearing distance from the audible appliance. In addition, alarms in guest rooms required to provide communication features shall comply with sections 4-3 and 4-4 of NFPA 72 (1999 edition) or sections 7.4 and 7.5 of NFPA 72 (2002 edition).

703 Signs

703.1 General. Signs shall comply with 703. Where both visual and tactile characters are required, either one sign with both visual and tactile characters, or two separate signs, one with visual, and one with tactile characters, shall be provided.

703.2 Raised Characters. Raised characters shall comply with 703.2 and shall be duplicated in braille complying with 703.3. Raised characters shall be installed in accordance with 703.4.

703.2.1 Depth. Raised characters shall be 1/32 inch (0.8 mm) minimum above their background.

703.2.2 Case. Characters shall be uppercase.

703.2.3 Style. Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.2.4 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "T".

703.2.5 Character Height. Character height measured vertically from the baseline of the character shall be 5/8 inch (16 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "T".

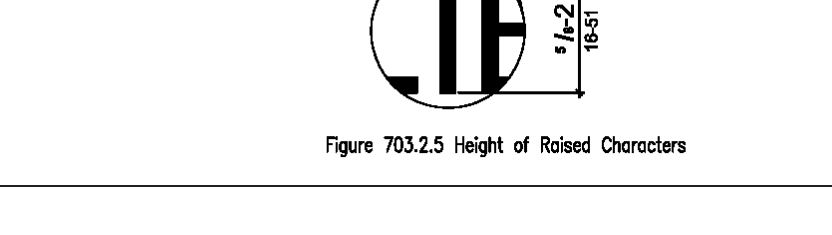


Figure 703.2.5 Height of Raised Characters

703.2.6 Stroke Thickness. Stroke thickness of the uppercase letter "T" shall be 15 percent maximum of the height of the character.

703.2.7 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Where characters have rectangular cross sections, spacing between individual raised characters shall be 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16 inch (1.6 mm) minimum and 4 times the raised character stroke width maximum at the base of the cross sections, and 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements 3/8 inch (9.5 mm) minimum.

703.2.8 Line Spacing. Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

703.3 Braille. Braille shall be contracted (Grade 2) and shall comply with 703.3 and 703.4.

703.3.1 Dimensions and Capitalization. Braille dots shall have a domed or rounded shape and shall comply with Table 703.3.1. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

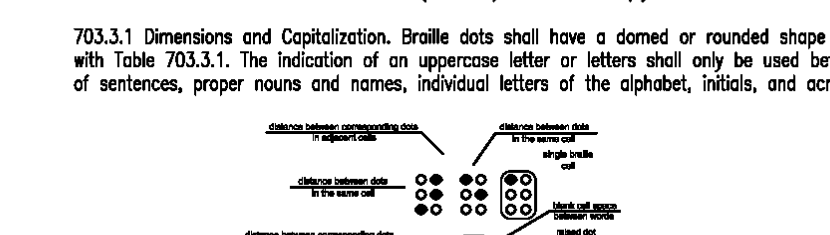


Figure 703.3.1 Braille Measurement

703.3.2 Position. Braille shall be positioned below the corresponding text. If text is multi-lined, braille shall be placed below the entire text. Braille shall be separated 3/8 inch (9.5 mm) minimum from any other tactile characters and 3/8 inch (9.5 mm) minimum from raised borders and decorative elements.

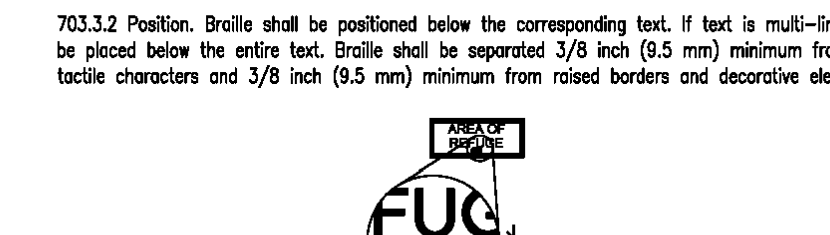


Figure 703.3.2 Position of Braille

703.4 Installation Height and Location. Signs with tactile characters shall comply with 703.4.

703.4.1 Height Above Finish Floor or Ground. Tactile characters or signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.

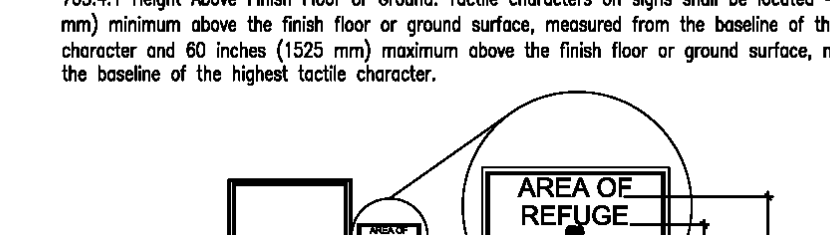


Figure 703.4.1 Height of Tactile Characters Above Finish Floor or Ground

703.4.2 Location. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leaves, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. 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.

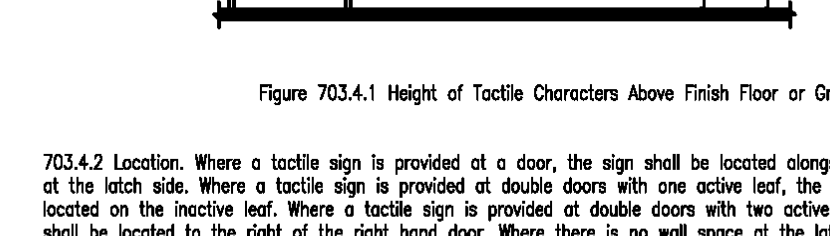


Figure 703.4.2 Location of Tactile Signs at Doors

703.5 Visual Characters. Visual characters shall comply with 703.5.

703.5.1 Finish and Contrast. Characters and their background shall have a non-gloss finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

703.5.2 Case. Characters shall be uppercase or lowercase or a combination of both.

703.5.3 Style. Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.5.4 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "T".

703.5.5 Character Height. Minimum character height shall comply with Table 703.5.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter "T".

703.5.6 Height from Finish Floor or Ground. Visual characters shall be 40 inches (1015 mm) minimum above the finish floor or ground.

703.5.7 Stroke Thickness. Stroke thickness of the uppercase letter "T" shall be 10 percent minimum and 30 percent maximum of the height of the character.

703.5.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

703.5.9 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height.

703.6 Pictograms. Pictograms shall comply with 703.6.

703.6.1 Pictogram Field. Pictograms shall have a field height of 8 inches (150 mm) minimum. Characters and braille shall not be located in the pictogram field.

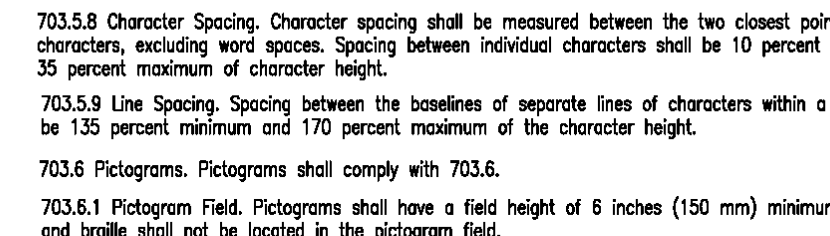


Figure 703.6.1 Pictogram Field

703.6.2 Finish and Contrast. Pictograms and their field shall have a non-gloss finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.

703.6.3 Text Descriptors. Pictograms shall have text descriptors located directly below the pictogram field. Text descriptors shall comply with 703.2, 703.3 and 703.4.

703.6.4 Symbols of Accessibility. Symbols of accessibility shall comply with 703.7.

703.7.1 Finish and Contrast. Symbols of accessibility and their background shall have a non-gloss finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

704 Telephones

704.1 General. Public telephones shall comply with 704.

704.2 Wheelchair Accessible Telephones. Wheelchair accessible telephones shall comply with 704.2.

704.2.1 Clear Floor or Ground Space. A clear floor or ground space complying with 305 shall be provided. The clear floor or ground space shall not be obstructed by bases, enclosures, or seats.

Advisory 704.2.1: Clear Floor or Ground Space. Because clear floor or ground space is required to be unobstructed, telephones, enclosures and related telephone book storage cannot encroach on the required clear floor or ground space and must comply with the provisions for protruding objects. (See Section 307).

704.2.1.1 Parallel Approach. Where a parallel approach is provided, the distance from the edge of the telephone enclosure to the face of the telephone unit shall be 10 inches (255 mm) maximum.

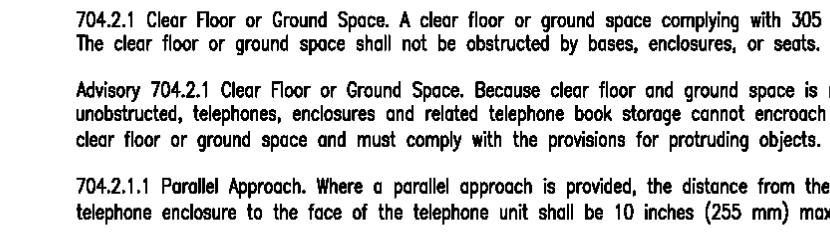


Figure 704.2.1.1 Parallel Approach to Telephone

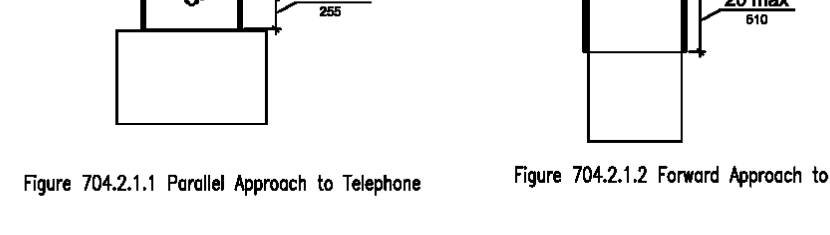


Figure 704.2.1.2 Forward Approach to Telephone

704.2.1.2 Forward Approach. Where a forward approach is provided, the distance from the front edge of a counter within the telephone enclosure to the face of the telephone unit shall be 20 inches (510 mm) maximum.

704.2.2 Operable Parts. Operable parts shall comply with 309. Telephones shall have push-button controls where such service is available.

704.2.3 Telephone Directories. Telephone directories, where provided, shall be located in accordance with 309.

704.2.4 Cord Length. The cord from the telephone to the handset shall be 29 inches (735 mm) long minimum.

704.3 Volume Control Telephones. Public telephones required to have volume controls shall be equipped with a receive volume control that provides a gain adjustable up to 20 dB minimum. For incremental volume control, provide at





BLUELINE

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FORT BEND COUNTY  
NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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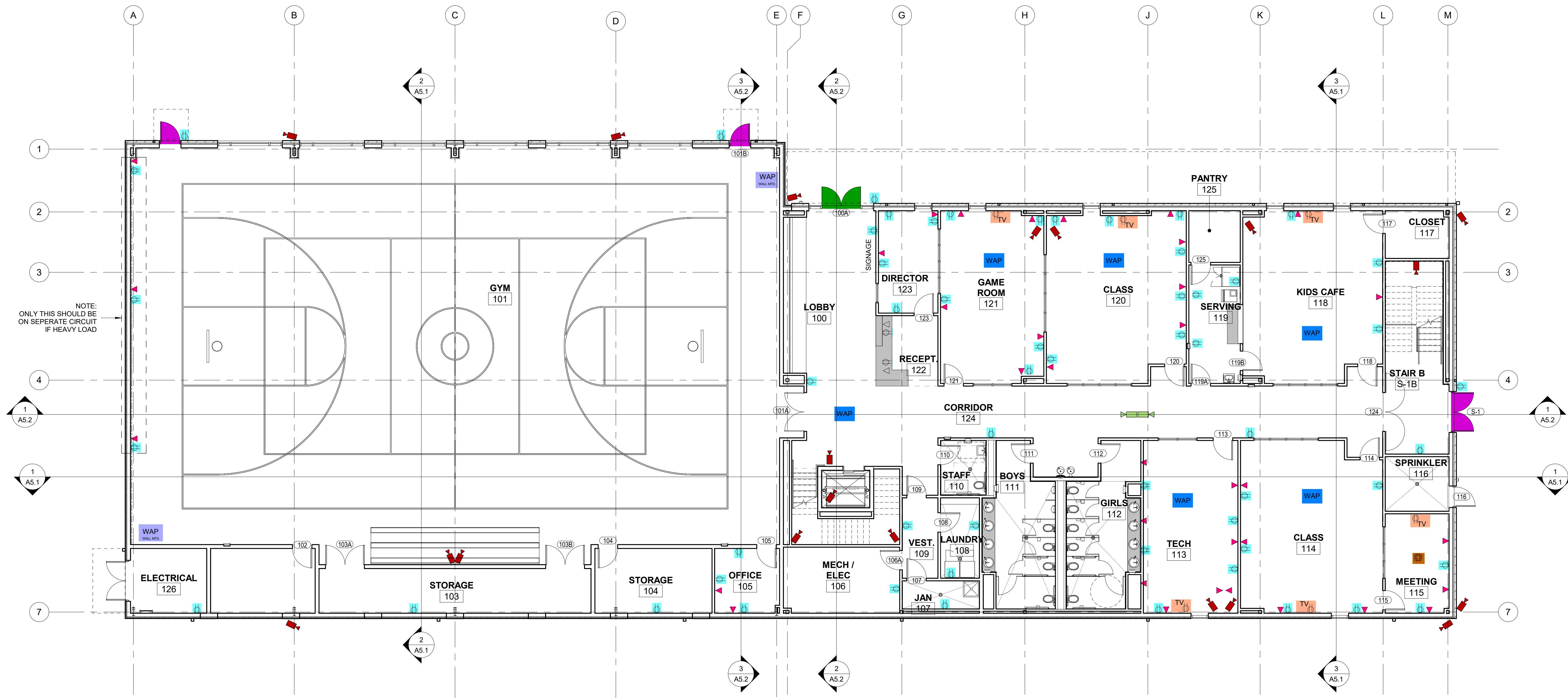
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T2.1

I.T. & SECURITY  
TECHNOLOGY  
FLOOR PLAN



1 FIRST FLOOR - I.T. & SECURITY  
1/8" = 1'-0"

NOTE:  
G.C. TO PROVIDE CONDUIT AND  
PULL STRING FOR ALL EQUIPMENT  
SHOWN, HOWEVER INSTALLATION  
OF THE EQUIPMENT IS BY OTHERS.  
G.C. TO COORDINATE

LEGEND

- STANDARD DUPLEX (MOUNTED AT 18" A.F.F.)
- STANDARD QUAD (MOUNTED AT 18" A.F.F.)
- FLOOR BOX
- DUPLEX FOR TV (MOUNTED AT 56" A.F.F.)
- DATA / COM.
- WIRELESS ACCESS POINTS (WALL MOUNTED AT 10' A.F.F. - GYM ONLY)
- WIRELESS ACCESS POINTS (CEILING MOUNTED)
- SECURITY CAMERA (110 DEG)
- SECURITY CAMERA (90 DEG - MOUNTED BACK TO BACK)
- ELEC. STRIKE DOOR (MAIN ENTRANCE ONLY)
- DOOR W/ CHIME BY OWNER



**FORT BEND COUNTY  
NEW COMMUNITY CENTER**  
AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

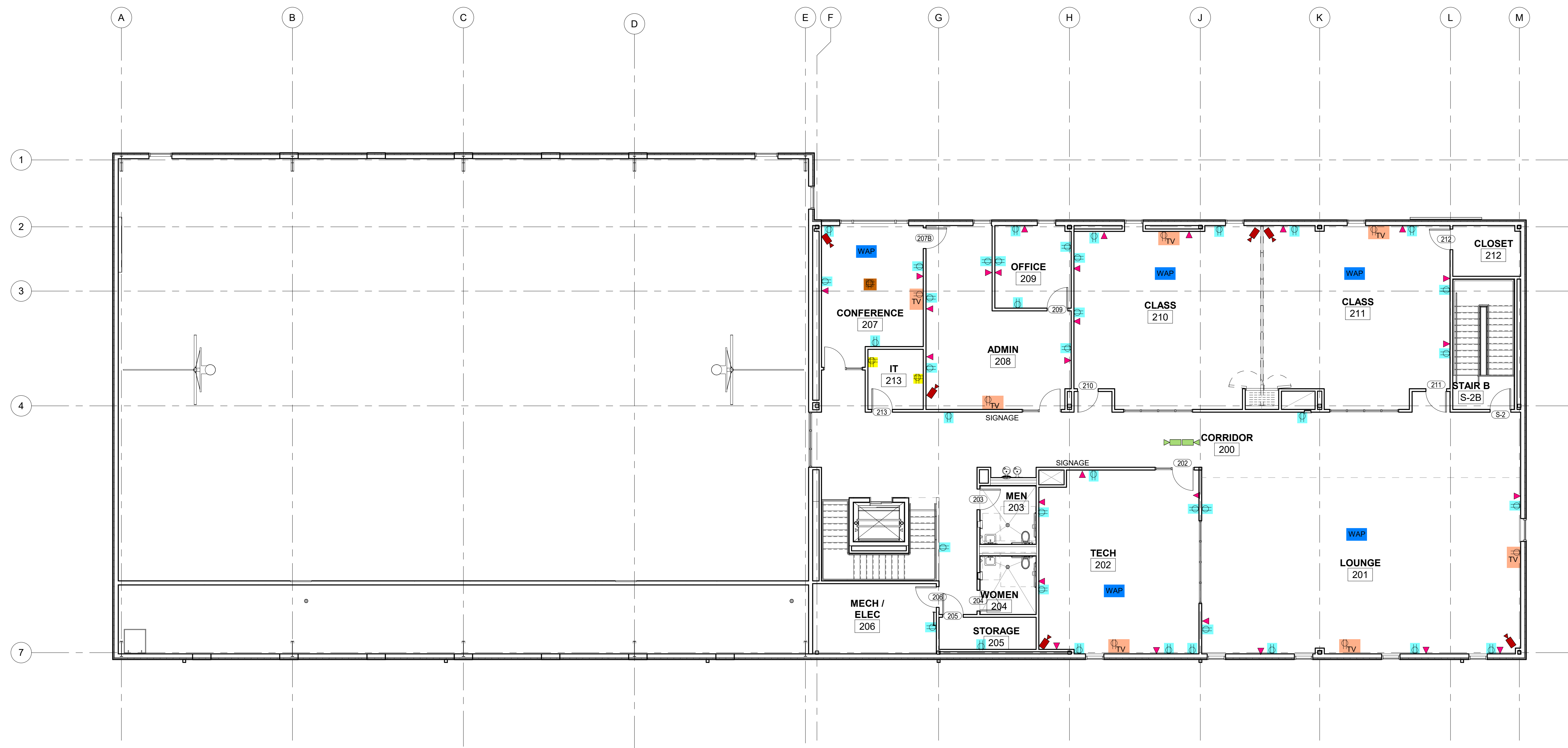
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**T2.2**  
**I.T. & SECURITY  
TECHNOLOGY  
FLOOR PLAN**



**1 SECOND FLOOR- I.T. & SECURITY**  
1/8" = 1'-0"

NOTE:  
G.C. TO PROVIDE CONDUIT AND  
PULL STRING FOR ALL EQUIPMENT  
SHOWN, HOWEVER INSTALLATION  
OF THE EQUIPMENT IS BY OTHERS.  
G.C. TO COORDINATE

**LEGEND**

- |  |   |  |  |
|--|---|--|--|
|  | STANDARD DUPLEX (MOUNTED AT 18" A.F.F.)                           |  | ELEC. STRIKE DOOR (MAIN ENTRANCE ONLY) |
|  | STANDARD QUAD (MOUNTED AT 18" A.F.F.)                             |  | DOOR W/ CHIME BY OWNER                 |
|  | FLOOR BOX   |  |  |
|  | DUPLEX FOR TV (MOUNTED AT 56" A.F.F.)                             |  |  |
|  | DATA / COM.   |  |  |
|  | WIRELESS ACCESS POINTS<br>(WALL MOUNTED AT 10' A.F.F. - GYM ONLY) |  |  |
|  | WIRELESS ACCESS POINTS (CEILING MOUNTED)                          |  |  |
|  | SECURITY CAMERA (110 DEG)   |  |  |
|  | SECURITY CAMERA (90 DEG - MOUNTED BACK TO BACK)                   |  |  |

# Fort Bend County New Community Center

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ROSENBERG, TEXAS 77471  
JOB # 221210



**BLUELINE**

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713.779.7132 | 800.422.7252  
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www.scaengineers.com  
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**FORT BEND COUNTY**

**NEW COMMUNITY CENTER**

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2	03-28-2022	Issue For Permit



**S0.000**

Cover Sheet

## ABBREVIATIONS

& L @ Ⓢ Ø #	AND ANGLE AT CENTERLINE DIAMETER OR ROUND POUND OR NUMBER	CANT CGS CIP CJ CL CLG CLR CLT CMU COL CONC CONN CONT CONST JT CORR CTR	CANTILEVER CENTER OF GRAVITY OF STRAND CAST IN PLACE CEILING JOIST OR CONTROL JOINT CENTER LINE CEILING CLEAR CROSS LAMINATED TIMBER CONCRETE MASONRY UNIT COLUMN CONCRETE CONNECTION CONTINUOUS CONSTRUCTION JOINT CORRIDOR CENTER	DT DWG DWL	DRAG TRUSS DRAWING DOWEL	GA GALV GB GC GL GT GB GYP	GAUGE GALVANIZED GRADE BEAM GENERAL CONTRACTOR GLU LAM GIRDER TRUSS GYPSUM BOARD GYPSUM	K OR KIPS KB  LLV LLH LP LSL LVL LSH LSV	THOUSAND POUNDS (KIP) KNEE BRACE  LONG LEG VERTICAL LONG LEG HORIZONTAL LOW POINT LAMINATED STRAND LUMBER LAMINATED VENEER LUMBER LONG SIDE HORIZONTAL LONG SIDE VERTICAL	OA O/O OC OA OPNG OPP OSB	OVERALL OUT TO OUT ON CENTER OPPOSITE HAND OPENING OPPOSITE ORIENTED STRAND BOARD	REQ'D RO RS  S- SEC SF SCHD SHT SIM SLP SPEC(S) SPF SQ STIFF STD STIR STL STRUCT SW SYM SYP	REQUIRED ROUGH OPENING ROUGH SAWN  SLAB TENDON (TENDON NUMBER) SECTION SQUARE FEET/ FOOT SCHEDULE SHEET SIMILAR SLOPE SPECIFICATION(S) SPRUCE PINE FIR SQUARE STIFFENER STANDARD STIRRUP STEEL STRUCTURAL SHEAR WALL SYMMETRICAL SOUTHERN YELLOW PINE	TOC TO CURB TOP TOS TOT TOW TPL TS TYP	TOP OF CONCRETE TOP OF CURB TOP OF PAVING OR TOP OF PLYWOOD TOP OF STEEL OR TOP OF SLAB TOP OF TRUSS TOP OF WALL TRIPLE TUBE STEEL TYPICAL	
AB ABV ADJ AFF ALT ANCH APPROX ARCH	ANCHOR BOLT ABOVE ADJACENT ABOVE FINISHED FLOOR ALTERNATE ANCHOR APPROXIMATE ARCHITECTURAL OR ARCHITECT	DB DBA DBL DEG DTL DF DFL DIA DIAG DIM DN	DROPPED BEAM DEFORMED BAR ANCHOR DOUBLE DEGREE DETAIL DRAG FORCE OR DOUG FIR DOUG FIR LARCH DIAMETER DIAGONAL DIMENSION DOWN	FB FD FF FIN FLR FOS FRMG FAST FS FT FTG	FLUSH BEAM FLOOR DRAIN FOUNDATION FINISH FLOOR FINISH FLOOR FACE OF CONCRETE FACE OF STUDS FRAMING FASTENER FAR SIDE FOOT OR FEET FOOTING	HB HC HDR HD HORZ HP HR HSA HSS HT INSUL INT	HOIST BEAM HANDICAPPED HEADER HOLDOWN HORIZONTAL HIGH POINT HOUR HEADED STUD ANCHOR HOLLOW STRUCTURAL SECTION HEIGHT INSULATION INTERIOR	MAX MC MECH MANUF MIN MSC MTL	MAXIMUM MOMENT CONNECTION MECHANICAL MANUFACTURER MINIMUM MISCELLANEOUS METAL	PAF  PB PIP PL PLF PLYWD PREFAB PSF PSI PSL PSW PT	POWDER ACTUATED FASTENER OR POWER ACTUATED FASTENER POCKET BEAM POURED IN PLACE PLATE POUNDS PER LINEAR FOOT PLYWOOD PREFABRICATED POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH PARALLEL STRAND LUMBER PERFORATED SHEAR WALL POST TENSION	OR OPPOSITE HAND OPENING OPPOSITE ORIENTED STRAND BOARD  POWDER ACTUATED FASTENER OR POWER ACTUATED FASTENER POCKET BEAM POURED IN PLACE PLATE POUNDS PER LINEAR FOOT PLYWOOD PREFABRICATED POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH PARALLEL STRAND LUMBER PERFORATED SHEAR WALL POST TENSION	RO RS  S- SEC SF SCHD SHT SIM SLP SPEC(S) SPF SQ STIFF STD STIR STL STRUCT SW SYM SYP	ROUGH OPENING ROUGH SAWN  SLAB TENDON (TENDON NUMBER) SECTION SQUARE FEET/ FOOT SCHEDULE SHEET SIMILAR SLOPE SPECIFICATION(S) SPRUCE PINE FIR SQUARE STIFFENER STANDARD STIRRUP STEEL STRUCTURAL SHEAR WALL SYMMETRICAL SOUTHERN YELLOW PINE	TOC TO CURB TOP TOS TOT TOW TPL TS TYP	TOP OF CONCRETE TOP OF CURB TOP OF PAVING OR TOP OF PLYWOOD TOP OF STEEL OR TOP OF SLAB TOP OF TRUSS TOP OF WALL TRIPLE TUBE STEEL TYPICAL
B-  BALC BLDG BLK BLKG BM BOT BRD BRG	BEAM TENDON (TENDON #) OR BOTTOM BALCONY BUILDING BLOCK BLOCKING BEAM BOTTOM BOARD BEARING	DB DBA DBL DEG DTL DF DFL DIA DIAG DIM DN	DROPPED BEAM DEFORMED BAR ANCHOR DOUBLE DEGREE DETAIL DRAG FORCE OR DOUG FIR DOUG FIR LARCH DIAMETER DIAGONAL DIMENSION DOWN	FB FD FF FIN FLR FOS FRMG FAST FS FT FTG	FLUSH BEAM FLOOR DRAIN FOUNDATION FINISH FLOOR FINISH FLOOR FACE OF CONCRETE FACE OF STUDS FRAMING FASTENER FAR SIDE FOOT OR FEET FOOTING	HB HC HDR HD HORZ HP HR HSA HSS HT INSUL INT	HOIST BEAM HANDICAPPED HEADER HOLDOWN HORIZONTAL HIGH POINT HOUR HEADED STUD ANCHOR HOLLOW STRUCTURAL SECTION HEIGHT INSULATION INTERIOR	MAX MC MECH MANUF MIN MSC MTL	MAXIMUM MOMENT CONNECTION MECHANICAL MANUFACTURER MINIMUM MISCELLANEOUS METAL	PAF  PB PIP PL PLF PLYWD PREFAB PSF PSI PSL PSW PT	POWDER ACTUATED FASTENER OR POWER ACTUATED FASTENER POCKET BEAM POURED IN PLACE PLATE POUNDS PER LINEAR FOOT PLYWOOD PREFABRICATED POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH PARALLEL STRAND LUMBER PERFORATED SHEAR WALL POST TENSION	OR OPPOSITE HAND OPENING OPPOSITE ORIENTED STRAND BOARD  POWDER ACTUATED FASTENER OR POWER ACTUATED FASTENER POCKET BEAM POURED IN PLACE PLATE POUNDS PER LINEAR FOOT PLYWOOD PREFABRICATED POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH PARALLEL STRAND LUMBER PERFORATED SHEAR WALL POST TENSION	RO RS  S- SEC SF SCHD SHT SIM SLP SPEC(S) SPF SQ STIFF STD STIR STL STRUCT SW SYM SYP	ROUGH OPENING ROUGH SAWN  SLAB TENDON (TENDON NUMBER) SECTION SQUARE FEET/ FOOT SCHEDULE SHEET SIMILAR SLOPE SPECIFICATION(S) SPRUCE PINE FIR SQUARE STIFFENER STANDARD STIRRUP STEEL STRUCTURAL SHEAR WALL SYMMETRICAL SOUTHERN YELLOW PINE	TOC TO CURB TOP TOS TOT TOW TPL TS TYP	TOP OF CONCRETE TOP OF CURB TOP OF PAVING OR TOP OF PLYWOOD TOP OF STEEL OR TOP OF SLAB TOP OF TRUSS TOP OF WALL TRIPLE TUBE STEEL TYPICAL

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- RFI'S AND FIELD ISSUES SUBMITTED ELECTRONICALLY ARE TO BE EMAILED TO: [rfi@scaengineers.com](mailto:rfi@scaengineers.com)
- STRUCTURAL FIELD REPORTS ARE TO BE EMAILED TO: [fieldreports@scaengineers.com](mailto:fieldreports@scaengineers.com)



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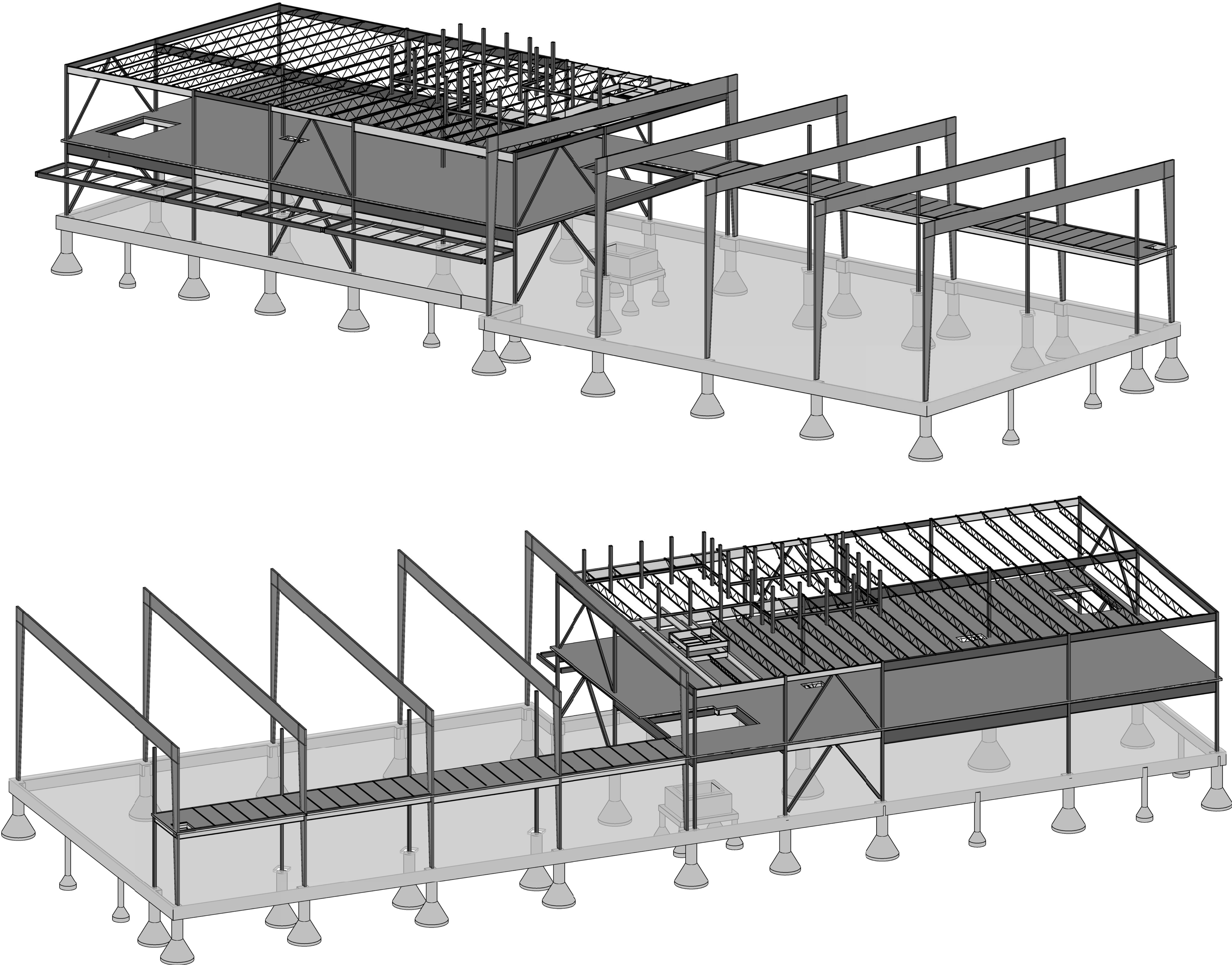
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2	03-28-2022	Project Status Issue For Permit



S0.001

3D Views





1. THE FOLLOWING SPECIFICATIONS ARE AN OUTLINE OF MINIMUM MATERIAL REQUIREMENTS AND THEIR APPLICATION. MANUFACTURER SPECIFICATION AND LOCAL CODE REQUIREMENTS, WHEN IN EXCESS OF MINIMUM SPECIFICATION, SHALL CONTROL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW AND SUBMIT ALL SHOP DRAWINGS AND REPORT ALL DISCREPANCIES TO THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO FABRICATING OR INSTALLING ANY MATERIAL.

2. AT CONSTRUCTION ISSUE, THESE DRAWINGS REPRESENT STRUCTURAL COMPONENTS IN THEIR FINAL AND FINISHED STATE. CONSTRUCTION PROCEDURES, BRACING METHODS, SAFETY PRECAUTIONS OR MECHANICAL REQUIREMENTS USED TO ERECT THESE ARE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR OR SUBCONTRACTOR DOING THE WORK.

3. THE GENERAL CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION. THE GENERAL CONTRACTOR SHALL DETERMINE FROM THE LOCAL BUILDING AUTHORITY AT THE TIME THAT THE BUILDING PERMIT IS OBTAINED, WHETHER ANY PERIODIC OR FINAL CONSTRUCTION COMPLIANCE LETTERS WILL BE REQUIRED OR REQUESTED FROM THE STRUCTURAL ENGINEER. THE GENERAL CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ALL SUCH REQUIREMENTS AND OBTAIN THE NECESSARY PERMITS PRIOR TO CONSTRUCTION.

4. WHEN STRUCTURAL OBSERVATIONS ARE REQUIRED FOR PERIODIC OR FINAL COMPLIANCE LETTERS A TWO-DAY ADVANCE NOTICE SHALL BE GIVEN TO THE STRUCTURAL ENGINEER OF THE SUCH OBSERVATION.

5. ONE WEEK PRIOR TO NEEDING THE FINAL COMPLIANCE LETTER THE GENERAL CONTRACTOR SHALL PROVIDE COPIES OF ALL TESTING AND SHOP DRAWING OBSERVATIONS TO THE ARCHITECT AND STRUCTURAL ENGINEER. THIRD PARTY TESTING LABS TO BE USED BY THE ARCHITECT AND STRUCTURAL ENGINEER. THIS INFORMATION IS TO BE PROVIDED A MINIMUM OF ONE WEEK PRIOR TO WHEN THE CONSTRUCTION COMPLIANCE LETTER IS NEEDED.

1. ROOF LIVE LOAD	20 PSF
2. FLOOR LIVE LOADS:	UNIFORM LOADS:
A. OFFICES	50 PSF
B. CORRIDOR ABOVE FIRST FLOOR (OFFICE BUILDING ONLY)	80 PSF

1. BASIC WIND SPEED (3-SECOND GUST)
  - A. ULTIMATE DESIGN  $V_{ULT}$
  - B. NOMIAL DESIGN  $V_{ASD}$
2. RISK CATEGORY
3. WIND EXPOSURE
4. INTERNAL PRESSURE COEFFICIENT
5. COMPONENT AND CLADDING PRESSURES: (NET, SEE PRESSURE ZONE DETAILS)

1. DRILLED PIERS SHALL BEAR IN SOIL SUITABLE FOR OBTAINING THE ALLOWABLE PIER CAPACITIES LISTED IN THE TABLE BELOW. THIS FOUNDATION CRITERIA IS BASED ON GEOTECHNICAL REPORT NO. 21G10708 PREPARED BY GEOSCIENCE ENGINEERING CONSULTANTS, INC. (GEC) ON BEHALF OF THE DISTRICT OF COLUMBIA. THERE SHALL BE NO TOTAL RELIANCE TO THE WORK SHOWN ON THESE DRAWINGS MUST BE FOLLOWED. IF QUESTIONABLE SOIL IS ENCOUNTERED, THE STRUCTURAL ENGINEER SHALL BE NOTIFIED IMMEDIATELY. PIER DIA.
2. A. ALLOW END BEARING CAPACITY MIN. 3,500 PSF MAX. 4,375 PSF
3. EXCAVATION CAPS SHALL BE NEAR VERTICAL SIDES SHALL BE SHORED OR SLOPED AS REQUIRED IN GEOTECHNICAL REPORT NO. 21G10708.
4. PIERS/ PIER CAPS/ FOOTINGS SHALL BE POURED IMMEDIATELY AFTER EXCAVATION.
5. ALL REINFORCING STEEL MARKED "CONTINUOUS" SHALL BE LAPPED PER THE REINFORCING SPECIFICATIONS. PROVIDE CORNER BARS WITH A STANDARD 90 DEGREE BEND AT CORNERS AND INTERSECTIONS.
6. 5. ALL SPAN LAP BOTTOM BARS AT SUPPORTS.
7. PLUMBING LINES SHALL BE COORDINATED WITH THE EOR AND SHALL NOT OCCUR BELOW, PARALLEL TO, OR WITHIN ANY FOUNDATION ELEMENT WITHOUT PRIOR REVIEW FROM BOTH THE STRUCTURAL AND GEOTECHNICAL ENGINEERS.
8. PLACE A MINIMUM 15 MIL VAPOR RETARDER UNDER ALL CONCRETE SLABS. VAPOR RETARDER TO HAVE A PERMEANCE OF LESS THAN 0.001 PERCENT PER INCH PER YEAR.
9. FOUNDATION PLAN AND ALL RELATED DETAILS SHALL BE REVIEWED AND APPROVED BY THE GEOTECHNICAL ENGINEER.

**008 - SITE PREPARATION SCHEMATIC:**

8" MIN. TO TOP OF LANDSCAPING OR PAVING, WITHOUT SEALED JOINTS, 6" AT HANDICAP RAMPS AND DRIVEWAYS.

5'-0" MIN. ALL AROUND BUILDING PERIMETER IN ACCORDANCE W/ GEOTECHNICAL REPORT RECOMMENDATIONS.

BUILDING LINE

FINISH SURFACE OF LANDSCAPING

4'-6" OF COMPACTED SELECT FILL IN ACCORDANCE W/ GEOTECHNICAL REPORT RECOMMENDATIONS.

SLAB CONSTRUCTION SEE PLAN

TOP OF CONCRETE - RE: ARCH

1" MIN.

\*12

1'-0" CLAY CAP BELOW LANDSCAPING WHERE GEOTECHNICAL REPORT IDENTIFIES MOISTURE SENSITIVE SOIL.

NATURAL GRADE

MIN. 1/2%

SELECT FILL IN ACCORDANCE W/ GEOTECHNICAL REPORT RECOMMENDATIONS

LINE OF EXCAVATION - THE SUBGRADE SHALL BE PREPARED IN ACCORDANCE W/ GEOTECHNICAL REPORT RECOMMENDATIONS. THE TESTING LABORATORY SHALL TEST AND APPROVE THE MOISTURE CONTENT AND DENSITY OF THE SUBGRADE PRIOR TO PLACEMENT OF ANY FILL MATERIAL.

\* INITIAL ROUGH GRADING SHALL BE COMPLETED W/ NATURAL CLAY MATERIALS (NO SAND ALLOWED) PRIOR TO FORM SETTING. IT SHALL SLOPE 1" FT. FOR THE FIRST 5' & 6" MIN. IN 10' TO INSURE POSITIVE DRAINAGE AWAY FROM THE SLAB.

**NOTE TO CONTRACTOR:**  
PROVIDE PUMPS ON SITE AND REMOVE ANY WATER  
FROM THE SITE 100% OF THE TIME. STANDING  
WATER IN THE EXCAVATION AT ANYTIME DAY OR  
NIGHT IS UNACCEPTABLE.

1. ALL CONCRETE WORK SHALL CONFORM TO THE ACI 318 AND ACI 301 BUILDING CODES, LATEST EDITIONS.

2. DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI 315, "ACI DETAILING MANUAL," LATEST EDITION.

3. REINFORCING BARS #6 AND BELOW SHALL CONFORM TO ASTM A-615 GRADE 60 (60,000 PSI YIELD) AND BARS #7 AND ABOVE SHALL BE GRADE 75 (75,000 PSI YIELD) OR GRADE 80 (80,000 PSI YIELD) UNLESS NOTED OTHERWISE. REINFORCING SHALL BE FREE FROM OIL, DIRT AND OTHER MATERIALS THAT WOULD REDUCE THE BOND WITH THE CONCRETE.

4. WELDED WIRE REINFORCING (WWR) SHALL CONFORM TO ASTM A-185. WELDED WIRE REINFORCING SHALL BE CHAIRED TO MAINTAIN THE REINFORCING AT ONE-THIRD THE DEPTH BELOW THE TOP SURFACE DURING CONCRETE PLACEMENT. SUPPORTS SHALL BE USED EACH WAY. LAP WELDED WIRE MESH SHALL BE FULL MESH AT SIDE AND END LAPS.

5. UNLESS OTHERWISE NOTED, CONCRETE PROTECTION FOR REINFORCING SHALL BE AS SPECIFIED IN THE ACI 318 BUILDING CODE, LATEST EDITION.

6. CONCRETE STRENGTH & PROTECTION:

A. STRUCTURAL ELEMENT	MINIMUM COVER (INCHES)	CONCRETE STRENGTH (PSI)	W/C RATIO (MAX)
a. FOOTINGS	ALL SURFACES	3,000	SEE TABLE
b. GRADE BEAMS	3" BOT / 3" EA. FACE / 1 1/2" TOP	3,000	SEE TABLE
c. SLAB ON GRADE	1 1/2" TOP & BOT	3,000	SEE TABLE
d. RETAINING WALLS	1" T&B / 2" EXT FACE / 3/4" INT FACE	3,000	SEE TABLE
e. ELEVATOR PITTS	1" T&B / 2" EXT FACE / 3/4" INT FACE	3,000	SEE TABLE

a. (1) EXT. EXPOSURE - INDICATES SLABS EXPOSED TO WEATHER (i.e. GARAGE SLABS, BALCONIES, ETC.) ROOFS AND THEIR SLABS THAT ARE WEATHER-PROOFED ARE NOT CONSIDERED EXTERIOR EXPOSURE UNLESS NOTED OTHERWISE.

b. CONCRETE STRENGTH NOTED AT 28 DAYS

c. PORTLAND CEMENT SHALL CONFORM TO ASTM C150, TYPE 1. MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD.

WATER CEMENT RATIO (W/C)		
CONCRETE f <sub>c</sub>	NON-AIR ENTRAINED	AIR ENTRAINED*
3000	0.52 (MAX.)	0.50 (MAX.)
4000	0.50 (MAX.)	0.48 (MAX.)
4500	0.45 (MAX.)	0.45 (MAX.)
5000	0.40 (MAX.)	0.40 (MAX.)
6000	0.40 (MAX.)	0.40 (MAX.)
7000	0.38 (MAX.)	0.38 (MAX.)
8000	0.38 (MAX.)	0.38 (MAX.)

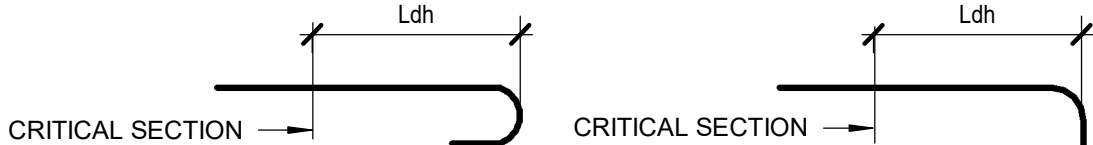
7. FLY-ASH MAY BE USED TO REPLACE A PORTION OF THE PORTLAND CEMENT. THE RATIO OF FLY-ASH TO THE TOTAL OF THE FLY-ASH AND CEMENT IN A MIX SHALL NOT EXCEED 20%. FLY-ASH SHALL CONFORM TO ASTM C618, TYPE C OR F.
8. NO WATER SHALL BE ADDED TO THE CONCRETE AT THE JOBSITE UNLESS IT IS EXPLICITLY NOTED ON THE BATCH TICKET THAT WATER MAY BE USED AT THE BATCH PLANT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE CONCRETE SUPPLIER TO ENSURE A PUMP-ABLE AND WORK-ABLE MIX WITHOUT THE ADDITION OF WATER AT THE JOBSITE. THE USE OF PLASTICIZERS, RETARDANTS AND OTHER ADDITIVES SHALL BE AT THE OPTION OF THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER. FOLLOW THE RECOMMENDATIONS OF THE MANUFACTURER FOR THE PROPER USE OF ADDITIVES. THE USE OF CALCIUM CHLORIDE OR OTHER CHLORIDE BEARING SALTS SHALL NOT BE PERMITTED.
9. CONCRETE SURVEYS SHALL BE MADE BEFORE AND AFTER THE ADDITION OF ADMIXTURES AND MAY BE TAKEN AT THE BACK OF THE TRUCK. CONCRETE FOR THE PREPARATION OF TEST CYLINDERS SHALL BE TAKEN FROM THE HOSE END FOR CONCRETE PLACED BY PUMP.
10. **REINFORCING STEEL SPICE NOTES:**
  - A. ALL REINFORCING STEEL SHALL BE SPLICED AS NOTED BELOW AND AS REQUIRED IN THE ACI BUILDING CODE LATEST EDITION.
  - B. AS NOTED IN THE DETAILS AND TABLES BELOW IS THE STRAIGHT BAR DEVELOPMENT LENGTH PER ACI-318.
  - C. CLASS B LAP SPICE TABLE SHALL BE USED FOR ALL LAP SPICES AND BAR DEVELOPMENT UNLESS NOTED OTHERWISE.
  - D. ALL REINFORCING STEEL MARKED "CONTINUOUS" SHALL BE LAPPED WITH A CLASS B LAP SPICE AND AROUND CORNERS OR INTERSECTIONS WITH A STANDARD 90 DEGREE HOOK.
  - E. SPICE TOP BARS AT CENTER OF SPAN; SPICE BOTTOM BARS AT SUPPORTS WITH CLASS B LAP SPICE.
  - F. SPICE ALL VERTICAL BARS IN COLUMNS AND VERTICAL AND HORIZONTAL BARS IN SHEAR WALLS WITH A CLASS B LAP SPICE UNLESS NOTED OTHERWISE.
  - F. LAP SPICES FOR #14 AND LARGER BARS SHALL BE MADE WITH MECHANICAL COUPLERS TO DEVELOP 125% OF THE BARS CAPACITY.
  - G. INCREASE DEVELOPMENT LENGTH SHOWN IN TABLES BELOW BY 1.25 FOR 75 KSI STEEL OR 1.33 FOR 80 KSI STEEL.
  - H. INCREASE DEVELOPMENT LENGTH SHOWN IN TABLES BELOW BY 1.50 FOR EPOXY COATED BARS.
  - I. INCREASE DEVELOPMENT LENGTH SHOWN IN TABLES BELOW BY 1.30 IF BAR IS TO BE USED AS A TOP BAR IN A BEAM OR SLAB WITH 12" OF FRESH CONCRETE BELOW THE BAR.
  - J. INCREASE DEVELOPMENT LENGTH SHOWN IN TABLES BELOW BY 1.20 FOR THREE-BAR BUNDLES AND 1.33 FOR FOUR-BAR BUNDLES. BAR BUNDLES SHALL NOT EXCEED FOUR BARS PER BUNDLE.
  - K. THE FOLLOWING TABLES ASSUME ONE OF THE BELOW CONDITIONS, PER ACI, ARE MET:
    - a. CLEAR SPACING OF BARS BEING DEVELOPED IS NOT LESS THAN 4db, CLEAR COVER NOT LESS THAN db
    - b. AND STIRRUPS OR TIES THROUGHOUT IS NOT LESS THAN CODE MINIMUM.
    - c. CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2db AND CLEAR COVER NOT LESS THAN db

CLASS B SPLICE (TO BE USED U.N.O.)									CLASS A SPLICE (USE ONLY IF NOTED ON DRAWINGS)								
A.C.I. REINFORCING DEVELOPMENT LENGTH SCHEDULE (1.3 Ld)									A.C.I. REINFORCING DEVELOPMENT LENGTH SCHEDULE (Ld)								
REINF. SIZE	CONCRETE STRENGTH (PSI)								REINF. SIZE	CONCRETE STRENGTH (PSI)							
	3000	4000	5000	6000	7000	8000	10000	12000		3000	4000	5000	6000	7000	8000	10000	12000
#3	23"	20"	17"	16"	16"	16"	16"	16"	#3	17"	15"	13"	12"	12"	12"	12"	12"
#4	29"	25"	23"	21"	20"	19"	16"	16"	#4	22"	19"	17"	16"	15"	14"	12"	12"
#5	37"	32"	29"	26"	24"	23"	16"	16"	#5	28"	24"	22"	20"	18"	17"	12"	12"
#6	43"	38"	34"	32"	29"	28"	20"	20"	#6	33"	29"	26"	24"	22"	21"	15"	15"
#7	63"	55"	50"	45"	42"	39"	36"	36"	#7	48"	42"	38"	34"	32"	30"	27"	27"
#8	72"	63"	58"	51"	47"	45"	36"	36"	#8	55"	48"	43"	38"	34"	32"	30"	30"
#9	81"	71"	63"	58"	54"	50"	45"	45"	#9	62"	54"	48"	44"	41"	38"	34"	34"
#10	91"	80"	71"	65"	60"	56"	51"	51"	#10	70"	61"	54"	50"	46"	43"	39"	39"
#11	102"	88"	78"	72"	67"	63"	56"	56"	#11	78"	67"	60"	55"	51"	48"	43"	43"

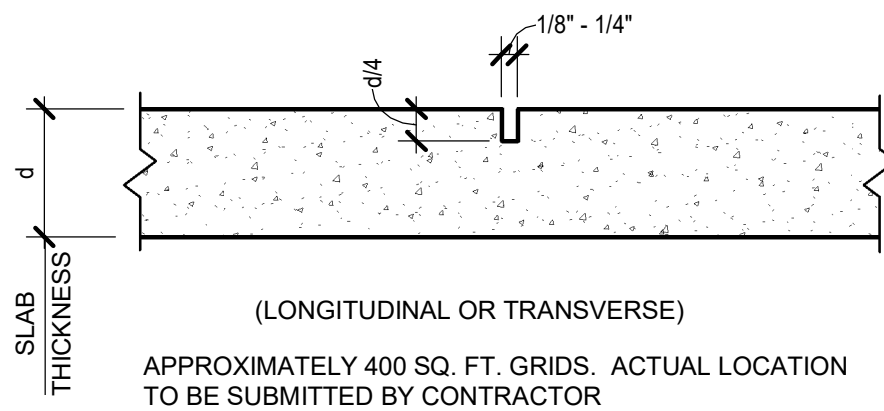
- L. ALL HOOKED REINFORCING STEEL SHALL BE AS NOTED BELOW AND AS REQUIRED IN THE ACI BUILDING CODE LATEST EDITION.

- a. LbH NOTED IN THE SCHEDULE BELOW IS THE BASIC TENSION DEVELOPMENT LENGTH FOR STANDARD ACl HOOKS, MEASURED FROM THE CRITICAL SECTION TO THE END OF THE HOOK.
- b.  $L_{dH} = 1.25 \cdot L_{dH}$  FOR GRADE 75 (75,000 PSI YIELD) REINFORCEMENT AND  $1.33 \cdot L_{dH}$  FOR GRADE 80 (85,000 PSI YIELD) REINFORCEMENT.
- c.  $L_{dH} = 1.2 \cdot L_{dH}$  FOR EPOXY COATED REINFORCEMENT.
- d. LbH UNLESS CONDITIONS NOTED IN B. OR C. ARE MET AND SHALL BE NOT BE LESS THAT 6" OR 8 BAR DIAMETERS

A.C.I. STANDARD HOOK REINFORCING DEVELOPMENT LENGTH SCHEDULE (L <sub>dh</sub> )									
REINF. SIZE	CONCRETE STRENGTH (PSI)								
	3000	4000	5000	6000	7000	8000	9000	10000	12000
#3	9"	8"	7"	6"	6"	6"	6"	6"	6"
#4	11"	10"	9"	8"	8"	7"	7"	6"	6"
#5	14"	12"	11"	10"	9"	8"	8"	8"	8"
#6	17"	15"	13"	12"	11"	11"	10"	9"	9"
#7	20"	17"	15"	14"	13"	12"	12"	11"	11"
#8	23"	20"	17"	16"	15"	14"	13"	12"	12"
#9	25"	22"	20"	18"	17"	16"	15"	14"	14"
#10	28"	25"	22"	20"	19"	18"	17"	16"	16"
#11	31"	27"	24"	22"	21"	19"	18"	17"	17"



11. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ANY OTHER ADDITIONAL SLEEVES, ANCHORS, VENT OPENINGS, ETC., NOT SHOWN ON STRUCTURAL PLANS THAT MIGHT BE REQUIRED.
12. PLACE CONCRETE IN A MANNER SO AS TO PREVENT SEGREGATION OF THE MIX. DELAY FLOATING AND TROWELING OPERATIONS UNTIL CONCRETE HAS LOST SURFACE WATER SHEEN OR ALL FREE WATER. DO NOT SPRINKLE FREE CEMENT ON THE SLAB SURFACE. FINISHING OF SLAB SURFACES SHALL COMPLY WITH THE RECOMMENDATIONS OF ACI 302.1 AND 304.
13. UNLESS NOTED OTHERWISE ON PLAN, CONTROL JOINTS TO BE LOCATED AT APPROXIMATELY 400 SQ. FT. GRIDS. ACTUAL LOCATION TO BE DETERMINED BY CONTRACTOR AND SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW. CONTROL JOINT TO BE ZIP STRIP OR EQUAL.



14. PROVIDE 7 DAY CURING OF SLAB IMMEDIATELY AFTER FINISHING USING ONE OF THE FOLLOWING METHODS:
  - A. CONTINUOUSLY WATERED BURLAP
  - B. WATERPROOF MEMBRANES
  - C. SPRAYED-ON LIQUID MEMBRANE
15. PROTECT THE CONCRETE SURFACE BETWEEN FINISHING OPERATIONS ON HOT, DRY DAYS OR ANY OTHER TIME THAT PLASTIC SHRINKAGE CRACKS COULD DEVELOP BY USING WET BURLAP, PLASTIC MEMBRANE OR FOGGING. PROTECT CONCRETE SLAB AT ALL TIMES FROM RAIN, HAIL OR OTHER INJURIOUS EFFECTS.
16. UNLESS SPECIFIED, CONCRETE MUST REACH THE FOLLOWING PERCENTAGES OF ITS 28-DAY COMPRESSIVE STRENGTH (F<sub>C</sub>) BEFORE FORMS MAY BE REMOVED
  - A. WALLS, COLUMNS, & BEAM SIDES 40%
  - B. JOIST PANS & BEAM BOTTOMS & FLOOR SYSTEMS (IF NOT RE-SHORED) 70%
  - C. JOIST PANS & BEAM BOTTOMS & FLOOR SYSTEMS (IF NOT RE-SHORED) 100%
17. REINFORCING WHEN REQUIRED, TO EXTEND FLOOR SUPPORTING FALSE-WORK (OR GROUND FLOOR) LAYOUT AND PROCEDURE TO BE SUBMITTED TO STRUCTURAL ENGINEER FOR APPROVAL AND SHALL BE SIGNED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE THE PROJECT IS LOCATED.
18. AN INDEPENDENT CERTIFIED TESTING LABORATORY SHALL VERIFY AND PROVIDE REPORTS CERTIFYING THE FOLLOWING:
  - A. CONCRETE PLANT BATCH TICKETS FOR EACH TRUCK VERIFY THAT THE CONCRETE MATCHES THE APPROVED DESIGN MIX.
  - B. CONCRETE SLUMP IS IN ACCORDANCE WITH APPROVED DESIGN MIX.
  - C. CONCRETE PLACEMENT OPERATIONS ARE IN ACCORDANCE WITH ACI SPECIFICATIONS.
  - D. CONTROL JOINTS ARE INSTALLED WITHIN THE ACI TIME ALLOWANCE.
  - E. PROPER CURING METHODS ARE BEING UTILIZED.
19. NO CONCRETE SHALL BE PLACED OUTSIDE OF THESE SPECIFICATIONS WITHOUT THE ENGINEER'S PRIOR APPROVAL. ANY ITEMS NOT IN COMPLIANCE WITH THE OUTLINED SPECIFICATION SHALL BE REPORTED TO THE OWNER AND STRUCTURAL ENGINEER WITHIN 24 HOURS.
20. CONSTRUCTION VEHICLE LOADS SHALL NOT BE PERMITTED ON ELEVATED SLABS AT ANY TIME.
21. ALL RETAINING WALLS TO BE BRACED UNTIL UPPER SLAB IS IN PLACE AND HAS REACHED 70% OF ITS DESIGN STRENGTH. FOR RETAINING WALLS TO BE BRACED, BRACING SHALL REMAIN IN PLACE UNTIL WALL HAS REACHED 100% OF ITS DESIGN STRENGTH. PROVIDE GRANULAR BACKFILL AND PERFORATED DRAIN PIPE CONNECTED TO SITE DRAINAGE. REF. CIVIL DRAWINGS.

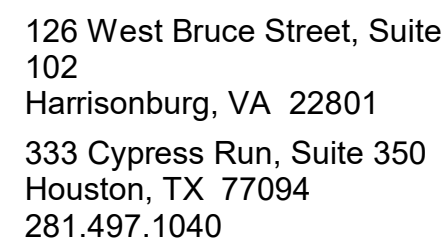
MARK	SIZE	"A"	"B"	"C"
DWL-A	#4	8"	2'-0"	-
DWL-B	#4	8"	3'-0"	-
DWL-C	#4	8"	4'-0"	-
DWL-D	#4	2'-0"	2'-0"	-
DWL-E	#5	-	4'-0"	-
DWL-F	#4	2'-0"	5'-0"	2'-0"

**NOTES:**

1. SCHEDULED DOWELS ARE MARKED "DWL" IN THE DETAILS.
2. DOWEL SPACING TO BE SAME AS VERTICAL BEAM OR WALL REINFORCEMENT UNLESS NOTED OTHERWISE IN THE DETAILS

1. MOLDING AND TESTING: CYLINDERS FOR STRENGTH TESTS SHALL BE MOLDED AND LABORATORY CURED IN ACCORDANCE WITH ASTM C31 AND TESTED IN ACCORDANCE WITH ASTM C39.
2. FIELD SAMPLES: FIELD SAMPLES FOR STRENGTH TESTS SHALL BE TAKEN IN ACCORDANCE WITH ASTM C172.
3. FREQUENCY OF TESTING: EACH SET OF TEST CYLINDERS SHALL CONSIST OF A MINIMUM (U.N.O.) OF FOUR STANDARD TEST CYLINDERS, A SET OF TEST CYLINDERS SHALL BE MADE ACCORDING TO THE FOLLOWING MIN. FREQUENCY GUIDELINES:
  - A. ONE SET FOR EACH CLASS OF CONCRETE TAKEN NOT LESS THAN ONCE A DAY.
  - B. MAT FOUNDATION: ONE SET FOR EACH 250 CUBIC YARDS OR FRACTION THEREOF.
  - C. PIERS: ONE SET FOR EACH 50 CUBIC YARDS OR FRACTION THEREOF.
  - D. UNDER-REAMED FOOTINGS: ONE SET FOR EACH 50 CUBIC YARDS OR FRACTION THEREOF.
  - E. PILE: ONE SET FOR EACH 50 CUBIC YARDS OR FRACTION THEREOF BUT NOT LESS THAN ONE SET FOR EACH PILE GROUP UNDER EACH COLUMN OR WALL.
  - F. BASEMENT WALLS: ONE SET FOR EACH 150 CUBIC YARDS.
  - G. SPREAD FOOTINGS AND PILE CAPS: ONE SET FOR EACH 50 CUBIC YARDS OR FRACTION THEREOF.
  - H. FLOORS: ONE SET FOR EACH 150 CUBIC YARDS OR FRACTION THEREOF BUT NOT LESS THAN ONE SET FOR EACH 5000 SQUARE FOOT OF FLOOR AREA.
  - I. COLUMNS: ONE SET FOR EACH 50 CUBIC YARDS OR FRACTION THEREOF WITH A MINIMUM OF 2 SETS PER FLOOR.
  - J. SHEAR WALLS: ONE SET FOR EACH 50 CUBIC YARDS BUT NOT LESS THAN 2 SETS PER FLOOR.
  - K. ALL OTHER CONCRETE: A MINIMUM OF ONE SET FOR EACH 150 CUBIC YARDS OR FRACTION THEREOF.
  - L. NO MORE THAN ONE SET OF CYLINDERS AT A TIME SHALL BE MADE FROM ANY SINGLE TRUCK.
  - M. IF THE TOTAL VOLUME OF CONCRETE IS SUCH THAT THE FREQUENCY OF TESTING AS SPECIFIED ABOVE WOULD PROVIDE LESS THAN FIVE STRENGTH TESTS PER CONCRETE BATCH, THEN THE FREQUENCY OF TESTING SHALL BE MADE FROM AT LEAST FIVE RANDOMLY SELECTED BATCHES OR FROM EACH BATCH IF FEWER THAN FIVE BATCHES ARE USED.
  - N. THE ABOVE FREQUENCIES ASSUME THAT ONE BATCH PLAN WILL BE USED FOR EACH POUR. IF MORE THAN ONE BATCH PLAN IS USED, THE FREQUENCIES CITED ABOVE SHALL APPLY FOR EACH PLAN USED.

1. ALL EXPOSED-TO-VIEW CONCRETE (REFERENCE ARCHITECTURAL DRAWINGS) SHALL HAVE A FINISH OF "5F-2.0" OR BETTER AS DEFINED BY THE AMERICAN CONCRETE INSTITUTE. EXPOSED CONCRETE IS ALSO TO BE SEALED WITH A WATER BASED ACRYLIC SEALER (PROSOCO SLOXANE PD OR SURE KLEAN WEATHER SEAL SLOXANE PD OR OWNER-APPROVED EQUIVALENT).
2. CONCRETE SUBCONTRACTOR SHALL USE MDO BOARD FOR ALL EXPOSED-TO-VIEW CEILING AND COLUMN FORM-WORK. CONCRETE SUBCONTRACTOR SHALL ALSO REPLACE MDO FORM-WORK MIDWAY THROUGH CONSTRUCTION OF CONCRETE SLAB TO PREVENT CRACKING OF FORMWORK. IF CRACKING DOES OCCUR, CRACKS SHALL BE REPAIRED WITH EPOXY FISH.
3. CONCRETE CEILINGS SHALL HAVE TIGHT BUT JOINTS, WITH LARGE PIECES REMOVED, HOWEVER, JOINTS SHALL NOT BE GROUND (UNLESS MISALIGNMENT EXCEEDS A C.I. STANDARDS, BUT NOT WITHOUT OWNER CONSULTATION AND APPROVAL).
4. ALL EXPOSED-TO-VIEW CONCRETE COLUMNS, COLUMN TRANSITION CAPS, BEAMS, SLAB EDGES, AND WALLS SHALL HAVE A 3/4" CHAMFERED EDGE
5. JOINTS BETWEEN POOR STRIPS (IF SHOWN) AND SLAB CEILINGS SHALL BE FLUSH BUT JOINTS, NOT CHAMFERED.
6. ALL EXPOSED TO VIEW CONCRETE ELEMENTS SHALL HAVE A SHRINKAGE LIMIT OF 0.040 PERCENT AT 28 DAYS. CONFORM TO REQUIREMENTS UNDER ITEM #11 OF CONCRETE NOTES.
7. SHOULD CONTRACTOR CHOOSE TO POUR EXPOSED TO VIEW CONCRETE ELEMENTS WITH HIGHER STRENGTH CONCRETE THAN SPECIFIED, CONTRACTOR SHALL UTILIZE AN APPROVED SHRINKAGE REDUCING ADMIXTURE PER MANUFACTURER'S RECOMMENDATION TO MEET THE 0.040 SHRINKAGE LIMIT.



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NEW COMMUNITY CENTER

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PROJECT NO.: Project Number

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MARK	DATE	ISSUED FOR
	Issue Date	Project Status
1	02-21-2022	Review Set
2	03-28-2022	Issue For Permit



\$0.100

## General Notes and Specifications



043-1 - FLOOR NOTES:

- FLOOR TO BE 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED WITH 6X6 W1.4 X W1.4 WWM OVER GALVANIZED FLOOR DECK. (SEE NOTE #2 FOR DECK SPECIFICATIONS.) CONCRETE TO BE 5 1/2 SACK PORTLAND CEMENT MIX; NO FLY-ASH; 3500 PSI AT 28 DAYS
- FLOOR DECK SPECIFICATION:
  - METAL DECK SHALL BE TEMPERED COLD ROLLED STEEL, SHEET SHALL BE FORMED TO A CORRUGATED RIB PATTERN OF VULCRAFT TYPE 1.5VLR22 OR EQUAL. THE STEEL SHALL CONFORM TO ASTM A653, GRADE 33, WITH ZINC COATING CONFORMING TO ASTM A924. G60 COATING CLASS AS DEFINED IN ASTM A653. END LAPS AND SIDE LAPS ARE TO BE PER THE MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE METAL DECK SUPPORT AT ALL BUILDING CORNERS, SKEWED BUILDING LINES WHERE SUPPORTING STRUCTURE BEARS PERPENDICULAR AND AROUND ALL FRAMED OPENINGS WITH L 4X4X1/4 UNLESS NOTED OTHERWISE. INSTALL 6" WIDE X 12 GA. SHEET STEEL COVER PLATES IN VALLEYS, RIDGES OR WHERE DECK CHANGES DIRECTION. SPOT WELD IN PLACE AT 12" O.C. MAXIMUM. CONTRACTOR TO COORDINATE WITH STEEL DECK SUPPLIER TO PROVIDE ALL NECESSARY DECK SUPPORTS REQUIRED TO ADEQUATELY SUPPORT THE METAL DECK.
- REFERENCE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION ON OPENINGS, MECHANICAL AND PLUMBING EQUIPMENT AND ROOF SLOPES
- [+XX'-YY"] ——— INDICATES TOP OF STEEL ELEVATION GIVEN ABOVE FINISHED FIRST FLOOR.
- WELD DECK TO STEEL SUPPORTS USING 5/8" DIA. PUDDLE WELD IN A 36/4 PATTERN WITH (2) WELD PER SIDE LAP.

050 - STRUCTURAL STEEL FRAMING NOTES:

- ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH "THE SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", AISC 360 AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", AISC 303, LATEST APPROVED EDITIONS.
- ALL STRUCTURAL STEEL SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST OSHA SAFETY STANDARDS FOR STEEL ERECTION. STRUCTURAL DOCUMENTS INDICATE TYPICAL CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL OSHA REQUIREMENTS ARE MET.
- STEEL MATERIALS SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS:

A. WIDE FLANGE SHAPES	ASTM A992 (50 KSI)
B. CHANNELS	ASTM A36 (36 KSI)
C. ANGLES	ASTM A36 (36 KSI)
D. SQUARE AND RECTANGULAR TUBES (HSS)	ASTM A500, GRADE C (50 KSI)
E. ROUND TUBES (HSS)	ASTM 500, GRADE C (46 KSI)
F. STEEL PIPE	ASTM A53, GRADE B (35 KSI)
G. PLATES AND BARS	ASTM A36 (36 KSI)
H. BOLTS	ASTM A325 OR A490
I. NUTS	ASTM A563
J. WASHERS	ASTM F436
K. ANCHOR RODS	ASTM F1554 (36 KSI)
L. HEADED STUDS	ASTM A108
M. WELDED ELECTRODES	E70XX
- ALL NON-SHRINK GROUTS FOR LEVELING OF BASE PLATES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 P.S.I. AT 28 DAYS. GROUT SHALL COMPLY WITH CORP OF ENGINEERS SPECIFICATION CRD-C 621.
- SPLICING OF STRUCTURAL STEEL MEMBERS IS PROHIBITED WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER AS TO LOCATION AND TYPE OF SPlice TO BE MADE.
- CAMBER INDICATED ON THESE DRAWINGS IS THE REQUIRED CAMBER AT TIME OF ERECTION. CAMBERED BEAMS SHALL BE ERECTED SUCH THAT THE PROFILE OF THE BEAMS ARE CROWNED UPWARD.
- ALL STEEL AT OR BELOW FINISHED GRADE OR BELOW FLOOR SLAB SHALL RECEIVE 2 COATS OF BITUMINOUS PAINT OR 3" MINIMUM CONCRETE COVER.
- ALL STRUCTURAL STEEL THAT IS EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED.
- "MC" AND "OR" ——— DENOTES COMPLETE PENETRATION MOMENT CONNECTIONS
- ALL SHOP DRAWINGS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER. DRAWINGS TO HAVE CONTRACTOR'S STAMP AFFIXED PRIOR TO REVIEW. CERTIFIED COPIES OF MILL TEST REPORTS SHALL BE AVAILABLE UPON REQUEST.
- THE GENERAL CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY FABRICATION OR ERECTION ERRORS OR DEVIATIONS AND RECEIVE WRITTEN APPROVAL BEFORE ANY FIELD CORRECTIONS ARE MADE. GAS CUTTING TORCHES SHALL NOT BE USED TO CORRECT FABRICATION ERRORS WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER.

STRUCTURAL STEEL CONNECTION NOTES:

- ALL CONNECTIONS, SPLICES AND ERECTION PIECES SHALL BE DESIGNED AND DETAILED BY THE FABRICATOR'S STRUCTURAL ENGINEER LICENSED IN THE JURISDICTION OF THE PROJECT UNLESS INDICATED AS BEING FULLY DESIGNED ON THE STRUCTURAL DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED DURING THE ENGINEER'S SEAL AND SIGNATURE. CALCULATIONS BEARING THE ENGINEER'S SEAL AND SIGNATURE SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER. DESIGN, DETAIL, FURNISH AND INSTALL STIFFENERS, CONTINUITY PLATES, DOUBLER PLATES, OR OTHER NECESSARY ADDITIONAL PARTS AS REQUIRED FOR LOCAL STRENGTHENING.
- UNLESS NOTED OTHERWISE, DETAILS INDICATED ON DRAWINGS INDICATE GENERAL CRITERIA FOR DESIGN AND DETAILING OF CONNECTIONS. DETAILS INDICATED ON DRAWINGS ARE NOT INTENDED TO CONVEY COMPLETELY CONNECTOR SIZES, PLATE SIZES, WELD SIZES, NUMBER OF BOLTS, OR ANY OTHER SPECIFIC INFORMATION THAT IS OBTAINED THROUGH DESIGNING OF A CONNECTION FOR A GIVEN SET OF LOADS. DETAILS SHOWN ON THE DRAWINGS DO NOT SHOW ERECTION AIDS. PROVIDE ERECTION AIDS AS REQUIRED AND REMOVE THEM AFTER WORK IS COMPLETE.
- ALL SHOP AND FIELD CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS OR WELDS. ALL HIGH STRENGTH BOLTS AND NUTS SHALL BE CLEARLY MARKED AS REQUIRED BY AISC SPECIFICATIONS.
- DESIGN ALL GRAVITY CONNECTIONS FOR FORCES INDICATED ON THE DRAWINGS. CONNECTION DESIGN FORCES INDICATED ON THE DRAWINGS ARE UN-FACTORED U.N.O., WHERE THE REACTION IS OMITTED FROM THE DRAWINGS, DESIGN THE CONNECTION FOR ONE HALF OF THE MAXIMUM TOTAL UNIFORM LOAD AS DEFINED IN THE AISC STEEL CONSTRUCTION MANUAL, TABLE 3-6 FOR NON-COMPOSITE BEAMS. FOR COMPOSITE BEAM CONNECTIONS, MULTIPLY ONE HALF OF THE AISC TABLE VALUE BY FACTORS NOTED BELOW.

DESIGN REACTION TABLE		
BEAM WEIGHT		FACTOR
UP TO 36# / FT.		2.0
37 TO 44# / FT.		1.8
45 TO 60# / FT.		1.7
61# / FT. AND OVER		1.6

COMPOSITE BEAM CONNECTION SHALL DEVELOP ONE-HALF OF THE TOTAL NON-COMPOSITE UNIFORM LOAD CAPACITY OF THE MEMBER MULTIPLIED BY THE FACTORS SHOWN U.N.O. ON PLAN

- MOMENT CONNECTIONS SHALL BE DESIGNED FOR THE FULL PLASTIC MOMENT OF THE BEAM IF THE MOMENT IS OMITTED FROM THE DRAWINGS.
- BRACE AND / OR TRUSS CONNECTIONS SHALL DEVELOP FULL FORCES SHOWN ON DRAWINGS AT EACH END OF MEMBER. CONNECTION DESIGN FORCES INDICATED ON THE DRAWINGS ARE UN-FACTORED U.N.O. WHERE BRACE AND / OR TRUSS (VERTICAL, HORIZONTAL AND DIAGONAL) FORCES ARE OMITTED FROM THE DRAWINGS DESIGN THE CONNECTIONS TO DEVELOP THE ALLOWABLE TENSILE AND COMPRESSIVE STRENGTH OF THE MEMBER SIZES SHOWN.
- NO CONNECTION SHALL CONSIST OF LESS THAN (2) 3/4" DIA. A325-N BOLTS OR WELDS DEVELOPING LESS THAN 10 KIPS. MINIMUM WELD SIZE SHALL BE A 3/16" FILLET WELD, OR MIN. PER ACIS D1.1, WHICHEVER IS LARGER.
- FOR CONNECTION DESIGN AND DETAILING, SET CONNECTION WORK POINT AT INTERSECTION OF MEMBER CENTERLINES, U.N.O.
- DO NOT USE OVERSIZED OR SLOTTED HOLES FOR ANY CONNECTIONS UNLESS SPECIFICALLY INDICATED ON HE DRAWINGS OR APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.
- ALL BOLTS SHALL BE TIGHTENED TO THE "SNUG-TIGHT" CONDITION DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH AS A MINIMUM U.N.O. THE "SNUG-TIGHT" CONDITION MUST ENSURE THAT THE PLIES OF THE CONNECTED MATERIAL HAVE BEEN BROUGHT INTO SNUG CONTACT.
- ALL BOLTS SUBJECT TO DIRECT TENSION OR DESIGNATED "SC" (SLIP-CRITICAL) SHALL BE PRE-TENSIONED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS AS DESCRIBED IN THE AISC "MANUAL OF STEEL CONSTRUCTION": TURN OF NUT TIGHTENING, CALIBRATED WRENCH TIGHTENING OR DIRECT TENSION INDICATOR TIGHTENING.
- EXPANSION JOINT CONNECTIONS AND SLIP CONNECTION INDICATED SHALL PROVIDE FREE MOVEMENT. BOLTS SHALL HAVE NUTS FINGER TIGHTENED AND THREADS CRIMPED.
- PROVIDE ACCESS FOR INSPECTION OF ALL SHOP AND FIELD CONNECTIONS FOR PROPER MATERIALS AND WORKMANSHIP. ALL CONNECTIONS SHALL BE INSPECTED BY AN INDEPENDENT TESTING LABORATORY.
- ALL WELDING INCLUDING WELDING ELECTRODES, WELDING PROCESS, MINIMUM PREHEAT AND INTERPASS TEMPERATURES SHALL BE IN ACCORDANCE WITH THE AISC AND AWS SPECIFICATIONS. ANY STRUCTURAL STEEL DAMAGED IN WELDING IS TO BE REPLACED OR REINFORCED AS ACCEPTABLE TO THE STRUCTURAL ENGINEER. WELDERS SHALL HAVE CURRENT EVIDENCE OF PASSING THE APPROPRIATE AWS QUALIFICATION TESTS. THE ENGINEER MAY REQUEST SUCH EVIDENCE AT ANY TIME DURING THE PROJECT.
- COMPLETE JOINT PENETRATION WELDS SHALL HAVE A MINIMUM CHARTPY V-NOTCH IMPACT TESTING VALUE AS FOLLOWS:

A. ASTM A6 HOT ROLLED SHAPES WITH A FLANGE THICKNESS EXCEEDING 2 INCHES AND BUILT UP HEAVY SHAPES WITH PLATES EXCEEDING 2 INCHES IN THICKNESS: 20 FT-LB @ 70 DEG. F
B. REGARDLESS OF THICKNESS, ALL TRUSSES, LATERAL FORCE RESISTING MEMBERS: 20 FT-LB @ 7 0 DEG. F
C. WELD METAL: 20 FT-LB @ MINUS 20 DEG. F AND 40 FT-LB @ 70 DEG. F
D. WELD METAL EXPOSED TO TEMPERATURES IN SERVICE BELOW 50 DEG. F: 25 FT-LB @ 40 DEG. F
- REMOVE WELD BACK UP BARS AND GRIND SMOOTH AFTER WELD IS COMPLETED, U.N.O..
- WELDING EXPOSED TO LOW TEMPERATURES IN SERVICE SHALL CONFORM TO AWS D1.5
- ALL WELD LENGTHS ARE CONTINUOUS U.N.O.
- ALL GROOVE WELDS ARE COMPLETE JOINT PENETRATION U.N.O.
- DIRECT CONTACT JOINTS BETWEEN TWO MEMBERS SHALL BE WELDED TO DEVELOP THE ALLOWABLE TENSILE CAPACITY OF THE SMALLER MEMBER U.N.O.

040-1A - COLD ROLLED STEEL SPECIFICATIONS (SSMA):

- PRIOR TO FABRICATION THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED CALCULATIONS AND ERECTION DRAWINGS FOR COLD ROLLED STEEL TO THE STRUCTURAL ENGINEER FOR APPROVAL. REQUIREMENTS IN THESE NOTES AND DRAWINGS SHALL BE A MINIMUM BASIS FOR DESIGN.
- ALL STUDS AND/OR JOISTS AND ACCESSORIES SHALL BE OF THE MINIMUM SIZE, GAUGE AND SPACING SHOWN ON THE DRAWINGS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY/COORDINATE THAT THE STUD GAUGE MEETS THE MINIMUM MANUFACTURE REQUIREMENTS OF ALL EXTERIOR FINISHES (BRICK, EFIS, STUCCO, ETC.).
- ALL STRUCTURAL MEMBERS AND CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AMERICAN IRON AND STEEL INSTITUTE (AISI) "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS", LATEST EDITION.
- ALL STUDS, RUNNERS, JOISTS AND TRUSSES SHALL BE FORMED FROM GALVANIZED STEEL, CORRESPONDING TO THE REQUIREMENTS OF ASTM A553, WITH A MINIMUM YIELD STRENGTH OF 50 KSI FOR .097, .068, .054 THICK MEMBERS AND 33 KSI FOR .043 AND .033 THICK MEMBERS AND FLAT STRAP BRACING.
- PREFABRICATED PANELS SHALL BE SQUARE, WITH COMPONENTS ATTACHED IN A MANNER AS TO PREVENT RACKING. HANDLING AND LIFTING SHALL BE DONE IN A MANNER SO AS NOT TO CAUSE DISTORTION IN ANY MANNER.
- ALL FRAMING COMPONENTS SHALL BE CUT SQUARELY FOR ATTACHMENT TO PERPENDICULAR MEMBERS OR, AS REQUIRED, FOR AN ANGULAR FIT AGAINST ABUTTING MEMBERS.
- AXIALLY LOADED STUDS SHALL BE INSTALLED IN A MANNER WHICH WILL ASSURE THAT THEIR ENDS ARE POSITIONED AGAINST THE INSIDE OF TRACK WEB PRIOR TO FASTENING. ALL PANEL STUDS SHALL BE COMPRESSED TO ENSURE THAT ALL STUDS ARE SEATED IN THE TRACK, SO THAT CONNECTIONS ARE NOT COMPROMISED WHEN PANELS ARE LOADED.
- FASTENING OF COMPONENTS SHALL BE WITH SELF-DRILLING SCREWS OR WELDS. SCREWS OR WELDS SHALL BE OF SUFFICIENT SIZE TO INSURE THE STRENGTH OF THE CONNECTION. WIRE TYING OF COMPONENTS SHALL NOT BE PERMITTED. ALL WELDS SHALL BE TOUCHED-UP WITH A ZINC-RICH PAINT.
- RUNNERS SHALL BE SECURELY ANCHORED TO THE SUPPORTING STRUCTURE. PROPOSED CONNECTION TO BE SUBMITTED FOR APPROVAL.
- ABUTTING LENGTHS OF TRACK SHALL EACH BE SECURELY ANCHORED TO A COMMON STRUCTURAL ELEMENT OR SPLICED.
- STUDS SHALL BE PLUMB, ALIGNED AND SECURELY ATTACHED TO FLANGES OF BOTH UPPER AND LOWER TRACKS.
- JACK STUDS OR CRIPPLES SHALL BE INSTALLED BELOW WINDOW SILLS, ABOVE WINDOW AND DOOR HEADERS, AND WHERE NEEDED TO FURNISH SUPPORT, AND SHALL BE SECURELY ATTACHED TO CONNECTING MEMBERS.
- RESISTANCE TO MINOR AXIS BENDING AND ROTATION SHALL BE PROVIDED BY GYPSUM BOARD OR GYPSUM SHEATHING AND BY HORIZONTAL STRAP AND BLOCKING OR COLD-ROLLED CHANNEL BRACING AT THIRD POINTS.
- SPLICES IN AXIALLY LOADED STUDS SHALL NOT BE PERMITTED.
- PROVIDE A MINIMUM OF (3) #12 SCREWS FOR ALL STUD TO STUD CONNECTIONS.
- BRIDGING SHALL BE INSTALLED IMMEDIATELY AFTER JOISTS ARE ERECTED AND BEFORE CONSTRUCTION LOADS ARE APPLIED TO PREVENT FLANGE ROTATION AND TO SUPPORT FLANGES IN COMPRESSION.

A. BRIDGING SHALL CONSIST OF SOLID BLOCKING PLUS STRAP BRACING OR 1 1/2" COLD-ROLLED CHANNELS SCREW-ATTACHED OR WELDED TO BOTTOM JOIST FLANGES.
B. BRIDGING SHALL BE INSTALLED AT MID SPAN FOR SPANS 16'-0" OR LESS AND AT 8'-0" O.C. MAX. FOR SPANS GREATER THAN 16'-0" U.N.O. SOLID BLOCKING, OF FIELD-CUT TRACK OR JOIST SECTION, SHALL BE PROVIDED, WELDED OR SCREW-ATTACHED BETWEEN OUTER JOISTS, OVER ALL INTERIOR SUPPORTS AND ADJACENT TO OPENINGS AT 10'-0" O.C. MAX. COLD-ROLLED CHAN BELS OR STRAP BRACING OF 1 1/2" X 33 MIL (0.033") CORROSION-RESISTANT STEEL SHALL BE SCREW-ATTACHED TO BOTTOM JOIST FLANGE BETWEEN SOLID BLOCKING. REFERENCE MANUFACTURER INSTALLATION INSTRUCTIONS.
- SSMA STEEL FRAMING CARRIES A FOUR PART CODE THAT IDENTIFIES THE WEB SIZE, STYLE, FLANGE WIDTH AND STEEL THICKNESS:

	362 S	162-43		
WEB SIZE:	STYLE:	FLANGE WIDTH	STEEL THICKNESS (MIL):	
250 - 2 1/2"	600 - 6"	S OR J - STUD/JOIST	125 - 1 1/4"	33
350 - 3 1/2"	800 - 8"	T - TRACK	137 - 1 3/8"	43
362 - 3 5/8"	1000 - 10"		162 - 1 5/8"	54
400 - 4"	1200 - 12"		202	68
550 - 5 1/2"	1400 - 14"		250 - 2 1/2"	97

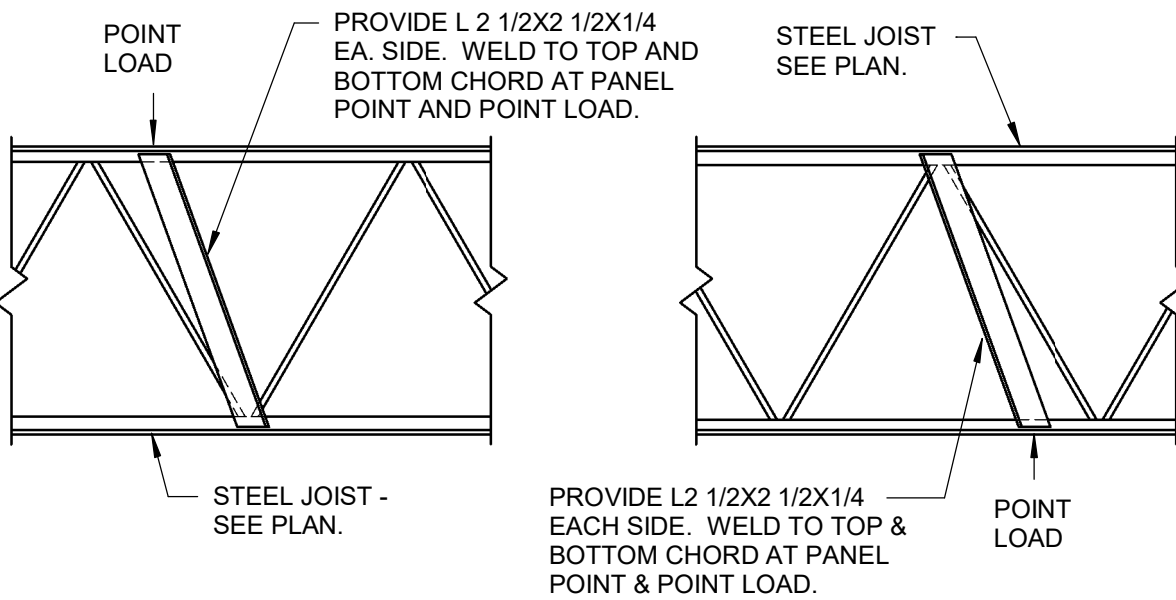
021 - STAIR & HANDRAIL NOTES:

ALL STAIRS AND HANDRAILS SHALL BE DESIGNED BY A LICENSED ENGINEER BASED ON THE FOLLOWING DESIGN CRITERIA. ALL DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED AND SUBMITTED AS SHOP DRAWINGS:

- STAIR STRINGERS, TREADS AND RISERS SHALL BE DESIGNED TO SUPPORT 100 PSF LIVE LOAD.
- INDIVIDUAL STAIR TREADS SHALL BE DESIGNED TO SUPPORT A 300 POUND CONCENTRATED LOAD PLACED IN A POSITION THAT WOULD CAUSE MAXIMUM STRESS.
- THE TOP RAIL OF HANDRAILS SHALL BE DESIGNED TO WITHSTAND A LOAD OF 50 PLF APPLIED HORIZONTALLY AT RIGHT ANGLES, OR A 200 POUND CONCENTRATED LOAD APPLIED IN ANY DIRECTION. INTERMEDIATE RAILS, PANEL FILLERS AND THEIR CONNECTIONS SHALL BE DESIGNED TO WITHSTAND A LOAD OF 50 PSF APPLIED HORIZONTALLY AT RIGHT ANGLES OVER THE ENTIRE TRIBUTARY AREA, INCLUDING OPENINGS AND SPACES BETWEEN RAILS.

051 - STEEL JOIST FRAMING NOTES:

- OPEN WEB STEEL JOISTS AND JOIST GIRDERS SHALL BE DESIGNED AND MANUFACTURED TO THE MINIMUM STANDARDS ESTABLISHED BY THE STEEL JOIST INSTITUTE. FOR JOISTS AN JOIST GIRDERS DESIGNED USING AISC-ASD THE 1/3 STRESS INCREASE ALLOWANCE FOR WIND AND SEISMIC LOADING SHALL NOT BE USED. TOP CHORDS OF JOISTS SHALL BE ANGLES OR TEES. BRIDGING SHALL BE DESIGNED (UNLESS NOTED OTHERWISE) IN ACCORDANCE WITH PARAGRAPH 5.4 OF THE STEEL JOISTS INSTITUTE SPECIFICATIONS. SHOP PAINT TO BE PER ARCH. SPECIFICATIONS.
- JOISTS GIRDERS SHALL BE DESIGNED, MANUFACTURED, AND ERECTED PER THE STEEL JOIST INSTITUTE SPECIFICATIONS.
- PROVIDE FLAT BEARING FOR ALL JOISTS. THE ENDS OF ALL JOISTS SHALL HAVE A MINIMUM BEARING OF 2 1/2", EXCEPT FOR LH & DLH JOISTS WHICH SHALL HAVE A MINIMUM BEARING OF 4". WHERE NECESSARY, JOISTS ARE TO BE STAGGERED WHEN BEARING OVER NARROW STEEL SUPPORTS. IF THE MINIMUM BEARING CANNOT BE OBTAINED, SPECIAL ENDS MUST BE SHOWN, NOTED AND DESIGNED BY MANUFACTURER AND SUBMITTED FOR APPROVAL.
- SJ - STRUT JOIST - BOTTOM CHORD TO BE ANGLES EQUAL IN SIZE TO TOP CHORD; DO NOT WELD BOTTOM CHORD TO STABILIZER PLATE.
- JOISTS SHALL BE CONNECTED WITH TWO 1/8" FILLET WELDS 1" LONG OR EQUAL.
- JOISTS SHALL BE FIELD BOLTED AT THE COLUMN LINES TO PROVIDE LATERAL STABILITY DURING CONSTRUCTION. USE TWO 1/2" DIAMETER BOLTS.
- UNLESS PRE-ASSEMBLED INTO PANELS, ALL JOISTS WITH SPANS OF 40'-0" OR MORE, SHALL HAVE EACH END CONNECTED TO THE SUPPORTING STEEL STRUCTURE W/ 1/2"O ERECTION BOLTS.
- JOISTS SHALL BE DESIGNED FOR APPLICABLE WIND LOADS, INCLUDING UPLIFT. SEE CHART S0.1 FOR ROOF UPLIFT PRESSURES.
- JOIST LOCATIONS ARE SHOWN FOR DESIGN PURPOSE. ACTUAL LOCATIONS MAY NEED TO BE ALTERED SLIGHTLY TO ACCOMMODATE BATHROOM PLUMBING FIXTURES. CONTRACTOR TO COORDINATE STEEL PLACEMENT PRIOR TO SUBMITTING SHOP DRAWINGS.
- WHERE 4 OR 5 ROWS OF BRIDGING ARE REQUIRED, A ROW NEAREST THE MID-SPAN OF THE JOIST SHALL BE DIAGONAL "X" BRIDGING WITH BOLTED CONNECTIONS AT CHORDS AND INTERSECTIONS.



JOIST REINFORCEMENT AT CONCENTRATED LOAD

053 - PRE-ENGINEERED STEEL BUILDING SPECIFICATIONS

DRAWINGS:

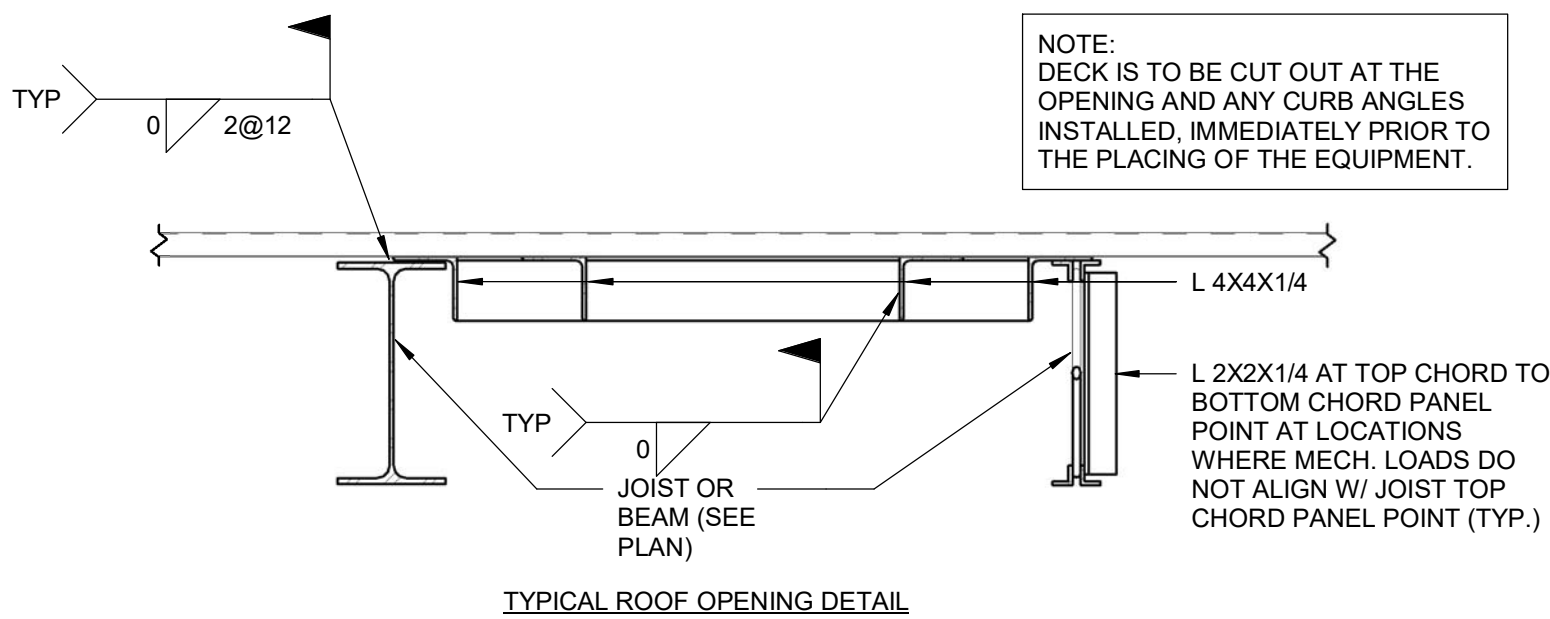
- THE BUILDING MANUFACTURER SHALL FURNISH COMPLETE ERECTION DRAWINGS SHOWING ANCHOR BOLT SETTINGS, SIDEWALL, END-WALL AND ROOF FRAMING, TRANSVERSE CROSS SECTIONS, COVERING AND FLASHING DETAILS, AND NECESSARY INSTALLATION DETAILS TO CLEARLY INDICATE THE PROPER ASSEMBLY OF ALL BUILDING PARTS.
- ALL ERECTION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION. CALCULATIONS SHALL BE SEALED BY A REGISTERED ENGINEER AND SUBMITTED FOR APPROVAL.

DESIGN:

- STRUCTURAL STEEL SECTIONS AND WELDED PLATE MEMBERS SHALL BE DESIGNED IN ACCORDANCE WITH THE APPLICABLE SECTIONS, RELATING TO THE DESIGN REQUIREMENTS AND ALLOWABLE STRESSES, OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STEEL FOR BUILDINGS".
- COLD-FORMED STRUCTURAL MEMBERS AND EXTERIOR COVERING SHALL BE DESIGNED IN ACCORDANCE WITH THE APPLICABLE SECTIONS, RELATING TO THE DESIGN REQUIREMENT AND ALLOWABLE STRESSES, OF THE AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, (LATEST EDITION).
- FRAMING MEMBERS SHALL BE SHOP-FABRICATED FOR BOLTED FIELD ASSEMBLY.
- COLD-FORMED SECTIONS SHALL BE MANUFACTURED BY ROLL OR BRAKE FORMING.
- WELDS SHALL BE DESIGNED TO MEET THE STRESS REQUIREMENTS OF AWS "STRUCTURAL WELDING CODE".
- FIELD CONNECTIONS SHALL BE BOLTED WITH A-307 (CLEAR ZINC PLATED), A-325 (BRONZE ZINC PLATED), OR A-490 BOLTS AS SHOWN ON DRAWINGS. A-325 AND A-490 BOLTS ARE TO BE TIGHTENED BY THE TURN OF THE NUT METHOD.
- FRAMING MEMBERS SHALL CARRY AN IDENTIFYING MARK, EITHER STAMPED, STENCILED OR PAINTED.
- WIND BRACING:
  - WHEN THE WIND LOAD IS APPLIED IN SUCH A DIRECTION THAT IT IS NOT FORCED BY THE TRANSVERSE RIGID FRAMES, BRACING SHALL BE PROVIDED TO ADEQUATELY TRANSMIT ALL WIND FORCES ON THE BUILDING TO THE FOUNDATION. MAXIMUM LATERAL DEFLECTION SHALL BE L/240. THE BRACING SHALL CONSIST OF:
    - DIAGONAL BRACING, SUCH THAT THE FORCES ARE CARRIED BY THE TRUSS ACTION; OR
    - WIND COLUMNS SHALL BE USED IN THE WALLS.
- PAINTING OF FRAMING:
  - FRAMING MEMBERS WHICH ARE NOT GALVANIZED SHALL BE PAINTED. ALL MATERIALS TO RECEIVE SHOP PRIMER SHALL BE CLEANED OF LOOSE RUST, LOOSE MILL SCALE AND OTHER FOREIGN MATERIAL BY THE MANUFACTURER. CLEANING SHALL BE DONE IN ACCORDANCE WITH SSPC-2.
- PANEL MATERIAL:
  - THE PANEL MATERIAL AS SPECIFIED SHALL BE ONE OF THE FOLLOWING:
    - GALVALUME ALUMINUM-ZINC ALLOY; OR
    - GALVANIZED STEEL PANELS AS PER ASTM SPECIFICATION A653.
- FASTENERS:
  - SELF-TAPPING SHEET METAL SCREWS SHALL HAVE TYPE "A" OR TYPE "AB" THREADS. WHERE REQUIRED FOR WEATHER TIGHTNESS, SCREWS SHALL BE EQUIPPED WITH MEV AND NEOPRENE WASHERS. SCREWS SHALL HAVE HEX HEADS, SHALL BE ZINC PLATED AND, WHEN NECESSARY, COLOR COATED TO MATCH ROOF OR WALL PANELS.
- ANCHORAGE:
  - THE BUILDING ANCHOR BOLTS SHALL BE DESIGNED TO RESIST THE MAXIMUM COLUMN REACTIONS RESULTING FROM THE SPECIFIC COMBINATIONS OF LOADINGS. THE ANCHOR BOLT DIAMETER AND PROJECTION SHALL BE SPECIFIED BY THE BUILDING MANUFACTURER.

054 - ROOF NOTES:

- ROOF TO BE "R" RIGID BOARD INSULATION OVER GALVANIZED ROOF DECK. (SEE NOTE #2 FOR DECK SPECIFICATION.) \*RE: ARCH. FOR THICKNESS.
- ROOF DECK SPECIFICATION:
  - METAL DECK SHALL BE TEMPERED COLD ROLLED STEEL, SHEET SHALL BE FORMED TO A CORRUGATED RIB PATTERN OF VULCRAFT TYPE 1.5B22 OR EQUAL U.N.O. SEE PLAN. THE STEEL SHALL CONFORM TO ASTM A653, GRADE E ZINC COATING CONFORMING TO ASTM A924. G60 COATING CLASS FOR GALVANIZED MATERIAL. END LAPS AND SIDE LAPS ARE TO BE PER THE MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE METAL DECK SUPPORT AT ALL BUILDING CORNERS, SKEWED BUILDING LINES WHERE SUPPORTING STRUCTURE BEARS PERPENDICULAR AND AROUND ALL FRAMED OPENINGS WITH L 4X4X1/4 UNLESS NOTED OTHERWISE. INSTALL 6" WIDE X 12 GA. SHEET METAL COVER PLATES IN VALLEYS, RIDGES OR WHERE DECK CHANGES DIRECTION. SPOT WELD IN PLACE AT 12" O.C. MAXIMUM. CONTRACTOR TO COORDINATE WITH STEEL DECK SUPPLIER TO PROVIDE ALL NECESSARY DECK SUPPORTS REQUIRED TO ADEQUATELY SUPPORT THE METAL DECK.



- REFERENCE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION ON OPENINGS, MECHANICAL AND PLUMBING EQUIPMENT AND ROOF SLOPES.
- [+X'-Y"] ——— INDICATES TOP OF STEEL ELEVATION GIVEN ABOVE FINISHED FIRST FLOOR.
- WELD DECK TO STEEL SUPPORTS USING 5/8" DIA. PUDDLE WELD IN A 36/4 PATTERN W/ (4)-#10 TEK SCREWS PER SIDE LAP PER SPAN U.N.O. SEE PLAN.

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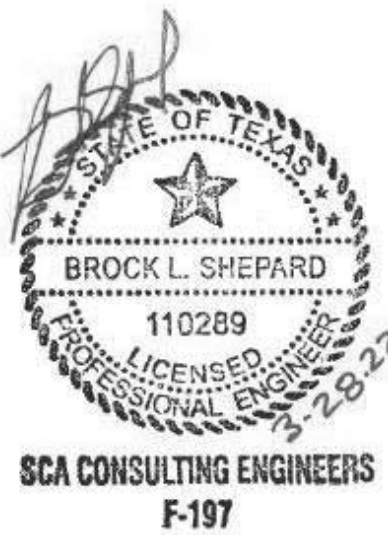
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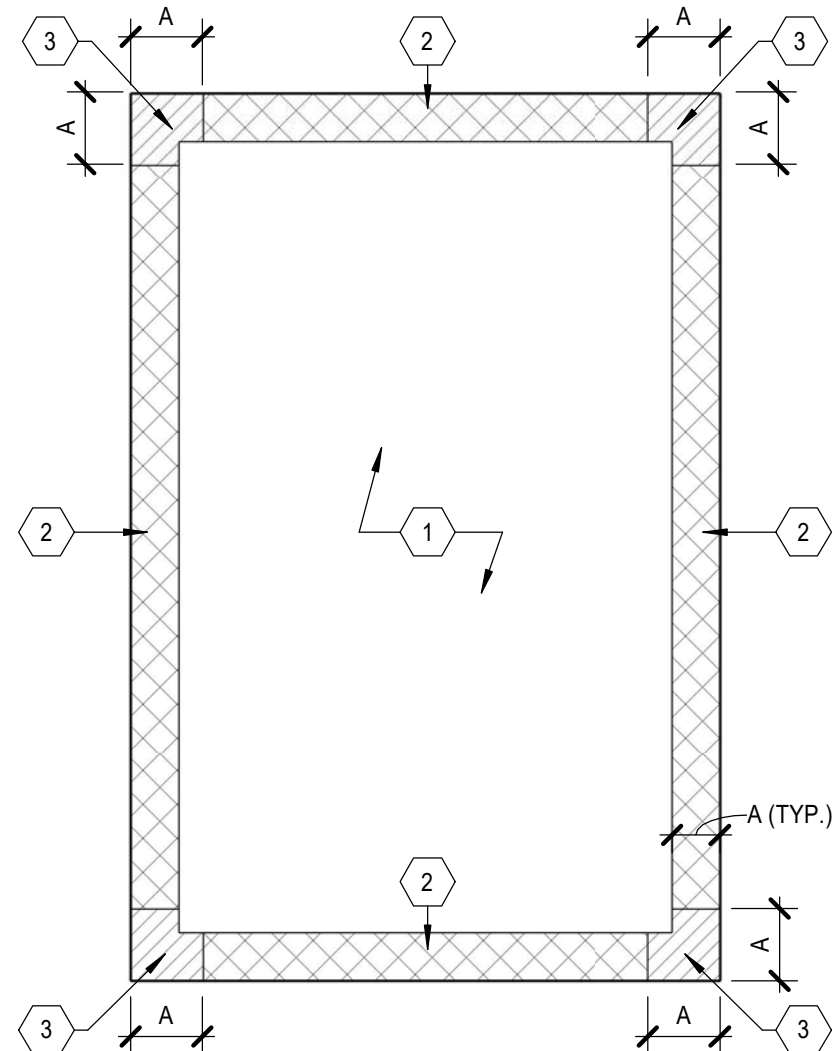
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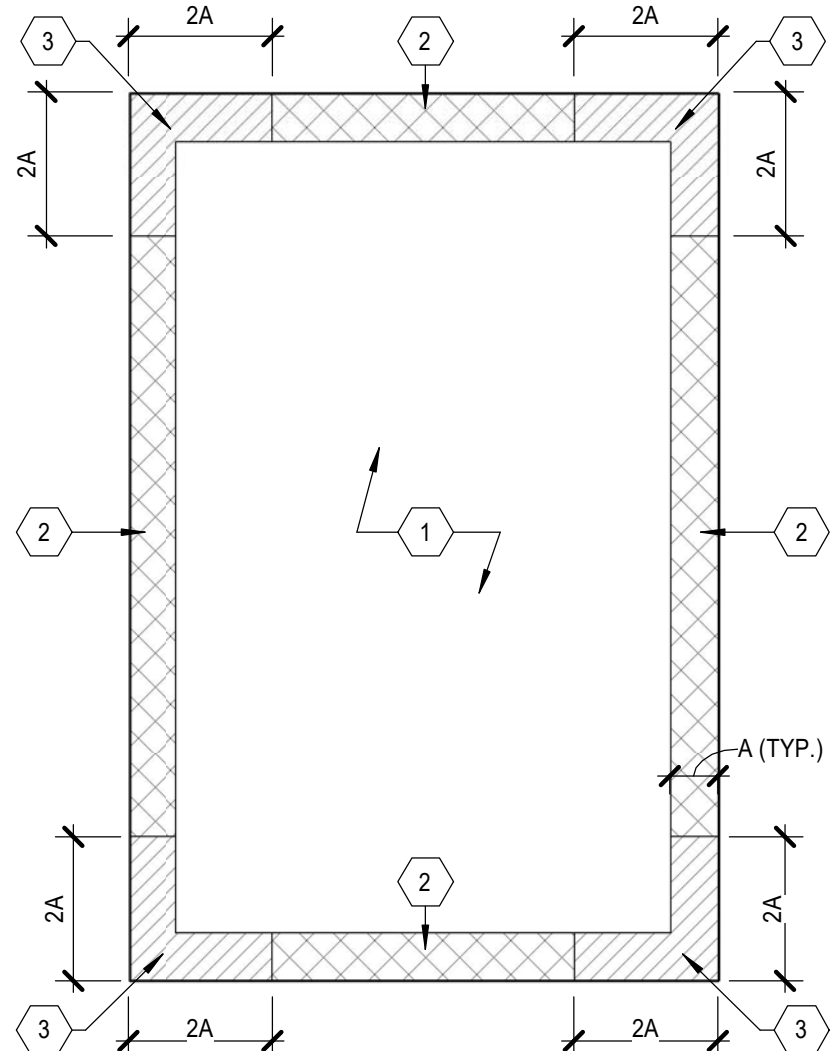
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General Notes and Specifications

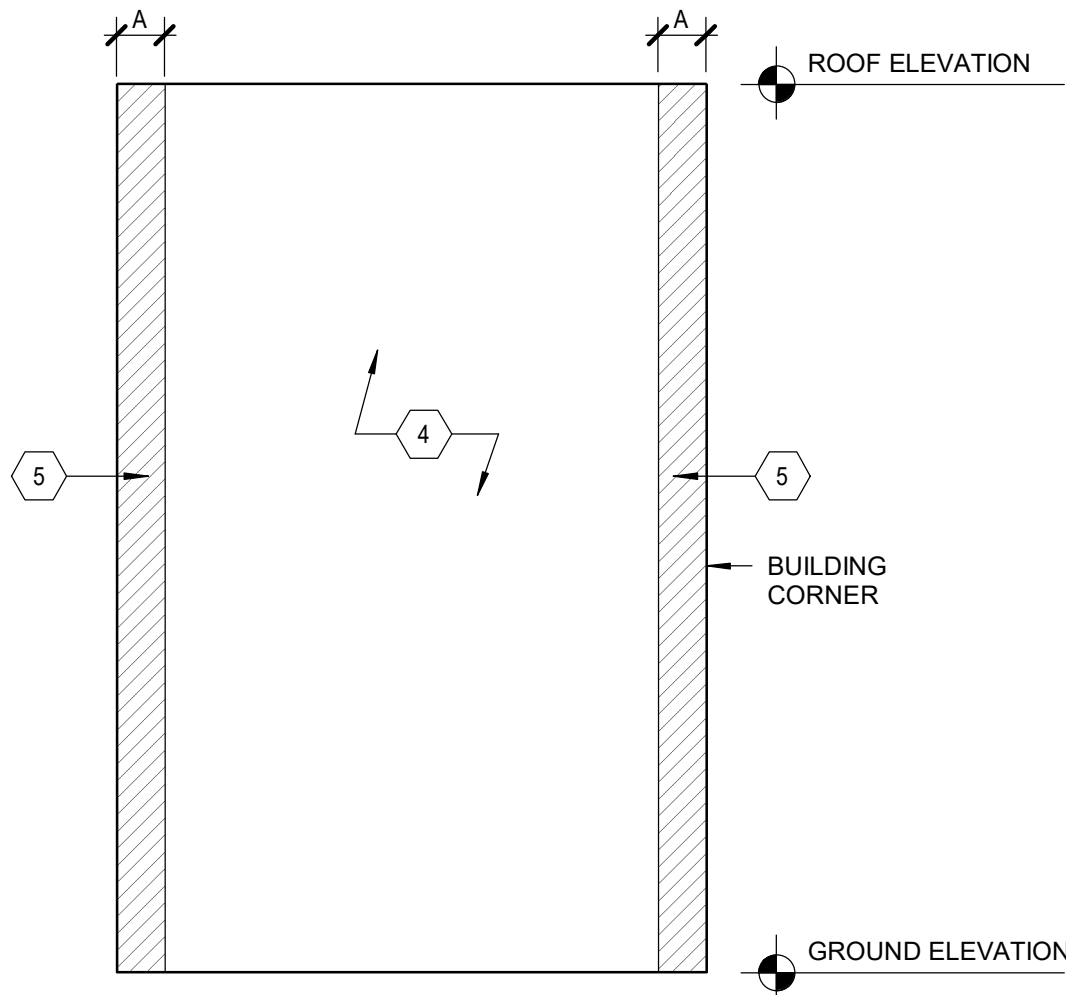
026-1 - COMPONENT AND CLADDING FOR DESIGN WIND PRESSURE



FLAT ROOF  
MEAN ROOF HEIGHT LESS THAN OR EQUAL TO 60 ft



FLAT ROOF  
MEAN ROOF HEIGHT GREATER THAN 60 ft



WALL ELEVATION

TRIB. AREA FT <sup>2</sup>	DESIGN WIND PRESSURE FLAT ROOF (LOADS SHOWN ARE SERVICE LOADS)		
	ZONE 1	ZONE 2	ZONE 3
10	-21.55 PSF +10.00 PSF	-36.16 PSF +10.00 PSF	-54.42 PSF +10.00 PSF
50	-20.27 PSF +10.00 PSF	-27.22 PSF +10.00 PSF	-32.72 PSF +10.00 PSF
100	-19.72 PSF +10.00 PSF	-23.37 PSF +10.00 PSF	-23.37 PSF +10.00 PSF

ZONE LENGTH	
A	7' - 0"

TRIB. AREA FT <sup>2</sup>	DESIGN WIND PRESSURE (LOADS SHOWN ARE SERVICE LOADS)	
	ZONE 4	ZONE 5
10	-23.37 PSF +21.55 PSF	-28.85 PSF +21.55 PSF
25	-22.09 PSF +20.27 PSF	-26.29 PSF +20.27 PSF
50	-21.12 PSF +19.29 PSF	-24.34 PSF +19.29 PSF

- NOTES:**
- ALL BUILDING COMPONENTS, CLADDING, FINISHES AND CONNECTIONS SHALL BE DESIGNED FOR WIND PRESSURES INDICATED FOR THE CORRESPONDING ZONE. CALCULATIONS AND/OR DESIGN DATA MUST BE AVAILABLE FOR REVIEW BY THE STRUCTURAL ENGINEER OF RECORD IF REQUESTED. PRESSURES SHOWN REPRESENT SERVICE LEVEL LOADS.
  - ZONE LENGTH INCLUDES OVERHANG.
  - ALL PARAPETS SHALL BE DESIGNED IN ACCORDANCE WITH THE WIND PRESSURES DETERMINED FROM THE ASCE7 EDITION THAT IS NOTED IN THE GOVERNING BUILDING CODE.
  - ALL ARCHED ROOFS SHALL BE DESIGNED IN ACCORDANCE WITH WIND PRESSURES DETERMINED FROM THE ASCE7 EDITION THAT IS NOTED IN THE GOVERNING BUILDING CODE.
  - PER IBC CHAPTER 16, EXTERIOR GLAZING SHALL BE IMPACT RESISTANT MEETING ASTM E 1886 AND ASTM E 1966 FOR STRUCTURES LOCATED IN WIND-BORNE DEBRIS REGIONS OF HURRICANE-PRONE REGIONS.
    - IBC DEFINES WIND-BORNE DEBRIS REGIONS AS PORTIONS OF HURRICANE-PRONE REGIONS THAT ARE WITHIN 1 MILE OF THE COASTAL MEAN HIGH WATER LINE WHERE THE BASIC WIND SPEED IS 110 MPH OR GREATER FOR ASCE 7-05 (OR WHERE THE ULTIMATE DESIGN WIND SPEED IS 130 MPH OR GREATER FOR ASCE 7-10 CALCULATED WIND SPEEDS); OR PORTIONS OF HURRICANE-PRONE REGIONS WHERE THE BASIC WIND SPEED IS 120 MPH OR GREATER FOR ASCE 7-05 CALCULATED WIND SPEEDS (OR WHERE THE ULTIMATE DESIGN WIND SPEED IS 140 MPH OR GREATER FOR ASCE 7-10 CALCULATED WIND SPEEDS); OR HAWAII. ADDITIONAL RESTRICTIONS FOR WIND SPEEDS CALCULATED BY ASCE 7-10 ARE STATED IN THE IBC CHAPTER 2.

025 - SPECIAL INSPECTION

WHEN INDICATED WITH A '✓' THE FOLLOWING SHALL BE INSPECTED IN ACCORDANCE WITH IBC SECTION 1704 BY A CERTIFIED SPECIAL INSPECTOR FROM AN ESTABLISHED TESTING AGENCY. ALL INSPECTION SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. FOR MATERIAL SAMPLING AND TESTING REQUIREMENTS, REFER TO MATERIAL SAMPLING AND TESTING SECTION BELOW. THE TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS TO THE STRUCTURAL ENGINEER, ARCHITECT, CONTRACTOR, OWNER AND BUILDING DEPARTMENT (IF REQUIRED). ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN IF LEFT UNCORRECTED TO THE STRUCTURAL ENGINEER, ARCHITECT AND BUILDING DEPARTMENT (IF REQUIRED).

ITEM	REQUIRED	REMARKS
GRADING, EXCAVATIONS, FILL, FOOTINGS	✓	BY GEOTECHNICAL ENGINEER
DRILLED PIERS/PILES	✓	CONTINUOUS
CONCRETE - BATCH PLANT INSPECTION	✓	PERIODIC
CONCRETE - VERIFY USE OF PROPER MIX DESIGN	✓	PERIODIC
CONCRETE - CONCRETE PLACEMENT	✓	CONTINUOUS
CONCRETE - REBAR PLACEMENT	✓	INSPECT FINAL PLACEMENT
CONCRETE- REBAR WELDING	✓	CONTINUOUS
CONCRETE - ANCHOR BOLTS AND PLATES	✓	INSPECT FINAL PLACEMENT
CONCRETE - POST-TENSIONING STEEL PLACEMENT		INSPECT FINAL PLACEMENT
CONCRETE - POST-TENSIONING STRESSING AND GREASE CAP (PART OF ENCAPSULATED SYSTEM) INSTALLATION		CONTINUOUS
CONCRETE - POST INSTALLED ANCHORS (MECHANICAL AND ADHESIVE)	✓	PERIODIC
CONCRETE - EPOXY	✓	PERIODIC
CONCRETE - SHOTCRETE PLACEMENT		CONTINUOUS
CONCRETE - PRECAST CONCRETE ERECTION		PERIODIC
MASONRY - VERIFICATION OF PROPORTIONS OF SITE PREPARED MORTAR		PERIODIC
MASONRY - VERIFICATION OF MORTAR JOINT		PERIODIC
MASONRY - VERIFICATION OF LOCATION OF REBAR AND CONNECTORS		PERIODIC
MASONRY - SIZE AND LOCATION OF STRUCTURAL ELEMENTS		PERIODIC
MASONRY - TYPE, SIZE AND LOCATION OF ANCHORS		PERIODIC
MASONRY - SIZE, GRADE AND TYPE OF REBAR		PERIODIC
MASONRY - REBAR WELDING		PERIODIC
MASONRY - PROTECTION OF MASONRY DURING HOT (TEMPERATURE ABOVE 90 DEG.) AND COLD WEATHER (TEMPERATURE BELOW 40 DEG.)		PERIODIC
MASONRY - VERIFICATION OF CLEAN GROUT SPACE PRIOR TO GROUT PLACEMENT		PERIODIC
MASONRY - REBAR PLACEMENT		PERIODIC
MASONRY - GROUT PLACEMENT		PERIODIC
MASONRY - COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED		PERIODIC
LIGHT GAGE STUD FRAMING; SHOP AND FIELD WELDING	✓	PERIODIC
COMPOSITE METAL DECK		PERIODIC
STRUCTURAL STEEL, SHOP WELDING - FILLET WELDS	✓	PERIODIC
STRUCTURAL STEEL, SHOP WELDING - PARTIAL OR FULL PENETRATION WELDS	✓	CONTINUOUS
STRUCTURAL STEEL, FIELD WELDING - FILLET WELDS	✓	PERIODIC
STRUCTURAL STEEL, FIELD WELDING - PARTIAL OR FULL PENETRATION WELDS	✓	CONTINUOUS
STRUCTURAL WOOD, NAILING, BOLTING, UPLIFT ANCHORS, HOLD-DOWNS		PERIODIC
STRUCTURAL WOOD, SHEARWALLS, DIAPHRAGMS, DRAG STRUTS, BRACES		PERIODIC
DRYWALL - SHEARWALL NAILING/SCREWS		PERIODIC

UPON COMPLETION OF THE JOB, THE TESTING LABORATORY PROVIDING SERVICES SHALL FURNISH TO THE OWNER, ARCHITECT, AND ENGINEER OF RECORD, A STATEMENT SIGNED BY A LICENSED PROFESSIONAL ENGINEER THAT, TO THE BEST OF THEIR KNOWLEDGE, ALL REQUIRED TESTS AND INSPECTIONS WERE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

MATERIAL SAMPLING AND TESTING:

WHEN INDICATED WITH A '✓' THE FOLLOWING SHALL BE SAMPLED AND TESTED BY A CERTIFIED INSPECTOR FROM AN ESTABLISHED TESTING AGENCY IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, GENERAL NOTES OR PREVAILING BUILDING CODE, WHICH EVER IS MORE STRINGENT. ALL MATERIAL SAMPLING AND TESTING SHALL BE PERFORMED IN ACCORDANCE WITH ASTM REQUIREMENTS. FOR ADDITIONAL INFORMATION ON MATERIAL SAMPLING AND TESTING, REFER TO PROJECT SPECIFICATIONS AND GENERAL NOTES. THE TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING REPORTS DIRECTLY TO THE STRUCTURAL ENGINEER, ARCHITECT, CONTRACTOR, OWNER AND BUILDING DEPARTMENT (IF REQUIRED). ANY MATERIALS WHICH FAIL TO MEET THE PROJECT SPECIFICATIONS SHALL BE IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER.

ITEM	REQUIRED	REMARKS
CONCRETE - REINFORCING	✓	MILL CERTIFICATES
CONCRETE - CYLINDERS	✓	AS REQ. PER SPECIFICATIONS
CONCRETE - DESIGN MIX	✓	CONTINUOUS
CONCRETE -SAMPLING FRESH CONCRETE AND PERFORMING SLUMP, AIR CONTENT AND DETERMINING THE TEMPERATURE OF FRESH CONCRETE AT THE TIME OF MAKING SPECIMENS FOR STRENGTH TESTS	✓	CONTINUOUS
CONCRETE - MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	✓	PERIODIC
CONCRETE - VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POSITIONED CONCRETE, AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS		CONTINUOUS
CONCRETE - LARGE CONCRETE MAT TEMPERATURE MONITORING DURING INITIAL CURING		MONITOR TEMPERATURE DURING CURING
POST-TENSIONING TENDONS		(2) 5 FT. SAMPLES PER REEL. ONE FROM EACH END
STRUCTURAL STEEL, ULTRASONIC TESTING	✓	
STRUCTURAL STEEL, BEND TESTS ON WELDED STUDS	✓	
POST INSTALLED ANCHORS (MECHANICAL AND ADHESIVE)	✓	COORDINATE WITH ENGINEER ON FREQUENCY OF TESTING
MASONRY - PREPARATION OF ANY REQUIRED GROUP SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS		PERIODIC



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FORT BEND COUNTY  
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1	02-21-2022	Review Set
2	03-28-2022	Issue For Permit



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F-197

S0.102

General Notes and Specifications





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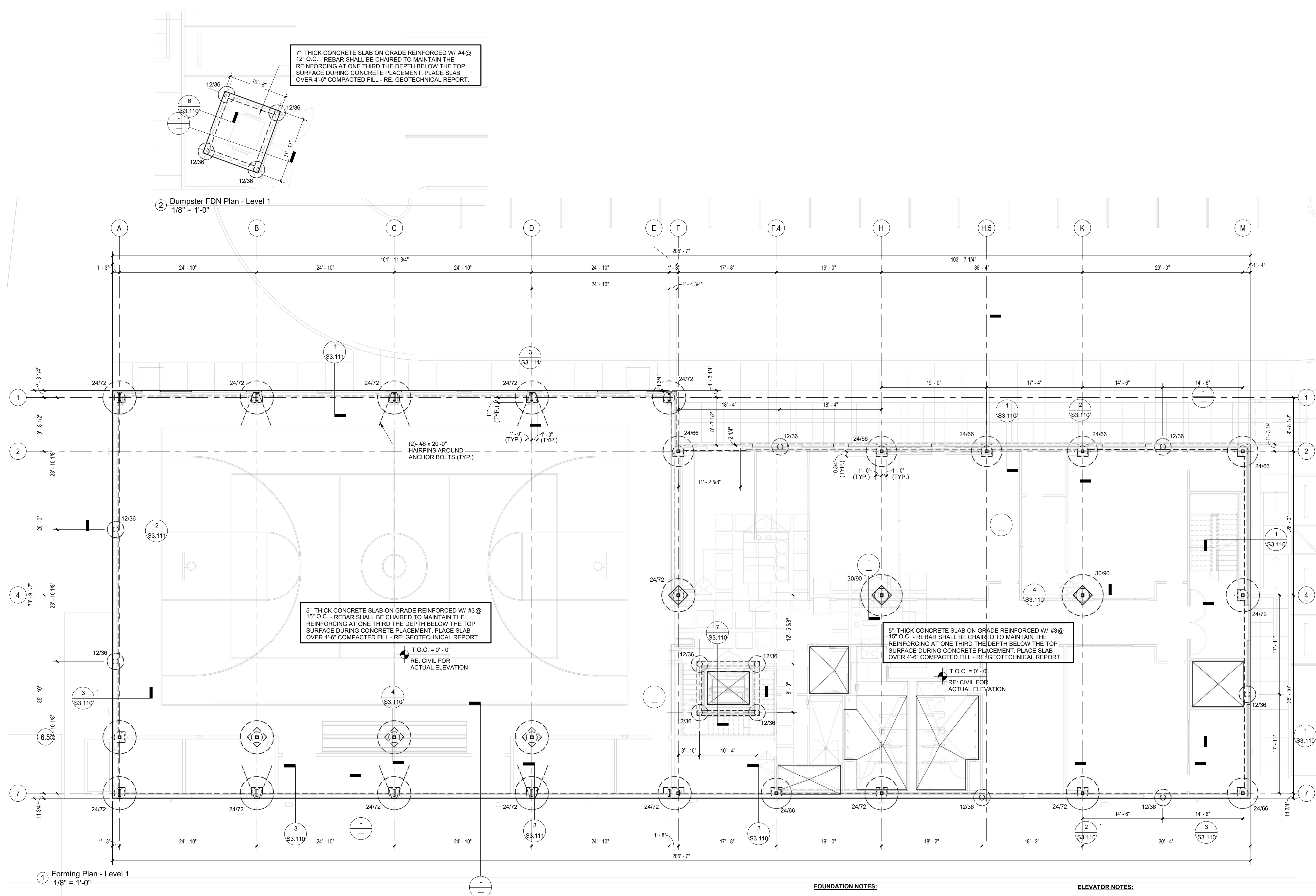
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S1.100

## Foundation Plan



**FOUNDATION NOTES:**

1. TOP OF CONCRETE ELEVATION = SEE PLAN
2. SLAB THICKNESS = SEE PLAN
3. SEE SHEET S3.100 FOR TYPICAL FOUNDATION DETAILS
4. SEE SHEET S5.100 FOR BRACE ELEVATIONS AND DETAILS
5. X'-X" INDICATES ELEVATION RELATIVE TO FINISH FLOOR ELEVATION

**ELEVATOR NOTES:**

1. WHERE GUIDE RAILS VERTICALLY SPAN MORE THAN 12 FEET TO 14 FEET HSS4x4x1/4 COLUMNS SHALL BE PROVIDED AT EACH END GUIDE RAIL LOCATION TO LATERALLY SUPPORT RAILS.
2. IF REQUIRED BY ELEVATOR MANUFACTURER A MINIMUM W8x15 HOIST BEAM SHALL BE PROVIDED IN JO LOCATION, IMPOSED LOADING, AND ELEVATION SHALL BE PROVIDED TO EOR
3. IF REQUIRED BY ELEVATOR MANUFACTURER A MINIMUM W8x15 DIVIDER BEAM SHALL BE PROVIDED IN U.O.G.C. SHALL COORDINATE DIVIDER BEAM LOCATION WITH ELEVATOR MANUFACTURER
4. G.C. TO COORDINATE WITH ELEVATOR MANUFACTURER MINIMUM REQUIRED ELEVATOR PIT DEPTH FINAL
5. G.C. TO VERIFY STRUCTURE MEETS MINIMUM VERTICAL CLEARANCE ( OVER RUN HEIGHT) ABOVE TOP LEVEL.

Schedule - Pier Schedule (Bell Bottomed Pier)

Type	Shaft Diameter	Bell Diameter	Vertical Reinforcement	Ties
12/36	1" - 0"	3" - 0"	(4) #5	#3 @ 10" O.C.
24/66	2" - 0"	5" - 6"	(6) #6	#3 @ 12" O.C.
24/72	2" - 0"	6" - 0"	(6) #6	#3 @ 12" O.C.
30/90	2" - 6"	7" - 6"	(8) #7	#3 @ 14" O.C.



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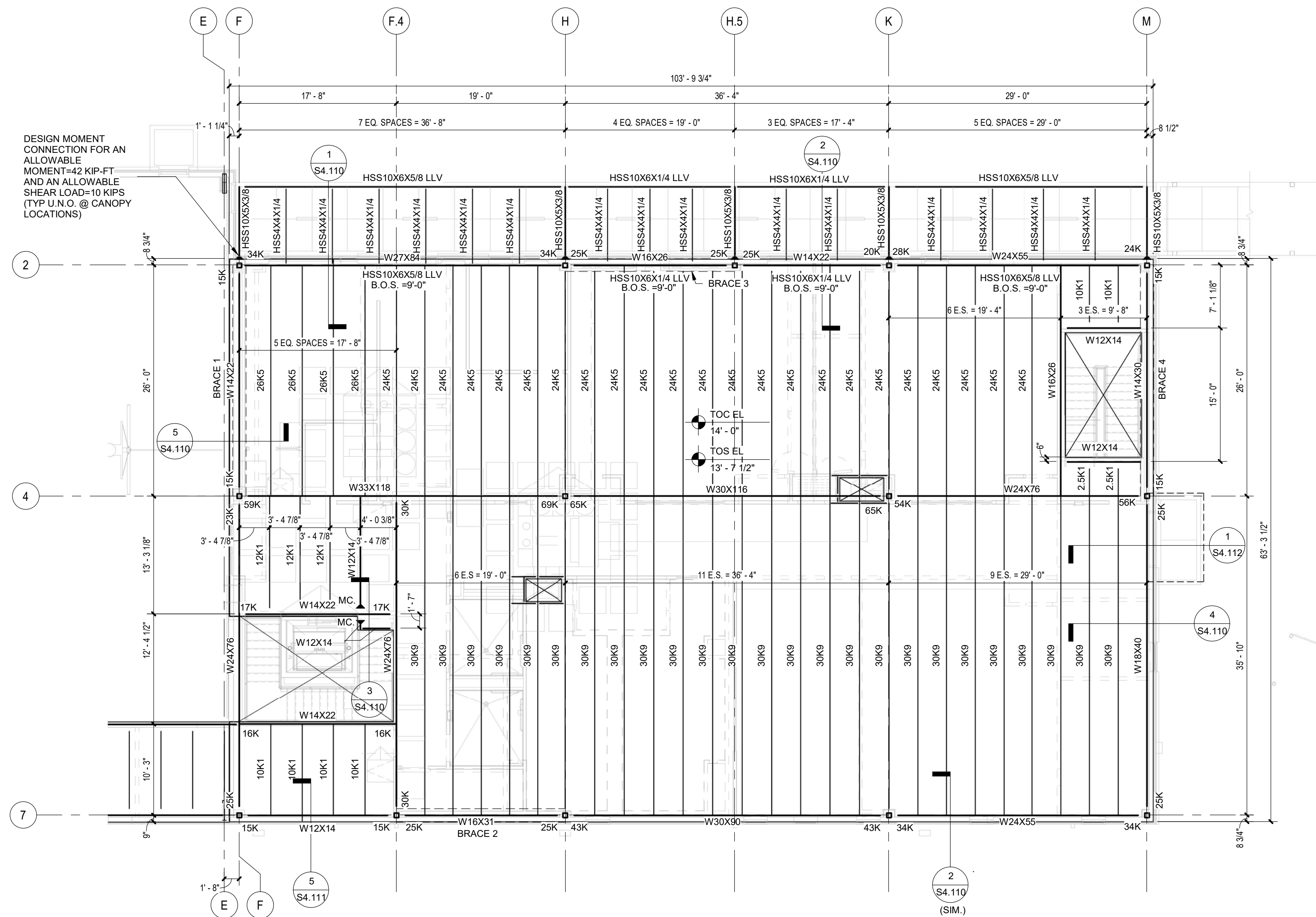
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2	03-28-2022	Issue For Permit



# S2.100


## Second Floor Framing Plan

2025-11-11 11:11:11 AM



① Second Floor Framing Plan - Level 2  
1/8" = 1'-0"

**FRAMING NOTES:**

1. TOP OF CONCRETE ELEVATION = SEE PLAN
2. SLAB THICKNESS = SEE PLAN
3. SEE SPEC. SHEET FOR ADDITIONAL STEEL JOIST AND ROOF FRAMING NOTES  
 INDICATES ELEVATION RELATIVE TO FINISH FLOOR ELEVATION
5. JOIST MANUFACTURER TO DESIGN FOR WEIGHT OF RTU RE: MECH.
6. SEE SHEET \$5.100 FOR STEEL BRACE ELEVATIONS AND DETAILS



**FORT BEND COUNTY  
NEW COMMUNITY CENTER**

1908 AVENUE E  
ROSENBERG, TEXAS 77471

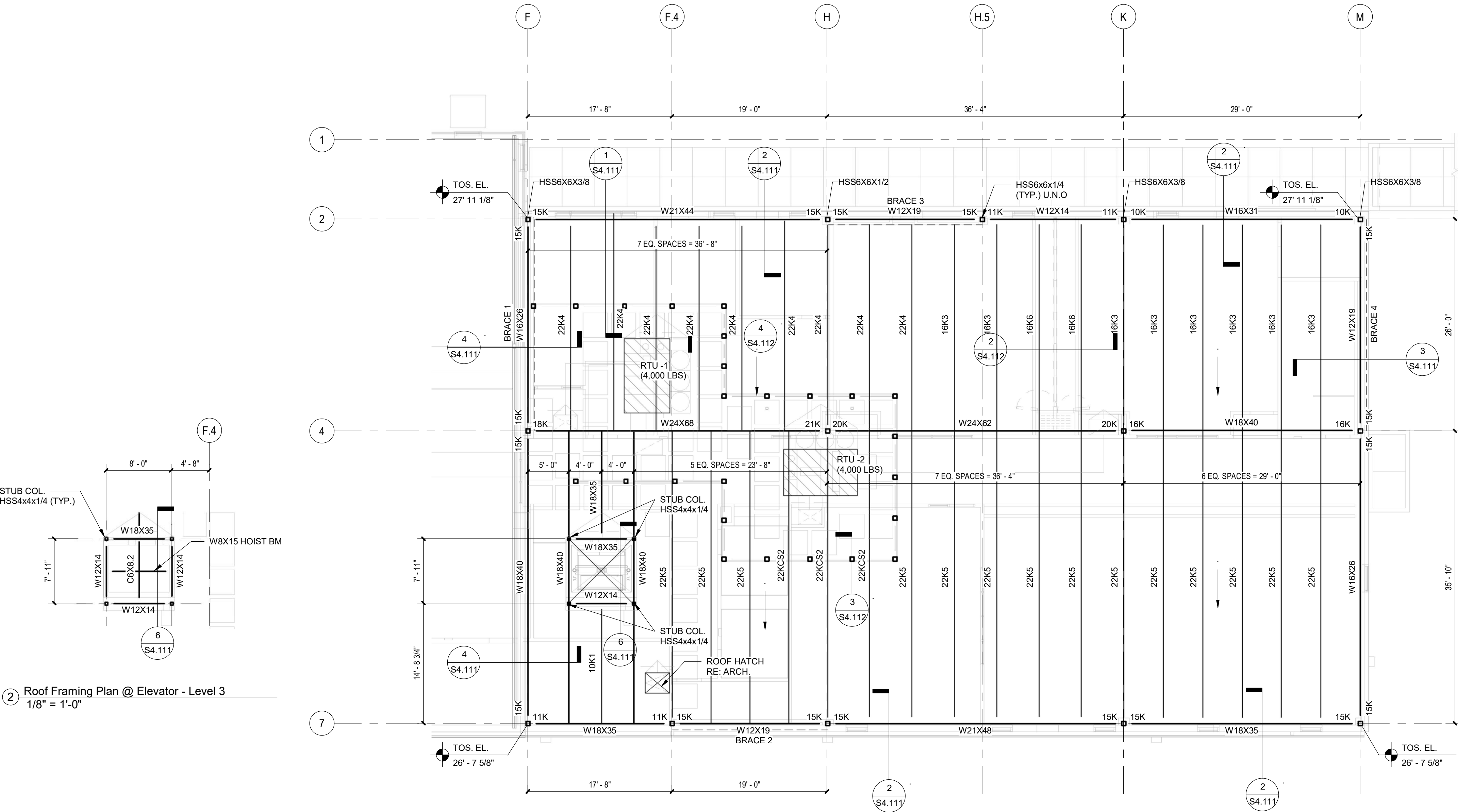
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**S2.110**

Roof Framing Plan



2 Roof Framing Plan @ Elevator - Level 3  
1/8" = 1'-0"

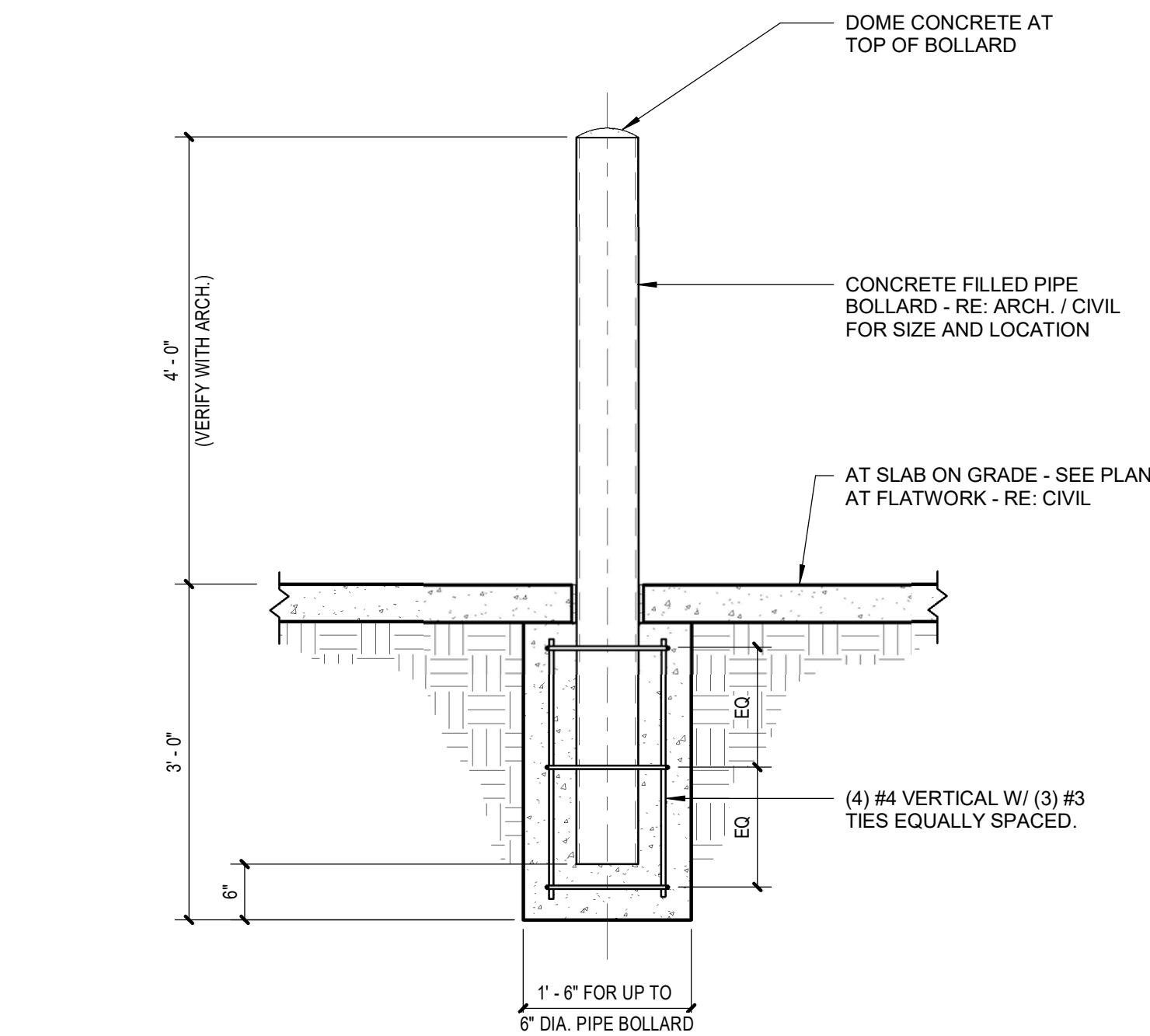
1 Roof Framing Plan - Level 3  
1/8" = 1'-0"

**ELEVATOR NOTES:**

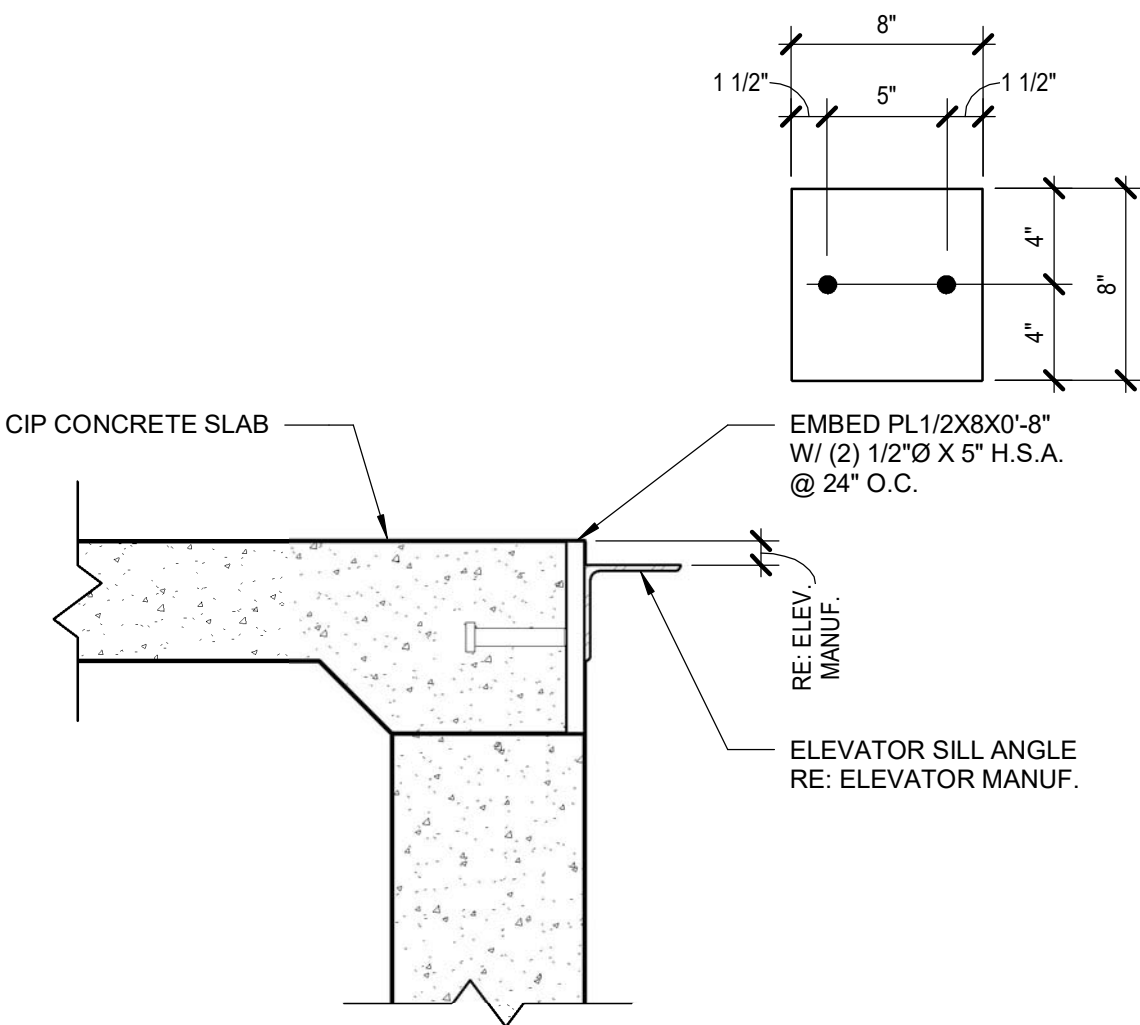
- WHERE GUIDE RAILS VERTICALLY SPAN MORE THAN 12 FEET TO 14 FEET HSS4X4X1/4 COLUMNS SHALL BE PROVIDED AT EACH END GUIDE RAIL LOCATION TO Laterally SUPPORT RAILS.
- IF REQUIRED BY ELEVATOR MANUFACTURER A MINIMUM W8X15 HOIST BEAM SHALL BE PROVIDED U.N.O. LOCATION, IMPOSED LOADING, AND ELEVATION SHALL BE PROVIDED TO EOR.
- IF REQUIRED BY ELEVATOR MANUFACTURER A MINIMUM W8X15 DIVIDER BEAM SHALL BE PROVIDED U.N.O. G.C. SHALL COORDINATE DIVIDER BEAM LOCATION WITH ELEVATOR MANUFACTURER.
- G.C. TO COORDINATE WITH ELEVATOR MANUFACTURER MINIMUM REQUIRED ELEVATOR PIT DEPTH FINAL.
- G.C. TO VERIFY STRUCTURE MEETS MINIMUM VERTICAL CLEARANCE(OVERRUN HEIGHT) ABOVE TOP LEVEL

**FRAMING NOTES:**

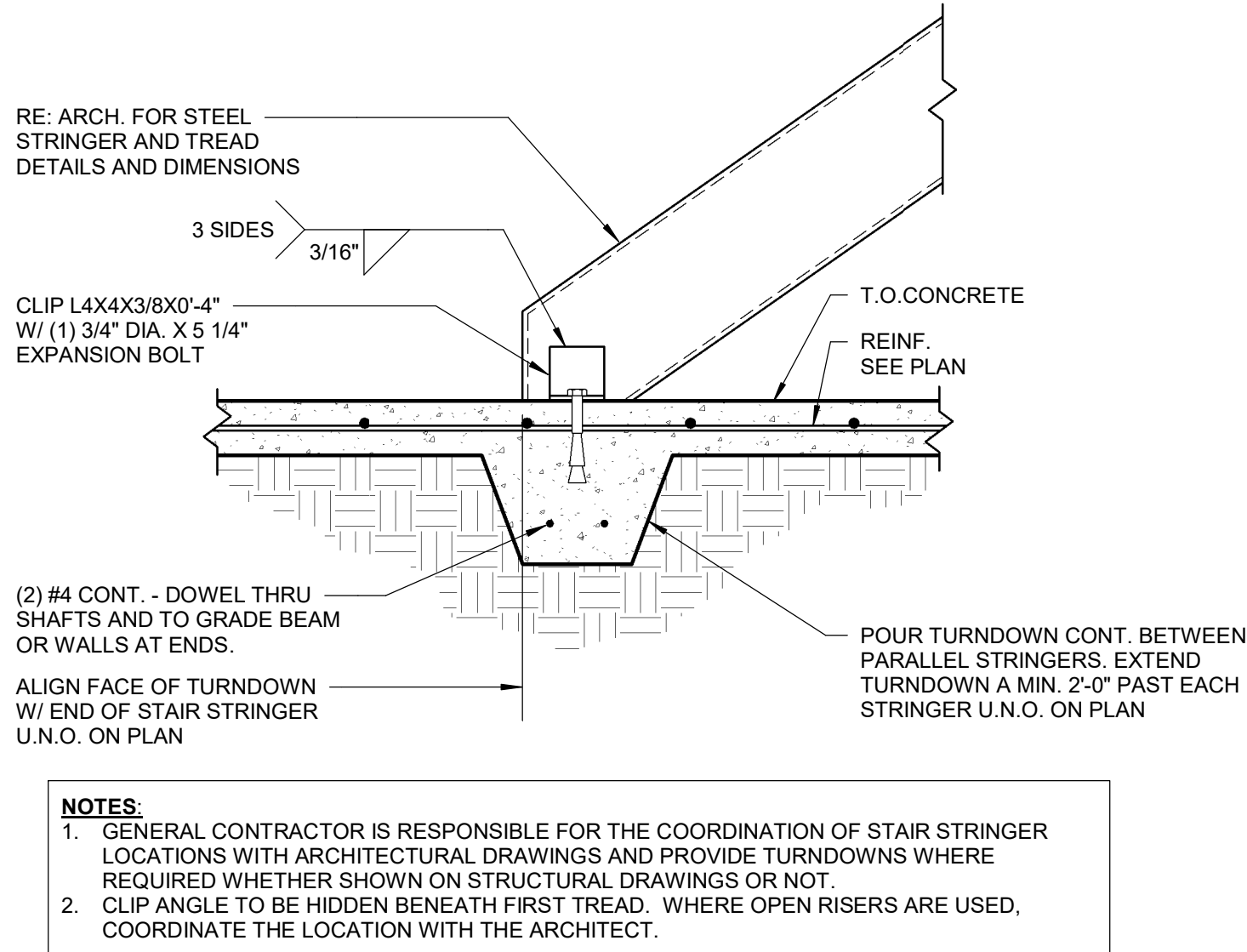
- SEE SPEC. SHEET FOR ADDITIONAL STEEL JOIST AND ROOF FRAMING NOTES
- X-X" INDICATES ELEVATION RELATIVE TO FINISH FLOOR ELEVATION
- JOIST MANUFACTURER TO DESIGN FOR WEIGHT OF RTU RE: MECH.
- SEE SHEET S5.100 FOR STEEL BRACE ELEVATIONS AND DETAILS



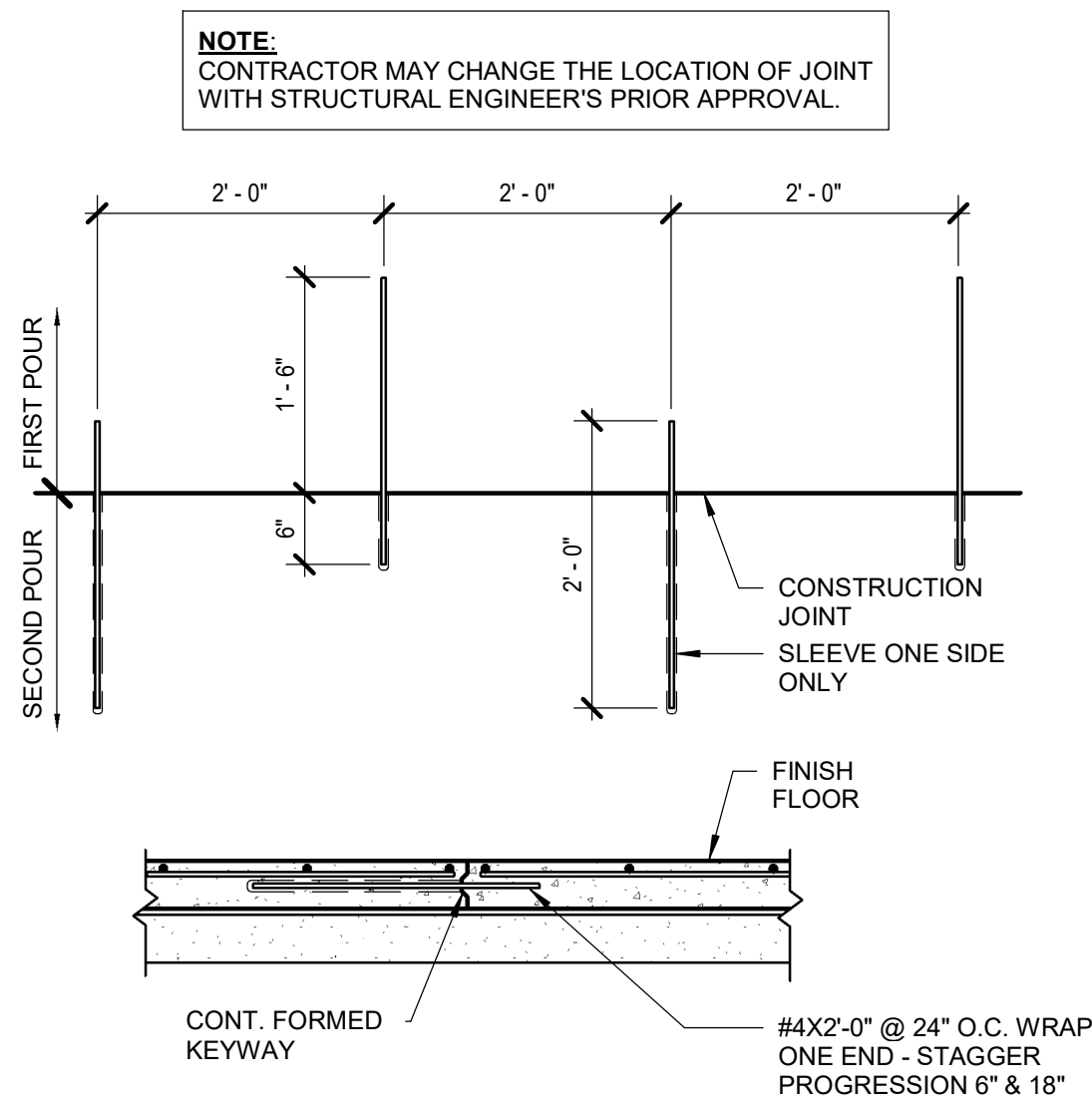
8 Pipe Bollard Foundation  
3/4" = 1'-0"



7 Sill Angle at Elevator Pit  
1 1/2" = 1'-0"

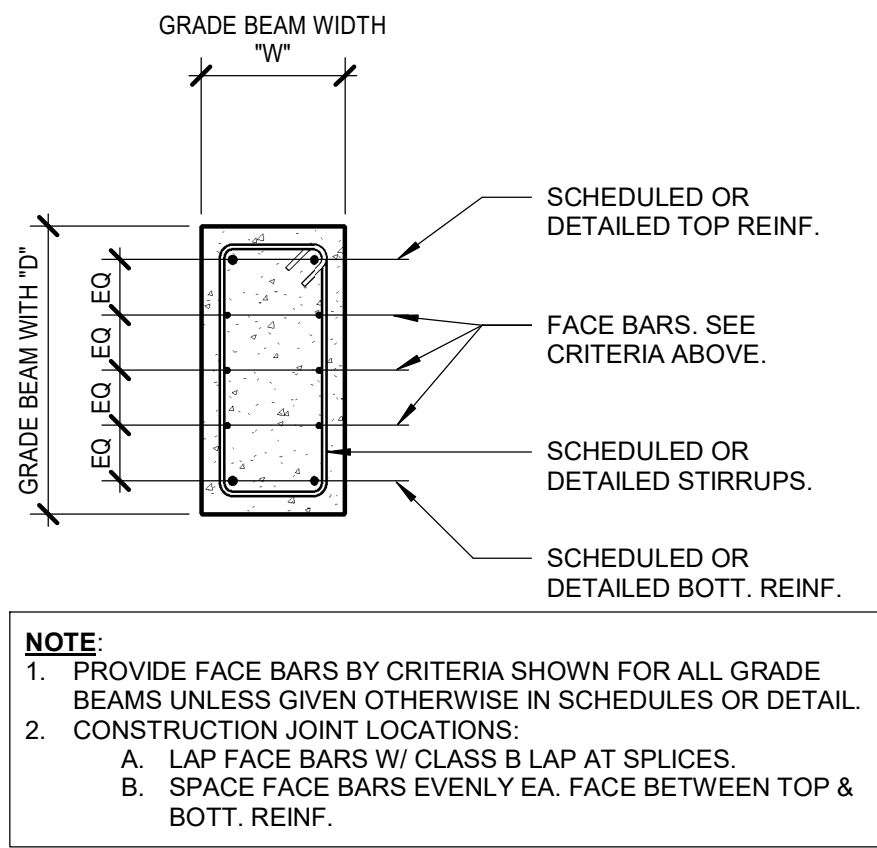


6 Typical Interior Turndown at Stair  
1" = 1'-0"

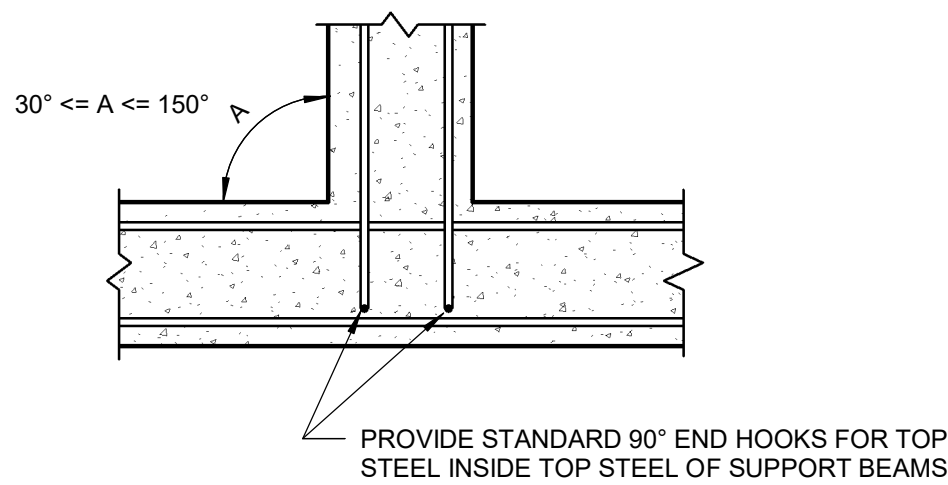


5 Typical Detail at Construction Joint  
3/4" = 1'-0"

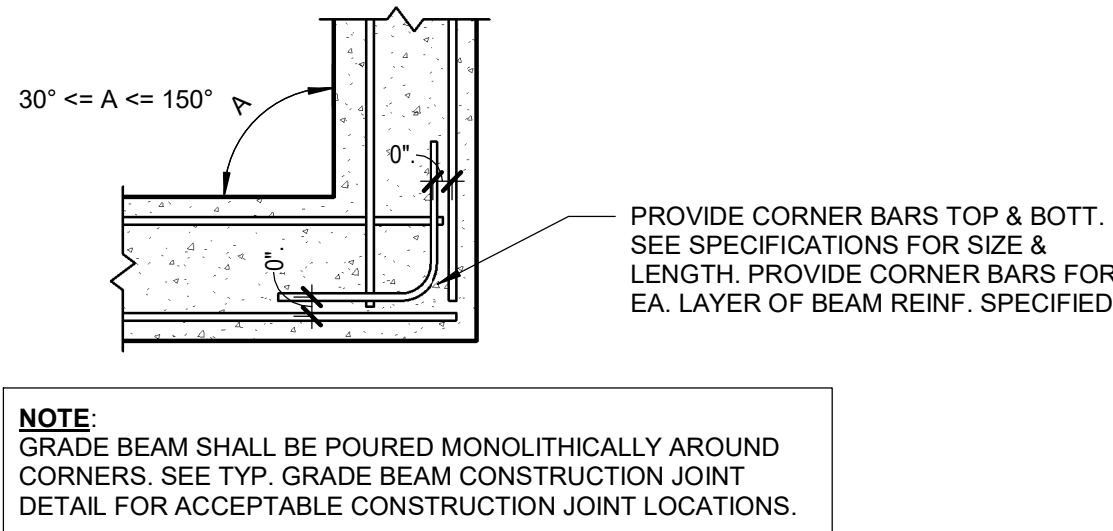
FACE BAR CRITERIA	
BEAM DEPTH	BARs EACH FACE
36 <= D < 42	(5) #4
42 <= D < 48	(5) #4
48 <= D < 54	(5) #5
54 <= D < 60	(5) #6
60 <= D < 72	(5) #7
72 <= D < 84	(6) #8
84 <= D < 96	(8) #8



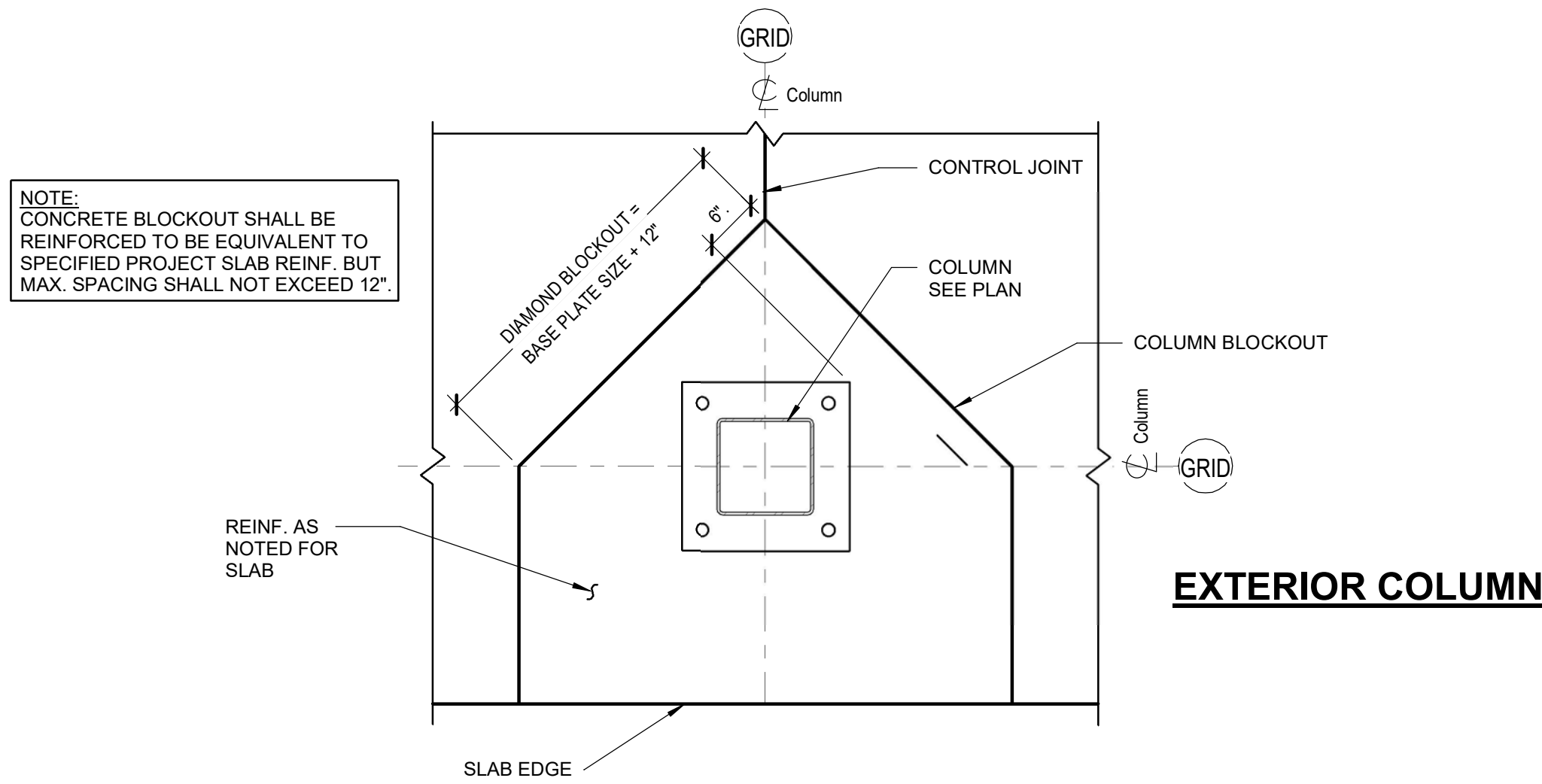
4 Typical Detail at Grade Beam  
3/4" = 1'-0"



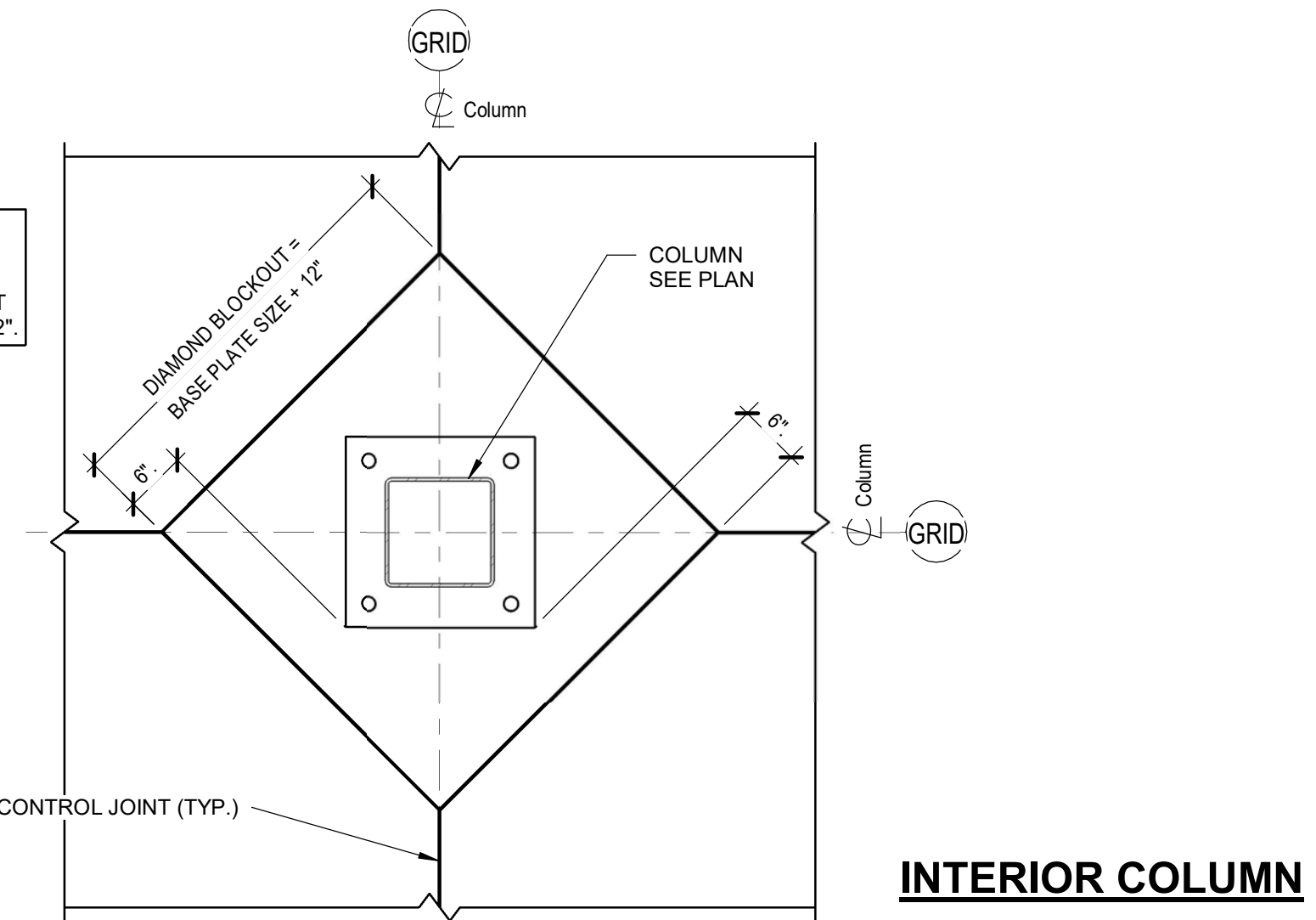
3 Grade Beam Reinforcement at "T"  
Intersection  
3/4" = 1'-0"



2 Grade Beam Splice at Corner  
3/4" = 1'-0"



1 Typical Column Blockout Detail  
1" = 1'-0"



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PROJECT NO.: Project Number

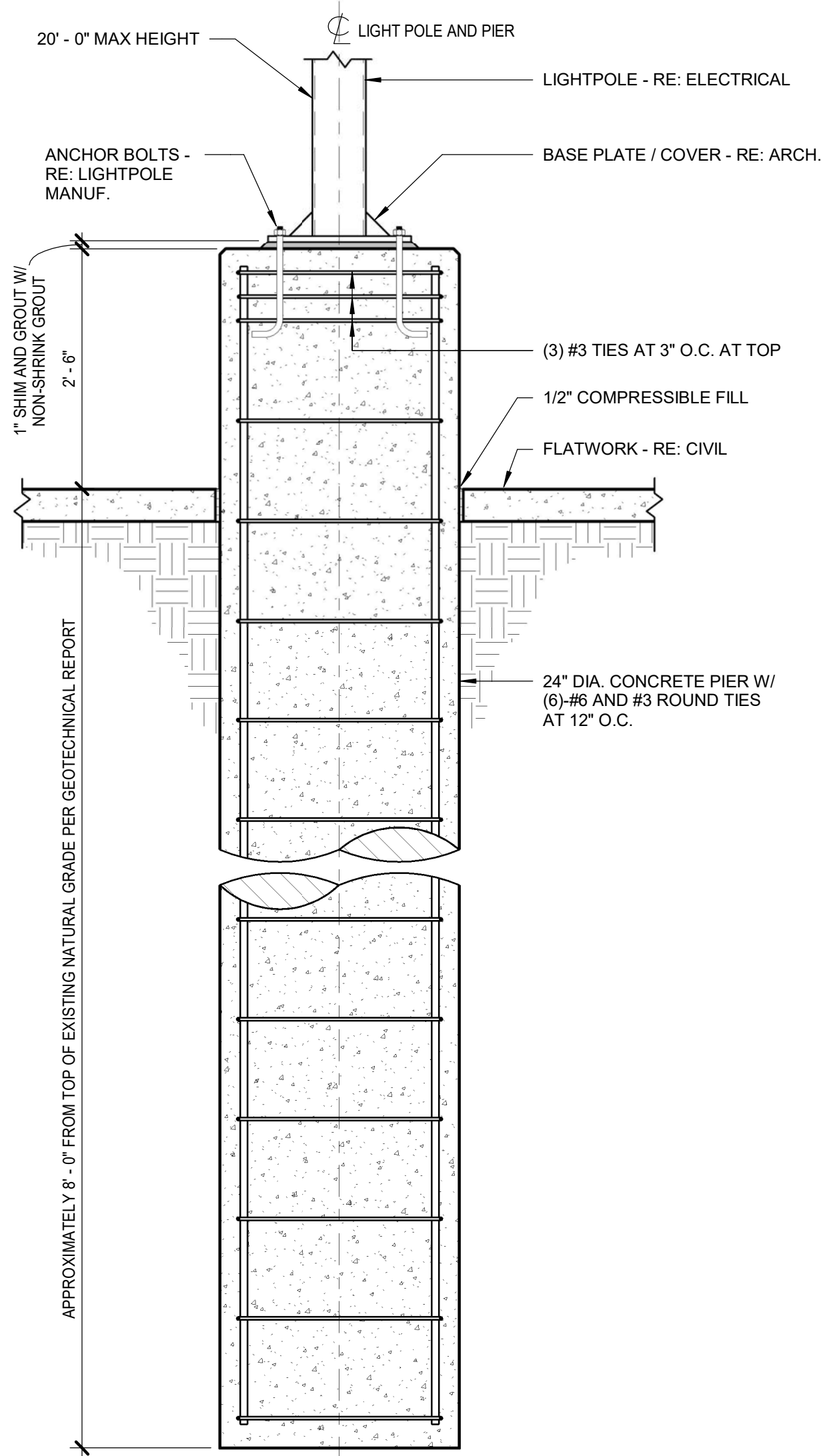
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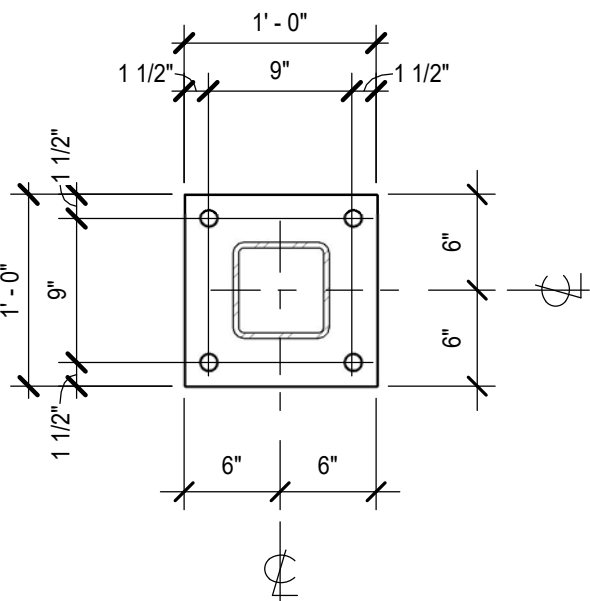


S3.101

Typical Foundation  
Sections

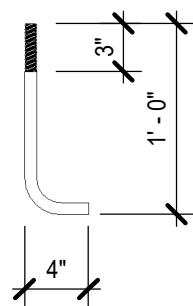


② Lightpole Detail  
3/4" = 1'-0"

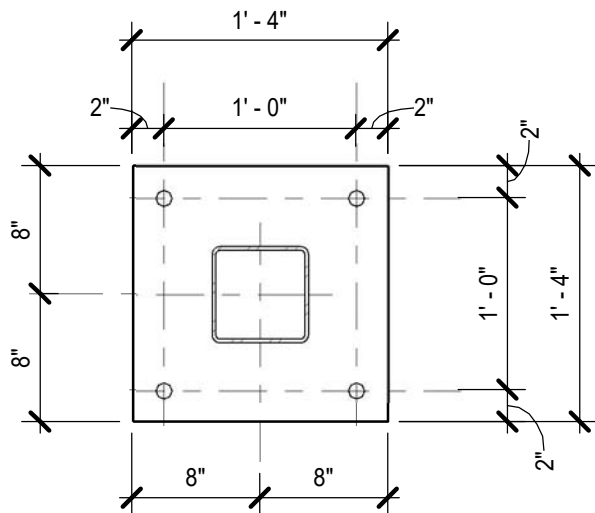


HSS6X6 COLUMN

PL 3/4 X 12 X 1'-0" W/  
(4)-3/4"Ø X 1'-4" ANCHOR BOLTS

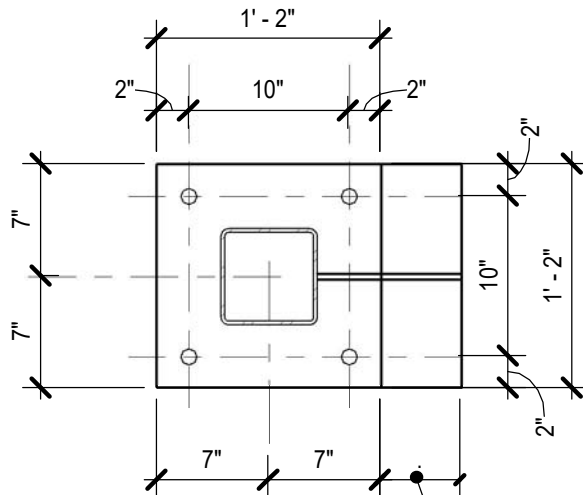


3/4"Ø ANCHOR BOLT



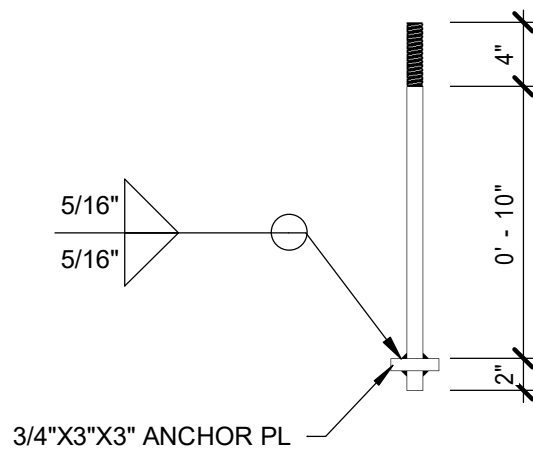
HSS8X8  
BRACE COLUMN

PL 7/8X14X1'-2" W/  
4 - 1" DIA. X 1'-4" HEX HEAD  
GR. 36KSI F1554 BOLTS



HSS6X6  
BRACE COLUMN

PL 7/8X14X1'-2" W/  
4 - 1" DIA. X 1'-4" HEX HEAD  
GR. 36KSI F1554 BOLTS



1" DIA. ANCHOR BOLT

① Base Plates & Anchor Bolts  
1" = 1'-0"

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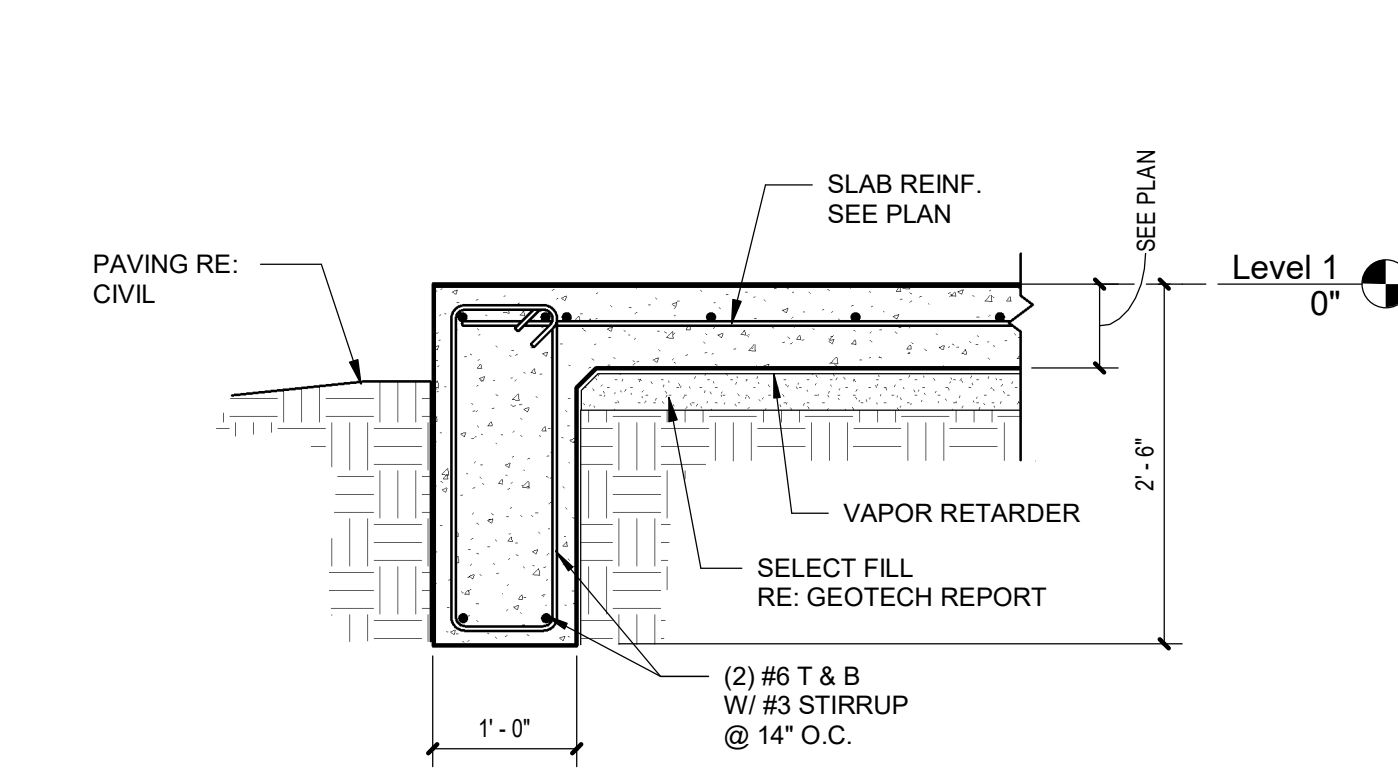
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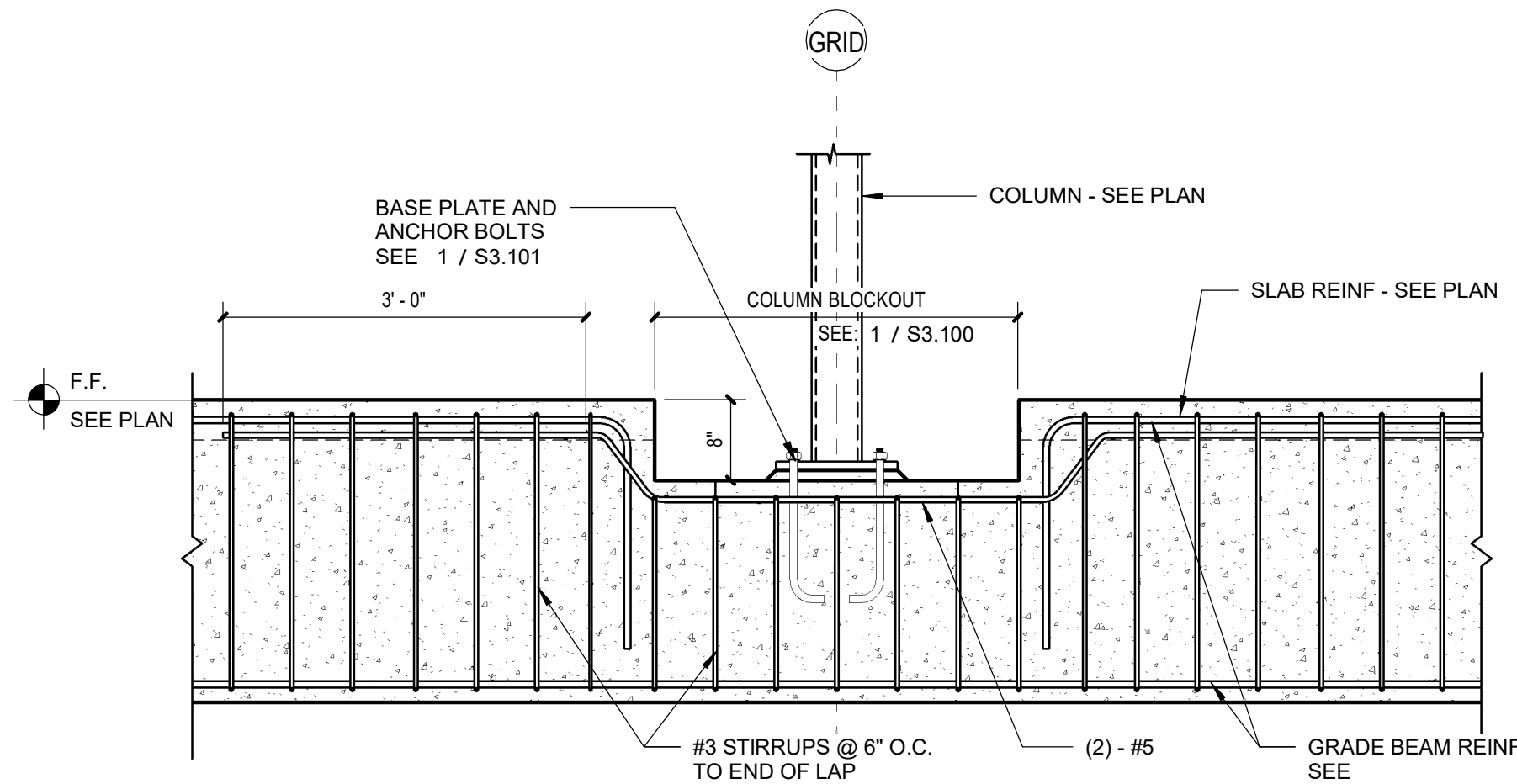


**S3.110**

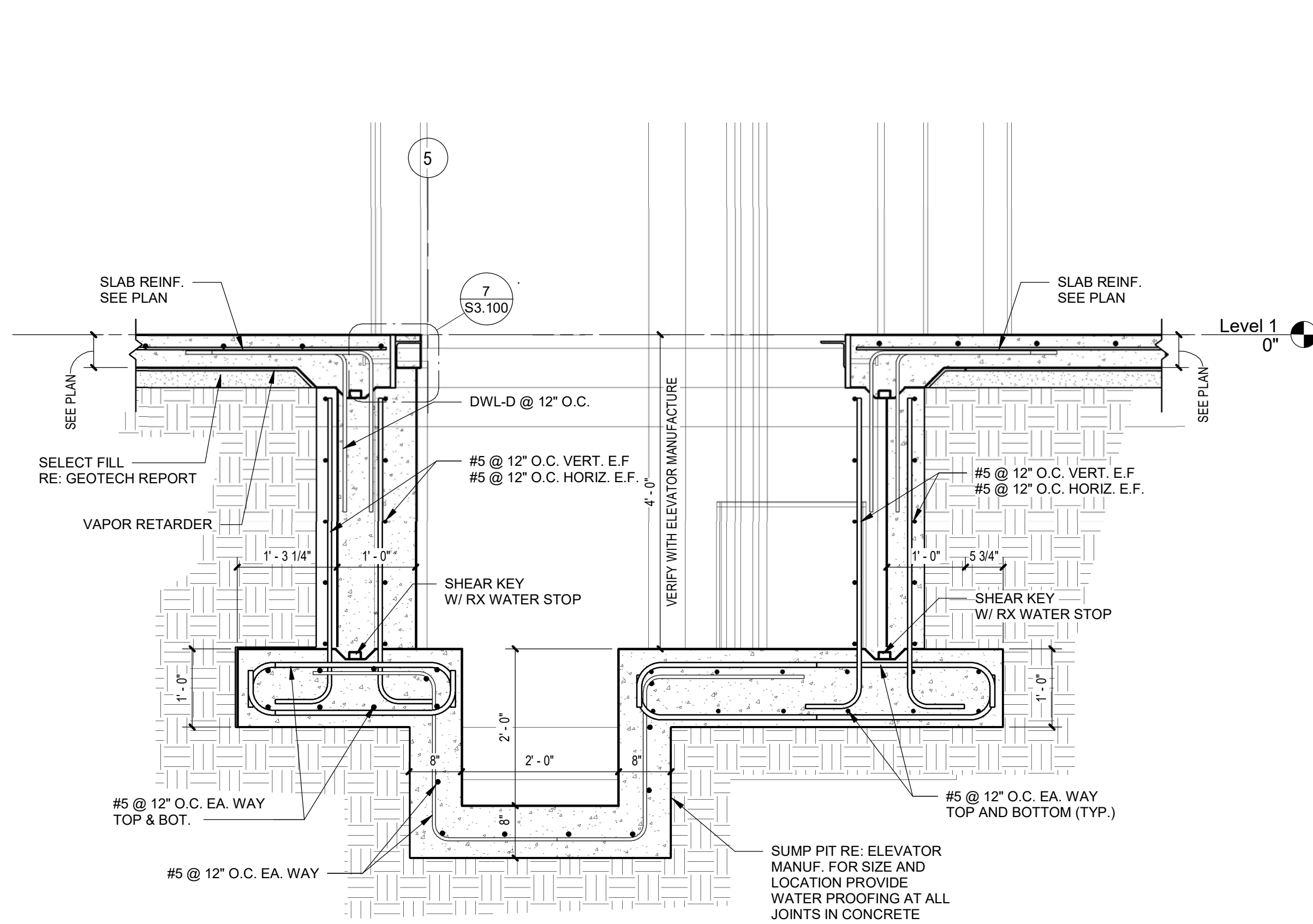
Foundation  
Sections



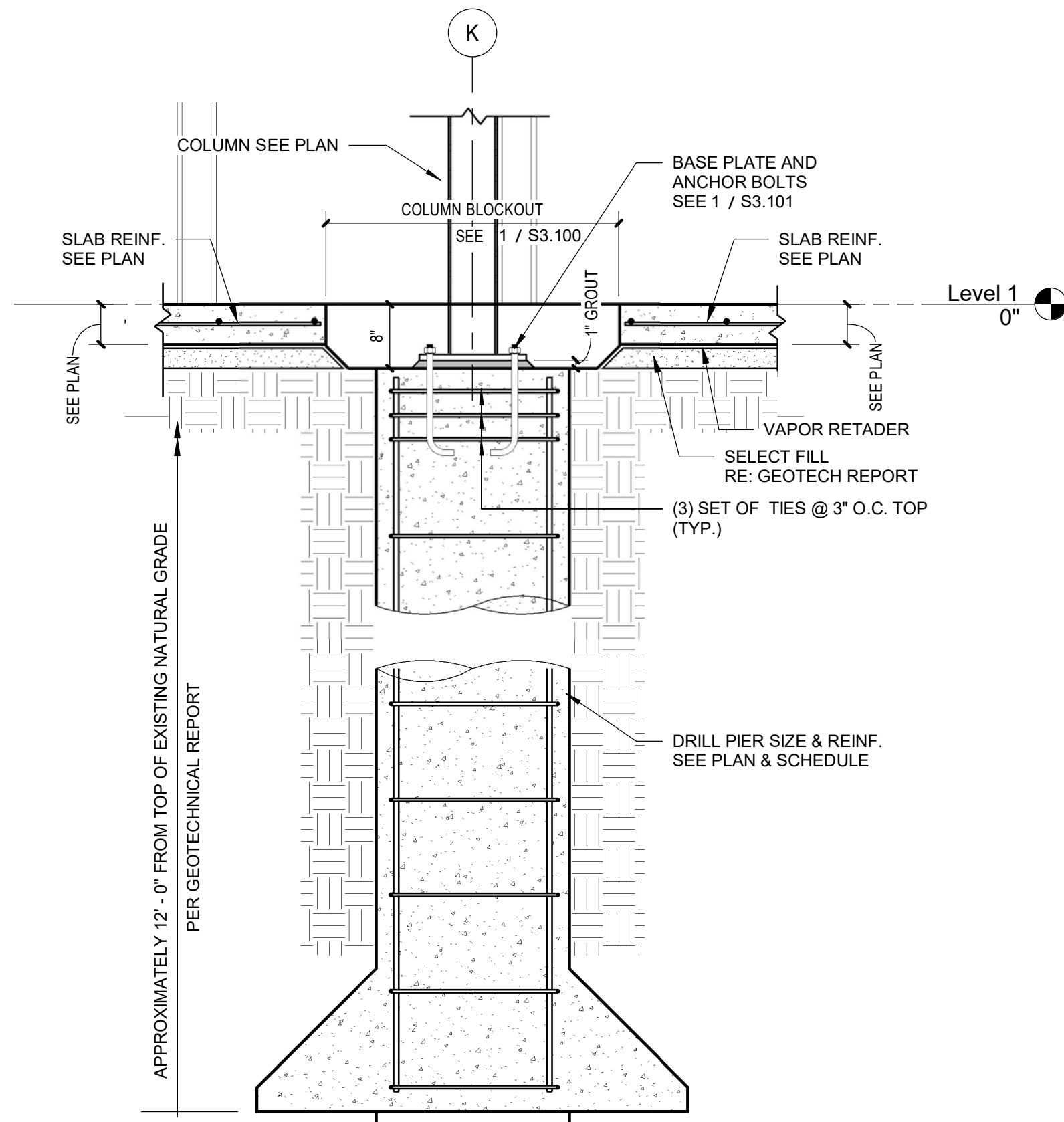
6 Exterior Detail @ Dumpster FDN  
3/4" = 1'-0"



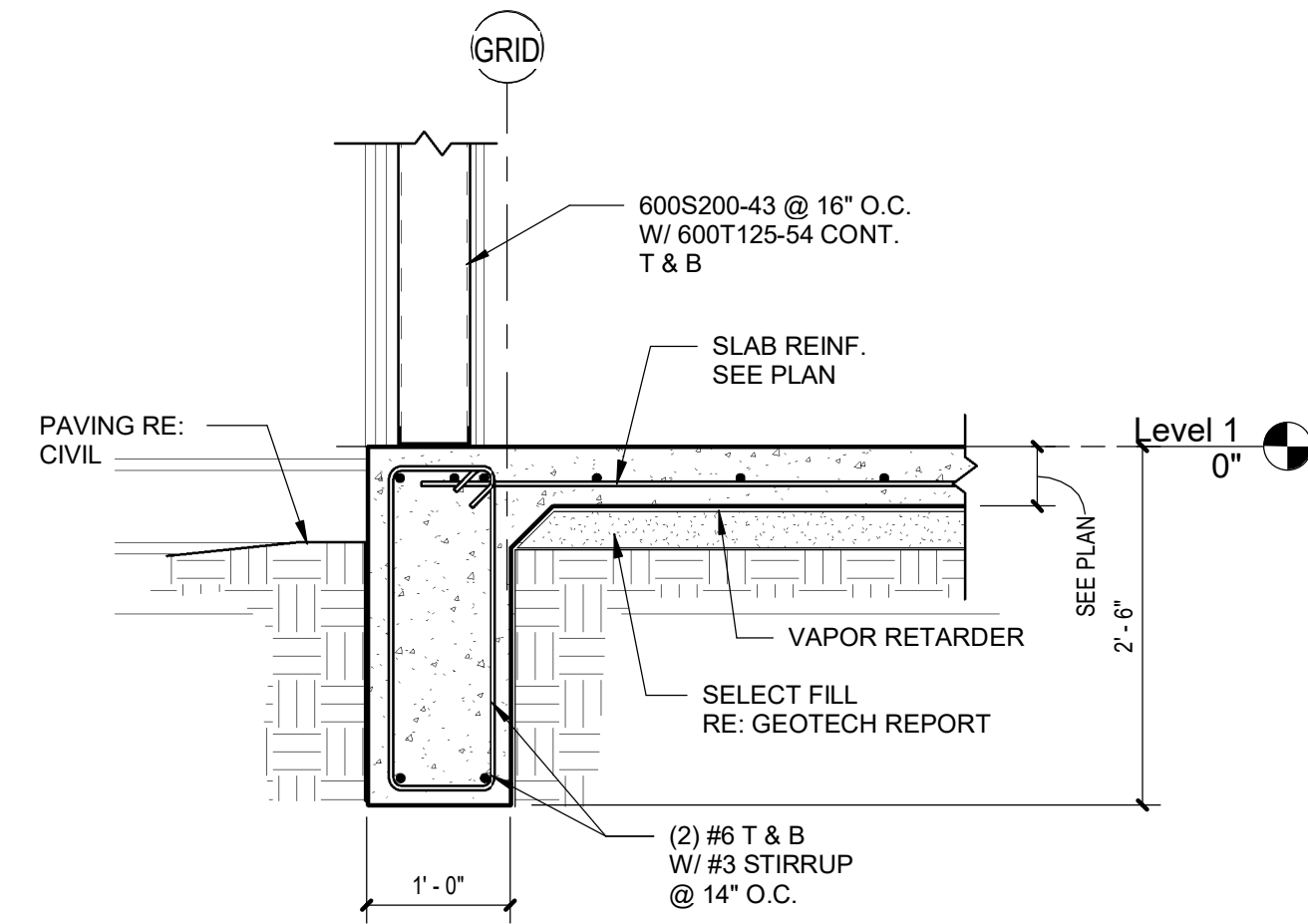
5 Typical G.B Detail  
3/4" = 1'-0"



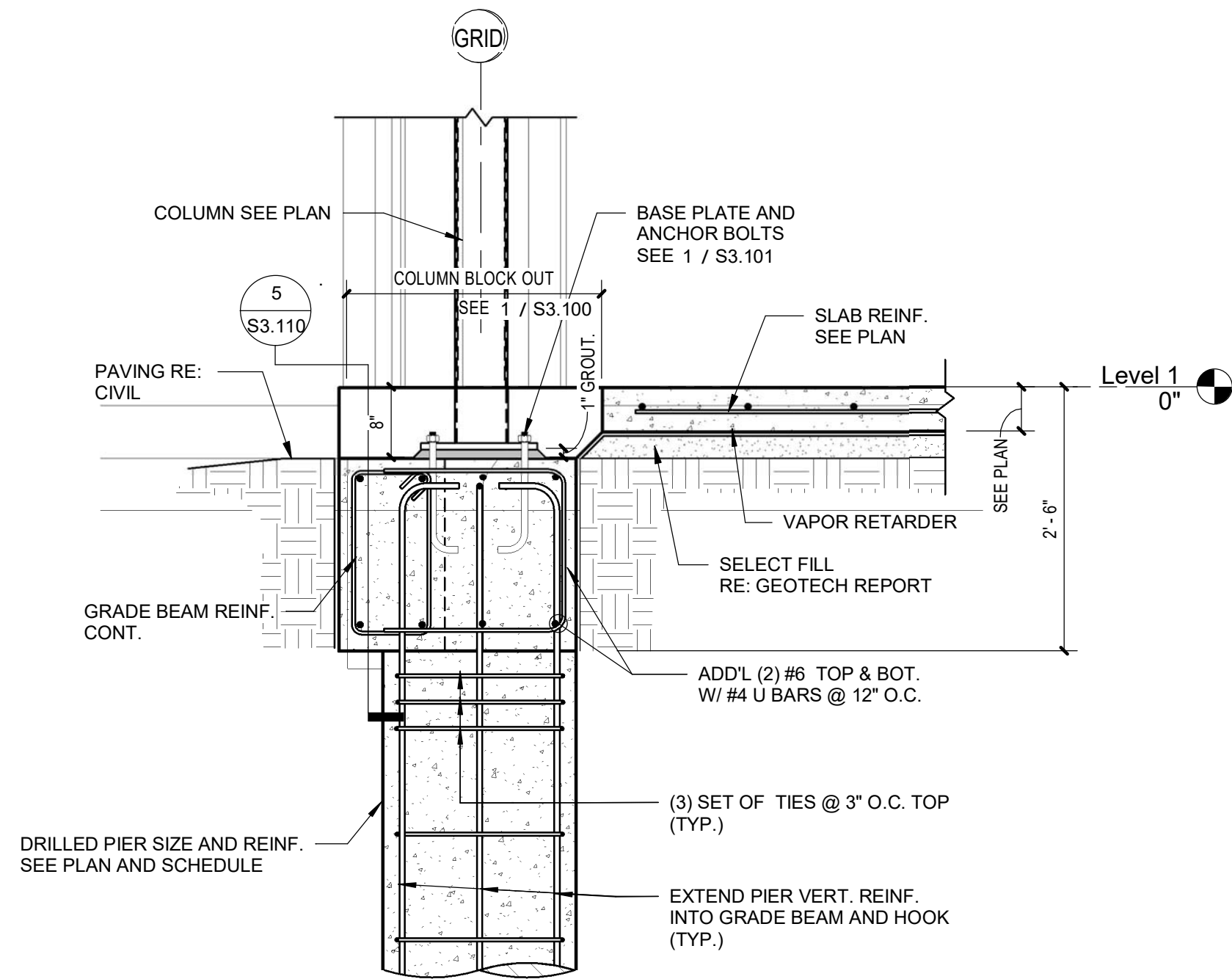
7 Interior Detail @ Elevator FDN  
3/4" = 1'-0"



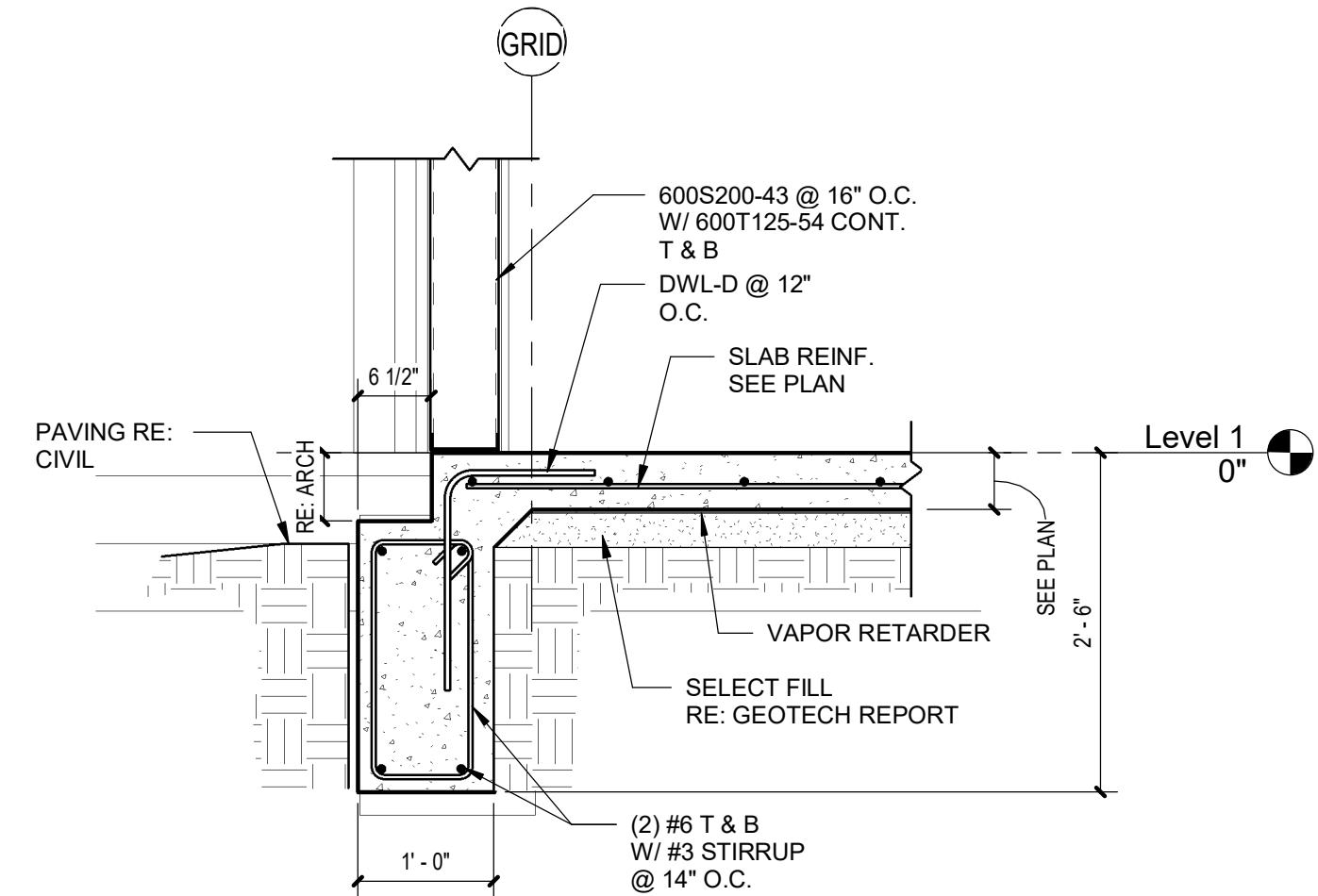
4 Interior Detail @ FDN  
3/4" = 1'-0"



3 Exterior Detail @ FDN  
3/4" = 1'-0"

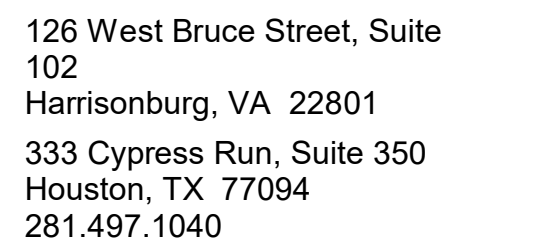


2 Exterior Detail @ FDN  
3/4" = 1'-0"



1 Exterior Detail @ FDN  
3/4" = 1'-0"





12511 Emily Court  
Sugar Land, Texas 77478  
713.779.7252 | 800.422.7252  
e-mail: sca@scaengineers.com  
www.scaengineers.com  
Dallas, Texas 214.557.5298  
Louisville, Kentucky 502.426.6789  
Orlando, Florida 407.883.6200  
Texas Registered Engineering Firm: F-197

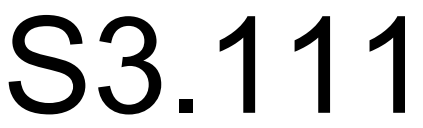
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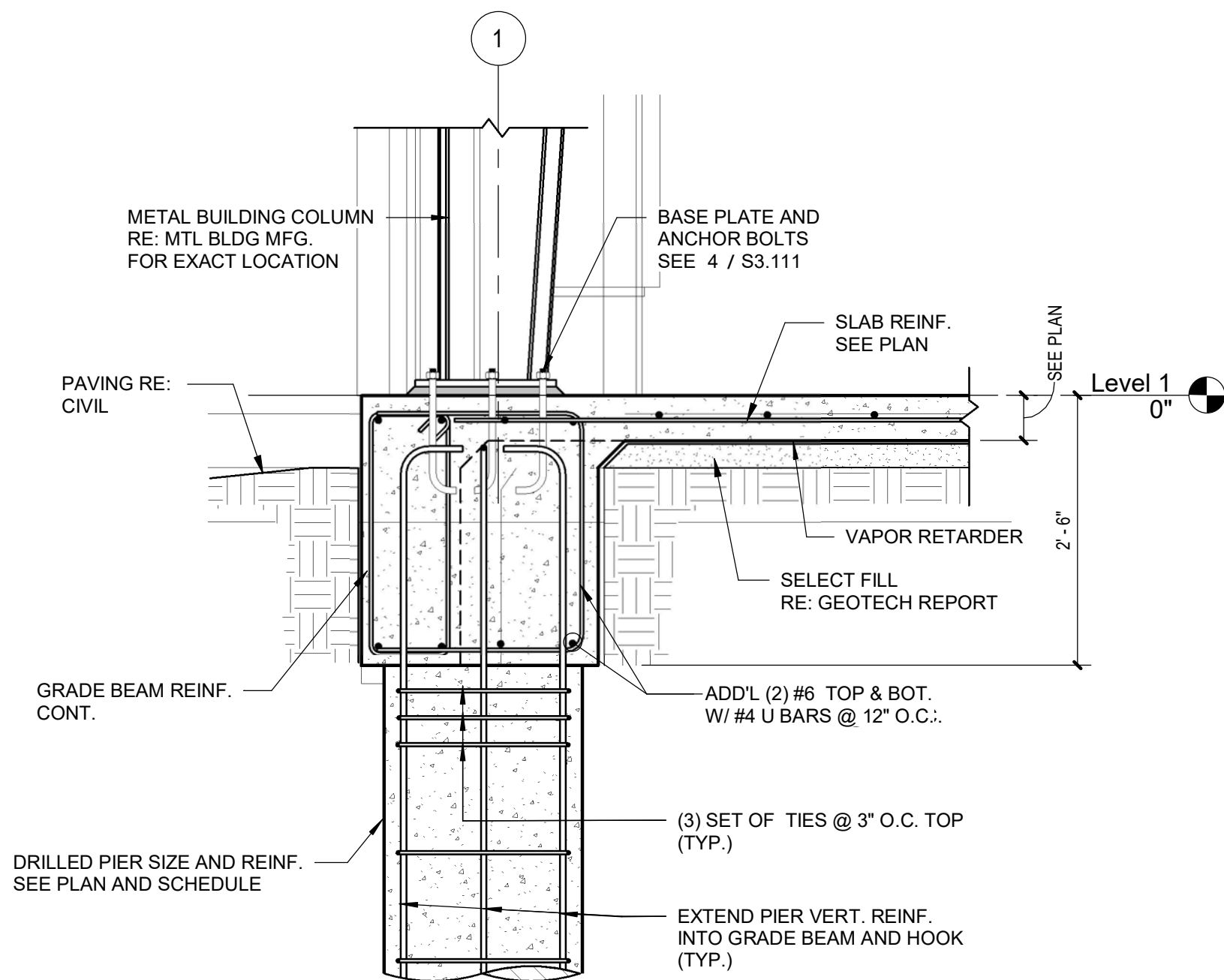
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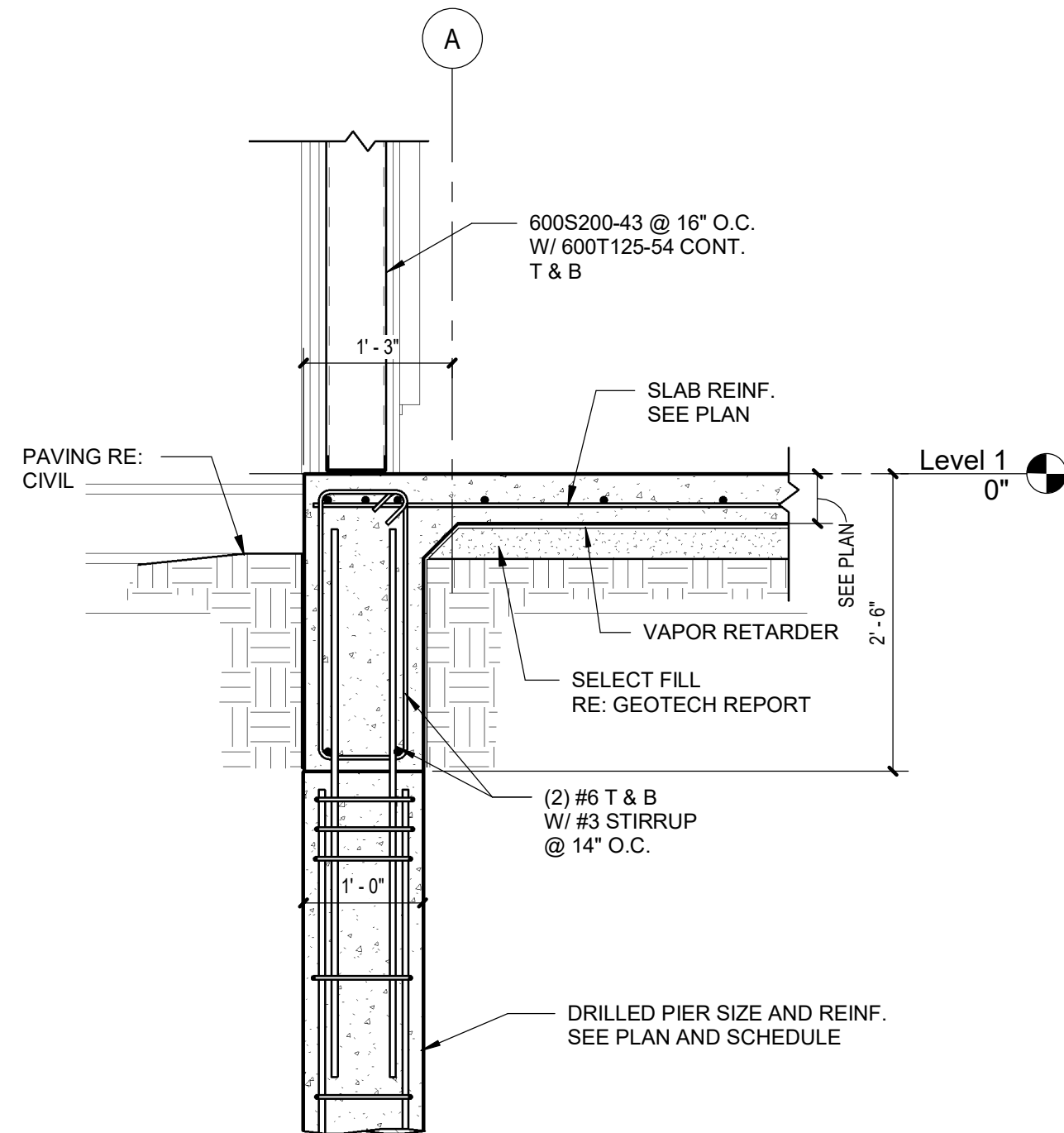
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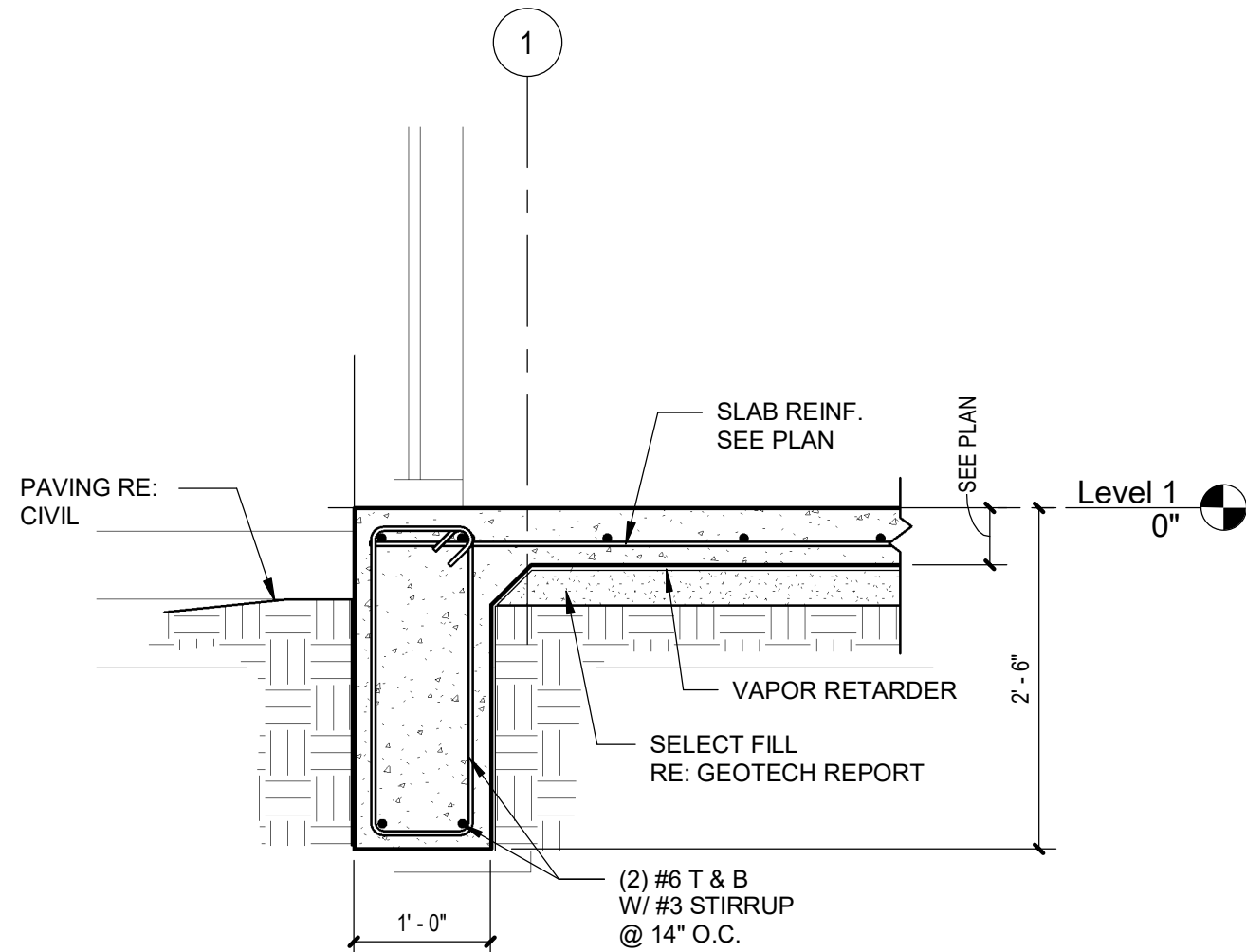
## Foundation Sections



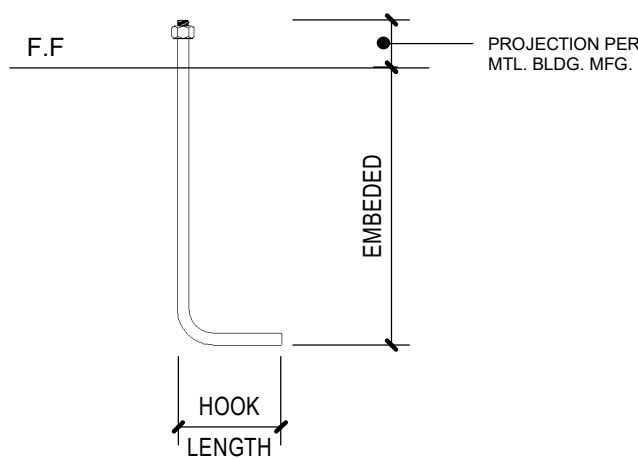
③ Exterior Detail @ FDN  
3/4" = 1'-0"



② Exterior Detail @ FDN  
3/4" = 1'-0"



1 Exterior Detail @ FDN  
3/4" = 1'-0"



BOLT DIA.	EMBEDED	HOOK LENGTH
1/2"	5"	2"
5/8"	10"	3"
3/4"	1' - 0"	3"
1"	1' - 3"	4"
1 1/4"	1' - 6"	6"

NOTE:  
DIMS. FOR BOLTS ON METAL BUILDING MFG.  
SHOP DRAWINGS TAKE PRECEDENCE

④ Anchor Bolt Chat  
1" = 1'-0"

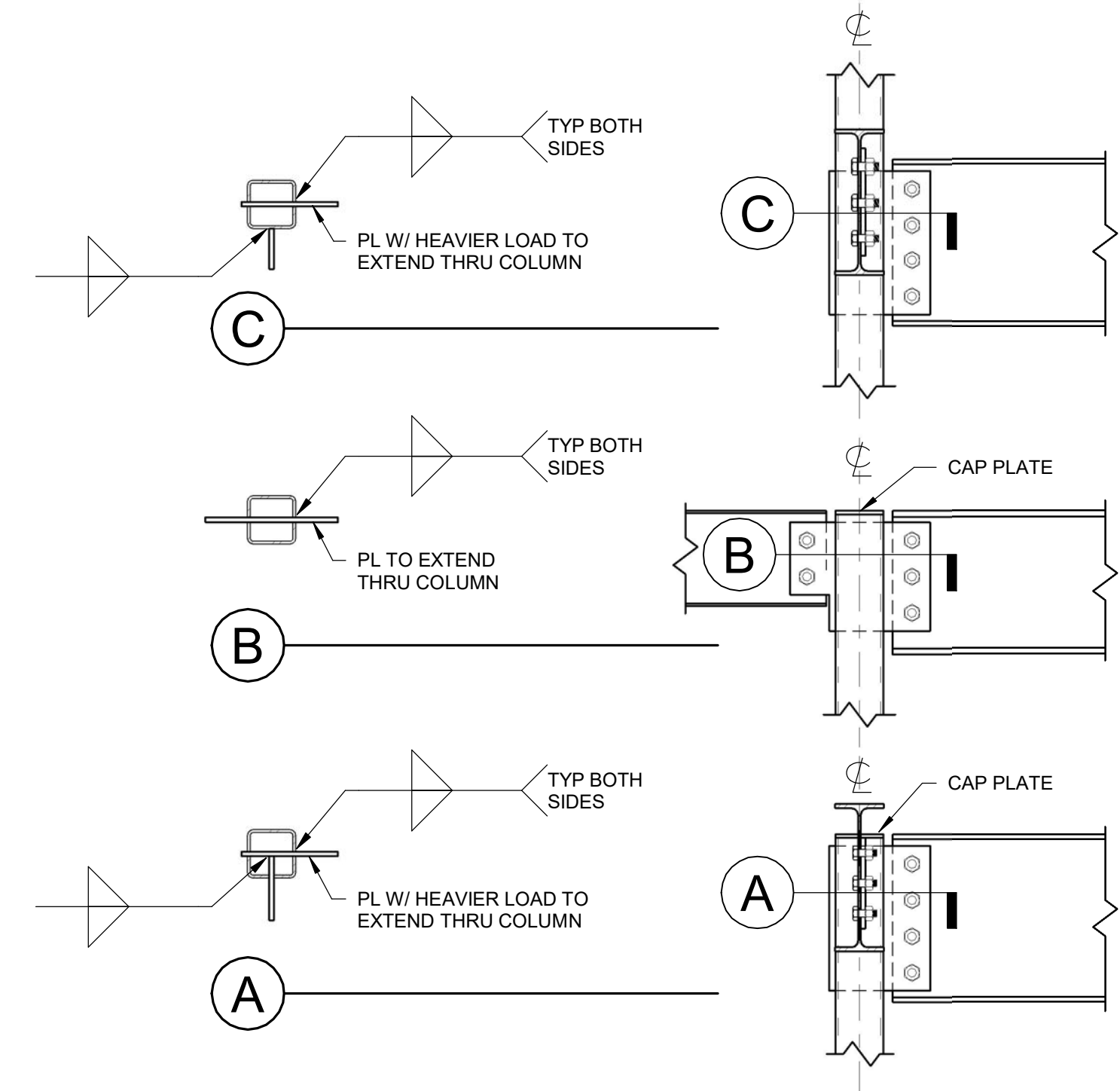
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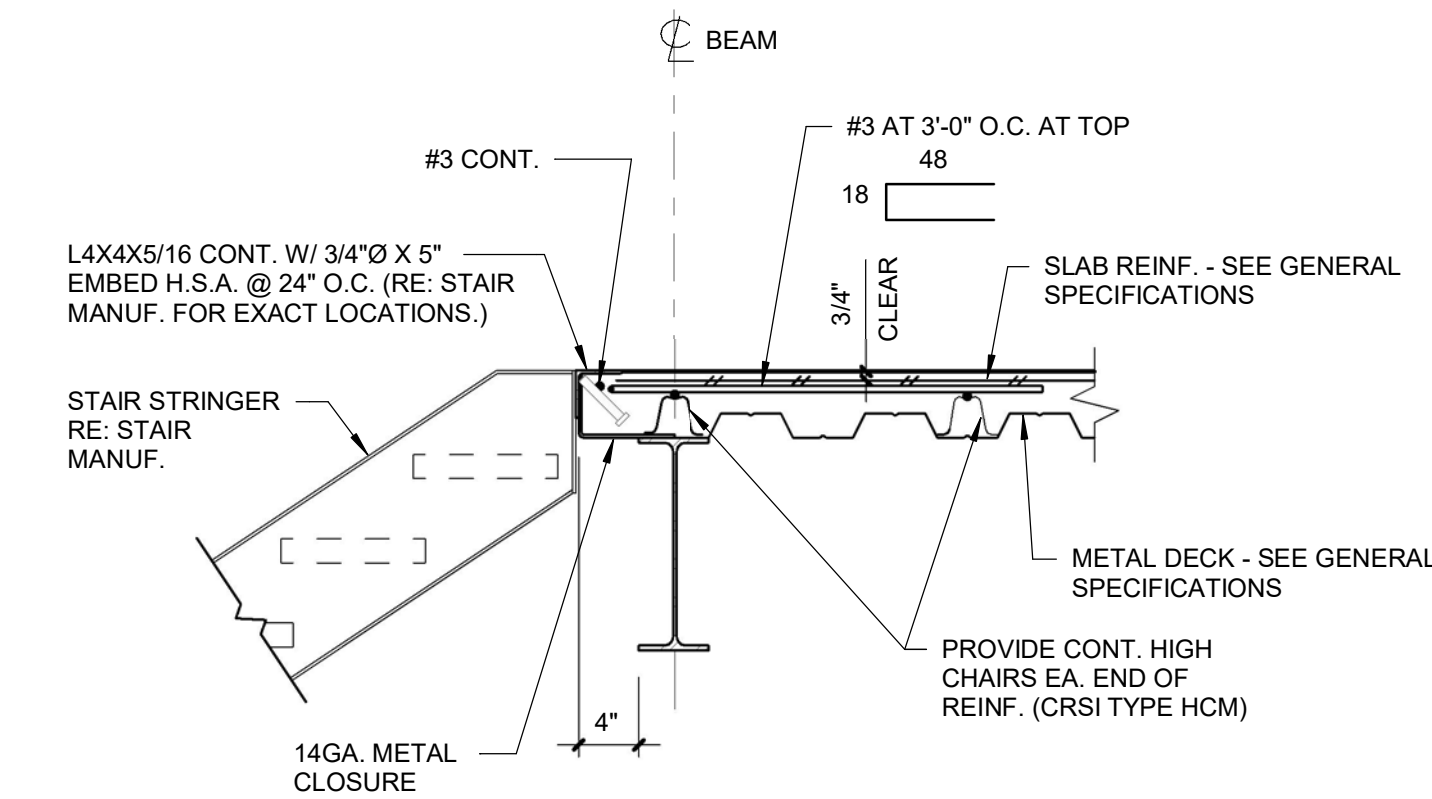
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**S4.100**  
Typical Steel Framing Details

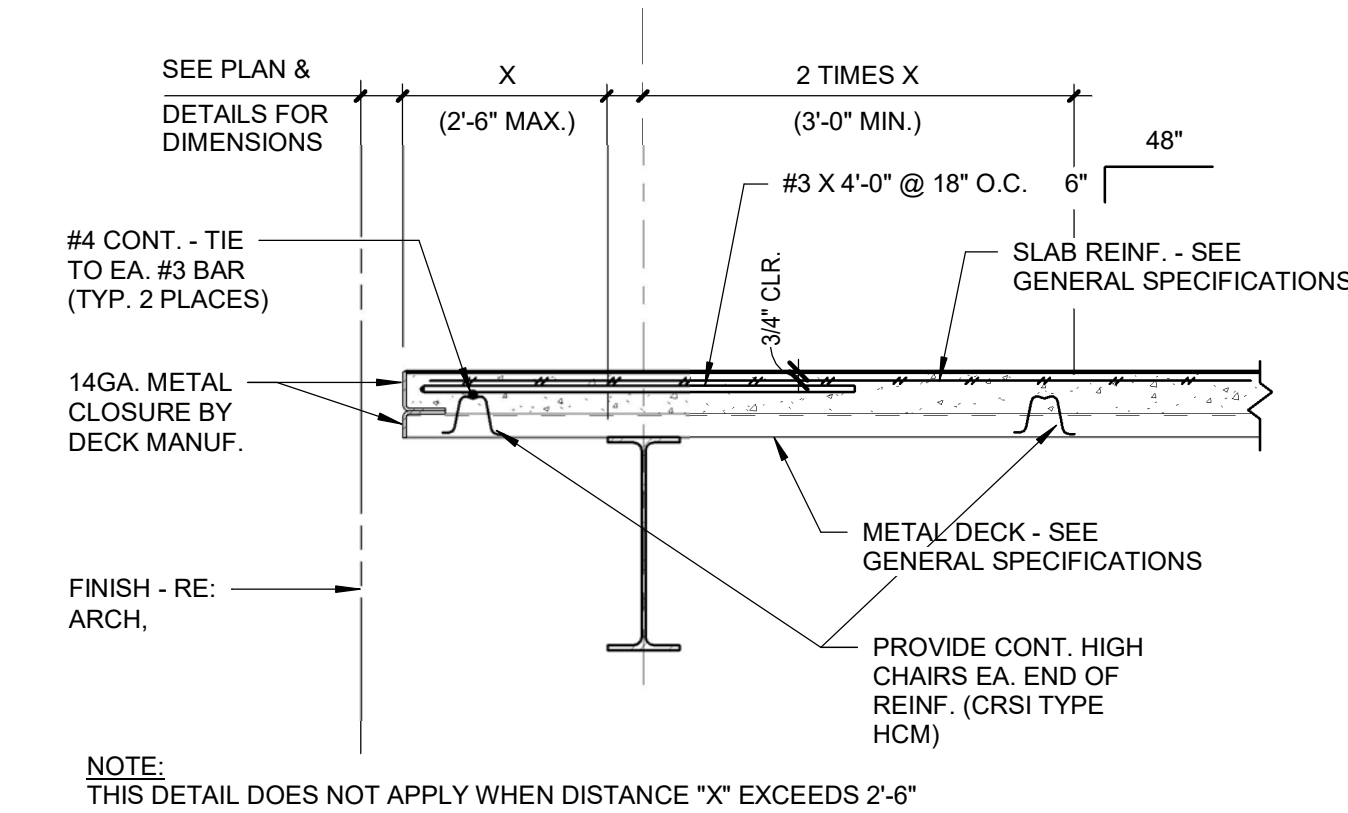


9 Simple Beam to Column Connections  
1" = 1'-0"



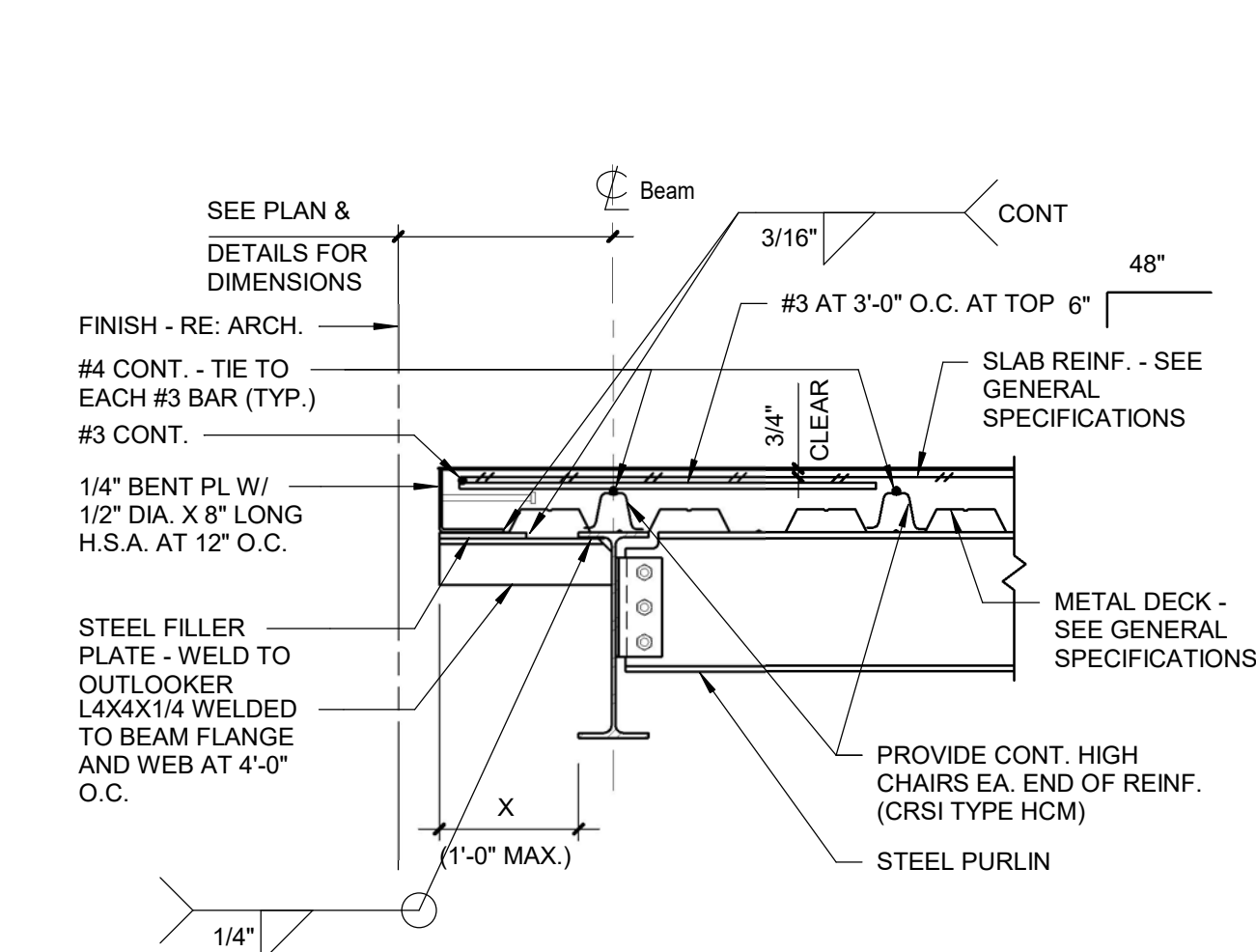
TYPICAL DETAIL AT METAL DECK CLOSURE PARALLEL TO BEAM (INTERIOR OPENING)

8 Typical Metal Deck Slab @ Stair Connection  
3/4" = 1'-0"



TYPICAL DETAIL AT METAL DECK CLOSURE PERPENDICULAR TO BEAM (INTERIOR OPENING)

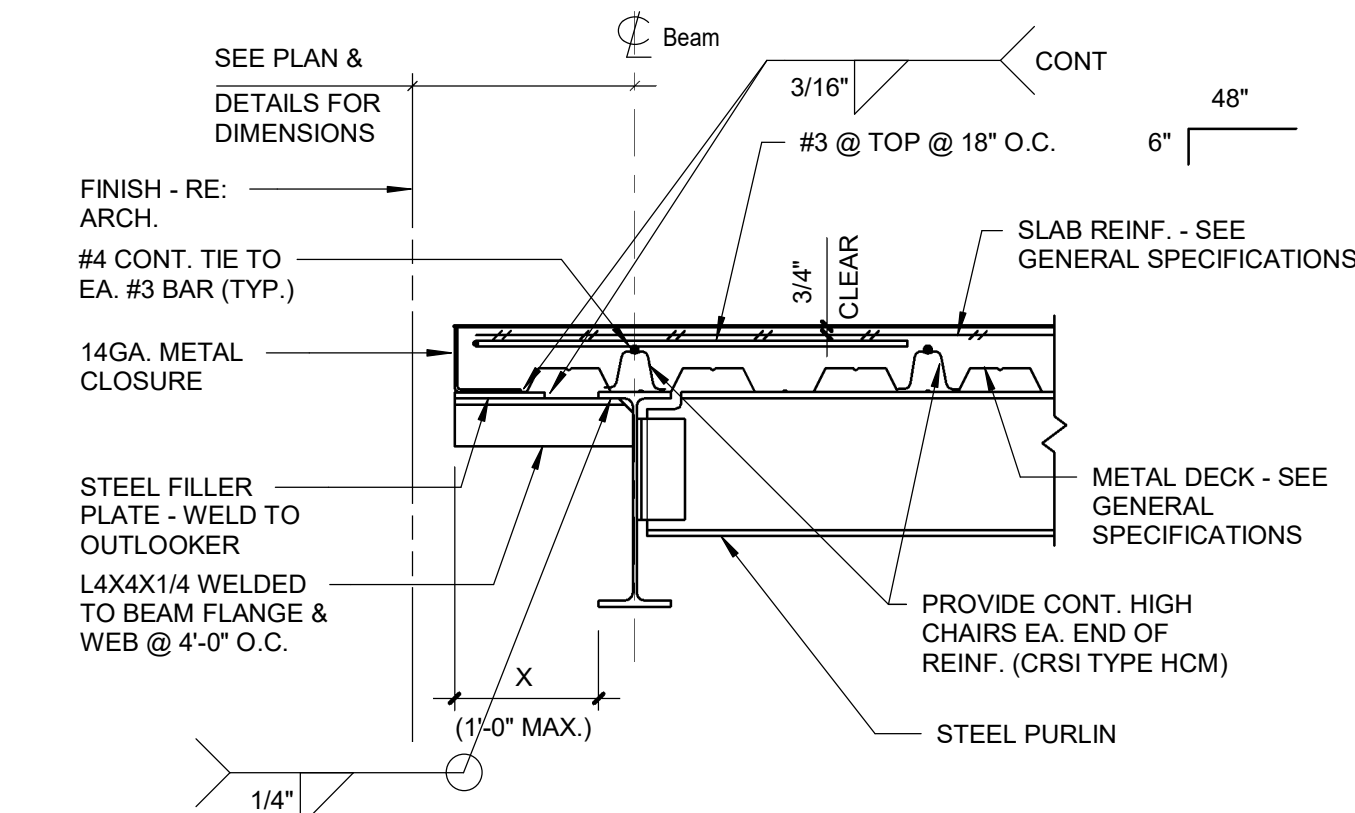
7 Typical Metal Deck Slab  
3/4" = 1'-0"



NOTE:  
THIS DETAIL DOES NOT APPLY WHEN DISTANCE "X" EXCEEDS 1'-0".

TYPICAL DETAIL AT METAL DECK CLOSURE PARALLEL TO BEAM (EXTERIOR)

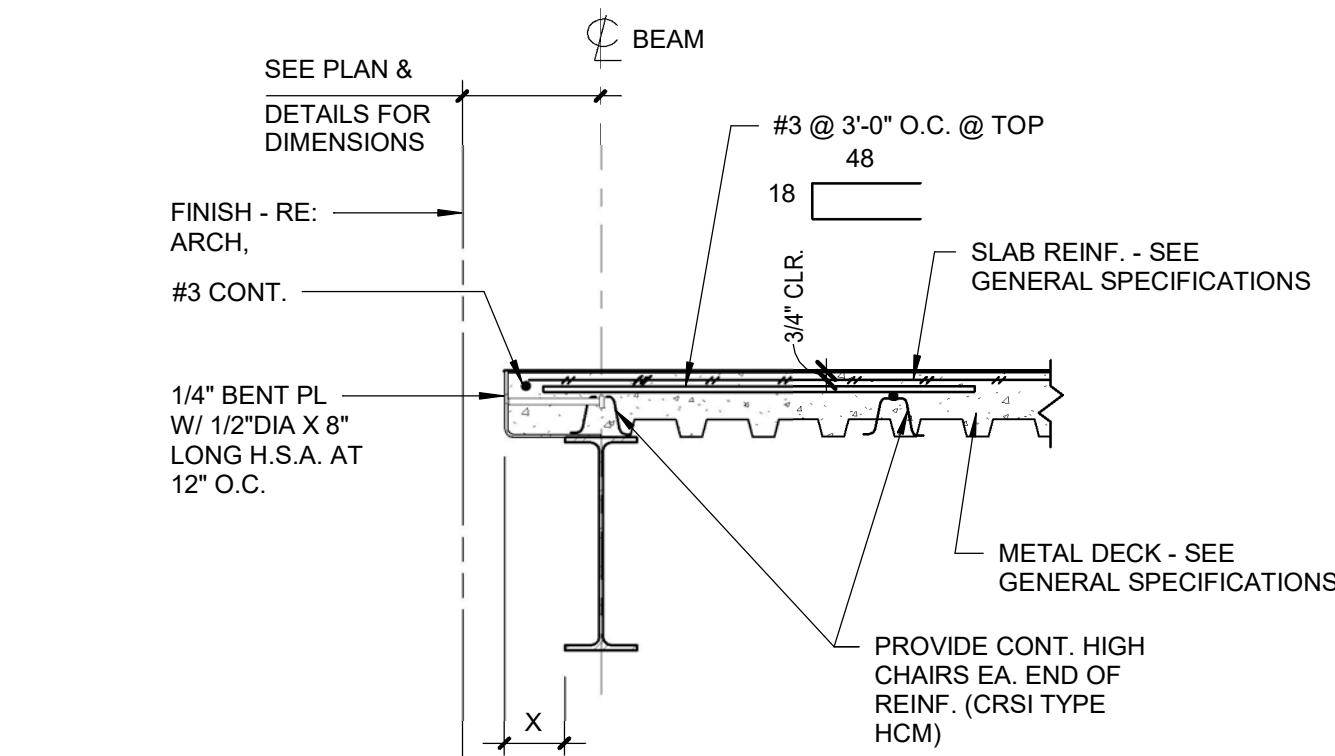
6 Typical Metal Deck Slab  
3/4" = 1'-0"



NOTE:  
THIS DETAIL DOES NOT APPLY WHEN DISTANCE "X" EXCEEDS 1'-0".

TYPICAL DETAIL AT METAL DECK CLOSURE PARALLEL TO BEAM (INTERIOR OPENING)

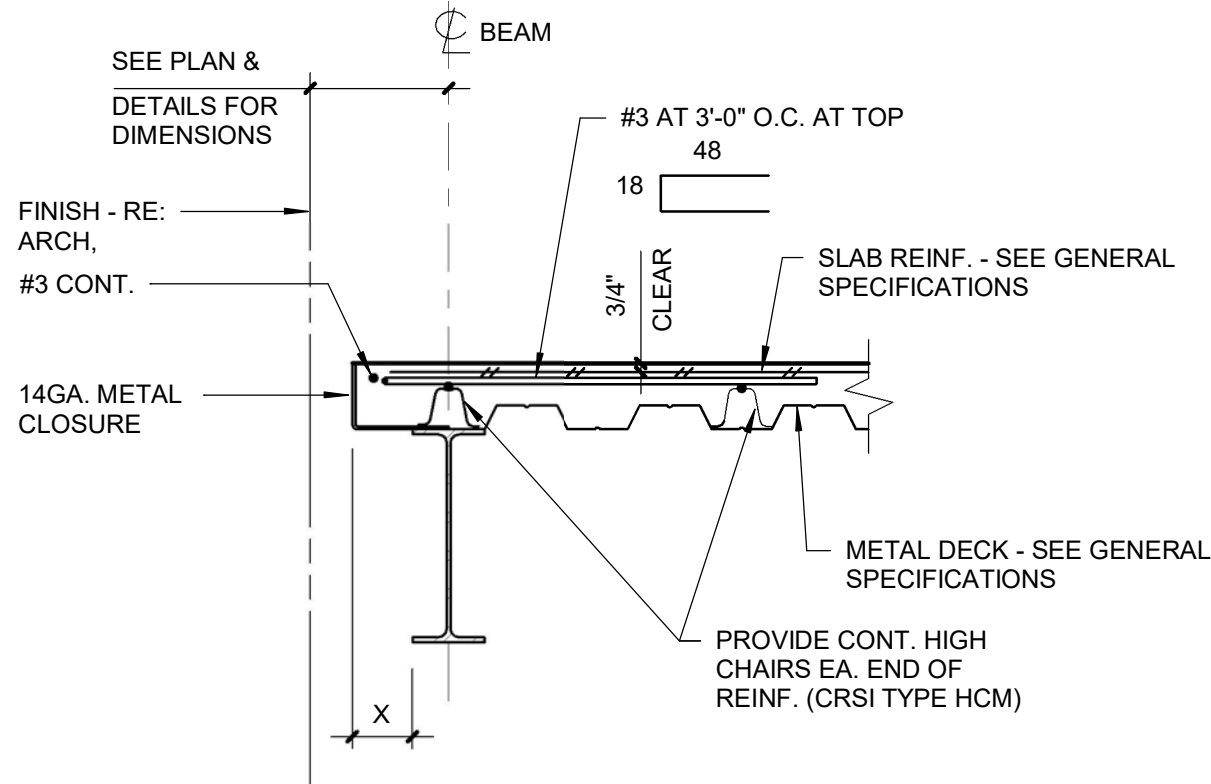
5 Typical Metal Deck Slab  
3/4" = 1'-0"



NOTE:  
THIS DETAIL DOES NOT APPLY WHEN DISTANCE "X" EXCEEDS 0'-5". SEE 6/S4.002 WHEN "X" EXCEEDS 0'-5".

TYPICAL DETAIL AT METAL DECK CLOSURE PARALLEL TO BEAM (EXTERIOR)

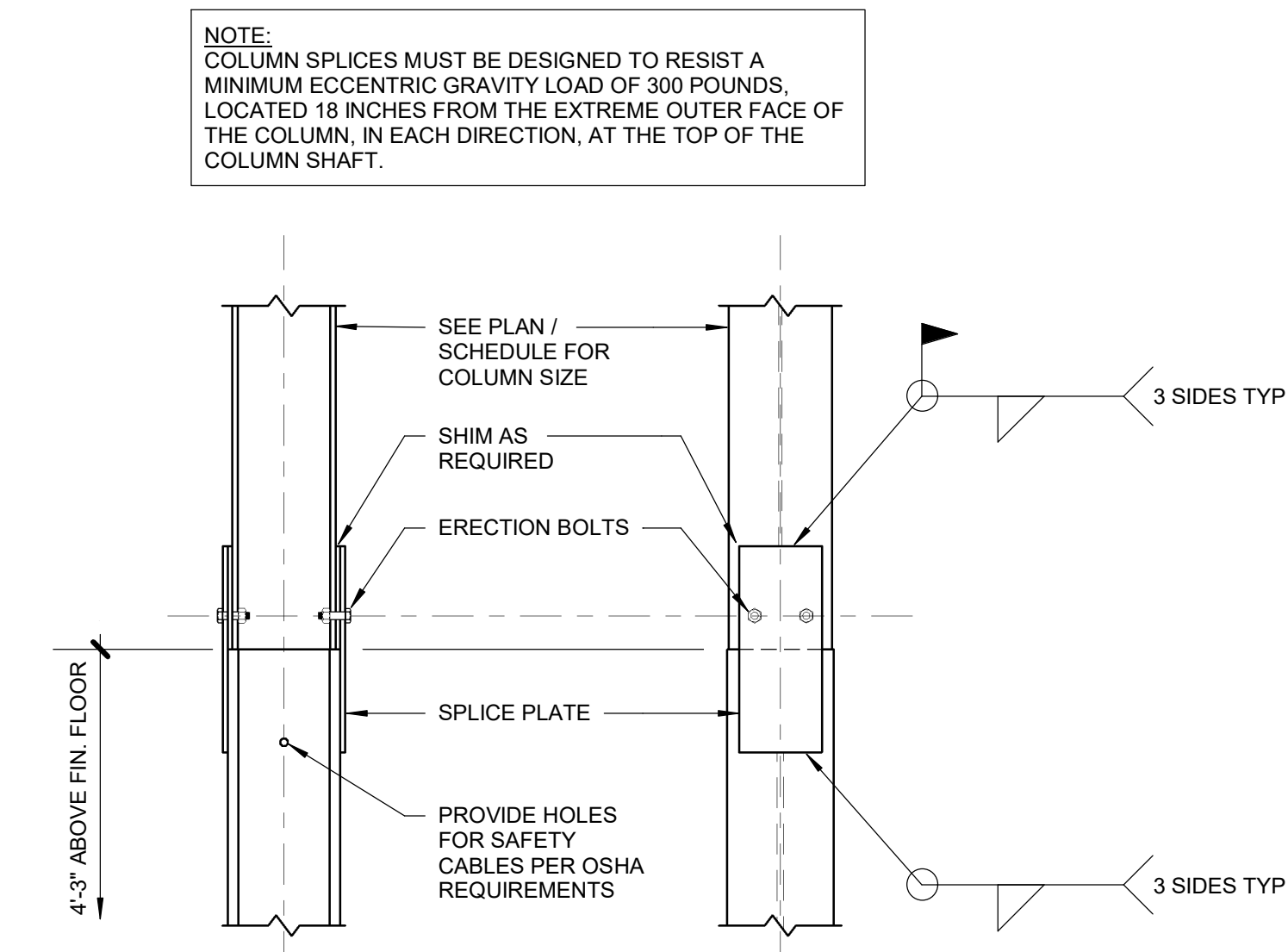
4 Typical Metal Deck Slab  
3/4" = 1'-0"



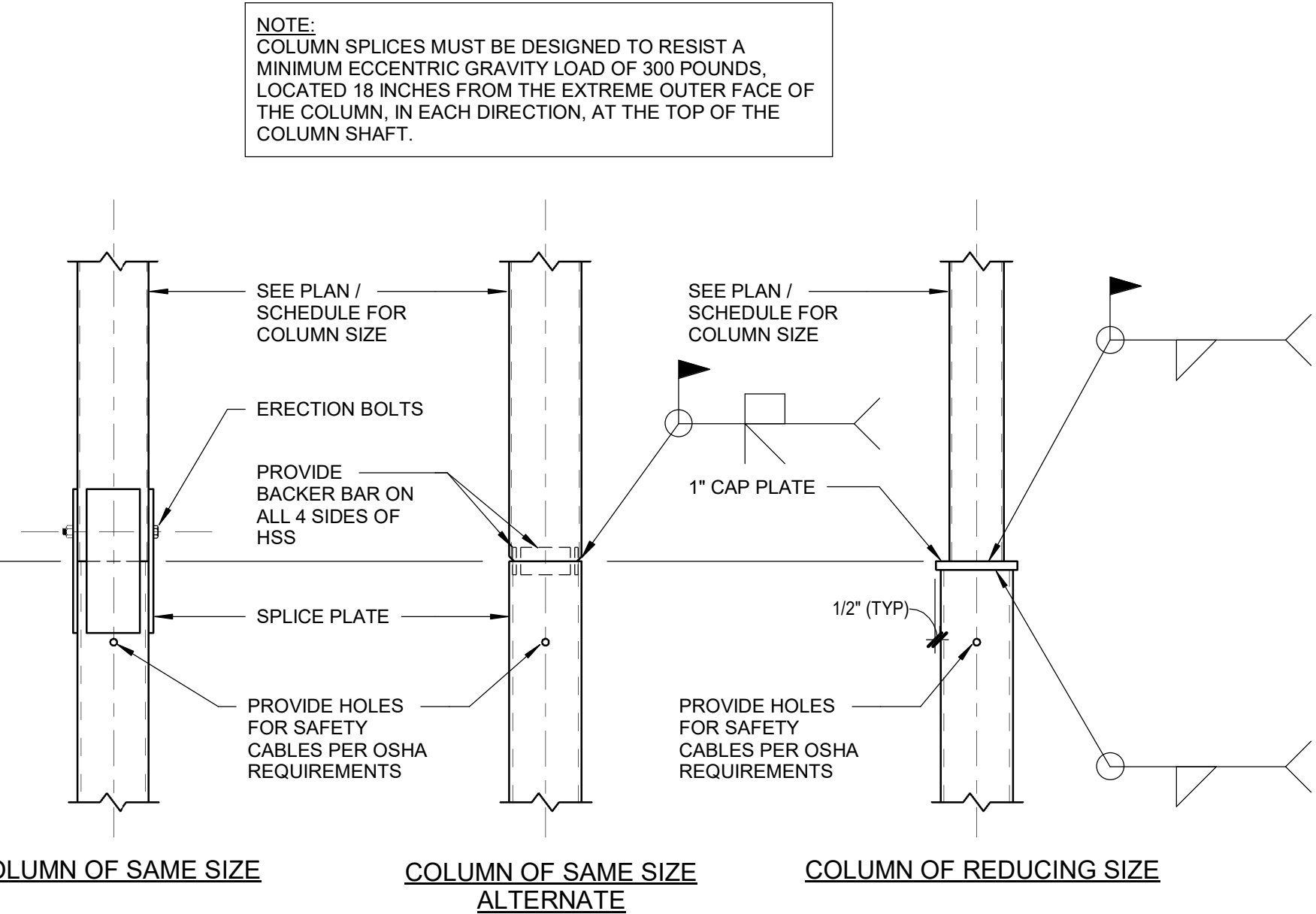
NOTE:  
THIS DETAIL DOES NOT APPLY WHEN DISTANCE "X" EXCEEDS 0'-5". SEE 5 / S4.100 WHEN "X" EXCEEDS 0'-5".

TYPICAL DETAIL AT METAL DECK CLOSURE PARALLEL TO BEAM (INTERIOR OPENING)

3 Typical Metal Deck Slab  
3/4" = 1'-0"



2 Typical Column Splice  
3/4" = 1'-0"



1 Typical Column Splice  
3/4" = 1'-0"

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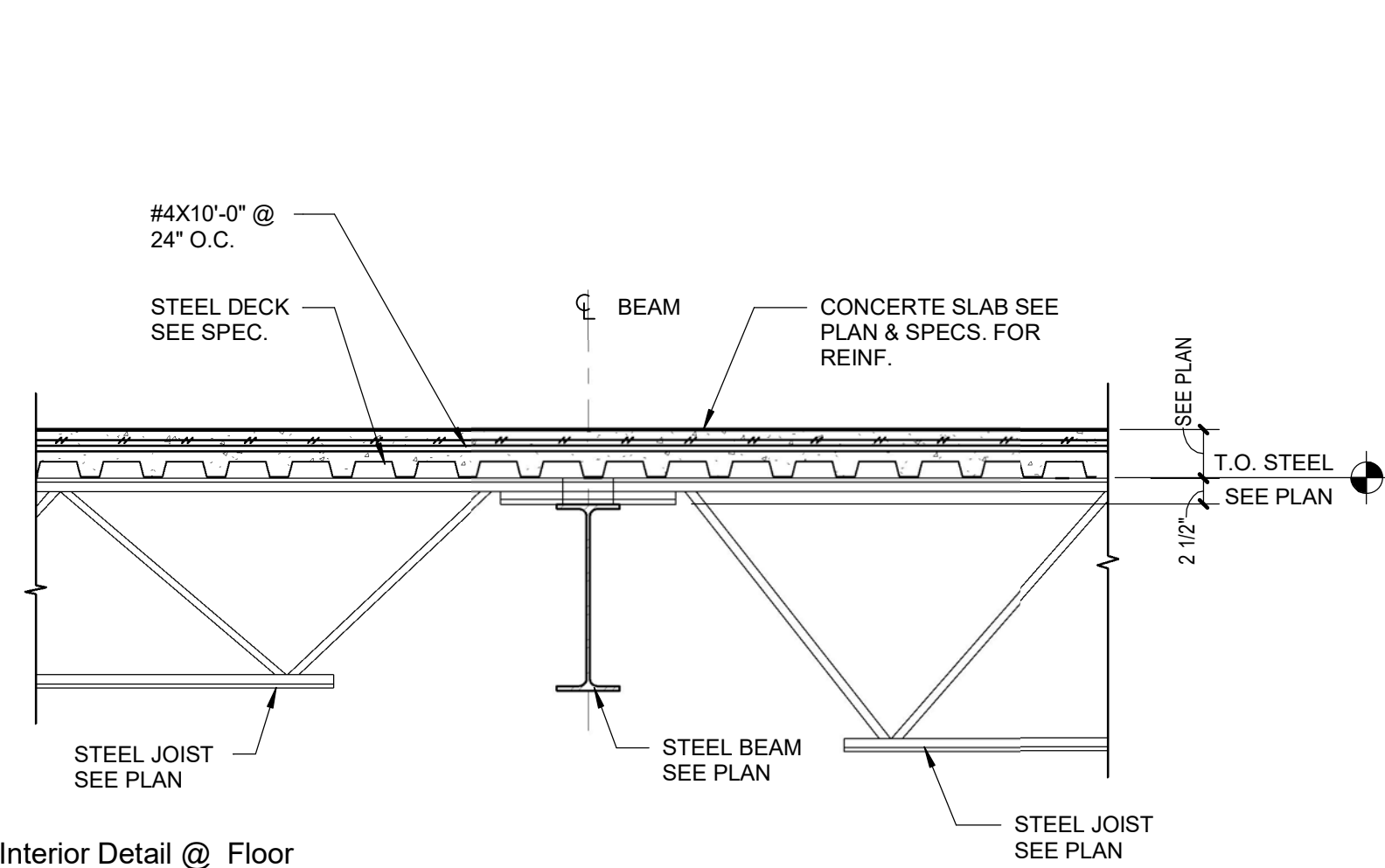
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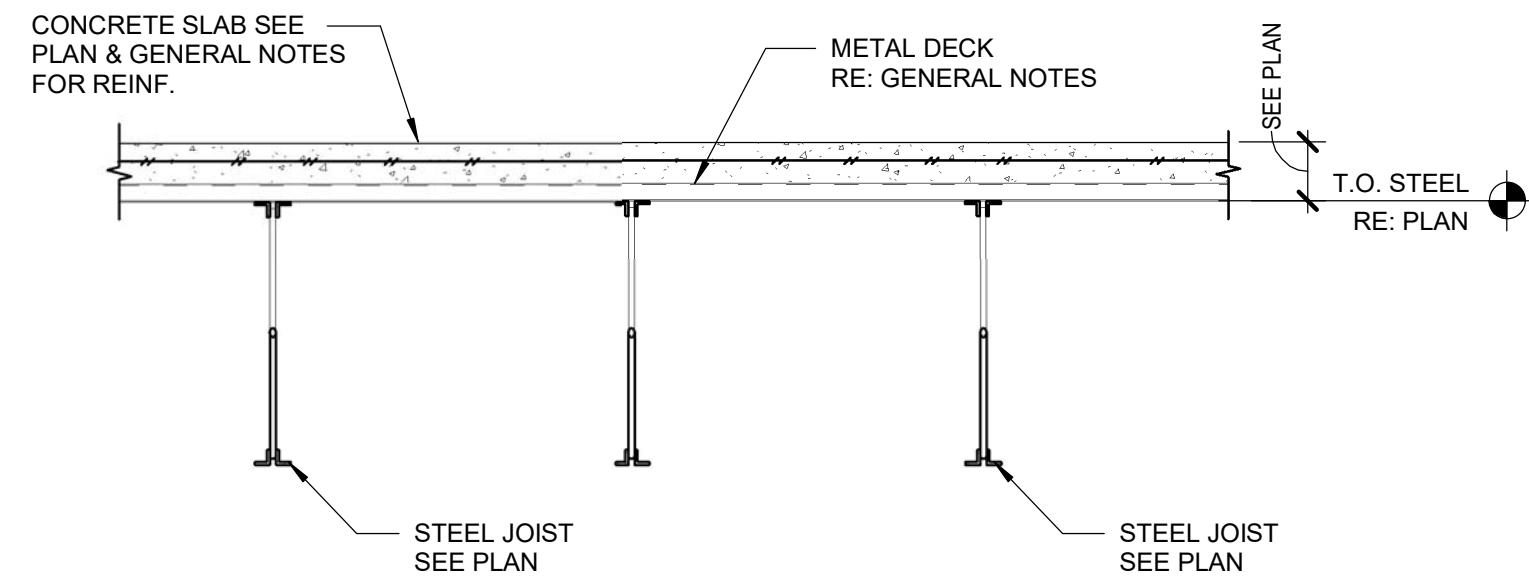
**S4.101**  
Typical Steel Framing Details

C:\Users\jyang\Documents\202110 - Ft Bend CC - R21 - CENTRAL\_jyang\SSBY.dwg

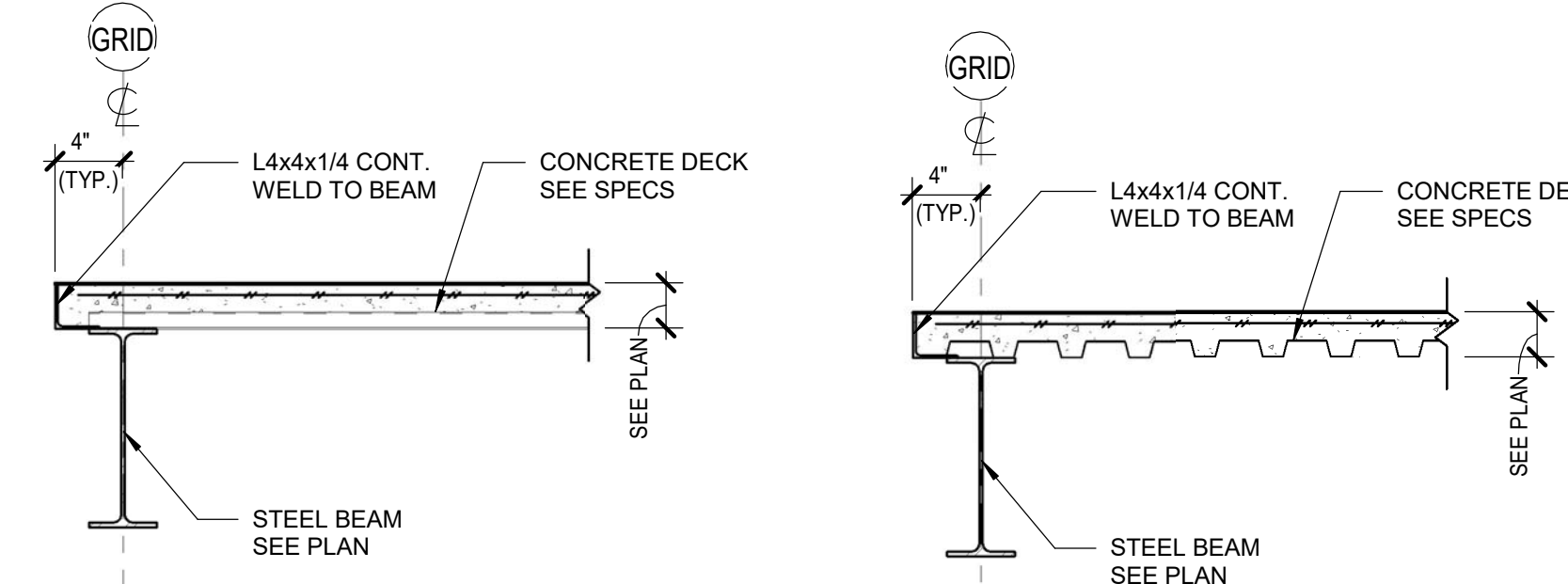
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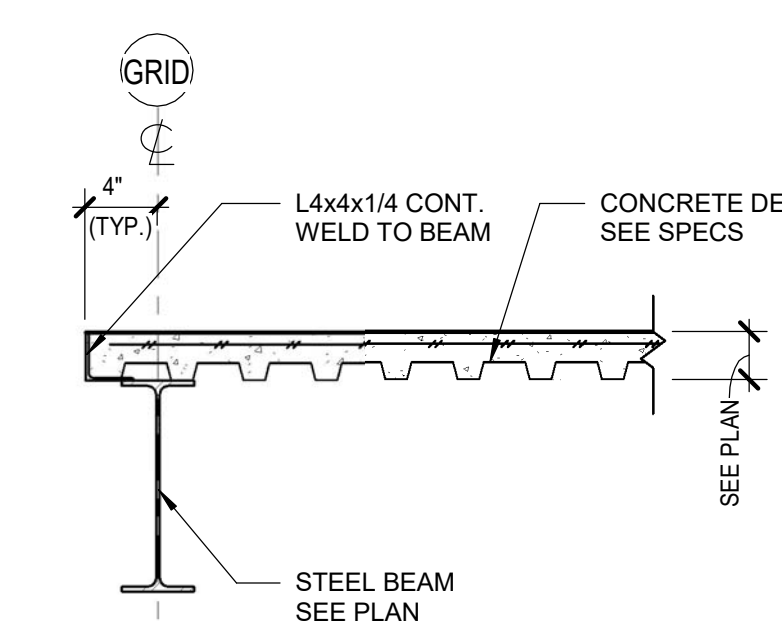
13 Interior Detail @ Floor  
3/4" = 1'-0"



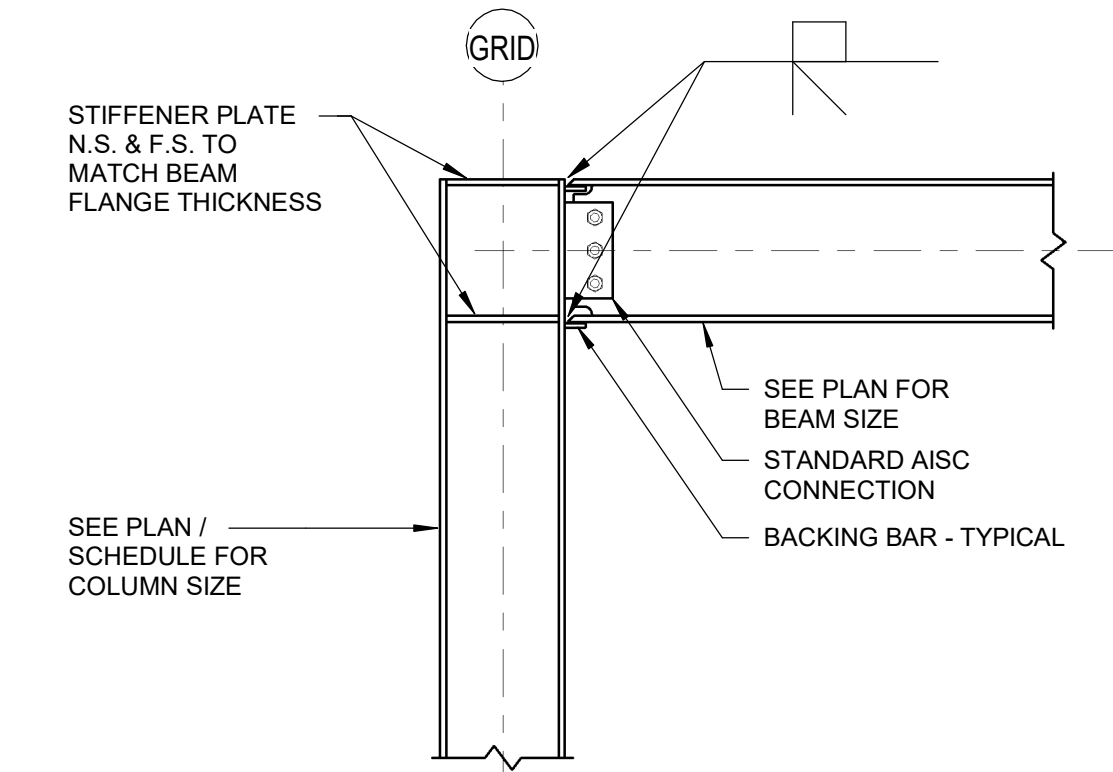
12 Interior Detail @ Floor  
3/4" = 1'-0"



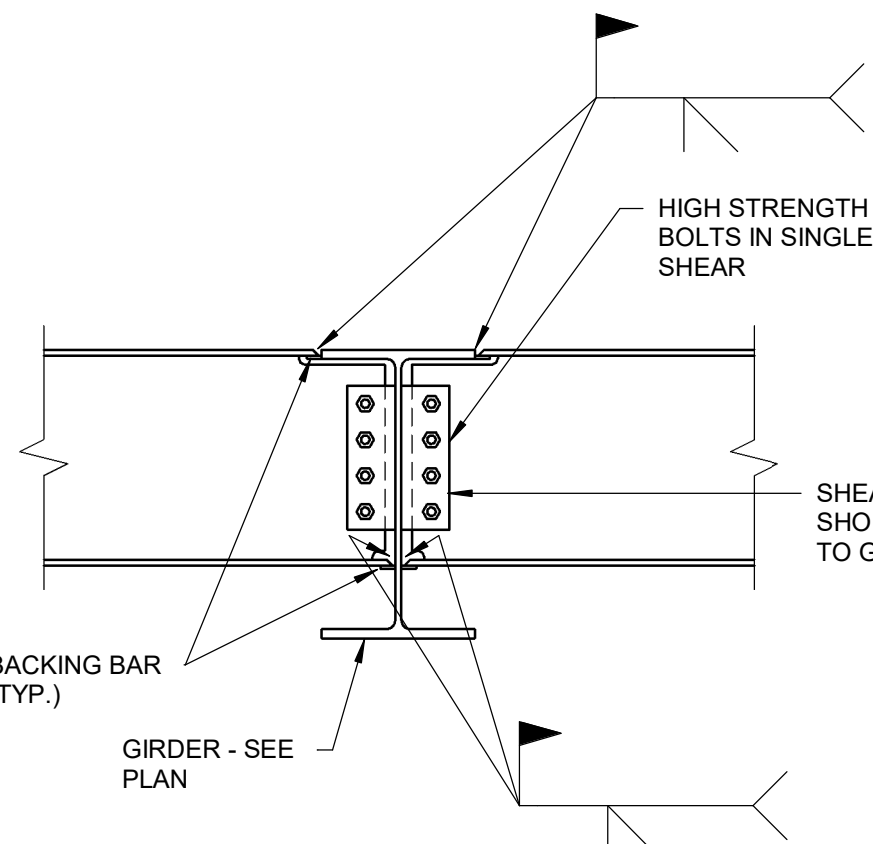
11 Typical @ Floor Opening Detail  
3/4" = 1'-0"



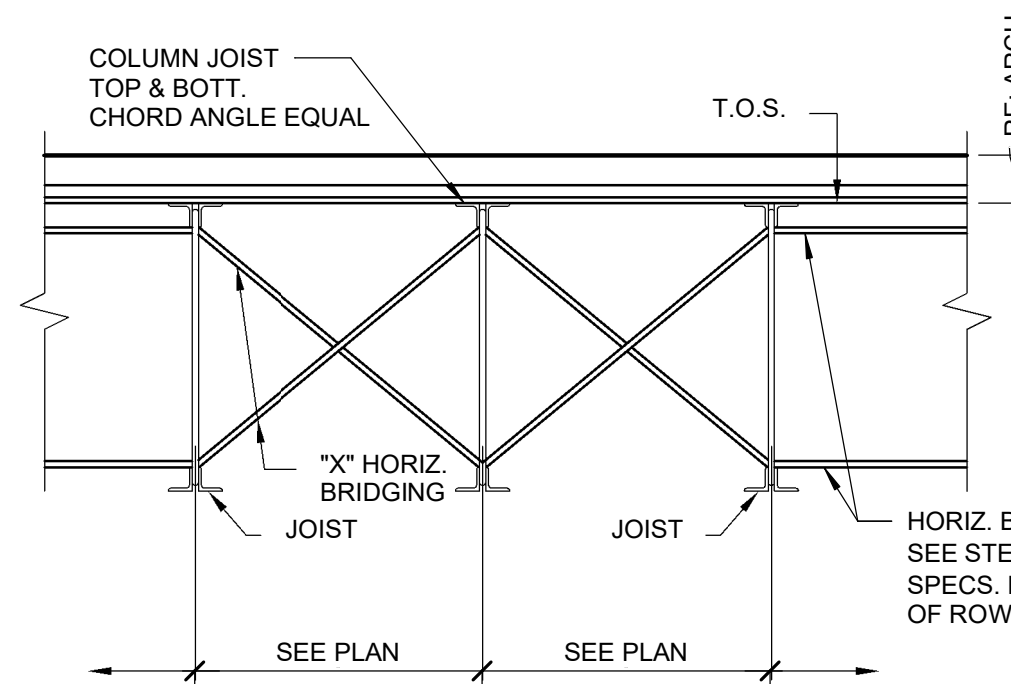
10 Typical @ Floor Opening Detail  
3/4" = 1'-0"



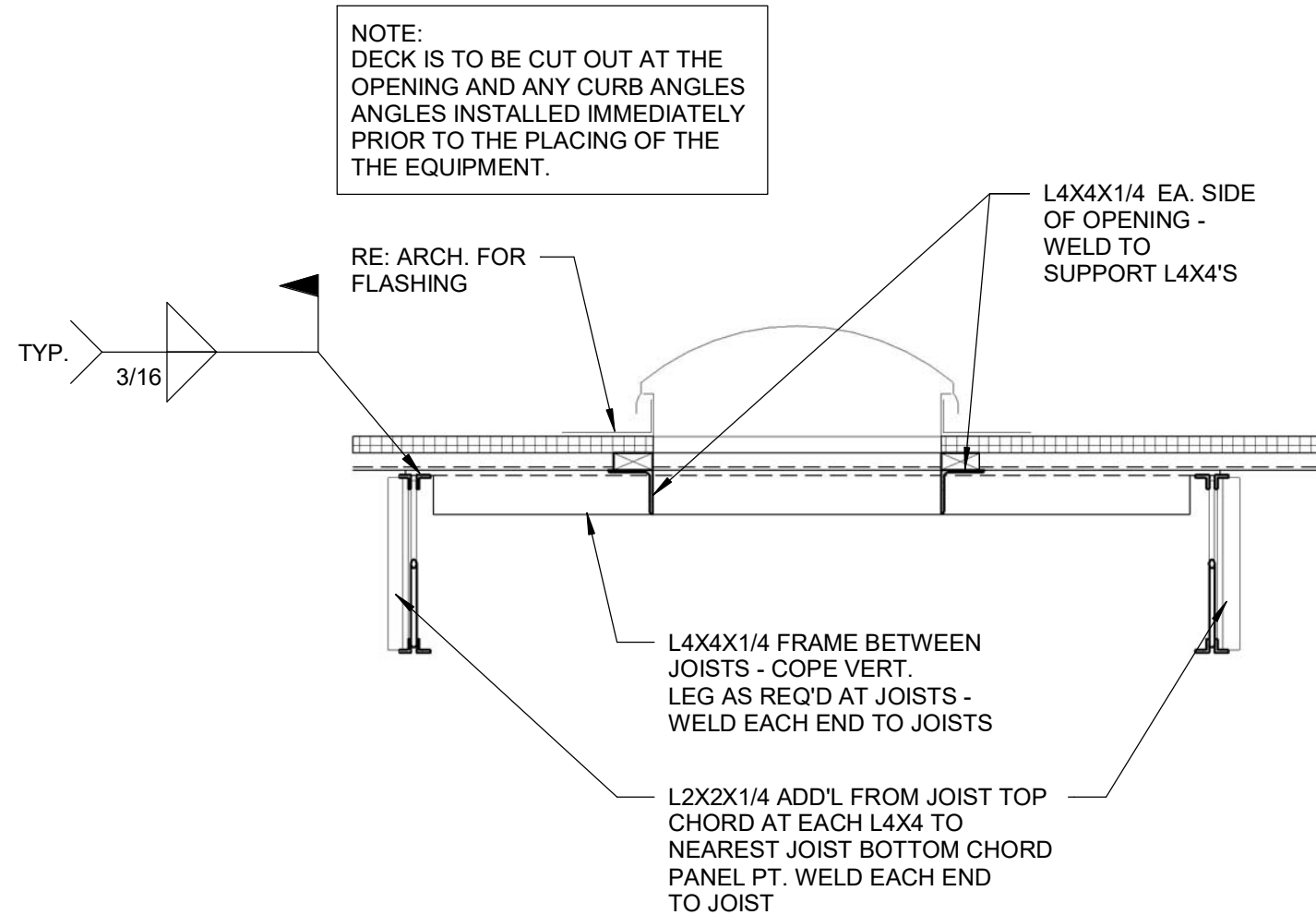
9 Typical Moment Frame Connection  
3/4" = 1'-0"



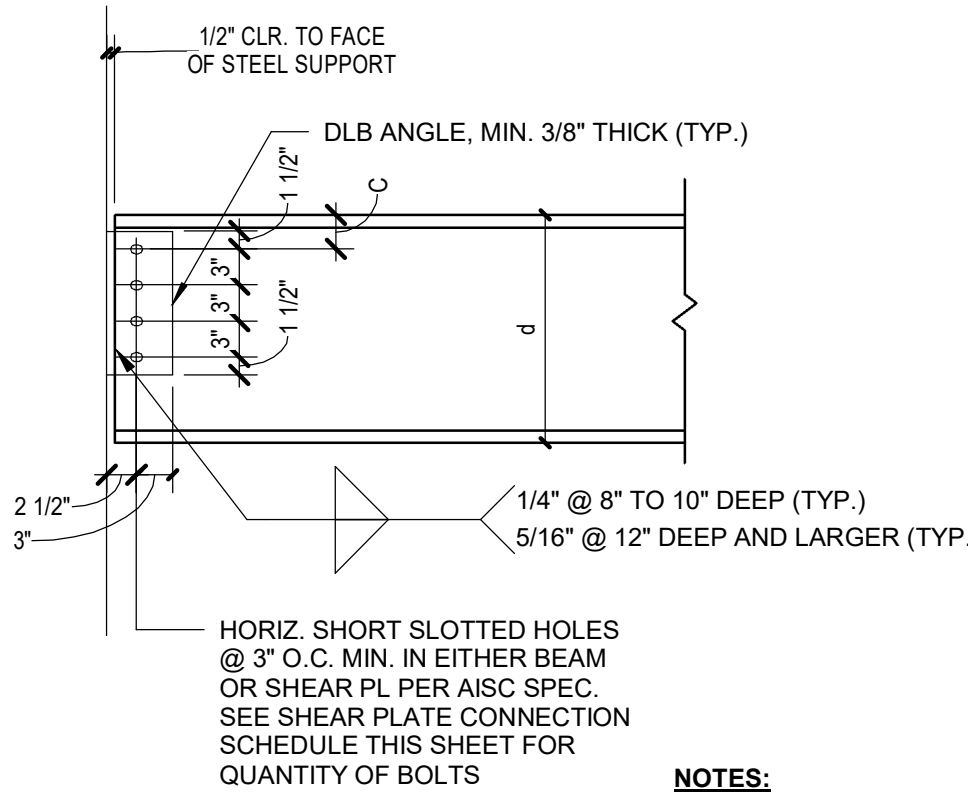
8 Typical Beam to Beam Moment Connection  
3/4" = 1'-0"



7 Typical Bridging At Column Joist  
3/4" = 1'-0"



6 Typical Roof Hatch Detail  
3/4" = 1'-0"

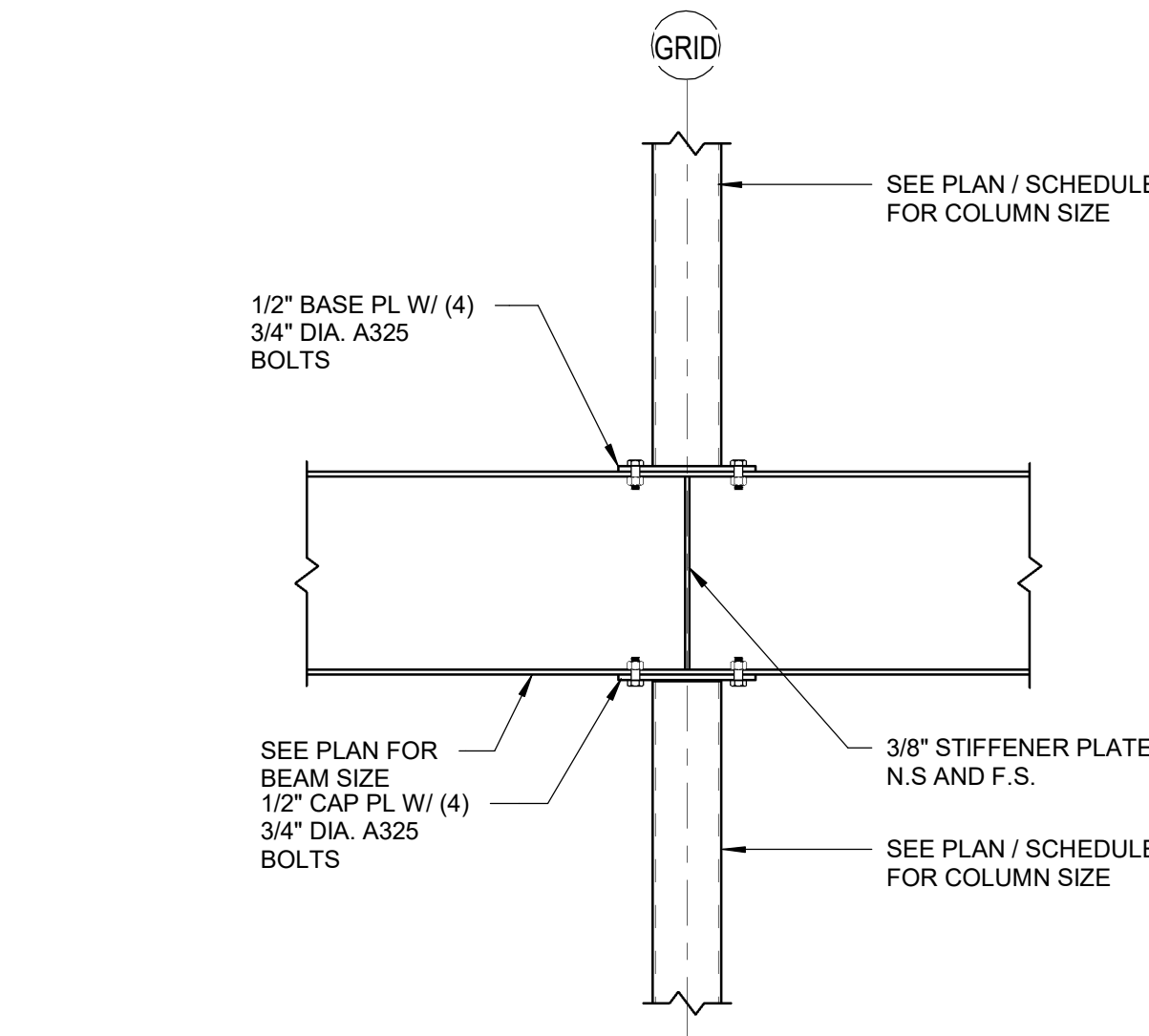


5 Typical Beam Connection Schedule  
3/4" = 1'-0"

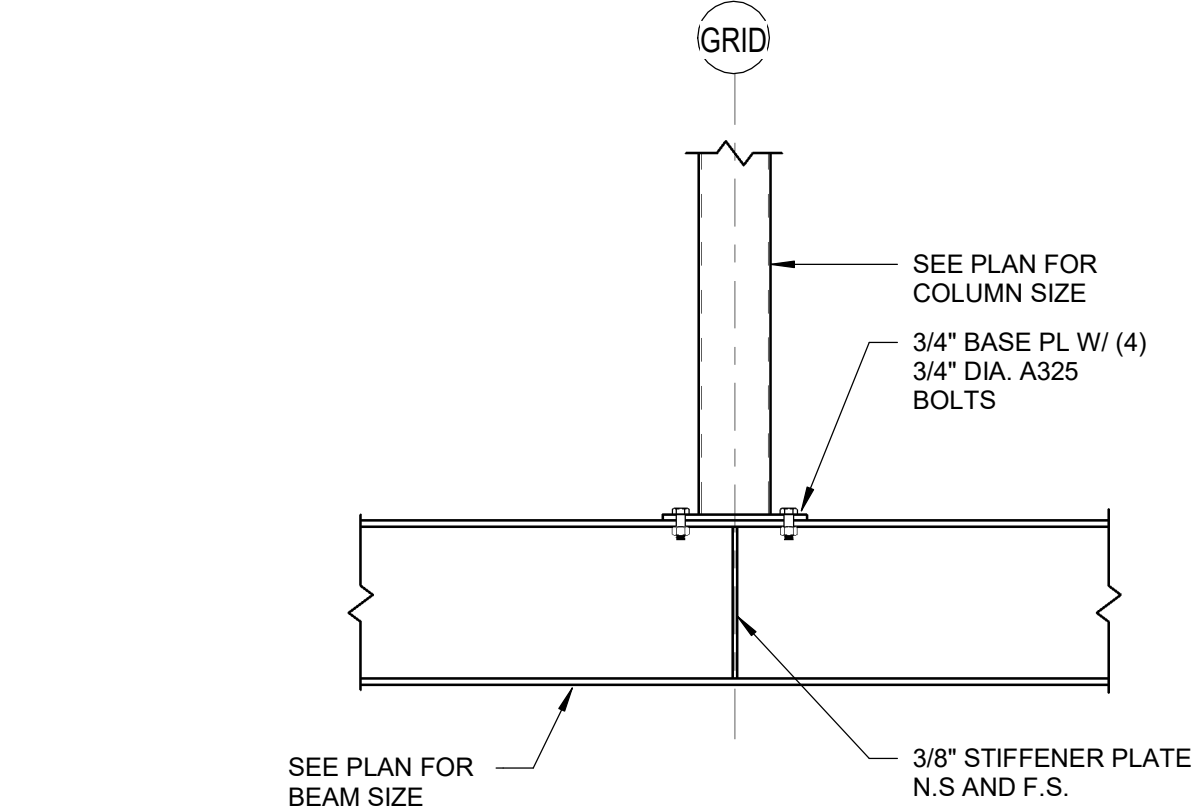
SHEAR PL CONNECTION SCHEDULE U.N.O.		
NOMINAL BEAM DEPTH "d"	# OF BOLTS IN ROW	DISTANCE "C"
UP TO 6"	2 BOLTS	3"
8" TO 10"	2 BOLTS	3"
12" TO 14"	3 BOLTS	3"
16"	4 BOLTS	3 1/2"
18"	5 BOLTS	4 1/2"
21"	6 BOLTS	4 1/2"
24"	7 BOLTS	4 1/2"

**NOTES:**

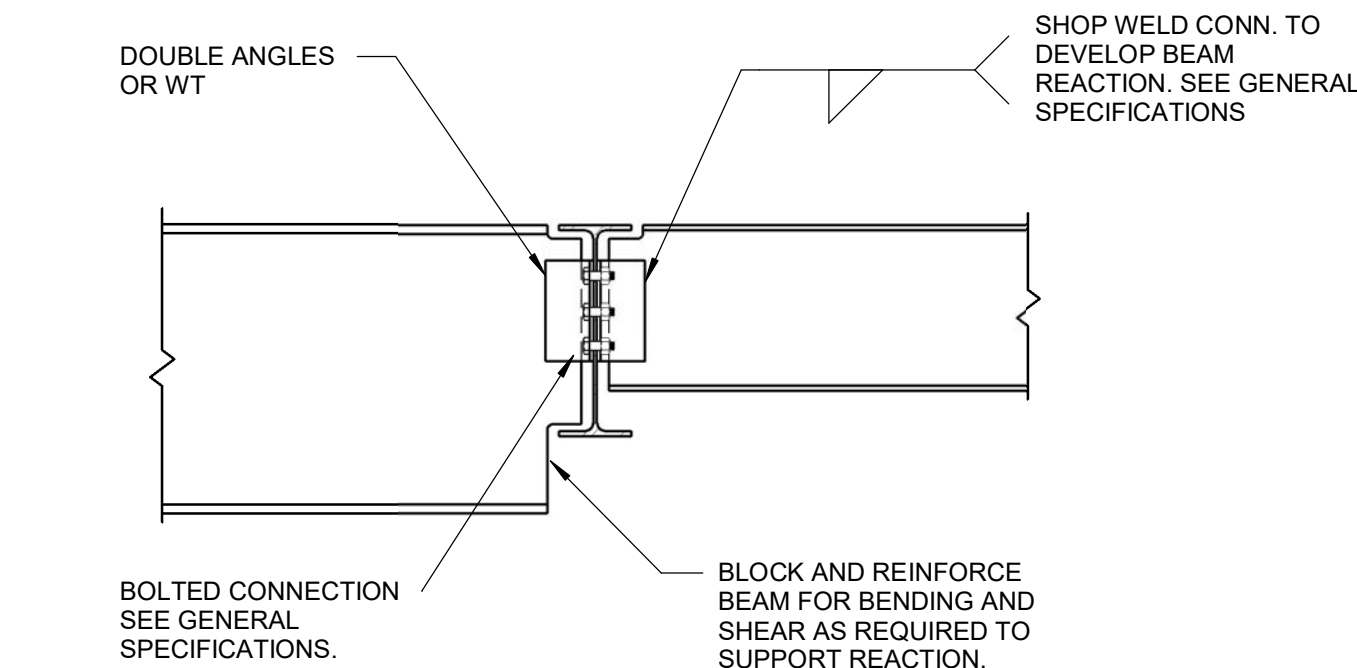
- 1.) TYPICAL CONNECTION CONSISTS OF THE DLB ANGLE WITH 3/4" Ø A325 BOLTS (UNO). SEE STEEL FRAMING NOTES ON SHEET S0.101 FOR MORE INFORMATION.
- 2.) MAINTAIN BOLT SPACING AND EDGE DISTANCES PER AISC SPECIFICATIONS.



4 Typical Column Splice  
3/4" = 1'-0"

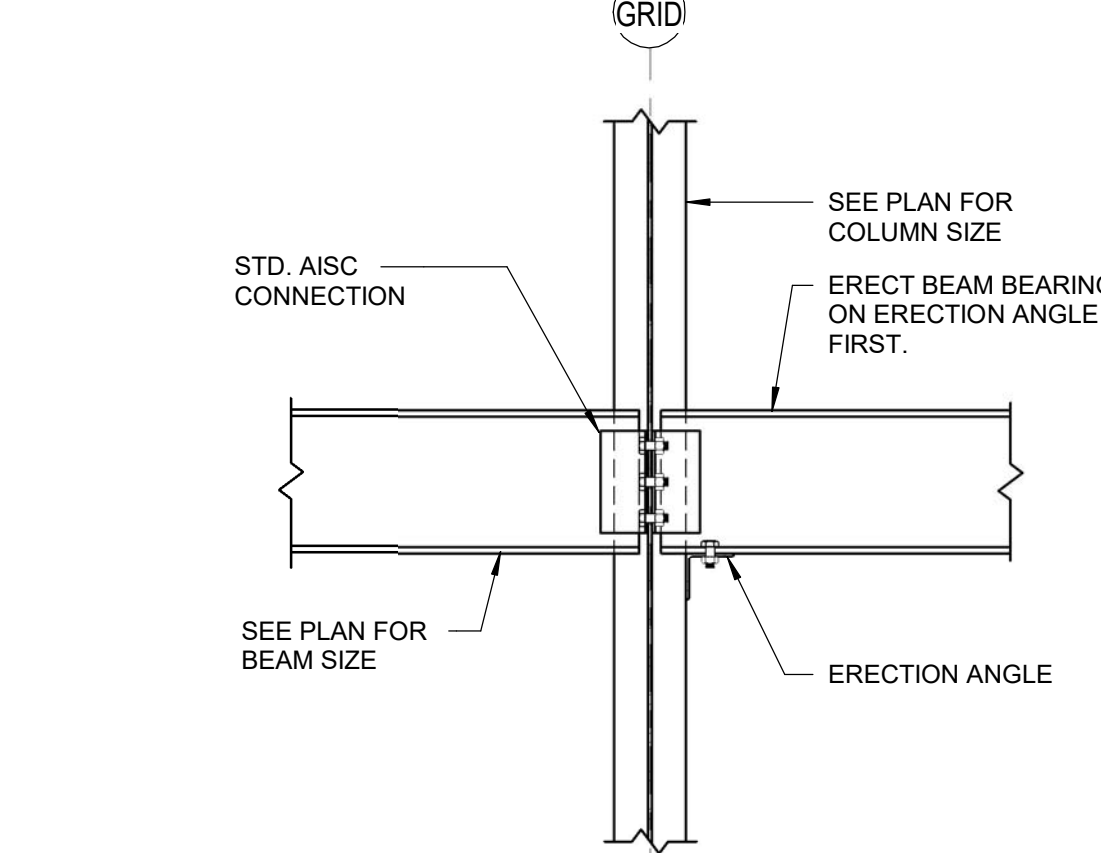


3 Section at Stub Column  
3/4" = 1'-0"

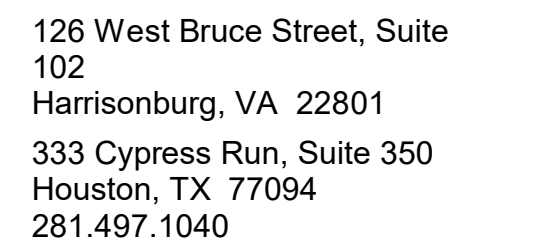


**TYPICAL DETAIL AT BEAM TO BEAM DOUBLE ANGLE SHEAR CONNECTION**

2 Typical Shear Connection Detail  
3/4" = 1'-0"

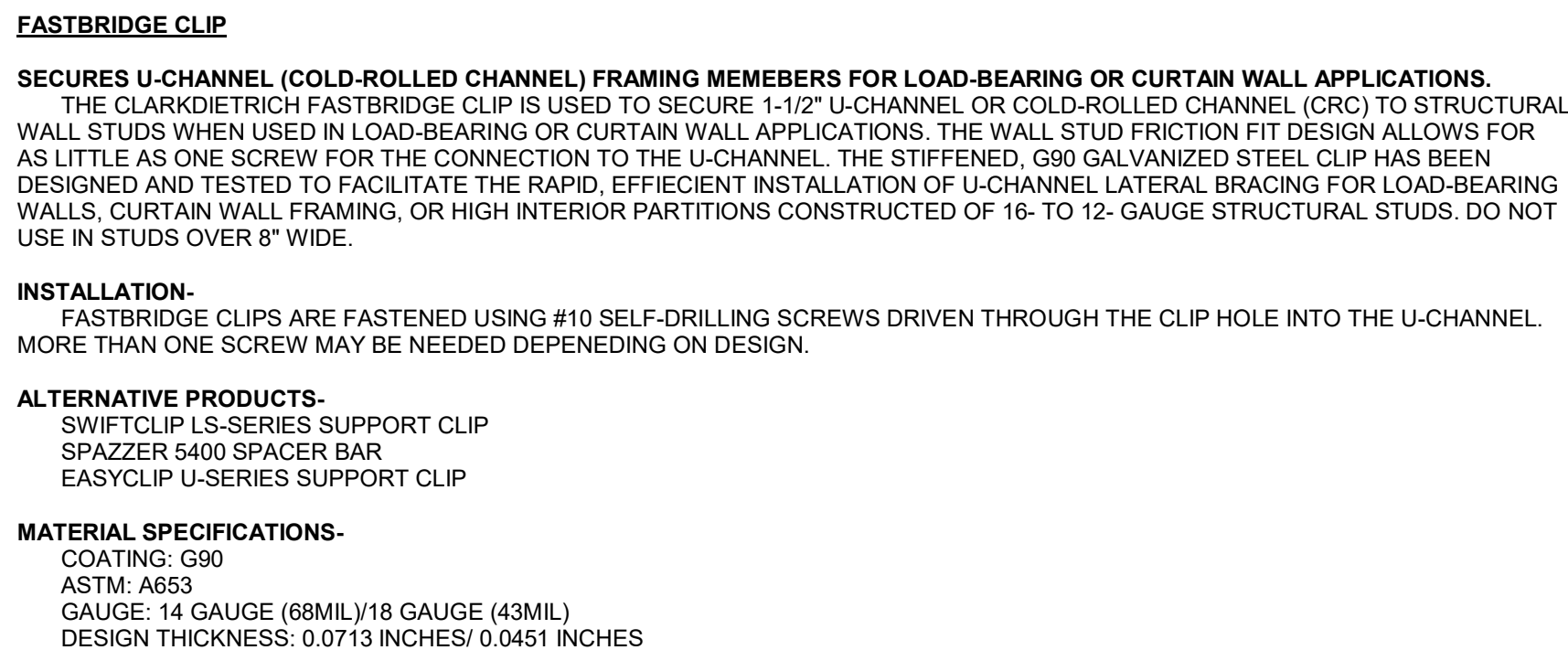
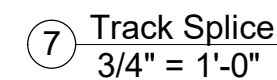
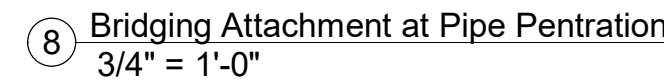
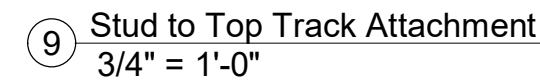


1 Typical Beam Connection Detail  
3/4" = 1'-0"



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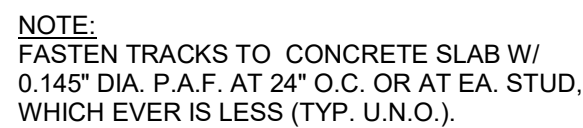
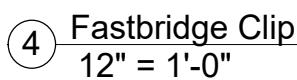
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Patent 20-088,331

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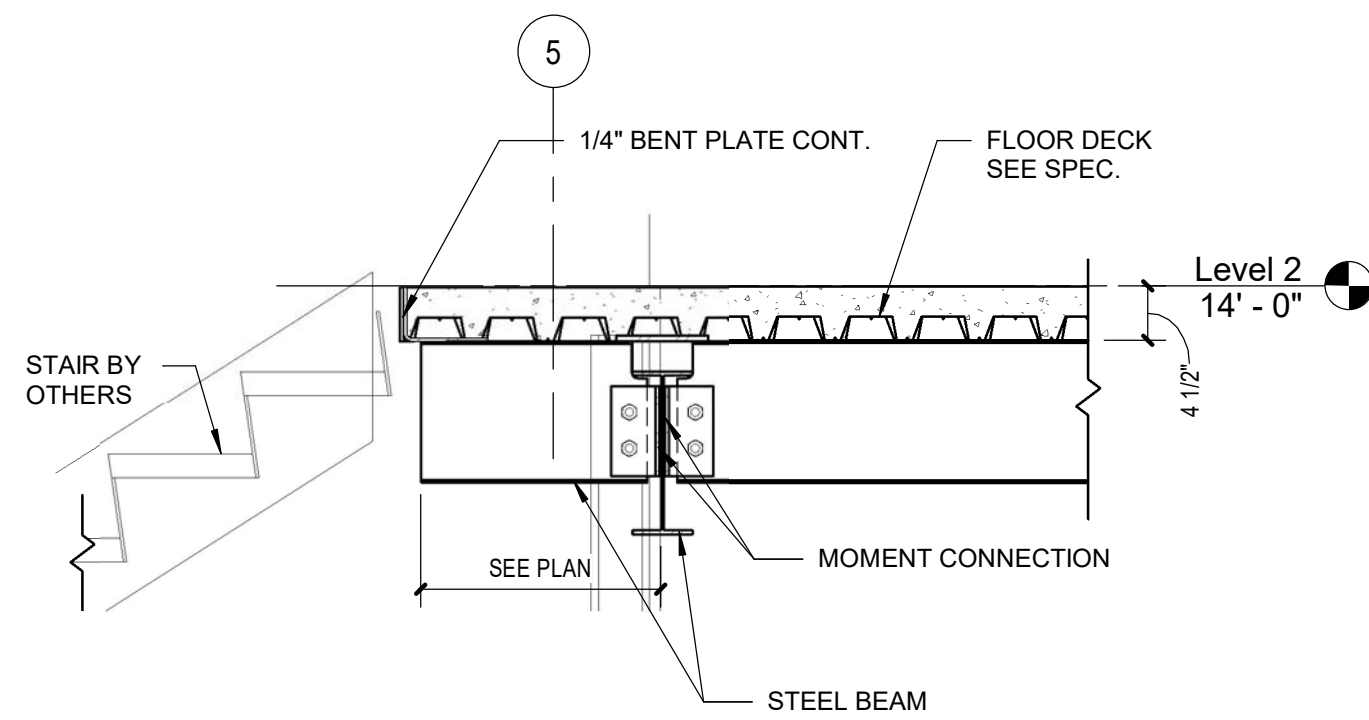
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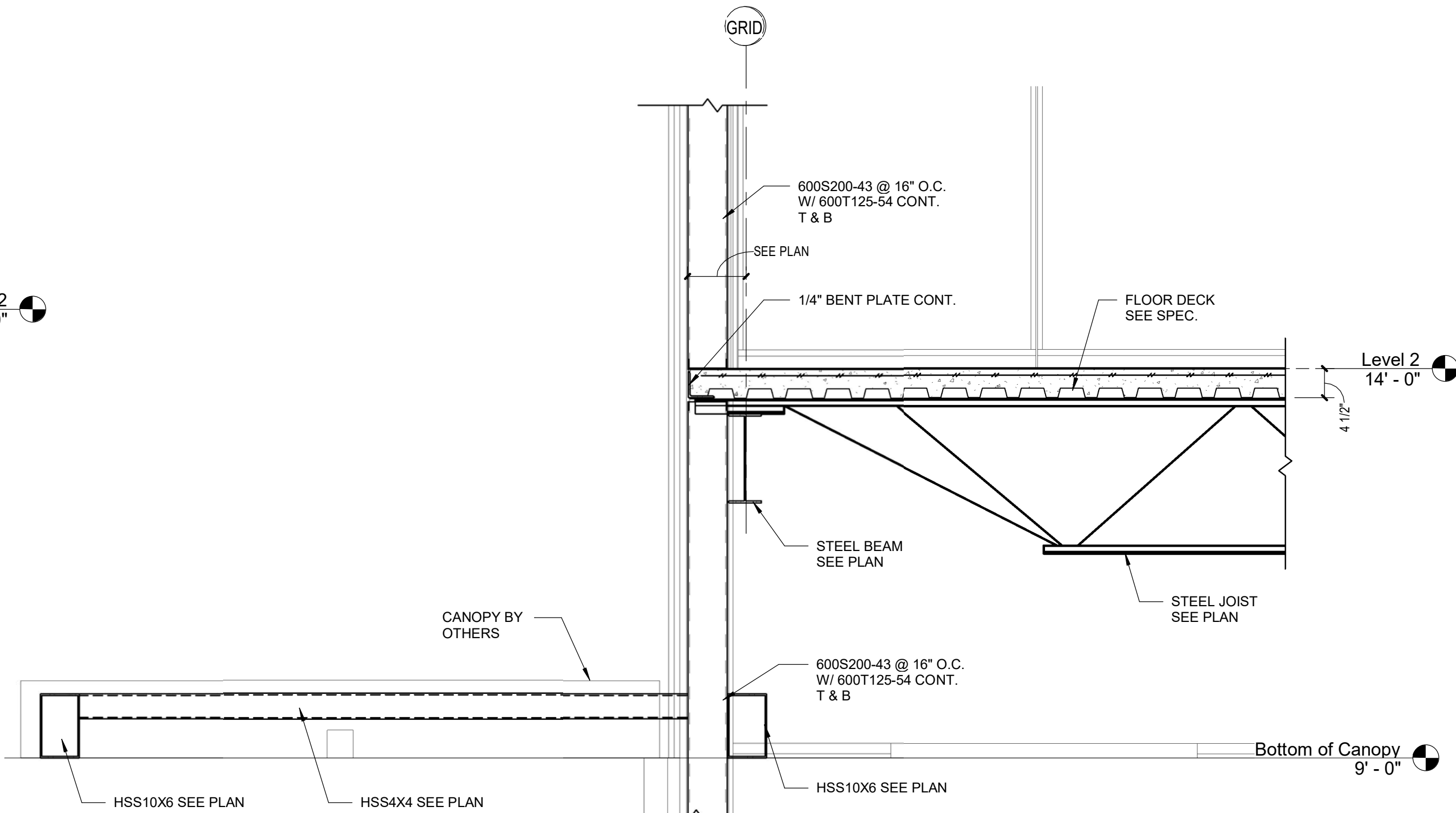



**S4.110**

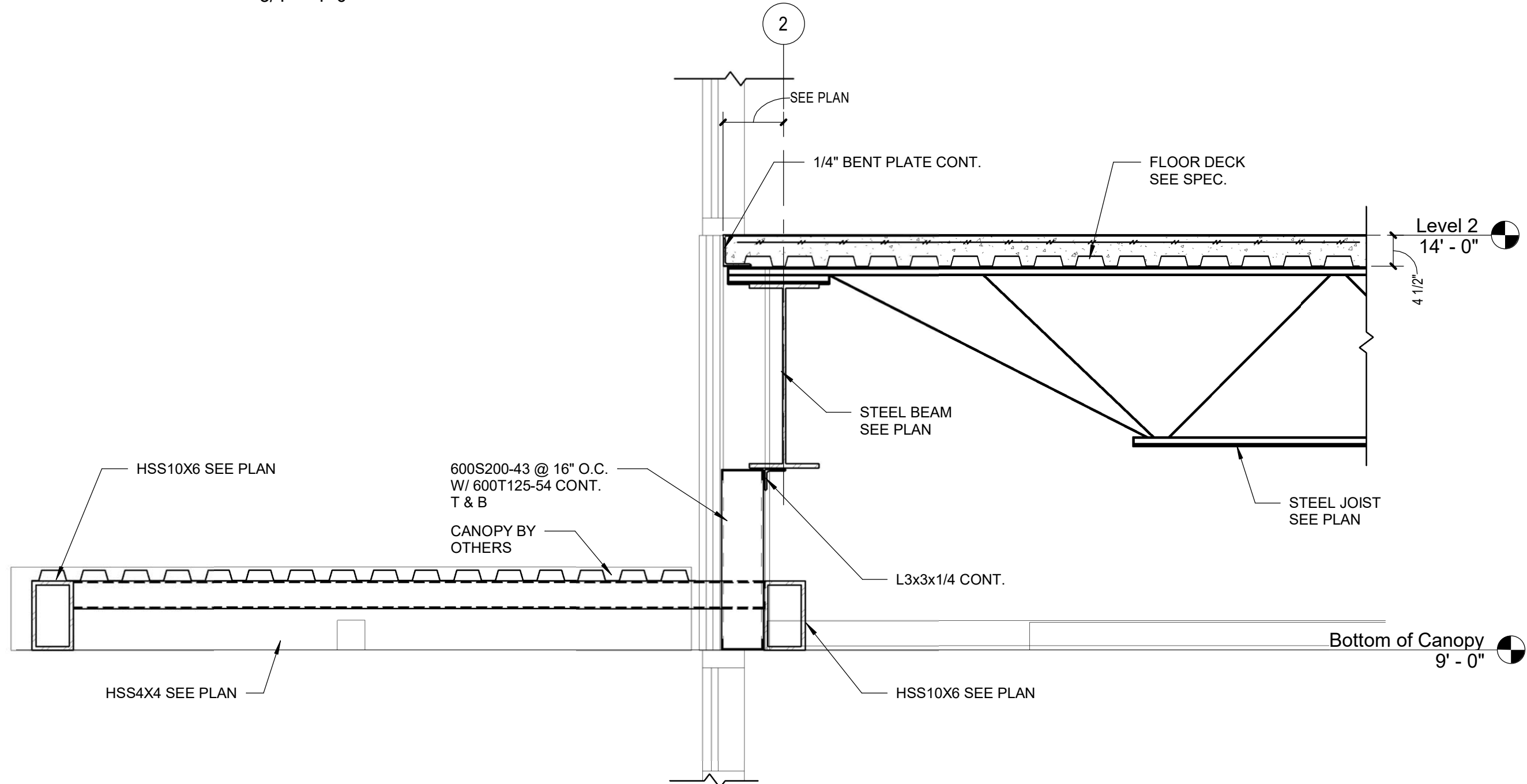
Framing Sections



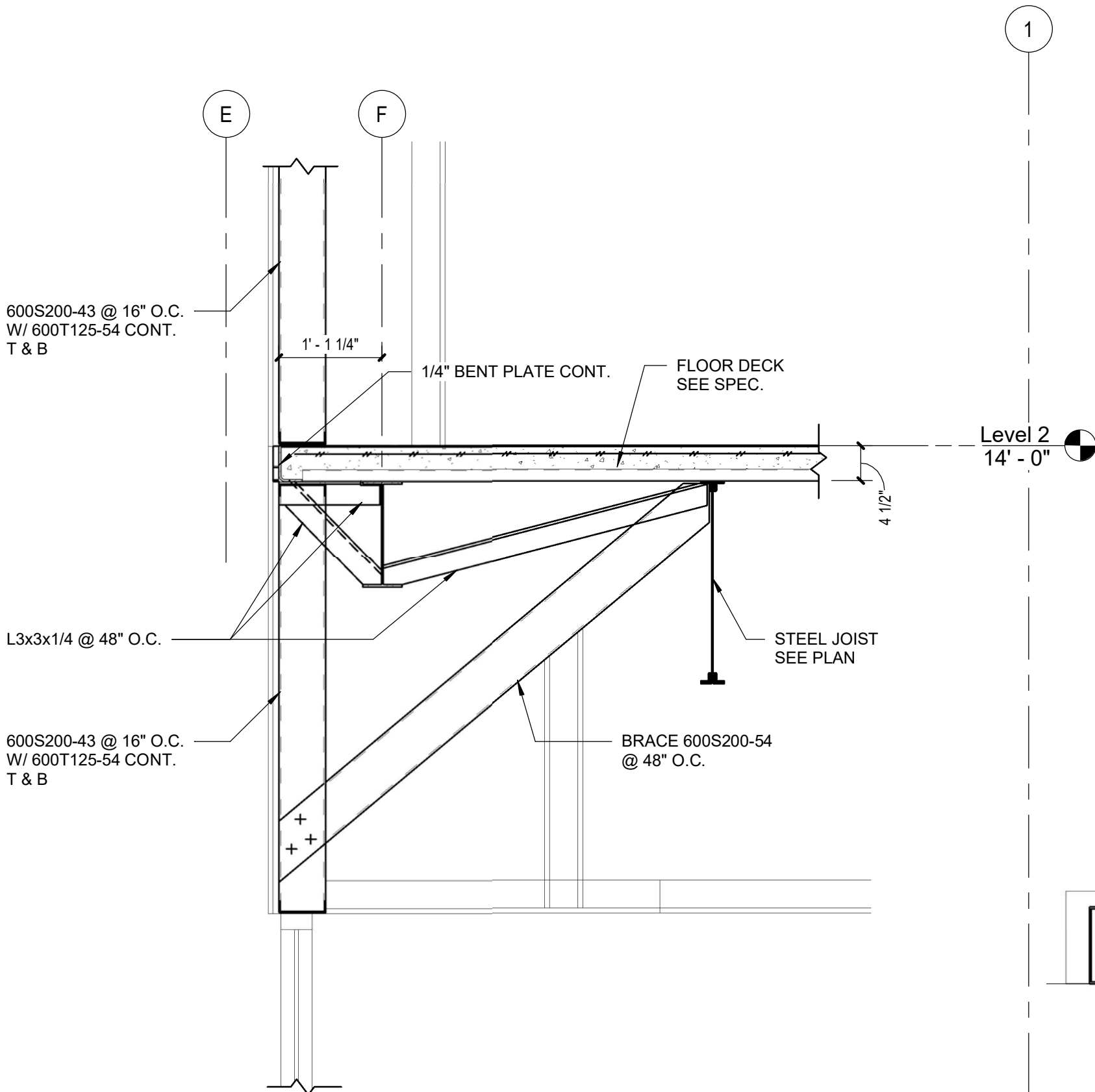
③ Interior Detail @ 2nd Floor  
3/4" = 1'-0"



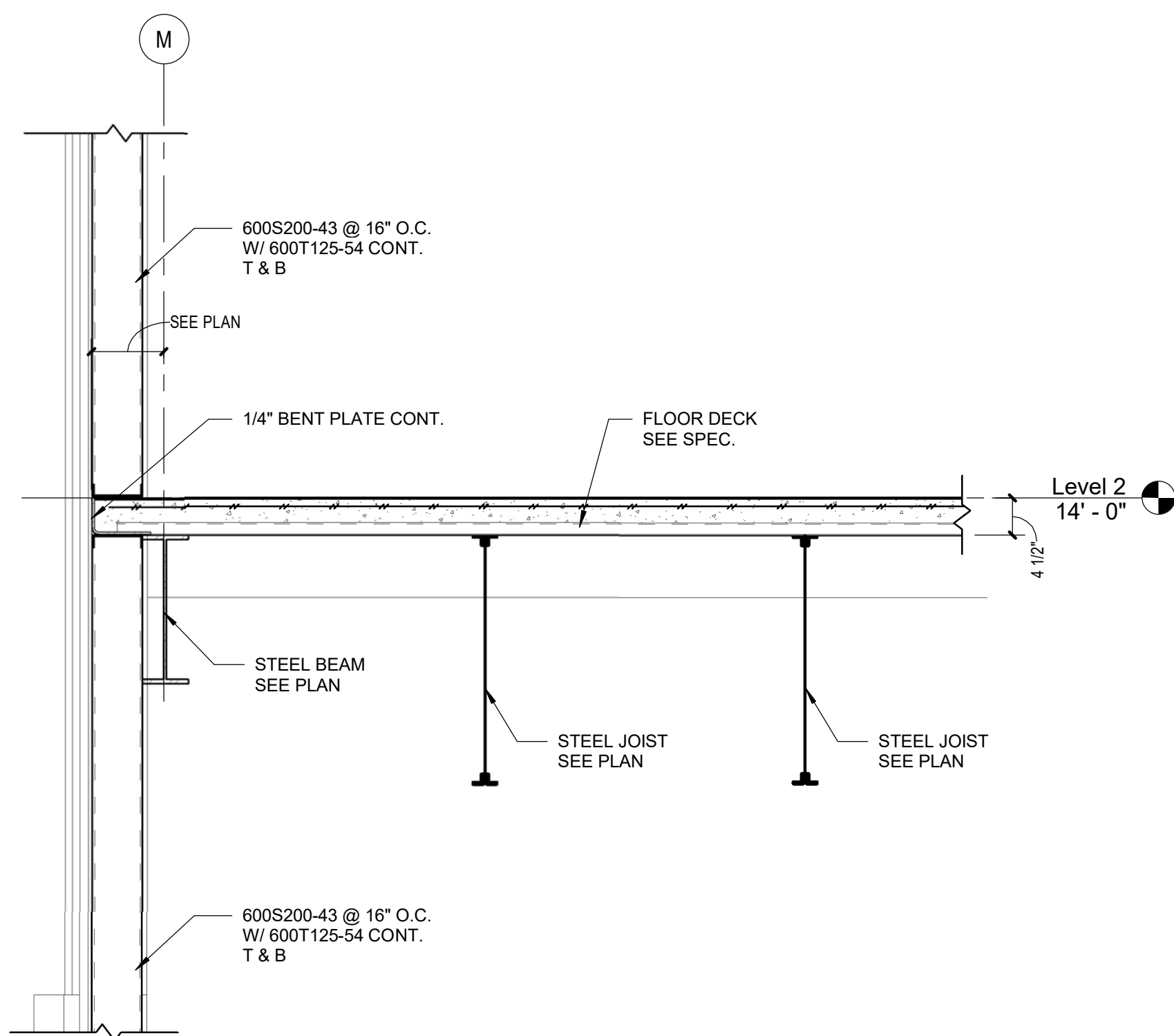
② Exterior Detail @ 2nd Floor  
3/4" = 1'-0"



① Exterior Detail @ 2nd Floor  
3/4" = 1'-0"



⑤ Exterior Detail @ 2nd Floor  
3/4" = 1'-0"



④ Exterior Detail @ 2nd Floor  
3/4" = 1'-0"

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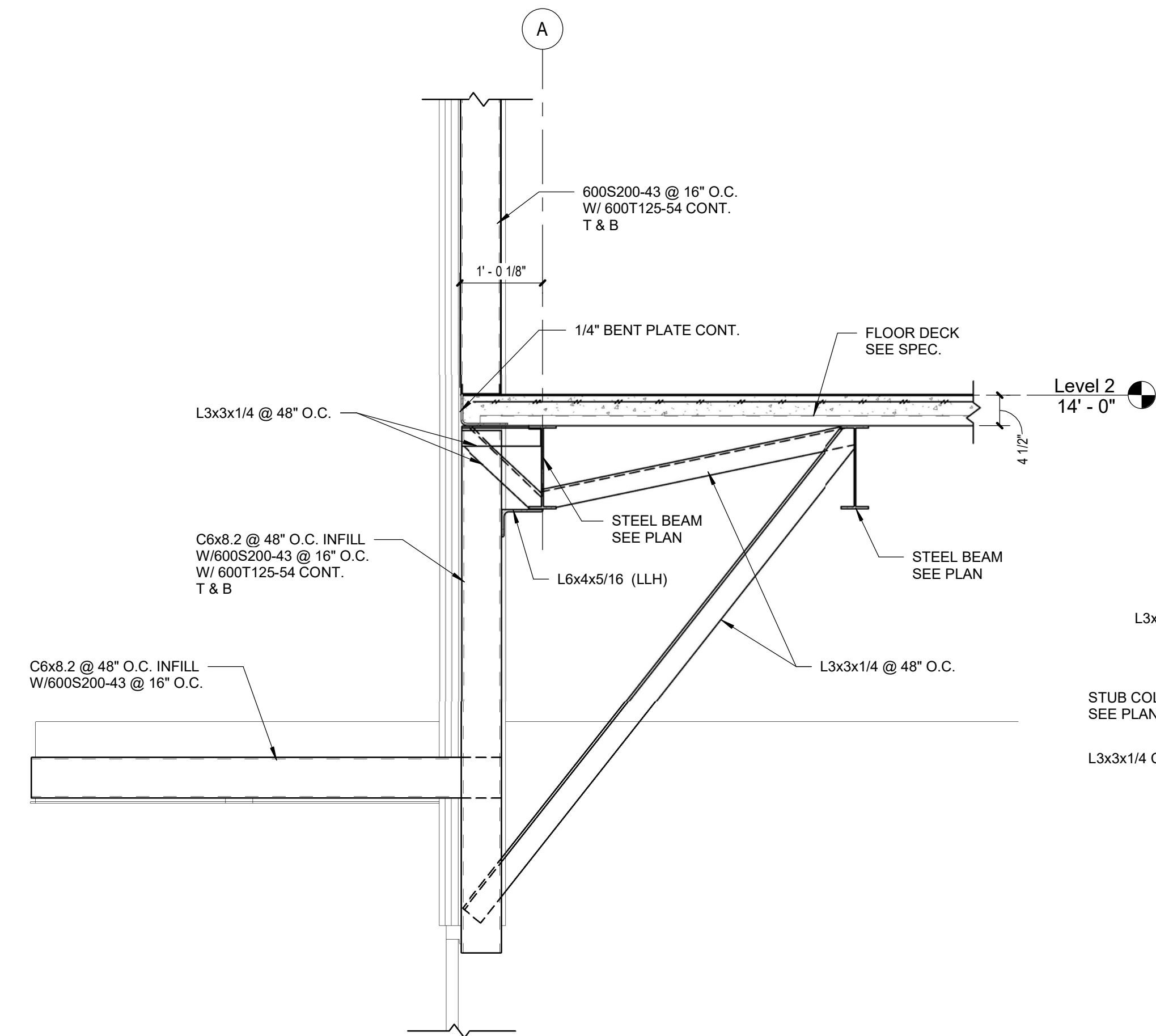
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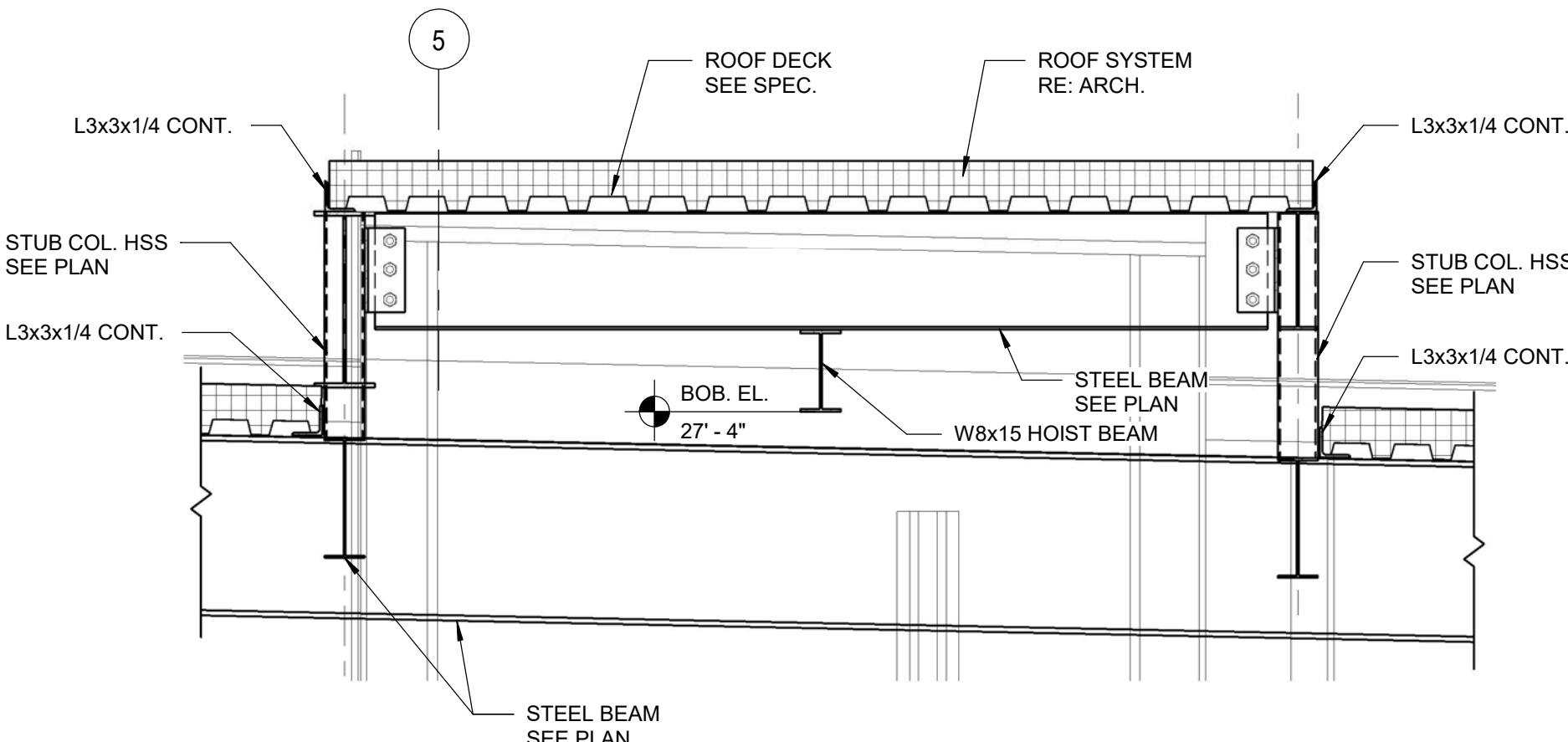
SCA CONSULTING ENGINEERS  
F-197

**S4.111**

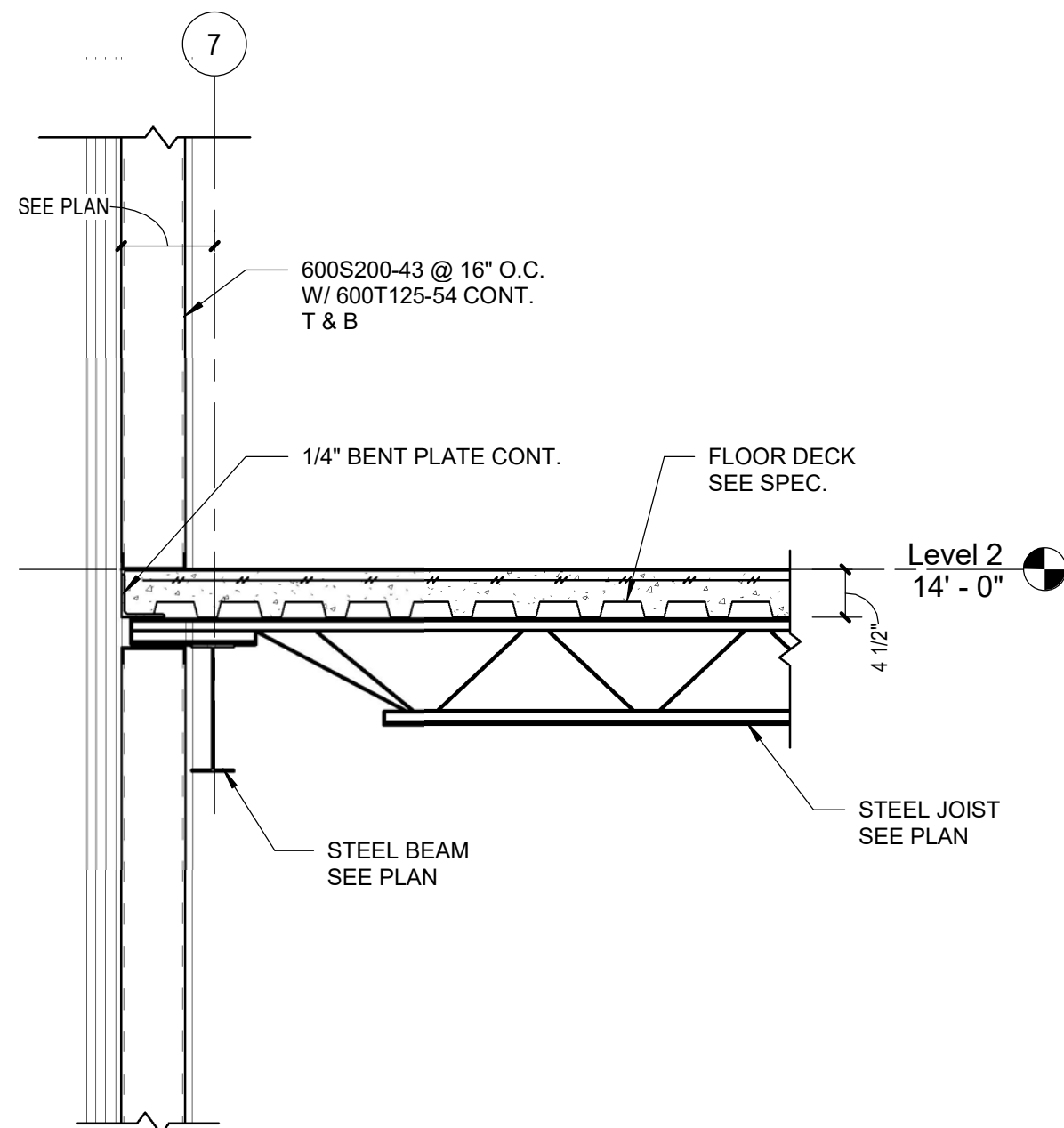
Framing Sections



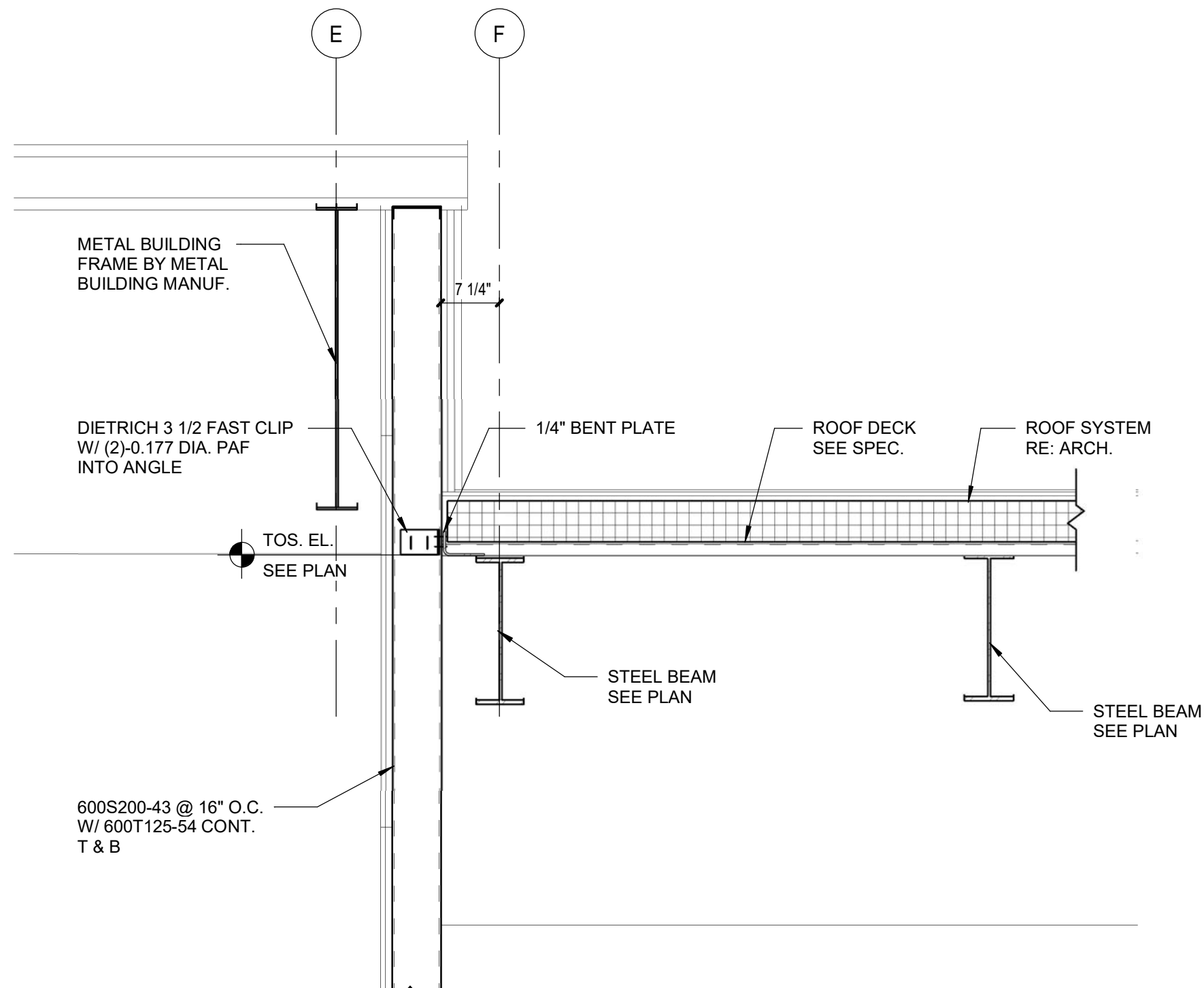
7 Section 27  
3/4" = 1'-0"



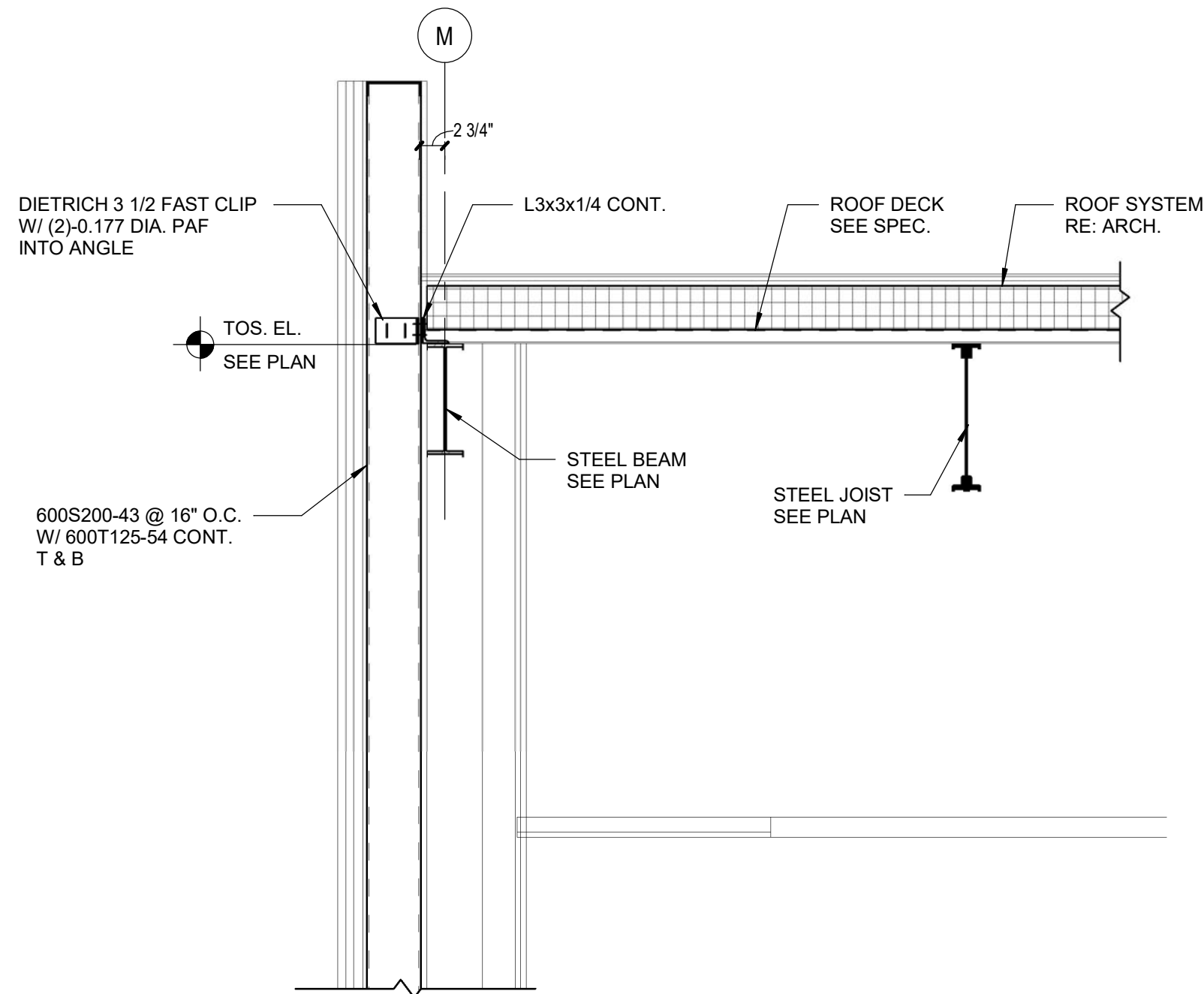
6 Interior Detail @ Roof  
3/4" = 1'-0"



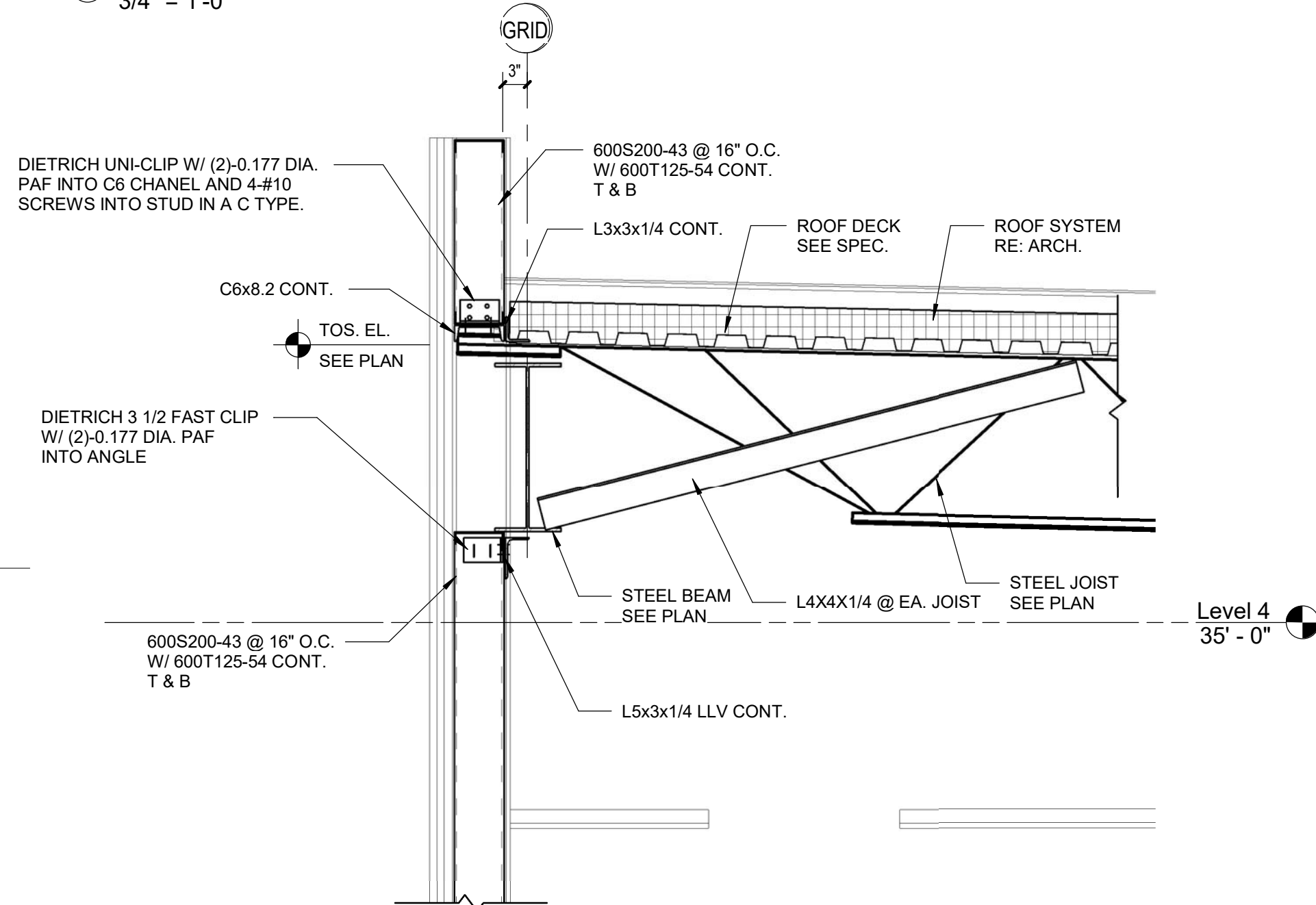
5 Exterior Detail @ 2nd Floor  
3/4" = 1'-0"



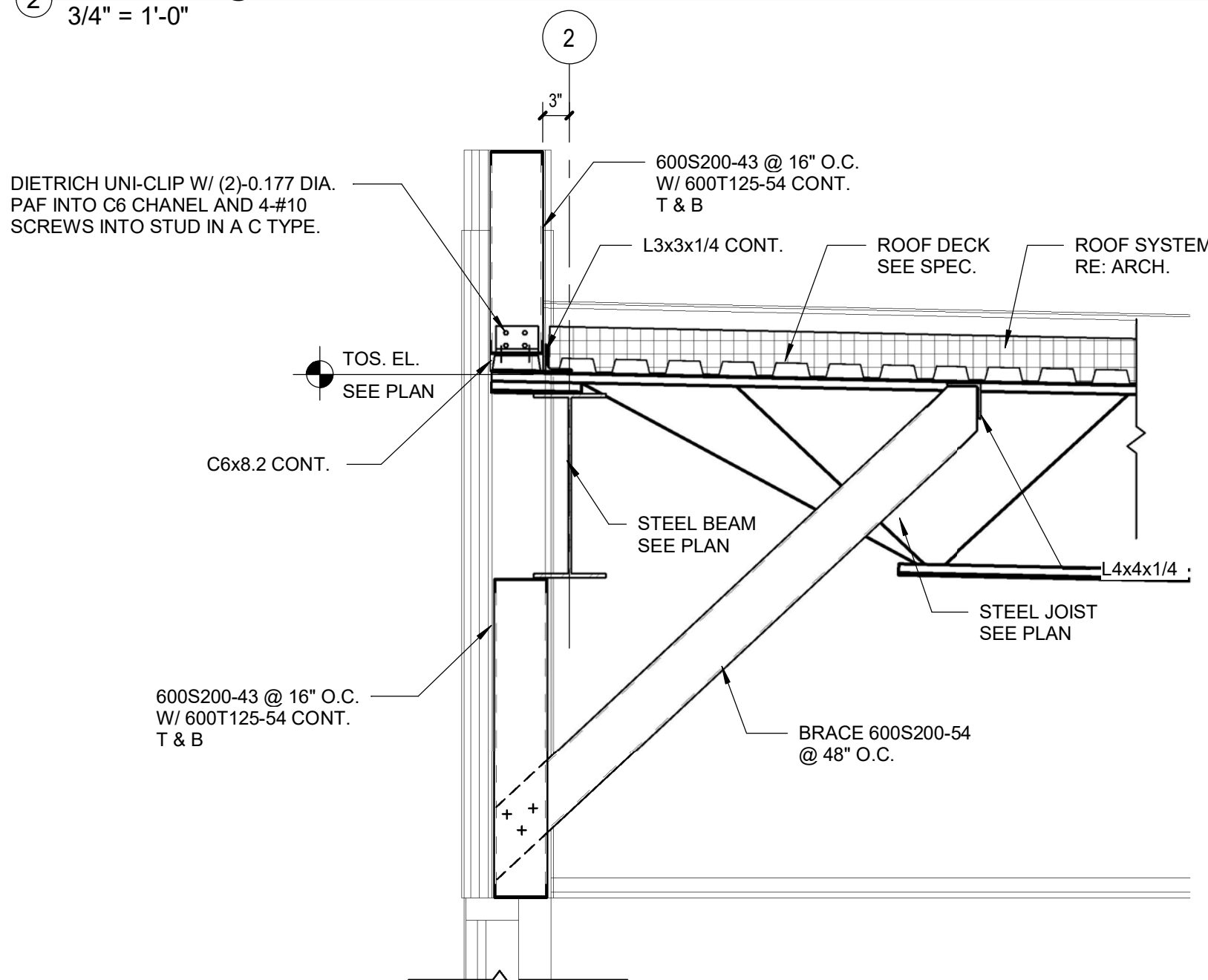
4 Interior Detail @ Roof  
3/4" = 1'-0"



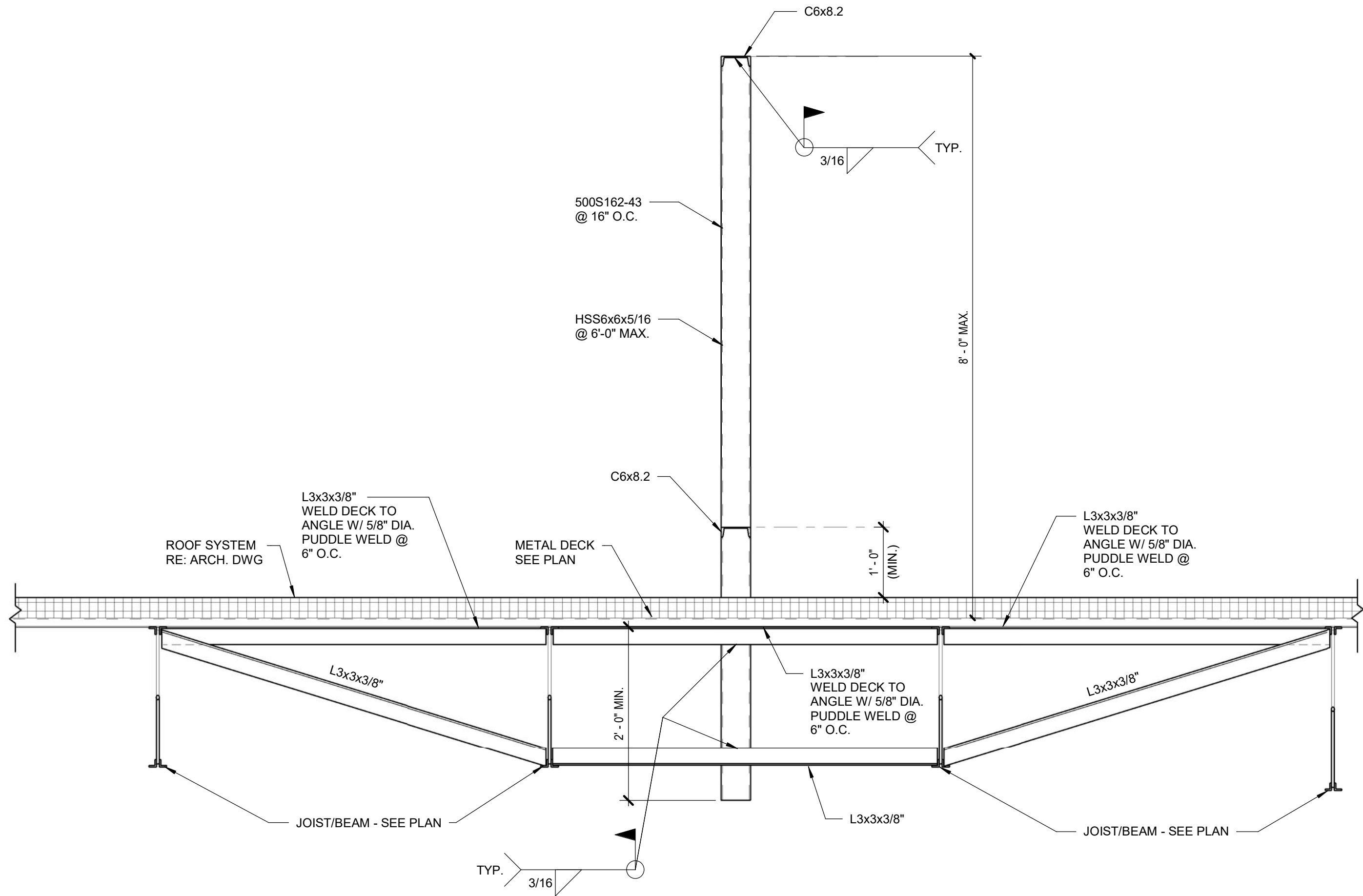
3 Exterior Detail @ Roof  
3/4" = 1'-0"



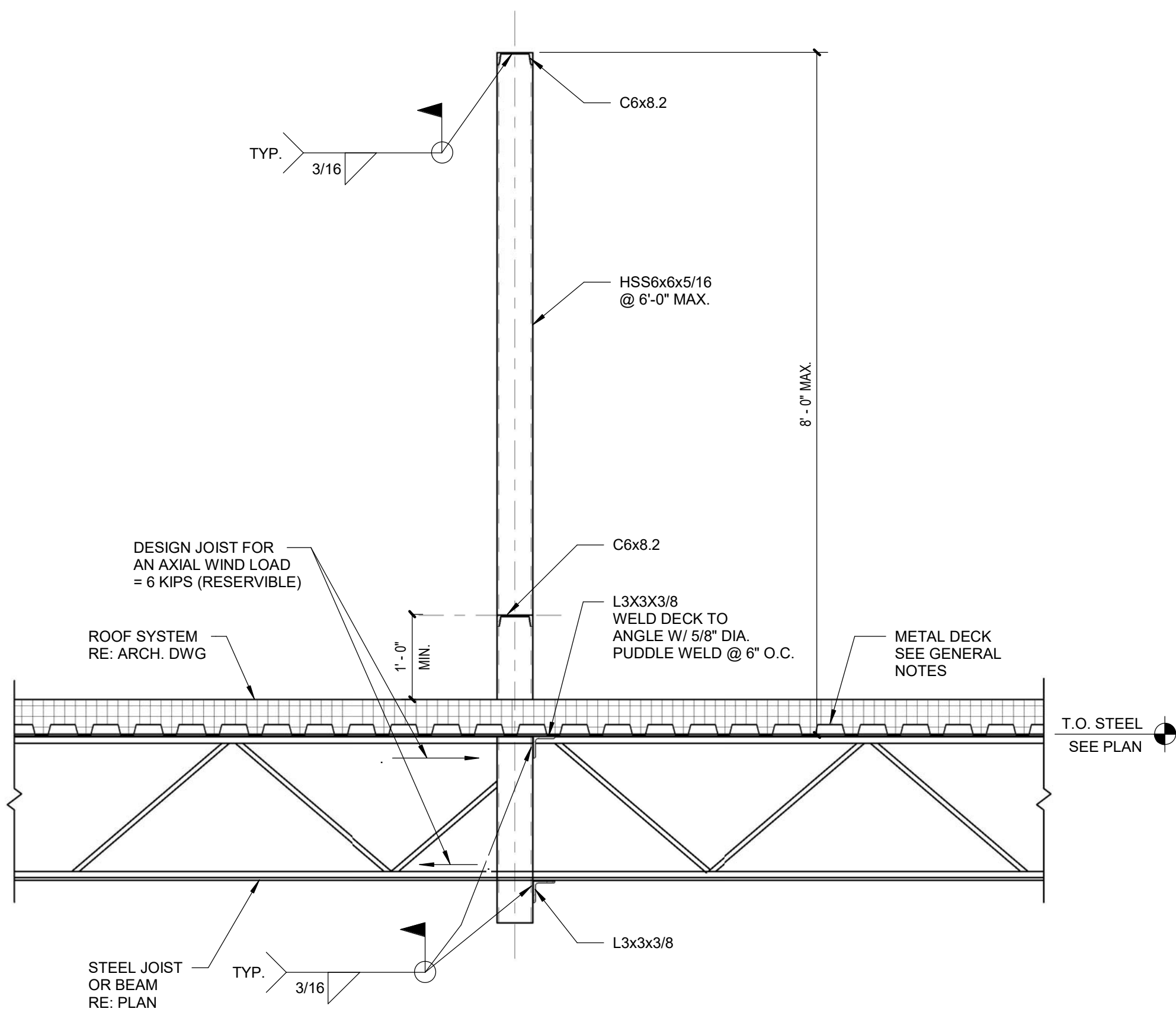
2 Exterior Detail @ Roof  
3/4" = 1'-0"



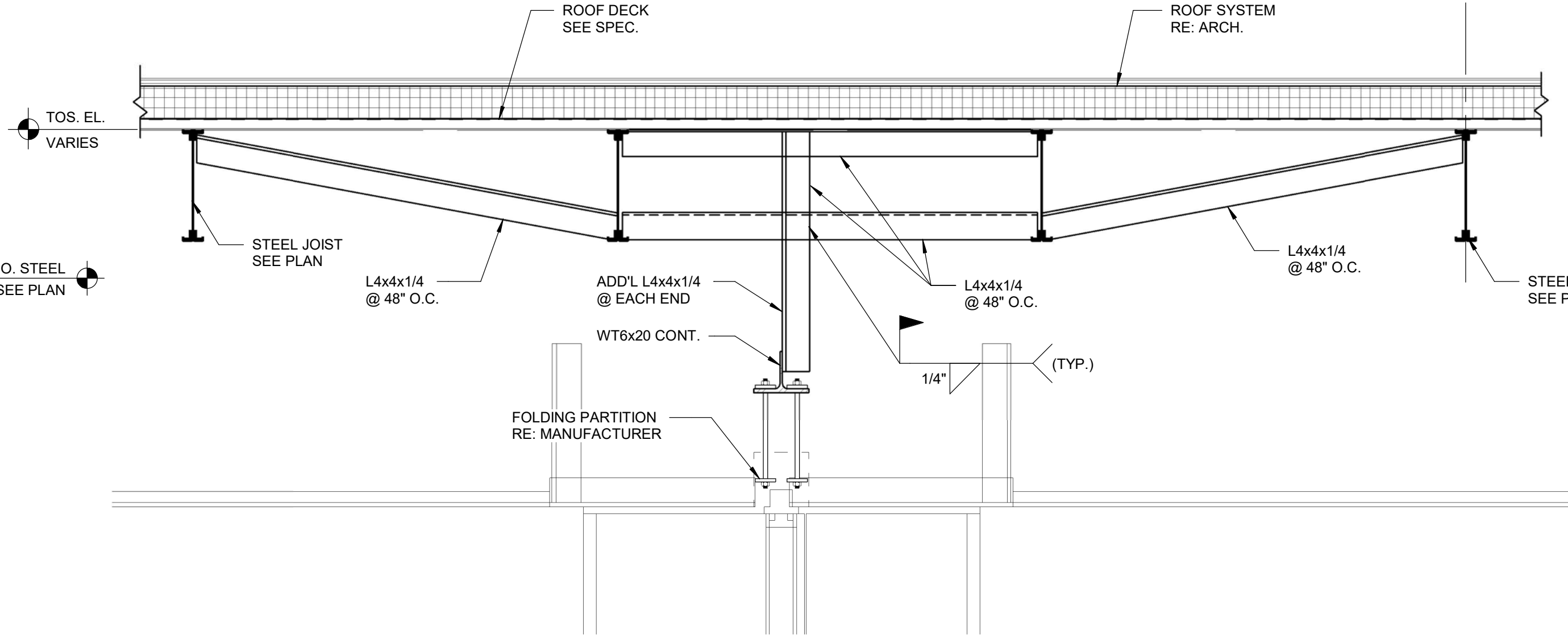
1 Exterior Detail @ Roof  
3/4" = 1'-0"



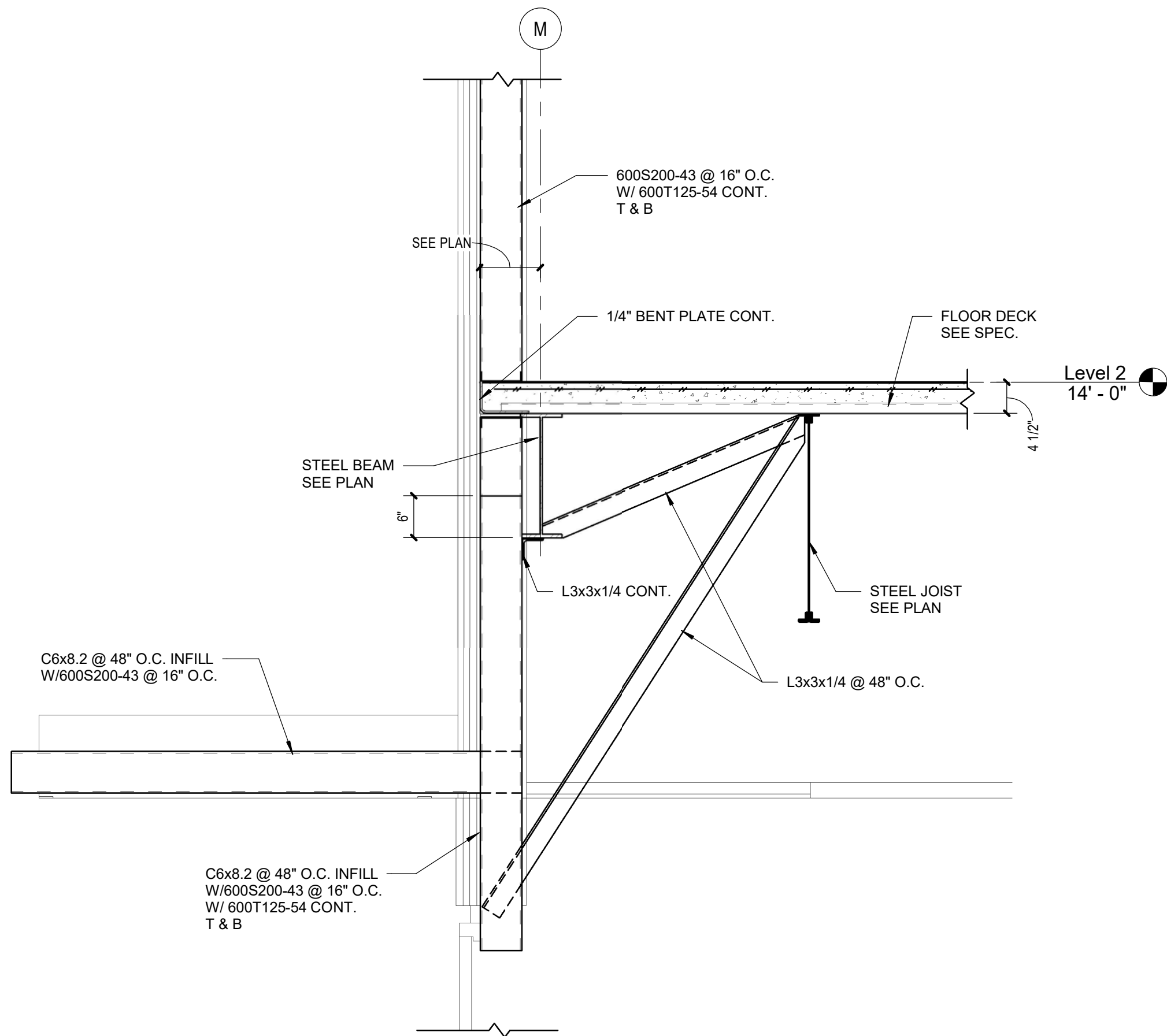
④ SCREEN ROOF DETAIL  
3/4" = 1'-0"



③ SCREEN ROOF DETAIL  
3/4" = 1'-0"



② Folding Partition Wall Detail  
3/4" = 1'-0"



① Exterior Detail @ 2nd Floor  
3/4" = 1'-0"

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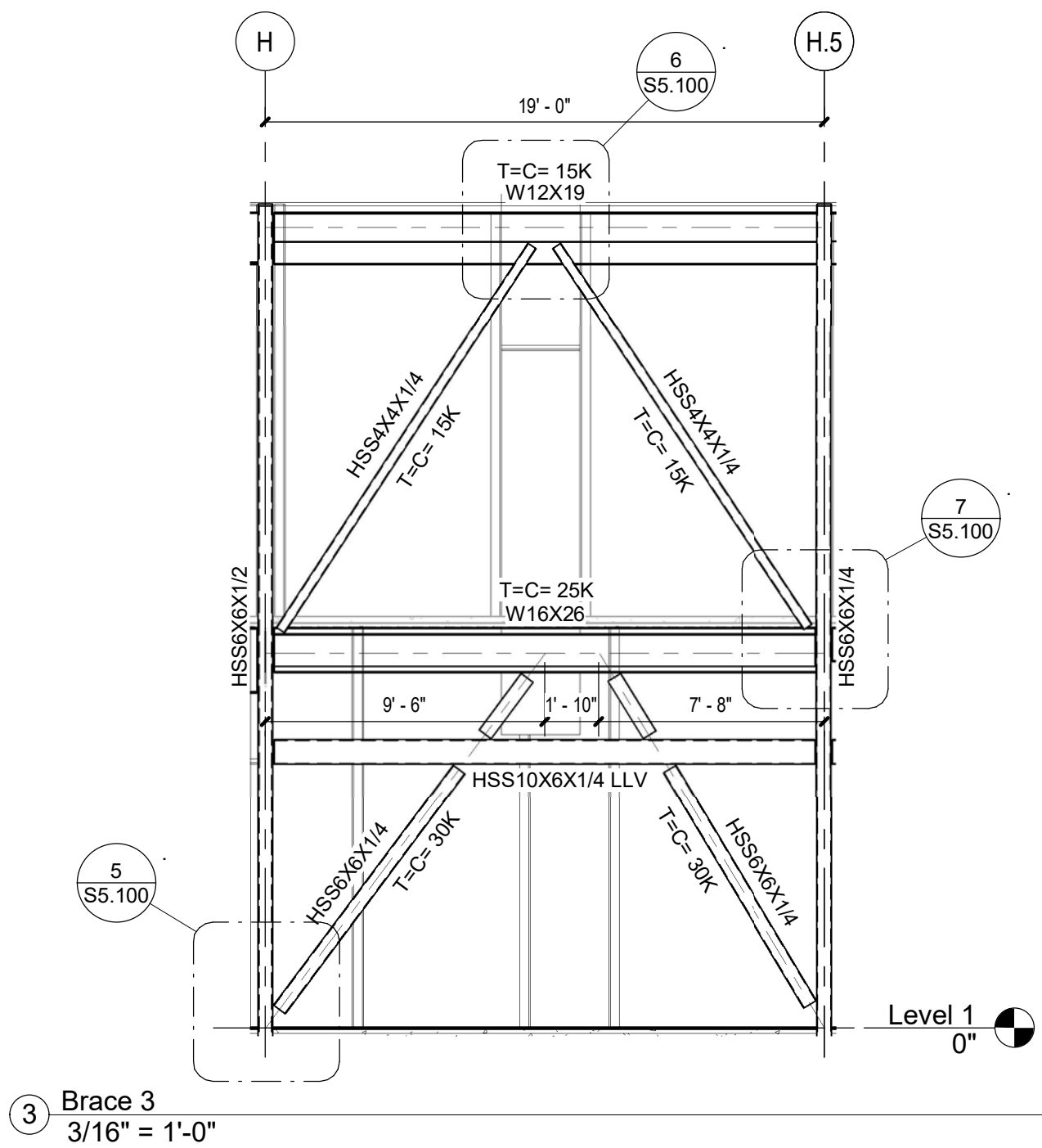
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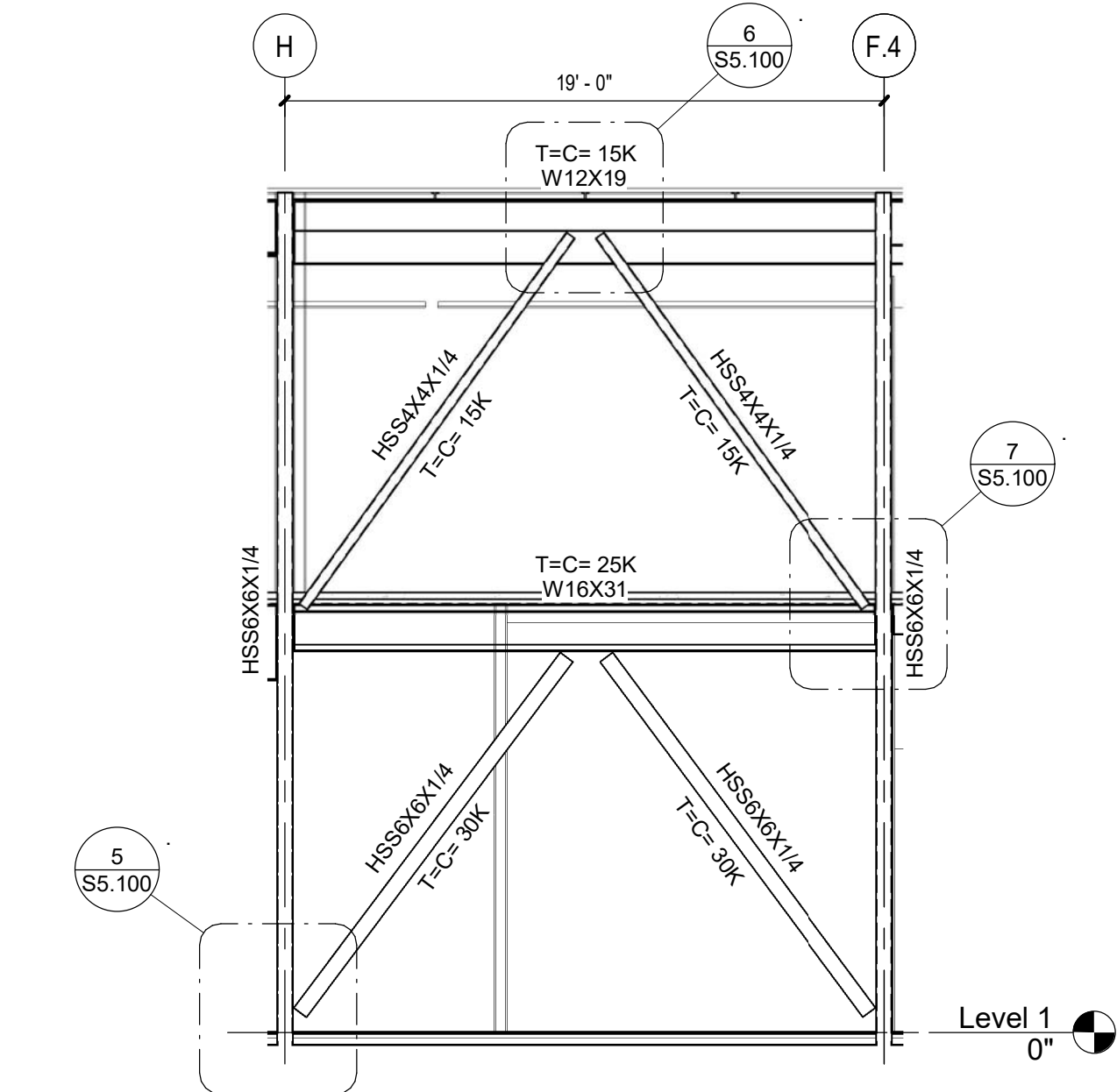
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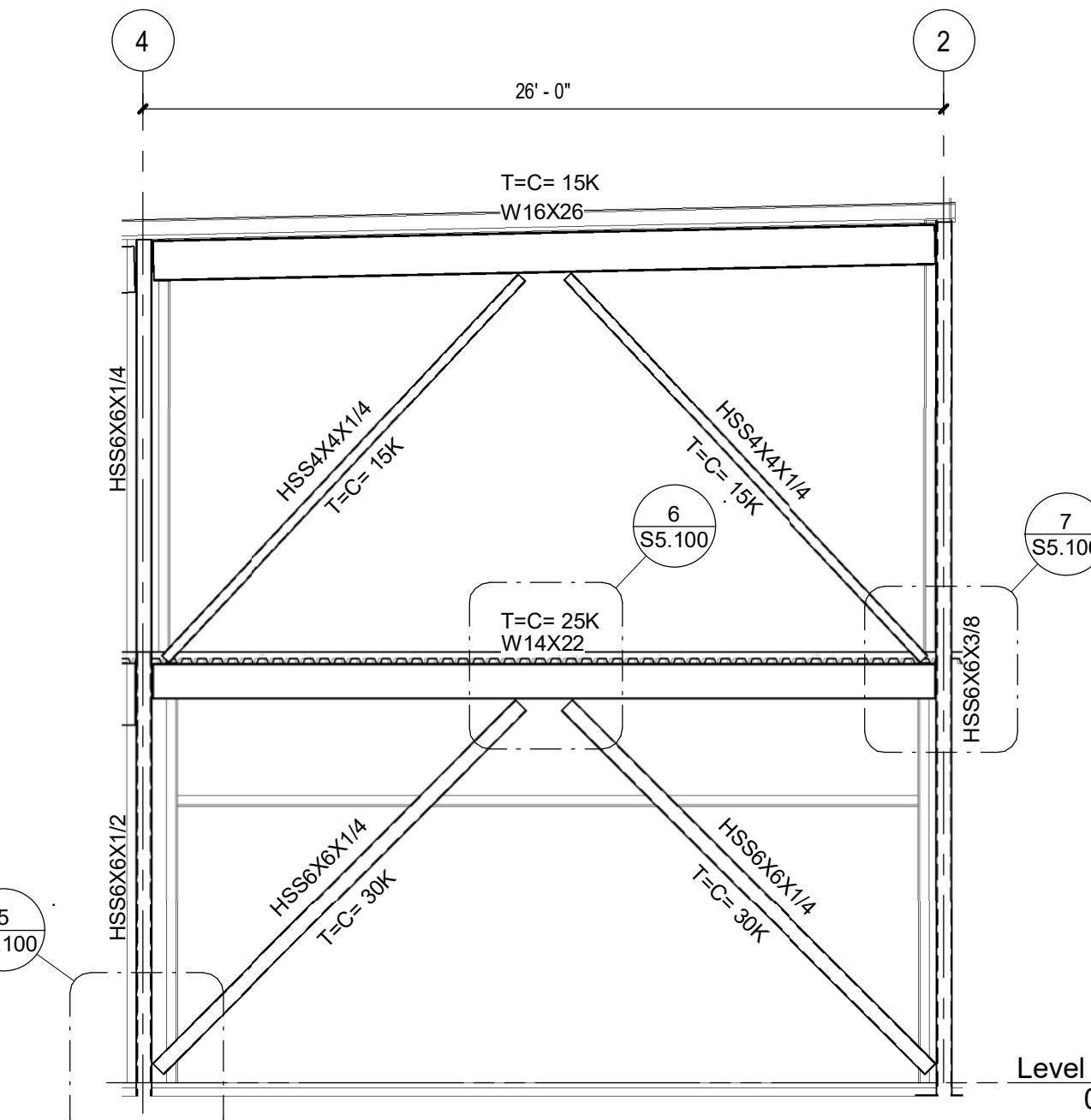

**S5.100**  
Brace Elevations  
and Details



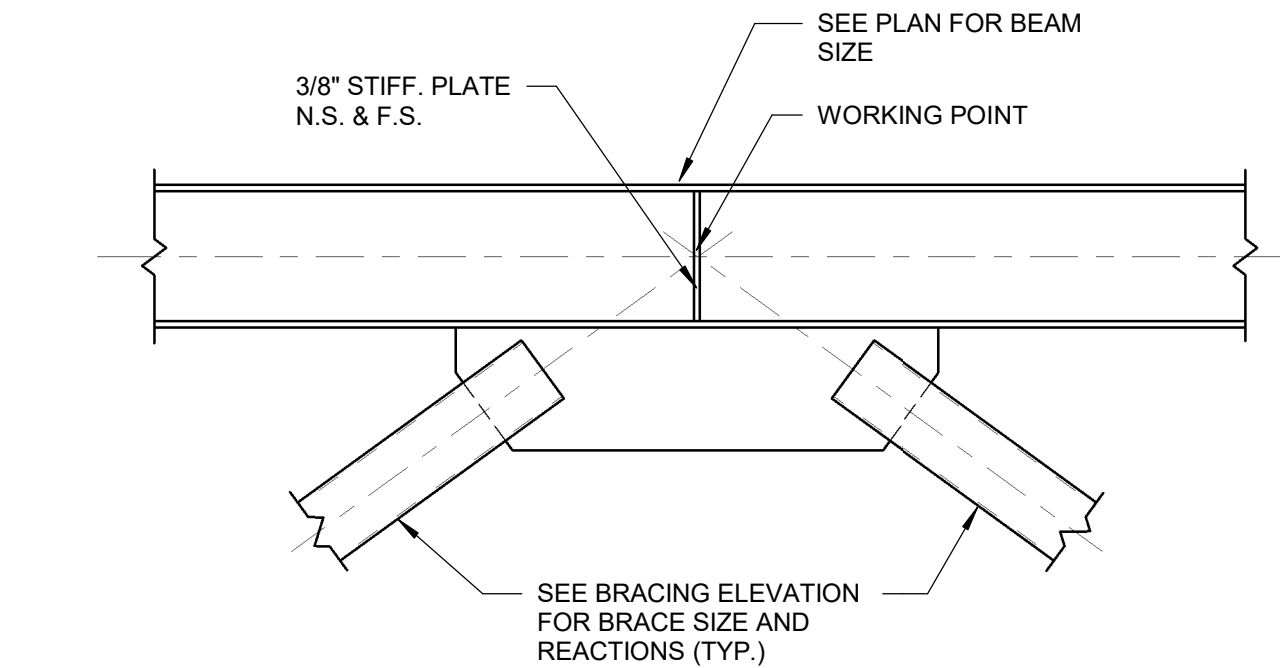
③ Brace 3  
3/16" = 1'-0"



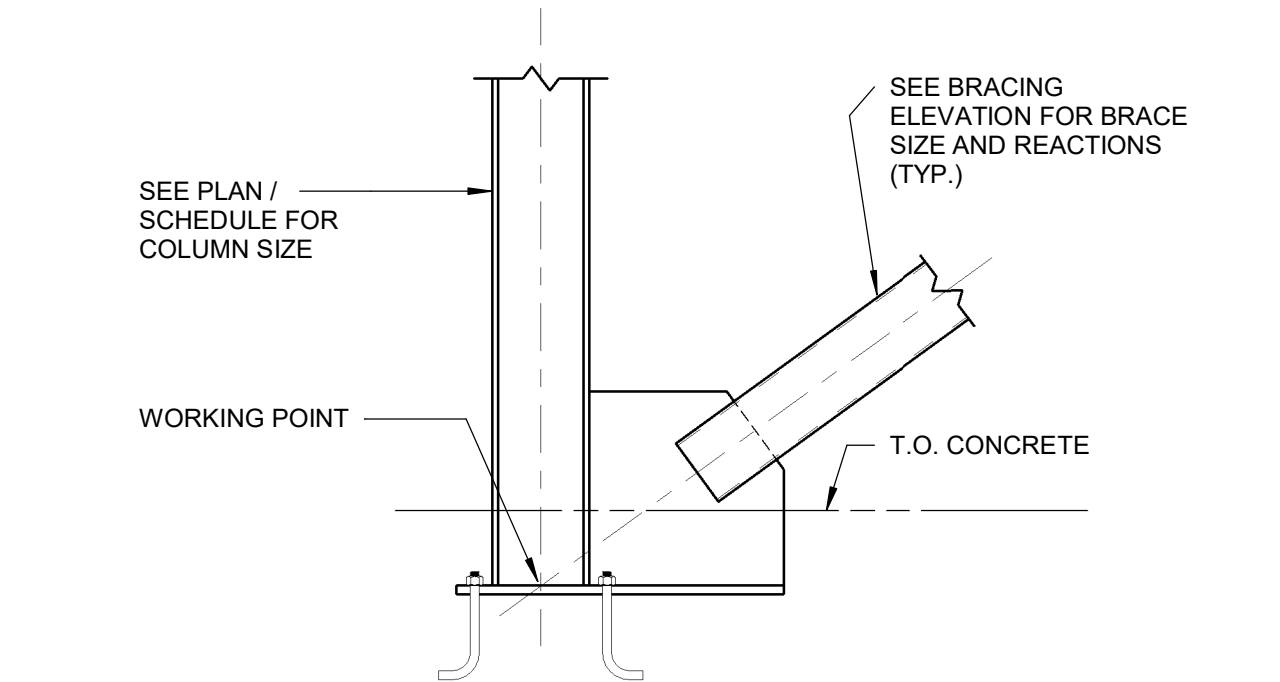
② Brace 2  
3/16" = 1'-0"



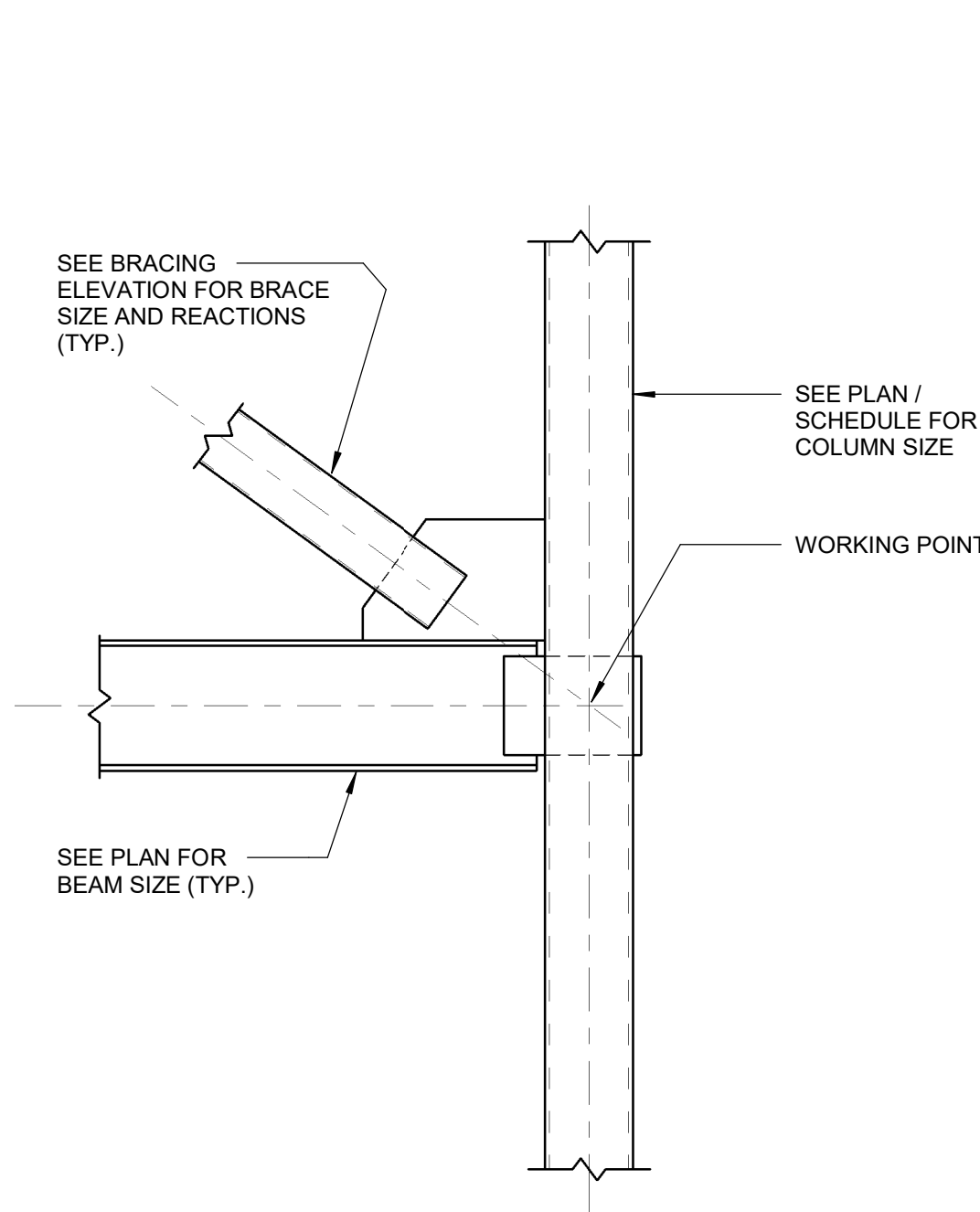
① Brace 1  
3/16" = 1'-0"



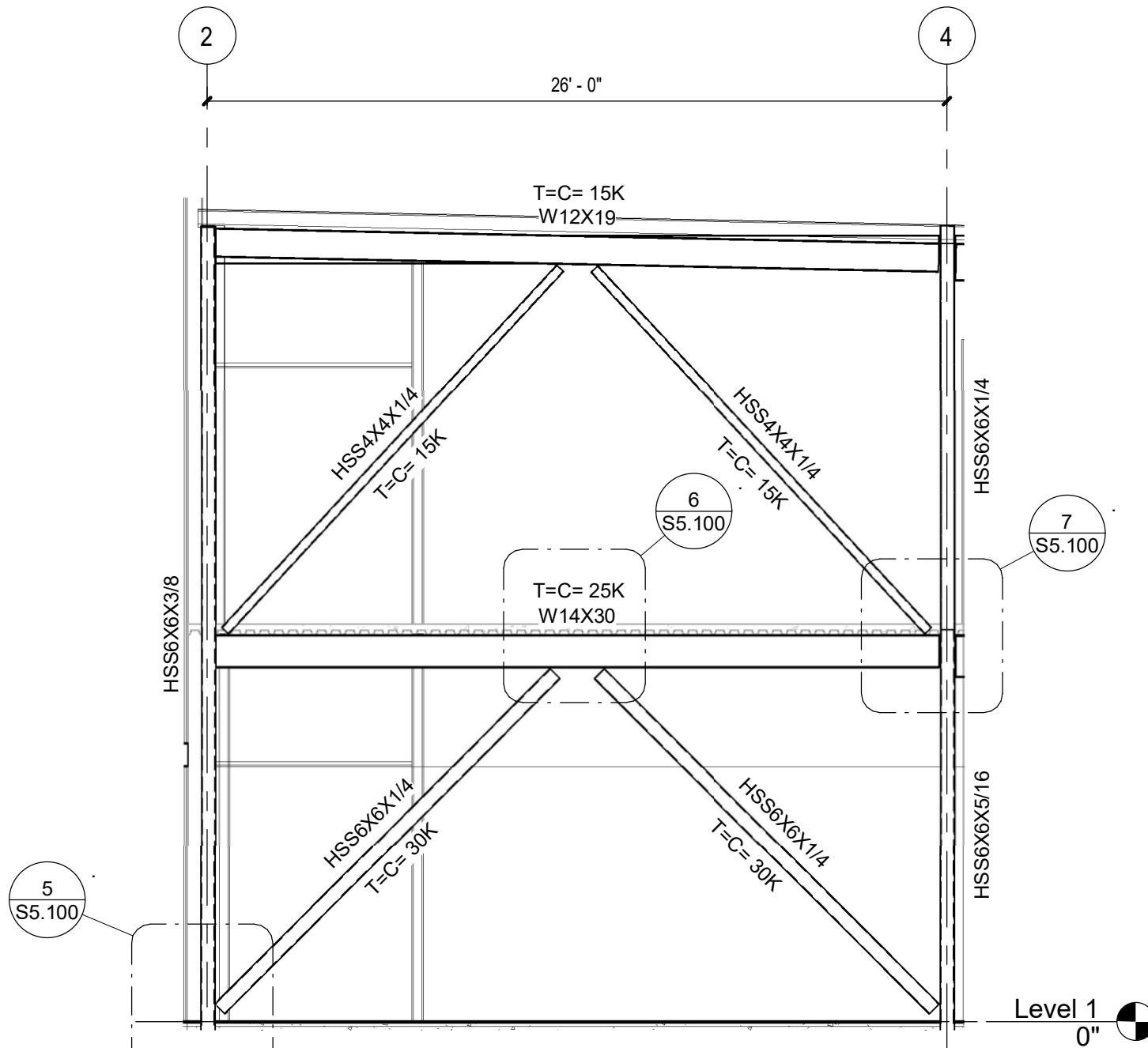
⑥ Brace Detail  
3/4" = 1'-0"



⑤ Brace Detail  
3/4" = 1'-0"



⑦ Brace Detail  
3/4" = 1'-0"



④ Brace 4  
3/16" = 1'-0"

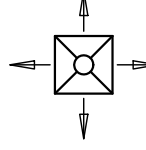


MEP SPECIFICATIONS: (NOT ALL SECTIONS USED)		
A. SCOPE		
1. WORK INCLUDED: FURNISH ALL LABOR, MATERIALS, SERVICES, TESTING, TRANSPORTATION, AND EQUIPMENT NECESSARY FOR AND REASONABLY INCIDENTAL TO THE PROPER AND SATISFACTORY INSTALLATION OF THE MEP IMPROVEMENTS TO THE BUILDING INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN.		
2. EXECUTION: ALL WORK SHALL BE EXECUTED IN WORKMANLIKE MANNER AND SHALL INCLUDE ALL LABOR AND MATERIALS ESSENTIAL TO PROVIDE COMPLETE AND FUNCTIONING SYSTEMS AS DESCRIBED. IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE PURCHASE, FABRICATION, OR INSTALLATION.		
B. GENERAL REQUIREMENTS		
1. DRAWINGS:		
a. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS AND ACCESSORIES WHICH MAY BE REQUIRED. CONTRACTOR SHALL CAREFULLY INVESTIGATE THE CONDITIONS SURROUNDING INSTALLATION OF HIS WORK AND SHALL FURNISH THE NECESSARY FITTINGS WHICH MAY BE REQUIRED TO COMPLETE THE INSTALLATION.		
b. THE DRAWINGS WERE PREPARED FROM THE BEST INFORMATION AVAILABLE AND ATTEMPT TO GIVE REASONABLE INDICATION OF EXISTING UTILITIES. HOWEVER, BEFORE BEGINNING WORK, THE CONTRACTOR SHALL VERIFY, IN THE FIELD, THE LOCATION OF THE EXISTING UTILITIES.		
2. CODES, RULES, AND REGULATIONS: COMPLY WITH THE MOST RECENTLY REVISED VERSIONS OF ALL APPLICABLE LAWS, RULES, REGULATIONS, AND ORDINANCES OF FEDERAL, STATE, DISTRICT AND LOCAL AUTHORITIES. MODIFICATIONS REQUIRED BY THE ABOVE SAID AUTHORITIES SHALL BE MADE WITHOUT ADDITIONAL CHARGE TO THE OWNER. ALL EQUIPMENT SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF LAWS, CODES, ORDINANCES, LEGISLATION, ETC., OF ALL FEDERAL, STATE, DISTRICT AND LOCAL AUTHORITIES, WHETHER INDICATED ON THE CONTRACT DOCUMENTS OR NOT.		
3. PERMITS, FEES, AND LICENSES: FEES, PERMITS AND LICENSES REQUIRED BY THE LEGALLY CONSTITUTED AUTHORITIES FOR INSTALLATION OF THE WORK ACCORDING TO THE PLANS AND SPECIFICATIONS SHALL BE OBTAINED AND PAID FOR BY THIS CONTRACTOR WHO SHALL DELIVER THE ABOVE MENTIONED CERTIFICATES TO THE OWNER'S REPRESENTATIVE.		
4. COORDINATION: NEW DUCTWORK, CONDUIT AND PIPING SHOWN ON DRAWINGS SHALL BE INSTALLED AS HIGH AS POSSIBLE. CONTRACTORS SHALL COORDINATE DUCTWORK, CONDUIT, AND PIPING INSTALLATION WITH LIGHTING FIXTURES, SPECIAL CEILING CONSTRUCTION, AIR DISTRIBUTION EQUIPMENT, ETC., AND PROVIDE ADDITIONAL RISES, DROPS, AND OFFSETS AS REQUIRED. IF INSTALLED NEW DUCTWORK, CONDUIT, OR PIPING IS FOUND TO BE IN CONFLICT WITH ARCHITECTURAL OR MEP ELEMENTS WHICH ARE EITHER EXISTING OR SHOWN ON THE CONTRACT DOCUMENTS, THE DUCTWORK, CONDUIT, OR PIPING SHALL BE RELOCATED WITHOUT ADDITIONAL COST.		
5. ACCESS: PROVIDE FREE AND CLEAR ACCESS TO EXISTING OR NEW EQUIPMENT FOR MAINTENANCE. NOTHING SHALL INHIBIT THE REMOVAL OF ACCESS PANELS ON THE BOTTOM OF OR ON THE SIDES OF EQUIPMENT, OR INHIBIT ACCESS TO THE POWER SWITCH OR CONTROL EQUIPMENT MOUNTED ON THE EXTERIOR OF THE EQUIPMENT. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: BEAMS, WALLS, LIGHT FIXTURES, PIPING OF ANY KIND, CONDUIT, AND CEILING SUPPORTS (OTHER THAN RUNNERS). PROVIDE ACCESS DOORS AT ALL HARD CEILING LOCATION WHERE ACCESS TO M.E.P. ITEMS IS REQUIRED FOR ADJUSTMENTS, ON/OFF AND OTHER SERVICE MODIFICATIONS. (ELMDOR OR EQUAL).		
6. EQUIPMENT SHALL BE IDENTIFIED BY MEANS OF NAMEPLATES PERMANENTLY ATTACHED TO THE EQUIPMENT. NAMEPLATES SHALL BE BLACK SURFACE, WHITE CORE LAMINATED BAKELITE WITH ENGRAVED LETTERS. PLATES SHALL BE A MINIMUM OF 3" LONG BY 1" WIDE WITH WHITE LETTERS 1/4" HIGH. NAMEPLATE DESIGNATIONS SHALL CORRESPOND TO THE IDENTIFICATION ON THE CONTRACT DRAWINGS.		
C. EXAMINATION OF PREMISES		
1. BEFORE PRICING THIS WORK, CONTRACTORS SHALL MAKE A CAREFUL EXAMINATION OF THE PREMISES AND SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH THE REQUIREMENTS OF THE CONTRACT AND BY THE ACT OF SUBMITTING A PRICE FOR THE WORK INCLUDED IN THIS CONTRACT, THE CONTRACTOR SHALL BE DEEMED TO HAVE MADE SUCH A STUDY AND EXAMINATION AND THAT HE IS FAMILIAR WITH AND ACCEPTS ALL CONDITIONS OF THE SITE.		
2. AFTER REVIEW OF THE SITE, THE CONTRACTOR SHALL INCLUDE IN HIS PRICE THE COST OF REPLACEMENT, REPAIR, RELOCATION OR REMOVAL OF EXISTING MEP ELEMENTS AS REQUIRED TO COMPLETE INSTALLATION OF ALL SYSTEMS SHOWN ON THESE DRAWINGS. ALL UNUSED EQUIPMENT SERVING THIS AREA SHALL BE REMOVED AND RETURNED TO THE OWNER'S STOCK. SOME WORK SHOWN MAY REQUIRE PREMIUM TIME TO AVOID DISRUPTION OF OTHER ACTIVITIES AND MEP SERVICES. CONTRACTOR SHALL CONFIRM THE REQUIREMENTS FOR PREMIUM TIME OR SPECIAL PROCEDURES WITH THE OWNER AND INCLUDE THE COST IN HIS PRICE.		
D. SUBMITTAL OF MATERIALS AND EQUIPMENT		
1. AS SOON AS POSSIBLE AND WITHIN 14 DAYS AFTER AWARD OF THE CONTRACT, AND BEFORE THEIR PURCHASE, CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOUR BOUND BOOKLETS CONTAINING A COMPLETE LIST OF MATERIALS, SPECIALTIES AND EQUIPMENT HE INTENDS TO FURNISH FOR THE INSTALLATION. SEE ARCH. SPECS FOR SUBMITTAL PROCEDURES.		
E. GUARANTEES		
1. THE CONTRACTOR SHALL GUARANTEE HIS WORK UNCONDITIONALLY FOR A PERIOD OF ONE (1) YEAR AFTER FINAL ACCEPTANCE. IF, DURING THIS PERIOD, ANY MATERIALS, EQUIPMENT, OR ANY PART OF THE SYSTEM FAILS TO FUNCTION PROPERLY, THE CONTRACTOR SHALL MAKE GOOD THE DEFECTS PROMPTLY AND WITHOUT ANY EXPENSE TO THE OWNER.		
2. AT COMPLETION OF PROJECT THE CONTRACTOR SHALL DELIVER 1 SET OF REPRODUCIBLE MEP AS-BUILT DRAWINGS, DIMENSIONS AND LOCATIONS OF ALL WORK SHALL BE CLEARLY IDENTIFIED. THE DRAWINGS SHALL BE LABELLED AS "AS-BUILTS" AND THE ENGINEER'S NAME SHALL BE BLACKED OUT.		
F. TESTING AND BALANCING		
1. AIR BALANCE PROCEDURES SHALL BE PERFORMED BY A NATIONAL ENVIRONMENTAL BALANCING BUREAU OR ASSOCIATED AIR BALANCE COUNCIL CERTIFIED, TESTING AND BALANCING CONTRACTOR(S) IN ACCORDANCE WITH THE CURRENT EDITION OF THE NEBB "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR THE ASAC NATIONAL STANDARDS. A FINAL BALANCE REPORT SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW.		
2. AIR BALANCE AND ADJUSTING:		
a. SUPPLY AND EXHAUST AIR SYSTEMS INSTALLED IN FINISHED AREAS OF THE BUILDING SHALL BE BALANCED AND ADJUSTED TO DELIVER THE VOLUME OF AIR AT EACH AIR OUTLET OR INLET WITHIN 10% OF DESIGN FLOW AS SHOWN ON THE DRAWINGS. AIR OUTLETS SHALL BE BALANCED WITH AIR PATTERN AS SHOWN ON THE DRAWINGS. ALL ZONES OR PORTIONS THEREOF SERVING OTHER SPACES AND WHICH MAY BE AFFECTED BY THE PROJECT SHALL BE TRAVERSED PRIOR TO CONSTRUCTION. THE FINAL AIR BALANCE SHALL RESTORE THESE AIR QUANTITIES. BEFORE AND AFTER AIR QUANTITIES SHALL BE LISTED IN THE AIR BALANCE REPORT.		
G. MATERIALS AND EQUIPMENT – MECHANICAL		
1. DUCTWORK		
a. THE SHEET METAL DUCTWORK INSTALLED IN THIS PROJECT SHALL BE OF THE LOW PRESSURE TYPE.		
b. THE EXECUTION OF THE WORK SHALL BE IN STRICT ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE AND WITH THESE SPECIFICATIONS. DUCTWORK LEAKAGE IN EXCESS OF 5% WILL NOT BE ACCEPTABLE. UNLESS OTHERWISE INDICATED OR SPECIFIED ALL SHEET METAL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE, FIRST EDITION, 1985, PUBLISHED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC., AND HEREIN REFERENCED AS THE SMACNA MANUAL.		
c. DUCTWORK SHALL BE CONSTRUCTED OF "LOCK FORMING QUALITY" GALVANIZED STEEL. DUCTWORK SHALL BE CONSTRUCTED FOR + OR - 2" W.G. PRESSURE (SUPPLY OR EXHAUST), 2500 FPM VELOCITY, SEAL CLASS A. ALL STEEL SHEETS SHALL HAVE A HOT DIPPED GALVANIZED COATING WHICH THAT COMPLIES WITH THE G90 SECTION OF ASTM A525 AND ASTM 90. NO JOINT OR REINFORCEMENT MEMBER SHALL BE INSTALLED UNDER ANY BEAM, NO JOINT JOINT OR REINFORCEMENT MEMBER SHALL EXCEED 1-1/2" IN HEIGHT. PROVIDE SEALANT AS REQUIRED SO THE LEAKAGE RATES SPECIFIED ARE NOT EXCEEDED. SEALANT SHALL BE WATER-BASED, AND NEITHER TOXIC NOR FLAMMABLE IN A WET OR DRY STATE.		
d. DUCT SIZES INDICATED ARE THE INSIDE CLEAR DUCT DIMENSIONS.		
e. HINGED ACCESS DOORS SHALL BE FURNISHED AND INSTALLED IN DUCTWORK FOR REQUIRED ACCESS AND FOR FIRE DAMPERS.		
f. PROVIDE TURNING VANES IN ALL 90 DEGREE ELBOWS. TURNING VANES SHALL BE DOUBLE FIN TYPE WITH 2" INSIDE RADIUS FOR SMALL VANES (FIGURE 2-3) AND 4-1/2" INSIDE RADIUS FOR LARGE VANES (FIGURE 2-3).		
g. ROUND SHEET METAL DUCTWORK SHALL BE IN ACCORDANCE WITH FIGURES 3-1 THROUGH 3-5 OF THE SMACNA MANUAL. DRAW BAND JOINT CONNECTION WILL NOT BE ACCEPTABLE.		
h. FLEXIBLE CONNECTION SHALL BE PROVIDED IN DUCTWORK CONNECTED TO THE INLETS AND/OR OUTLETS OF ALL AIR HANDLING UNITS, FANS, ETC.. THE MATERIAL SHALL BE CLASSIFIED BY UNDERWRITERS' LABORATORIES AS NON-COMBUSTIBLE FOR THE FABRIC AND FIRE RETARDANT FOR THE COATING. ENDS OF FABRIC MUST BE OVERLAPPED 2" AND GLUED. SEWING OR STAPLING WILL NOT BE ACCEPTABLE. AT LEAST ONE INCH SLACK SHALL BE ALLOWED IN ALL FLEXIBLE CONNECTION INSTALLATIONS TO INSURE THAT NO VIBRATION IS TRANSMITTED.		
i. FLEXIBLE DUCT SHALL BE PROVIDED IN DUCTWORK CONNECTED TO THE VARIOUS AIR OUTLETS, ETC., AS SHOWN ON THE DRAWINGS. MAXIMUM LENGTH SHALL BE 6'-0". FLEXIBLE DUCT SHALL BE A FACTORY GLASS FIBER INSULATED ASSEMBLY WITH VAPOR BARRIER JACKET. IT SHALL REQUIRE NO MORE THAN TWO 90 DEGREE ELBOWS AS INSTALLED. THE FLEXIBLE DUCT ASSEMBLY SHALL BE LISTED CLASS 1 BY THE UNDERWRITERS' LABORATORY AT A FLAME SPREAD OF NOT OVER 25 AND A SMOKE DEVELOPED RATE OF NOT OVER 50 AND SHALL COMPLY WITH NFPA STANDARD 90A. FLEXIBLE DUCT CLAMPS SHALL BE STAINLESS STEEL WITH SWIVEL ACTION SCREW OR 100% NYLON SELF-LOCKING CLAMP. IF IT COMPLIES WITH THESE SPECIFICATIONS, (R-VALUE MUST BE R-6 OR GREATER INSIDE BUILDING ENVELOPE, R-8 OR GREATER OUTSIDE BUILDING ENVELOPE). FLEXIBLE DUCT MANUFACTURED BY GENFLEX TYPE SLR-25VM, THERMAFLEX TYPE M-KC, OR FLEXMASTER (TYPE TL-V OR TL-M) WILL BE ACCEPTABLE.		
2. AIR DISTRIBUTION EQUIPMENT		
a. FURNISH AND INSTALL ALL AIR DEVICES, DIFFUSERS, GRILLES, REGISTERS, AND CEILING OUTLETS AS INDICATED ON THE DRAWINGS AND AS REQUIRED FOR PROPER DISTRIBUTION OF CONDITIONED AIR WITHIN THE CONDITIONED SPACE AND FOR RETURN OF CONDITIONED AIR FROM THE CONDITIONED SPACE TO THE VARIOUS AIR CONDITIONING SYSTEMS. THE CONTRACTOR SHALL VERIFY THAT THE LOCATION OF CEILING AND WALL MOUNTED AIR CONDITIONING SLOTS, DIFFUSERS, GRILLES, AND REGISTERS SHOWN ON THE DRAWINGS ARE ACCEPTABLE TO THE ARCHITECT PRIOR TO INSTALLATION.		
b. ALL GRILLES, REGISTERS, LINEAR DIFFUSERS, SLOT DIFFUSERS, AND CEILING OUTLETS SHALL BE SIMILAR AND APPROVED EQUAL TO THE TYPES INDICATED ON THE DRAWINGS.		
c. SPECIAL FINISH REQUIREMENTS: WHERE EXPOSED TO VIEW, ALL AIR DELIVERY OR RETURN DEVICES WITH FACTORY APPLIED BAKED ENAMEL FINISH MUST CONFORM TO STANDARD COLOR SAMPLE SUPPLIED BY THE ARCHITECT. IF REQUESTED, FULL SIZE FINISHED SAMPLES OF TYPICAL DEVICE OF EACH TYPE AND COLOR SHALL BE DELIVERED TO THE ARCHITECT FOR WRITTEN APPROVAL. NO DEVICES SHALL BE PAINTED UNTIL SAMPLES ARE APPROVED.		
d. OUTLETS MANUFACTURED BY TITUS, KRUEGER, ANEMOSTAT, AIR DEVICES, CARNES, PRICE, NALOR OR METALAIRES SYSTEMS WILL BE ACCEPTABLE IF THE EQUIPMENT FURNISHED COMPLIES WITH THESE SPECIFICATIONS.		
3. THERMAL INSULATION FOR DUCTWORK		
a. ALL SUPPLY & RETURN DUCTWORK AND ALL ROUND AND FLEXIBLE DUCTWORK NOT FACTORY INSULATED SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS FLEXIBLE BLANKET TYPE INSULATION 1.0 POUND DENSITY, 2" THICK WITH OR WITHOUT FACING. THE INSULATION SHALL BE SECURED TO THE DUCTS WITH ADHESIVE APPLIED IN 6" WIDE STRIPS ON APPROXIMATELY 12" CENTERS. FIBERGLASS TYING CORD SHALL BE USED FOR SECURING INSULATION UNTIL THE ADHESIVE SETS. (R-VALUE MUST BE R-6 OR GREATER INSIDE BUILDING ENVELOPE, R-8 OR GREATER OUTSIDE BUILDING ENVELOPE)		
4. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL OR ASTM B88-72 TYPE "L" HARD DRAWN COPPER WITH ASTM B 32-76 GRADE 95TA TIN-ANTIMONY SOLDERED JOINTS. CONDENSATE DRAINS ABOVE FINISHED CEILINGS SHALL BE INSULATED AS SPECIFIED FOR HOT WATER PIPING EXCEPT 1" THICK. PUMPED OR GRAVITY CONDENSATE PIPING MAY BE COMBINED WITH LIKE SYSTEMS BUT NOT TOGETHER. PROVIDE CHECK VALVES ON COMBINED PUMPED CONDENSATE DRAIN PIPING SYSTEMS. SIZES SHALL BE IN ACCORDANCE WITH THE APPLICABLE CITY MECHANICAL CODE, LATEST VERSION FOR CHART OF COMBINING CONDENSATE WASTE.		
5. DOMESTIC COLD WATER PIPING ABOVE CEILINGS AND/OR EXPOSED TO FREEZING SHALL BE INSULATED WITH 3/4" ARMSTRONG ARMAFLEX II OR RUBATEX R1800 FS 25/50 RATED FLEXIBLE ELASTOMERIC SHEET INSULATION (ASTM C34). ADHESIVE SHALL BE ARMSTRONG 520 OR RUBATEX 373. EXTERIOR EXPOSED INSULATION SHALL BE COVERED WITH ALUMINUM JACKETING.		
6. ALL HOT WATER PIPING SHALL BE INSULATED WITH ASTM C547 1-1/2" THICK GLASS FIBER PIPE INSULATION WITH THERMAL CONDUCTIVITY (K-FACTOR) NOT EXCEEDING 0.23 BTU. IN/HR PER SQUARE FOOT PER OPEN ENDS OF THE PIPE INSULATION SHALL BE INSULATED WITH CELLULAR GLASS INSULATION. INSULATION SHALL BE THOROUGHLY VAPOR SEALED WITH FOSTER 30-35 OR CHILDERS VAPOR CP30 LO BARRIER MASTIC. ADHESIVE SHALL BE FOSTER 85-75 OR CHILDERS CP 82.		
7. ALL REFRIGERANT PIPING SHALL BE INSULATED WITH ARMSTRONG ARMAFLEX II OR RUBATEX R FLEXIBLE ELASTOMERIC SHEET INSULATION (ASTM C34). ADHESIVE SHALL BE ARMSTRONG 520 OR RUBATEX 373. EXPOSED INSULATION SHALL BE COVERED WITH ALUMINUM JACKETING. INSULATION THICKNESSES SHALL BE IN ACCORDANCE WITH THE ENERGY CODE REQUIREMENTS.		
8. ALL SUSPENDED HVAC EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS USING ALL THREAD STEEL RODS AND VIBRATION ISOLATORS. COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS WITH THE STRUCTURAL ENGINEER.		
H. MATERIALS AND EQUIPMENT – ELECTRICAL		
1. METALLIC CONDUIT		
a. METALLIC CONDUIT AND MISCELLANEOUS MATERIALS SHALL BE AS FOLLOWS:		
1) ELECTRICAL METALLIC TUBING (EMT):		
a) EMT SHALL BE FORMED WITH A SUFFICIENT DEGREE OF ACCURACY TO PERMIT THE USE OF CONNECTORS. EMT SHALL BE JOINED WITH MIDWEST CATALOG NOS. 460-469 COUPLINGS. CONDUITS SHALL BE SECURED WITH MIDWEST CATALOG NOS. 450-459 OR APPROVED EQUAL STEEL SET SCREW TYPE CONNECTORS AT PANELS, JUNCTION BOXES, OUTLETS, ETC.		
b) AT THE CONTRACTOR'S OPTION, METALLIC TUBING USING "UNI-COUPLE" TYPE CONNECTORS MAY BE USED INSTEAD OF TUBING AND INDIVIDUAL COUPLINGS.		
c) EMT AND FITTINGS SHALL MEET IN ALL RESPECTS UNDERWRITERS LABORATORIES STANDARD FOR ELECTRICAL METALLIC TUBING, CURRENT EDITION.		
2) FLEXIBLE CONDUIT		
a) FLEXIBLE METALLIC CONDUIT SHALL BE STEEL AND SHALL BE USED FOR FINAL CONNECTIONS ONLY TO MOTORS, TRANSFORMERS, CONTROL EQUIPMENT AND DEVICES, LIGHTING FIXTURES NOT CONNECTED BY RIGID CONDUIT, APPLIANCES, AND EQUIPMENT AND DEVICES REQUIRING ADJUSTMENT OR REMOVAL FOR MAINTENANCE.		
b) CONTINUITY OF THE EQUIPMENT GROUND ACROSS FLEXIBLE CONDUIT CONNECTIONS SHALL BE MAINTAINED FOR ALL SYSTEMS THAT ARE OVER 150 VOLTS TO GROUND. THE CONTINUITY SHALL BE MAINTAINED BY INSTALLING A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH TABLE 250-95 OF THE 1975 NATIONAL ELECTRICAL CODE. IN CONDUIT SIZES 1-1/4" AND SMALLER AND LENGTHS OF 6 FEET OR LESS, FLEXIBLE CONDUIT UL RATED AS A GROUNDING CONDUCTOR MAY BE USED IN LIEU OF A FLEXIBLE METALLIC CONDUIT AND SEPARATE GROUNDING CONDUCTOR AS DESCRIBED ABOVE.		
c) FLEXIBLE CONDUIT SHALL BE SECURED WITH MIDWEST CATALOG NOS. 1708-1715 OR APPROVED EQUAL INSULATED THROAT CLAMP.		
2. WIRE AND CABLE		
a. ALL WIRE AND CABLE SHALL BE OF SOFT DRAWN ANNEALED COPPER WIRE HAVING A CONDUCTIVITY OF NOT LESS THAN 98% OF THAT OF PURE COPPER. EACH WIRE AND CABLE SHALL BE CONTINUOUS WITHOUT WELD, SPLICED, OR JOINT THROUGHOUT ITS LENGTH BETWEEN PANELS, JUNCTION BOXES, PULL BOXES, ETC.		
b. ALL WIRE #8 AND LARGER SHALL BE STRANDED AND #10, #12, AND #14 WIRE SHALL BE SOLID. CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS SHALL NOT BE SMALLER THAN #12.		
c. ALL COPPER CONDUCTORS SHALL BE STANDARD CODE, TYPE "THW," "THHN" OR "THWN" INSULATED WIRE EXCEPT #12 BRANCH CIRCUITS OR AS OTHERWISE INDICATED ON THE DRAWINGS. BRANCH CIRCUIT CONDUCTORS #12 SHALL BE TYPE "TW," "THHN," OR "THWN," INSULATED WIRE.		
d. INSTEAD OF THE ABOVE, CONDUCTORS FOR LIGHTING AND RECEPTACLE HOMERUNS, AND FOR SWITCH CIRCUITS, IN CONCEALED FINISHED AREAS, MAY BE 3-WIRE (GND. INCLUDED) COPPER CONDUCTOR ARMOR-CLAD, FLEXIBLE CABLE WITH NO. 12 AWG COPPER TW OR THW INSULATED PHASE CONDUCTORS AND ONE NO. 12 AWG COPPER GROUND CONDUCTOR SUBJECT TO THE LOCAL BUILDING INSPECTION DEPARTMENT. CABLE RUNS MUST ORIGINATE FROM INDIVIDUAL JUNCTION BOXES (ONE PER CIRCUIT) LOCATED OUTSIDE OF ELECTRICAL ROOMS. CIRCUIT HOMERUNS FROM EACH JUNCTION BOX BACK TO THE PANEL SHALL BE IN CONDUIT AS SPECIFIED IN THE PARAGRAPHS ENTITLED "CONDUIT". ARMOR-CLAD TERMINATION FITTING SHALL BE SIMILAR AND APPROVED EQUAL TO MIDWEST NO. 640-V. FOUR AND FIVE WIRE COPPER CONDUCTOR ARMOR-CLAD FLEXIBLE CABLE SHALL BE SIMILAR TO THREE-WIRE CABLE SPECIFIED HEREIN, EXCEPT FOR ADDITIONAL COPPER CONDUCTORS. FLEXIBLE CABLE SHALL NOT BE PULLED DIRECTLY OUT OF PANELBOARDS. FLEXIBLE CABLE SHALL NOT BE USED FOR CIRCUITS WHICH SUPPLY EQUIPMENT LOCATED ON MORE THAN ONE FLOOR, INCLUDING STAIRWELL OR STANDBY LIGHTING CIRCUITS. IN ALL CASES, CABLE SHALL BE SUPPORTED BY AN APPROVED MEANS AT INTERVALS NOT EXCEEDING 4-1/2 FEET AND WITHIN 12 INCHES ON EACH SIDE OF EVERY OUTLET BOX OR FITTING AS REQUIRED BY THE NATIONAL ELECTRICAL CODE. 2-WIRE BX CABLEING IS UNACCEPTABLE.		
e. ALL WIRE SHALL BEAR THE STAMPED SEAL OF APPROVAL OF THE NATIONAL BOARD OF WIRE UNDERWRITERS. ALL WIRE SHALL BE PROPERLY CODED FOR IDENTIFICATION.		
3. LUGS, TAPS, AND SPLICES (600 VOLT)		
a. SPLICES AND TAPS ON BRANCH CIRCUITS SHALL OCCUR ONLY WHEN SUCH CIRCUITS DIVIDE AS SHOWN ON THE DRAWINGS AND SHALL CONSIST OF ONE "THROUGH" CIRCUIT TO WHICH THE BRANCH CIRCUIT SHALL BE SPLICED OR TAPPED. NO SPLICES SHALL BE MADE IN CONDUCTORS EXCEPT AT OUTLET BOXES, JUNCTION BOXES, OR SPLICE BOXES.		
b. ALL #8 AWG AND SMALLER CONDUCTORS SHALL BE SPLICED WITH SKOTCHLOK OR BUCHANAN B-CAP PREINSULATED SPRING CONNECTORS. NO OTHER TYPE OF MECHANICAL CONNECTOR MAY BE USED FOR SIZES #8 AND SMALLER WIRE.		
c. ALL #6 AWG AND LARGER COPPER CONDUCTORS, EXCEPT FOR LOAD SIDE LUGS ON PANELBOARDS, FUSIBLE SWITCHES, CIRCUIT BREAKERS, SMALL TRANSFORMERS HAVING WIRE PITGAILS, AND INDIVIDUAL MOTOR CONTROLLERS, SHALL BE TERMINATED, SPLICED, AND TAPPED WITH SERIES 54200 HIGH CONDUCTIVITY WROUGHT COPPER COLOR-KEYED COMPRESSION CONNECTORS AS MANUFACTURED BY THE THOMAS & BETTS COMPANY.		
d. SET SCREW TYPE CONNECTORS ARE NOT ACCEPTABLE, EXCEPT ON THE LOAD SIDE LUGS OF PANELBOARD CIRCUIT BREAKERS AND FUSIBLE SWITCHES, AND ON INDIVIDUAL MOTOR CONTROLLERS.		
4. SWITCHES		
a. ALL SWITCHES SHALL BE TYPE HD (HEAVY DUTY) AND SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC OR CUTLER-HAMMER-EATON, AND SHALL BE SUITABLE FOR VOLTAGES AS INDICATED ON THE DRAWINGS, AND SHALL HAVE PROVISIONS FOR PADLOCKING.		
5. FUSES		
a. ALL FUSED SWITCHES SHALL BE PROVIDED WITH CARTRIDGE FUSES WHICH SHALL BE OF THE KNIFE BLADE OR FERRULE TYPE WITH CAPACITIES AS SHOWN ON THE DRAWINGS. FUSES SHALL BE BUSS "FUSETRONS" FOR PROPER VOLTAGE (NO SUBSTITUTE).		
6. GROUNDING		
a. THE SYSTEM NEUTRAL ON INTERIOR WIRING SHALL BE KEPT ISOLATED FROM GROUNDING SYSTEMS THROUGHOUT THE BUILDING AND SHALL BE GROUNDED ONLY TO THE ELECTRIC SERVICE GROUND.		
b. EACH SYSTEM OF ELECTRICALLY CONTINUOUS METALLIC PIPING AND DUCTWORK SHALL BE ELECTRICALLY GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CODE FOR GROUNDING CONDUCTORS" AS THEY APPLY TO THE GROUNDING OF "CONDUCTOR ENCLOSURES AND EQUIPMENT ONLY." ISOLATED METALLIC PIPING AND DUCT SYSTEMS SHALL BE BONDED TO THE BUILDING EQUIPMENT GROUNDING SYSTEM.		
c. BONDING AND GROUNDING WIRES SHALL BE SIZED, SHALL BE RUN IN CONDUIT, AND SHALL BE CLAMPED TO VARIOUS SERVICES IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AUTHORITIES AND THE NATIONAL ELECTRICAL CODE.		
d. ALL EXPANSION JOINTS, POINTS OF ELECTRICAL DISCONTINUITY, OR CONNECTIONS IN CONDUIT WHERE FIRM MECHANICAL BOND IS NOT POSSIBLE SHALL BE BONDED WITH OZ TYPE "B" OR APPROVED EQUAL BONDING JUMPER. A FLEXIBLE BONDING JUMPER SHALL BE PROVIDED AROUND ISOLATING COUPLINGS AND SHALL BE SIMILAR AND APPROVED EQUAL TO OZ TYPE "B," MECHANICAL EQUIPMENT SHALL BE BONDED ELECTRICALLY TO THE BUILDING EQUIPMENT GROUNDING SYSTEM. THIS INCLUDES BUT IS NOT LIMITED TO FLEXIBLE DUCT CONNECTIONS, FANS, PUMPS, ETC.		
7. LINE VOLTAGE SWITCHES		
a. FURNISH AND INSTALL LINE VOLTAGE, FLUSH, HEAVY DUTY AC QUIET TYPE ROCKER HANDLE SWITCHES WHERE INDICATED ON THE DRAWINGS FOR THE CONTROL OF CERTAIN CIRCUITS. SWITCHES, UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS, SHALL BE FLUSH MOUNTED AND SIMILAR AND APPROVED EQUAL TO ONE OF THE FOLLOWING MANUFACTURERS: BRYANT, SIERRA, ARROW-HART (CROUSEHINDS), HUBBELL, PASS & SEYMOUR/LEGRAND, GENERAL ELECTRIC, OR LEVITON.		
8. FIRE ALARM SYSTEM (FIRE ALARM DESIGN DRAWINGS WILL BE DEFERRED SUBMITTALS TO AH)		
a. FIRE ALARM CONTRACTOR SHALL PROVIDE DESIGN PLANS TO BE SUBMITTED TO THE LOCAL AUTHORITY FOR APPROVAL PRIOR TO INSTALLATION AND THE INSTALLATION MUST BE APPROVED BEFORE THE CERTIFICATE OF OCCUPANCY MAY BE ISSUED.		
b. DETECT DETECTORS WILL BE FURNISHED AND INSTALLED BY THE FIRE ALARM CONTRACTOR, AND SHALL BE ZONED AS SPECIFIED.		
c. ALL SPACE SMOKE AND SPACE HEAT DETECTORS SHALL BE INDIVIDUALLY ADDRESSABLE SMOKE AND HEAT SENSORS. THE FIRE ALARM SYSTEM SHALL INCORPORATE ADDRESSABLE DETECTORS. THE SENSORS SHALL TRANSMIT ANALOG SIGNALS WHICH SHALL BE AVAILABLE FOR DISPLAY AT THE FIRE CONTROL PANEL. THE ALARM THRESHOLDS FOR THE SENSORS SHALL BE ADJUSTABLE WITHIN THE LIMITS DEFINED BY UL THROUGH MANUAL COMMANDS ISSUED BY AN AUTHORIZED OPERATOR VIA THE CONTROL PANEL OR AUTOMATICALLY BY EVENT INITIATED PROGRAMS INITIATED BY CALENDAR DATE, TIME OR INDIVIDUAL CHANGES OF STATE.		
d. THE STATUS OF ALL OTHER INDIVIDUAL INITIATION DEVICES SHALL EACH BE MONITORED BY A MODULE WHICH IS INDIVIDUALLY ADDRESSABLE AND SHALL TRANSMIT A NORMAL/ALARM STATUS SIGNAL.		
e. THE INDICATION AND CONTROL DEVICES SHALL BE CONNECTED TO CONVENTIONAL ZONE MODULES AND SHALL BE ZONED AS SPECIFIED.		
f. THE INTELLIGENT DEVICE COMMUNICATION BUSS SHALL BE FAULT TOLERANT SUCH THAT ANY FAULT ON THE LINE SHALL BE ANNUNCIATED AS A TROUBLE AT THE CONTROL PANEL AND A COMPLETE SEVERING OF THE BUSS SHALL NOT PREVENT THE RECEIPT OR TRANSMISSION OF ALARMS. THE BUSS SHALL SUPPORT UP TO 198 INDIVIDUAL DEVICES ON EACH LOOP.		
g. ALL OF THE DEVICES ON THE INTELLIGENT COMMUNICATION BUSS SHALL BE CAPABLE OF BEING IN ALARM SIMULTANEOUSLY WITHOUT DEGRADING THE SYSTEM PERFORMANCE.		
h. THE LOCAL PANEL FOR THE INTERFACE BETWEEN THE INTELLIGENT DEVICES AND THE CONTROL PANEL SHALL HAVE ADDITIONAL ABILITY TO INTERFACE TO THE INTELLIGENT SYSTEM AS DESCRIBED HEREIN.		
i. ALL EXPOSED FIRE ALARM WIRING SHALL BE RUN IN RIGID CONDUIT WHERE POSSIBLE AND CONCEALED FROM VIEW. ALL FIRE ALARM WIRING NOT EXPOSED (ABOVE CEILING & INSIDE WALLS) SHALL BE PLENUM RATED CABLEING, COLOR CODED.		
9. PLUG RECEPTACLES		
a. FURNISH AND INSTALL PLUG RECEPTACLES WHERE INDICATED ON THE DRAWINGS. INDOOR RECEPTACLES, UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS, SHALL BE FLUSH MOUNTED AND SIMILAR AND APPROVED EQUAL TO ONE OF THE FOLLOWING MANUFACTURERS: HUBBELL, ARROW-HART (CROUSE-HINDS), BRYANT, PASS & SEYMOUR/LEGRAND, GENERAL ELECTRIC, SIERRA, OR LEVITON.		
10. FLUSH WALL PLATES		
a. PROVIDE MATCHING PLASTIC WALL PLATES FOR ALL WIRING DEVICES INCLUDING MULTIPLE GANG PLATES WHERE REQUIRED.		
b. THE COLOR OF WIRING DEVICE WALL PLATES SHALL BE AS DESIGNATED BY THE ARCHITECT.		
11. EXPOSED, EXTERIOR AND MOIST LOCATION WALL PLATES		
a. PLATES FOR EXPOSED OR SURFACE MOUNTED BOXES SHALL BE OF THE GALVANIZED TYPE FOR INTERIOR USE AND CAST METAL TYPE WITH GASKETS AND COVERS FOR MOIST LOCATIONS AND EXTERIOR USE.		
12. PANELBOARDS – GENERAL		
a. PANELBOARDS SHALL BEAR THE LABEL OF UNDERWRITERS' LABORATORIES, INC.		
b. PANEL BUS SHALL BE ARRANGED TO ACCOMMODATE T&B COMPRESSION CONNECTORS AT THE MAIN LUG CONNECTION. SEE THE PARAGRAPHS ENTITLED "WIRE AND CABLE" FOR CONNECTOR SPECIFICATIONS. ATTACH THESE LUGS TO THE PANEL BUS WITH TWO BOLTS PER LUG. BOLTS SHALL BE CAPTIVE OR SHALL BE STUDS TO FACILITATE RE-INSTALLATION OF THE LUGS WITH THE WIRE ATTACHED. PROVIDE TYPEWRITTEN DIRECTORIES FOR ALL PANELBOARDS.		
c. IF IT COMPLIES WITH THESE SPECIFICATIONS, ONE OF THE FOLLOWING MANUFACTURERS WILL BE ACCEPTABLE: GENERAL ELECTRIC, SQUARED D, OR CUTLER/HAMMER-EATON.		
13. LIGHTING AND POWER PANELBOARDS		
a. PANELBOARDS FOR 120/208, 277/480 3 & 4 WIRE, 3 PHASE SERVICE SHALL BE GENERAL ELECTRIC, SQUARE D, OR CUTLER HAMMER – EATON OR AN APPROVED EQUAL.		
b. BUSBARS SHALL BE SIZED TO LIMIT THE TEMPERATURE RISE WITHIN THE PANELBOARD TO 50 DEGREE C OVER A 40 DEGREE C AMBIENT TEMPERATURE. ALL BUSBARS SHALL BE COPPER.		
c. PANELBOARDS SHALL BE BUSSED FOR ALL SWITCHES OR BREAKERS, INCLUDING SPARE SPACES. ALL BREAKERS SHALL BE EQUIPPED WITH THERMAL AND MAGNETIC TRIP ELEMENTS. ALL 2 AND 3 POLE BREAKERS SHALL HAVE COMMON TRIP ACTION AND SHALL BE INTERCHANGEABLE WITH SINGLE POLE BREAKERS.		
d. PANELBOARD MAIN LUGS CONNECTED TO #6 AWG OR LARGER COPPER CONDUCTORS SHALL BE FURNISHED TO ACCOMMODATE COMPRESSION CONNECTORS. ADEQUATE WIRING SPACE SHALL BE PROVIDED TO ACCOMMODATE THE COMPRESSION CONNECTORS.		
e. BREAKERS SERVING HVAC EQUIPMENT SHALL BE HACR RATED.		
f. PANELBOARDS SHALL HAVE INTEGRAL TVSS.		
14. GENERAL WIRING NOTES:		
a. EXPOSED RACEWAYS IN MECHANICAL AND ELECTRICAL ROOMS SHALL BE RIGID CONDUIT OR EMT AS REQUIRED BY CODE.		
b. SEPARATE HOME RUNS SHOWN ON THE DRAWING SHALL HAVE INDIVIDUAL PHASE AND NEUTRAL CONDUCTORS AS SHOWN ON THE DRAWINGS BROUGHT BACK TO THE PANELBOARD.		
c. FOR 20 AMP CIRCUITS, NOT MORE THAN 6 #12 THW OR 9 #12 THHN CURRENT CARRYING CONDUCTORS SHALL BE INSTALLED IN EACH RACEWAY.		
d. ALL 120V, 20 A. HOME RUNS LONGER THAN 100' SHALL BE #10 MINIMUM..		
e. ALL WIRING SYSTEMS (ELECTRICAL, FIRE ALARM, SECURITY, DOOR CTRL., ETC.) SHALL BE IN APPROVED CONDUIT.		
15. ALL LIGHTING FIXTURES SHALL BE SUPPORTED BY FIXTURE SUPPORT SYSTEM RODS OR WIRES, INDEPENDENT OF THE CEILING SUSPENSION DEVICES, FOR EACH FIXTURE. LOCATE NOT MORE THAN 6 INCHES FROM THE LIGHTING FIXTURE CORNERS		
16. OCCUPANCY LIGHTING CONTROLS:		
THE TYPES OF OCCUPANCY SENSOR LIGHTING CONTROL SYSTEMS REQUIRED INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING:		
1. WALL OR CEILING-MOUNTED (ULTRASONIC OR INFRARED) SENSOR/SWITCH UNITS.		
a. GENERAL: PROVIDE A COMPLETE AND OPERABLE PASSIVE INFRARED OCCUPANCY SENSOR LIGHTING CONTROL SYSTEM IN AREAS SHOWN ON THE DRAWINGS. SENSORS SHALL BE DESIGNED TO TURN ROOM LIGHTING "ON" IMMEDIATELY UPON SENSING A ROOM OCCUPANT, OR SHALL REQUIRE LIGHTING TO BE TURNED ON MANUALLY, AND SHALL TURN ROOM LIGHTING "OFF" IF NO ROOM OCCUPANT IS SENSED FOR THE ENTIRE PERIOD OF THE SENSORS OFF TIME DELAY, REGARDLESS OF THE SHAPE OF THE ROOM.		
b. SYSTEM COMPONENTS: OCCUPANCY SENSOR LIGHTING CONTROL SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL REQUIRED SENSORS, TRANSFORMERS, INTERFACE CONTROLS AND RELAYS, WIRING AND BYPASS SWITCHES.		
c. SENSORS REQUIREMENTS:		
1. SENSORS SHALL BE SELF-CONTAINED AND SHALL PROVIDE COVERAGE WITHOUT GAPS IN COVERAGE WITHIN THE CONTROLLED AREAS BY DETECTING CHANGES IN INFRARED ENERGY IN THE PROTECTED AREA.		
2. SENSORS SHALL HAVE BUILT IN TIMING AND LOAD CONTROL DRIVING CIRCUITRY. HOUSINGS SHALL BE WHITE IMPACT RESISTANT PLASTIC.		
3. COVERAGE OF SENSORS SHALL REMAIN CONSTANT AFTER SENSITIVITY CONTROL HAS BEEN SET. NO AUTOMATIC REDUCTION IN COVERAGE SHALL OCCUR WHEN AIR CONDITIONING OR HEATING FANS ARE OPERATING.		
4. ALL SENSORS SHALL HAVE EASILY ACCESSIBLE, USER-ADJUSTABLE CONTROLS FOR ADJUSTING SENSITIVITY OF A SENSOR TO ITS CONTROLLED AREA, AND FOR ADJUSTING "TIME TO LIGHT OFF" DELAY. TIME DELAY SHALL BE MADE SETTABLE DOWN TO 5 MINUTES. SENSORS MUST ALSO INCLUDE A TIME DELAY ADJUSTMENT OF ONE		

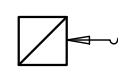


AIR DEVICE SCHEDULE

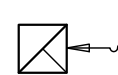


"SCO" DIFFUSER AND FLEX DUCT SCHEDULE

CFM	FACE SIZE	NECK SIZE	SYMBOL
0-130	24"x24"	6"ø	
131-240	24"x24"	8"ø	
241-380	24"x24"	10"ø	
0-130	12"x12"	6"ø	
141-240	12"x12"	8"ø	

"RAR" GRILLE AND FLEX DUCT SCHEDULE

CFM	FACE SIZE	NECK SIZE	SYMBOL
0-1000	24"x24"	15"ø OR 15"x15"	
0-175	12"x12"	6"x6"	

"EAR" GRILLE AND FLEX DUCT SCHEDULE

CFM	FACE SIZE	NECK SIZE	SYMBOL
0-175	24"x24"	6"x6"	
176-450	24"x24"	10"x10"	
0-200	12"x12"	6"x6"	
"SWR" GRILLE AND NECK SIZE SCHEDULE			
CFM	GRILLE SIZE	NECK SIZE	SYMBOL
0-125	7 3/4"x7 3/4"	6"x6"	
126-310	13 3/4"x7 3/4"	12"x6"	
"EXR" GRILLE AND NECK SIZE SCHEDULE			
CFM	GRILLE SIZE	NECK SIZE	SYMBOL
0-125	7 3/4"x7 3/4"	6"x6"	
126-275	13 3/4"x8 3/4"	12"x6"	
276-364	17 3/4"x7 3/4"	16"x6"	
365-540	19 3/4"x9 3/4"	18"x8"	

NOTES:

SCO'S SHALL BE "PRICE" MODEL SPD SQUARE CONE PLAQUE DIFFUSERS OF STEEL CONSTRUCTION UNLESS OTHERWISE NOTED. FACE SIZE SHALL BE 24" x 24", 24"x12" OR 12" x 12" (SEE PLANS). FRAMES TYPE SHALL BE SUITABLE FOR THE CEILING CONSTRUCTION WHERE GRILLES ARE LOCATED. BAKED ENAMEL FINISH. CFM'S AS ILLUSTRATED.

RAR'S SHALL BE "PRICE" MODEL SPD SQUARE CONE PLAQUE RETURN GRILLES OF STEEL CONSTRUCTION. FRAMES TYPE SHALL BE SUITABLE FOR THE CEILING CONSTRUCTION WHERE GRILLES ARE LOCATED. BAKED ENAMEL FINISH.






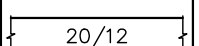
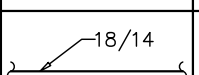




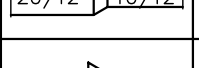






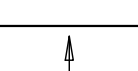
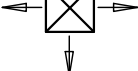





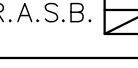

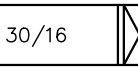


EAR'S SHALL BE "PRICE" MODEL ASDP SQUARE CONE PLAQUE RETURN GRILLES OF ALUMINUM CONSTRUCTION. FRAMES TYPE SHALL BE SUITABLE FOR THE CEILING CONSTRUCTION WHERE GRILLES ARE LOCATED. BAKED ENAMEL FINISH.

SWR'S SHALL BE "PRICE" MODEL 520 SIDEWALL SUPPLY REGISTER, STEEL CONSTRUCTION REGISTER WITH FRONT VERTICAL AND REAR HORIZONTAL ADJUSTABLE AIR FOIL TYPE BLADES ON 0.750" CENTERS. PROVIDE WITH AIR EXTRACTOR TO MATCH GRILLE, REMOVABLE CORE. BAKED ENAMEL FINISH, OPPOSED BLADED DAMPER.

SIDEWALL RETURN REGISTER "EXR": PRICE MODEL 530 STEEL CONSTRUCTION LOUVERED RETURN WITH FRONT HORIZONTAL FIXED BLADES ON 0.750" CENTERS. PROVIDE WITH REMOVABLE CORE. BAKED ENAMEL FINISH.

PROVIDE INSULATION ON TOP OF ALL DEVICES WHEN NOT INSTALLED IN A RETURN AIR PLENUM AND SUBJECT TO CONDENSATION FORMATION.

COLOR OF SCO DEVICES TO MATCH CEILING GRID. REFER TO ARCHITECTURAL FINISH SCHEDULE. APPROVED EQUAL DIFFUSERS AS MANUFACTURED BY TITUS, METALAIRE, CARNES, KRUEGER, NAILOR-HART OR TUTTLE & BAILEY WILL BE ACCEPTABLE.

MECHANICAL LEGENDS, SYMBOLS AND ABBREVIATIONS		MECHANICAL LEGENDS, SYMBOLS AND ABBREVIATIONS	
MARK	MANUFACTURER	MARK	MANUFACTURER
	CARBON DIOXIDE SENSOR		CONDENSATE DRAIN LINE
	RELATIVE HUMIDITY SENSOR		REFRIGERANT LINE
	TEMPERATURE SENSOR OR THERMOSTAT		DOUBLE LINE DUCTWORK
A.F.F.	ABOVE FINISHED FLOOR		SINGLE LINE RIGID DUCTWORK
DB/WB	DRY BULB/WET BULB		DOUBLE LINE DUCTWORK MITERED 90° ELBOW WITH TURNING VANES
BTUH	BRITISH THERMAL UNITS PER HOUR		SINGLE LINE DUCTWORK MITERED 90° ELBOW WITH TURNING VANES
CAP.	CAPACITY		DOUBLE LINE DUCTWORK LONG RADIUS ELBOW (UNLESS OTHERWISE NOTED)
CFM	CUBIC FEET PER MINUTE		SINGLE LINE DUCTWORK LONG RADIUS ELBOW (UNLESS OTHERWISE NOTED)
C.O.	CLEAN OUT		DOUBLE LINE DUCTWORK TRANSITION
CRAC	COMPUTER ROOM AIR CONDITIONER		SINGLE LINE DUCTWORK TRANSITION
DIA.	DIAMETER		SINGLE LINE FLEXIBLE DUCTWORK
EAT	ENTERING AIR TEMPERATURE		FLEXIBLE DUCTWORK CONNECTION
CU	CONDENSING UNIT		DOUBLE LINE DUCTWORK EQUAL SPLITTER WITH TURNING VANES
FT/MIN	FEET PER MINUTE		SIDE WALL AIR SUPPLY REGISTER (SWR)
	FIRE DAMPER		SLOT SUPPLY DIFFUSER (SSD)
H.P.	HORSE POWER		SUPPLY AIR DIFFUSER (SCO)
HTG	HEATING		RETURN AIR REGISTER (RAR)
IN.	INCHES		INLET ATTENUATOR SECTION (IAS)
IN. W.G.	INCHES WATER GAUGE		VARIABLE AIR VOLUME BOX
KW	KILOWATTS		FAN POWERED TERMINAL BOX
LAT	LEAVING AIR TEMPERATURE		RETURN AIR SOUND BOOT
MAX.	MAXIMUM		DOUBLE LINE DUCTWORK UP
	VOLUME DAMPER		DOUBLE LINE DUCTWORK DOWN
	MOTORIZED DAMPER		
MIN.	MINIMUM		
N.C.	NOISE CRITERIA		
O.A.	OUTSIDE AIR		
P.D.	PRESSURE DROP		
R.A.	RETURN AIR		
R.A.S.B.	RETURN AIR SOUND BOOT		
RH	RELIEF HOOD		
RPM	REVOLUTIONS PER MINUTE		
ST. PR.	STATIC PRESSURE		
TYP.	TYPICAL		
TEF	TOILET EXHAUST FAN		
	VOLUME DAMPER		
VFD	VARIABLE FREQUENCY DRIVE		

BUILDING CONTROL SYSTEM:	
<p>PROVIDE A DIRECT DIGITAL CONTROL SYSTEM TO THE AUTOMATED LOGIC CONTROL SYSTEM. SYSTEM SHALL MONITOR AND CONTROL ALL COMPONENTS OF THE BUILDINGS HVAC SYSTEMS, HAVE BAC COMPLIANT COMPONENTS, EASY TO USE, TRAINABLE, AND BE ABLE TO BE INSTALLED. PROVIDE DETAILED SUBMITTALS SHOWING ALL CONTROL SEQUENCES, SETBACKS, OPERATING MODES, EQUIPMENT AND ALL OTHER COMPONENTS. SYSTEMS AS MANUFACTURED TRANE, CARRIER, LENNOX, YORK OR MCQUAY ARE ACCEPTABLE.</p>	<p>BUILDING AUTOMATION SYSTEM SIMILAR OR EQUAL TO THE AUTOMATED LOGIC CONTROL SYSTEM. SYSTEM SHALL MONITOR AND CONTROL ALL COMPONENTS OF THE BUILDINGS HVAC SYSTEMS, HAVE BAC COMPLIANT COMPONENTS, EASY TO USE, TRAINABLE, AND BE ABLE TO BE INSTALLED. PROVIDE DETAILED SUBMITTALS SHOWING ALL CONTROL SEQUENCES, SETBACKS, OPERATING MODES, EQUIPMENT AND ALL OTHER COMPONENTS. SYSTEMS AS MANUFACTURED TRANE, CARRIER, LENNOX, YORK OR MCQUAY ARE ACCEPTABLE.</p>

MARK	CFM	MAX. OUTSIDE AIR CFM DCV	EXTERNAL S.P. (IN. W.G.)	E.A.T. (DB/WB)	L.A.T. (DB/WB)	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)		ELECTRICAL DATA				WEIGHT LBS	NOTES
									HP	VOLTS/ PHASE/	MCA	MOCp		
RTU-1-1 & RTU-1-2	7,500	1500	1.8	80.5/67.5	57.1/56.7	258	192		7.5	480/3	49	60	3500	1,2,3,4

NOTES:

1. PROVIDE ISOLATED ROOF CURB WITH "HURRICANE RATED" CONSTRUCTION, HURRICANE CLIPS & STRAP-DOWN, WP DISCONNECT, POWERED RECEPTACLE,, HAIL GUARD, SS CONDENSATE PAN, MERV 11 FILTERS, SERVICE VALVES, DA HOOD, INSULATED FLOOR & DRAIN PANS, RA CO 2 SENSOR INTERLOCKED WITH MODULATING DA ECONOMIZER DAMPER MODULATING FROM 500 CFM MIN. TO MAX. SHOWN, VARIABLE CAPACITY LEAD COMPRESSOR & MUTI-COMPRESSOR ARRANGEMENT STAGING, DOUBLE WALL CONSTRUCTION, DIRECT DRIVE FANS.
2. PROVIDE VARIABLE FREQUENCY DRIVE (W/BYPASS) FOR FAN MOTOR CONTROLLED BY STATIC PRESSURE SENSOR LOCATED 2/3 DOWN THE LONGEST PRIMARY DUCT RUN.
3. SELECT WITH 105 AMBIENT TEMPERATURE. 96.8/80.1 SUMMER DA EAT, 28 DEG. WINTER DA EAT.
4. ROOF TOP UNITS SHALL BE JOHNSON, CARRIER, LENNOX, ENGINEERED AIR, GREENHECK, TRANE, AON OR APPROVED EQUAL.

126 W. BRUCE STREET, SUITE 102  
 HARRISONBURG, VIRGINIA 22801  
  
 333 CYPRESS RUN, SUITE 350  
 HOUSTON, TEXAS 77094

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TEXAS BOARD OF PROFESSIONAL ENGINEERS  
 FIRM REGISTRATION NO. F-6008

*WS TOWER*

4/22/22

## FORT BEND COUNTY

## NEW COMMUNITY CENTER

AVENUE E AND SECOND STREET  
 ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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SHEET TITLE

## MECHANICAL SCHEDULES

SHEET NO.

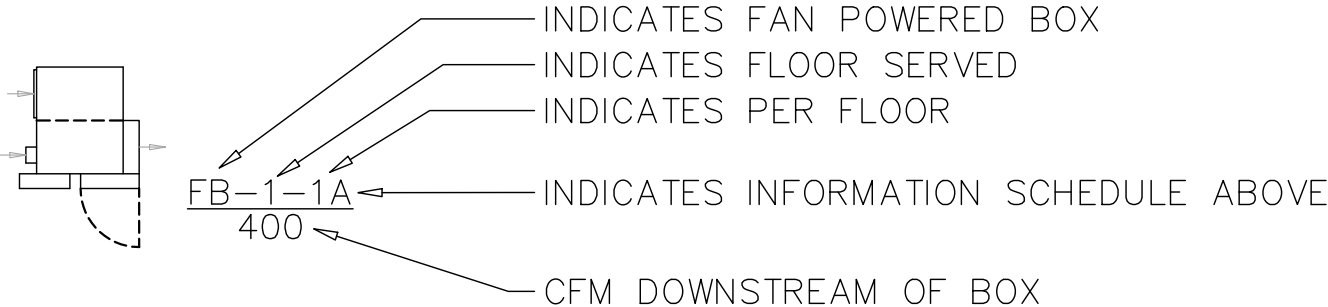

# M0.1

SCHEDULE OF ELECTRIC UNIT HEATERS	
UNIT NO.	EUH-1
SERVICE	SPR ROOM
AIR VOLUME	380
FAN RPM	1750
TOTAL HEAT--BTU/HR	10,200
TEMPERATURE RISE--oF	25
HEATER SIZE--KW	3
MOTOR HORSEPOWER	1/40
VOLTAGE/PHASE	480/3
AIR DISCHARGE PATTERN	HORIZ./VERT. ADJUSTABLE
BASIS OF DESIGN	MODINE HER30

\*NOTES - PROVIDE WALL SUSPENSION KIT, LOW VOLTAGE CONTROL KIT, SUMMER/WINTER SWITCH AND T-STAT. SERVICE DISCONNECT.

EXHAUST FAN SCHEDULE									
MARK	CFM	S.P. IN W.G.	FAN RPM	DRIVE TYPE	SONES	MTR. HP	ELECT. V/P/H	MANUFACTURER	MODEL
TEF-1	1310	0.5	1395	DIRECT	12	0.26	120/1/60	GREENHECK	G120
NOTES: PROVIDE WITH HIGH WIND ROOF CURB AND TIE DOWNS, SPEED CONTROLLER. PROVIDE WITH FACTORY INSTALL NON-FUSED DISCONNECT SERVICE SWITCH. APPROVED EQUAL EXHAUST FANS AS MANUFACTURED BY COOK, ACME, PENN. PROVIDE FAN ASSEMBLY WITH WITH AUTOMATIC SHUT-OFF DAMPER.									

AIR HANDLING & CONDENSING UNIT SCHEDULE		
MARK	AHU-1,2	
BASIS OF DESIGN MFG.	TRANE	
MODEL (INDOOR UNIT)	TWE180	
NOMINAL TONS	15	
TYPE	HORIZONTAL	
TOTAL CFM	5000	
OUTSIDE AIR CFM (demand ctrl.)	250 - 1500	
EXT. ST. PR. IN W.G.	1.0	
FAN HP	3.0	
V/P/HZ	480/3/60	
MCA	51	
MOCP	60	
ENT AIR DB	80	
ENT AIR WB	67	
COOLING CAPACITY - MBH SENSIBLE/TOTAL	130/180	
ELECTRIC HEAT (KW)	25	
CONDENSER UNIT	ACCU-1,2	
BASIS OF DESIGN MFG.	TRANE	
MODEL	TTA180	
REFRIGERANT	R410A	
ENTERING AIR TEMP. - DEGREES F	95	
V/P/HS	480/3/60	
MCA	32	
MOCP	40	
NOTES	1-5	
NOTES: 1. REFRIGERANT LINE SIZES AS RECOMMENDED BY MANUFACTURER (PROVIDE WITH SUBMITTALS). MANUFACTURER TO PROVIDE SST BALANCE POINT FOR SYSTEM CAPACITY PERFORMANCE. 2. PROVIDE CRANK CASE HEATER, SIGHT GLASS, LIMIT SWITCHES, SOLENOIDS, TIME GUARD RELAY, LIQUID LINE FILTER DRYER, SERVICE VALVES, TXV, SINGLE ZONE VARIABLE CAPACITY/2-STAGE. 3. PROVIDE BACNET CAPABILITIES. 4. INSTALL AIR HANDLERS WITH VIBRATION ISOLATORS, IAQ DRAIN PAN, MIXING BOXES AND MERV 11 FILTERS. INSTALL AIR HANDLERS IN AUXILIARY DRAIN PAN WITH POWER OFF FLOAT SWITCH. 5. APPROVED EQUAL UNITS AS MANUFACTURED BY CARRIER, JOHNSON, AON, OR LENNOX ARE ACCEPTABLE.		

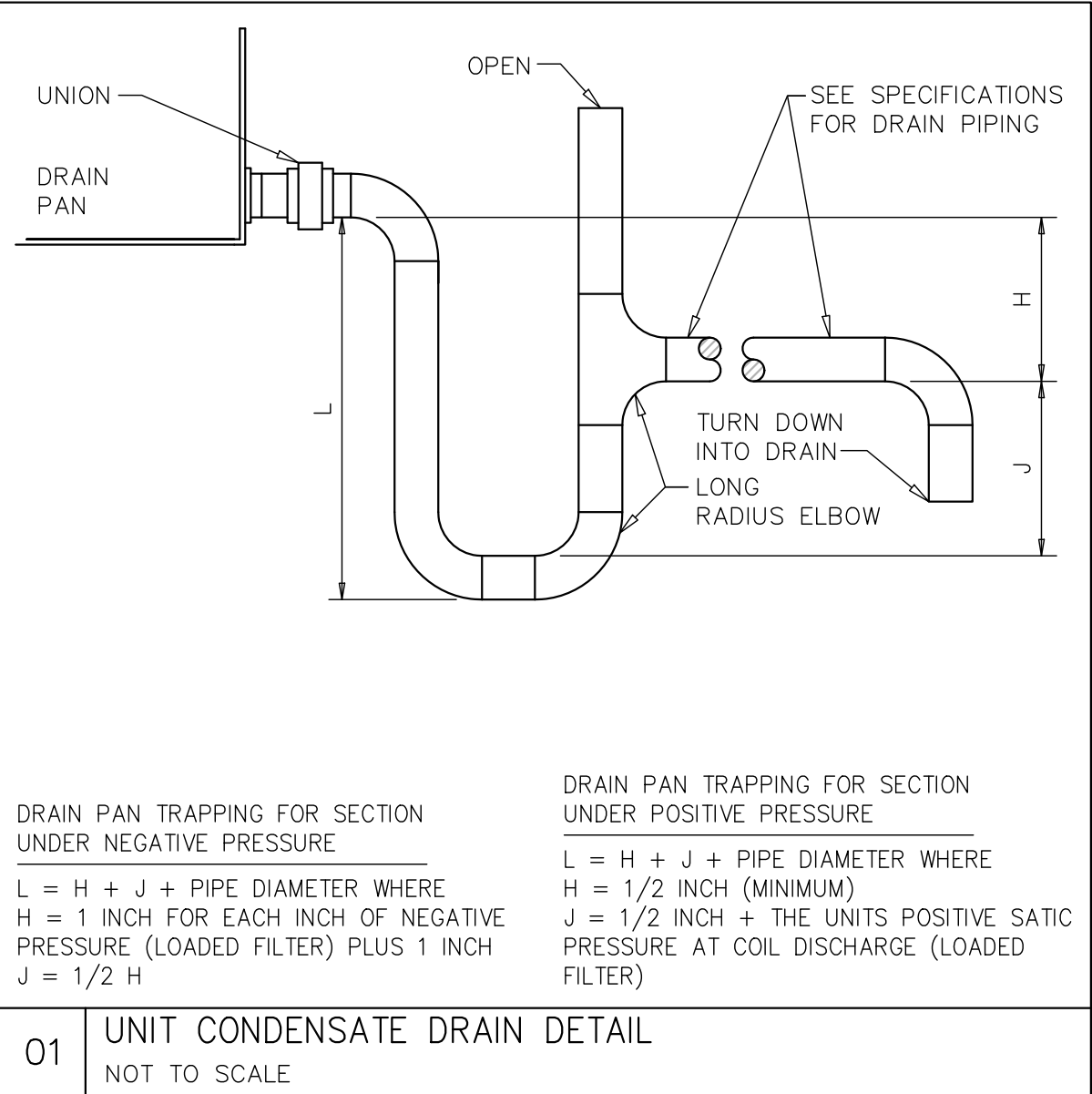
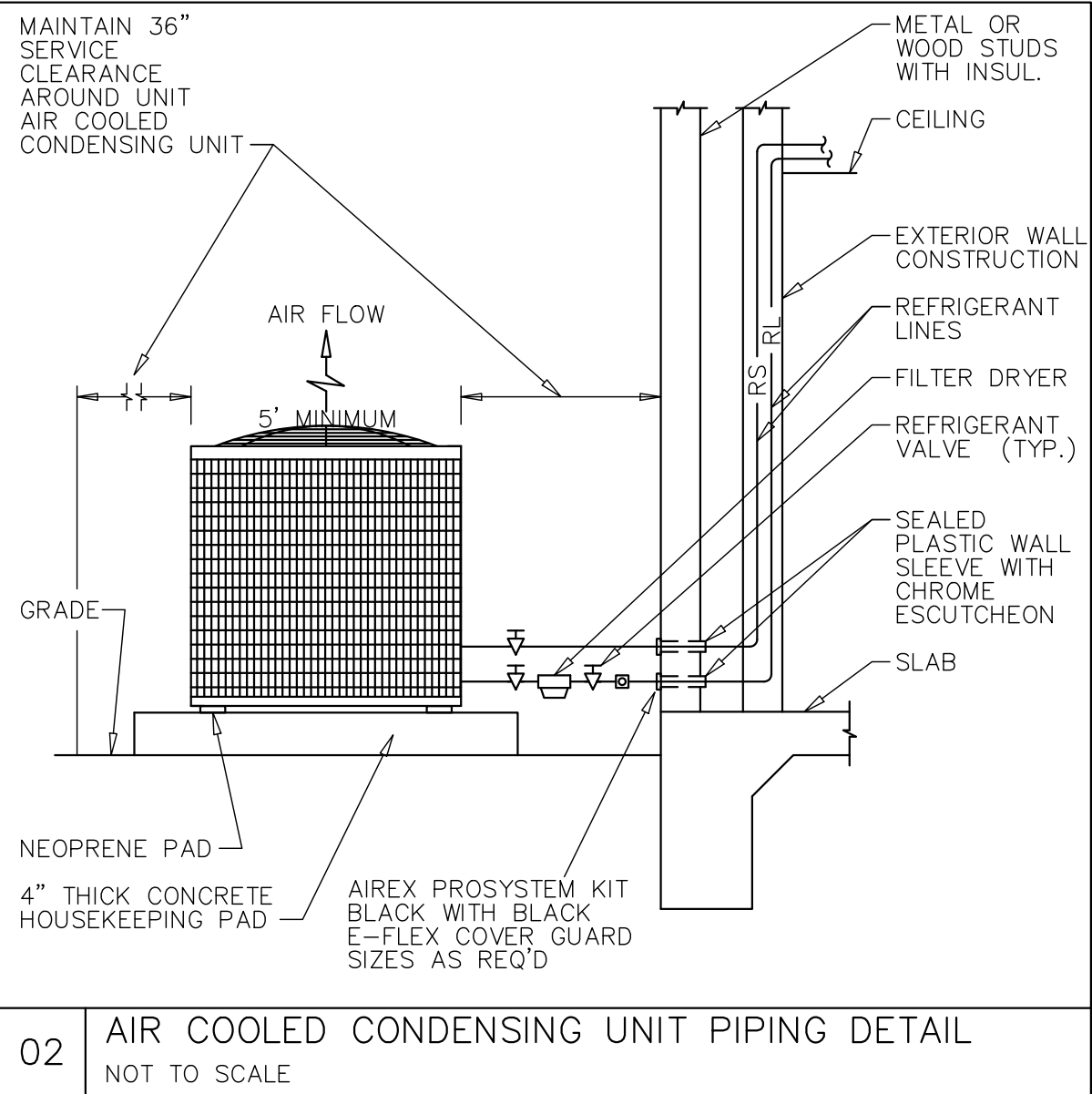
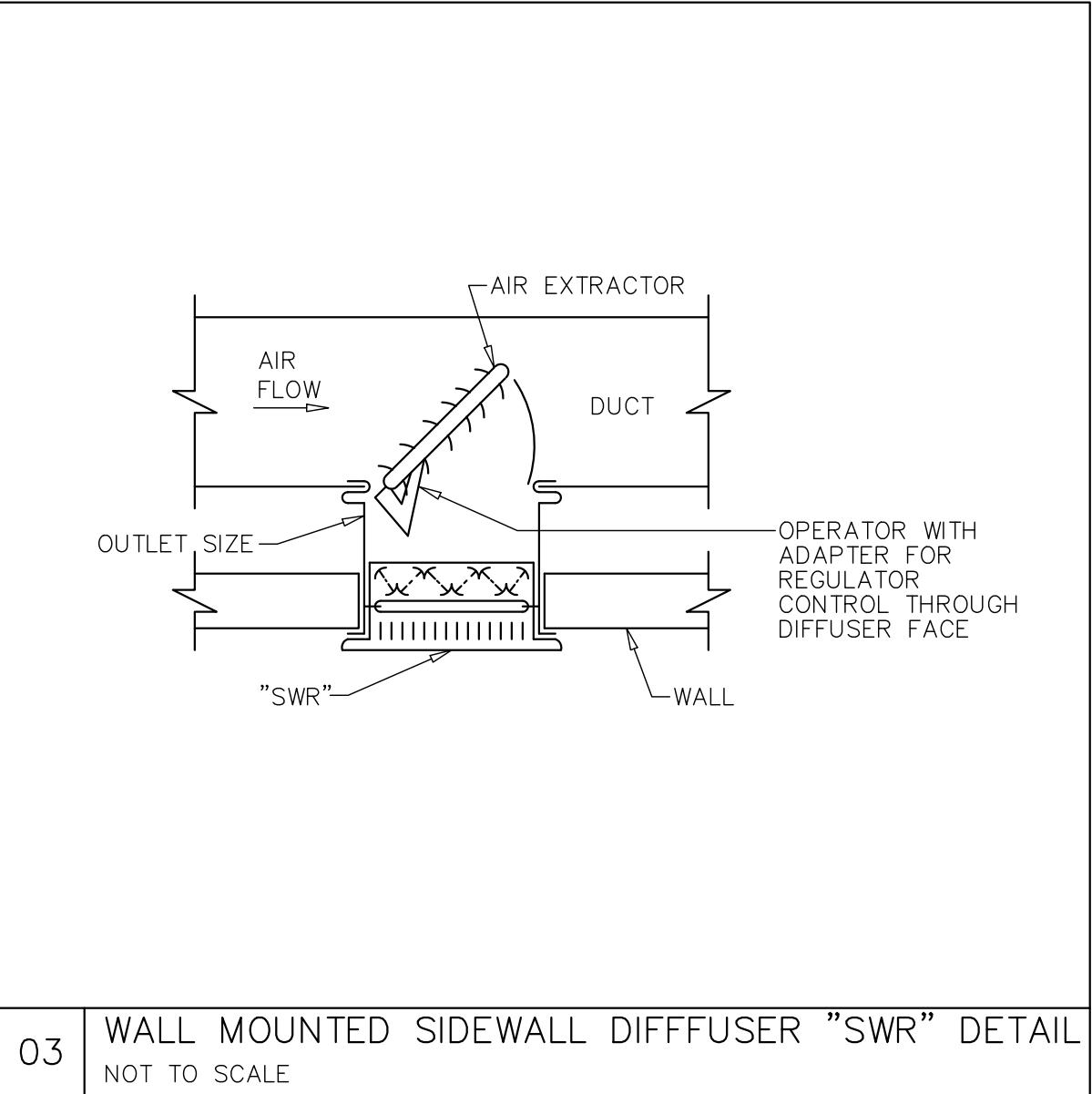
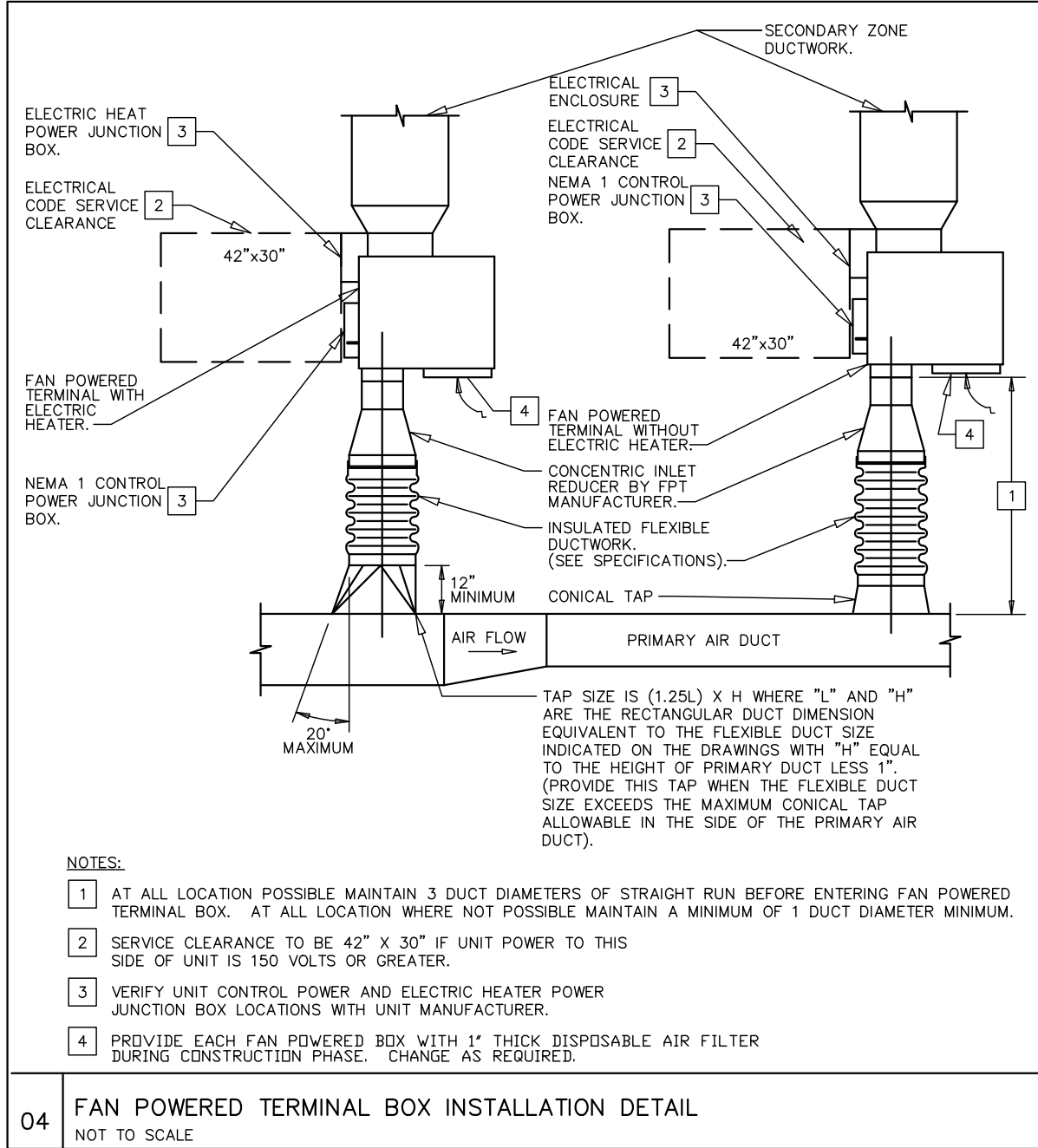
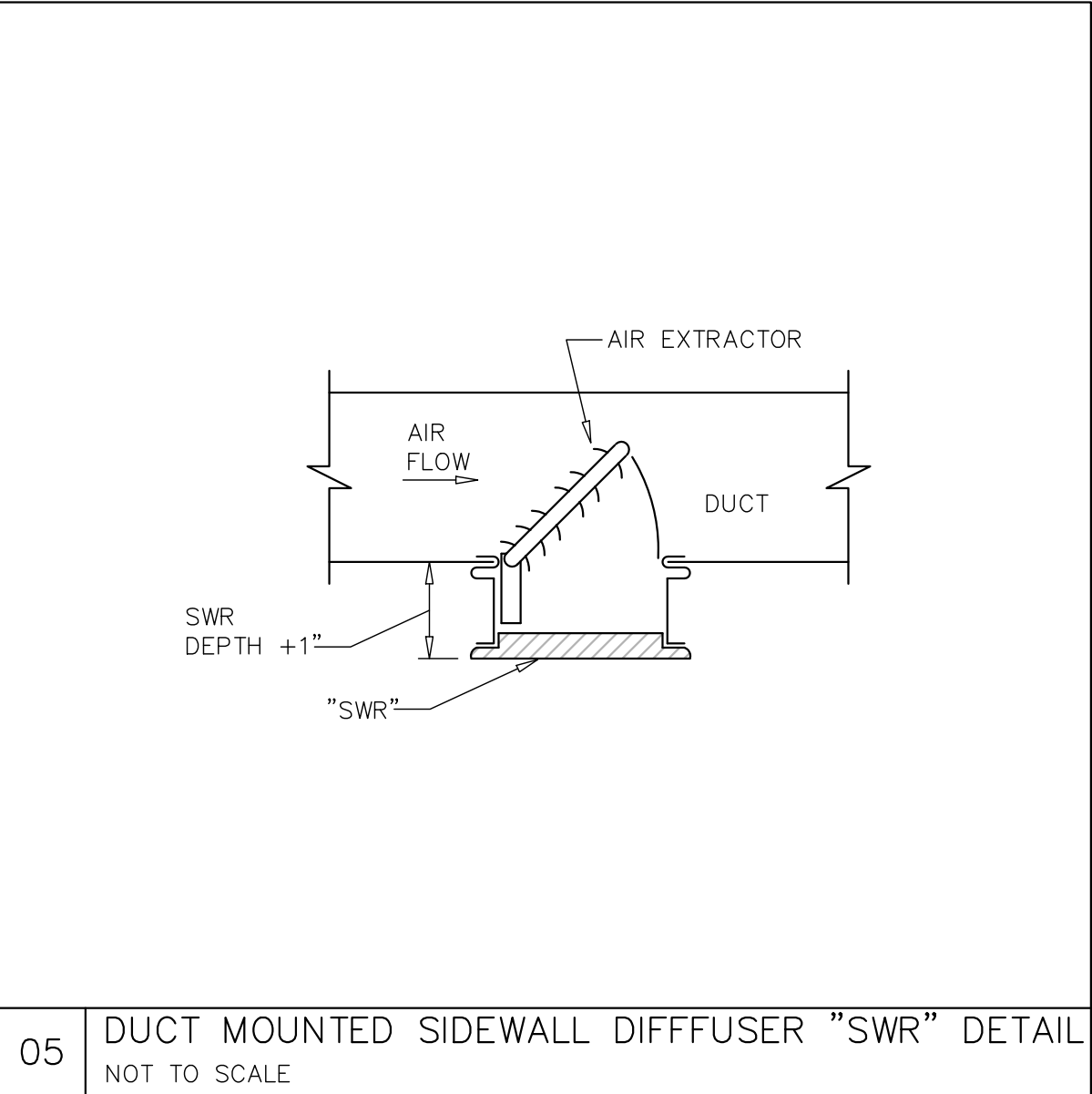
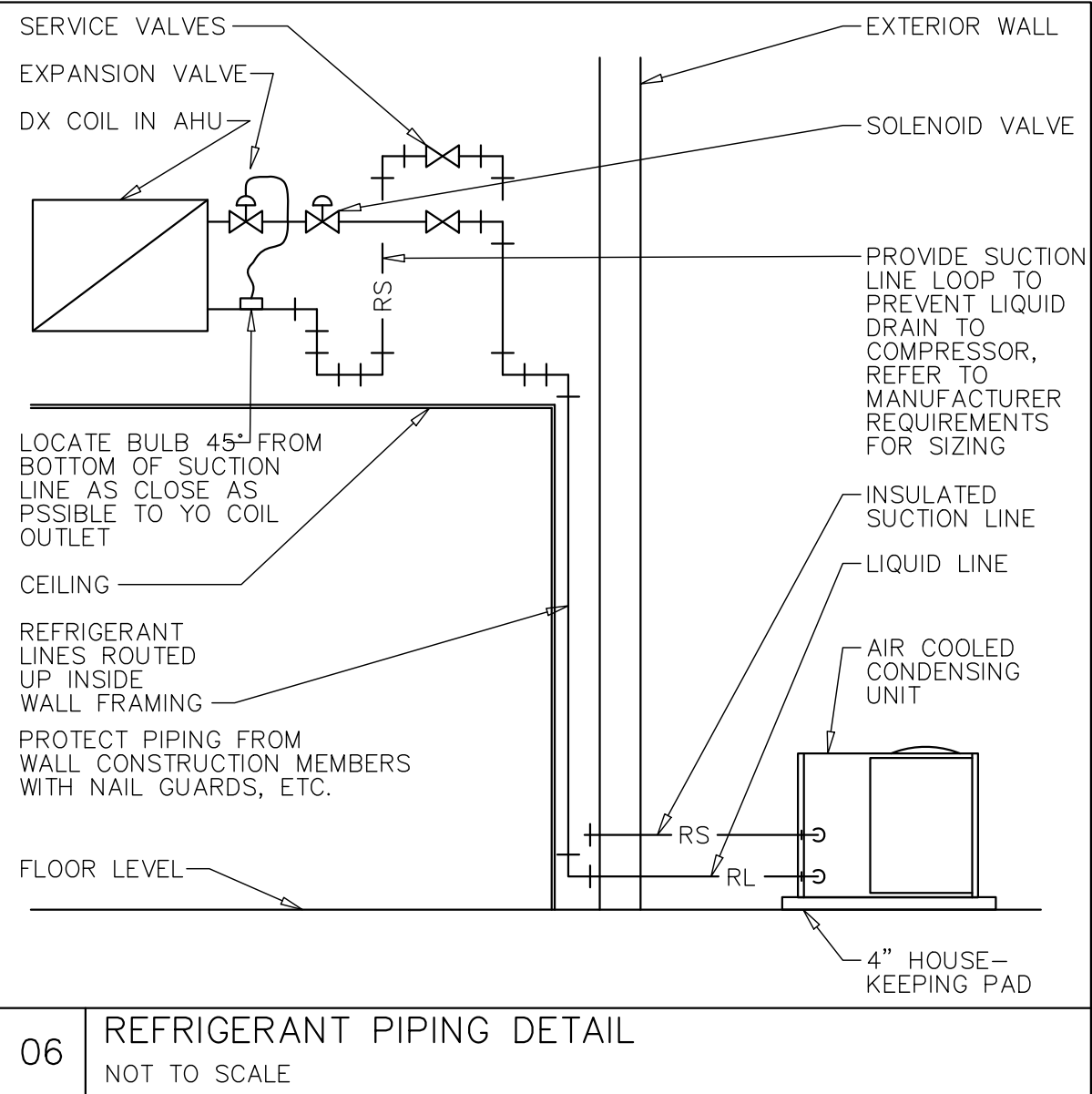
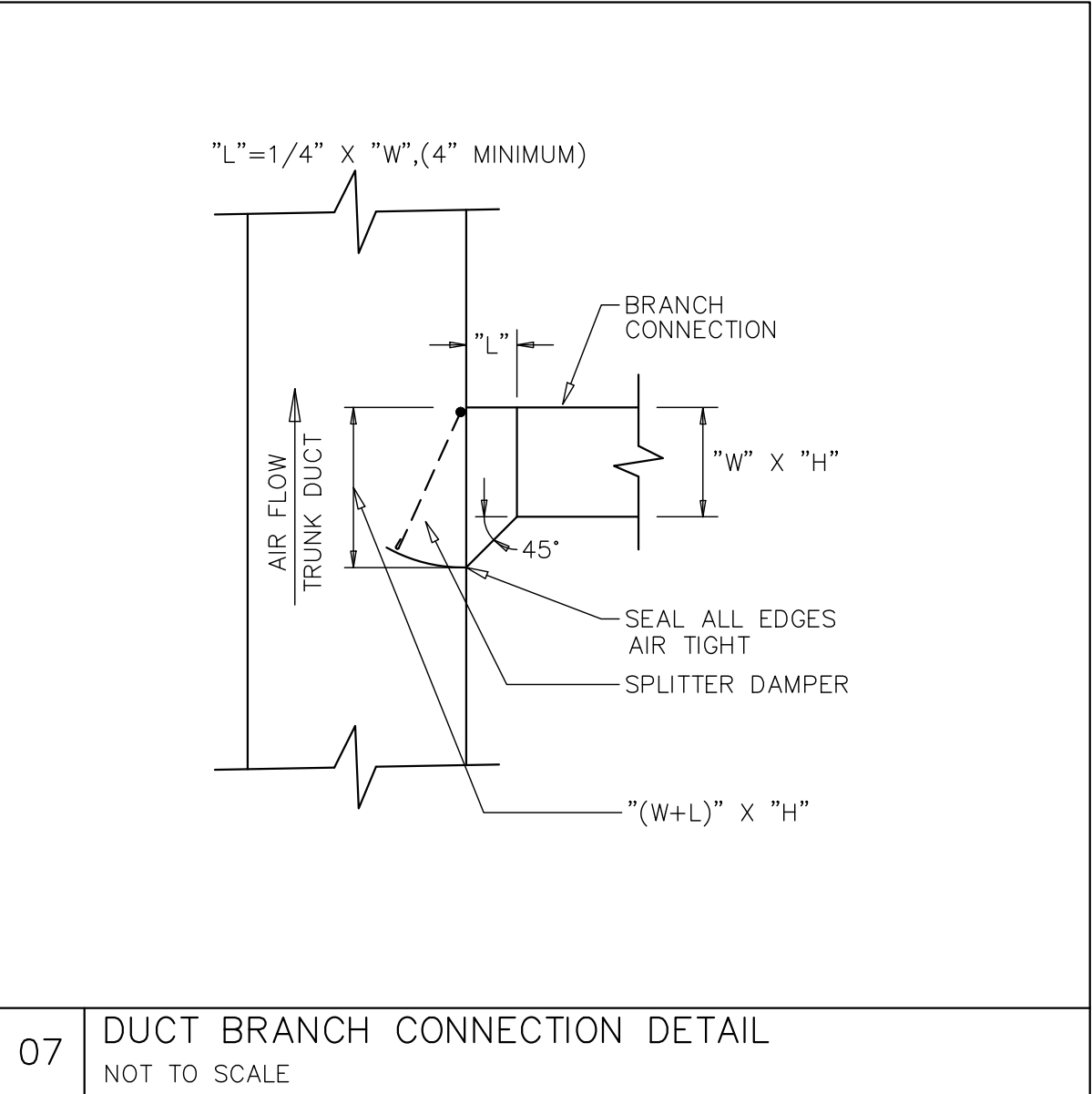
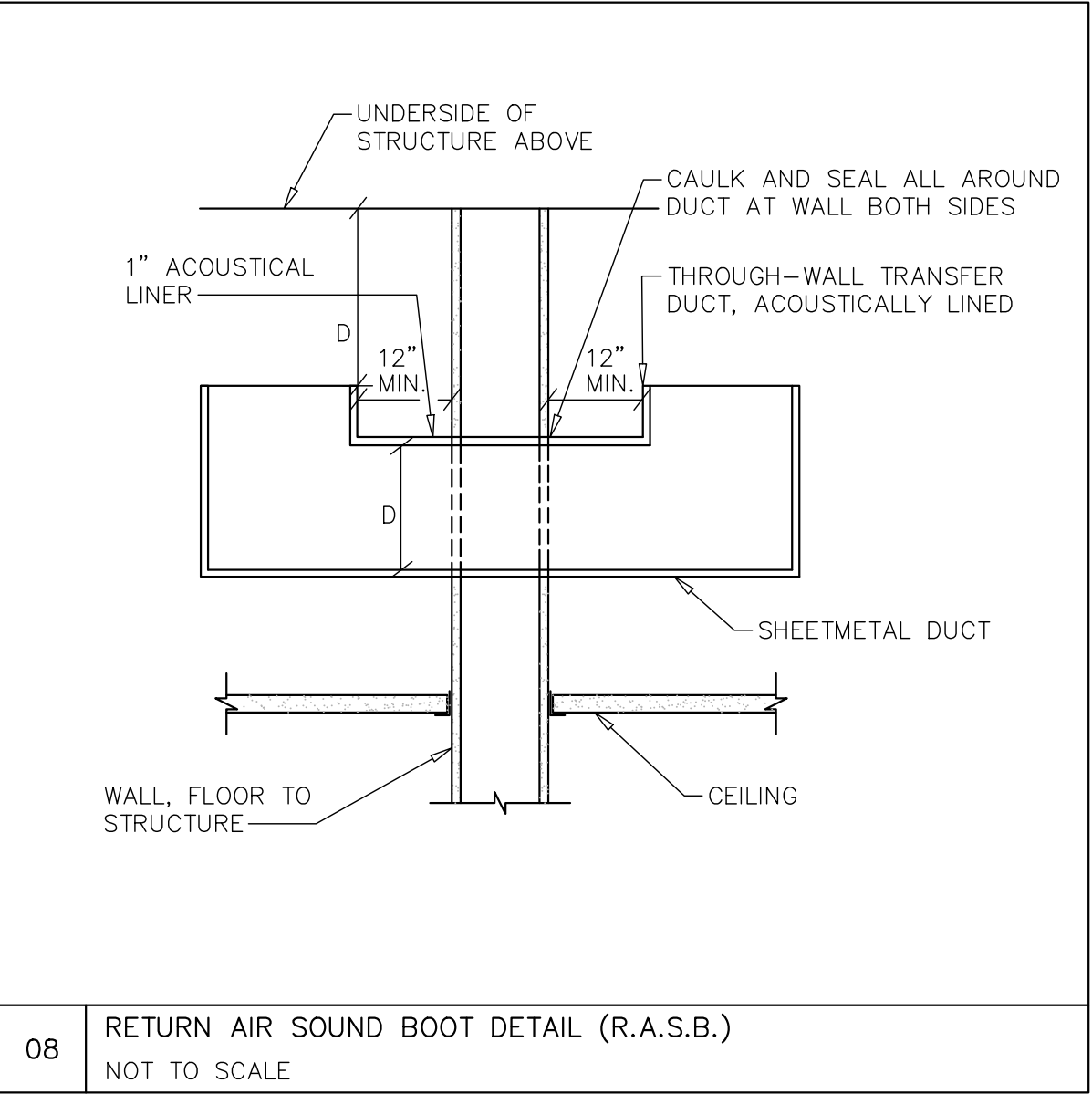
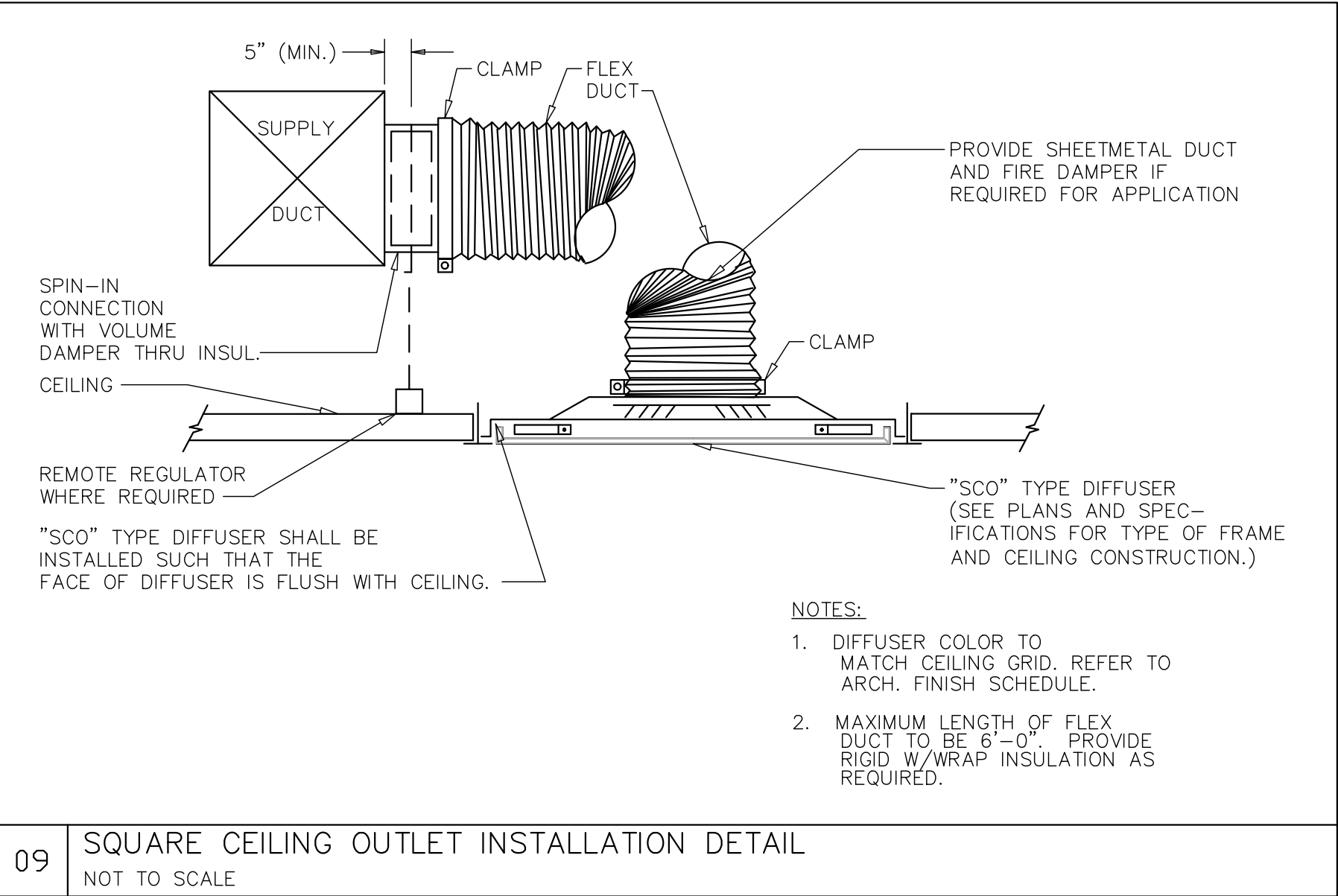
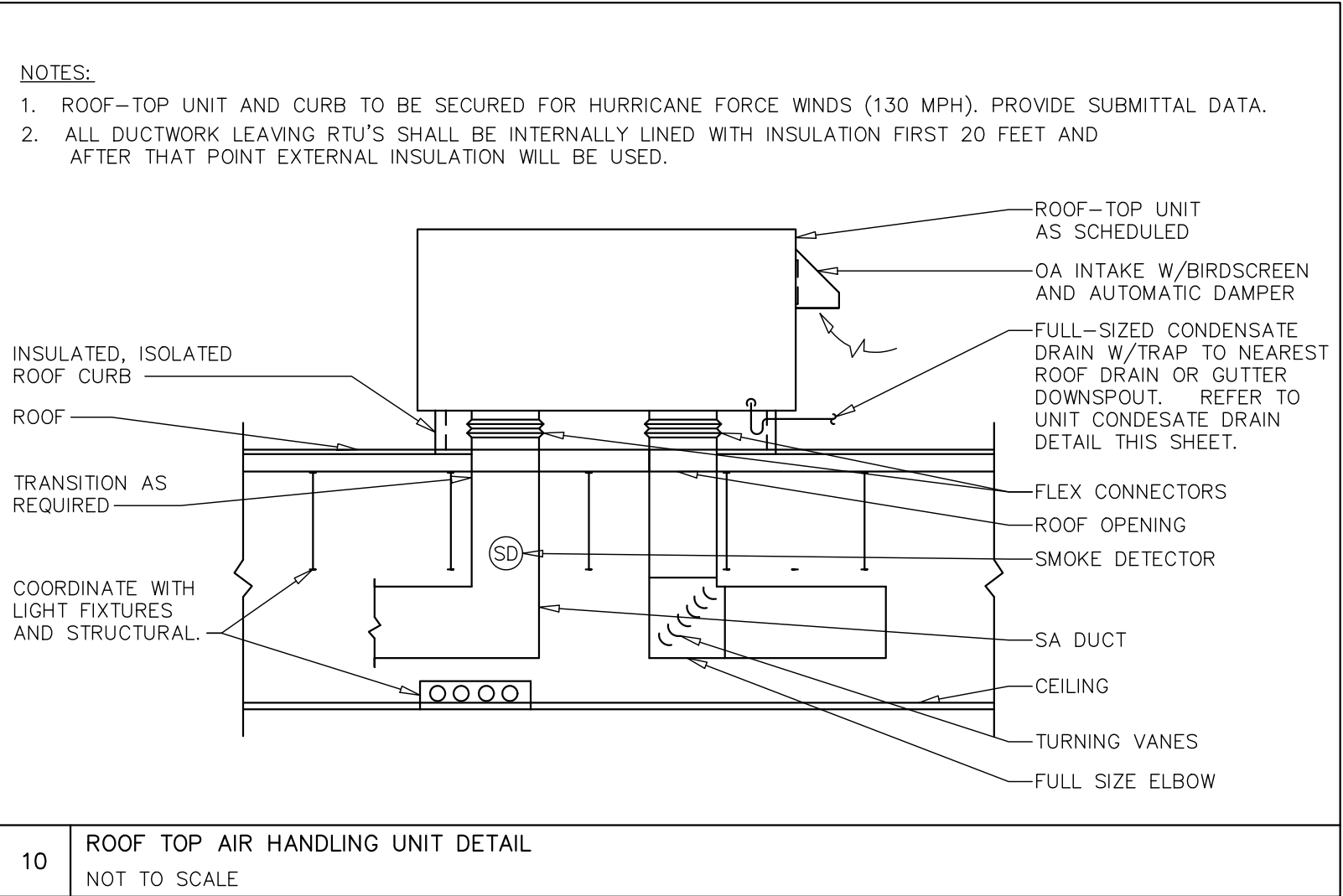
FAN POWERED BOX - BASIS OF DESIGN																		
TAG ID	MANF.	MODEL	UNIT SIZE	INLET SIZE	MAX. PRIMARY CFM	MIN. PRIMARY CFM	FAN FLOW CFM	INLET ST. PR. (IN. WG.)	DOWNSTREAM ST. PR. (IN. WG.)	MIN. OPER. P.D. (IN. WG.)	MAXIMUM DISCHARGE (N.C.)	MAXIMUM RADIATED (N.C.)	MOTOR H.P.	FAN MOTOR VOLTAGE	CAP. KW	STEPS	VOLTS	INLET ATTENUATOR
FB-A	PRICE	FDC5	2008	8"Ø	400	135	400	0.50	0.25	0.05	--	21	1/3	277-ECM	2	1	277-1	NONE
FB-B	PRICE	FDC5	3010	10"Ø	750	225	750	0.50	0.25	0.08	--	26	1/2	277-ECM	2.5	1	277-1	NONE
FB-C	PRICE	FDC5	4012	12"Ø	1000	305	1000	0.50	0.25	0.03	21	32	1/2	277-ECM	3	1	277-1	NONE
FB-D	PRICE	FDC5	4012	12"Ø	1500	305	1500	0.50	0.25	0.06	29	37	1/2	277-ECM	5	2	277-1	NONE
FB-E	PRICE	FDC5	5014	14"Ø	2000	440	2000	0.50	0.25	0.07	32	37	1	480-ECM	6.5	2	480-3	IAS
FB-F	PRICE	FDC5	6014	14"Ø	2500	440	2500	0.50	0.25	0.02	29	36	(2) 1/2	480-ECM	7	2	480-3	IAS
NOTES: 1. PROVIDE WITH FACTORY INSTALL NON-FUSED DISCONNECT SERVICE SWITCH, FIBERGLASS STERILE LINER, FILTER. 2. SELECTION BASED ON PERFORMANCE @ .5 INLET STATIC PRESSURE 3. APPROVED EQUAL PRICE, TITUS, TRANE, NAILOR, METALAIRE AND CARRIER.																		
SYMBOL:  INDICATES FAN POWERED BOX INDICATES FLOOR SERVED INDICATES PER FLOOR INDICATES INFORMATION SCHEDULE ABOVE CFM DOWNSTREAM OF BOX																		
 IAS ATTENUATOR (BOXES E & F ONLY) UNLESS NC DATA CAN BE ACHIEVED WITHOUT																		

DUCTLESS SPLIT SYSTEMS SCHEDULE			
OUTDOOR UNIT MARK	ACCU-IT		
SERVES	AH-IT		
GRAND TOTAL COOLING (BRUH)	9,000		
AMBIENT TEMP. (°F)	105		
STEPS OF CAPACITY	1		
VOLTS/PHASE/HERTZ	208/1/60		
FUSE (AMPS)	20		
MINIMUM AMPERAGE	7		
M.O.C.P.	20		
SEER	17.0		
REFRIGERANT TYPE	R410A		
MANUFACTURER	MTSUBISHI		
MODEL NUMBER	NTY-SST09A112A		
INDOOR UNIT MARK	AH-IT		
SERVES	IT		
UNIT TYPE	WALL MOUNTED WIRELESS REMOTE W/ COND. PUMP		
COOLING CAPACITY (BTUH)	9,000		
VOLTS/PHASE/HERTZ	208/1/60		
COOLING POWER CONSUMPTION (WATTS)	1 AMP		
COOLING OUTPUT RANGE (BTUH)	3,500-12,000		
CFM (DRY AIR)	145-170-239		
CFM (WET AIR)	109-134-201		
OUTISDE AIR CFM	NONE		
MINIMUM AMPERAGE	1		
MANUFACTURER	MTSUBISHI		
MODEL NUMBER	NTYWST09A112A		
UNIT WEIGHT (LBS)	22		
NOTES	1,2,3,4,5,7,8,9		
NOTES: 1. INDOOR UNIT RECEIVES POWER FROM OUTDOOR UNIT THROUGH FIELD SUPPLIED INTERCONNECTED WIRING PROVIDE NEMA 4X DISCONNECT. 2. INSTALL PER MANUFACTURERS SPECIFICATIONS. 3. REFRIGERANT LINES TO BE SIZED BY MANUFACTURER. 4. PROVIDE 5 YEAR PART VARRANTY AND 7 YEAR COMPRESSOR WARRANTY. 5. PROVIDE AND INSTALL A UNIT MANUFACTURER THERMOSTAT TO ENERGIZE FAN COIL UNIT ONCE SPACE TEMPERATURE REACHES 80 DEGREES F OR ABOVE (ADJUSTABLE). 6. PROVIDE UNIT WITH CONDENSATE PUMP. CONDENSATE SHALL BE ROUTED TO NEAREST SANITARY PIPING WITH HUB DRAIN ON TAILPIECE OF FIXTURE. 7. INSULATE BOTH REFRIGERANT LINES.			

GENERAL MECHANICAL NOTES:	
1.	ALL WORK ILLUSTRATED ON THE DRAWNGS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2.	REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF ALL AIR DISTRIBUTION DEVICES.
3.	EACH CONTRACTOR SHALL COORDINATE INSTALLATION OF MATERIALS AND EQUIPMENT SO THAT ALL MATERIALS AND EQUIPMENT ARE INSTALLED WITHOUT CONFLICT.
4.	ALL DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
5.	AIR BALANCE OF ALL SUPPLY AND RETURN AIR DIFFUSERS INSTALLED IN NON-ACCESSIBLE CEILINGS SHALL BE AIR-BALANCED PRIOR TO CEILING INSTALLATION. PROVIDE CONCEALED DAMPER REGULATORS WHERE REQUIRED.
6.	ALL AIR HANDLING UNITS SHALL BE PROVIDED WITH IONIZATION DETECTORS INSTALLED AS REQUIRED BY LOCAL AUTHORITY (SUPPLY) AT THE UNIT. THE DETECTORS SHALL BE SUPPLIED AND WIRED BY THE ELECTRICAL CONTRACTOR. ACTIVATION OF DEVICE SHALL SHUT DOWN THE UNIT AND INITIATE AN ALARM SIGNAL.
7.	INSTALL DUCTWORK IN SUCH A MANNER AS TO MAINTAIN A MAXIMUM CLEARANCE BELOW DUCTWORK SYSTEM INCLUDING BRACING TO BOTTOM SIDE OF CEILING CONSTRUCTION TO ALLOW FOR LIGHT FIXTURES, SPRINKLERS AND OTHER SYSTEMS EQUIPMENT. PROVIDE RISES, DROPS AND TRANSITIONS AS NECESSARY.
8.	ALL ROUND DUCT TAPS SHALL BE PROVIDED WITH SPIN-IN DEVICES AND VOLUME DAMPERS.
9.	THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND, EXCEPT WHERE SPECIFICALLY DIMENSIONED OR DETAILED, INDICATE THE APPROXIMATE LOCATIONS AND GENERAL ARRANGEMENTS OF THE WORK. EXAMINE ALL OTHER CONTRACT DRAWINGS AND SITE CONDITIONS AND INSTALL ALL WORK TO CONFORM AS NEARLY AS POSSIBLE TO THE LOCATIONS AND ARRANGEMENTS INDICATED WITH ONLY MINOR ADJUSTMENTS AS NECESSARY FOR COORDINATION BETWEEN ALL TRADES. ALL DUCT OFFSETS, RISES, DROPS AND FITTINGS ARE NOT NECESSARILY SHOWN ON THE DRAWINGS; HOWEVER THE CONTRACTOR SHALL PROVIDE THEM AS REQUIRED.
10.	ALL DRAIN PIPING IN WALLS OR ABOVE CEILINGS FOR CONDENSATE SHALL BE INSULATED. SEE SPECIFICATIONS.
11.	PROVIDE 1/4" SCALE DUCTWORK SHOP DRAWINGS ILLUSTRATING EXACT DIMENSIONS, ELEVATIONS, RISES, DROPS AND OFFSETS.

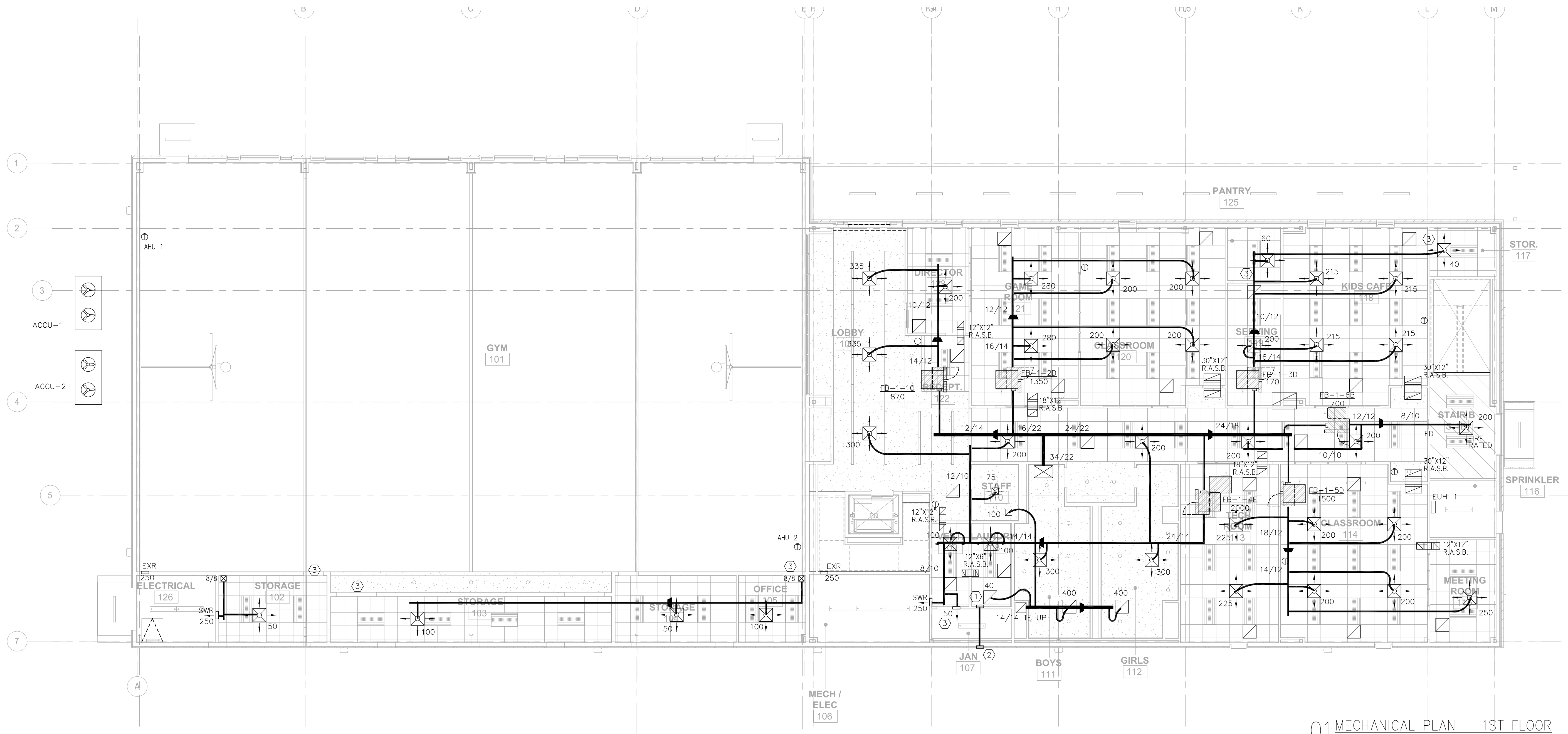
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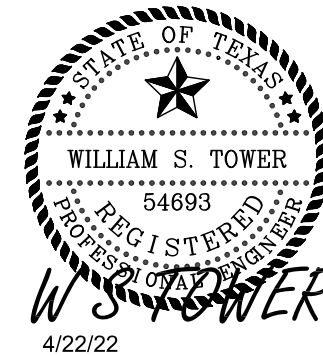


01 MECHANICAL PLAN - 1ST FLOOR  
SCALE: 1/8" = 1'-0"

KEYED NOTES:

- ① PROVIDE RECESSED DRYER VENT WALL BOX. CONNECT 4" DRYER VENT FLEX TO RECESSED BOX. PROVIDE RECESSED LINT TRAP W/COVER. ROUTE 4" RIGID RD. SHEETMETAL TO EXTERIOR DRYER WALL VENT HOOD.
- ② HEARTLAND DRYER VENT CLOSURE. PAINT TO MATCH WALL. COORDINATE LOCATION WITH ARCHITECT.
- ③ UNDERCUT DOOR 5/8".

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FIRM REGISTRATION NO. F-6008



**FORT BEND COUNTY**

**NEW COMMUNITY CENTER**

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

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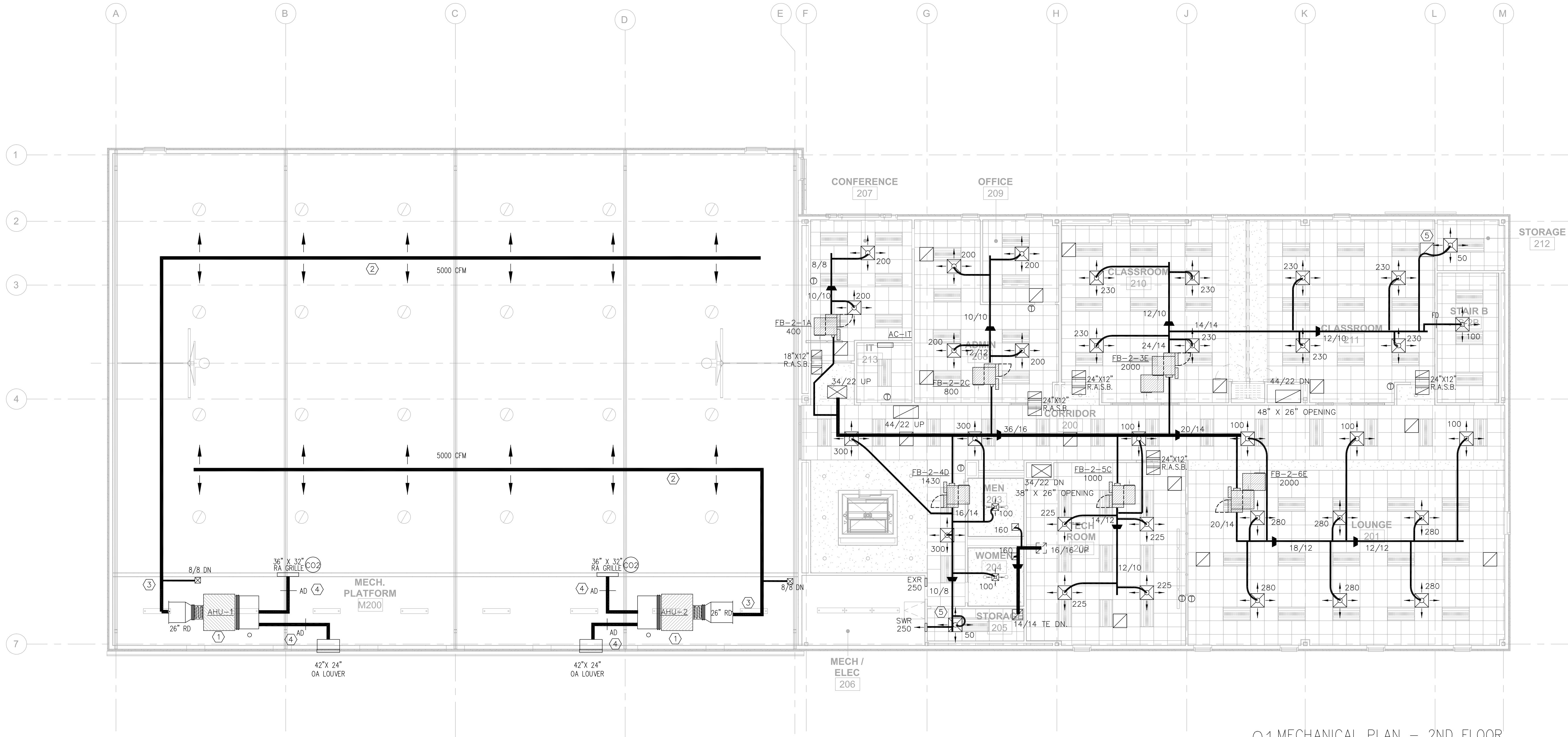
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	4.22.22	ISSUE

SHEET TITLE

**MECHANICAL  
PLAN - 1ST  
FLOOR**

SHEET NO.

**M1.1**

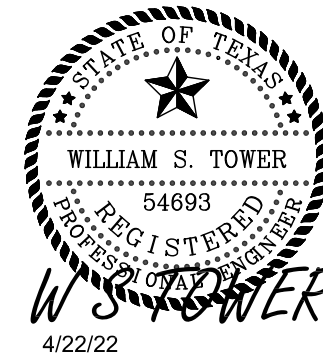


01 MECHANICAL PLAN - 2ND FLOOR  
SCALE: 1/8" = 1' - 0"

KEYED NOTES:

- ① PROVIDE AUXILIARY DRAIN PANS UNDER UNIT. INSTALL WATER SENSOR POWER OFF SWITCHES IN PAN.
- ② FABRIC DUCT DISTRIBUTION AND DESIGN BY HD GRANT INC. DESIGN ASSUMES THAT THE MANUFACTURER WILL PROVIDE INSTALLATION DETAILS, DUCT SIZE THROUGHOUT, SUPPORT DETAILS, NOZZLE SIZE LOCATION AND ORIENTATION AND INSTALLATION INSTRUCTIONS. COLOR SELECTED BY ARCHITECT. CONTACT INFO. JOHN WALIK - 713-830-4523.
- ③ TRANSITION TO FABRIC DIFFUSER DETAIL BY FABRIC DUCT MANUFACTURER. DUCT SOX TO BE USED ONLY HORIZONTALLY.
- ④ AUTOMATIC MOTORIZED DAMPERS SHALL MODULATE FROM MINIMUM OUTSIDE AIR QUANTITY SCHEDULED TO QUANTITY REQUIRED TO SATISFY THE CO2 SENSOR IN A DEMAND CONTROL VENTILATION STRATEGY.
- ⑤ UNDERCUT DOOR 5/8".

**The TOWER COMPANY**  
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TEXAS BOARD OF PROFESSIONAL ENGINEERS  
FIRM REGISTRATION NO. F-6008



**FORT BEND COUNTY  
NEW COMMUNITY CENTER**  
AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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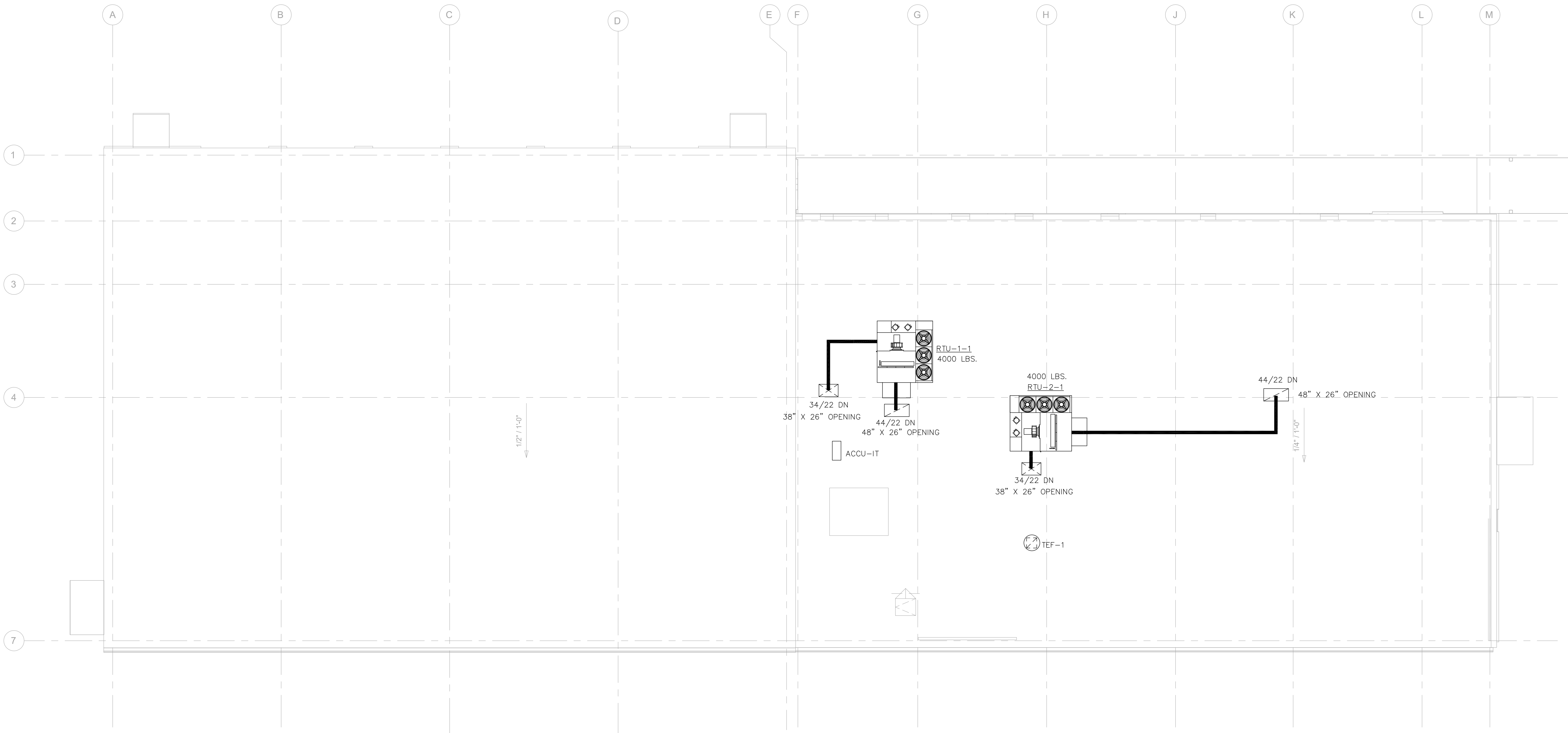
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SHEET TITLE

**MECHANICAL  
PLAN - 2ND  
FLOOR**

SHEET NO.

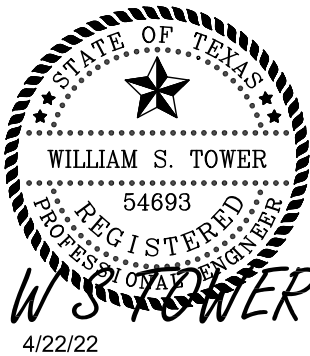
**M1.2**



EXPOSED DUCTWORK SJALL BE ENCLOSED IN ALUMAGUARD 60 OR APPROVED EQUAL.

01 MECHANICAL PLAN - ROOF  
SCALE: 1/8" = 1' - 0"

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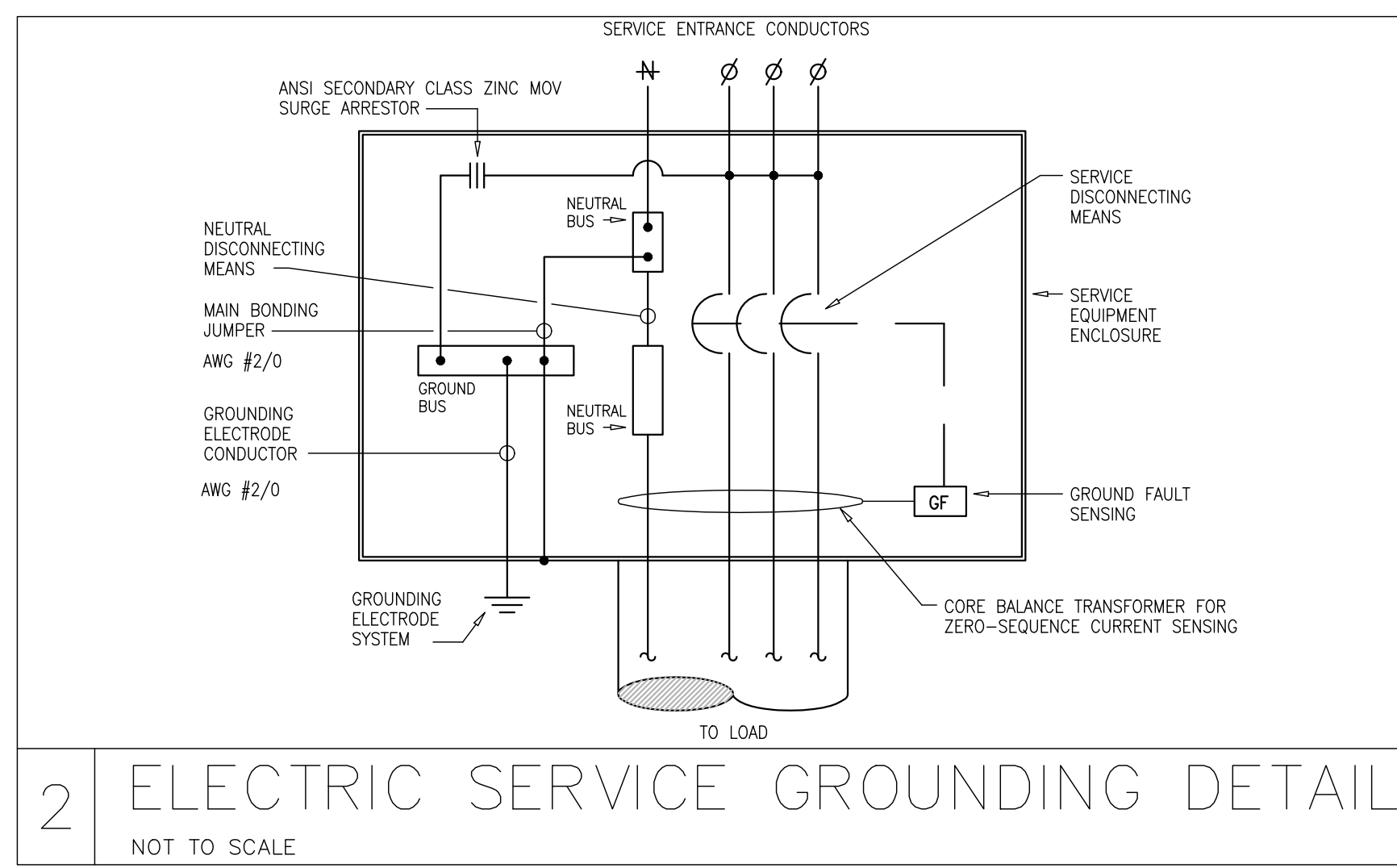
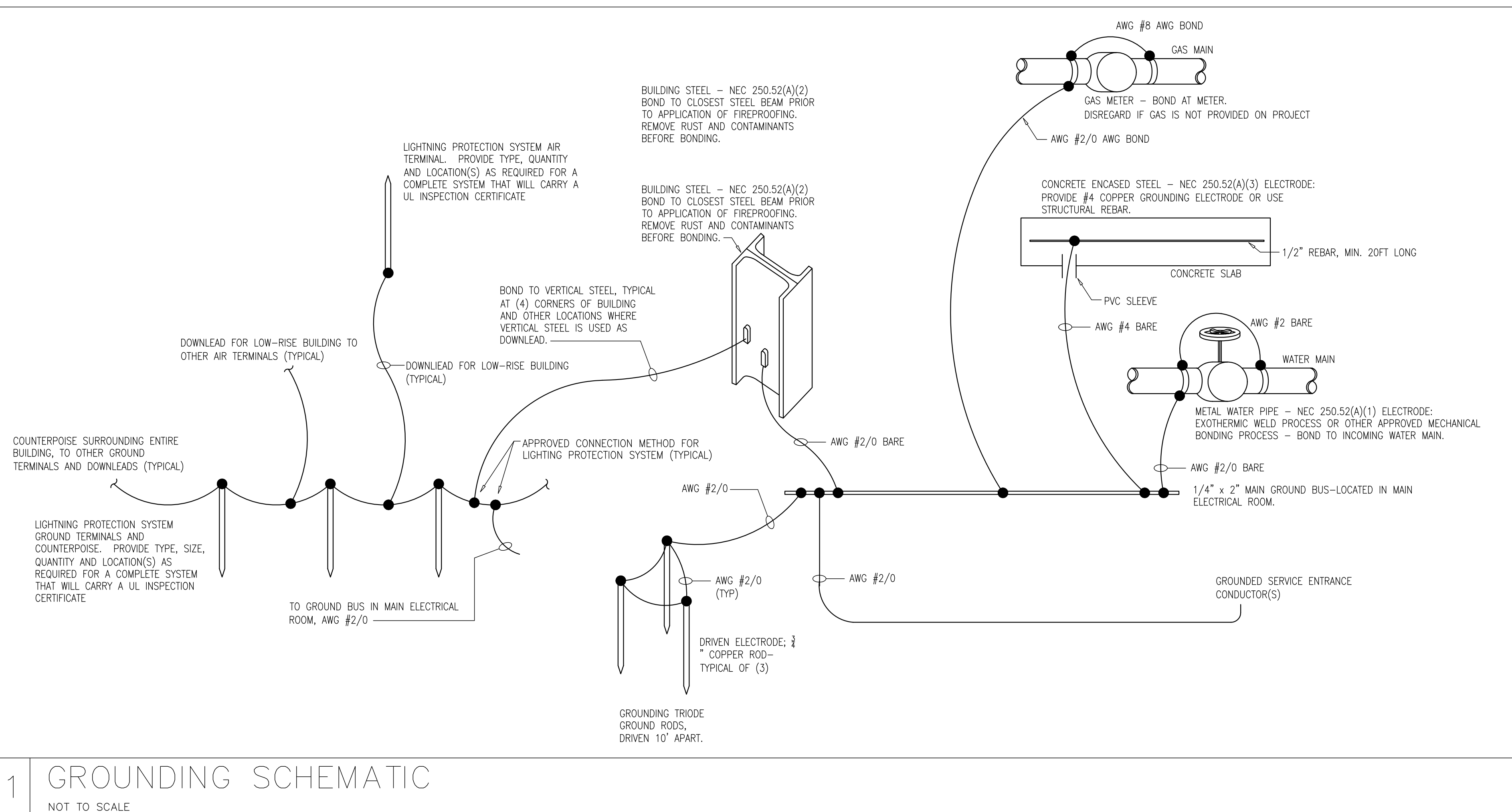
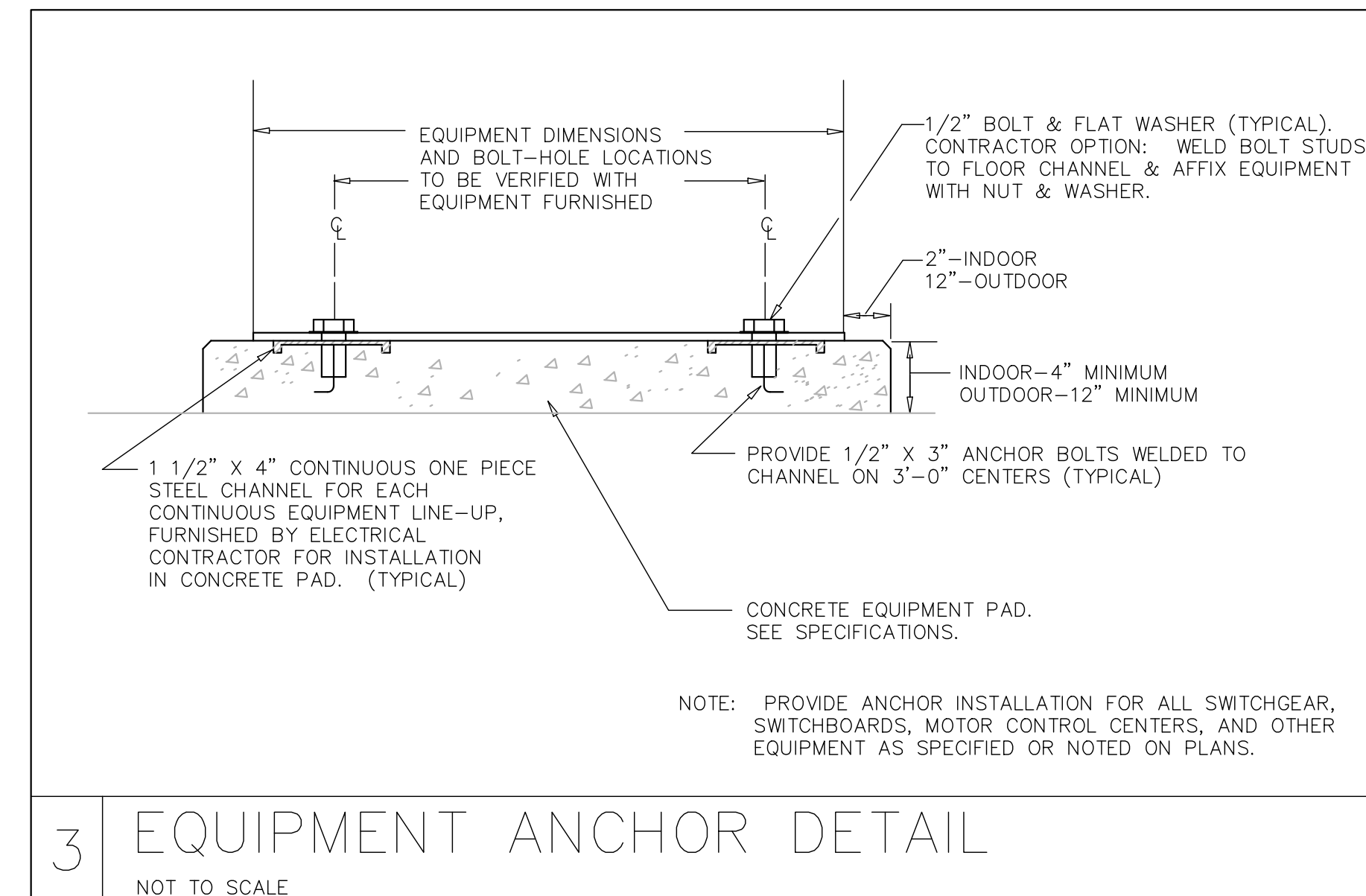
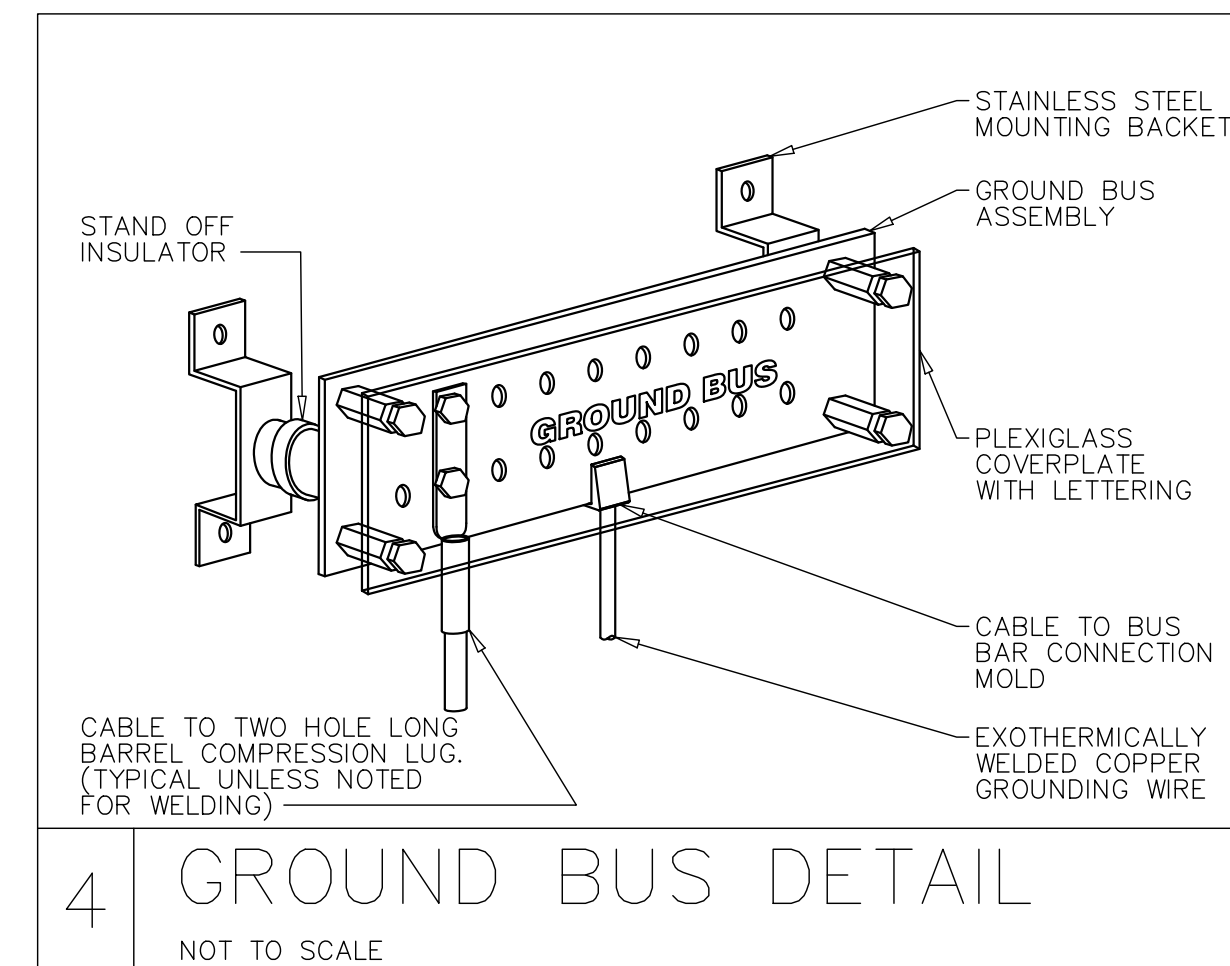
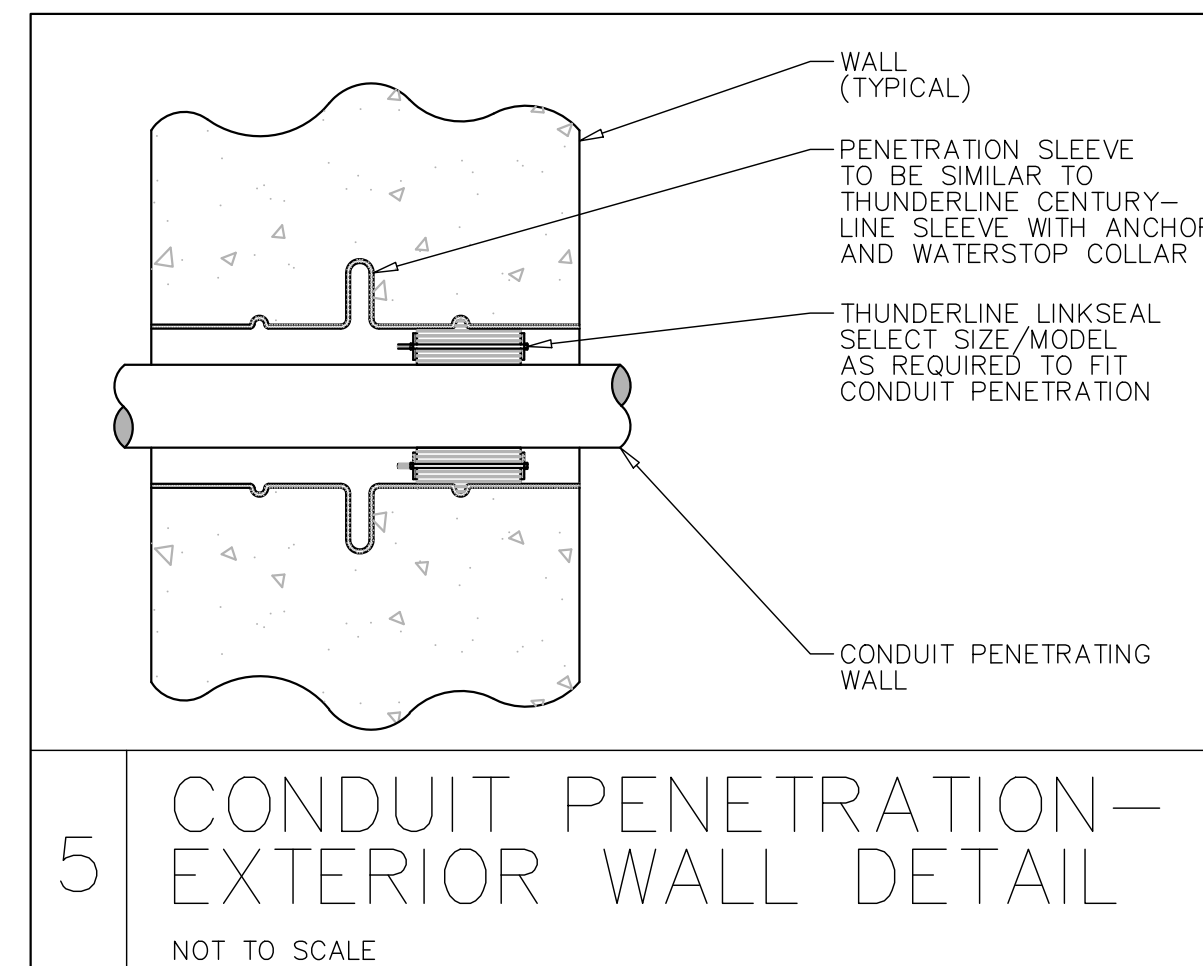
MECHANICAL  
PLAN - ROOF

SHEET NO.

M1.3

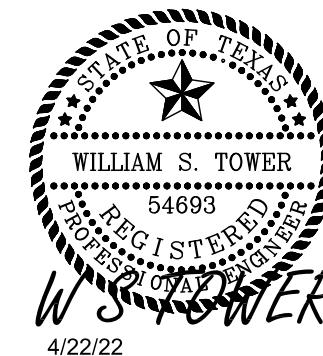






**b**  
**BLUE LINE**

**The TOWER COMPANY**  
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	SHEET TITLE
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## ELECTRICAL DETAILS

SHEET NO.

## E0.2





LOAD		LOAD WATTS	WIRE	CKT. BKR.	400 AMP MCB	CKT. BKR.	WIRE	LOAD WATTS	LOAD
EHLS		52630	3	100	<div style="display: flex; justify-content: space-between;"> <div>1 3 5</div> <div> </div> <div>2 4 6</div> </div>	150	1/0	90000	HG
H1		48400	3	100	<div style="display: flex; justify-content: space-between;"> <div>7 9 11</div> <div> </div> <div>8 10 12</div> </div>	200	3/0	127930	H2
SPACE					<div style="display: flex; justify-content: space-between;"> <div>13 15 17</div> <div> </div> <div>14 16 18</div> </div>				SPACE
					<div style="display: flex; justify-content: space-between;"> <div>19 21 23</div> <div> </div> <div>20 22 24</div> </div>				
					<div style="display: flex; justify-content: space-between;"> <div>25 27 29</div> <div> </div> <div>26 28 30</div> </div>				
					<div style="display: flex; justify-content: space-between;"> <div>31 33 35</div> <div> </div> <div>32 34 36</div> </div>				
					<div style="display: flex; justify-content: space-between;"> <div>37 39 41</div> <div> </div> <div>38 40 42</div> </div>				
LOAD		101030						217930	LOAD

TOTAL CONNECTED LOAD = 318960

$318960 / 831 = 383A$

14,000 AIC RATING NEMA 1

LOAD		LOAD WATTS	WIRE	CKT. BKR.	150 AMP MCB	CKT. BKR.	WIRE	LOAD WATTS	LOAD
AHU-1		42400	#6	60	<div style="display: flex; justify-content: space-between;"> <div>1</div> <div>2</div> </div> <div style="display: flex; justify-content: space-between;"> <div>3</div> <div>4</div> </div> <div style="display: flex; justify-content: space-between;"> <div>5</div> <div>6</div> </div>	60	#6	42400	AHU-2
ACCU-1		26,600	#8	40	<div style="display: flex; justify-content: space-between;"> <div>7</div> <div>8</div> </div> <div style="display: flex; justify-content: space-between;"> <div>9</div> <div>10</div> </div> <div style="display: flex; justify-content: space-between;"> <div>11</div> <div>12</div> </div>	40	#8	26,600	ACCU-2
XFMRG		4600	#12	20	<div style="display: flex; justify-content: space-between;"> <div>13</div> <div>14</div> </div> <div style="display: flex; justify-content: space-between;"> <div>15</div> <div>16</div> </div> <div style="display: flex; justify-content: space-between;"> <div>17</div> <div>18</div> </div>				SPACE
SPACE					<div style="display: flex; justify-content: space-between;"> <div>19</div> <div>20</div> </div> <div style="display: flex; justify-content: space-between;"> <div>21</div> <div>22</div> </div> <div style="display: flex; justify-content: space-between;"> <div>23</div> <div>24</div> </div>				
					<div style="display: flex; justify-content: space-between;"> <div>25</div> <div>26</div> </div> <div style="display: flex; justify-content: space-between;"> <div>27</div> <div>28</div> </div> <div style="display: flex; justify-content: space-between;"> <div>29</div> <div>30</div> </div>				
					<div style="display: flex; justify-content: space-between;"> <div>31</div> <div>32</div> </div> <div style="display: flex; justify-content: space-between;"> <div>33</div> <div>34</div> </div> <div style="display: flex; justify-content: space-between;"> <div>35</div> <div>36</div> </div>				
					<div style="display: flex; justify-content: space-between;"> <div>37</div> <div>38</div> </div> <div style="display: flex; justify-content: space-between;"> <div>39</div> <div>40</div> </div> <div style="display: flex; justify-content: space-between;"> <div>41</div> <div>42</div> </div>				
LOAD		69000						69000	LOAD

TOTAL CONNECTED LOAD = 138000  
 HTG. GREATER THAN COOLING SO REVISED LOAD IS:  
 90000/831 = 108A

14,000 AIC RATING NEMA 1

PROVIDE HUBBELL (OR APPROVED EQUAL) CX LIGHTING CONTROL RELAY PANELS FOR PROGRAMMED CONTROL OF ALL LIGHTING CIRCUITS. PROVIDE AUXILIARY AFTER HOURS ON/OFF OVERRIDE CONTROLS FOR OWNER USE. COORDINATE LOCATION OF OVERRIDE SWITCHES WITH OWNER.

## PANEL "EHLS"

SERVICE: 277/480 VOLTS 3  $\phi$  4 W

MAINS: 100 AMPS 100A MCB

CABINET: SURFACE MOUNTED

LOAD	LOAD WATTS	WIRE	CKT. BKR.	100 AMP MCB	CKT. BKR.	WIRE	LOAD WATTS	LOAD
SITE LTS	750	10	20	1  2	20	10	945	EXT LTS
GYM LTS 1ST & MEZZ	735	12	20	3  4	20	12	1375	1ST FLR S LTS
1ST FLR N LTS	1615	12	20	5  6	20	12	1000	EXIT/EGRESS LTS
GYM LTS	2100	12	20	7  8	20	12	2100	GYM LTS
2ND FLR S LTS	1530	12	20	9  10	20	12	1090	2ND FLR N LTS
ELEVATOR	34,900	6	70	11  12	20	10	945	EXT LTS
				13  14	20			SPARE
				15  16	20			SPARE
SPACE				17  18				SPACE
				19  20				
				21  22				
				23  24				
				25  26				
				27  28				
				29  30				
				31  32				
				33  34				
				35  36				
				37  38				
				39  40				
				41  42				
LOAD	41,630						7455	LOAD

TOTAL CONNECTED LOAD = 49085

25% MORE LT = 3545 + 49085 = 52630

52630/631 = 63A

14,000 AIC RATING NEMA 1

- ② COORDINATE EXACT REQUIREMENTS WITH THE ELEVATOR MANUFACTURER.
- ③ PROVIDE BREAKER WITH LOCK "ON" DEVICE.

## PANEL "LG"

SERVICE: 120/208 VOLTS 3 Ø 4 W

MAINS: 100 AMPS 30A MCB

CABINET: SURFACE MOUNTED

LOAD	LOAD WATTS	WIRE	CKT. BKR.	30 AMP MCB	CKT. BKR.	WIRE	LOAD WATTS	LOAD
REC	180	#12	20	1  2	20	#12	180	REC
REC	180			3  4			720	REC
REC	720			5  6			360	REC
EXT REC	720			7  8			360	MEZZ REC
SCOREBOARD	300			9  10			300	SCOREBOARD
GENSET MISC	500			11  12				SPARE
SPARE				13  14				SPARE
SPACE				15  16				
				17  18				
				19  20				
				21  22				
				23  24				
				25  26				
				27  28				
				29  30				
				31  32				
				33  34				
				35  36				
				37  38				
				39  40				
				41  42				
LOAD	2600						1980	LOAD

TOTAL CONNECTED LOAD = 4580

4580/360 = 13A

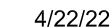
10,000 AIC RATING NEMA 1

126 W. BRUCE STREET, SUITE 102  
HARRISONBURG, VIRGINIA 22801

333 CYPRESS RUN, SUITE 350  
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SHEET TITLE	
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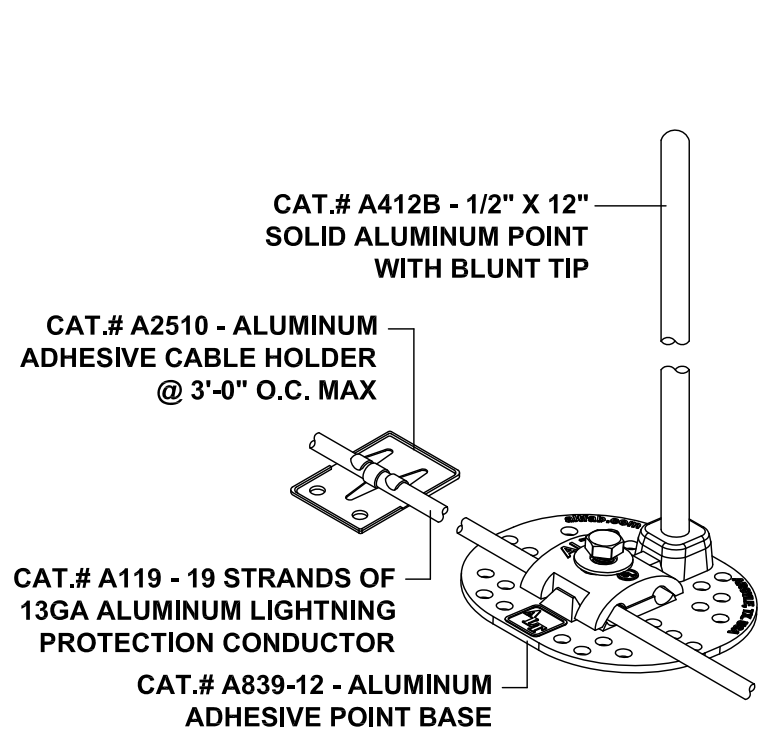
# ELECTRICAL PANEL SCHEDULES

SHEET NO.

## E0.4

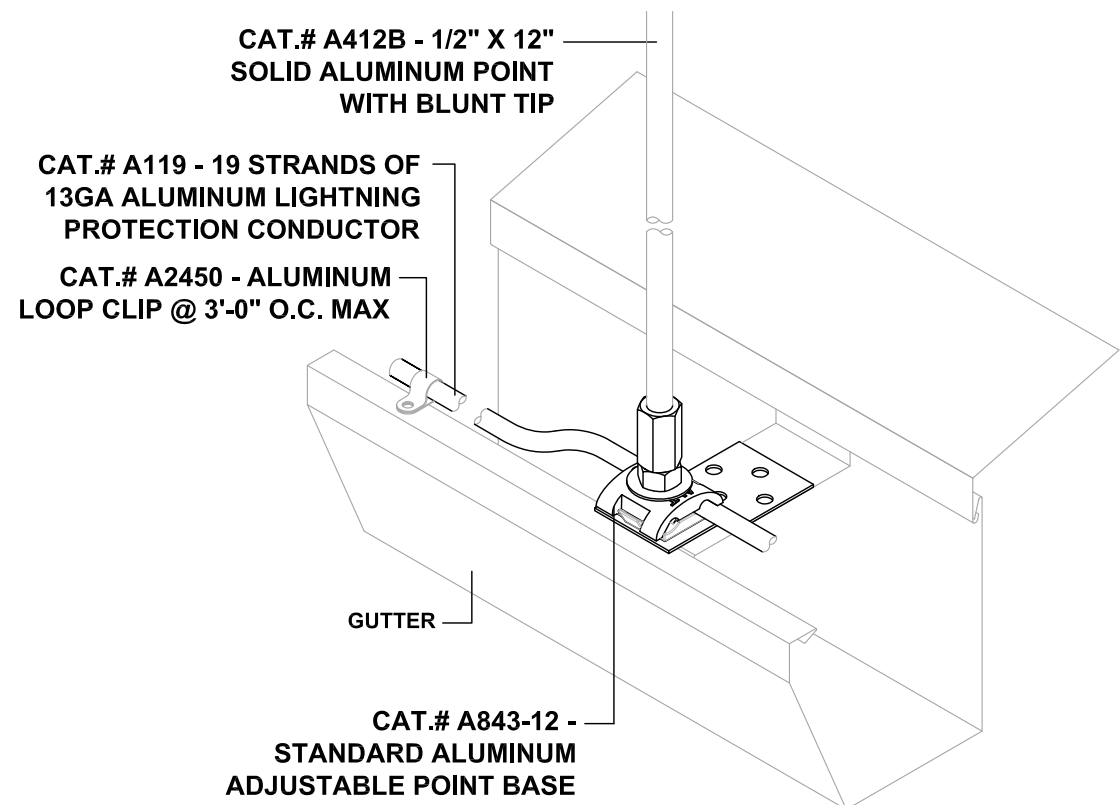
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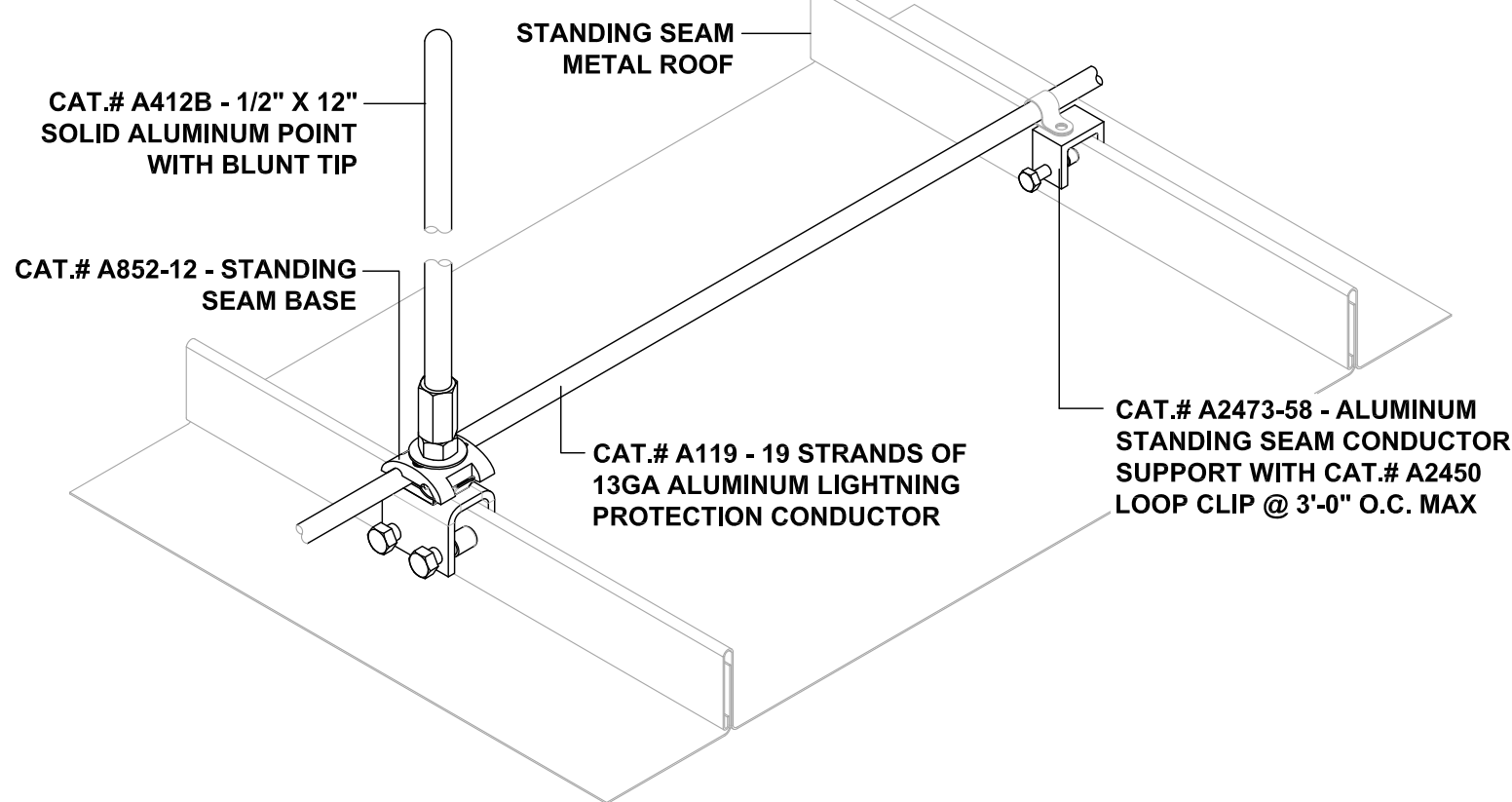
DETAIL - A ○A

NOTE:  
ADHERE CABLE HOLDER AND BASE TO ROOF WITH URETHANE SEALANT.

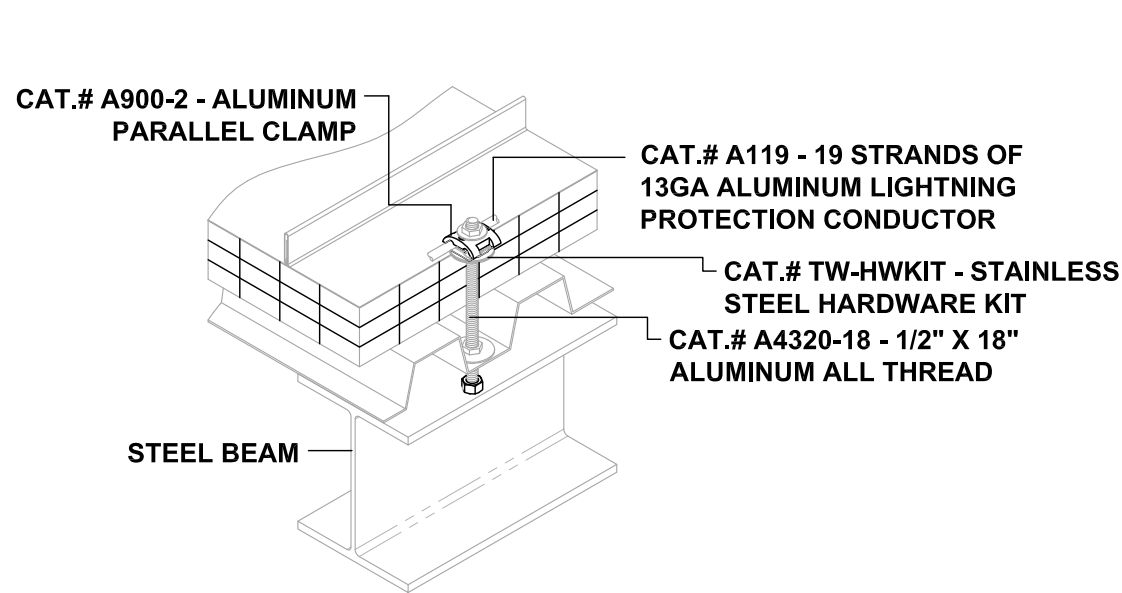


DETAIL - B ○B

NOTE:  
SECURE BASE & LOOP CLIP TO GUTTER SUPPORT WITH STAINLESS STEEL SCREWS

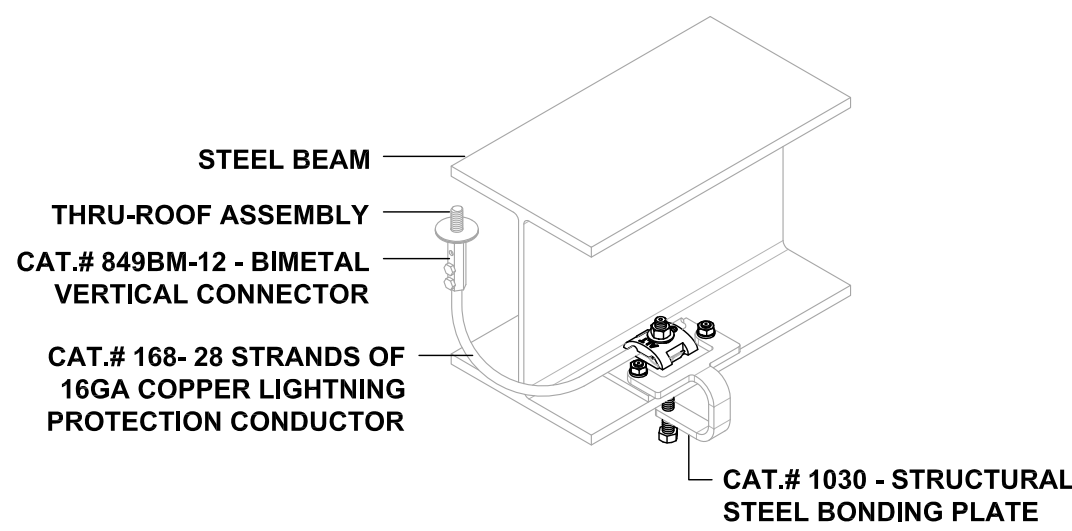


DETAIL - C ○C

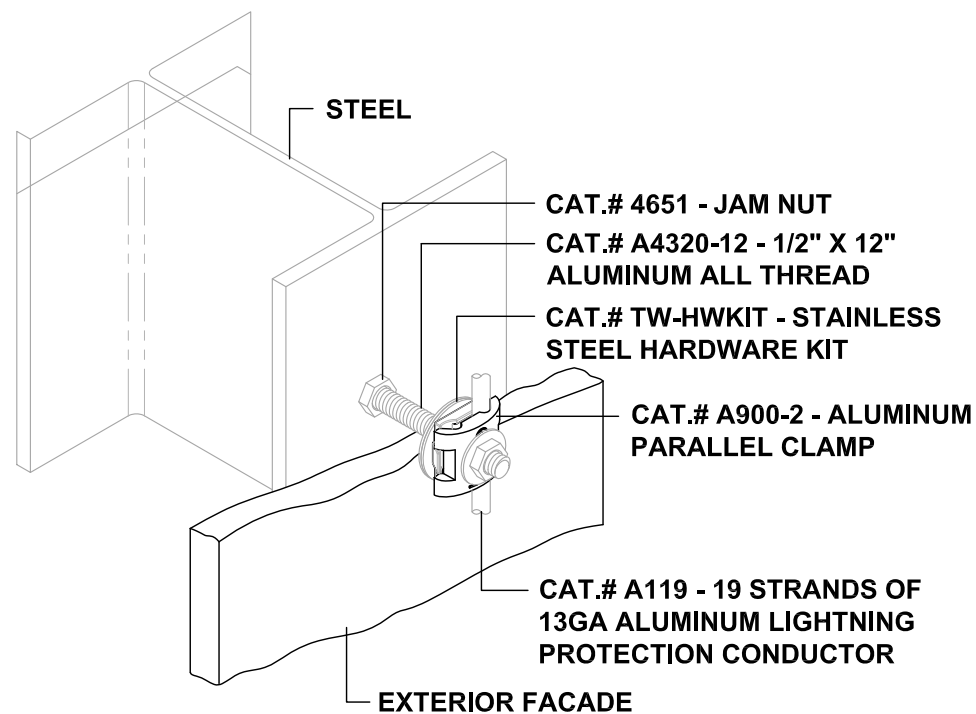


DETAIL - T □T

NOTE:  
ROOF PENETRATIONS SEALED AND FLASHED BY ROOFING CONTRACTOR.

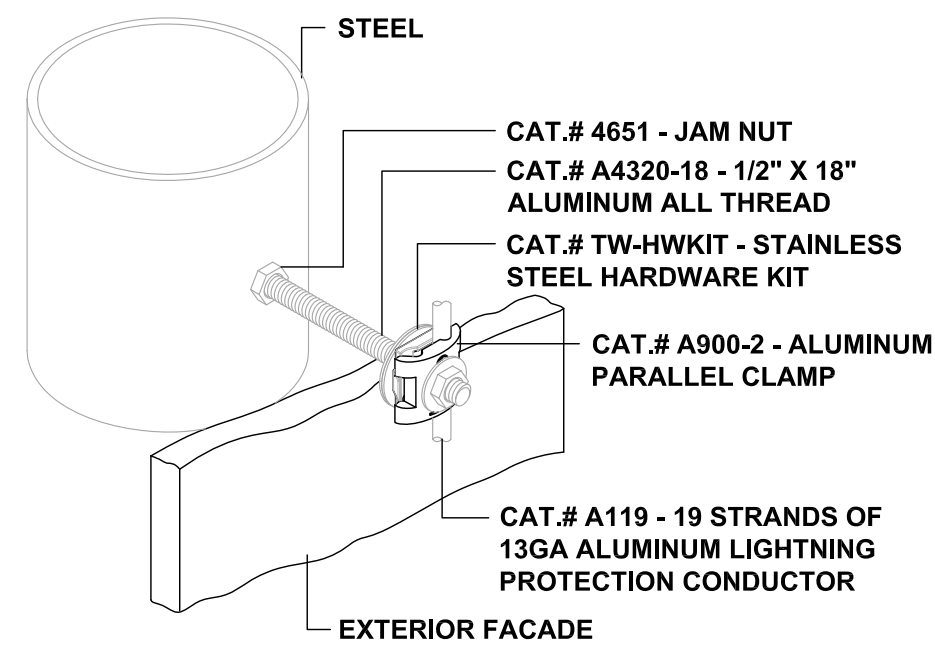


ALTERNATE CONNECTION TO STEEL FOR DETAIL - T



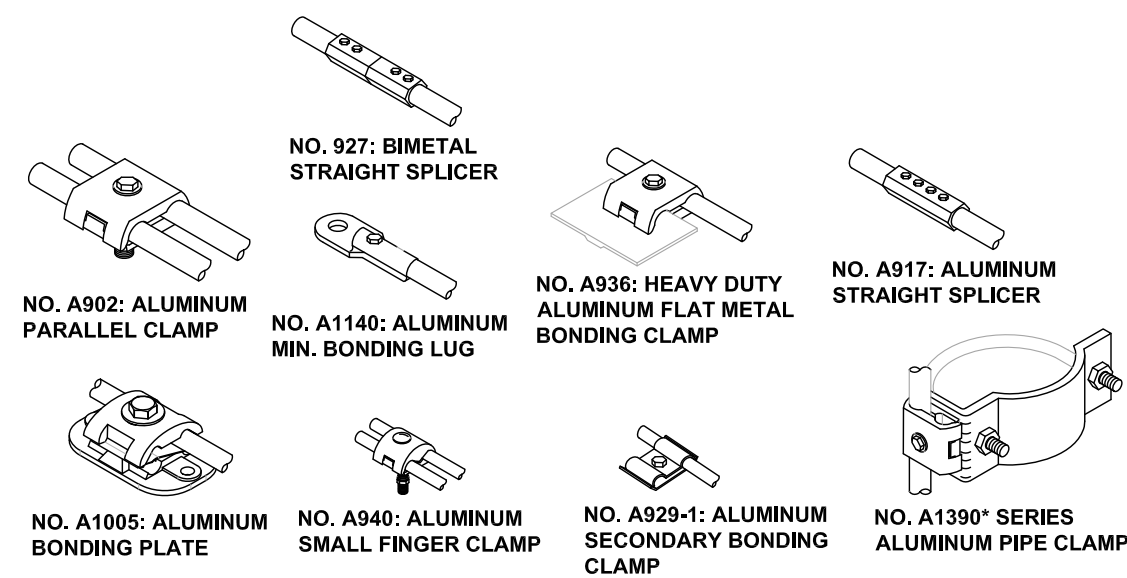
DETAIL - TW ▷TW

NOTE:  
SEAL AROUND WASHERS WITH URETHANE SEALANT.

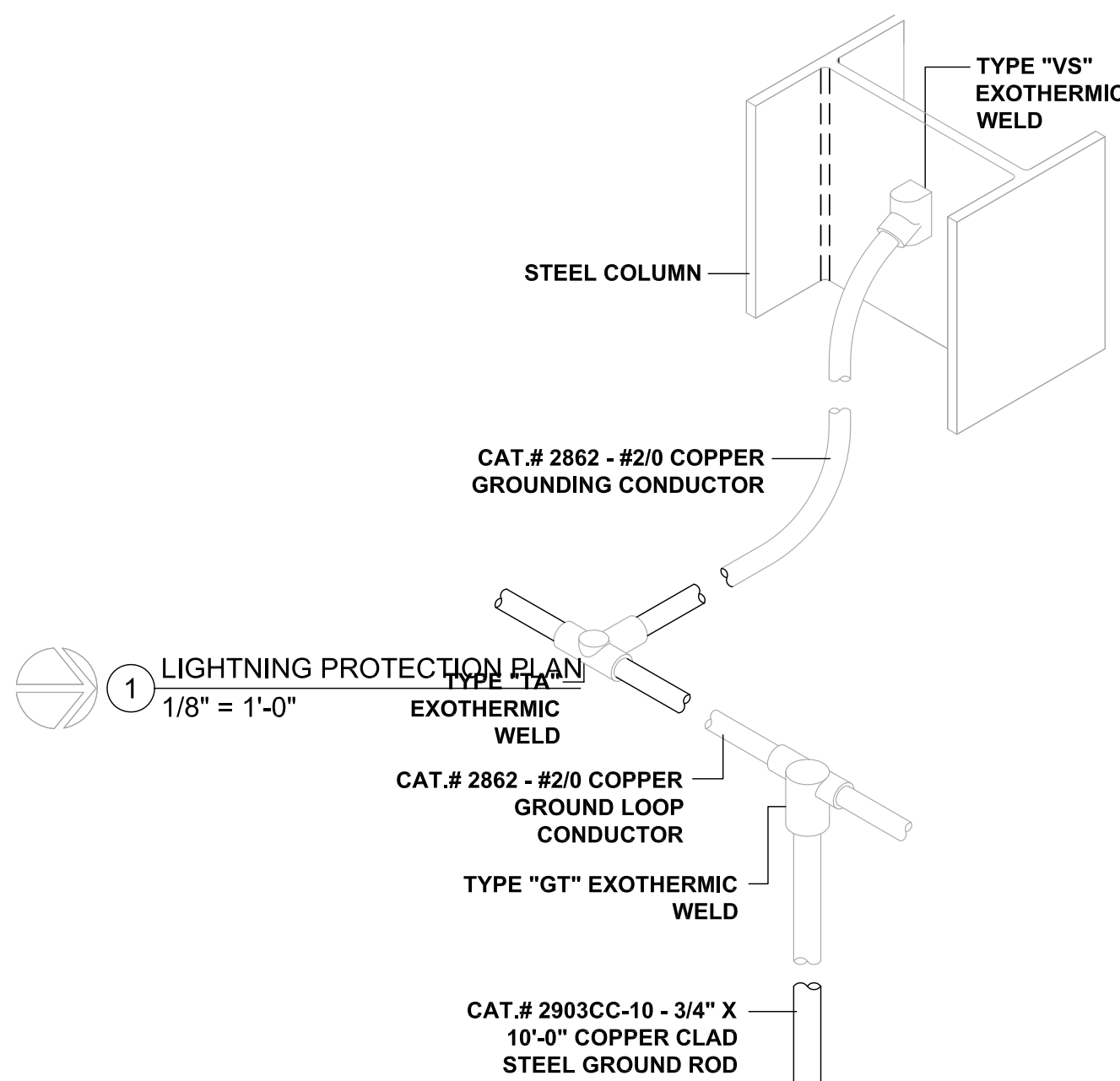


DETAIL - TW1 ▷TW1

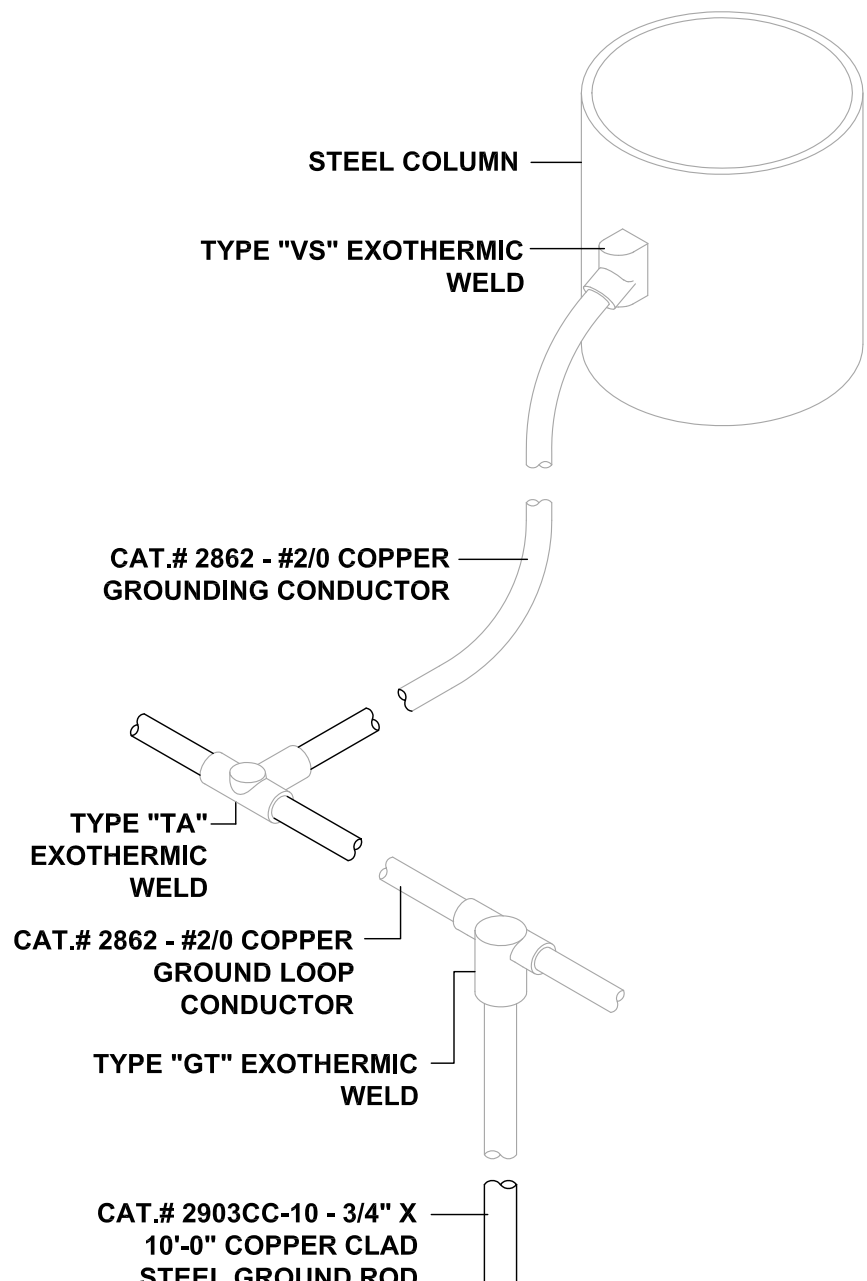
NOTE:  
SEAL AROUND WASHERS WITH URETHANE SEALANT.



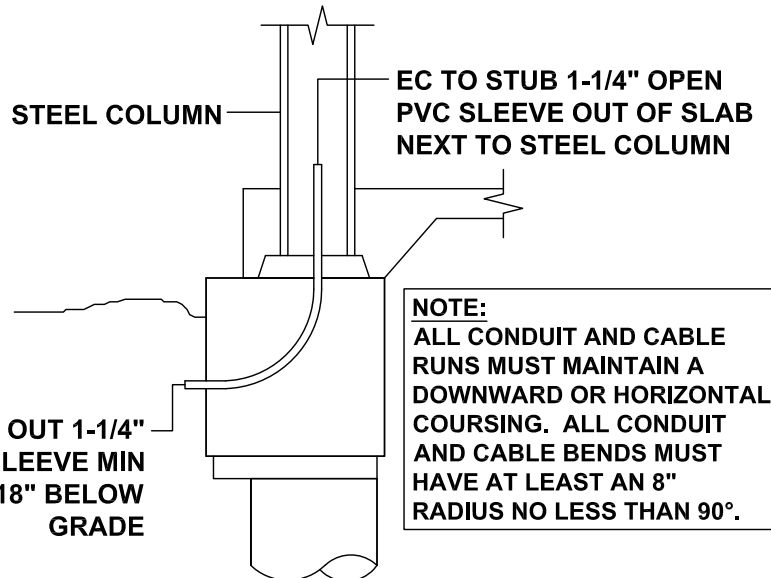
TYPICAL BONDING & SPLICING EQUIPMENT



DETAIL - G



DETAIL - G1



SLEEVE DETAIL - 200

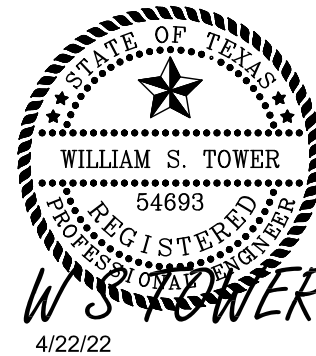
CAT.# 2862 - INSTALL #2/0 COPPER GROUND LOOP MIN. 18" BELOW GRADE AND 24" FROM FOUNDATION.

GENERAL NOTES:

1. INSTALLATION SHALL COMPLY IN ALL RESPECTS TO U.L. CODE 96A.
2. INSTALLATION SHALL COMPLY IN ALL RESPECTS TO L.P.I. CODE 175. INSTALLATION SHALL BE MADE BY OR UNDER SUPERVISION OF AN L.P.I. CERTIFIED MASTER INSTALLER.
3. COMPLETE DESIGN DRAWINGS SHOWING THE TYPE, SIZE AND LOCATION OF ALL GROUNDING DOWN CONDUCTORS, THROUGH ROOF/THROUGH WALL ASSEMBLIES, ROOF CONDUCTORS AND AIR TERMINALS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. ALL METAL EQUIPMENT MOUNTED ON ROOF SHALL BE PROTECTED BY THE NEW SYSTEM.
5. ALL NEW AIR TERMINALS SHALL BE FURNISHED WITH A SAFETY TIP.
6. DETAILS ARE BASED ON EQUIPMENT PROVIDED BY BONDED LIGHTNING PROTECTION SYSTEMS, LTD. EQUAL SYSTEMS WILL BE CONSIDERED.

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FIRM REGISTRATION NO. F-6008



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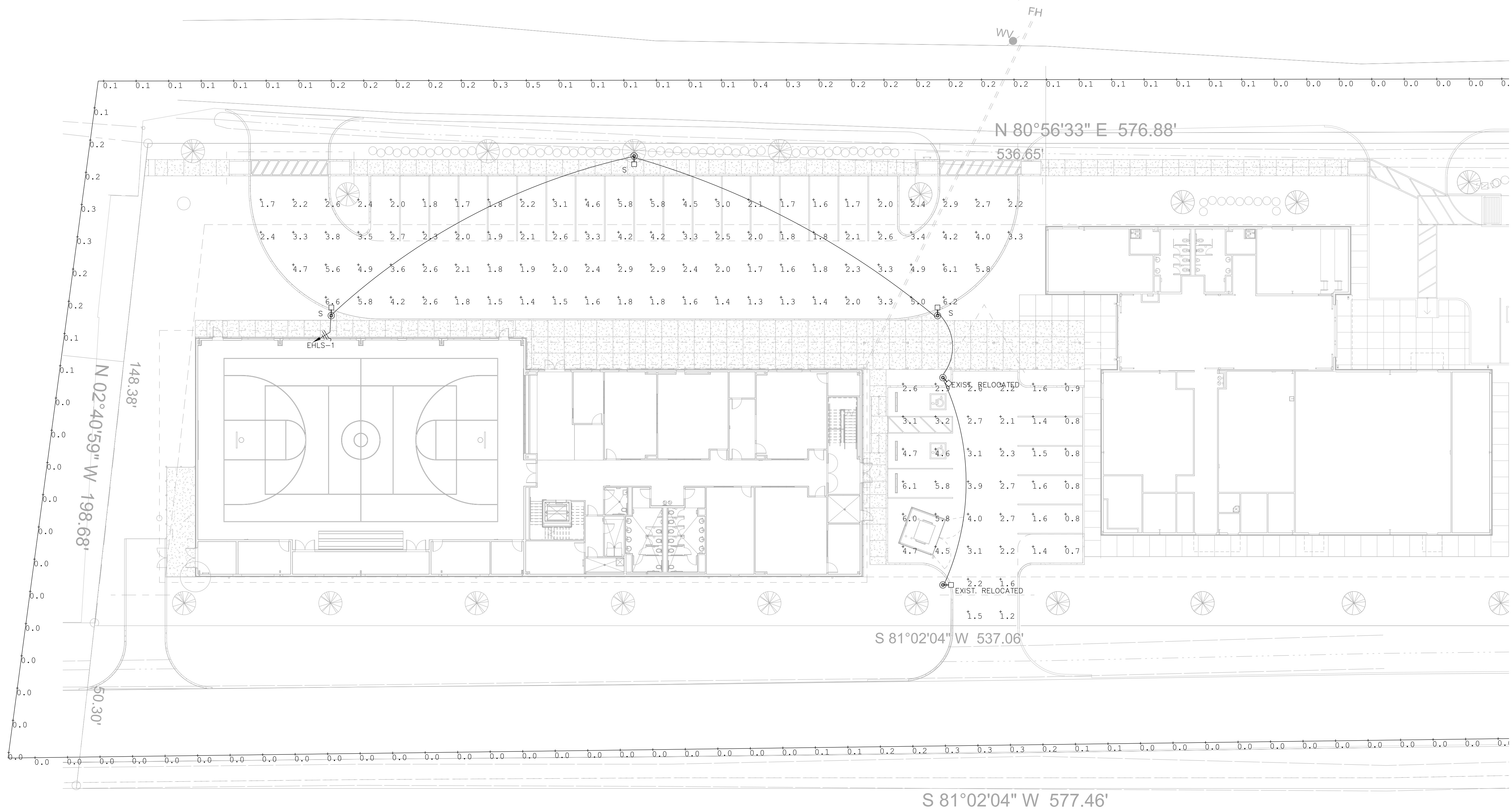
SHEET TITLE

**LIGHTNING  
PROTECTION  
ADD ALTERNATE**

SHEET NO.

**E0.5**

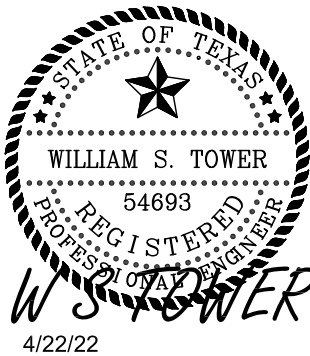




01 SITE LIGHTING PHOTOMETRIC PLAN  
SCALE: 1/16" = 1' - 0"

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
20 Feet Beyond Prop Line	Illuminance	Fc	0.06	0.5	0.0	N.A.	N.A.
East Parking Planar	Illuminance	Fc	2.70	6.1	0.7	3.86	8.71
North Parking Planar	Illuminance	Fc	2.86	6.6	1.3	2.20	5.08

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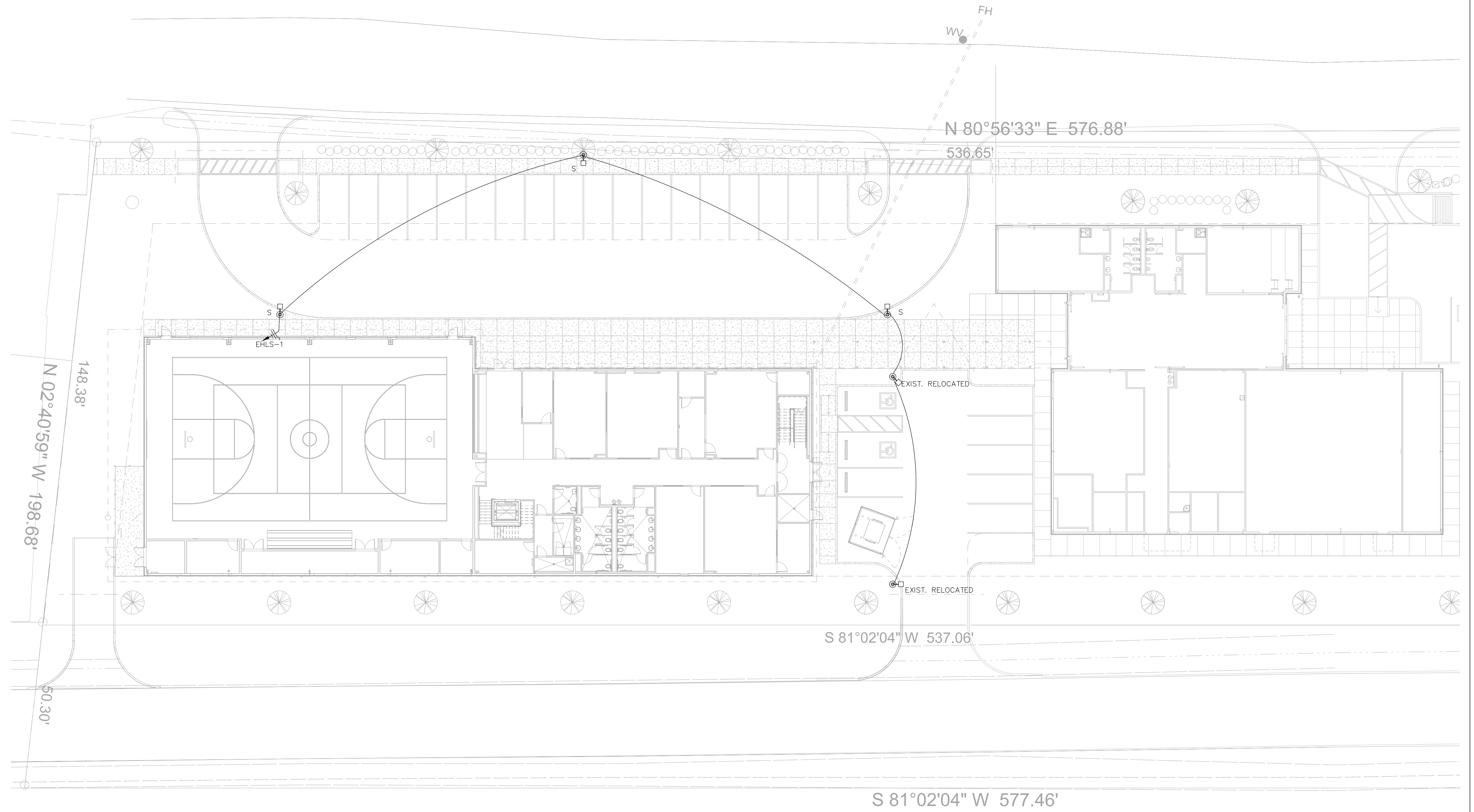
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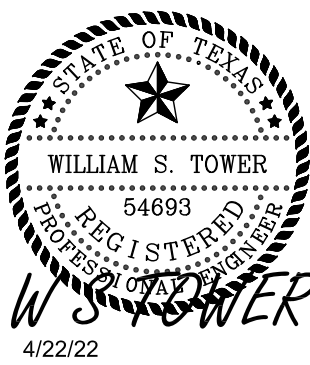
SHEET TITLE  
**SITE  
LIGHTING  
PHOTOMETRIC  
PLAN**

SHEET NO.  
**E1.0P**



01 SITE LIGHTING PLAN  
SCALE: 1/16" = 1' - 0"

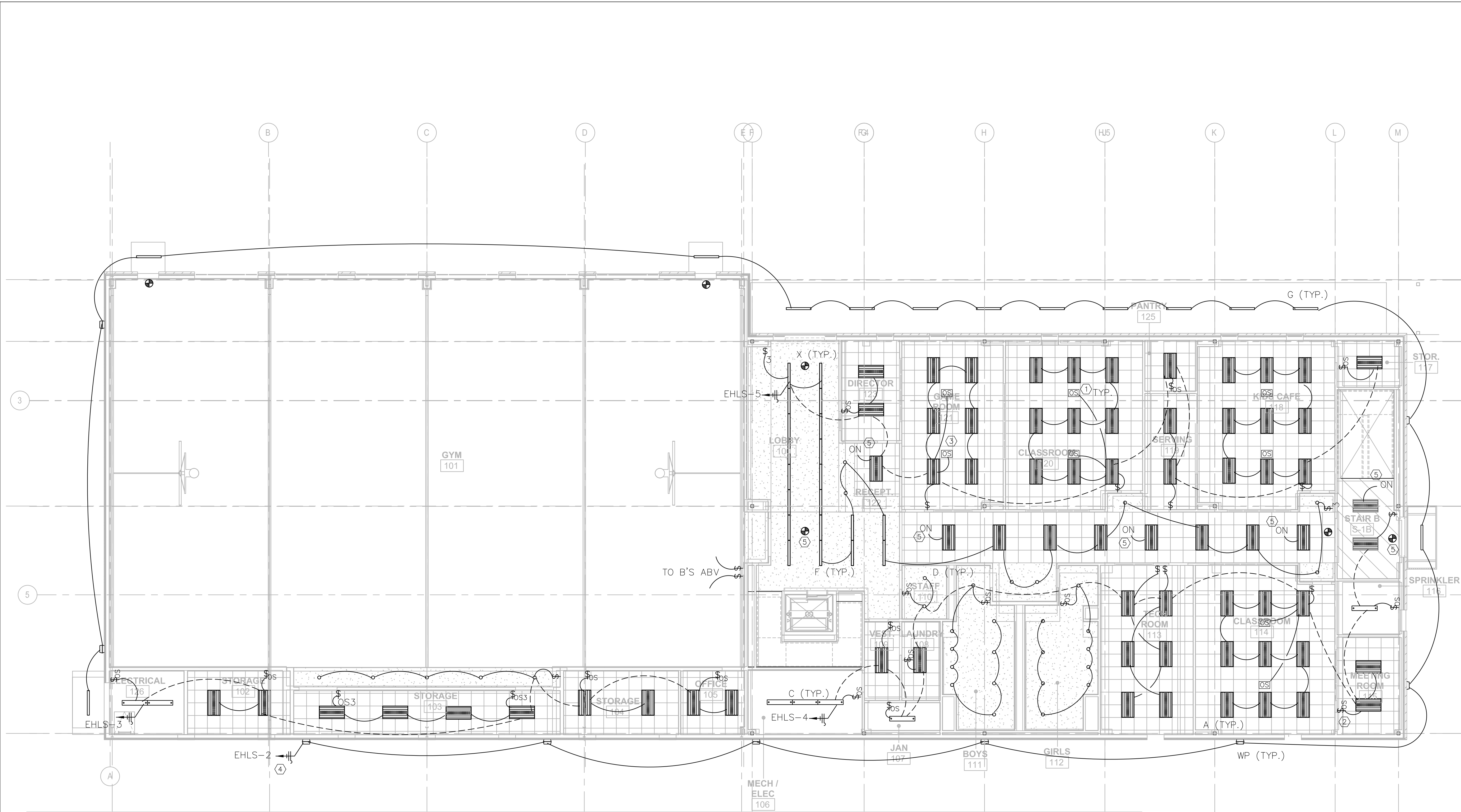
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SHEET TITLE		
SITE LIGHTING PLAN		
SHEET NO.		
E1.0		





Lighting Fixture Schedule

Fixture Type	Manufacturer	Catalog Number	Lamp Type	Mounting	Voltage	Dimming Type	Description
A	PINN	AD24-A-835MO-MOUNT-U-PL2-1-0-W	32.1 W LED	Recessed	UNV	0-10V	4000 LUMEN ARCHITECTURAL 2X4
B	SLG	HR-250-WD-G3-35K-S16L-FC+S16-CB	175W LED	SUSPENDED	UNV	0-10V	25,000 LUMEN ROUND HIGH BAY
C	DAYB	FSSEZ440L835-UNV-DIM	31W LED	SUSPENDED/SURFACE	UNV	0-10V	4000 LUMEN INDUSTRIAL STRIP
D	LOL	6RN-P6RDL20835Z10U	21W LED	RECESSED	UNV	0-10V	2000 LUMEN RECESSED DOWNLIGHT
F	PINN	EV6A-35-4'-FLF-UNV-1D-FINISH	21W LED	RECESSED	UNV	0-10V	4' ARCHITECTURAL STRIP LIGHT
G	TECHOLED	TECHOLED-IP-D-4-45-40-U-S-R-D	45W LED	RECESSED	UNV	0-10V	EXTERIOR RATED, RECESSED ARCHITECTURAL LINEAR
S	ALS	ALV-150-40-T3-DB-UNVD-MOUNT-ALV-SR	150W	POLE	UNV	0-10V	SITE LIGHT
S (POLE)	KW	STSP25-6.25-11-(F)-DM10-BC	N/A	POLE	N/A	N/A	25' SQUARE TAPERED STEEL POLE
WP	SLG	WV-40-G1-4K	40W LED	WALL	UNV	0-10V	3,600 LUMEN WALL PACK
X	EMER	TOTAL EDGE SERIES	3W LED	UNV	UNV	N/A	EDGE LIT EXIT SIGN

01 LIGHTING PLAN - 1ST FLOOR  
SCALE: 1/8" = 1' - 0"

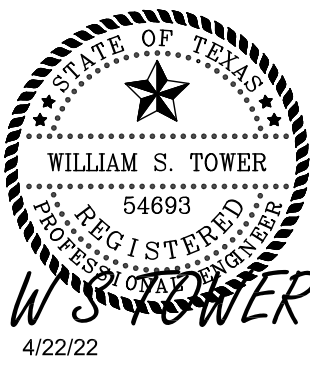
GENERAL NOTES: ALL LIGHTING CIRCUITS

PROVIDE HUBBELL (OR APPROVED EQUAL) CX LIGHTING CONTROL RELAY PANELS FOR PROGRAMMED CONTROL OF ALL LIGHTING CIRCUITS. PROVIDE AUXILIARY AFTER HOURS ON/OFF OVERRIDE CONTROLS FOR OWNER USE. COORDINATE LOCATION OF OVERRIDE SWITCHES WITH OWNER.

KEYED NOTES:

- ① CONNECT OCCUPANCY SENSOR TO SWITCH LEGS SERVING THIS SPACE.
- ② PROVIDE AND INSTALL WALL MOUNTED LIGHT SWITCH W/ OCCUPANCY SENSOR AT THIS APPROXIMATE LOCATION, TYPICAL.
- ③ PROVIDE AND INSTALL NEW CEILING OCCUPANCY SENSOR AT THIS APPROXIMATE LOCATION. OCCUPANCY SENSOR PROVIDES 150-650 SQ. FT. OF COVERAGE, TYPICAL.
- ④ EXTERIOR LIGHTS SHALL HAVE CIRCUIT CONTROLLED BY PHOTO CELL "ON" AND TIME CLOCK "OFF".
- ⑤ CONNECT TO ALWAYS ON CKT. EHLS-6. TYPICAL

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FORT BEND COUNTY  
NEW COMMUNITY CENTER  
AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

PROJECT NO.: 06-21-011

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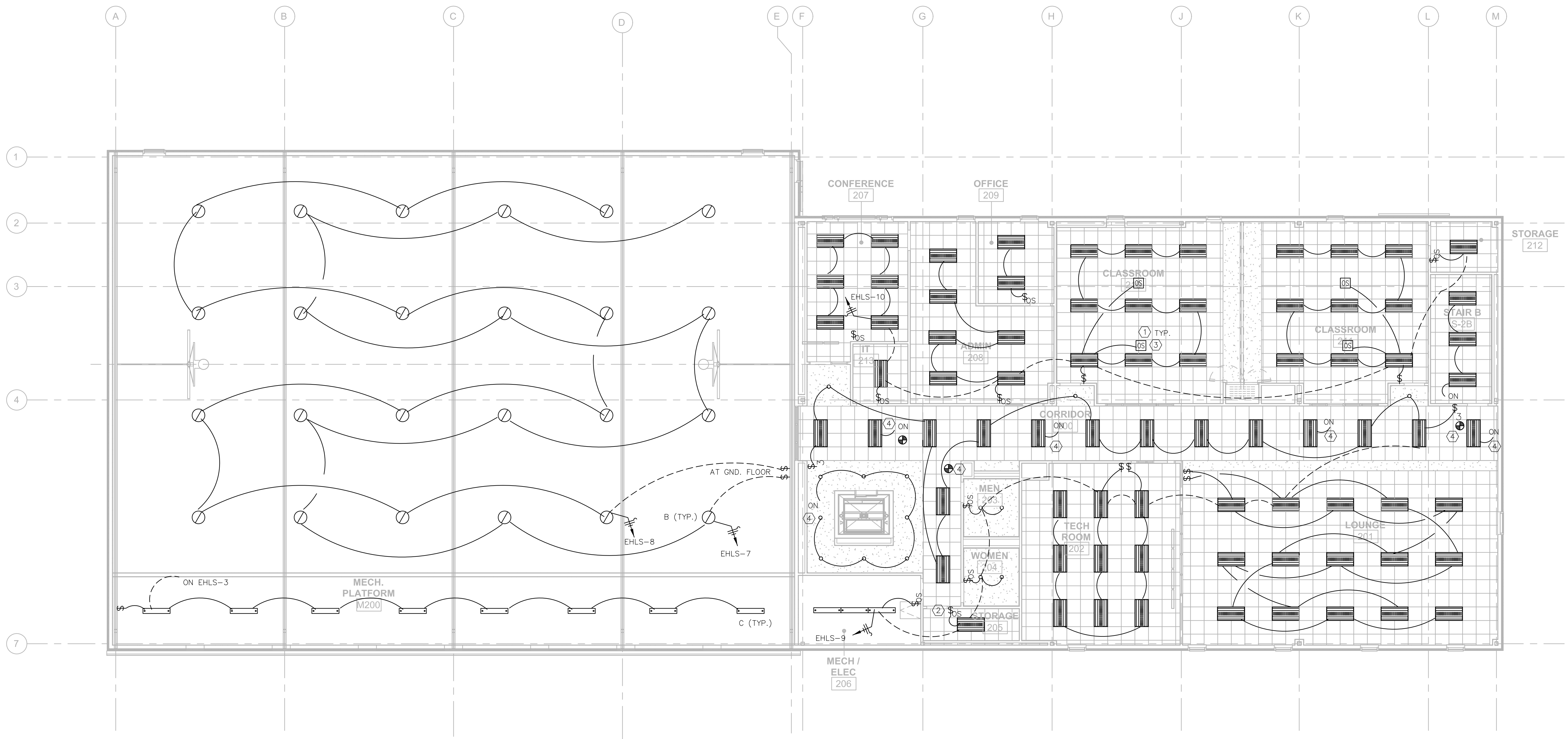
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LIGHTING  
PLAN - 1ST  
FLOOR

SHEET NO.

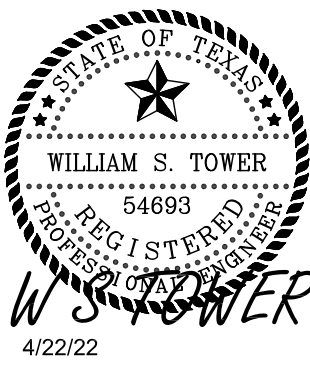
E1.1



01 LIGHTING PLAN – 2ND FLOOR  
SCALE: 1/8" = 1' - 0"

- KEYED NOTES:
- ①CONNECT OCCUPANCY SENSOR TO SWITCH LEGS SERVING THIS SPACE.
  - ②PROVIDE AND INSTALL WALL MOUNTED LIGHT SWITCH W/ OCCUPANCY SENSOR AT THIS APPROXIMATE LOCATION. TYPICAL.
  - ③PROVIDE AND INSTALL NEW CEILING OCCUPANCY SENSOR AT THIS APPROXIMATE LOCATION. OCCUPANCY SENSOR PROVIDES 150-650 SQ. FT. OF COVERAGE. TYPICAL.
  - ④CONNECT TO ALWAYS ON CKT. EHLS6. TYPICAL

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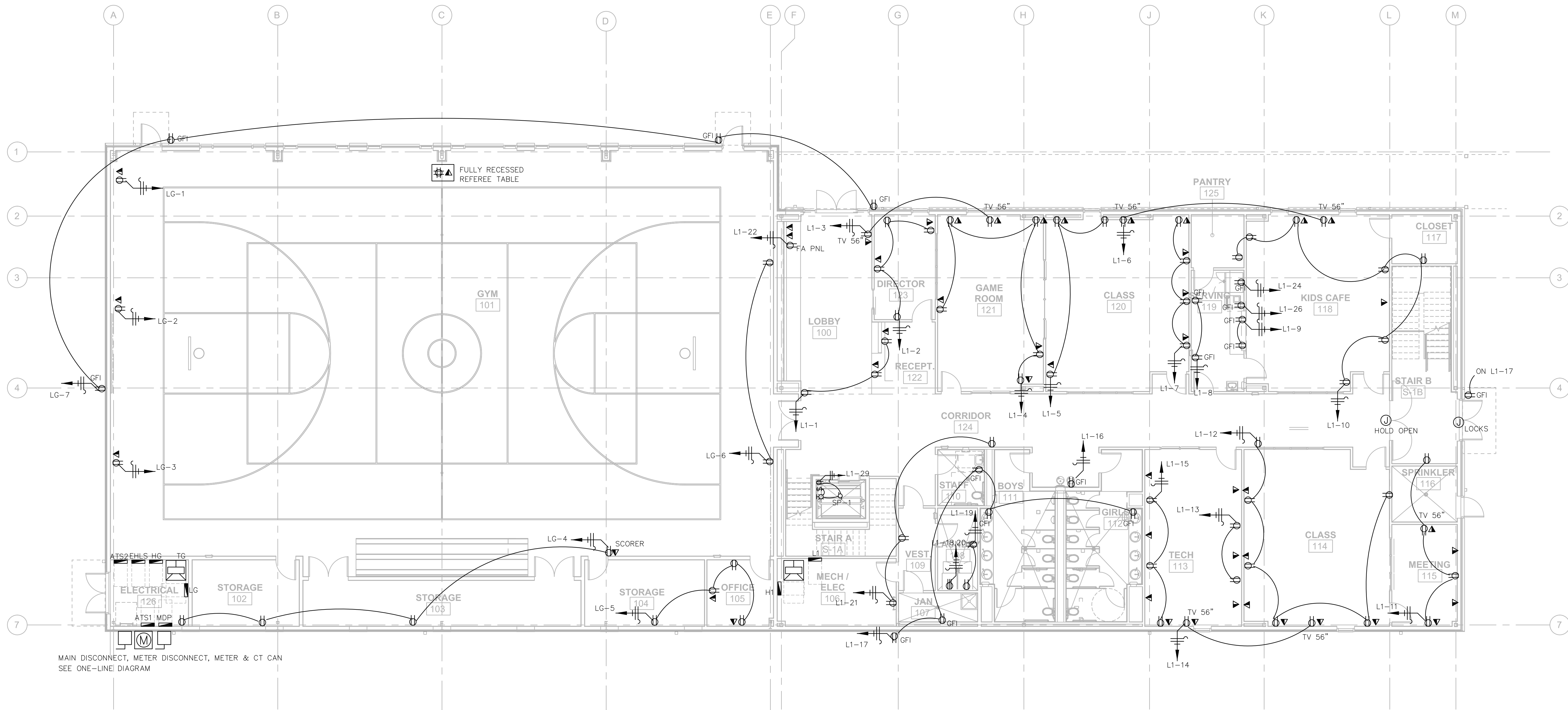


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**LIGHTING  
PLAN - 2ND  
FLOOR**  
SHEET NO.  
**E1.2**

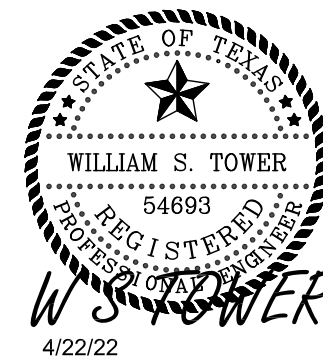




01 POWER PLAN - 1ST FLOOR  
SCALE: 1/8" = 1' - 0"

### POWER AND COMMUNICATIONS LEGEND

- ▼ TELEPHONE & DATA OUTLETS WITH 3/4" CONDUIT & PULL STRING TO ABOVE CEILING
- ⊕ DUPLEX RECEPTACLE
- ⊕ QUADRAPLEX RECEPTACLE
- ⊕ SPECIAL PURPOSE RECEPTACLE
- ⊕ JUNCTION BOX (POWER AS INDICATED ON PLAN)
- ⊕ DISCONNECT SWITCH
- ⊕ FLOOR BOX OUTLET (WITH QUADRAPLEX RECEPTACLE & TELEPHONE & DATA OUTLETS)



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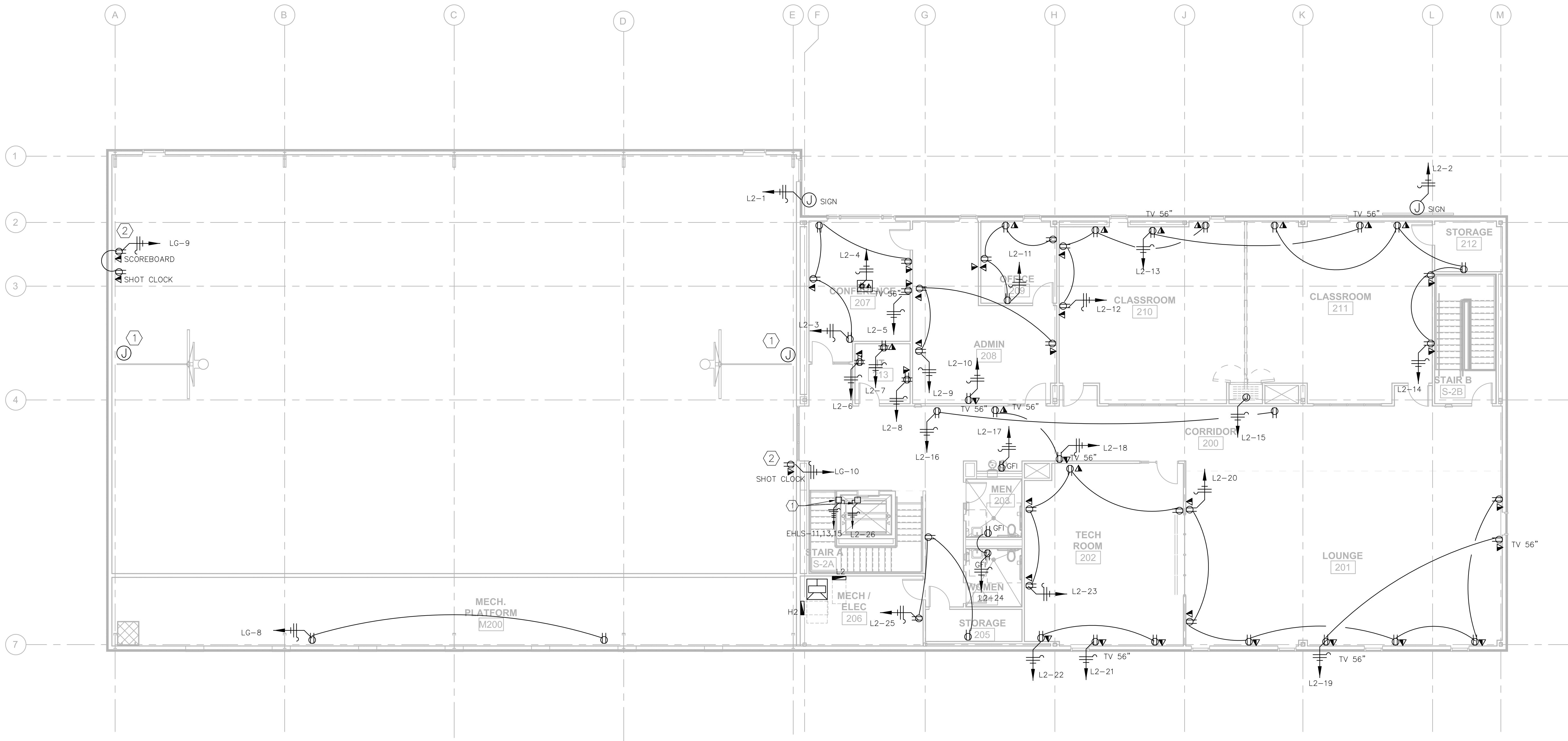
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**POWER  
PLAN - 1ST  
FLOOR**

SHEET NO.

**E2.1**

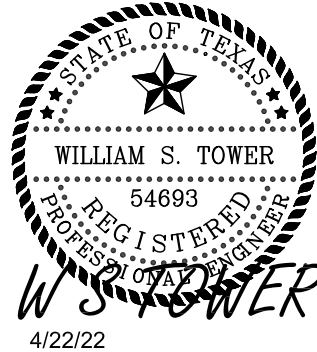


01 POWER PLAN - 2ND FLOOR  
SCALE: 1/8" = 1' - 0"

- KEYED NOTES:
- ① COORDINATE BB GOAL REMOTE CONTROL W/OWNER.
  - ② COORDINATE SCOREBOARD LOCATION & REQUIREMENTS W/OWNER. PROVIDE WALL BLOCKING & STRUCTURAL SUPPORT FOR SCOREBOARD.

POWER AND COMMUNICATIONS LEGEND		
▼	TELEPHONE & DATA OUTLETS WITH 3/4" CONDUIT & PULL STRING TO ABOVE CEILING	
⊕	DUPLEX RECEPTACLE	
⊕	QUADRAPLEX RECEPTACLE	
⊕	SPECIAL PURPOSE RECEPTACLE	
⊕	JUNCTION BOX (POWER AS INDICATED ON PLAN)	
⊕	DISCONNECT SWITCH	
⊕	FLOOR BOX OUTLET (WITH QUADRAPLEX RECEPTACLE & TELEPHONE & DATA OUTLETS)	

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**POWER  
PLAN - 2ND  
FLOOR**

SHEET NO.

**E2.2**



- ① COORDINATE EXACT REEL LOCATIONS WITH OWNER. TYPICAL.
- ② PROVIDE WALL BLOCKING AND STRUCTURAL SUPPORT FOR XFMR. MOUNT SUCH THAT BOTTOM OF ASSEMBLY IS 6'-10" MIN.

333 CYPRESS RUN, SUITE 350  
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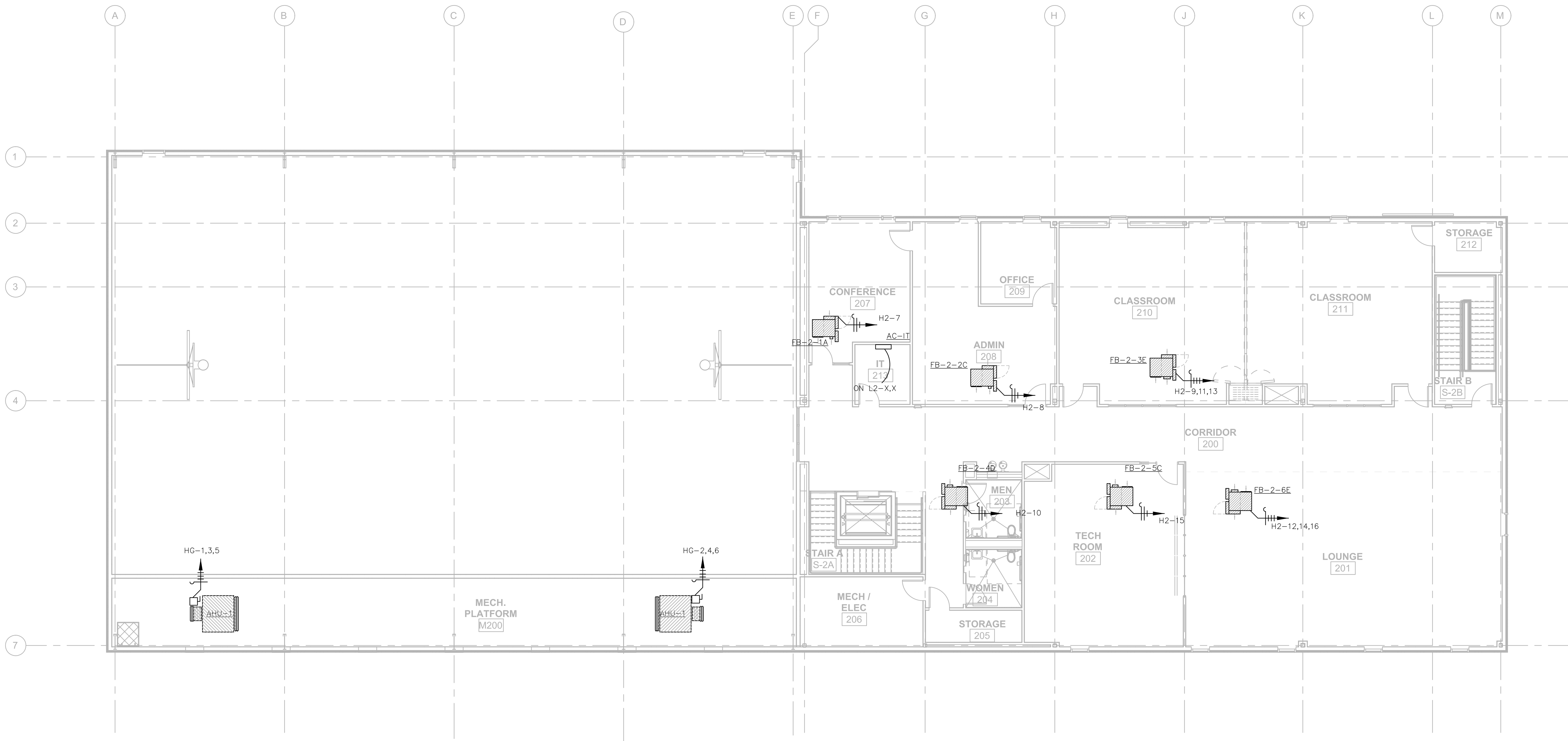
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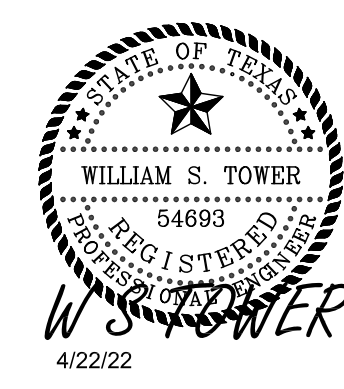
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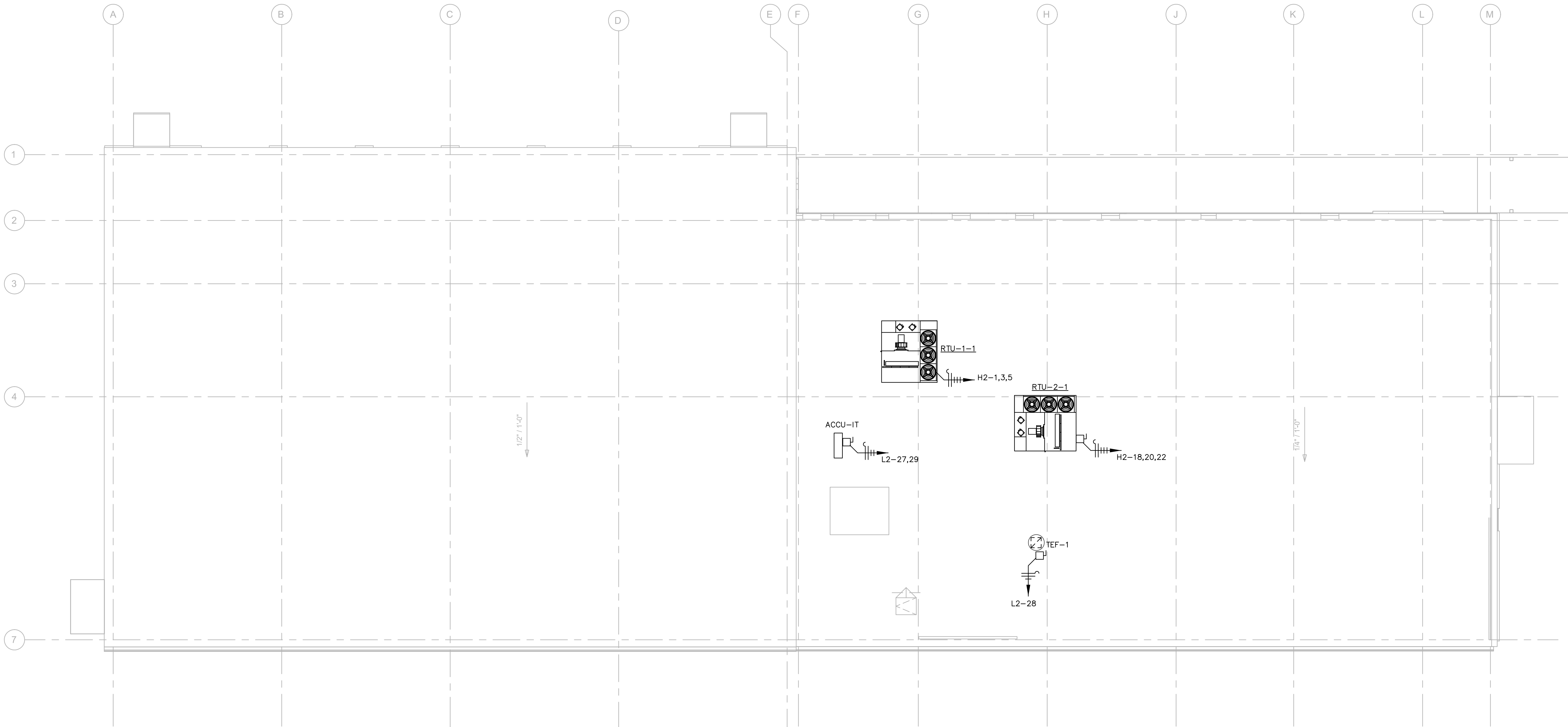
01 MECH. EQUIPMENT POWER PLAN – 2ND FLOOR  
SCALE: 1/8" = 1' - 0"

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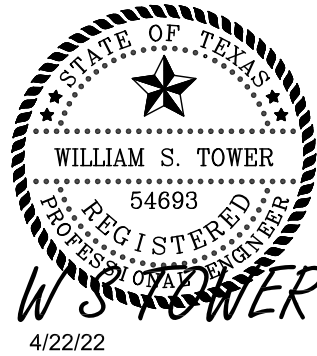


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MECH. EQUIPMENT POWER PLAN 2ND FLOOR		
SHEET NO.		
E3.2		



01 MECHANICAL EQUIPMENT POWER PLAN – ROOF  
SCALE: 1/8" = 1' - 0"



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**MECH.  
EQUIPMENT  
POWER PLAN  
ROOF**

SHEET NO.

**E3.3**

PUMP SCHEDULE									
MARK	LOCATION	SERVICE	GPM	HEAD FT.	MIN. EFF.	HP	VOLTS/Ø /	RPM	MAKE AND MODEL
<u>HWC</u> –1	LEVEL 1	DOMESTIC HOT WATER	5	7	--	1/15	120/1Ø	1750	BELL & GOSSET SERIES 100, 3/4" FLANGED ALL BRONZE, INLINE TYPE

WATER HEATER SCHEDULE								
MARK	SERVICE	STORAGE IN GALLONS	ELECTRICAL	ELEMENT WATTS	FLA	RECOVERY AT 90° RISE	MANUFACTURER/ MODEL BASIS OF DESIGN	NOTES
EWH–1	ELECTRIC WATER HEATER	30	208/1/60	3,000	14.4	14	A.O. SMITH MODEL NO. DEL–30	1,2,3
NOTES: 1. WATER HEATERS MUST HAVE COPPER T. & P. PRESSURE RELIEF VALVE LINES TO AN APPROVED LOCATION. 2. TIME CLOCK CONTROLLED. 3. PROVIDE WITH SERVICE DISCONNECT SWITCH								

PLUMBING MATERIALS	
<u>ABOVEGROUND DOMESTIC HW &amp; CW:</u>	TYPE "L" HARD DRAWN COPPER.
<u>UNDERGROUND DOMESTIC HW &amp; CW:</u>	DUCTILE IRON BELL AND SPIGOT OR (IF APPROVED BY LOCAL AUTHORITIES) PRESSURE APPROVED TYPE SCHEDULE 40 PVC.
<u>SEWAGE VENT AND DRAINAGE PIPING:</u>	CAST IRON ABOVE GROUND, SCHEDULE 40 ABS DWV UNDERGROUND, 8" OR LARGER UNDERGROUND – SDR35.
<u>NATURAL GAS:</u>	SCHEDULE 40 BLACK STEEL W/CLASS 150 BLACK MALLEABLE IRON SCREWED FITTINGS.

PLUMBING GENERAL NOTES	
1.	MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
2.	ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH 2015 INTERNATIONAL PLUMBING CODE.
3.	OBTAIN ALL NECESSARY PERMITS, PAY LEGAL FEES AND COMPLY WITH ALL NATIONAL, STATE AND MUNICIPAL LAWS, CODES AND ORDINANCES RELATING TO BUILDING AND PUBLIC SAFETY.
4.	CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN ON-SITE FLOW TEST AT THE NEAREST FIRE HYDRANT. THE RESULTS OF THIS TEST SHALL BE SUBMITTED TO THE ENGINEER OF RECORD UPON COMPLETION OF THE TEST.
5.	ALL SOIL AND WASTE PIPING SHALL BE INSTALLED AT A MAXIMUM OF 1/8" (1%) PER FOOT GRADE UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
6.	PROTECT EQUIPMENT AND WORK FROM DAMAGE DURING HANDLING AND INSTALLATION UNTIL COMPLETION OF CONSTRUCTION.
7.	REMOVE ALL EXCESS MATERIAL AND DEBRIS AND CLEAN ALL EQUIPMENT UPON COMPLETION OF WORK. TOUCH UP WITH PAINT WHERE REQUIRED.
8.	ALL SYSTEMS SHALL BE COMPLETE AND WORKING AT COMPLETION OF CONSTRUCTION.
9.	GUARANTEE ALL WORK AND MATERIALS FURNISHED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER AND ARCHITECT.
10.	ALL CONNECTIONS BETWEEN PIPES OF DISSIMILAR MATERIALS SHALL BE MADE WITH DI-ELECTRIC UNIONS.
11.	CONTRACTOR SHALL NOTIFY OWNER OF ANY REQUIRED SHUT DOWNS AND COORDINATE THESE WITH OWNER. DOWNTIME SHALL BE HELD TO A MINIMUM.
12.	CONTRACTOR SHALL COORDINATE ALL WORK CLOSELY WITH EXISTING AND NEW MECHANICAL AND ELECTRICAL ITEMS.
13.	SUBMIT SHOP DRAWINGS OF PROPOSED NEW DEVICES PRIOR TO INSTALLATION.
14.	FURNISH OWNER WITH COMPLETE OPERATING MANUALS AND INSTRUCTIONS FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
15.	FURNISH AND INSTALL SHOCK ARRESTOR IN COLD WATER LINES AT CONNECTIONS TO FLUSH VALVE AND QUICK CLOSING VALVES AND AT ALL HOT WATER CONNECTIONS TO FIXTURES.
16.	CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
17.	COORDINATE PLUMBING FIXTURE SIZES WITH MILLWORK PRIOR TO INSTALLATION. COORDINATE ROUGH-IN ELEVATIONS WITH MOUNTING HEIGHTS.
18.	NEW DOMESTIC WATER SHUT-OFF VALVES TO BE NIBCO MODEL NO. T–585–66–LF. FURNISH WITH EXTENDED STEM FOR VALVES IN INSULATED LINES.
19.	REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF ALL WALLS AND CHASES.
20.	FOR COMMERCIAL ENERGY CODE 2015, ALL HOT WATER PIPING SHALL BE INSULATED: 1–1/4" AND BELOW 1" REQUIRED, 1–1/2" AND ABOVE 1 1/2" REQUIRED PER TABLE C403.2.1. REFER TO SPECS. FOR ADDITIONAL INFORMATION.

PLUMBING FIXTURE SCHEDULE									
MARK	TYPE	DESCRIPTION	SIZE OF CONNECTIONS					MANUFACTURER/ MODEL BASIS OF DESIGN	
			TRAP	SS	SV	CW	HW		
WC–1 HWC–1		WATER CLOSET HANDICAPPED	N/A	4"	2"	1"	N/A	AMERICAN STANDARD NO.2257.001 "AFWALL" VITREOUS CHINA, WALL HUNG SIPHON JET WATER CLOSET WITH ELONGATED BOWL, ZURN Z6000AV MANUAL FLUSH VALVE FOR "WATER CLOSETS" WITH ALL ACCESSORIES 1.28 GPF FLUSH VALVE WITH SCREWDRIVER STOP AND PROTECTIVE CAP ON STOP. BEWIS 1655C WHITE OPEN FRONT SEAT WITH CONCEALED STAINLESS STEEL CHECK HINGE, ZURN, WADE, J.R. SMITH OR JOSAM ADJUSTABLE WALL MOUNTING, SINGLE OR DOUBLE, AS REQUIRED BY WASTE LINE LOCATIONS CONFORMING TO PIPING SYSTEM USED. MOUNT HWC–1 FIXTURE AT HANDICAPPED HEIGHT.	
L–1		LAVATORY HANDICAPPED	1 1/4"	2"	2"	1/2"	1/2"	AMERICAN STANDARD NO. 9482.000 "OVALYN UNIVERSAL" 19" VITREOUS CHINA, UNDERCOUNTER–MOUNTED LAVATORY WITH AMERICAN STANDARD 1340.827 WIDESPREAD METERING FAUCET. McGUIRE # 8872 CAST BRASS P–TRAP WITH CLEANOUT PLUG, McGUIRE # 155A CAST BRASS P.O. PLUG WITH OPEN GRID STRAINER AND 17 GAUGE TAILPIECE,McGUIRE # 2165LK SUPPLIES WITH RISER AND WALL ESCUTCHEON, ANGLE SUPPLY AND P–TRAP SHALL BE INSULATED WITH TRAP WRAP BY BROCAR PRODUCTS, INC. OR APPROVED EQUAL. PROVIDE SIMMONS OR EQUAL POINT OF USE THERMOSTATIC TEMPERING VALVES FOR FIXTURES.	
L–2		LAVATORY HANDICAPPED	1 1/4"	2"	2"	1/2"	1/2"	AMERICAN STANDARD NO. 0356.028 "LUCRENE" 20.5"x18.25" VITREOUS CHINA, WALL–MOUNTED LAVATORY AMERICAN STANDARD #6502.175 "MONTERREY" FITTING WITH VANDAL PROOF HANDLE 4–1/16" SPOUT McGUIRE # 8872 CAST BRASS P–TRAP WITH CLEANOUT PLUG, McGUIRE # 155A CAST BRASS P.O. PLUG WITH OPEN GRID STRAINER AND 17 GAUGE TAILPIECE,McGUIRE # 2165LK SUPPLIES WITH RISER AND WALL ESCUTCHEON, ANGLE SUPPLY AND P–TRAP SHALL BE INSULATED WITH TRAP WRAP BY BROCAR PRODUCTS, INC. OR APPROVED EQUAL. PROVIDE SYMMONS OR EQUAL POINT OF USE THERMOSTATIC TEMPERING VALVES FOR FIXTURES.	
L–3		LAVATORY HANDICAPPED	1 1/4"	2"	2"	1/2"	1/2"	AMERICAN STANDARD NO. 0356.028 "LUCRENE" 20.5"x18.25" VITREOUS CHINA, WALL–MOUNTED LAVATORY AMERICAN STANDARD #1340.227 CENTERING METERING FAUCET. McGUIRE # 8872 CAST BRASS P–TRAP WITH CLEANOUT PLUG, McGUIRE # 155A CAST BRASS P.O. PLUG WITH OPEN GRID STRAINER AND 17 GAUGE TAILPIECE,McGUIRE # 2165LK SUPPLIES WITH RISER AND WALL ESCUTCHEON, ANGLE SUPPLY AND P–TRAP SHALL BE INSULATED WITH TRAP WRAP BY BROCAR PRODUCTS, INC. OR APPROVED EQUAL. PROVIDE SYMMONS OR EQUAL POINT OF USE THERMOSTATIC TEMPERING VALVES FOR FIXTURES.	
EDF–1		ELECTRIC DRINKING FOUNTAIN HANDICAPPED	1 1/4"	2"	2"	1/2"	N/A	ELKAY NO. E25TLR.C BARRIER-FREE TWO LEVEL WALL MOUNT FOUNTAIN WITH 98324C APRON PROVIDE McGUIRE NO. 8088 CHROME-PLATED ADJUSTABLE P–TRAP WITH CLEANOUT PLUG, 1–1/4" TRAP NIPPLE AND CHROME-PLATED STOP VALVE. REFER TO ARCHITECT FOR MOUNTING HEIGHTS. W/BOTTLE FILLER.	
MS–1	STD	MOP SINK	3"	3"	2"	1/2"	1/2"	STERN WILLIAMS MODEL No. SBC1400 OR APPROVED EQUAL WHITE (24"x24") SERVICE SINK WITH 12" HIGH WALLS, 3" STAINLESS STEEL COMBINATION DOME STRAINER AND LINT BASKET OUTLET, ACID RESISTANT, MOLDED STONE. REMOVABLE VINYL–COATED RIM GUARD No. V–70–24. SINK FITTING T&S No. T–10–VS ROUGH CHROME PLATED BRASS FINISH, RIGID SPOUT, WALL BRACE, INTEGRAL STOPS, PAIL HOOK, HOSE END, VACUUM BREAKER AND VANDAL PROOF SCREWS, PROVIDE 30" HOSE (MINIMUM) WITH STAINLESS STEEL BRACKET (EQUAL TO STERN, – WILLIAMS No. T–35) AND STAINLESS STEEL MOP HANGER (EQUAL TO STERN, – WILLIAM'S No. T–40). PROVIDE 12" HIGH, 20 GAUGE TYPE 316 STAINLESS STEEL SPLASH GUARDS ON ALL WALLS ADJACENT TO THE SERVICE SINK. PROVIDE AND INSTALL INTERNAL WALL SUPPORTS IN ACCORDANCE WITH THE ARCHITECTS REQUIREMENTS FOR THE WALL BRACE ATTACHMENTS.	
FD–1	STD	FLOOR DRAIN	2"	2"	2"	N/A	N/A	J.R. SMITH FIGURE MODEL 9600–(A06–SS OR APPROVED EQUAL PAINTED STAINSTAIN STEEL FLOOR DRAIN AND SEEPAGE FLANGE, SIZE AS NOTED ON DRAWINGS, CLAMPING UNIT, AUTOMATIC TRAP GUARD "ATP–1", AND 6"x6" SQUARE ADJUSTABLE STAINLESS STEEL STRAINER TYPE TOP AND DEEP SEAL TRAP.	
FD–2	STD	FLOOR DRAIN	2"	2"	2"	N/A	N/A	J.R. SMITH FIGURE MODEL 9692 EQUAL PAINTED STAINLESS STEEL FLOOR DRAIN AND SEEPAGE FLANGE, SIZE AS NOTED ON DRAWINGS, CLAMPING UNIT, AUTOMATIC TRAP GUARD "ATP–1", AND 6"x6" SQUARE ADJUSTABLE POLISHED STAINLESS STEEL STRAINER TYPE TOP AND DEEP SEAL TRAP, 1/2 GRATE.	
HB–1	STD	HOSE BIBB	N/A	N/A	N/A	3/4"	N/A	CHICAGO FAUCET #387–E27CP WITH #E27 SPOUT OUTLET VACUUM BREAKER, LOOSE KEY HANDLE POLISHED CHROME PLATED.	
ATG–1	STD	AUTOMATIC TRAP GUARD	N/A	N/A	N/A	N/A	N/A	PRO SET "TRAP GUARDS" (TRAP GUARDS SHALL BE PLACED AT ALL FLOOR DRAIN LOCATIONS)	
WF–1	STD	WATER FILTER	N/A	N/A	N/A	1/2"	N/A	AQUA PURE WATER FILTER SYSTEM MODEL NO AP101T WITH APS117 CARTRIDGE TYPE REPLACEMENT FILTERS.	
RVB–1	STD	REFRIGERATOR VALVE BOX	–	–	–	1/2"	–	GUY GRAY #BIM–875 10–3/4" X 9" 16GA. STEEL WITH EPOXY FINISH , 3/8" O.D. SWEAT CONNECTION PROVIDE FILTER WHEN MAKING FINAL CONNECTION, AQUA–PURE #AP717	
TS–1	STD	TIME SWITCH	–	–	–	3/4"	–	TORK ELECTROMECHANICAL 24 HOUR TIME SWITCH POWERED BY A SELF STARTING SYNCHRONOUS MOTOR. INSTALL ON WALL ADJACENT TO CIRCULATING PUMP. COORDINATE WITH ELECTRICAL AND PROVIDE FOR 120/1/60 HZ POWER REQUIREMENT.	
U–1		URINAL HANDICAPPED	N/A	2"	2"	3/4"	N/A	AMERICAN STANDARD NO. 6541.132 "ALLBROOK", WALL HUNG URINAL, WITH ZURN AQUAADVANTAGE AV Z6003AV–EWS 0.5 FLUSH VALVE, WITH SCREWDRIVER ANGLE STOPS WITH PROTECTIVE CAP ON STOP. WADE, J.R. SMITH, ZURN OR JOSAM WALL MOUNTED CARRIER WITH RETANGLAR UPRIGHT. SEE ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT.	
FS–1	STD	FLOOR SINK	3"	3"	2"	N/A	N/A	J.R. SMITH FIGURE No. 3040–12 OR APPROVED EQUAL ROUND NICKEL BRONZE TOP 8–1/2" PAINTED CAST IRON FLOOR DRAIN WITH DOME BOTTOM STRAINER, 1/2" GRATE, SIZE AS NOTED ON PLANS, CLAMPING UNIT, QUAD CLOSE TRAP SEAL GUARD AND DEEP SEAL TRAP. SET TO RIM FLUSH WITH FINISH FLOOR .	
HL–1	STD	KITCHEN HAND LAV	1 1/2"	2"	2"	1/2"	1/2"	AMER. STD. LUCERNE # 0355.012. PROVIDE AMERICAN STANDARD #6802.002 "HERITAGE" FAUCET WITH #0000.352H POLISHED CHROME LEVER HANDLES, GRID DRAIN, P–TRAP AND SUPPLIES WITH STOP. PROVIDE SIMMONS OR EQUAL POINT OF USE THERMOSTATIC TEMPERING VALVES FOR FIXTURES.	



128 W. BRUCE STREET, SUITE 102  
HARRISONBURG, VIRGINIA 22801

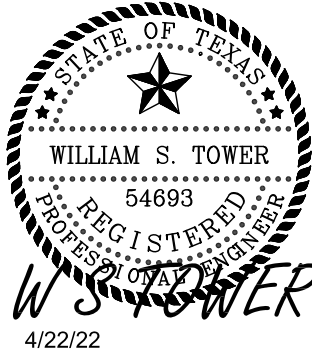
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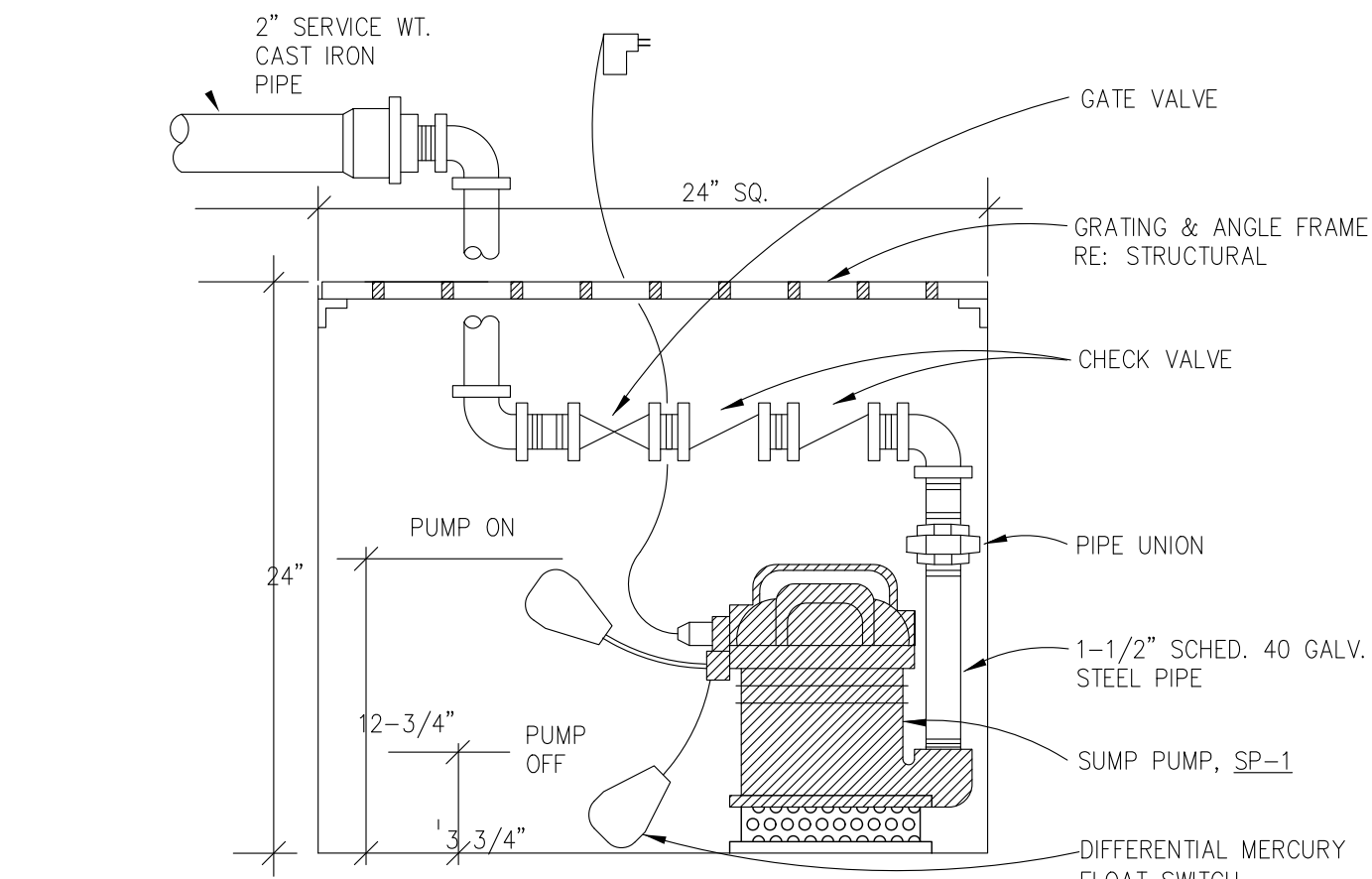
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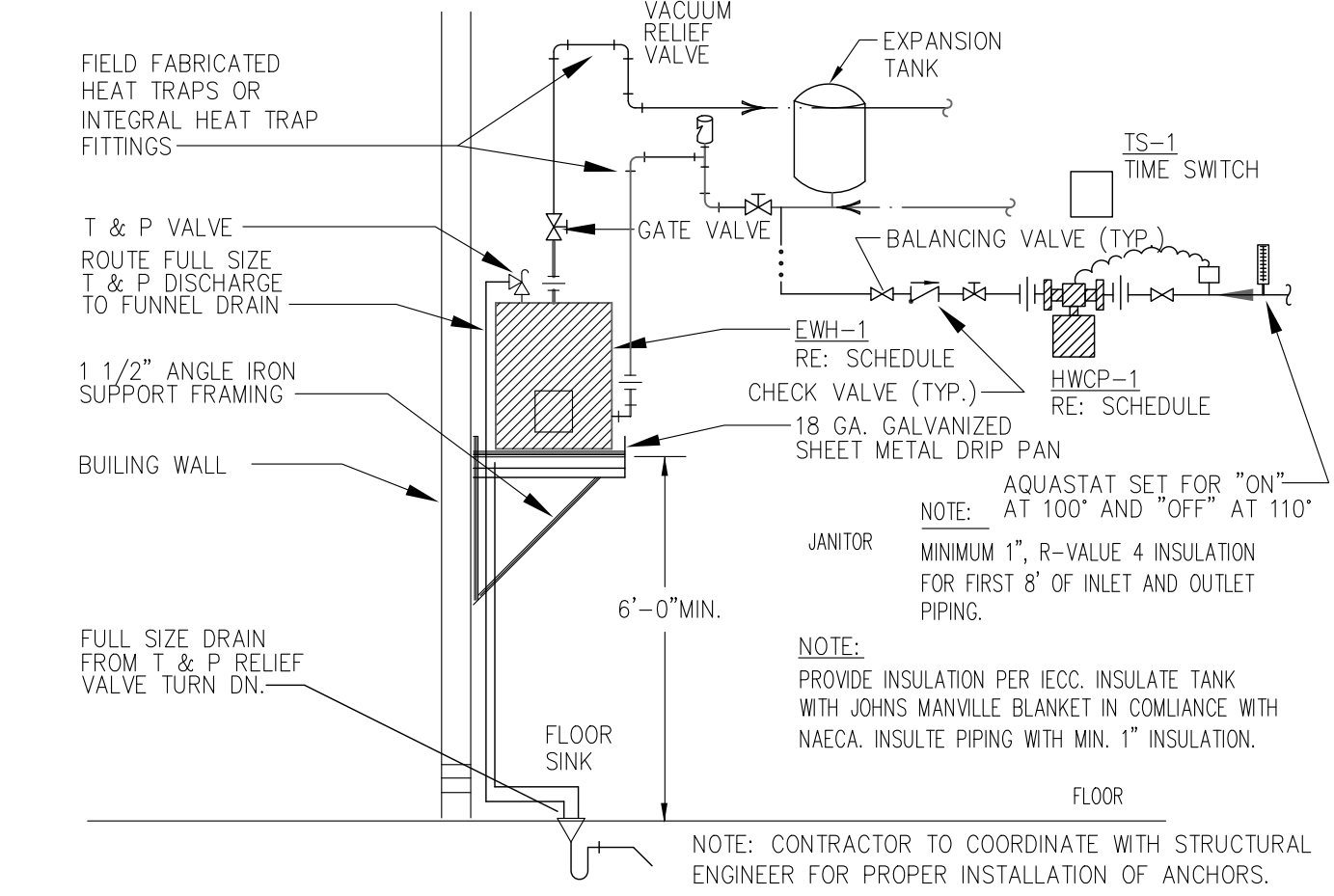




ELEVATOR PIT SUMP PUMP - SP1

SCALE: NONE

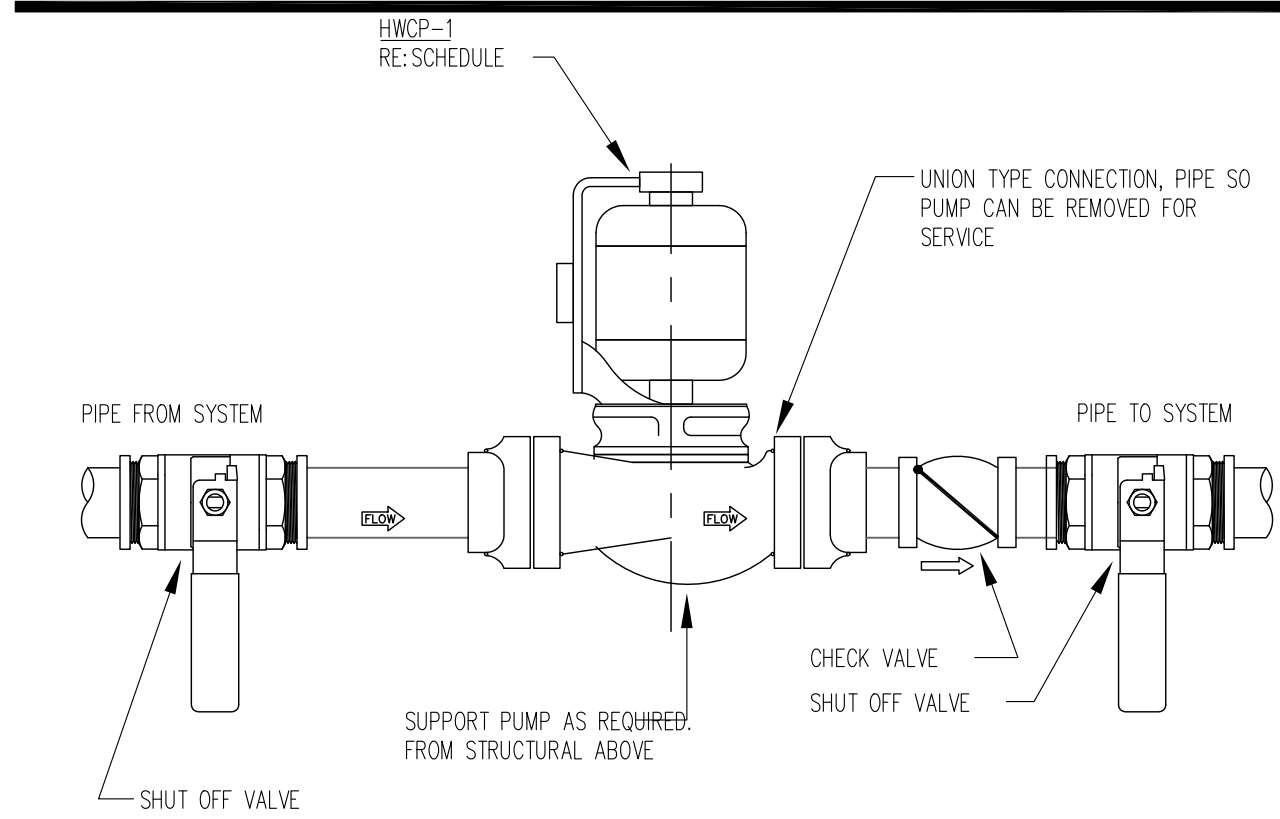
13



ELECTRIC WATER HEATER DETAIL

SCALE: NONE

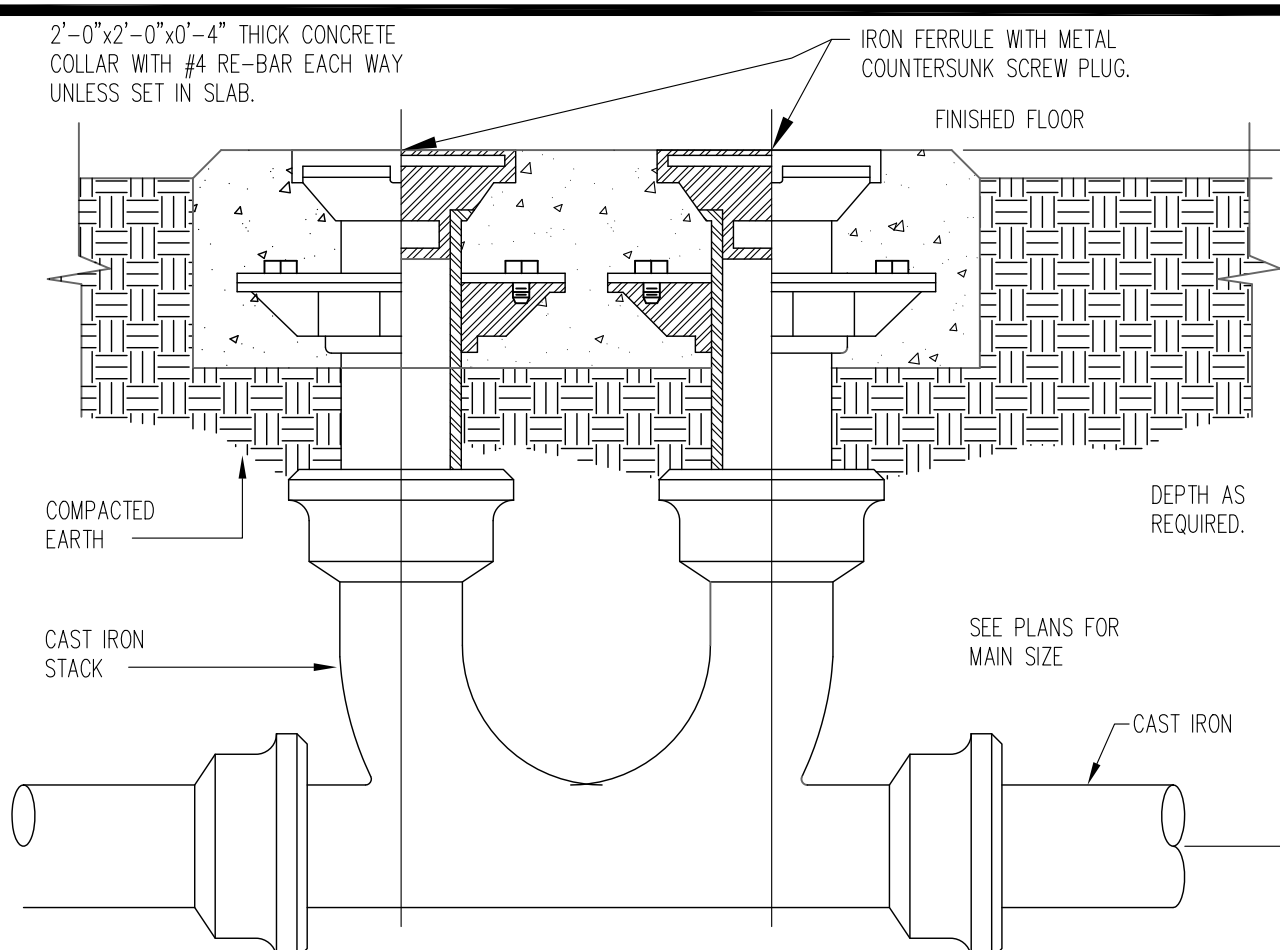
12



IN LINE CIRCULATING PUMP - HWC-1

SCALE: NONE

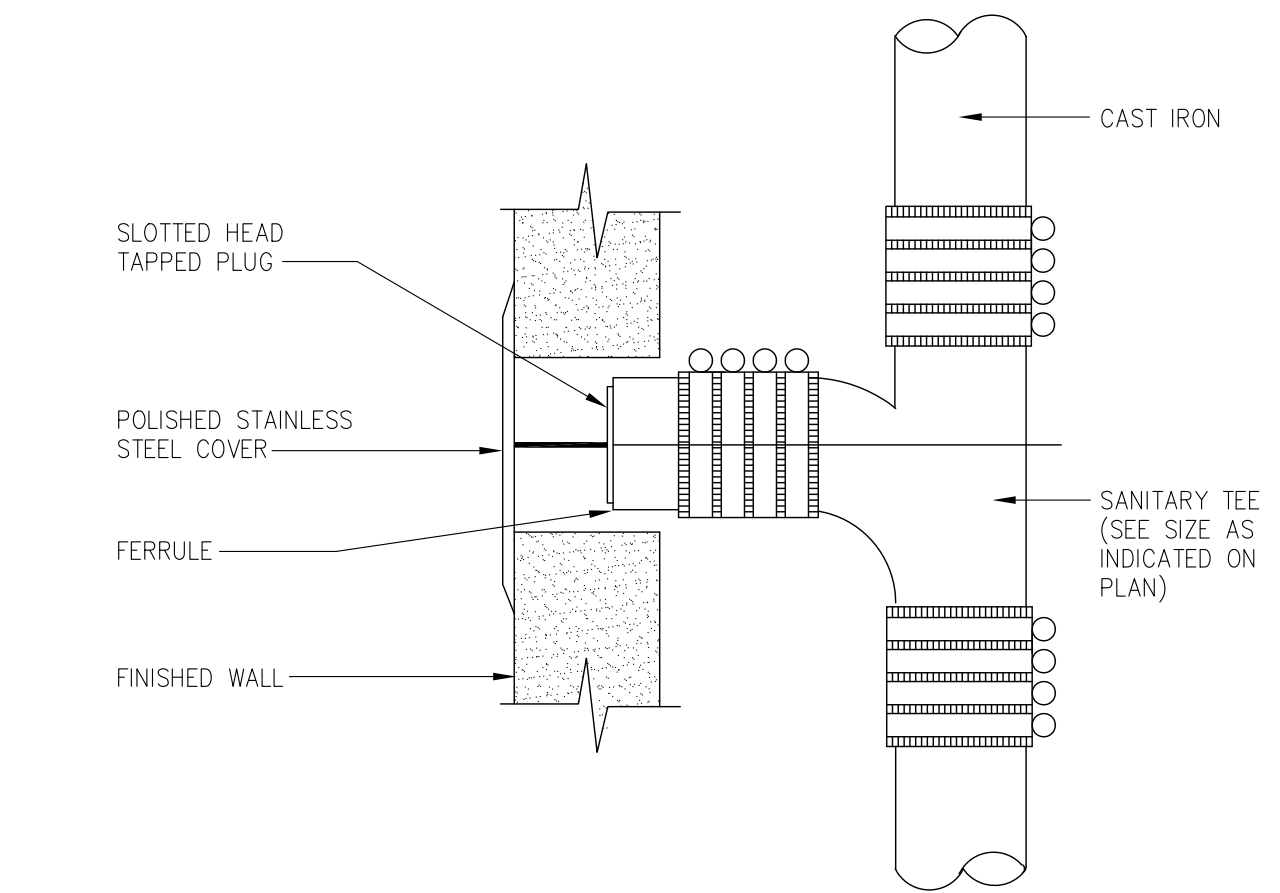
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2-WAY CLEANOUT DETAIL

SCALE: NONE

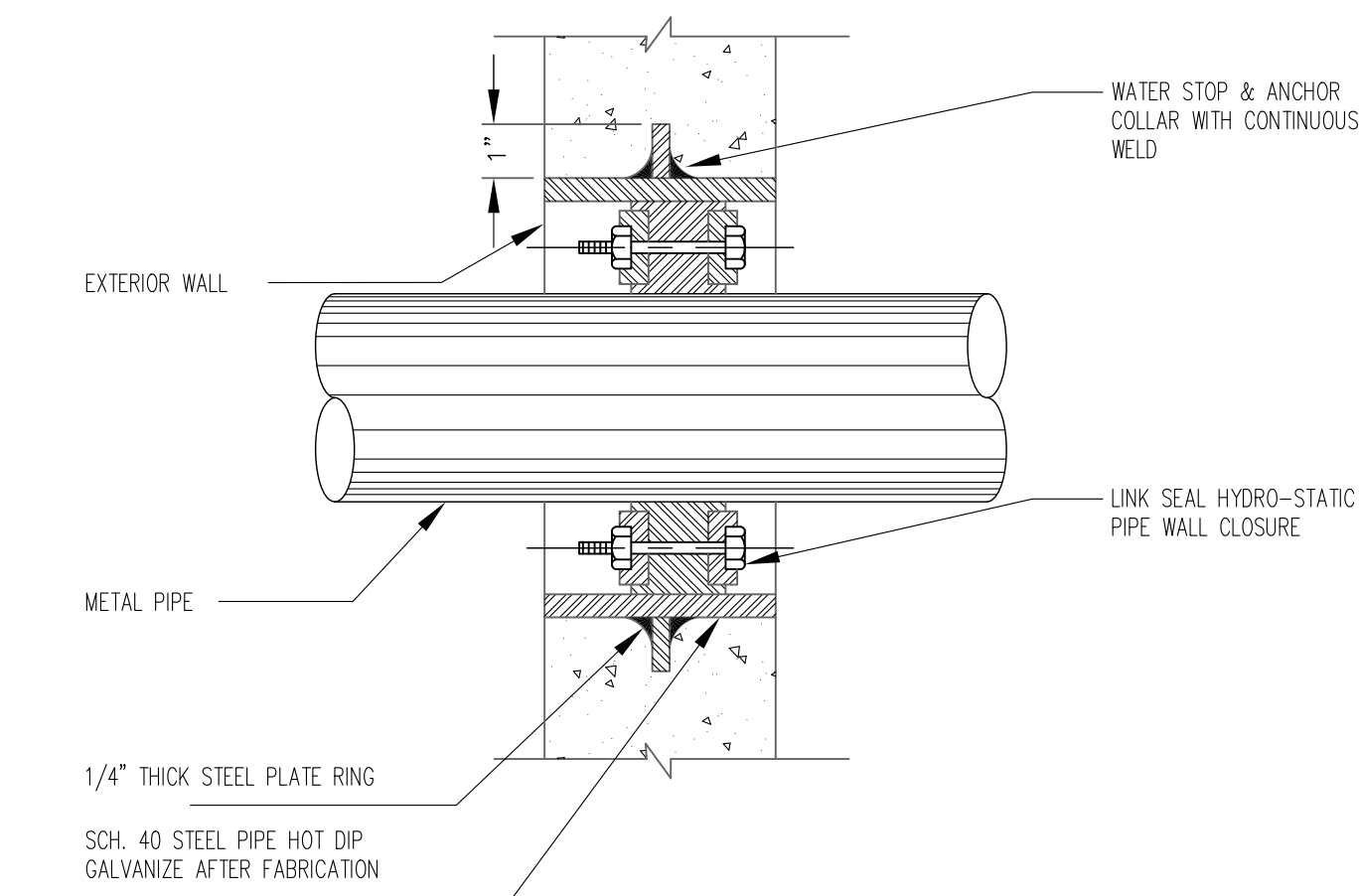
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WALL CLEANOUT DETAIL

SCALE: NONE

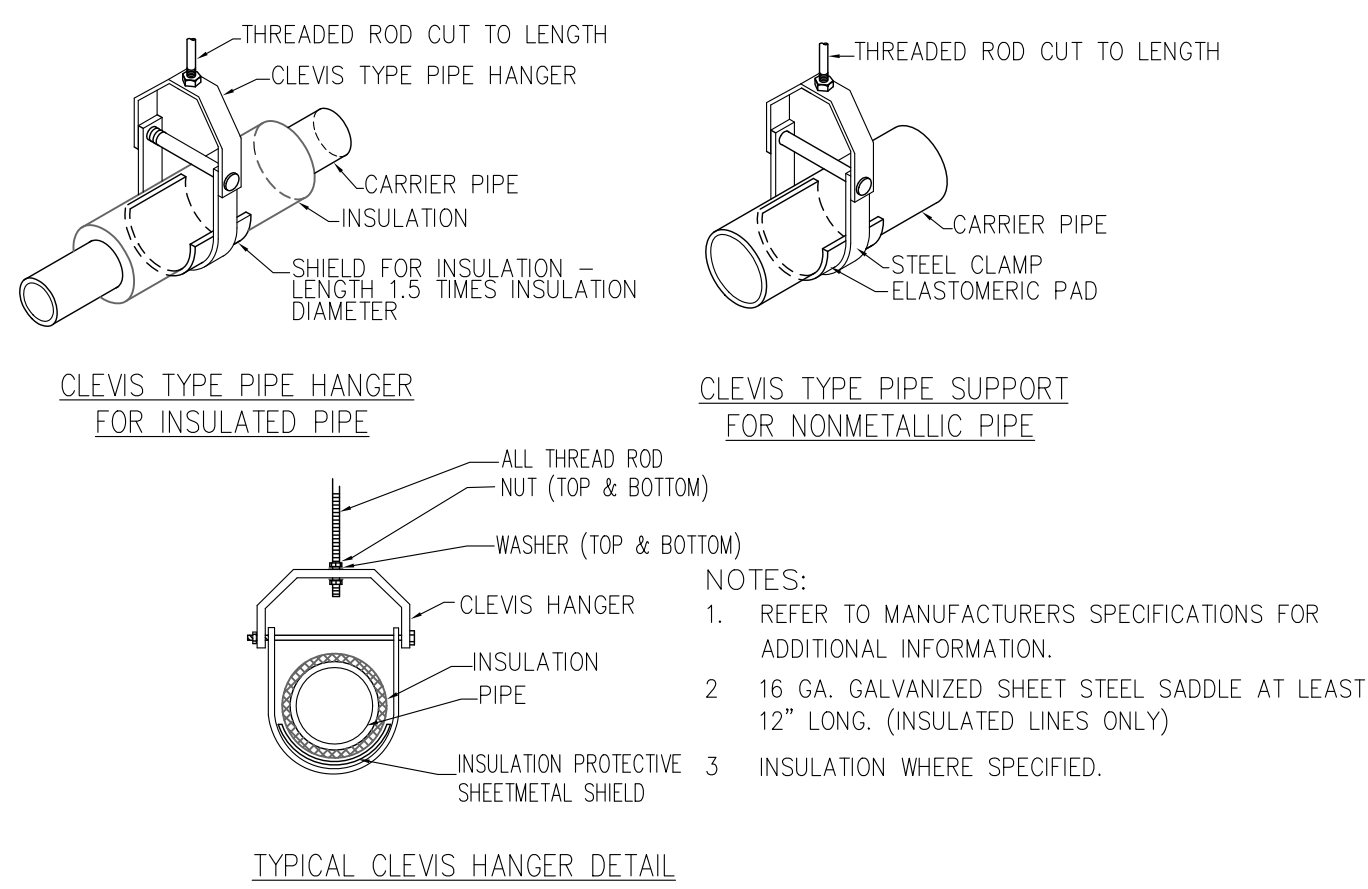
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EXTERIOR WALL SLEEVE DETAIL

SCALE: NONE

08

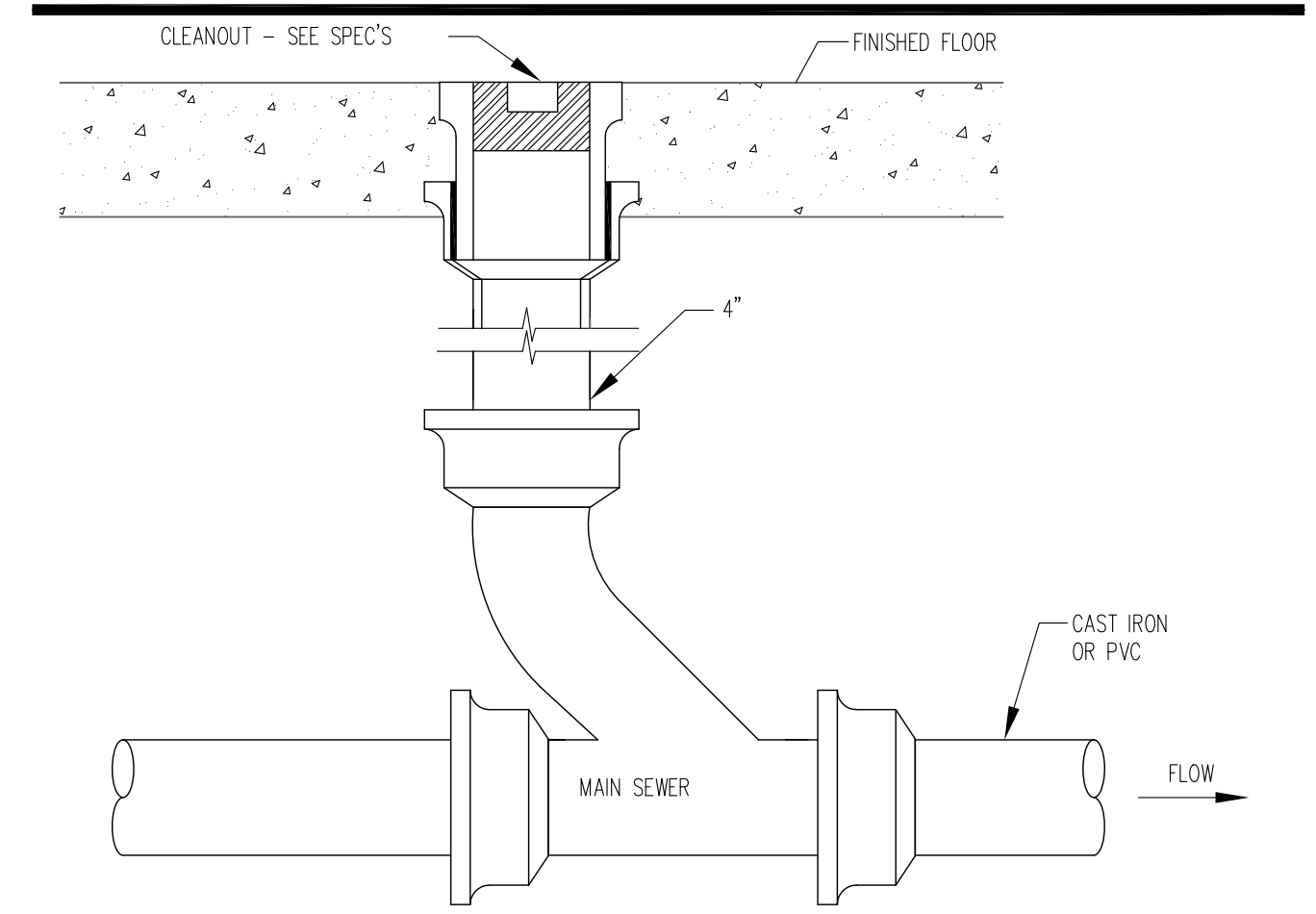


TYPICAL CLEVIS HANGER DETAIL

CLEVIS PIPE HANGER SUPPORT DETAIL

SCALE: NONE

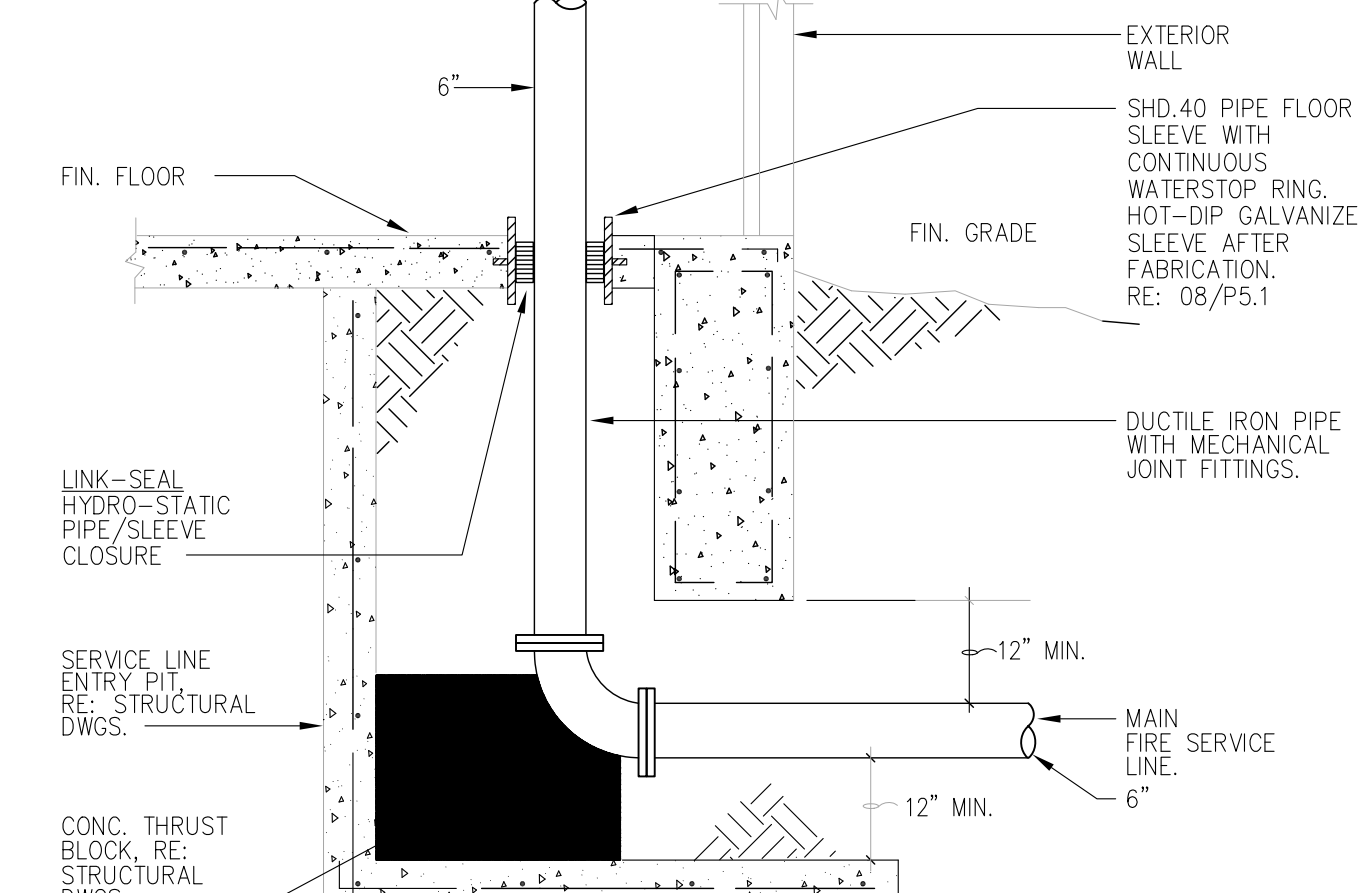
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TYPICAL FLOOR CLEANOUT DETAIL

SCALE: NONE

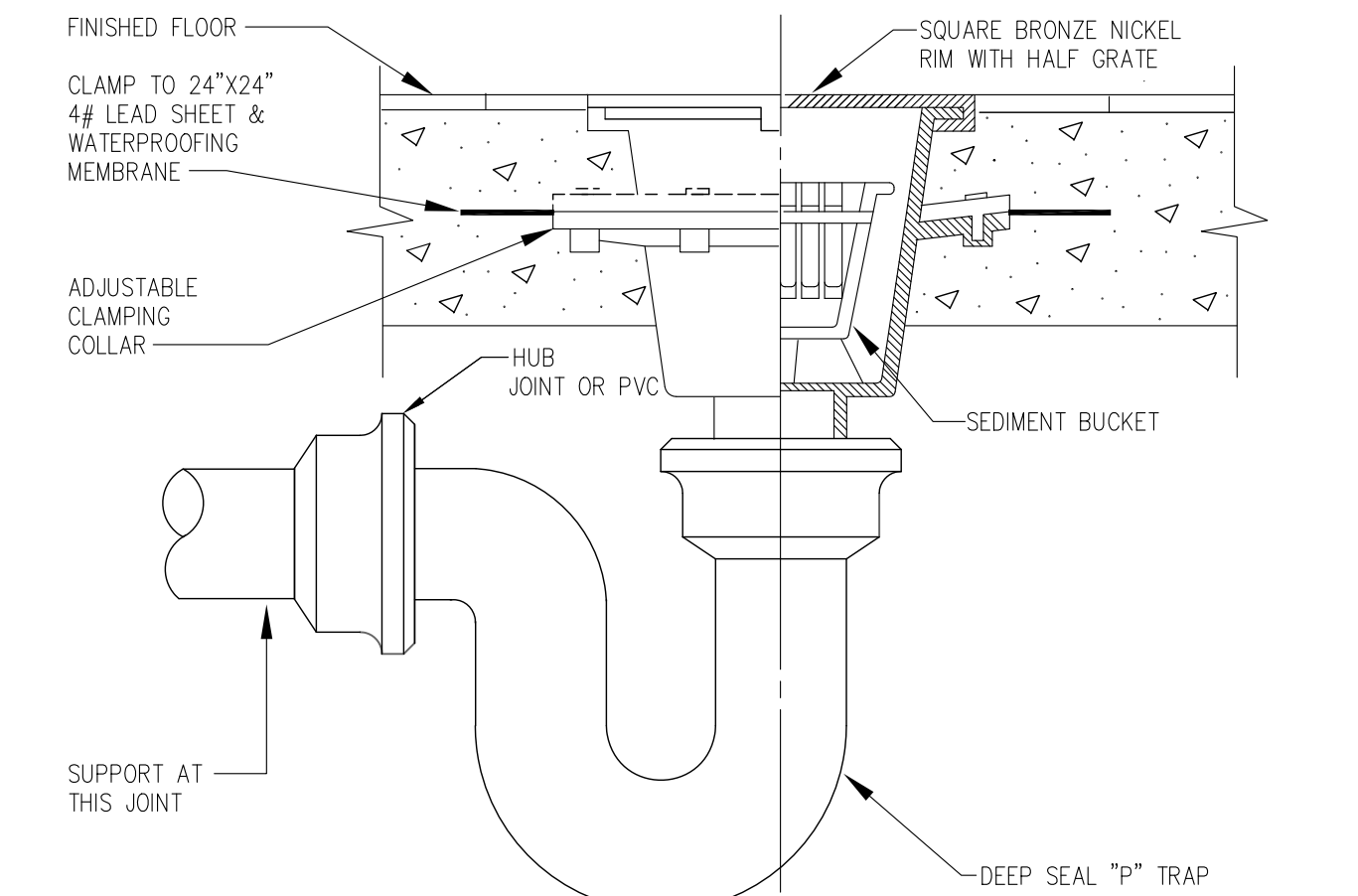
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FIRE PROTECTION SERVICE ENTRY DETAIL

SCALE: NONE

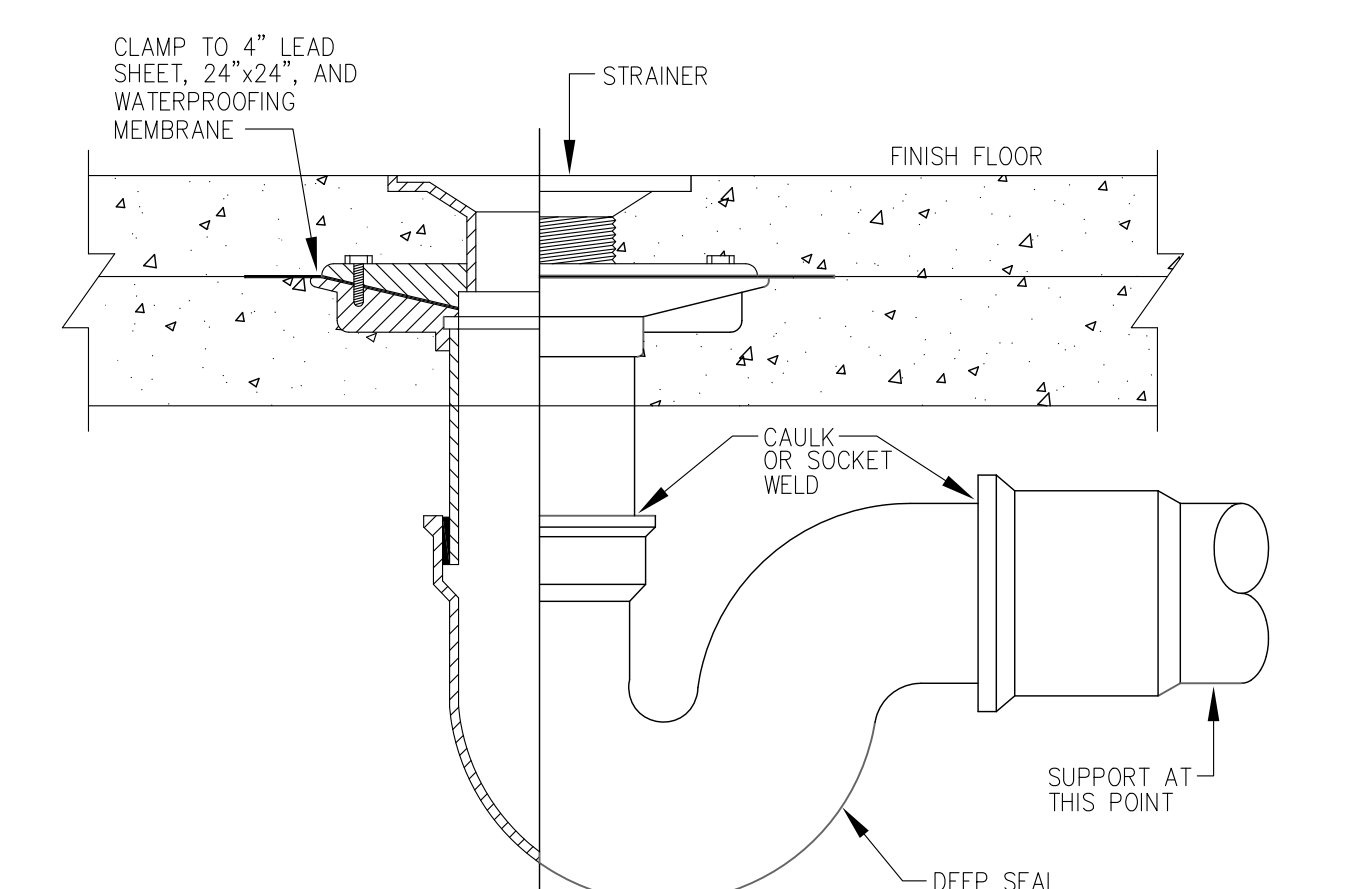
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FLOOR DRAIN DETAIL FD2

SCALE: NONE

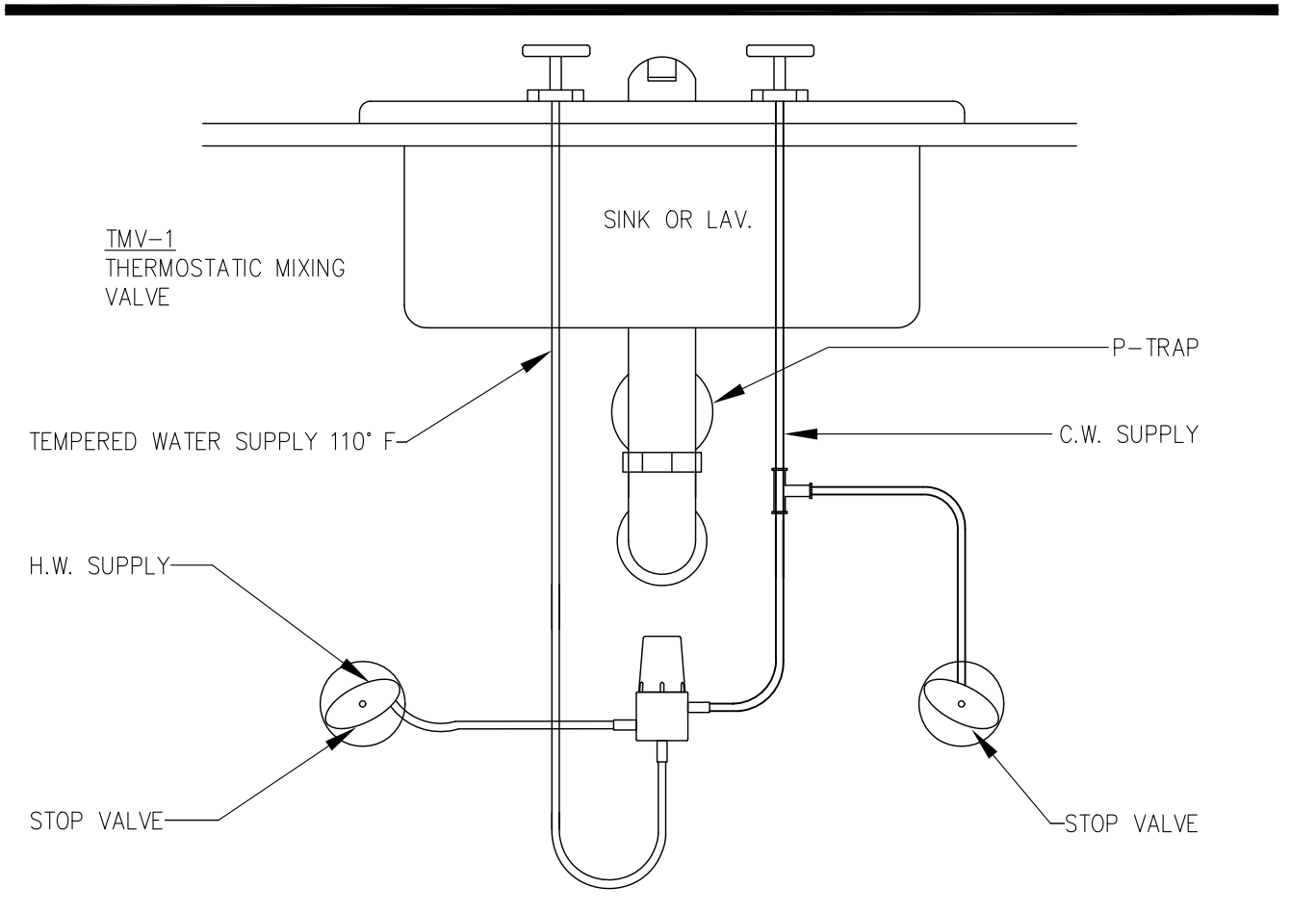
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FLOOR DRAIN DETAIL FD1

SCALE: NONE

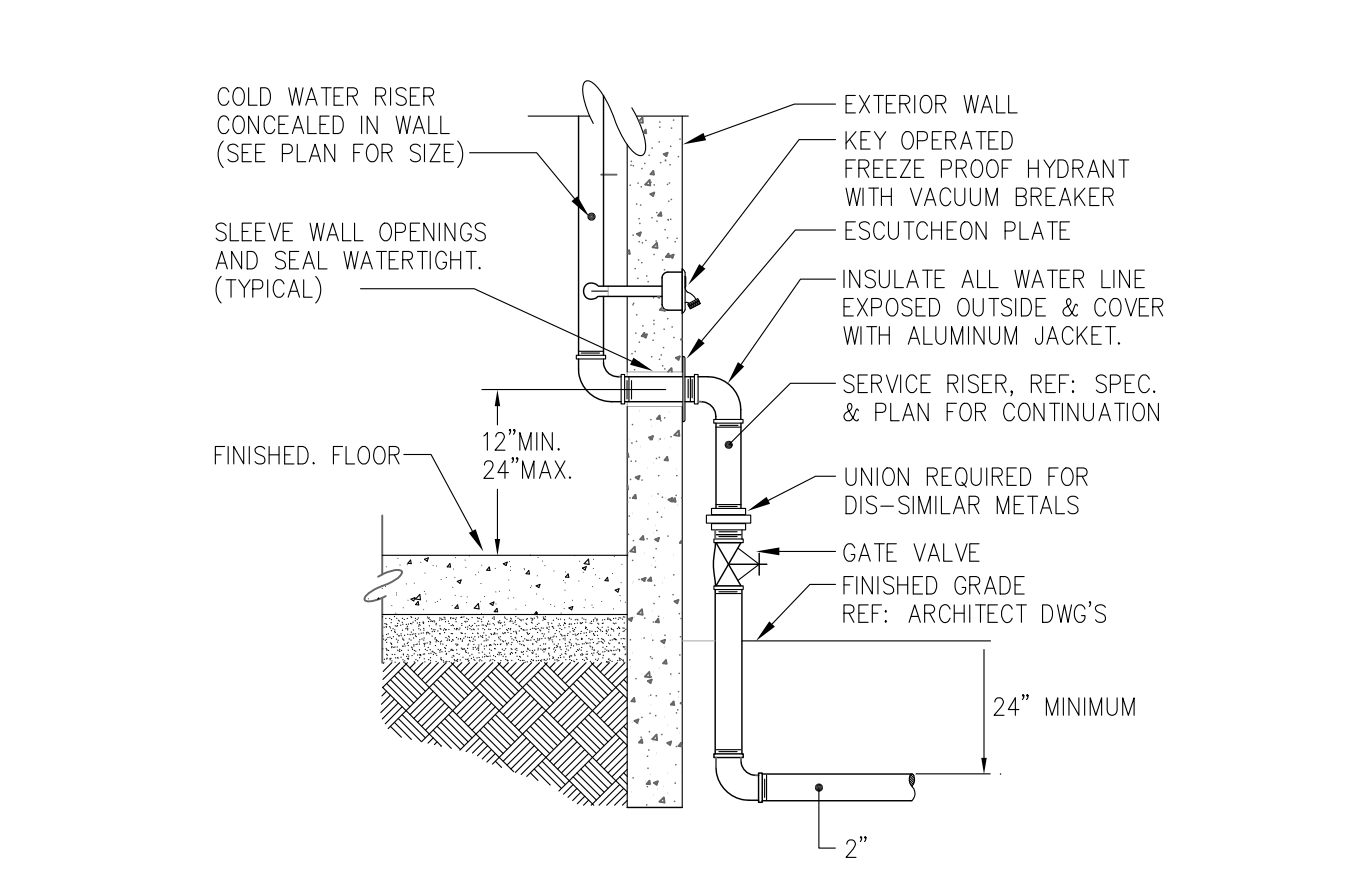
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THERMOSTATIC MIXING VALVE DETAL TMV-1

SCALE: NONE

02

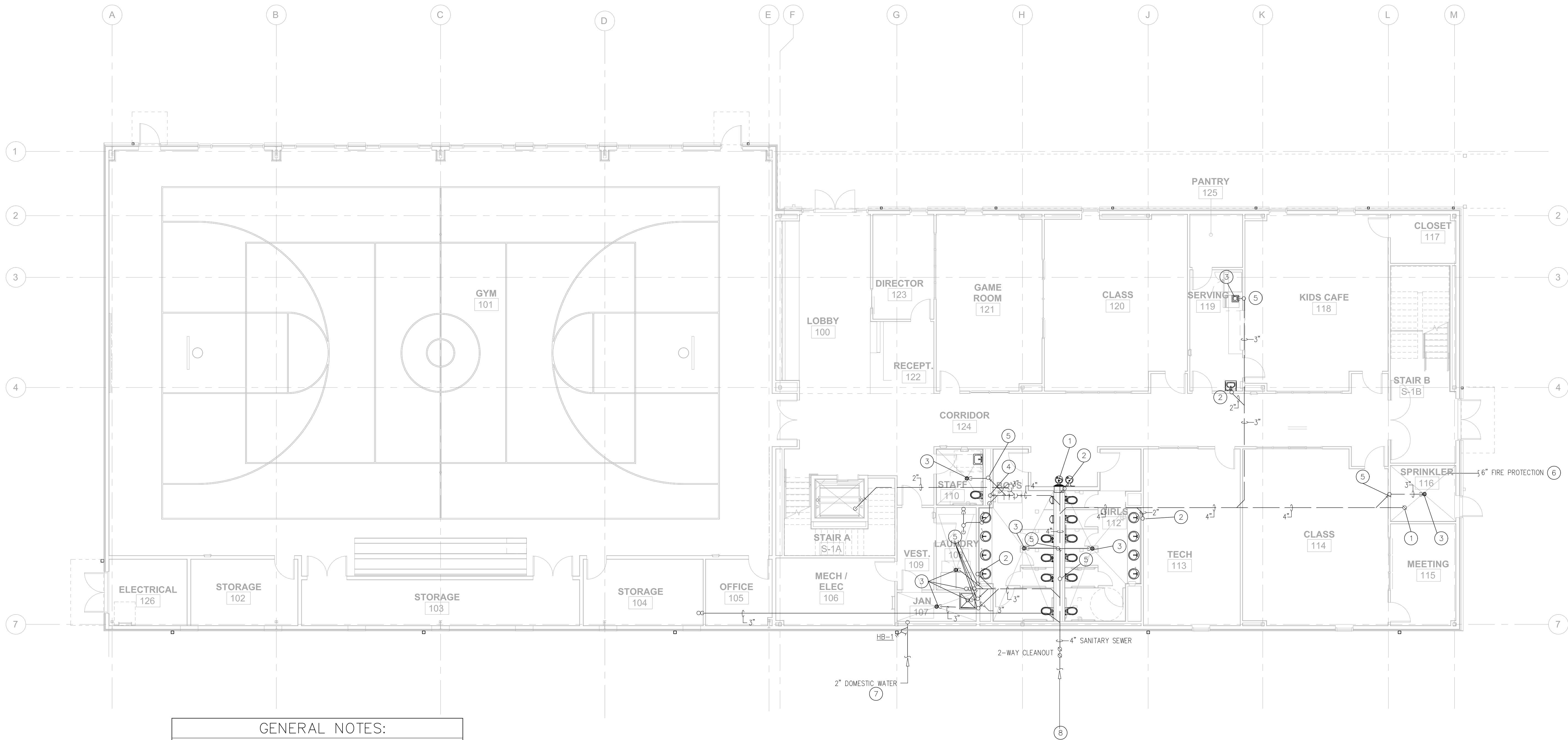


DOMESTIC WATER ENTRY DETAIL

SCALE: NONE

01

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GENERAL NOTES:

- SEE MEP0.1 FOR SPECIFICATIONS.
- FOR PLUMBING FIXTURE INFORMATION AND PIPE CONNECTION SIZES REFER PLUMBING FIXTURE SCHEDULE ON P0.1.
- CONTRACTOR TO INSTALL ALL REQUIRED ACCESS PANELS TO ALLOW FOR OPERATION OF SHUTOFF VALVES FROM BELOW CEILING OR FROM OUTSIDE WALL OF ROOM.

SHEET LEGEND	
— SW —	SANITARY WASTE (SW)
- - - SV - - -	SANITARY VENT (SV)
— CWP —	COLD WATER PIPING (CW)
— HWP —	HOT WATER PIPING (HW)
— HWR —	HOT WATER RETURN PIPING (HWR)
— S —	SHUT - OFF VALVE
— BV —	BALANCING VALVE
— TU —	PIPE TURNING UP
— TD —	PIPE TURNING DOWN
— WFS —	WATER FILTER SYSTEM (WF-1)

GENERAL PLUMBING NOTES:

- REFER TO SHEET P0.1 FOR "SYMBOL LEGEND", ABBREVIATIONS AND ADDITIONAL "GENERAL NOTES".
- ALL THE BASE BUILDING STANDARDS AND SPECIFICATION WHICH ARE PART OF THE CONTRACT DOCUMENTS SHALL APPLY TO ALL WORK INDICATED ON THESE DRAWINGS.
- THE DIVISION 22 CONTRACTOR SHALL COORDINATE THE WORK SHOWN ON THESE DRAWINGS WITH ALL OTHER TRADES. THE DIVISION 22 CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL ITEMS INDICATED ON THIS AND ALL OTHER PLUMBING DRAWINGS AND ALL ITEMS SPECIFIED IN THE DIVISION 15 SPECIFICATION UNLESS IT IS SPECIFICALLY LISTED AS BEING FURNISHED AND/OR INSTALLED BY OTHER.
- REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF ALL WALLS AND CHASES.

PLUMBING KEYED NOTES:

- UP TO FLOOR OR GRADE CLEANOUT.
- 2" SANITARY WASTE UP THROUGH SLAB.
- 3" SANITARY TRAPPED WASTE UP THROUGH SLAB.
- 4" SANITARY WASTE UP THROUGH SLAB.
- 2" SANITARY VENT UP THROUGH SLAB.
- 6" FIRE SERVICE ENTRY—REFER TO CIVIL FOR CONTINUATION AND TO DETAIL.
- 2" DOMESTIC WATER SERVICE ENTRY—REFER TO CIVIL FOR CONTINUATION AND TO DETAIL.
- REFER TO CIVIL FOR CONTINUATION.

01 UNDERFLOOR PLUMBING PLAN  
SCALE: 1/8" = 1' - 0"

**The TOWER COMPANY**  
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FIRM REGISTRATION NO. F-6008



**FORT BEND COUNTY  
NEW COMMUNITY CENTER**

AVENUE E AND SECOND STREET  
ROSENBERG, TEXAS 77471

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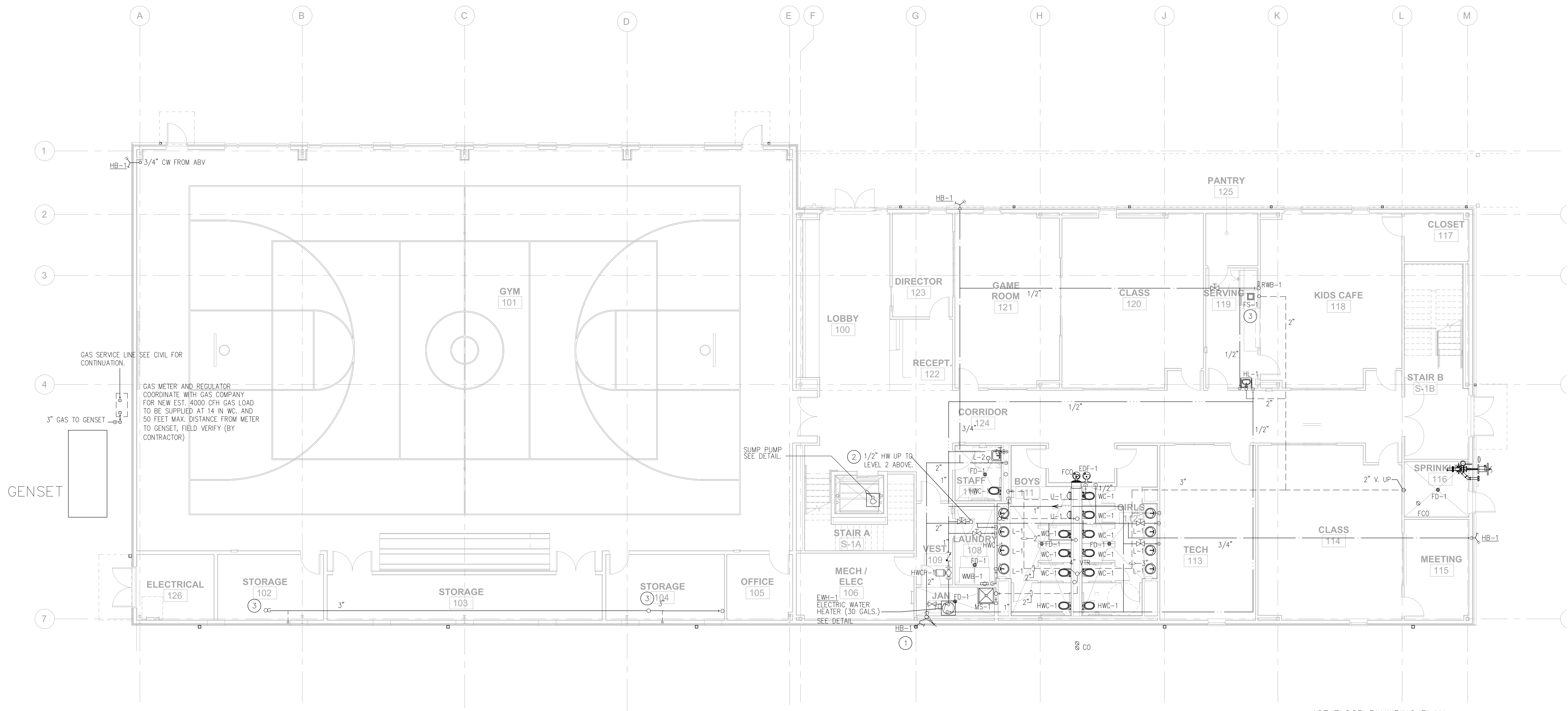
SHEET TITLE

**PLUMBING  
UNDERFLOOR  
PLAN**

SHEET NO.

**P1.0**





01 1ST FLOOR PLUMBING PLAN  
SCALE: 1/8" = 1' - 0"

**GENERAL PLUMBING NOTES:**

REFER TO SHEET P1.01 FOR "SYMBOL LEGEND", ABBREVIATIONS AND ADDITIONAL "GENERAL NOTES". ALL THE BASE BUILDING STANDARDS AND SPECIFICATION WHICH ARE PART OF THE CONTRACT DOCUMENTS SHALL APPLY TO ALL WORK INDICATED ON THESE DRAWINGS.

THE DIVISION 22 CONTRACTOR SHALL COORDINATE THE WORK SHOWN ON THESE DRAWINGS WITH ALL OTHER TRADES. THE DIVISION 22 CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL ITEMS INDICATED ON THIS AND ALL OTHER PLUMBING DRAWINGS AND ALL ITEMS SPECIFIED IN THE DIVISION 15 SPECIFICATION UNLESS IT IS SPECIFICALLY LISTED AS BEING FURNISHED AND/OR INSTALLED BY OTHER.

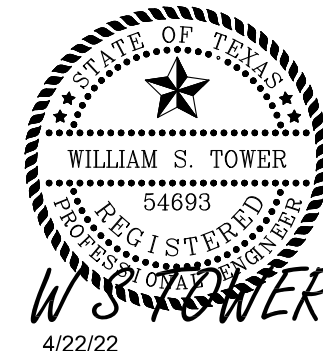
REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF ALL WALLS AND CHASES.

**PLUMBING KEYED NOTES:**

- 1 2" DOMESTIC COLD WATER DROP AND UP TO SECOND FLOOR.
- 2 3/4" HOT WATER DROP AND UP TO SECOND FLOOR.
- 3 PROVIDE WF-1 AND BACKFLOW PREVENTOR AT ICE-MAKER CONNECTION.

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4/22/22

**FORT BEND COUNTY**

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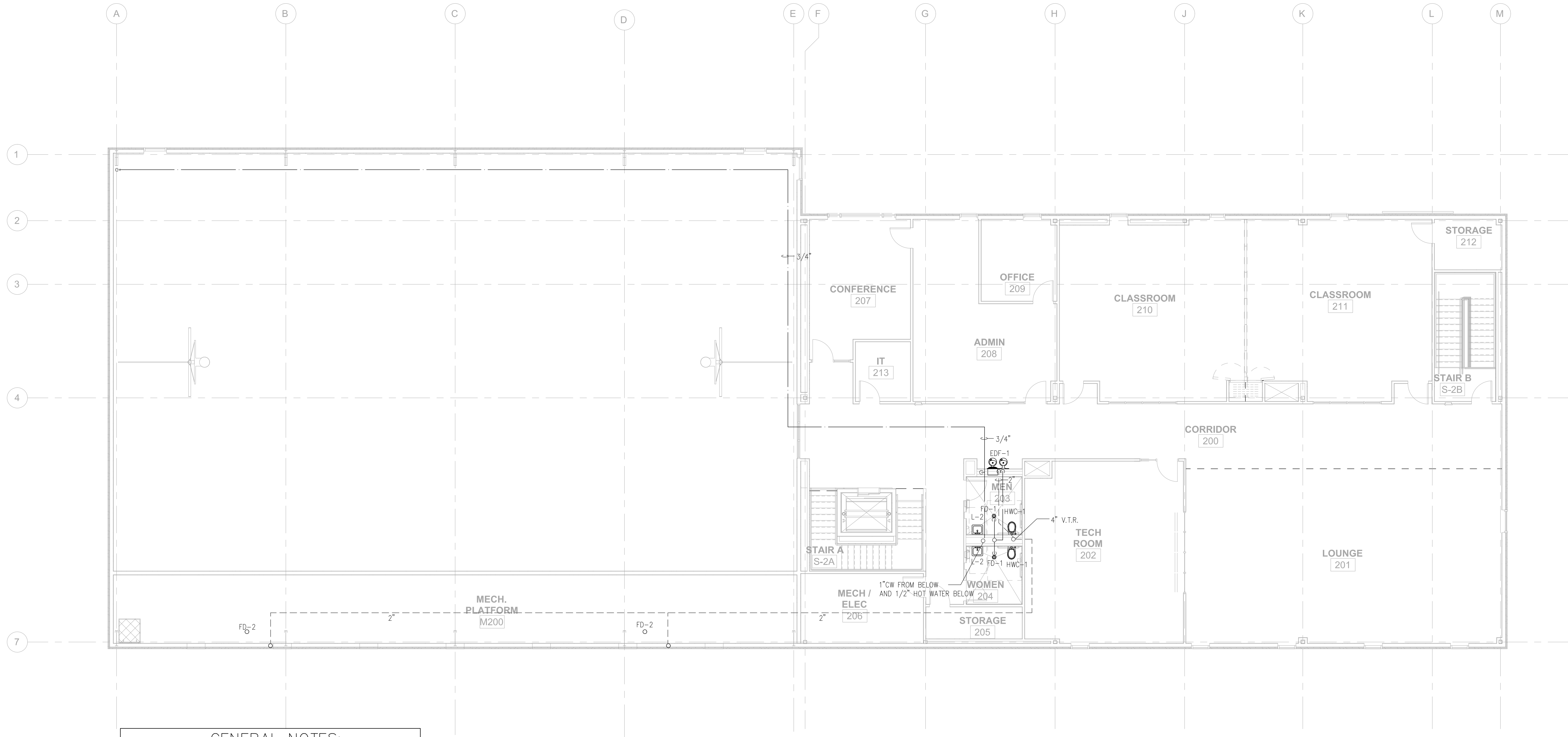
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SHEET TITLE

**PLUMBING  
1ST FLOOR  
PLAN**

SHEET NO.

**P1.1**



GENERAL NOTES:

1. SEE MEPO.1 FOR SPECIFICATIONS.
2. FOR PLUMBING FIXTURE INFORMATION AND PIPE CONNECTION SIZES REFER PLUMBING FIXTURE SCHEDULE ON P.O.I.
3. CONTRACTOR TO INSTALL ALL REQUIRED ACCESS PANELS TO ALLOW FOR OPERATION OF SHUTOFF VALVES FROM BELOW CEILING OR FROM OUTSIDE WALL OF ROOM.

SHEET LEGEND

— SW —	SANITARY WASTE (SW)
- - - SV - - -	SANITARY VENT (SV)
— CWP —	COLD WATER PIPING (CW)
— HWP —	HOT WATER PIPING (HW)
— HWR —	HOT WATER RETURN PIPING (HWR)
— S —	SHUT - OFF VALVE
— BV —	BALANCING VALVE
— TU —	PIPE TURNING UP
— TD —	PIPE TURNING DOWN
— WFS —	WATER FILTER SYSTEM (WF-1)

GENERAL PLUMBING NOTES:

1. REFER TO SHEET P.O.1 FOR "SYMBOL LEGEND", ABBREVIATIONS AND ADDITIONAL "GENERAL NOTES".
2. ALL THE BASE BUILDING STANDARDS AND SPECIFICATION WHICH ARE PART OF THE CONTRACT DOCUMENTS SHALL APPLY TO ALL WORK INDICATED ON THESE DRAWINGS.
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4. REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF ALL WALLS AND CHASES.

01 SECOND FLOOR PLUMBING PLAN  
SCALE: 1/8" = 1' - 0"

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SHEET TITLE

**PLUMBING  
2ND FLOOR  
PLAN**

SHEET NO.

**P1.2**